

Canada's Demographic Future: Some Reflections on Projection Assumptions

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March 3, 2000  
Revised 8 May 2000

Office of the Chief Actuary, Canada Pension Plan, Seminar on Demographic and Economic Perspectives of Canada: Years 2000 to 2050, Ottawa, 17 March 2000  
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## Abstract

*Projections since the start of the Canada Pension Plan have been reasonably accurate with regard to population size, but they have under-projected population aging, and thus the ratio of beneficiaries to contributors. A case is made for long terms assumptions including fertility of 1.6 births per woman, life expectancy of 85, and net immigration of 0.47 per 100 population. By 2026, there will be fewer than three persons aged 20-64 per person aged 65 and over, compared to over six when the program was started. According to medium projections, the proportion 20-64 to 65+ will change from 4.9 in 2000 to 2.2 in 2100. This will also be in the context of a slower growing and aging labour force. Population policies are considered that would seek to avoid population decline and reduce the pace of aging.*

Demographics take on a new meaning in a welfare state, as there is interest to determine the relative well-being of various components of the population, and to plan for improvements. Population projections become more than an academic exercise. For most activities of the welfare state, like health, education and social security, short term projections are sufficient, but for pensions a long term perspective becomes more important, particularly for having a sense of the change in relative numbers of contributors and recipients.

In this historical context, it is useful to observe that some of the first attempts to project Canada's population were rather disastrous. Burton Hurd (1939: 494), who also wrote various census analytic studies, projected that the population of Canada would reach 15.4 million in 1971. At the end of the war, demographers at the Dominion Bureau of Statistics, including Enid Charles and Nathan Keyfitz, projected even lower figures. They projected that the 1971 population would be between 13.8 and 14.6 million (Charles et al., 1946: 19, 34). They further estimated that the population would reach a maximum of 15 million in 1990 (p. 5). We now know that by 1951 the population already reached 14.0 million and by 1971 it was 21.6 million. These projections essentially failed to foresee the baby boom and they also anticipated that international migration would continue to be negligible, as it had been during the depression and the war.

While the Dominion Bureau of Statistics was recovering from these disastrous results by not engaging in projections, others were bolder at the Central Mortgage and Housing Corporation and the Economic Council of Canada. Of course, these projections, associated with housing and economic futures could focus on the relatively short term. Least these institutions be off the hook, it is useful to observe that as recently as its 26<sup>th</sup> annual review, the Economic Council of Canada (1989) was projecting mortality based on the deaths per 1000 population. Having observed that the crude death rate had been constant for some time, it was held constant to 2040 without realizing that this required a rather heroic increase in life expectancy in an aging population. For instance, the projections by Statistics Canada (1990) were expecting the deaths per 1000 population to increase from 7.3 to 13.5 in forty years.

There are various things to criticize in the Statistics Canada projections after this agency took the lead in projections after the 1971 census. Nonetheless, it is useful to observe that the recorded numbers for 2000 on total population (30.8 million) are within the band of these four projections released in 1974 (Statistics Canada, 1974). The closest is Projection B, based on a fertility of 2.2

and net immigration of 60,000 per year, which yielded a 2000 population of 30.4 million. Especially in the context of the changes in definition wherein the non-permanent residents are now considered part of the population, and the adjustments now made for under-enumeration, these are rather accurate results. For the record, the band of projections for the year 2000 in this first generation was 28.2 to 34.1 million. However, there were compensating errors, with fertility being over-estimated and immigration being under-estimated. Consequently, in this Projection B, the population over 65 was projected to be 3,314,800 while the current estimate is 3,805,500, representing a shortfall of 13 percent. In other words, this projection had expected that 10.9 percent of the population would be aged 65 and over, while the current estimate is 12.5 percent.

The United Nations projections for the world population have had similar success in the past 30 years, with medium projections that have been within five percent of the mark. Once again, there are compensations, with the growth of Africa having been under-estimated and that of Europe over-estimated.

While the results are much better than those produced in the early post-war period, it may be because the changes, especially in fertility, have not been at all as volatile as that experienced in the baby boom. When fertility has been within the range of 1.6 and 1.7 for 20 years in Canada, it is not hard to be close to the mark in projections. At the world level, it was much harder to predict when the fertility transition would start in given regions, than to anticipate its trajectory once the decline had started.

As a last historical comment, consider the “reconciliation” released by the Department of Finance (1996) at the time of the 17<sup>th</sup> review of the Canada Pension Plan (Table 1). As can be seen, the “blame” for having underestimated the costs in 1966 can be divided about equally into three components: changed demographics, changed economics and enrichment of benefits. The changed demographics largely refers to not having anticipated below replacement fertility, because the first projections had assumed a total fertility rate stabilizing at 3.0 births per woman. Note that in 1964 the total fertility rate was 3.5, having been as high as 3.9 over the period 1956-60.

**Table 1.**

**Projected CPP costs in year 2030, showing reconciliation  
from 1964 and from 1972**

	Costs as percentage of contributory earnings	
	1964	1972
Costs in 2030 as projected in	5.5	7.3
Changed demographics	2.6	1.5
Changed economics	2.2	2.2
Enrichment of benefits	2.4	1.7
Disability	1.5	1.5
Costs in 2030 as projected in 1997	14.2	14.2

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*Source: Department of Finance, 1996: 20 and special tabulations  
from CPP model.*

As of the 1972 review of the CPP, the ultimate fertility had been changed from 3.0 to 2.2 which made a 1.1 percentage point change in the pay-as-you-go rate estimated for 2030. That is, after this second revision, the changed demographics have accounted for only 1.5 percentage points in the 2030 pay-as-you-go rate, or 22 percent of the change anticipated to 2030 in this 17<sup>th</sup> review. Thus, even before Statistics Canada returned to population projections, the Office of the Chief Actuary of the CPP was doing better on anticipating changed demographics than changed economics or changed benefits. Nonetheless, the gap between anticipated and actual demographics remains substantial.

Given the changes that have occurred since the mid-1960s, a number of the underlying assumptions have had to be revised (Beaujot and Richards, 1996). The mid-1960s were a time of considerable demographic growth in a relatively young population. Families largely followed the breadwinner model, with relatively few lone parents. It was also a time of economic growth, with much confidence that the future would be able to fund an expanding welfare state. Socially, there was interest to expand social security, especially to benefit the elderly who were a significant pocket of poverty (Myles, 2000). Given the relatively small numbers of elderly, it was possible to establish programs without particularly high total costs, anticipating that economic growth would keep up to future costs.

The objectives of this paper are limited to the demographics. After considering the assumptions underlying fertility, mortality, international and internal migration, some results will be presented especially in terms of the ratio of beneficiaries to contributors. The paper will end with some reflections on policy that might seek to attain an optimal demographic future.

## 1. Fertility

In 1964, the ultimate fertility was set at 3.0, this was changed to 2.2 in the 1<sup>st</sup> report of 1969, then to 2.1 in the 6<sup>th</sup> report of 1977, and later to 1.85 as of the 11<sup>th</sup> report of 1988. In the 17<sup>th</sup> actuarial report, the long term fertility is set at 1.7 births per woman (Table 2). The current Statistics Canada projections based on the 1996 census use assumptions of 1.3, 1.5 and 1.8 (Table 3).

**Table 2.**

### Summary of Key Ultimate Demographic Assumptions Used in Previous Reports

Report #	Valuation Date	Ultimate Canada Fertility Rate	Canada Net Migration Rate as a % of the Population	Canada Life Expectancy at age 65 Males 2050*	Canada Life Expectancy at age 65 Females 2050*	Canada e <sub>0</sub> Males 2050	Canada e <sub>0</sub> Females 2050	Internal Migration
0	1964	3.00	0.50	n/a	n/a			
1	1969	2.20	0.50	n/a	n/a			
2	1972	2.20	0.50	n/a	n/a			
3	1973	2.20	0.50	n/a	n/a			
4	1973	2.20	0.50	n/a	n/a			
5	1973	2.20	0.50	n/a	n/a			
6	1977	2.10	0.47	16.0	20.7			
7	1977	2.10	0.47	16.0	20.7			
8	1982	2.00	0.32	17.1	22.4			
9	1982	2.00	0.32	17.1	22.4			
10	1985	2.00	0.32	17.3	22.4			
11	1988	1.85	0.32	n/a	n/a			
12	1988	1.85	0.40	n/a	n/a			
13	1988	1.85	0.40	n/a	n/a			
14	1991	1.85	0.40	n/a	n/a			
15	1993	1.85	0.40	17.8	22.8			
16	1993	1.85	0.40	17.8	22.8			
17	1997	1.70	0.60	18.4	22.8	82.0	87.8	10,000
18	2000	1.60	0.47 0.47*			83.5	86.5	10,000

\*Immigration of 175,000

Source: *Special Tabulation from Chief Actuary, CPP.*  
Assumptions for 2000 by author.

**Table 3.****Assumptions underlying Statistics Canada projections from 1971 to 1996 censuses**

Projection	Total fertility rate						Life expectancy M/F		
				Immigration			H	M	L
	L	M	H	L	M	H			
1971 census	1.8	2.2	2.6	120,000	...	160,000		70.2/78.3	
1976 census	1.7	...	2.1	125,000	150,000	175,000		70.2/78.3	
1981 census	1.4	1.66	2.2	100,000	...	150,000		74.9/81.6	
1986 census	1.2	1.67	2.1	140,000	...	200,000		77.2/84.0	
1991 census	1.5	1.7	1.9	150,000	250,000	330,000	81.0/86.0	78.5/84.0	77.0/83.0
1996 census	1.3	1.5	1.8	150,000	210,000	270,000	81.5/85.0	80.0/84.0	78.5/83.0

Source: Statistics Canada, 1974: 26, 59; 1979: 21, 29; 1985: 27, 41; 1990: 12, 26; 1994: 59

Statistics Canada, Demography Division, special tabulations

It is useful to observe that most Canadian demographers involved in projections took some time to conclude that fertility would go **below replacement and stay there**. In the first generation of projections, a high of 2.6 was used, anticipating that what comes down would go back up again. The evolving demographics even passed through the low estimate of 1.8 by 1978, four years after the projections were released. While lower numbers were subsequently used for the high projection, the projections following the 1976, 1981 and 1986 censuses all used replacement fertility as a high assumption, just as those following the 1971 census had used it as a medium assumption (Table 3). There has been a tendency for demographers to consider that there is something magical about 2.1: if fertility is going down it will stabilize at 2.1; if it is below replacement it will return to 2.1. The same applies to United Nations projections, with a focus on when less developed countries will reach replacement fertility, and the use replacement fertility for the ultimate high assumption for more developed countries. Evolving patterns in a number of countries show that the trends pay no attention whatsoever to the figure of 2.1.

This fixation with replacement fertility can also be seen in the CPP projections, which were still anticipating an ultimate fertility of 2.0 in 1985 even though we had not seen such figures since 1976. When the assumption was changed to 1.85 it was held at this level into the 16<sup>th</sup> report (1993), even though we had not seen such figures since 1975. This tendency to anticipate higher fertility is also observed in the sensitivity analyses done in the CPP reviews. For instance, in the 14<sup>th</sup> report, the sensitivity studied was between 1.85 and 1.95 (Office of the Superintendent, 1991: 9). Given that lower fertility presents more problems for the plan, one would think that sensitivity analyses would especially focus on the prospect of fertility being lower than anticipated. In effect, the 17<sup>th</sup> review used a sensitivity between fertility of 1.5 and 1.9 (Office of the Superintendent, 1998: 35).

Clearly, the questions regarding fertility are whether it has bottomed out, might it decrease further in the long term, and might it increase? Reflections on these questions need to consider the

**dynamics of fertility in modern societies.** Most of the theoretical interpretations start with a demographic transition from high to low levels of childbearing (Beaujot, 2000: 240-242). While this first transition is clearly over, the dynamics of a second transition are less understood. The first transition involved a change especially in the economic value and cost of children, and a changed cultural orientation toward the advantages of controlling one's reproductive destiny. The second transition has especially involved family change. Observing similar changes over a number of modern societies, Lesthaeghe (1995) has proposed that there are three stages in this transformation. The **first stage**, from about 1960 to 1970 involved the end of the baby boom, the end of the trend toward younger ages at marriage, and the beginning of the rise in divorces. The **second stage** from 1970 to 1985 involved the growth of common law unions and eventually of children in cohabiting unions. The **third stage** since 1985 involves a plateau in divorce, an increase in post-marital cohabitation (consequently a decline in re-marriage), and a plateau in fertility due in part to higher proportions of births after age thirty.

**Table 4. SUMMARY STATISTICS ON FAMILY CHANGE, CANADA, 1941-96**

	1941	1951	1961	1971	1976	1981	1986	1991	1996
Total fertility rate (average births per women)	2.8	3.5	3.8	2.1	1.8	1.7	1.6	1.7	1.6
Median age at first marriage	23.0	22.0	21.1	21.3	21.6	22.5	23.9	25.1	26.3
Brides									
Grooms	26.3	24.8	24.0	23.5	23.7	24.6	25.8	27.0	28.3
Divorces per 100,000 married couples	-	180	180	600	990	1180	1302	1235	1222
Common-law couples as a percent of all couples	-	-	-	-	0.7	6.4	8.2	11.2	13.7
Births to non-married women as a percent of all births	4.0	3.8	4.5	9.0	10.9	14.2	18.8	28.6	36.3
Births to women aged 30+ as a percent of all births	35.6	36.2	34.1	21.6	19.6	23.6	29.2	36.0	43.7
Lone-parent families as a percent of all families with children	9.8	9.8	11.4	13.2	14.0	16.6	18.8	20.0	22.3

Notes: For 1941-71 births to non-married women are designated as illegitimate births.

Data for 1995 are shown as 1996 for divorce and births to non-married

Source: **Beaujot, 2000: 89**

Table 4 presents some statistics that capture these trends in the Canadian case. In terms of the first stage, the average **births** per woman, as measured by the total fertility rate, had reached a peak of 3.9 in 1957, declined to 2.2 in 1971, and has been very stable at about 1.6 to 1.7 births per woman

over the whole period 1980 to 1996 (into the third stage). The median **age at first marriage** declined over this century to reach a low of just over 21 years for brides and 23 years for grooms in the early 1970s, then increased to ages 26 and 28 for women and men respectively in 1996. The law permitting **divorces** on grounds other than adultery dates only from 1968. Per 100,000 married women, there were under 200 divorces in each year over the period 1951-1966 compared to 1,000 in 1976 and 1,200 in 1996. **Cohabiting** unions were not specifically enumerated in the 1976 census, although some 0.7 percent of couples indicated that they were living common-law. By 1986, most of the Statistics Canada data no longer distinguished between married and cohabiting couples. The 1996 census determined that 13.7 percent of couples were cohabiting. The 1995 General Social Survey found that among persons born between 1951 and 1970, two out of five have lived in a cohabiting union, and over half of first unions taking place since 1985 have been cohabitations rather than marriages (Dumas and Bélanger, 1997: 135, 139). The proportion of births occurring to women who are **not married**, and who are now largely cohabiting, increased from 9 in 1971 to 36 percent in 1996. In the third stage, we find that by 1990, half of divorced persons aged 30-39, and more than a third of those aged 40-49, were in **cohabiting** relationships (Dumas and Péron, 1992: 50). Besides the stable **fertility** of 1.7 births per woman over the period 1980-96, the proportion of births occurring to women **aged 30 and over** increased from 19.6 percent in 1976 to 43.7 percent in 1996. These changes in births, marriage, cohabitation and divorce have brought fewer children, but also a higher proportion of children who are not living with both biological parents. In particular, lone-parent families as a proportion of all families with children increased from 11.4 in 1961 to 22.3 in 1996.

These data also confirm the uniqueness of the 1950s as a period between the two demographic transitions. Various authors have observed that this was a period when life was family centred. Not only was this the peak of the **baby boom**, but it continued the trend of a **marriage rush**, as marriage occurred at young ages and high proportions of persons married at least once in their lives. It was possibly a "golden age of the family," where many families corresponded to the ideal of domesticity, and consequently there was less variability (Skolnick, 1987: 6-16). However, not all was ideal in this golden age, with women in particular growing restless for more diversified roles and opportunities. The unusualness of the immediate post-war period indicates that it should not be used as a base for projecting trends.

While the second transition has involved much change, especially in terms of the flexibility for entering and exiting from unions, it is useful to recognize that there are also some stable patterns. There is a delay in entry into marriage, and even into relationships, and thus a higher proportion of young persons living in the parental home or on their own. But at ages 30-54 there is a strong commonality of experience involving living in a relationship, having children and working (Beaujot, 1995a). For older persons, there is also an increase in living alone, due in part to differential mortality of women and men. However, in the middle of adult ages there is not much change in the propensity to live alone. In some regards non-traditional families have increased, in particular lone-parent families, cohabiting couples, couples without children, and living alone. However, in some other regards families and households have become less diversified: households now mostly consist either of one family with no additional persons, or of one person living alone (Péron et al., 1999).



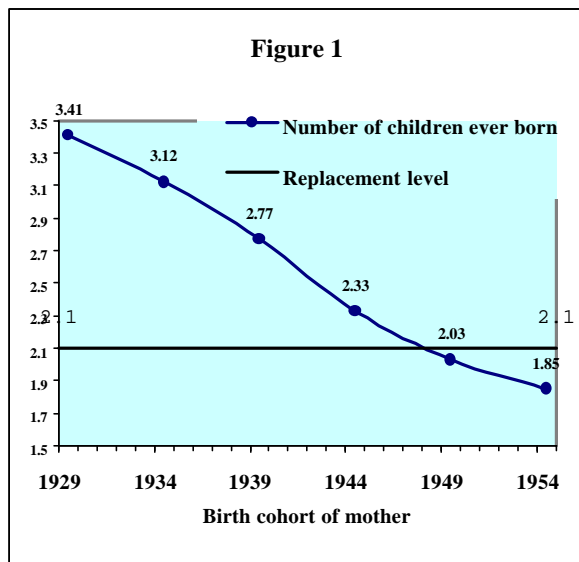
Returning to the fertility trend, the period 1961-76 saw much change in levels, while the subsequent 20 years has seen remarkably stable patterns, with *cohort fertility* around 1.8 births per woman (Beaujot, 2000: 234-237). What has changed in the last 20 years is the age patterns, toward later ages at childbearing ( Figure 1, Tables 5 and 6).

Table 5. Women by five year birth cohorts, 1927-1956, and number of children ever born, 1995

---Birth Cohort---

	(1952-56)	(1947-51)	(1942-46)	(1937-41)	(1932-36)	(1927-31)
Number of children						
0	19.1	12.8	12.1	10.7	13.0	10.5
1	14.6	13.7	9.5	11.1	12.0	7.4
2	38.3	42.1	41.5	26.1	15.9	24.8
3	19.6	23.0	21.1	27.4	16.7	10.9
4	7.1	6.8	6.8	8.0	16.1	13.3
5+	1.3	1.4	8.9	16.8	26.4	33.1
Children per women	1.85	2.03	2.33	2.77	3.12	3.41

Source: Beaujot, 2000: 236.



Source: Ford and Nault 1996:44

Table 6. Distribution of age-specific fertility, Canada, 1966-96

	1966	1976	1986	1996
15-19	8.5	9.4	7.3	6.8
20-24	30.1	29.8	24.9	21.1
25-29	29.1	35.6	37.3	33.6
30-34	18.4	17.9	22.6	26.8
35-39	10.2	5.9	6.9	10.0
40-44	3.4	1.2	1.0	1.6
45-49	0.3	0.1	0.0	0.1
Total	100.0	100.0	100.0	100.0
Total Fertility Rate	2.81	1.80	1.60	1.62

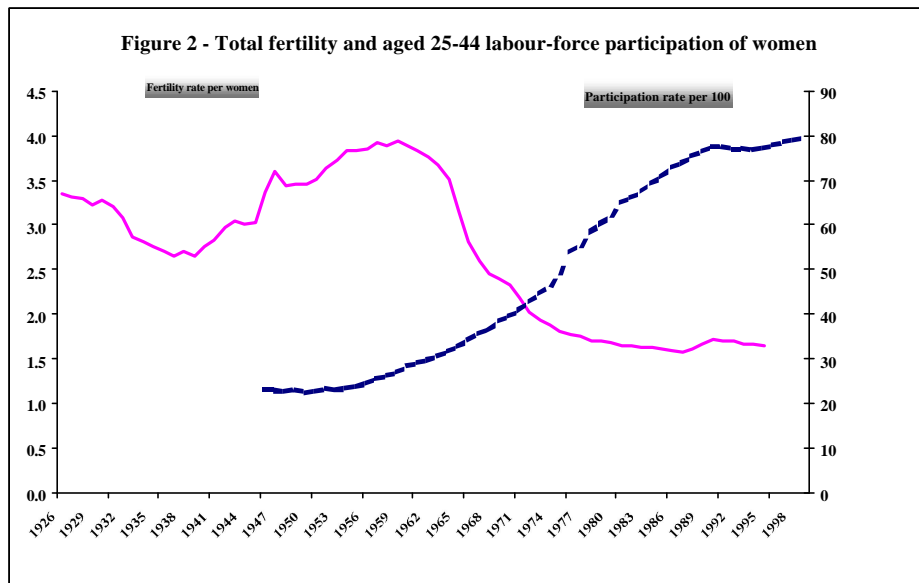
Source: Beaujot, 2000: 237.

Putting these fertility and family changes into a larger context, it is useful to consider three levels of analysis: proximate factors, the value and cost of children, and the place of women and men in relations of production (Beaujot, 2000: 243-265).

The *proximate factors* of childbearing that are particularly relevant are the later entry into unions, higher cohabitation, and more secure contraception. While births clearly occur in cohabiting unions, the rates are lower than in marriages (Beaujot, 1995a: 50; Dumas and Bélanger, 1997: 159; Dupuis, 1998: 3). In addition, the instability of relationships is probably the main reason why people do not have the intended number of children. The increased security of contraception does not apply to teenagers, where fertility rates have been stable over the last 20 years, in spite of half of pregnancies being aborted (Beaujot, 2000: 301, 305; Wadhera and Millar, 1997).

The *value and cost* of children to parents has changed in a variety of ways, but it is useful to appreciate that children still represent important values to most adults. One value can be called the joy of interacting with children, seeing them grow, and the sometimes unexpected joys of interacting with adult children. Another value is the security of having someone in life; given that marital relationships are less secure, children represent a kind of insurance against the risk of being alone in life. The costs of children include the direct and opportunity costs, along with psychic costs like those associated with labour force withdrawal or interruptions, and the risk of being left alone to raise children.

At the macro level, it is particularly useful to consider childbearing in the context of the place of women and men in *relations of production*. In that light, Figure 2 is particularly useful. Many have observed that childbearing has gone down as women's labour force participation has gone up. However, it should be observed that this inverse relation is largely limited to the period 1960-1975. Before 1960, the relationship was not inverse as women were having more children, but also staying at school longer and participating more in the labour force. In the last 20 years, fertility has been stable while labour force participation has continued to increase, although less so in the early 1990s. My interpretation would be that the contradictions between production and reproduction are less significant when there are one or two children, when these few children are born later, and when men take more of the responsibility for caring activities (Beaujot, 2000: 175-230). In the period 1976-96, the difficult economic situation of young men may have contributed as much as the higher labour force participation of women. As there is a greater orientation toward co-providing and co-parenting, the average age at childbearing will probably continue to increase. This reflects the needs of both men and women to delay childbearing until they are better able to handle the trade-offs between investing in themselves and investing in reproduction. There are some indications from Sweden that women have more births when men show a greater willingness to absorb some of the cost of children (Olah, 1996). Nonetheless, couples who have a more balanced division of both paid and unpaid work are more likely to be living with fewer children (Beaujot, 2000: 225).



Source: Beaujot, 2000:259.

In light of these observations, I would not anticipate a significant further reduction in childbearing. It may even be that the 1.55 which we see in 1997 under-estimates the levels given the continuing trend toward delayed childbearing. Anticipated childbearing, especially for younger persons, is significantly above these levels (Table 7). Especially if we manage to have supportive policies, on which I will return, it may be that 1.6 or even 1.7 remains a good prognosis for the long term future. While it is necessarily dated, cohort fertility is at 1.75. That is, I would suggest a figure

higher than the 1.5 used as the medium assumption by Statistics Canada. Nonetheless, sensitivity analyses should be undertaken with fertility of 1.3 and 1.8 which are the low and high assumptions from Statistics Canada.

Table 7. Intended number of children by age and sex, Canada, 1990

	---Number of children intended---					Average
	0	1	2	3	4+	
<b>Males</b>						
15-29	6.0	4.9	52.2	26.3	10.6	2.31
30-34	8.5	9.8	49.4	23.3	9.1	2.19
35-39	10.5	10.2	52.6	17.0	9.7	2.10
40-44	13.0	13.0	42.7	21.9	9.1	2.03
<b>Females</b>						
15-29	6.8	6.0	47.9	28.4	10.7	2.30
30-34	7.7	11.5	51.1	21.7	8.0	2.12
35-39	15.7	11.3	47.0	18.3	7.7	1.93
40-44	15.1	12.3	42.8	21.1	8.7	2.00

Source: Beaujot, 2000: 236.

## **2. Mortality**

Turning to mortality, we can make a similar use of past projections to the effect that anticipated change has been conservatively projected in the assumptions adopted. Just as it was hard to think that fertility could move permanently to below replacement levels, the tendency has been to anticipate a certain capping of improvements in life expectancy. Notice, for instance, that the ultimate life expectancy has had to be increased from generation to generation in the projections, and that it has never been decreased. Notice also that the tendency to under-project the change in fertility and mortality both work in the same direction of under-projecting pension recipients in comparison to contributors. As a specific example, the first generation of Statistics Canada projections had used an ultimate life expectancy of 70.2 for men and 78.4 for women, which was to be reached in 1986, while the 1996 estimates are 75.7 for men and 81.4 for women (Statistics Canada, 1999b: 10). Since the fourth generation, the Statistics Canada projections have used more than one set of assumptions, but the medium projections from the latest generation still use an ultimate life expectancy of only 80.0 for men and 84.0 for women (Table 3). The ultimate life expectancy underlying the 17<sup>th</sup> revision of the Canada Pension Plan is 80.2 for men and 87.7 for women (Office of the Superintendent, 1998: 20; 1993: 35).

Another example of this conservative orientation occurs in the special attention to AIDS in the projections for the Canada Pension Plan (e.g. Office of the Superintendent, 1988: 41; 1993: 35-37). While incorporating AIDS makes for a more fully elaborated projection of mortality, which has been necessary in the case of Africa, exponential growth can sometimes be short-lived, even in the case of a disease for which there is no cure.

There seems to be a natural tendency to pay attention in particular to things that are getting worse, without paying sufficient attention to things which are getting better. As of 1971, it was thought that the improvements in life expectancy were reaching some limit, and in effect the improvements had been declining from census to census, yet the changes over the period 1971-76 were larger than had been observed since 1951-56. It was also being anticipated that the divergence between women and men would continue to grow (Gee and Veevers, 1983). At a 1978 conference, I proposed that the 1976 divergence, of 7.3 years, was the end of an era of increasing differences. In effect, this divergence has now decreased to 5.8, not because women are dying more as some pessimists had thought, but because men have made significant gains.

It was largely unanticipated in the early 1970s that adult mortality would recede significantly. In effect, much of the previous gains had been due to reductions in infant and childhood mortality, along with less deaths of women in childbirth, and by the early 1970s there was little room for further improvements in these forms of mortality. But we subsequently saw improvements in cardiovascular mortality, then in accidental deaths, and now in cancer mortality (Dumas and Bélanger, 1997: 49-66; Belliveau and Gaudette, 1995). That is, all three of the modern causes of death are in decline. We can usefully speak of a fourth phase of the epidemiological transition toward delayed degenerative diseases and hybrid causes (Bah and Fernando, 1991). Delayed degenerative means that cardiovascular and cancer deaths are occurring at older ages. Hybrid mostly means “man made,” an over-confidence that produces recklessness in the face of danger. Certainly HIV-AIDS follows this pattern in terms of reckless sexual activity, however in other regards such as driving too fast and especially drinking and driving, the risks have declined.

The proximate factor or *cause of death*, requires a fuller analysis in terms of risk factors and treatment. It is probably safe to say that, for many major causes of death, both of these are in significant improvement, and there is room for further change. In terms of *risk factors*, with the exception of certain categories of youth, there is increased concern about health in areas ranging from diets and exercise, to harmful substances like smoke (Galambos and Tilton-Weaver, 1998; Millar and Beaudet, 1996). For accidental deaths, not only are there concerns with regard to greater safety measures at home, at work and on roads, but there has been a greater recognition of certain dangers such as drinking and driving. Especially with regard to cancer where the declines are slight, environmental quality may be an important avenue thought which to reduce risks, but this may be particularly difficult to achieve in a world where standards of living depend on high use of energy and other environmentally unfriendly forms of consumption.

It is the *treatment factors* that are particularly hard to predict, because they involve scientific and technological advances. While we complain about the under-funding of the health system, and rent seekers in that system are particularly apt at pointing to the deficit, there are several bases for optimism. First there is the high quality of the personnel in the health system, which would predict technological advance. Secondly, there is a public that is very sympathetic to further public

spending for health. Finally, there is a growing willingness to seek help from the health system; the interactions with the system are increasing much faster than population growth or aging would predict.

While it is easy to have 20/20 hindsight to the effect that we were conservative in anticipating past changes, are we being conservative in anticipating further changes? I think so. In the high assumption from Statistics Canada, the ultimate life expectancy is 81.5 for men and 85.0 for women. The reduction of the differential, to 3.5 years, is in the right direction, but it could even be lower. Without having any data, Keyfitz (1989) has suggested that the biological basis for this differential could be as low as three years. The United Nations uses a projection model where the highest possible life expectancy is 85. Why not use that for Canada, which is among the handful of top countries in the world. Thus I would propose figures of 83.5 for men and 86.5 for women. Around this figure, the sensitivity analysis which uses 50% and 150% of the improvements in rates by cause of death seems sensible.

### **3. Immigration**

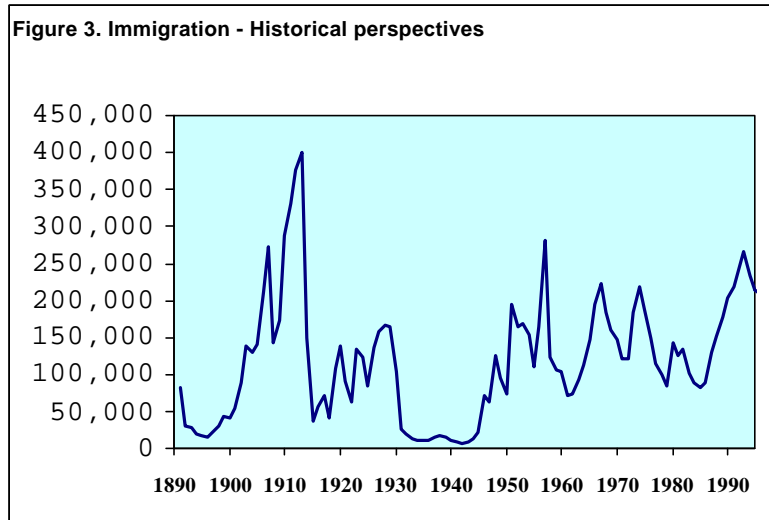
Mortality has a certain simplicity in the sense that everyone dies, and only once, of a given cause, and there are also certain biological constraints for fertility, but migration is considerably more complex. Some live and die in the same place, others are always moving, and some even return to where they started. While people are adventurous, especially when they are young adults, my orientation is to think that there is a natural tendency not to move.

Staying represents integration in family and community, and consequently it is at life course stages and other circumstances when individuals are less integrated that there is a tendency to move. Contrary to the view that there would be more and more movement in a modern world, much movement is associated with life course changes like leaving home, going to school, getting a job, starting or ending a relationship, retiring and entering an old-folks home. When people are at stages where they are more prone to move, the push and pull factors have much to do with where they move (Beaujot, 1991: 162-164; Goldscheider, 1971).

Especially when considering international migration, there are also various barriers between places of origin and potential places of destination. These barriers, represented especially by policy, are probably the main way in which to understand shifting trends (Beaujot and Matthews, 2000). At the very least, we need to appreciate that levels of immigration are a function of things happening within Canada and others happening outside of the country, both in the short and longer terms.

In some ways, the only regularity that can be seen in immigration to Canada is that when the trend has been upward it has ultimately come down, and when the trend has been downward it has ultimately gone back up (Figure 3). Thus the key difficulty has been to predict the point of inversion. Given the near impossibility to predict these short term fluctuations, the tendency has been to hold immigration constant, either in terms of absolute numbers, net numbers, or as a proportion to population size. Thus the challenge in formulating assumptions is that of choosing an appropriate figure to hold constant.

As seen in Table 2, the Canada Pension Plan projections were using a net migration rate of 0.50 percent of population as of the first report, which was reduced as low as 0.32 in the early 1980s, then increased to 0.60 in the 17<sup>th</sup> report. Clearly, the lower levels in the early 1980s reflected the orientation of the then Liberal government to reduce immigration during this economic recession, in spite of the argument from the Conservative opposition who saw this as a mistake.



Source: Beaujot, 1998b:97

The Statistics Canada assumptions have followed a similar pattern, but we can also see a tendency to increase the medium assumption from the first (1971 census) to the fifth (1991 census) projections (Table 3). The range in assumptions has also increased over these projections, in part because actual immigration was soon above the high assumptions that were used in generations 3 and 4 (1981 and 1986 censuses). Nonetheless, I have argued that the range used in the projections following the 1991 census was excessive. While it represents 1.0 percent of the receiving population, it is hard to envisage a scenario where immigration would be in excess of 300,000 per year, year after year. The demographers may have been too susceptible to the posturing that was occurring in political parties.

What drives immigration? There is clearly no shortage of a potential pool of people who want to come to Canada, and these outside pressures are probably increasing (Golini, 1996; Castles and Miller, 1993). The factors that have been analysed from within Canada have been especially economic and demographic, but I would propose that they should be seen as more social and political. At various times, the case has been proposed that Canada needs immigrants, either for economic growth or to overcome demographic stagnation. These are strong arguments. While immigration is probably favourable to economic growth, is it far from being a major factor (Economic Council of Canada, 1991). Immigration can sustain demographic growth, but it can do little to counter the more serious problem of population aging.

The fact that unemployment is one of the better predictors of immigration can probably be mostly interpreted in social and political terms (Veugelers and Klassen, 1994; Foot, 1994; Simmons, 1994). In spite of the research to the effect that immigration contributes little to unemployment,

there is a social and political tendency to be less favourable to immigration when economic conditions are more difficult (Palmer, 1996, 1999). That is, when the social mood is more favourable, there is a tendency to see immigration positively, especially in terms of increasing the cultural richness of Canada and contact with a broader pluralistic world, to say nothing of our interest in being generous to the disadvantaged. When the climate is less favourable, there is a sense that we should first look after ourselves, or a felt need to retrench, to reduce the pace of change. Some theorists have seen natural tendencies toward opening and closing over intervals of time (Klapp, 1978).

Politically, the orientation has often been to follow the social climate, and thus not to deviate excessively from public opinion. Nonetheless, it is interesting to observe that the Conservative government continued its orientation of “planned controlled growth” through the recession of the early 1990s. The party was on record as having judged it a mistake on the part of the Liberal government to have reduced immigration in the recession of the early 1980s. In addition, the governing party was at an all-time low in political opinion in the early 1990s, having alienated various groups from the West who wanted more say in government, to business interests, and those from Quebec seeking a renewed constitution. It may be that the party saw in the interest groups surrounding immigration, both multi-cultural groups and business interests, as one of the ways through which they could make public opinion inroads in these difficult political times (Foot, 1994).

If this interpretation is correct, to the effect that receptivity to immigration is mostly a function of social climate and political opportunity, then predictions of changes in trends are particularly difficult. This also indicates that extending a short term level (say the last three or five years) is subject to considerable difficulty. However, an average over a longer term has a better chance of catching the swings in terms of both opening and closing. For instance, as a low assumption, one could use the average of the entire post-war period, and as a high assumption that of the past ten years (150,000 and 200,000 respectively).

Reporting in the middle of the 1980s, the MacDonald Commission had suggested moving toward levels of immigration that corresponded to the average for the entire post-war period, which could be justified in the sense that the country had accommodated and taken advantage of such levels in the past and could also do so in the future (Table 8). The average of the 1990s may be risky because it is still a short period which may have been unusual for the political reasons just mentioned. It does have the advantage of providing a high assumption, although still not as high as the 270,000 used in the current generation from Statistics Canada. Since only one assumption is to be used, how about the average of the two, that is 175,000 along with a sensitivity analysis using the high and low from Statistics Canada (150,000 and 270,000).



Table 8. Immigration, emigration and contribution to population growth, Canada, 1851-2001.

	Population (at end of period)	Immigration	Average immigration (% of population)	Emigration	Contribution to population growth
1851	2,523,000				
1851-61	3,230,000	352,000	1.22 %	170,000	23.0%
1861-71	3,689,000	260,000	0.75 %	410,000	-32.6%
1871-81	4,325,000	350,000	0.87 %	404,000	- 8.5%
1881-91	4,833,000	680,000	1.49 %	826,000	-28.7%
1891-1901	5,371,000	250,000	0.49 %	380,000	-24.2%
1901-11	7,207,000	1,550,000	2.46 %	740,000	44.1%
1911-21	8,788,000	1,400,000	1.75 %	1,089,000	19.7%
1921-31	10,376,700	1,200,000	1.25 %	970,000	14.5%
1931-41	11,506,700	149,000	0.14 %	241,000	- 8.1%
1941-51	14,009,400	548,000	0.43 %	379,000	7.9%
1951-61	18,238,200	1,543,000	0.96 %	463,000	25.5%
1961-71	21,962,082	1,429,000	0.71 %	707,000	21.7%
1971-81	24,820,382	1,429,000	0.61 %	636,000	28.6%
1981-91	28,030,864	1,381,000	0.52 %	490,000	27.7%
1991-98	30,300,422	1,556,000	0.67%	328,000	54.1%
1991-2001(est.)	31,048,284	1,881,000	0.64%	428,000	48.2%

Sources: *Beaujot and Matthews, 2000: Table 1.*

There is a certain demographic elegance to using rates rather than absolute numbers. For emigration, a rate expressed either per population or per immigration makes much sense. It is the

existing population that is emigrating, and the two flows are linked because a considerable proportion of emigration consist of people who were immigrants (Beaujot and Rappak, 1989). However, for immigration, the base should be the population outside of the country, and the political discussion of levels mostly focuses on absolute numbers.

Nonetheless, it is useful to convert the above assumptions into net immigration rates. For the low assumption, the average immigration rate for the period 1951-2001 is 0.688 (Table 8). In this period, emigration represented 35 percent of immigration, thus the net immigration rate would be 0.45. In the period 1991-2001, the immigration rate of 0.64 needs to be reduced by an emigration of 23 percent to produce a net immigration rate of 0.49. For one assumption, the average of the two would be 0.47.

#### **4. Internal migration between Quebec and the ROC**

The proposed conceptualizations of internal migration are indicated above, where social and life-course questions, associated with extent of integration in community, are more responsible for whether people move, and economic questions more responsible for the choice of destination when people do move.

In the Statistics Canada projections, alternative scenarios of internal migration are suggested to the provinces in order to arrive at a set of compatible alternative assumptions where each province feels comfortable with at least one of the scenarios. An analysis of past projections has shown that the central interprovincial migration assumption has tended to under-project both out-migration for provinces losing population and in-migration for those gaining (Beaujot, 1997). This is probably a natural tendency in projections, to downplay the role of volatile factors, especially if they are politically sensitive.

The question of internal migration becomes simpler when only Quebec and the rest of Canada are considered as regions. Nonetheless, it is useful to observe that there is considerable in and out movement, producing a net which could easily change. For instance, as a yearly average in 1996-97 and 1997-98, there were 40,732 departures from Quebec and 23,305 arrivals from other provinces, producing a net of only 17,445. The net has been negative each year over the period 1976-98, ranging from 4,774 to 30,382. The trend was downward from 1976-81 to 1986-91. The average over the period 1986-98 is 10,600. The CPP assumption in the Seventeenth Actuarial Report uses a net departure of 10,000 per year (Office of the Superintendent, 1998: 20). This remains a reasonable assumption.

A better analysis of this question would take advantage of the rather different migration propensities of the French and English speaking populations of Quebec and the Rest of Canada. In terms of the French of Quebec and the English of the Rest of Canada, these two regions operate somewhat as separate countries in migration terms (Termote, 1995; Newbold, 1996). Recent immigrants are also more likely to move, and it is largely for reasons of lack of linguistic assimilation into the French majority, and the propensity of the non-French immigrations to leave, that immigration does not work as well for Quebec as for the rest of Canada (Beaujot, 1998a). If a more careful analysis was to be made in terms of propensities to move between Quebec and the

rest of Canada, it would take into account the significantly different rates for these various population groups.

The general tendency for Quebec to lose population through internal migration is likely to continue. This relates to a variety of factors including the general westward movement on the continent, and particularly the ascendancy of Toronto over Montreal as the economic metropolis of the country (Beaujot and McQuillan, 1982: 165; Beaujot, 1991: 153-154). Toronto profits from various factors, including its closer cultural connection to the United States.

## **5. Demographic implications on population size and age structure**

In terms of size, the projections over the past quarter century have been quite accurate. For instance, in the first generation there were compensating errors with both fertility and mortality being over-projected, and immigration under-projected. These factors have not produced compensating errors with regard to the age structure. The over-projected fertility and mortality have both under-projected population aging. Immigration has less impact on the age structure, but the assumption has typically involved using a constant age distribution of immigrants at arrival, while their average age at arrival has in effect increased over time as the world population has aged. The average age of immigrants at arrival has increased from 25 years in 1956-76 to 30 years in 1994-96 (Beaujot and Matthews, 2000). Consequently, all of these factors have under-projected the population aging.

According to the United Nations (1999: 128-129) estimates and projections, Canada's population grew from 13.7 million in 1950 to 31.4 million in 2000. Over the next 50 years, the high, medium and low projections are 44.7, 42.3 and 31.3 million. While this represents slower growth, the change is not as significant as in the case of Europe which increased from a total size of 544 million persons in 1950 to 726 million in 2000, but the high, medium and low projections are 746, 628 and 550 million in 2050 (Monnier, 2000). The 17<sup>th</sup> revision of the Canada Pension Plan used projections that arrived at 44.1 million in 2050 and 55.3 million in 2100 for the national total. The current generation of Statistics Canada projections has yet to be extended beyond 2026, but the earlier generation gave figures ranging from 35.1 to 50.6 in 2041.

The Statistics Canada projections from the 1986 census had indicated that, with a fertility constant at 1.7 births per woman, the natural increase would become negative around 2020 and population would start to decline after 2026 with an immigration of 140,000, or after 2035 with an immigration of 200,000. These results and subsequent analyses on questions like labour force growth may have been part of the reason for moving to higher immigration levels by the late 1980s. The projections based on the 1991 census indicate that a total fertility rate of 1.5 and immigration of 150,000 would show population decline only after 2033. Combinations of fertility at 1.7 and immigration at 250,000 show continued growth to the end of the projection period, that is 2041. In the projections based on the 1996 census, a fertility of 1.3 and immigration of 150,000 shows negative natural increase after 2015, and a fertility of 1.5 with immigration of 210,000 shows this negative after 2024. However, all the projections show continued growth until the end of the projection period, that is 2026.

Aging is more advanced in Europe. The proportion aged 60 and over in Canada is 16.5 percent in 2000, compared to 19.5 percent as the European average (Monnier, 2000: 3; United Nations, 1999: 252, 253, 255). The difference is largely a function of the baby boom who will be crossing the 60 year old threshold from 2006 to 2026. After that point, the Canadian age structure will not look that different from that of other developed countries, and Canada will be older than any country is now (see also bottom panel of Table 9).

For purposes of the Canada Pension Plan, the ratio of population aged 20-64 to 65+ is a particularly useful measure of the age structure, in terms of beneficiaries and contributors. Table 9 presents such figures from 1951 to 2100, using the results from Statistics Canada, various reviews of the Canada Pension Plan, along with simulations by Denton and Spencer. Even though it was based on a fertility of 2.2 rather than the high assumption of 2.6, Projection B from the first generation of Statistics Canada projections, which has very accurately projected the total population 25 years later, in effect significantly under-projected the beneficiaries in comparison to the contributors. The same applies to the earlier projections from the Canada Pension Plan for the year 2000. As can be seen, the revisions of the Canada Pension Plan projections have been in the direction of reducing the proportion of contributors in relation to beneficiaries. Overall, it is useful to observe that this ratio changed from 6.97 in 1951, to 6.49 in 1976 and 4.86 in 2001, and can be expected to decrease to about 2.9 in 2026, 2.4 in 2050 and 2.2 in 2100 (Table 9). These are rather amazing numbers: what was once close to seven persons in the labour force ages per person at retirement ages, has changed to under five, and will further change to under three by 2026 and eventually to close to two persons in labour force ages per person at retirement ages.

Table 9. Ratio of population aged 20-64 to population aged 65+,  
Canada, 1950-2100, Europe, 2025-2050

Historical data			
1951	6.97		
1976	6.49		
2001	4.86		
Statistics Canada medium projections for 2001			
Projected from 1971 census	5.35		
Projected in CPP for	<u>2000</u>	<u>2050</u>	<u>2100</u>
Report 0 (1964)	6.22	5.61	
Report 6 (1977)	5.62	3.47	
Report 12 (1988)	4.83	2.48	2.32
Report 17 (1997)	4.92	2.39	2.17
Projected for 2026, by Statistics Canada in 1994			
Low	2.77		
Medium	2.91		
High	2.92		
Projected with alternate immigration levels	<u>2016</u>	<u>2036</u>	
Zero immig	3.36	1.79	
100,000	3.54	2.02	
200,000	3.70	2.22	
300,000	3.86	2.40	
400,000	4.00	2.59	
500,000	4.15	2.70	
Projected by United Nations		<u>2025</u>	<u>2050</u>
Canada			
Low		2.69	1.78
Medium		2.78	2.25
High		2.89	2.33
Europe			
Low		2.78	1.72
Medium		2.81	1.92
High		2.88	2.25

Source: Statistics Canada, 1999: 249, 1974: 133; Denton et al., 1997: 39, 41  
Special tabulations from CPP model; United Nations, 1999: 79-81, 253-255.

Various analyses have been made on the basis of population projections to further **decompose these trends in age composition**. Based on the projections from the 1991 census, George et al. (1997) used a sensitivity analysis that considered the range of assumptions and their impact on the size and age composition. Given the large range used in the immigration assumptions, it is understandable that these played the largest role for the total population. Nonetheless, on a year to year basis, after 2035, a difference of 0.4 births would have more impact on the changing size than a difference of 180,000 immigrants per year. The three factors of fertility, mortality and migration also have differential roles for the various parts of the age structure. In particular, alternative fertility assumptions, followed by those for immigration, have more impact on the population aged 0-14; immigration has the largest impact on the population aged 15-64, followed by mortality and fertility over the longer term; for those aged 65 and over, it is the alternative mortality assumptions that have the largest role, followed by immigration.

Ryder (1997) used alternative assumptions to make projections to the **point of stability**. In the *sub-replacement model*, fertility is fixed at its current level and there is no migration. This yields a population that grows over the next twenty years, but then declines to 18.0 million or 60 percent of its current size after 100 years. In the *replacement fertility model*, fertility is immediately raised to replacement, with no immigration; the population in 100 years is 33.2 million or 12.3 percent larger than at the outset. In the model called *replacement migration*, fertility stays at current levels but there is a level of immigration sufficient to yield the same ultimate population size as in the replacement fertility model. Of interest here is that the net immigration in this third model is 167,225 persons per year, that is about 10 percent lower than that of the 1991-96 period. This is an important result, implying that an immigration of slightly above 200,000 is sufficient to avoid population decline. Using the average emigration of the 1991-96 period, the immigration would need to be 213,000. Using the average emigration of the 1971-96 period, the immigration would need to be 220,000 per year. This is similar to results from Avery and Edmonston (1988) showing that a net migration of 163,000 (or immigration of 213,000) prevents population decline under a fertility assumption of 1.7 births per woman.

In the stable population models that Ryder (1997) has used for projections into the future, the median age at equilibrium is 45.0 years with present fertility and no migration, compared to 40.9 with replacement fertility and no migration, and 44.0 with present fertility and sufficient migration to assure population replacement. That is, compared to zero migration, a net immigration of 167,225 per year (immigration of some 210,000) reduces the average age by 1.5 years in the stable population that is reached at the point of equilibrium. Since the median age in Canada increased from 31.6 years in 1986 to 35.3 in 1996, this level of net migration would ultimately reduce the average age by some two and a half years of aging. Clearly, the movement from current fertility to replacement fertility would have a larger impact, ultimately reducing the average age by 4.1 years. Even in this replacement migration population, the age structure of immigrants does not have a large impact on that of the total population. For instance, if the mean age of migrants at arrival is 25, the mean age of the population is 44.6, compared to 45.7 if the mean age is 35 at arrival (Ryder, 1997: 18).

Looking at the **impact of alternative levels of immigration**, Denton et al. (1997) use immigration levels in 100,000 increments ranging from zero to 500,000, with fertility of 1.64, showing projection results every five years. The zero and 100,000 immigration assumptions involve population decline after 2016, while all others show continuous growth to the end of the projection period in 2036. In the zero assumption, the 2036 population is 0.7 percent smaller than that of 1996, in the 100,000 assumption the overall growth is 15.5 percent to 2036, and these figures become 31.7 percent with 200,000 immigrants, 47.8 with 300,000, 64.0 with 400,000 and 80.2 with 500,000. This might be compared to the 86.3 percent growth that Canada experienced in the previous forty years, 1956-1996. However, growth over the period 1956-1996 occurred with a very different combination of fertility and immigration experiences, since the average immigration in that period was 155,000 per year.

Based on a constant age structure of immigrants on arrival. Denton et al. (1997: 41) produce the following proportions over 65:

<u>Immigration level</u>	<u>Percent over 65</u>	
	<u>2016</u>	<u>2036</u>
zero	18.1	29.1
100,000	17.3	26.7
200,000	16.6	24.8
300,000	16.0	23.4
400,000	15.5	22.2
500,000	15.0	21.3

In comparison, the proportion aged 65 and over changed from 10.5 percent in 1986 to 12.2 in 1996, or 1.7 percentage points over ten years. In 2016, each additional 100,000 immigrants would have reduced the proportion over 65 by some 0.6 percentage points, which is comparable to the aging that occurs over about four years in current conditions. In 2036, each 100,000 immigrants would have reduced the proportion over 65 by 1.6 percentage points. While the impact is larger as one moves further into the future, the assumption of a constant age structure of immigrant arrivals becomes increasingly unrealistic.

Nonetheless, each of these scenarios involves a population that ages considerably from its present state. Even with 500,000 immigrants per year, the proportion over 65 would increase from 12.2 in 1996 to 15.0 in 2016 and 21.3 in 2036. Denton et al. (1997: 23) conclude that “immigration is clearly not an effective tool for offsetting the process of population aging.”

Various calculations have been made of **dependency ratios**, seeking to measure those dependent on persons who are at labour force ages, or employed. These results show declines in dependency since the baby boom period, and increases only after 2011 when the baby boom starts moving into retirement ages. In this regard, we are living in an ideal time as the proportion of children has declined and the proportion of elderly has not risen that much, maximizing the proportion of persons at labour force ages. After 2011, all of the dependency measures and immigration levels show increased dependency (Denton et al., 1997: 40-41). Nonetheless, this dependency remains lower in 2036 than it was in 1971 when the baby boom was at young ages. These authors have

also attempted various simulations of immigration levels that might prevent the anticipated increase in dependency. They find that the levels would have to be far in excess of a million persons per year at the current age distribution for immigrants (p. 20).

Another approach in measuring of the age distribution is to consider the growth of the **labour force**. There has been considerable growth of the labour force, especially as the baby boom entered the work force, and women took paid employment. The peak growth was a 17.9 percent increase between 1971 and 1976, and the growth has since declined to 4.2 percent between 1991 and 1996 (Denton et al., 1997: 38-39). At the same time, the contribution of net immigration to labour force growth has increased from 9.6 percent in 1976-81 to 71.0 percent between 1991 and 1996. Under their base assumption of 200,000 immigrants per year, the size of the labour force declines slightly in the period 2026 to 2036, but the size in 2036 is 16 percent larger than in 1996. They also attempt various scenarios to determine the level of immigration that would be needed to maintain the labour force growth that was experienced between 1986 and 1996. For the period 1996-2006, an annual immigration of some 227,000 would be sufficient, but after 2016 levels in excess of 500,000 would be needed (p. 44).

However, there is nothing magical about the labour force growth rate of the 1986-96 period, which was significantly lower than that of the earlier decade. If one considers the alternative goal of **avoiding decline of the labour force**, an immigration just above 200,000 per year is sufficient. With zero net immigration, the labour force would decline after 2006, with a total decline of some 20 percent in the next two decades. An immigration level of 100,000 per year involves a peak labour force size in 2016 with a decline of eight percent in the next fifteen years. An immigration of 200,000 per year produces labour force growth of 16 percent between 1996 and 2016 and basic stability to 2036. In comparison, an immigration of 300,000 per year produces a continuous labour force growth, for a total of 33 percent between 1996 and 2036.

Before turning to the next section on economic implications, it is useful to appreciate the **demographic implications** of an aging population. As the bulge in the population passes beyond childbearing years, aging brings fewer births. It also brings more deaths as more people are at ages where dying is more prevalent. Some of the increased health costs are a function of the costs of dying, including the period shortly before death, rather than being the direct health costs of an aging population. As already indicated, aging of the world population also tends to increase the age of immigrants at arrival.

## **6. Possible economic implications of slower growth and aging**

Other than an increase over the period from the mid 1980s to the early 1990s, population growth has been on a downward trend since 1951-56 and this can be expected to continue (Denton and Spencer, 1997: 20). Even though the demographic growth has been slowing down for some 45 years, and aging has occurred for over a century, the labour force has not been subject to these consequences until more recently. Thanks to the baby boom and to the entry of women into the paid labour force, the labour force has increased rapidly over the period 1961-81 and actually getting slightly younger over this same 1961-81 period (Denton and Spencer, 1998: 5). Even in



1996, the male labour force was not older than it was in 1966. However, the population aging is now clearly affecting the labour force.

It is useful to distinguish population aging at the various parts of the age structure, and its possible differential effect. Initially aging was a function of declining fertility; at first this was very slow because infant and child mortality were also declining, making more surviving children. This may be called *aging at the bottom*, due to fertility reductions, and it was particularly rapid in the 1960s and 1970s. As the baby boom moved up into higher ages, we see *aging at the middle*, which affects labour force ages since 1981. *Aging at the top* is also a function of differential improvements in mortality for adults and elderly, which have especially occurred since 1971. This produces particularly rapid aging, due to low fertility, lower mortality at older ages and the movement of the baby boom through the structure. Aging at the bottom, middle and top may have different consequences. At the bottom it means fewer young dependents, also liberating adults to be in the labour force. At the top it can mean more older dependents, especially as the frail elderly increase in relative size. Aging in the middle can mean a labour force that is less flexible but more experienced.

Thus it is important to know what might be the impact of a labour force population that is both aging and growing much slower. Among the studies done for the Review of Demography and its Implications for Economic and Social Policy (1986-92), two take a relatively optimistic attitude on this question, while two others are more pessimistic.

Denton and Spencer (1988) emphasize the fact that an older labour force will be more experienced. In their model, the productivity of age groups is measured by income. Since incomes rise with age, an older labour force increases per capita incomes. Fortin and Fortin (1987) consider that a labour force that is growing less rapidly will need less new investments to accommodate new workers. This would permit "capital deepening" or more investments per worker and a higher quality labour force. It will be necessary to ensure improvement in the quality of the labour force, through emphasis on education, training and retraining.

Foot (1987) speaks especially of the disadvantages of an aging labour force in terms of reduced flexibility. There would be less geographic mobility, less mobility across sectors of the economy, and consequently less possibility to accommodate changes in the relative growth of the various sectors. An older worker has less to gain in terms of increased lifetime earnings, and more to lose in terms of seniority, through movement, training or change of occupation. Similarly, Ryder (1985) is concerned that a declining population would imply less entry into the labour force from below. He suggests that the future labour force will have characteristics that, in current arrangements, would imply less productivity, vitality and flexibility. We would lose a large part of the capacity to transform the economy by means of new entrants to the labour force.

Lapierre-Adamcyk et al. (1988) observe that the only demographic element that has enhanced productivity over the period 1955-1985 has been a measure of level of education weighted by the age-sex structure. That is, the productivity of the economy benefited from a higher level of education, especially for the young, and from a labour force that became younger and less male dominant. This could be interpreted by suggesting that younger workers and women, including

those working part-time, are exploited in the sense that they receive less income than their productivity would justify, while older male workers receive more income for given levels of productivity. An older labour force would consequently cost more for a given unit of productivity. If the Denton and Spencer (1988) simulations have over estimated the productivity of older workers, this brings into question the results showing that slower demographic growth brings higher per capita incomes.

Summarizing the thinking on the economic consequences of population aging along with slower growth or decline, McNicoll (1986) concludes that the main effects, in terms of per capita economic growth, are not serious, but the distributional effects may be more significant. The **distributional effect** may result from the reduced mobility prospects in a population that is less pyramidal. With growing demands for elderly benefits, especially in terms of health and pensions, there can also be a reduced potential for the state to re-distribute in other directions, especially in favour of the young. In terms of political economy, there may also be negative consequences for an economy if the underlying population is declining while other populations are growing. Especially if standards of living are increasing in these more rapidly growing populations, the older declining population may have less power in the world economy.

McNicoll (1986) summarizes three **main economic effects** associated with persistent below replacement fertility. There is less labour force growth, but this can be compensated through higher participation. The reduced potential for innovation and technology because of a more slowly growing labour force can be compensated through re-training. The lower potential for investments and consumer demand can be compensated through trade and different forms of consumption. Given the results from Lapierre-Adamcyk et al. (1988) one might ask if the balance, even for these main economic effects, might not be more negative when aging is occurring in the middle with an older labour force and at the top with more frail elderly. Much depends on the productivity of older workers. In my casual observation, some remain very productive but that is not true of many others. That is, aging has been occurring for some time, and we may say that it has been accommodated. However, the dynamics may be different when they bring significant population aging at labour force ages. The potential for re-training may be over-estimated based on selective older workers. More research is needed on productivity by age and the factors that would ensure continued productivity in an aging labour force. Note also that immigration can be used to compensate for the lack of labour force entry, but it has much less consequence on labour force aging.

## **7. Population policy: can we endogenize the demographics?**

The invitation to the workshop encourages thinking on optimal demographic futures. While it is not popular to talk about population policy, let me finish with comments along this line. Even the Cairo conference on Population and Development tended to avoid setting demographic goals at the macro level or promoting population policy, preferring instead to promote mechanisms and services that would allow individuals to control their reproductive destiny. In effect, there has been much repression in the name of population control. It is essential that ethical questions be brought forward and that only acceptable means be adopted. In terms of childbearing, as the Cairo

conference indicates, people should have the means to make free and responsible decisions on the number and timing of their children. Policy that would infringe on this human right must be condemned, along with deliberate incentives that would constrain behaviour (United Nations, 1994: 32). People should not be constrained to have the children that they do not want, and they must be permitted to have the children that they want. However, I would argue that it is legitimate for the society to call for a certain behaviour that would enhance collective well-being, in childbearing as in other domains.

Demographics are precisely at this juncture of individual and collective interests (Demeny, 1990). The number of children to have, and where to live, are immensely personal questions, but the society also has an interest because these behaviours influence collective well-being. The number and composition of its membership is of clear interest to the whole society, and there is a legitimate basis for inter-personal influences in regard to the associated behaviours which are far from purely private.

Malthus had long ago separated the means of controlling population between those that were unacceptable (“positive checks” and “vice”) and those that were acceptable (“preventive checks”). Seeking to avoid the positive check of higher mortality, Malthus promoted delayed marriage and responsible parenthood. Not all fertility checks were seen as acceptable; as a “vice” he obviously included infanticide, but also abortion, and even condoms which were used with prostitutes but did not belong in the marriage bed. The Cairo conference also did an excellent job of separating the acceptable and unacceptable means to reduce fertility in today’s moral context. That is, coercion and other top-down approaches are judged unacceptable, while reproductive health is to be promoted. However, the conference spends much time on condemning the unacceptable means, and it tends to focus on some acceptable means that are particularly difficult and expensive. For instance, rather than elaborate on family planning as an obvious means through which individuals and couples can control their reproductive destiny, it focuses on the emancipation of women and sexual and reproductive rights (McIntosh and Finkle, 1995; Beaujot, 1995b). While all these means, including social development through education, health, security and equity, are important goals in and of themselves, they are among the more difficult and costly means to achieve fertility reduction (see also Basu, 2000).

There is no institutional basis in Canada for evolving population policy in the sense of a vision of the preferred demographic future and a discussion of the means to move in that direction. In my view, this might start with two elements: (1) the advantages of some population growth or at least avoiding decline, and (2) slower rather than more rapid aging. Substantial growth may be more economically useful, or at least it has been in the past, but avoiding decline is probably more important from an economic point of view (United Nations, 2000). Decline would mean various superfluous investments and difficult adjustments of various kinds, and it would include particularly significant aging. The environmental arguments point in particular to the disadvantages of high growth. Population growth could encourage more environmentally friendly consumption and technology, but there is no avoiding the direct multiplier of population size on environmental impact, given our standards of living based on high use of energy and other forms of damaging consumption (Daly, 1991). In the context of uncertainties associated with environmental questions, the wise course of action would be to seek to minimize the impact (LeGrand, 1998).

In terms of specific components, **fertility** is key for both growth and aging. There is clearly limited potential for leverage in regard to fertility, some would say there is none. However, reflections on countries that have particularly low fertility, for instance in Southern and Eastern Europe, suggest that these very low levels occur when women have opportunities in education and the labour force, but the family remains traditional (McDonald, 1997). If women have to absorb the family work especially once there are children, they are particularly oriented to emphasizing the public sphere where opportunities are more equal. Rather than policies that would enhance the traditional family, fertility in a modern society may be sustained by policies that would reduce dependencies in families and that would prompt a better sharing of earning and caring activities between men and women (Beaujot, 2000). This would not likely bring fertility above replacement, but it may allow more people to have the children that they originally intended. That is, we should seek to remove the barriers to childbearing, including the gender barriers.

**Mortality** is easier since longer and healthier lives are a widely shared value. As indicated earlier, in an era of delayed degenerative and hybristic mortality, key are the risk factors and treatment. This points to the importance of continued public education on risk factors, along with advances in treatment. It also points to the various other bases for disadvantage that discourage individuals from taking control of their lives. Other risk factors are environmental, where more research is needed, but there is considerable evidence on the impact of environmental quality on population health. In effect, there is more knowledge on the effect of environment on population than the effect of population on environment. But here again, the greater danger is the lack of political will to conclude from the research in a policy direction.

In terms of **internal migration**, the dilemmas include the contrasts between efficiency and equity; that is, the movement of people serves the whole through greater efficiency, and the receiving areas in particular, but areas of net departure are often more interested in equity. For the benefit of disadvantaged regions, moving people toward jobs will always need to be balanced with moving jobs toward people.

That leaves **international migration**, where the policy basis is best established. While immigration targets work quite well, there is need for more discussion on the basis for setting these targets in terms of both number and composition. Even the Immigration Legislative Review (1997: 2) observed that, for many, levels of immigration were not an “intriguing topic” and that the important questions were Not just numbers. The costs and benefits of immigration to the receiving society need fuller analysis, especially in terms of the differential costs/benefits to different interests and parts of the society. For instance, it is concluded in Sweden that by avoiding the cheap solution of guest workers, the society was prompted to make more space for women in the labour force, including policies that would allow workers to have children (Hoem and Hoem, 1996). While immigration is appreciated in terms of bringing diversity, richness, pluralism and contact with a broader world, population renewal that is excessively based on migration rather than fertility means much change and possibly less potential for socializing new members into a common society. If one considers immigration in terms of pressures from outside of Canada, one way to handle and control these pressures is through higher immigration, along with fair trade and

international assistance (Golini, 1996). Clearly, higher immigration is of interest to individuals who are seeking to migrate to Canada, and it is often of interest to sending societies.

We may agree or disagree on these specifics, but the broader problem is the lack of an institutional basis for policy that would seek to endogenize population. Looking at the Australian case, McNicoll (1995) finds that there are various impediments to population policy in liberal democracies. Besides the lack of a political basis for long-term planning, the emphasis on individual welfare, and the lack of attention to scale, there is also a tendency for “government to see its constituency only in terms of organized groups and its role that of arbitrating competing claims” (p. 18). In the Canadian case, Pal (1993) has analysed how various “civil society” groups, often set up by the state, are also seeking rents through the political system and may control agendas based on specific interests. It would appear that these interests relate less to the population as a whole, than to specific concerns like those of family, feminism, environment, health, multi-culturalism or refugees. That is, the potential constituents to discussion of population policy are absorbed in distinct political domains and they are consequently responsive to separate rather than common interests. Some of the constituents would even be against any discussion of population policy (Hodgson and Watkins, 1997). That is, even population policy may be condemned as a “vice” because it can be used in a heavy-handed top-down manner.

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