

**AN EXAMINATION OF CANADIAN FERTILITY RATES
BY THE GENERATION AND CALENDAR YEAR APPROACH**

by

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Introduction

Starting in 1972, the Canadian Total Fertility Rate (TFR) has fallen to levels below the zero population growth level of 2.1. For policy making reasons, it is often important to forecast future fertility rates. In order to predict future fertility rates, a key question to ask is whether the fertility rates for all age groups change at the same time (i.e., in a particular calendar year) or whether there is just a transference in fertility between age groups with a relatively small change in fertility over a person's whole period of fecundity. The TFR, which is the total of the age-specific fertility rates in a particular calendar year, is the normal measure of fertility that is used by demographers, but it may not be a good measure to forecast the population growth if it can be shown that there is a lot of transference in fertility between age groups. Rather a generational fertility rate, which is the sum of the age-specific rates over the lifetime of each birth cohort, might be preferred and should be examined.

It is these two types of fertility rates that are studied in this paper, using the quinquennial age-specific fertility rates for the years 1926 to 1989 from Statistics Canada.* Another important question that is related to these two measures is whether the fertility rate over the lifetime of a person has ever fallen below the zero population level of 2.1, as has the TFR, or whether the transfer in fertility between age-groups has kept the total rate above that key level.

Analysis

In order to get the generational fertility rates, the age-specific fertility rates were tabulated by the year of birth of the mid-point of each age group. For example, the fertility rate for the group 25-29 in the year 1930 was attributed to the birth cohort of 1903 since this cohort will be 27.5 years old in 1930. The complete fertility profiles could only be calculated for birth cohorts from 1909 to 1942, since these were the only cohorts for which data is available and which had completed their period of fecundity by 1989. In order to expand this period of experience while

* "Current Demographic Analysis: Fertility in Canada," *Statistics Canada Catalog* 91-524E 1984

introducing very little error, the fertility rates for the age-group 45-49 for the birth cohorts of 1943-1952 were estimated to be 0.0005 and for the age-group 40-44 for the birth cohorts of 1948-1952 were estimated to be 0.019. Since the fertility rates for these age-groups are so small the error introduced by estimating them can be deemed to be very small. These fertility profiles can be seen in Figure 1 with the fertility rates for each age-group plotted as an independent series and in Figure 2 as a cumulative rate over the lifetime of each cohort. Figure 3 is an expansion of Figure 1, showing all of the available data on the age-specific fertility rates by birth cohort, including those for cohorts that have not yet completed their periods of fecundity but not including the above mentioned estimated values for certain age groups.

In addition, the normal TFR's were also calculated by adding the age-specific fertility rates for each calendar year. The age-specific fertility rates, tabulated by the year in which they occurred, can be seen separately in Figure 4 and as a cumulative of the year's fertility rates (i.e.. the TFR) in Figure 5.

Results

When the complete generational fertility rate profile for the birth cohorts from 1909 to 1942 are examined, one can see that there are no clearly discernible overall patterns that indicate that it might be easier to predict the future fertility rates based on the generational fertility rates. The cumulative rate rose for birth cohorts from 1909 to 1932 and then declined steadily (see Figure 2). When the breakdown of the rates by age groups is examined (see Figure 1), it is seen that there is some transference in fertility from one age group to another, i.e.. from cohorts born after 1930 the fertility rates for the ages 15-24 were rising but the rate for 25-49 were falling, however, the cohorts after 1941 show an increase in fertility for 25-49 with a fall for the 20-24 age groups. Nevertheless, the main thing that can be seen is that the direction and magnitude of the changes for each of these different rates does not have any clear or predictable pattern.

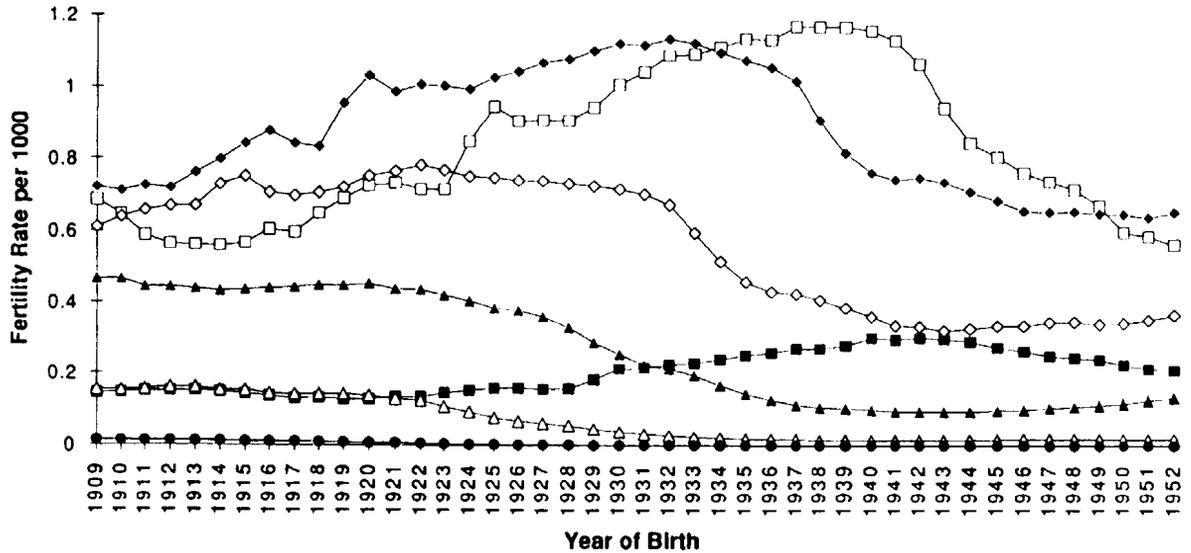
When the fertility rates as tabulated by the year of occurrence are examined, however one sees that the fertility rates for most of the age groups normally move together and in the same direction (with a few exceptions). Notable exceptions include the fertility rate for those 40-44 which has steadily declined, and since 1982, a rise in the rates for the age groups between 25-34 while the rates for 15-24 have fallen.

Conclusions

After looking at the two possible ways of grouping the fertility data we can show two major conclusions. First, it is hard to predict the future trend of fertility rates using either of the ways of grouping the data. Second, the normal method of looking at the rates for a calendar year and calculating the calendar-year TFR is at least as good as (if not better than) the generational method for two reasons. First, the generational method is missing important information for cohorts that have not yet completed their period of fecundity. Second, since the rates tend to move together in a calendar year, it is easier to forecast the single trend of the TFR rather than a series of trends for each age-specific group as the generational method requires and then use that to forecast the generational total fertility. This is because there are often events or developments, such as the introduction of the birth control pill, that affect the fertility rates across all generations in one calendar year.

Another conclusion that can be drawn from the data, is that the fertility rate over a person's entire period of fecundity for birth cohorts after 1948 will fall below the zero population growth level of 2.1 (as the TFR has done beginning in 1972). As mentioned above, examining fertility by birth cohort requires a lot of lead time and this may have confounded attempts to see this before. But by looking at the cohorts whose main fertility years were after the Baby Boom years, it is clear that even over an entire lifetime, there has been a dramatic fall in total generational fertility.

Figure 1: Age-Specific Fertility Rates (per 1000) for Cohorts Born in 1909-1952



15-19
 20-24
 25-29
 30-34
 35-39
 40-44
 *
 45-49**

* Data for years 1948-1952 is estimated. ** Data for years 1943-1952 is estimated.

Figure 2: Breakdown of Generational Fertility Rates (per 1000) for Cohorts Born in 1909-1942

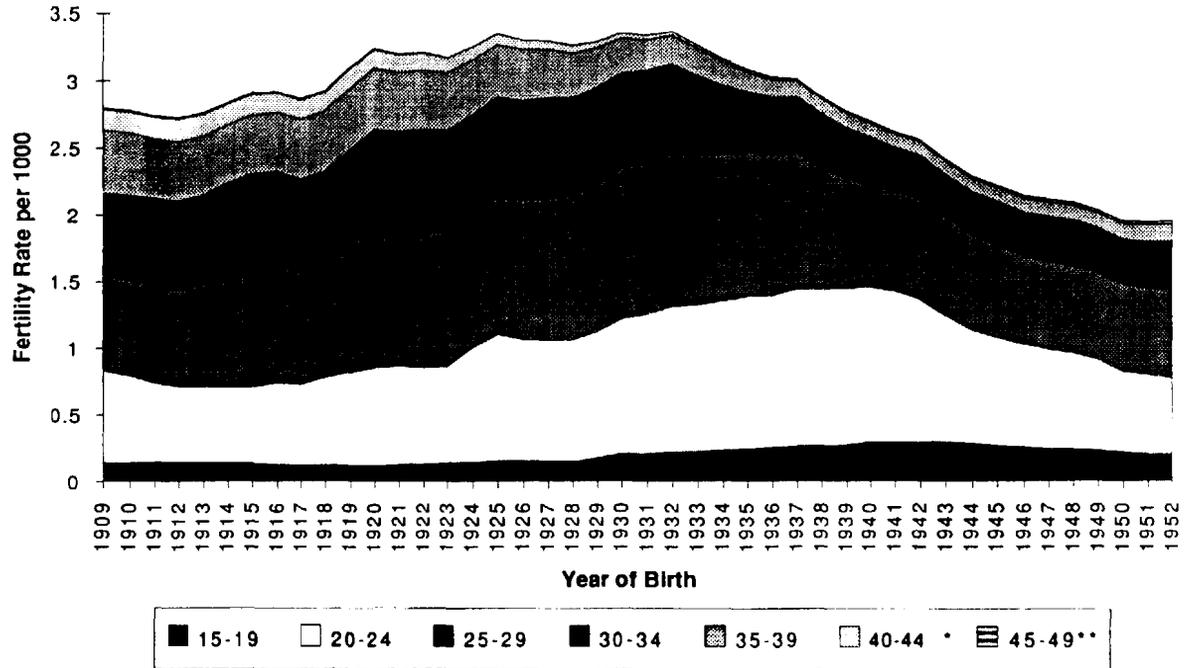


Figure 3: Age-Specific Fertility Rates (per 1000) for Cohorts Born in 1909-1971 (Actual Available Data)

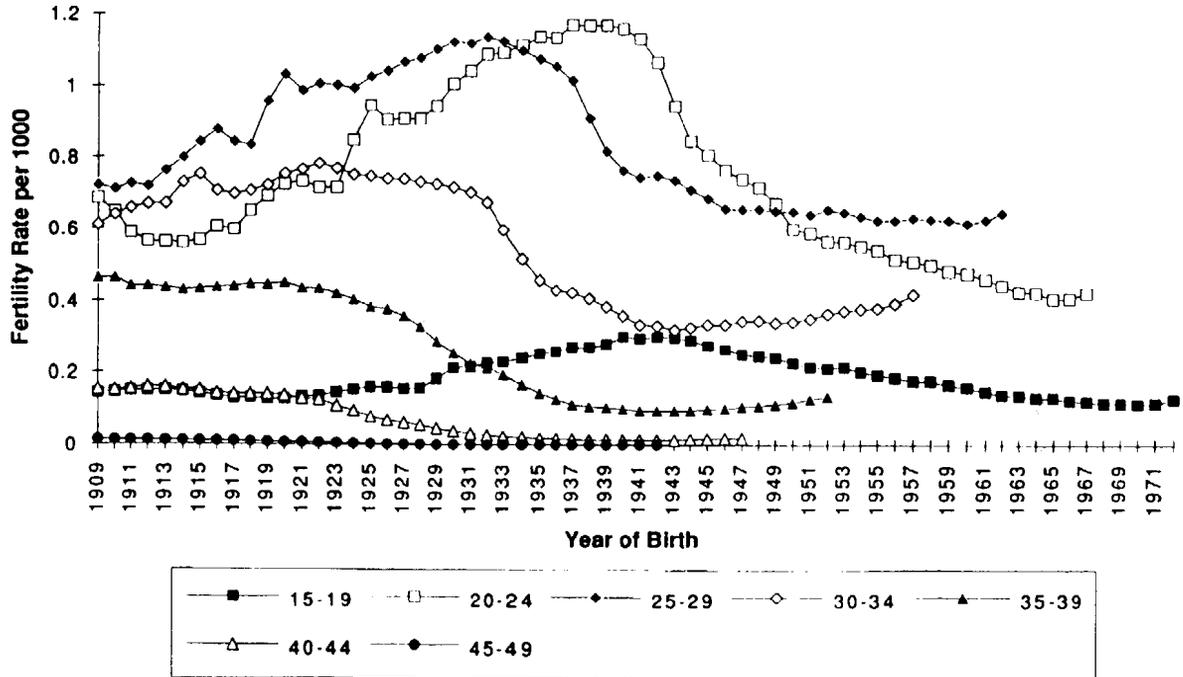


Figure 4: Age-Specific Fertility Rates (per 1000) for Calendar Years 1926-1989

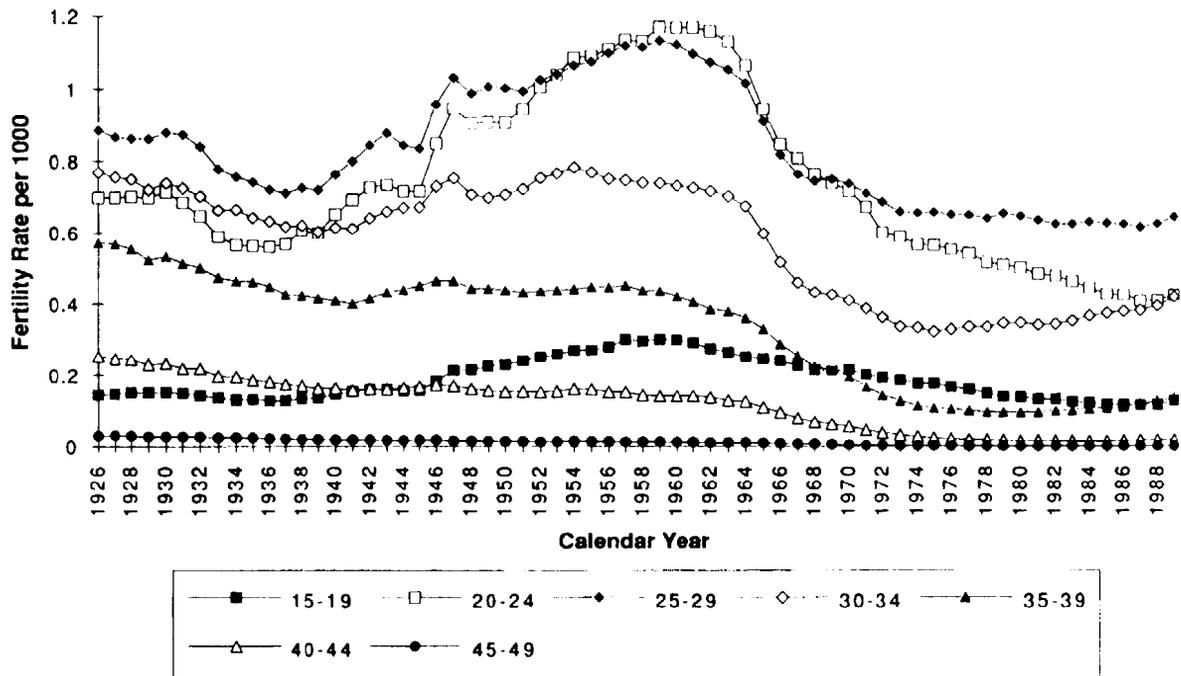


Figure 5: Breakdown of Fertility Rates (per 1000) for Calendar Years 1926-1989

