

Appendix 1

Population Projections

1. *General*

Population projections were carried out for all of Canada and for the province of Quebec separately and the populations required for the financial estimates for Canada excluding Quebec were obtained simply by subtracting from the projected populations for all of Canada the corresponding projected populations for Quebec. So that as much information as possible would be available to interested persons, pertinent assumptions are described and resulting populations are tabulated hereinafter for all of Canada and for Quebec separately.

The three factors affecting population are mortality, fertility and net migration. Because of the wide variation possible in future fertility rates and in numbers of "net" immigrants, it was decided to make "low" and "high" assumptions in respect of each of these factors and, starting with the 1961 Census populations, to develop two series of populations, one based on low fertility—low immigration assumptions and the other on high fertility—high immigration assumptions. For purposes of the long-range estimates, populations were developed for each quinquennial year from 1965 to 2050. (It may be noted here that the projected populations based on low fertility—low immigration assumptions yield "high cost" estimates and those based on high fertility—high immigration assumptions yield "low cost" estimates.)

For the short range, populations for each year 1965 to 1975 were developed by interpolation methods from the long-range low fertility—low immigration populations for 1961, 1965, 1970 and 1975. (Fertility, of course, has no effect on short-range costs.)

It is important to keep in mind that the population projections were made in conformance with the objective of producing cost estimates that, for the long term, are upper and lower limits. Thus, the projected populations are not attempted forecasts of what the actual populations will be in future years. It is, however, reasonable to assume that actual future populations will lie somewhere between the low and high projected populations.

In the following sections are described the basic assumptions made, rates and other factors developed in accordance with those assumptions, the general methods used for the projections and the resulting populations.

2. *Mortality*

Many different approaches have been used in the prediction of future population mortality experience.

The Division of the Actuary of the Social Security Administration of the United States Department of Health, Education, and Welfare, recently used a novel approach in the development of projected mortality rates for use in projections of the U.S. population for the purposes of the Old-Age, Survivors, and Disability Insurance program. Very briefly and very generally, groups of medical and health statisticians examined each of the main causes of death individually and predicted, for each sex and age group, how the probability of death from each such cause would change between now and the year 2000. From these ratios were estimated the changes resulting from all causes, and mortality rates and survivorship factors for the year 2000 were determined by applying these combined ratios to current factors. It was assumed that mortality would remain constant after the year 2000.

The Government Actuary's Department of Great Britain, for the Second Quinquennial Review of The National Insurance Acts, predicted future mortality rates for use in projections of the British population. For these forecasts, it was assumed that at ages under 45, 1953-57 mortality rates would decrease by