

# **Analysis of population changes**

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## **Abstract**

This paper focuses on indirect estimation of the influence of the mean net migration rate on the change in the mean age and change the proportion in active working ages . The Paper includes a concrete application from the indirect estimation presented for Canada in the period from 1990 to 1995.

## **1. Introduction.**

The age structure of a population has important economic consequences. Childhood is a time of learning, consumption and economic dependence. Much of adulthood is a time of production, savings and economic independence. In old ages, adults often become net consumers once again, living off any accumulated savings as well as transfers from younger generations. Changes in age structure are an important force – although not the only one – that drive the shares of the population that are net consumers and net producers (Goldstein 2009).

The aging of population (also known as demographic aging and population aging) is a term that is used to describe shifts in the age distribution (age structure) of a population toward people of older ages. A direct consequence of the ongoing global fertility transition (decline) and of mortality decline among people of older ages, population aging is expected to be among the most prominent global demographic trends of the twenty-first century. Population aging is progressing rapidly in

many industrialized countries, but developing countries whose fertility declines began relatively early also are experiencing rapid increases in the proportion of elderly people. This pattern is expected to continue, eventually affecting the entire world (Gavrilov et al. 2003).

Both populations that are very young and very old have high “dependency” burdens, with a relatively small portion of population in active working ages.

It is absolutely crucial to an understanding of both the dynamics of population change, and the age and sex composition of a population at any single point in time. Births, deaths do not occur equally to people of all ages and both sexes. Instead, they tend to be concentrated among, for example, the old, the very young or women of childbearing ages. Migration also can cause big distortions in age distributions because it is normally concentrated among young adults, and it is sometimes selective. Immigration usually slows down population ageing, because immigrants tend to be younger. Areas where substantial numbers of immigrants have settled will have a young age structure, with many children and very few elderly. Conversely, areas from which substantial numbers have emigrated will, in extreme cases, have top-heavy pyramids with an unusually high proportion of the population in older age groups, few young adults and, consequently, few children.

Consequently, the numbers of births, deaths and moves occurring in a population at any particular time are determined not only by its overall size and the levels of fertility, mortality and migration but also by its age and sex structure. Typical census tabulation groups the population into 5 (or 10) year age groups. Population pyramids are an elegant and useful way of graphically presenting an age/sex distribution.

The visual comparison of the entire age distribution is a good way to see the full age distribution. For conciseness and to compare across populations easily, demographers use a set of single-numbers to summarize this age distribution. These include generic statistical measures like the mean, median and mode, as well as ratios of age groups (Goldstein 2009).

In this paper we will try to find how the mean net migration rate influenced on the change in the mean age of the population and change the proportion in active working ages . Decomposing the change in mean age of the population and change the proportion in active working ages (Vaupel and Canudas Romo 2002), we assume that we have no data about migration. In the decomposition formula, substituting for age specific growth rate (Maglaperidze 2013) we use the variable r-method (Preston and Coale 1982; Preston et al. 2001) and by indirect estimation find how the net migration

rate influenced the change in mean age of the population and change the proportion in active working ages .

The United States, Canada, and Australia are the major traditional countries of permanent immigration. Northern America had a stock of 23.9 million migrants in 1990 and a net migration rate of 3.4 per thousand for 1990-1995 (National Research Council, 2000).

In our empirical example we present the relative contribution of net migration rate to the average annual change in the mean age and in the proportion in active working ages in Canada for males and females , respectively over time from 1990 to 1995 (calculations will be based on Human Mortality Database)

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