# Canada's infant mortality: a developing world within its borders

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### Abstract

The infant mortality rate is the number of child deaths under 1 year of age/1000 live births. It is a central indicator of both health system effectiveness and socioeconomic conditions. However, Canada's infant mortality rate is unacceptably high for its level of healthcare and socioeconomic development. Canadians living in income-deprived areas and those experiencing health inequities have higher infant mortality rates than those in other areas. We introduce feasible healthcare practitioner activities that will promote improved social environments for children and contribute to bridging gaps in infant mortality.

## Introduction

The health of Canadian children is rooted in profound social and economic inequities. Among these imbalances are poverty, inadequate housing, food insecurity, racism and the Indigenous peoples' history of persecution by colonial policies and practices.[1]

The purpose of our commentary is to provide an introductory framework of Canada's infant mortality. We include feasible activities for healthcare practitioners (HCP) that will foster and promote improved social environments for all children in Canada.

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## Infant Mortality Rate

The infant mortality rate (IMR) is the number of child deaths under 1 year of age/1000 live births.[1] In the first month of life, infant deaths (neonatal mortality) in Canada are mainly due to prematurity, congenital malformations, infection, and birth complications.[1] Premature births are most common and increasing due to rising maternal age and multiple births from assisted reproductive technology. Later infant deaths after 1 month of life result from sudden infant death syndrome and infection, including diarrhea and pneumonia.[1] In developing countries, prominent causes of infant death are malaria, measles and malnutrition.[2]

Socioeconomic influences are a major contributor to infant death. Factors may include exposure to household smoke, low maternal education, inadequate housing, lack of access to healthcare, food insecurity, poverty, and unemployment.[1] Importantly, public health measures, such as sanitation, access to clean water, and immunization, promote infant survival.[3]

The IMR is a central indicator of local health system effectiveness and socioeconomic conditions.[4] It is also an important measure of advancement toward the United Nations Sustainable Development Goals of peace and prosperity for all people.[5]

### Canada Ranks Low Amongst Peer Countries

Canada boasts a publicly funded universal healthcare system. However, its 2019 IMR of 4.4 infant deaths per 1000 live births is high for the country's level of socioeconomic development.[3] Most peer Organization for Economic Co-operation and Development (OECD) countries have surpassed Canada and achieved better rates. For example, Japan's IMR which was 31 in 1960 is now 1.7 − half the Canadian rate. Other countries, such as Finland (3.3), Sweden (2.4), and Italy (2.7), have lower IMR. Among 17 fellow OECD countries, Canada ranked 5th in 1960 and today has the
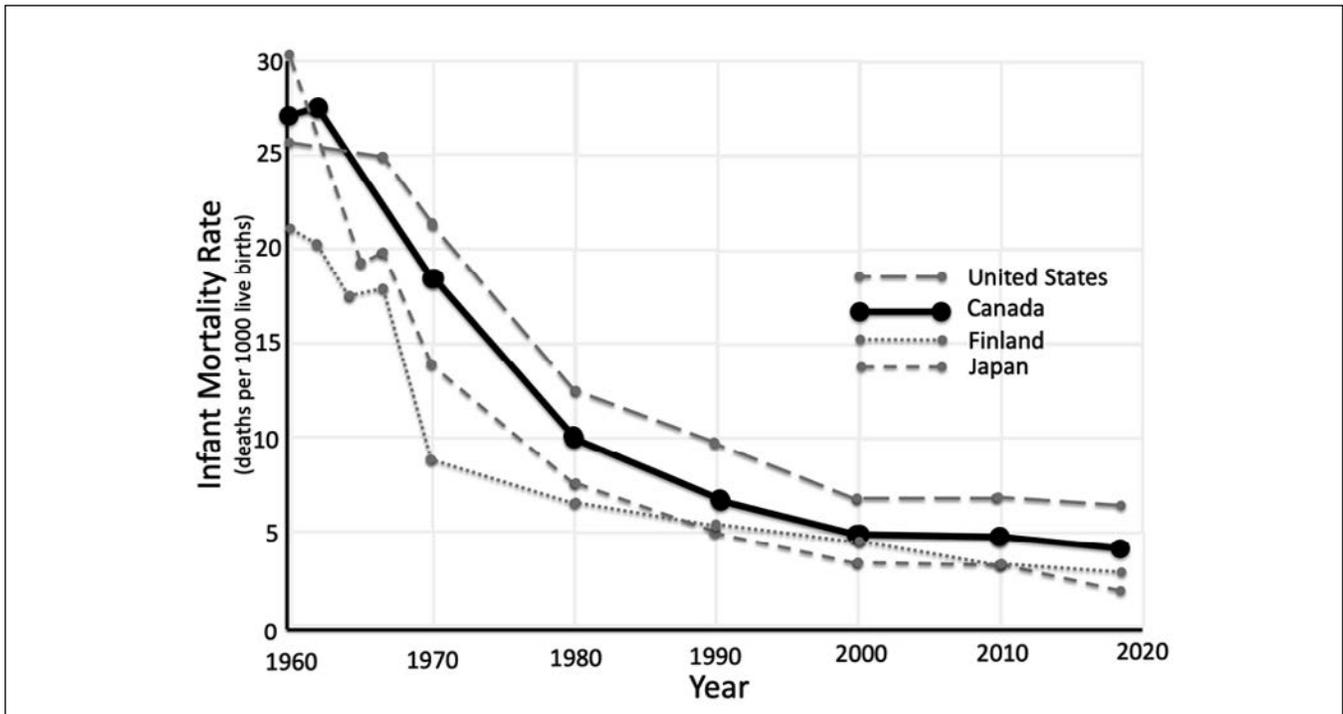
**Figure 1. Trends in infant mortality rate,** 1960–2019. Note: Graph for Canada and selected Organization for Economic Co-operation and Development Countries. Infant mortality rates 2019: US (5.8), Canada (4.4), Finland (3.3), Japan (1.7). Data for most countries are based on a minimum threshold of 22 weeks of gestation period (or 500 grams birthweight) to remove the impact of different registration practices of extremely premature babies across countries. Adapted from OECD Health Statistics 2019.[6]
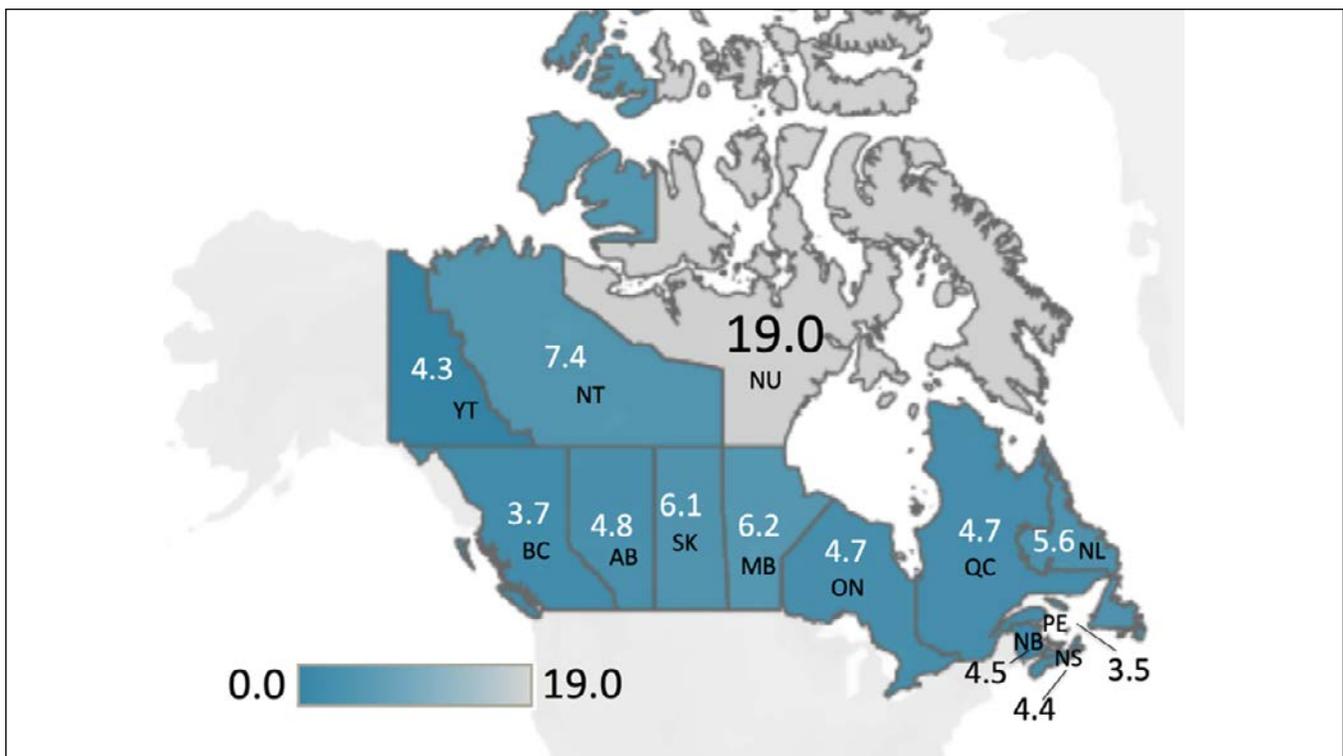


**Figure 2. Infant mortality rate by province and territory** (5-year average, 2011-16). Note: NU, Nunavut. NT, Northwest Territories. YT, Yukon. BC, British Columbia. AB, Alberta. SK, Saskatchewan. MB, Manitoba. ON, Ontario. QC, Quebec. NB, New Brunswick. NS, Nova Scotia. PE, Prince Edward Island. NL, Newfoundland and Labrador. Adapted from Statistics Canada.[15]

second highest IMR. Only the United States (US) (5.8) continues to perform worse than Canada (Figure 1).[3]

Capturing data has been challenging with variations in countries' registering practices for preterm infants. Canada and the US register a high proportion of babies weighing less than 500 g with low odds of survival and higher infant mortality.[6] There are also greater numbers of infants born early due to use of new medical technologies in high-risk deliveries. Furthermore, new fertility programs have resulted in increased multiple births and premature babies at higher risk of infant death. Although researchers caution interpretation, IMR is the single most comprehensive indicator of health in a society and long-established measure of child and family well-being.[3,7]

## Canada's Within-Country Pattern is Striking

Canada's infant mortality is not equally distributed among its provinces and territories (Figure 2). Compared to peer OECD countries with IMRs below 4, only British Columbia and Prince Edward Island rank on par. Four provinces (New Brunswick, Nova Scotia, Ontario, Quebec) and Yukon are below the Canadian average. By contrast, four provinces (Alberta, Newfoundland and Labrador, Manitoba, Saskatchewan) and two territories (North West Territories [NWT], Nunavut) are above the Canadian average.

The IMR of NWT and Nunavut are outliers (2.0 and 5.1 times higher than the national average, respectively).[3] The leading causes of infant death in these territories are sudden infant death syndrome, respiratory infection, and prematurity. Maternal smoking, overcrowding and teenage pregnancies, which are prominent among Indigenous communities, are major contributing factors.[6] Genetic factors may also play a role.[8]

Canadians living in the most income-deprived areas with more poverty, unemployment, low education, food insecurity and poor housing, have higher IMRs (1.6 times) than those in the least deprived areas.[1] The Public Health Agency of Canada reported that health inequities are disproportionately experienced by Indigenous peoples and result in higher IMR. This is seen when comparing Inuit (3.9 times), First Nations (2.3 times) and Métis (1.9 times) populations to the overall Canadian rate.[1,7] Therefore, awareness that Canada's IMR is unequally distributed and strongly associated with socioeconomic status can promote upstream policies and programs to address social inequities.[1]

## Healthcare Setting Activities

Clinical and complementary activities of HCP can impact infant mortality by integrating social dimensions into the delivery of healthcare.[9] Activities that may contribute to bridging the gap towards healthy equity include:

1. *Adjustment* in clinical activities to reduce social inequities. Examples include breastfeeding practice support, safe sleep education, newborn screening, immunization, and parental counselling to reduce unintentional injuries.

2. *Assistance* to reduce social risk by connecting parents to social care resources. Referrals may include preconception and prenatal care, education on maternal vitamin supplementation, counselling for women who drink alcohol during pregnancy, and smoking cessation programs.[10]

3. *Alignment* by healthcare systems to understand, organize and deploy social care assets. These include improving tracking and census of infant deaths, standardizing birth registration, research to understand variations in IMR among vulnerable populations, and implementation of low technology ideas.[11] Japan's Mother-Child Handbook and Finland's "baby box" (a collection of high-quality baby essentials given to new mothers) are good examples.[12,13]

4. *Advocacy* to promote policies of social equality in education, family income and material wealth that influence maternal and infant health, such as advocating for a basic income guarantee and subsidized day care.[3]

Finally, HCPs need to collaborate with partners to transform systems, practices and policies that address social and health inequities experienced by vulnerable populations, including those who live in income-deprived areas and Indigenous peoples.

## Conclusion

The Infant Mortality Rate is a sentinel indicator of child health and societal well-being. Compared to peer countries, Canada's IMR is unacceptably high in the presence of universal healthcare and an advanced level of socioeconomic development. These challenges are rooted in the social and health disparities of vulnerable populations. The activities of HCPs must aspire to "ensure with the maximum extent possible the survival and development of the child."[14]

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