Community Characteristics, Birth Outcomes and Infant Mortality among First Nations in Quebec

FIRST NATIONS OF QUEBEC AND LABRADOR
HEALTH AND SOCIAL SERVICES COMMISSION

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Many reports have shown that First Nations babies die more often in the first year of their lives than do other babies in Canada. But little is known about how the community in which you live could change the death rate of babies or affect birth outcomes. In a project funded by the *Canadian Institutes of Health Research* (CIHR), in collaboration with the **Department of Obstetrics and Gynecology, Sainte-Justine Hospital, University of Montreal** and the FNQLHSSC, we studied, over the 2005-2008 period, whether community characteristics affect birth outcomes and infant mortality among First Nations in Quebec.

The study was based on birth and infant death data in Quebec between 1991 and 2000. A baby was identified as "First Nations" if the mother or father reported a First Nation mother tongue on the birth registration. Furthermore, we could identify babies born to mothers residing in First Nations communities based on their residential postal codes.

Scope of the Study

We looked at the birth weight of the babies, at whether the babies were preterm, on due date, or born after the due date, and whether the babies had died:

- Was the baby preterm?

  "Preterm birth" means that the baby was born too early, before 37 completed weeks of gestation.

- What was the baby's birth weight?

  For the purpose of this study **"low birth weight"** means less than 2500 g or about 5 ½ pounds and **"high birth weight"** means more than 4000 g or about 9 pounds.

- Was the baby smaller or larger than you would expect for a baby born at that gestational age?

  "Small-for-gestational-age" means the baby's weight would be in the lowest 10% of babies born at that gestational age.
  "Large-for-gestational age" means the baby's weight would be in the top 10%.

- Did the baby die?

  - If the baby was dead at birth (no signs of life), it was called a **"stillbirth"**.
  - If the baby died sometime in the first four weeks (0-27 days) after birth, it was called a **"neonatal death"**.
  - If the baby died sometime between 28 days and 1 year of age, it was called a "**postneonatal death"**.
  - The latter two ("neonatal death" and "postneonatal death") are called **"infant death"** or **"infant mortality"**, i.e. any death before the child's first birthday.

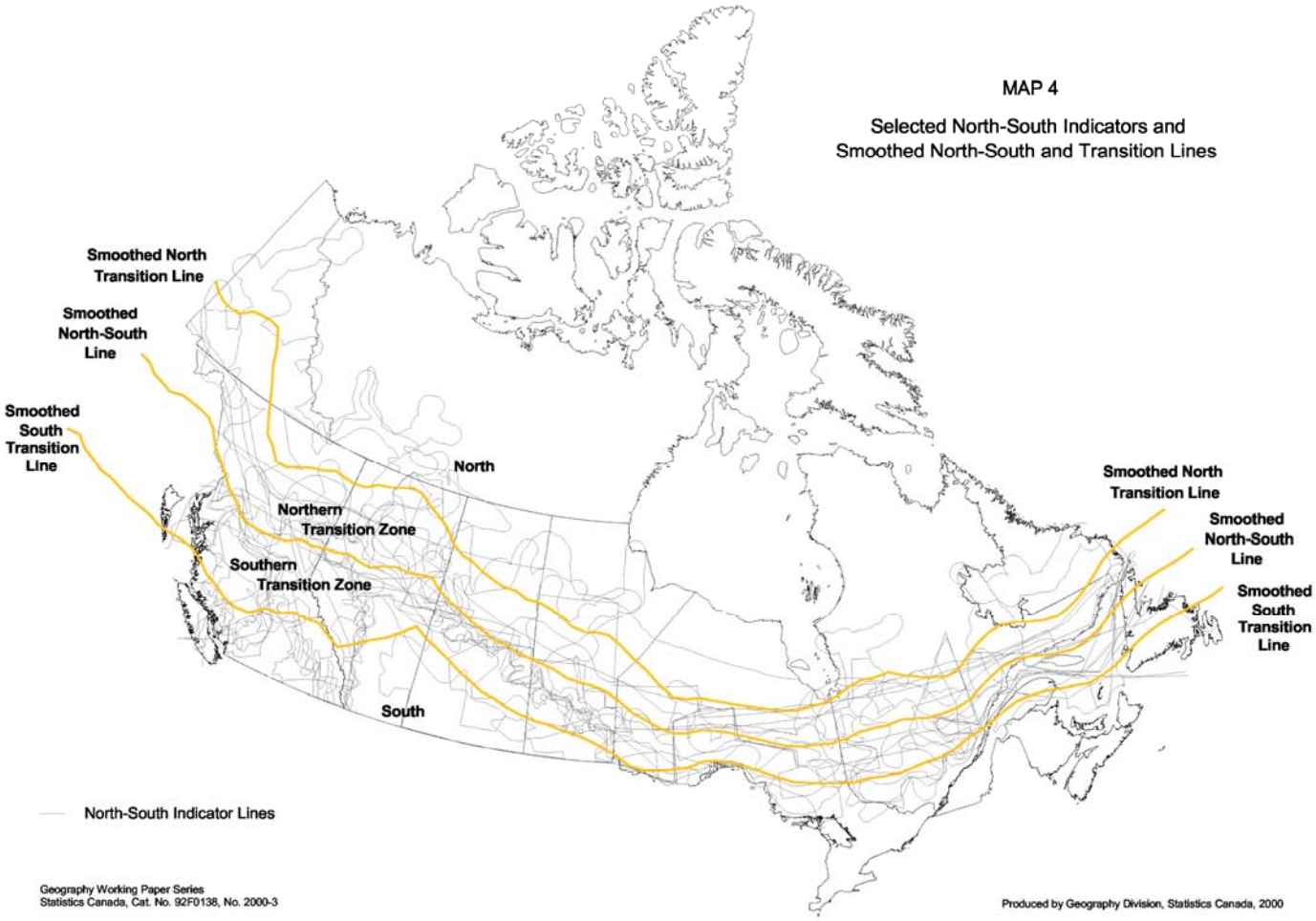
Babies born too early (preterm) or too small (low birth weight or small-for-gestational-age) are more likely to die in the first year of life (infant mortality), and more likely to have various health problems (such as impaired cognitive development) in postnatal life. Infants too large at birth (large-for-gestational-age or high birth weight) are also more likely to have certain health problems (such as obesity) in postnatal life.

Impact of Community Characteristics

We examined if babies born to mothers from certain types of communities had different birth outcomes and infant mortality:

- Rural community compared to urban community (urban meant a community that had at least 10,000 persons in it).

- Community located in the North compared to the South in the province of Quebec.



Map 1: Selected North-South Indicators and Smoothed North-South and Transition Lines

- Living in a First Nations community compared to living outside a community.
- Community remoteness – based on the First Nations Band Classification by Indian and Northern Affairs Canada (**INAC**) from least remote Zone 1 to most remote Zone 4[1]:

1) Zone 1: Located within 50 km of the nearest service centre with year-round road access.
Zone 2: Located between 50 and 350 km from the nearest service centre with year-round road access.
Zone 3: Located over 350 km from the nearest service centre with year-round road access.
Zone 4: The First Nation has no year- round road access to a service centre and, as a result, experiences a higher cost of transportation. The definition of the remoteness zones is taken from INAC's Band Classification Manual

- Neighbourhood socioeconomic characteristics – this grouping looked at things concerning the neighbourhood where the mother lived: average income, and percentage of people in the neighbourhood who were unemployed, or didn't finish high school, or were single parents.

Highlights of the study

- In comparison to the babies of non-Aboriginal mother tongue women in Quebec, babies of First Nations mother tongue women were **(Figure 1)**:

  - Only about half as likely to have a low birth weight.
  - Only about one-third as likely to be small-for-gestational age (**SGA**).
  - 2.7 times as likely to have a high birth weight.
  - 3.2 times as likely to be large-for-gestational-age (**LGA**).
  - Had almost 2 times the rate of infant mortality (8.7 vs. 4.4 per 1000).
  - Were 3.8 times at risk of postneonatal death.
  - 4.9 times more likely to die of sudden infant death syndrome (**SIDS**), and 9.8 times more likely to die due to infection.
  - 2 times more at risk of neonatal death for low birth weight babies.
  - 8 times more at risk of postneonatal death for large-for-gestational-age.

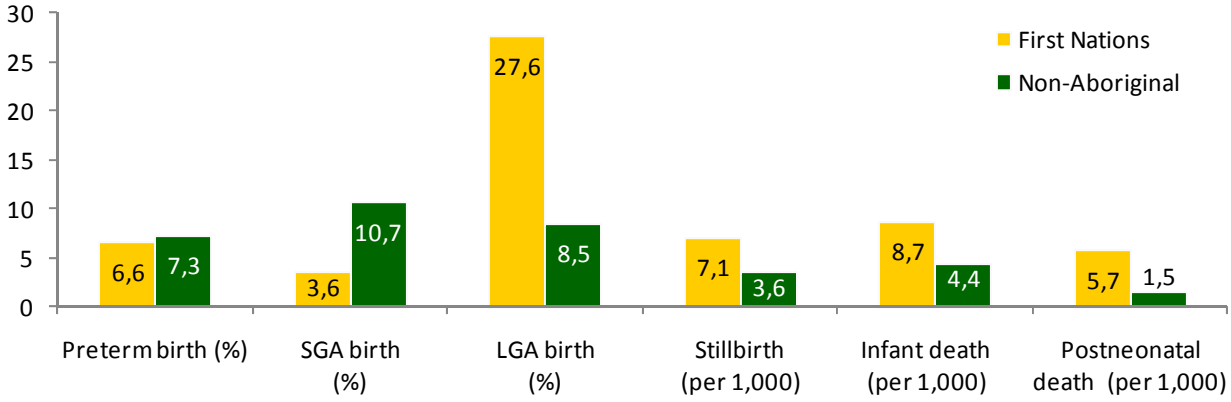


Figure 1 - Birth Outcomes and Infant Mortality Rates among First Nations versus non-Aboriginal Mother Tongue Women in Quebec, 1991-2000

Study Results

- First Nations communities (reserves) compared to non-Aboriginal communities:
  - The infant mortality rate was 1.9 times higher in First Nations communities, mainly due to almost three times the postneonatal mortality rate. The stillbirth rate was 1.5 times higher.
  - Babies in First Nations communities had much higher rates of death due to AIDS and infections.
- Rural versus urban:
  - For First Nations: when comparing rural versus urban areas, there was no difference in infant mortality rates. Small-for-gestational-age births were more frequent in urban areas.
  - For non-Aboriginal mother tongue women, there is an "urban benefit" - babies were less likely to die in the 1st year of life in urban vs. rural areas.
- North/South:
  - For both First Nations and French (the majority) mother tongue groups, there were no differences in stillbirth and infant mortality rates for mothers living in the North compared to those living in the South.
  - First Nations women living in the North were less likely to have small-for-gestational-age (SGA) babies, but more likely to have large-for-gestational-age (LGA) babies compared to those living in the South.
  - By contrast, French mother tongue women living in the North were more likely to have a SGA baby than those living in the South.
    - In the North, First Nations infants were much more likely to be large at birth, and had higher postneonatal mortality rates than infants of non-Aboriginal mother tongue infants (**Figure 2**). Inuit had the highest rates of preterm birth and infant mortality in the North.

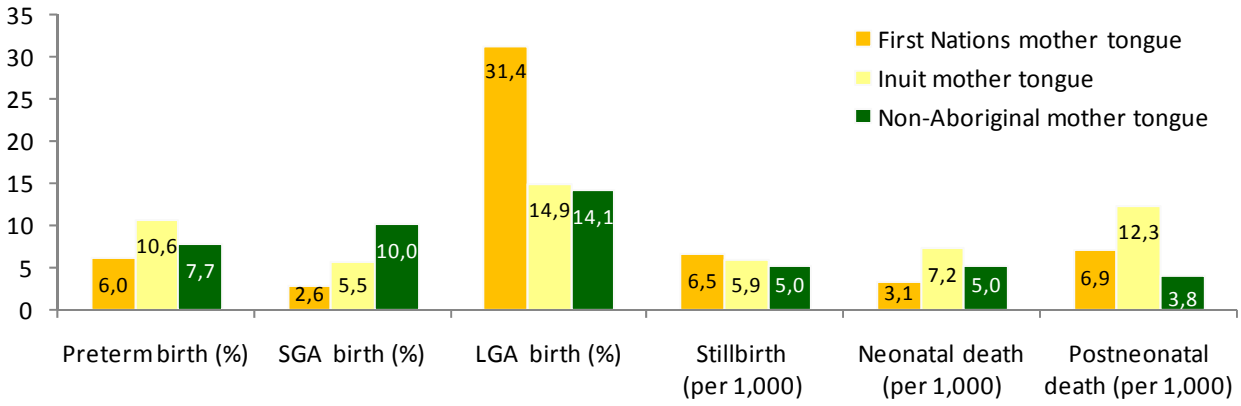


Figure 2 - Birth Outcomes and Infant Mortality Rates among Inuit, First Nations and non-Indigenous Mother Tongue Women in Northern Quebec, 1991-2000

- Living in community vs. living outside community
  - In general, birth outcomes were similar for First Nations living in community versus outside the community.
  - In communities, First Nations babies were less likely to be SGA.

- Community remoteness:
  - Among First Nations, infants in the more remote communities had lower preterm birth rates, but higher rates of stillbirth and infant mortality, especially postneonatal mortality. The infant mortality rate was 15.3 per 1000 in the most remote communities (Zone 4), more than 2 times the rate of 6.3 per 1000 for the least remote communities (Zone 1).

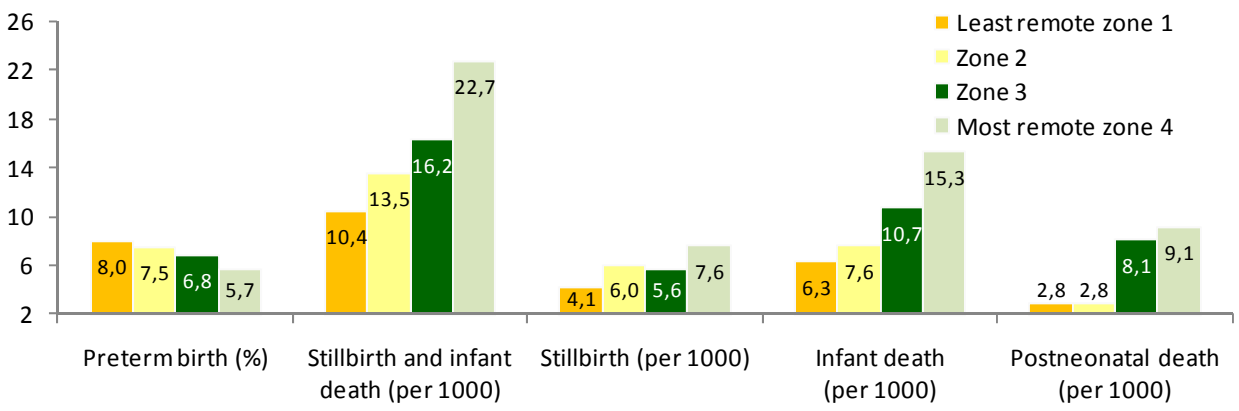


Figure 3 - Birth Outcomes and Infant Mortality Rates among First Nations Communities by Community Remoteness (INAC Zone) in Quebec, 1991-2000.

- Neighbourhood socioeconomic conditions (income, education, employment, type of family):
  - In both rural and urban areas, neighbourhood socioeconomic conditions were worse when comparing First Nations versus French mother tongue women.
  - In general, mothers who lived in neighbourhoods with poor socioeconomic conditions had poorer birth outcomes among French mother tongue women. However, the associations between poorer neighbourhood socioeconomic conditions and poorer birth outcomes were inconsistent for First Nations women.

Summary of key findings

- There was a large gap in stillbirth and infant mortality rates (especially postneonatal mortality rates) between First Nations and non-Aboriginal mother tongue women, and between First Nations and non-Aboriginal communities in Quebec. However, there was a low risk of First Nations babies being born small-for-gestational-age or low birth weight.
- Low birth weight First Nations infants are twice more at risk of neonatal death
- First Nations were 3 times likely to be large at birth; those large babies were 8 times more at risk of postneonatal death compared to such infants of French mother tongue women.
- There was a lower risk of infant death in urban vs. rural areas for the infants of non-Aboriginal mother tongue women, but such an urban "benefit" was absent for the infants of First Nations mother tongue women, suggesting that urban living is not associated with better infant health for First Nations.
- In general, the differences in the geographical location in the Quebec province North-South in still-birth and infant mortality rates were small and non-significant. However, living in the South was associated with a lower risk of SGA birth for First Nations, but a higher risk for French mother tongue babies.
- First Nations babies located in the North of the province of Quebec were much more likely to be large at birth, and had a greater risk of postneonatal death than infants of non-Indigenous mother tongue women.
- Most birth outcomes were similar for First Nations mother tongue women living in community versus outside the community. The babies of First Nations women living in community are less likely to be SGA compared to those living outside the community.
- First Nations in the more remote communities had higher rates of stillbirth infant mortality. This implies that they need more attention for improved prenatal and infant care.
- Neighbourhood socioeconomic conditions were generally worse for First Nations compared to non-First Nations. The differences in birth outcomes from poorer to better socioeconomic conditions were less consistent for First Nations mother tongue women.

Implications of the findings

These study findings indicate a need for improving perinatal and infant care for First Nations people migrating out of traditional communities (and into outside community, southern and urban areas), and a need for improving socioeconomic conditions and more effective infant health promotion programs for First Nations mothers notwithstanding the location where they live. There is a need for improved access to high-quality neonatal care for high-risk (low birth weight) babies and improved infant care for large birth size babies among First Nations. There is a need for more studies in order to understand the implications of large birth size for perinatal and infant health among First Nations in Quebec.

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