



## Portrait of Preterm and Small-for-Gestational-Age Birth by Linguistic Community in Québec, 1989 to 2010

LANGUAGE AS DETERMINANT OF HEALTH AND QUALITY OF SERVICES

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## Background

Maternal language is increasingly recognized as a significant health determinant (Bouchard and Desmeules, 2013). Specifically, inclusion in a minority linguistic community<sup>1</sup> is often associated with a more precarious health status (Batal et al., 2013; Gagnon-Arpinet et al., 2013).

Previous work has examined the perinatal health of Francophones and French-speaking communities, Québec's main linguistic community, which accounts for the majority of the province's population, and Anglophones and English-speaking communities, who form the largest minority (Auger, Park, and Daniel, 2013; Auger, Park, and Harper, 2012). Previous data indicated that perinatal health indicators were more favorable among Anglophones than Francophones, but that the gap between the two groups had narrowed between 1981 and 2008. Variations based on place of residence and level of material deprivation were also observed (Auger, Park, and Harper, 2012; Auger, Park, and Daniel, 2013).

This surveillance report aims to present data on preterm and small-for-gestational-age birth rates for the main linguistic communities in Québec during the years 2008 to 2010 in order to determine whether the previously observed trend has continued. In addition to the Francophone majority and Anglophone minority, a third linguistic community has been added to this comparative study of perinatal health: Allophones, i.e., births to mothers who are neither Francophone nor Anglophone. Differences based on selected sociodemographic characteristics including rural or urban place of residence, mother's immigrant status, and material deprivation have also been investigated.

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<sup>1</sup> Here and throughout our work, the term "linguistic community" is used to refer to a group of individuals who use a common language (e.g., English speakers), notwithstanding differences in their geographical location and history. For this report, inclusion in a language community is determined according to the mother's first language.

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## Highlights

This surveillance report examines changes from 1989–1992 to 2008–2010 in preterm and small-for-gestational-age birth rates in Québec for the general population and by mother’s first language. Rates based on selected sociodemographic characteristics (e.g., place of residence, material deprivation, and immigrant status) of mothers in each linguistic community are also presented.

The report’s main finding is that previously observed variations in perinatal health favoring Anglophones were not observed in 2008–2010: preterm and small-for-gestational-age birth rates were similar for Anglophones, Francophones, and Allophones during this period.

### Preterm birth rates

- Preterm birth rates increased for all linguistic communities from 1989–1992<sup>2</sup> and stabilized beginning in 2002–2004.
- In 2008–2010 preterm birth rates per 100 live births were comparable for Francophones, Anglophones, and Allophones. Some variations were observed based on selected sociodemographic characteristics of mothers.
  - Francophone and Allophone mothers living in highly materially deprived neighbourhoods experienced higher preterm birthrates. There were no differences in rates for Anglophone mothers based on level of neighbourhood deprivation.
  - There was no variation in preterm birth rates between immigrant and nonimmigrant mothers for the three linguistic communities studied.

### Small-for-gestational-age birth rates

- Overall, small-for-gestational-age birth rates declined across all linguistic communities from 1989–1992 and have remained stable since 2005–2007.
- In 2008–2010 rates per 100 live births were comparable for Francophones, Anglophones, and Allophones. Some variations were observed based on selected sociodemographic characteristics of mothers.
  - Small-for-gestational-age birth rates were higher among Francophone mothers living in highly materially deprived neighbourhoods.
  - Rates were also higher among immigrants for all three linguistic communities studied.

In 2008–2010 variations in rates for both perinatal health indicators were observed among Anglophones and Allophones based on whether the mother’s place of residence was urban or rural. Caution should be used in interpreting these results due to the low number of births in rural communities.

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<sup>2</sup> Birth data from 1989 to 2010 (22 years) were available at the time of this study. It had to be divided into periods to generate a large enough case mix to effectively compare linguistic communities. The data were divided into three-year periods, except the initial period which was set at four years.

## 1 Introduction

Preterm and small-for-gestational-age births are significant perinatal health issues that are associated with more life-course morbidity and mortality and impose a significant burden in terms of neonatal care and services (Lim et al., 2009). In Québec, the overall preterm birth rate increased during the 1980s, 1990s, and 2000s, while the small-for-gestational-age birth rate decreased over the same period (Auger, Park, and Harper, 2012).

An earlier study of variations in perinatal health between Québec's major linguistic communities found that Francophone mothers had higher preterm and small-for-gestational-age birth rates than Anglophone mothers between 1981 and 2008 (Auger, Park, and Harper, 2012). We also know that these rates can vary according to some sociodemographic characteristics, such as rural or urban place of residence (Auger, Park, and Harper, 2012) and level of neighbourhood material deprivation (Auger, Park, and Daniel, 2013). In addition the risk of preterm and small-for-gestational-age births is higher for immigrant mothers (Auger et al., 2008).

The objective of this report is to study variations in preterm and small-for-gestational-age birth rates for Francophones, Anglophones, and Allophones using more recent data (2008–2010). Then variations based on place of residence (rural vs. urban), neighbourhood material deprivation, and immigrant status of mothers will be presented for each linguistic community.

## 2 Methodology

### 2.1 Population

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We used data from Québec's register of live births from 1989 (the earliest available material deprivation index) to 2010.

### 2.2 Newborn health indicators

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We examined preterm and small-for-gestational-age births. Preterm delivery refers to births with a gestation period of less than 37 weeks from amenorrhea. It is further divided into three categories: moderately preterm (between 33 and 36 weeks gestation), very preterm (between 28 and 32 weeks) and extremely preterm (less than 28 weeks). Small-for-gestational-age births refer to birth weights below the 10th percentile for gestational age by sex. The indicator is valid only for singleton births, since gestational weight is generally lower in multiple pregnancies (Kramer et al., 2001).

These indicators will first be presented by linguistic community, and then by selected sociodemographic characteristics for each linguistic community. A description of the variables is presented below.

### 2.3 Linguistic communities

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In this study, as in previous work (Auger, Park, and Harper, 2012), linguistic communities are determined according to the mother's first language and are defined as follows:

- Francophone: Mothers whose first language is French, either solely or with another language other than English
- Anglophone: Mothers whose first language is English, either solely or with another language other than French
- Allophone: Mothers whose first language is neither French nor English.

It should be noted that bilingual mothers make up a very small proportion of Québec's birth register and do not face the same linguistic challenges as mothers from minority linguistic communities. Thus their preterm and small-for-gestational-age birth data are not presented here.



## 2.4 Sociodemographic characteristics

For each linguistic community, rates will be specified according to the following sociodemographic characteristics of mothers:<sup>3</sup>

- Mother's place of residence: urban or rural. Urban areas include the census metropolitan area (CMA) of Montréal (zone 1), Québec City, Trois-Rivières, Sherbrooke, Gatineau, and Saguenay CMAs (zone 2), and the census agglomerations (zone 3). Rural areas include small towns and rural communities (zone 4).
- Material deprivation index for the mother's place of residence: calculated based on dissemination areas (Pampalon et al., 2012) and divided into quintiles. Areas in quintile 1 are highly privileged while areas in quintile 5 are highly deprived.
- Mother's immigrant status: nonimmigrant (born in Canada) or immigrant (born outside Canada).

## 2.5 Calculations

The preterm birth rate was calculated by dividing the number of births with less than 37 weeks gestation by the total number of live births and is expressed per 100 live births.

The rate of small-for-gestational-age births was calculated by dividing the number of small-for-gestational-age births by the total number of live births and is expressed per 100 live births.

## 2.6 Statistical analyses

The preterm and small-for-gestational-age birth rates are presented with confidence intervals calculated at 95% when several groups are compared. The variations described in this report are those where the confidence intervals do not overlap.

# 3 Results

## 3.1 Description of communities

The linguistic communities varied with respect to selected sociodemographic characteristics. In 2008–2010 the overwhelming majority of Francophone mothers were born in Québec (93.4%) and lived in urban areas (77.8%). About 18% (17.7%) lived in highly privileged neighbourhoods (quintile 1). Compared to Francophone mothers, Anglophone mothers were more likely to live in urban areas (88.1%), live in highly privileged neighbourhoods (26.8%), and be immigrants (27.8%). Allophone mothers were the least likely to live in highly privileged neighbourhoods (15.6%). They were also more likely than Anglophone or Francophone mothers to be immigrants (82.5%) and live in urban areas (94.8%).

## 3.2 Preterm birth rate

### 3.2.1 CHANGES OVER TIME FOR THE POPULATION AS A WHOLE AND THE MAIN LINGUISTIC COMMUNITIES

For the population of Québec as a whole, the preterm birth rate (< 37 weeks gestation)<sup>4</sup> per 100 live births increased from 6.4 in 1989–1992 to 7.7 in 2002–2004 and gradually decreased to 7.3 in 2008–2010. Québec has one of the lowest rates in Canada, along with Nova Scotia (7.3%) and Saskatchewan (7.4%). By comparison Alberta and Ontario have respective rates of 8.6% and 8.1% (Canadian Institute for Health Information, 2012) (not shown).

Preterm birth rates for Francophones, Anglophones, and Allophones increased in Québec (Figure 1). Figure 1 shows preterm birth rates per 100 live births for each linguistic community from 1989 to 2010. The highest rates were among Francophones between 1989–1992 and 2002–2004. The preterm birth rate among Francophones has decreased slightly since 2002–2004. In 2008–2010 it was 7.3 per 100 live births (Figure 1).

The preterm birth rate among Anglophones was lower than or the same as the rate among Francophones from 1989–1992 to 2002–2004. The preterm birth rate among

<sup>3</sup> Variations between linguistic communities for each sociodemographic characteristic are presented in Appendices 4 and 5.

<sup>4</sup> A breakdown of changes in preterm birth rates by weeks of gestation (28, 28–31, and 32–36) is provided in Appendix 1.

Anglophones has remained fairly stable since 2005–2007. In 2008–2010 it was 7.6 per 100 live births.

Allophones have the lowest preterm birth rates between 1989–1992 and 1999–2001. The rate among Allophones decreased slightly to 7.0 per 100 live births in 2008–2010.

In 2008–2010 there were no significant variations between preterm birth rates per 100 live births for Francophones [7.3 (95% CI: 7.2; 7.4)], Anglophones [7.6 (95% CI: 7.3; 8.0)], and Allophones [7.0 (95% CI: 6.8; 7.3)] (Figure 1 and Appendix 2).

**Figure 1 Preterm birth rates (< 37 weeks gestation) by linguistic community, Québec, 1989–2010**

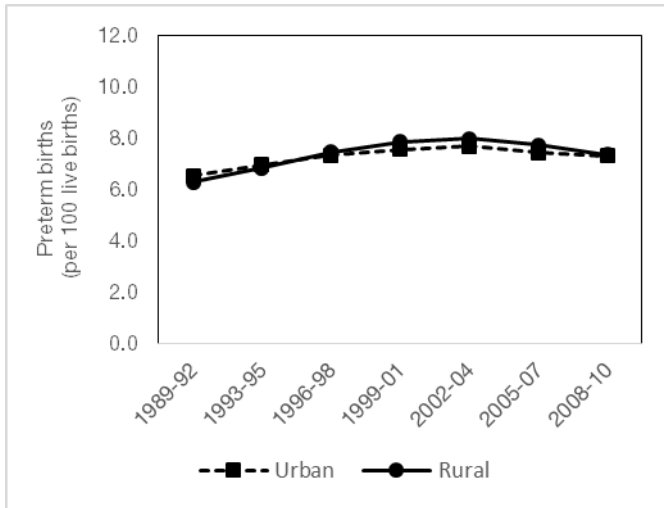


**3.2.2 PRETERM BIRTH RATES FOR FRANCOPHONES BY SELECTED SOCIODEMOGRAPHIC CHARACTERISTICS**

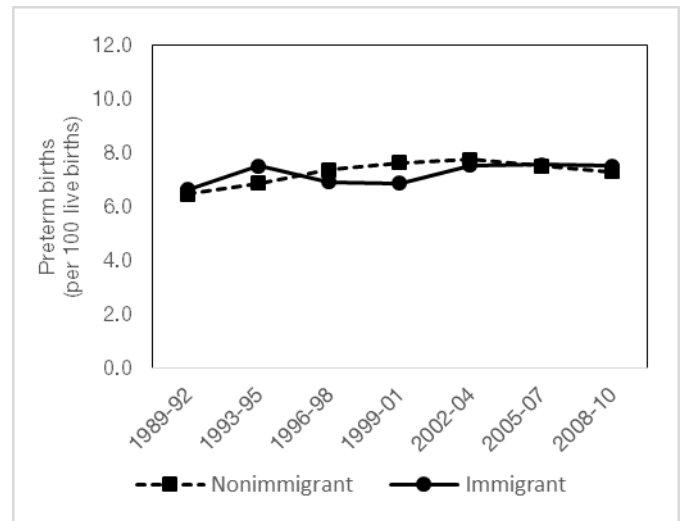
Figures 2, 3, and 4 show the change in preterm birth rates per 100 live births to Francophone mothers by place of residence (urban vs. rural), level of neighbourhood deprivation, and immigrant status from 1989–1992 to 2008–2010. These figures show that there was no significant statistical variation in preterm birth rates among Francophone mothers according to their place of residence (Figure 2) or immigration status (Figure 4) during these periods.

However, for all periods studied, preterm birth rates among mothers living in highly deprived neighbourhoods (quintile 5) were statistically higher than rates among mothers living in highly privileged neighbourhoods (quintile 1) (Figure 3). In 2008–2010 the preterm birth rate for the most deprived quintile was 8.2 (95% CI: 7.8; 8.4) and the rate for the most privileged quintile was 6.8 (95% CI: 6.6; 7.1). The increase over time was less significant for mothers living in highly privileged neighbourhoods. Rates for Francophones increased from 1989–1992 to 2002–2004 and then stabilized.

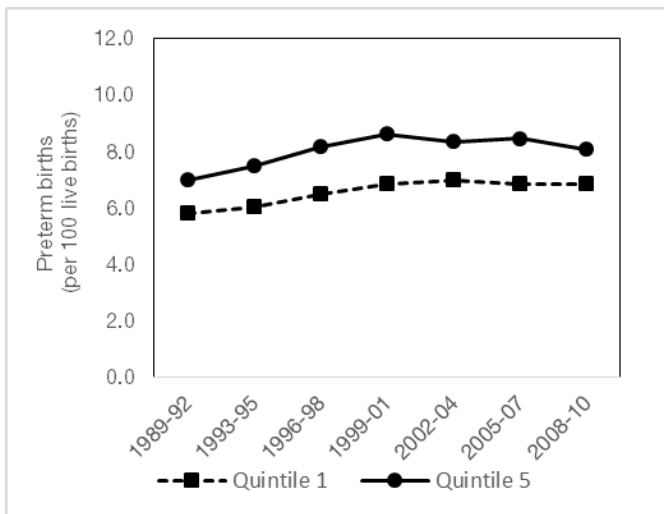
**Figure 2** Preterm birth rates (< 37 weeks gestation) for Francophone mothers by place of residence, Québec, 1989-2010



**Figure 4** Preterm birth rates (< 37 weeks gestation) for Francophone mothers by immigrant status, Québec, 1989-2010



**Figure 3** Preterm birth rates (< 37 weeks gestation) for Francophone mothers by level of neighbourhood material deprivation, Québec, 1989-2010

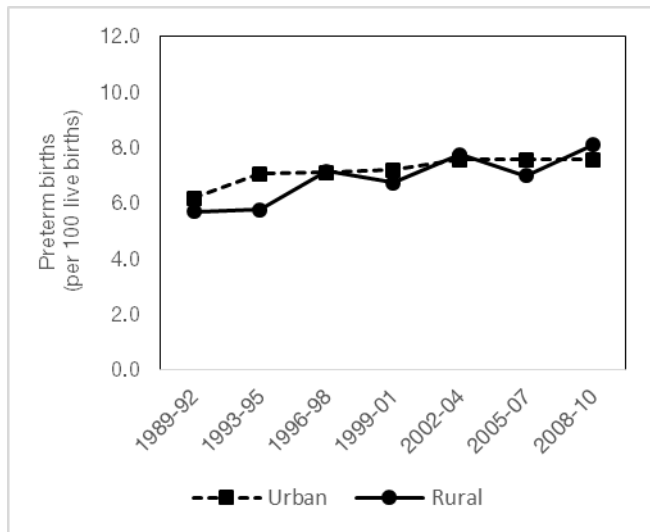


### 3.2.3 PRETERM BIRTH RATES FOR ANGLOPHONES BY SELECTED SOCIOECONOMIC CHARACTERISTICS

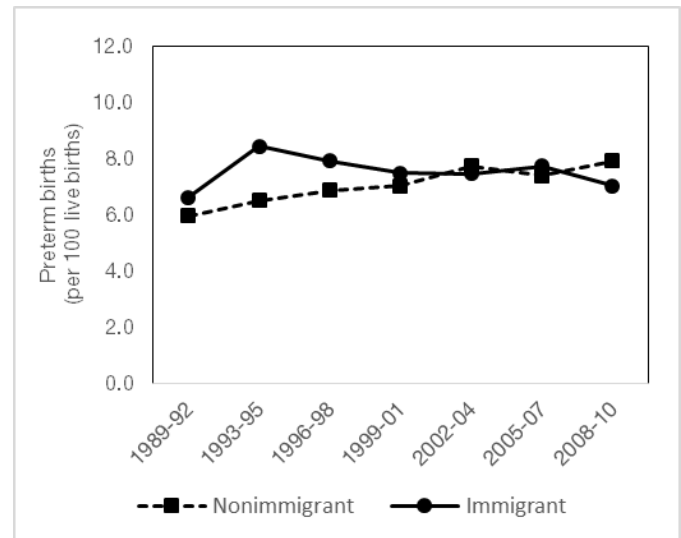
Figures 5, 6, and 7 show the change in preterm birth rates per 100 live births to Anglophone mothers by place of residence, level of neighbourhood deprivation, and immigrant status from 1989–1992 to 2008–2010. Since 1999–2001 there has been no statistically significant variation in preterm birth rates for Anglophone mothers based on place of residence (Figure 5) or immigration status (Figure 7).

However, between 1989 and 2010, preterm birth rates among mothers living in highly deprived neighbourhoods (quintile 5) were statistically higher than the rates for mothers living in highly privileged neighbourhoods (quintile 1) (Figure 6, except 2008–2010 when the gap between the two quintiles was not statistically significant). The largest increase occurred in highly privileged neighbourhoods, where the rate rose from 5.4 per 100 live births in 1989–1992 to 7.6 in 2008–2010. Rates actually increased up to 1996–1998, fell in 1999–2001, and rose again until 2008–2010. By comparison, the rate per 100 live births to Anglophone mothers living in highly deprived neighbourhoods rose from 7.4 in 1989–1992 to 8.2 in 2008–2010.

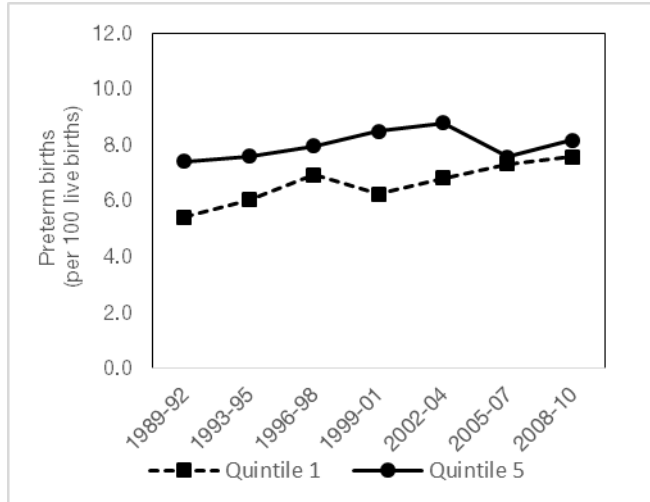
**Figure 5 Preterm birth rates (< 37 weeks gestation) for Anglophone mothers by place of residence, Québec, 1989-2010**



**Figure 7 Preterm birth rates (< 37 weeks gestation) for Anglophone mothers by immigrant status, Québec, 1989-2010**



**Figure 6 Preterm birth rates (< 37 weeks gestation) for Anglophone mothers by level of neighbourhood deprivation, Québec, 1989-2010**



**3.2.4 PRETERM BIRTH RATES FOR ALLOPHONES BY SELECTED SOCIODEMOGRAPHIC CHARACTERISTICS**

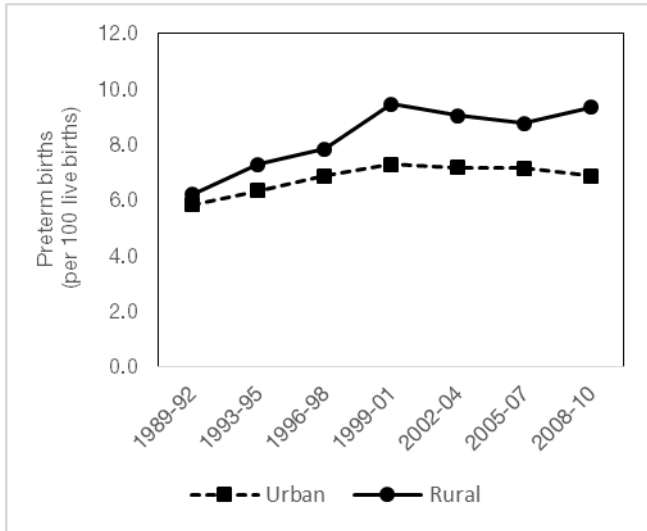
Figures 8, 9, and 10 show the change in preterm birth rates per 100 live births to Allophone mothers by place of residence, level of neighbourhood deprivation, and immigrant status from 1989–1992 to 2008–2010.

The increase in preterm birth rates was greater among Allophone mothers living in rural areas than those in urban areas (Figure 8). In 2008–2010 Allophone mothers in urban areas had a rate of 6.9 (95% CI: 6.6; 7.1) per 100 live births, which was lower than the rate for Allophone mothers in rural areas [9.3 (95% CI: 8.1; 10.6)]. It should be noted that there were only 187 preterm births to Allophone mothers in rural areas during this period.

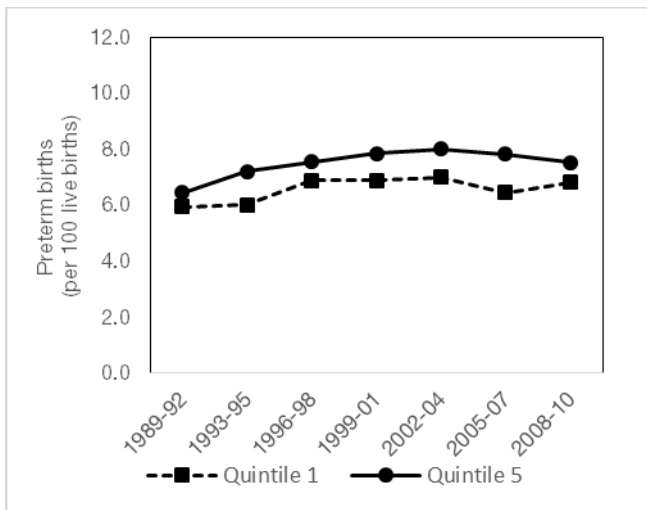
Rates among mothers living in highly materially deprived neighbourhoods (quintile 5) were higher compared to mothers living in highly privileged neighbourhoods (quintile 1) (Figure 9). In 2008–2010 the gap based on level of neighbourhood deprivation was relatively small: the preterm birth rate per 100 live births for mothers living in highly privileged areas was 6.8 (95% CI: 6.2; 7.4), which was slightly lower than the same rate for mothers living in highly deprived neighbourhoods [7.5 (95% CI: 7.1; 8.0)]. Preterm birth rates have remained stable since 1996–1998.

Between 1999–2001 and 2005–2007, preterm birth rates were comparable for immigrant and nonimmigrant Allophone mothers. In 2008–2010 the rates were 6.9 per 100 live births (95% CI: 6.7; 7.2) for immigrant mothers and 7.5 (95% CI: 6.9; 8.1) for nonimmigrant mothers (Figure 10).

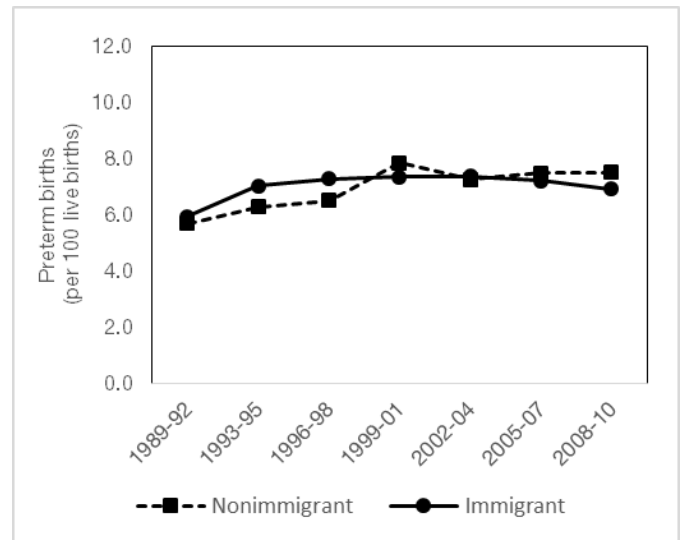
**Figure 8 Preterm birth rates (< 37 weeks gestation) for Allophone mothers by place of residence, Québec, 1989-2010**



**Figure 9 Preterm birth rates (< 37 weeks gestation) for Allophone mothers by level of neighbourhood material deprivation, Québec, 1989-2010**



**Figure 10 Preterm birth rates (< 37 weeks gestation) for Allophone mothers by immigrant status, Québec, 1989-2010**



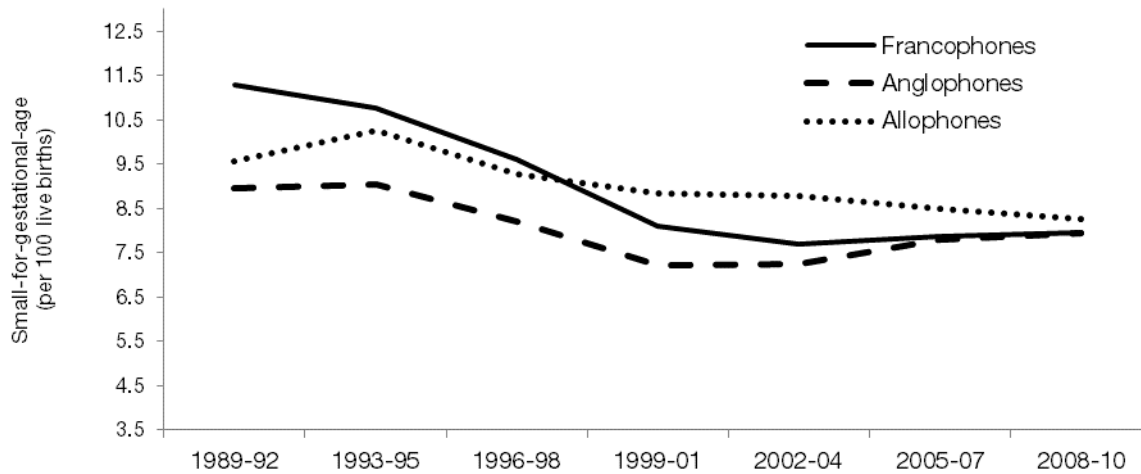
### 3.3 Small-for-gestational-age birth rates

#### 3.3.1 CHANGES OVER TIME FOR THE POPULATION AS A WHOLE AND THE MAIN LINGUISTIC COMMUNITIES

The overall small-for-gestational-age birth rate per 100 live births has decreased since 1989–1992 for the Québec population, putting it among the lowest provincial rates in Canada (Canadian Institute for Health Information, 2012) (not shown).

In 1989–1992 the rate for Francophone mothers (11.3%) was significantly higher than the rates for Anglophone (9.0%) and Allophone (9.6%) mothers. By comparison, in 2008–2010, there was no statistically significant variation between the rates for Francophone mothers [8.0 (95% CI: 7.8; 8.1)], Anglophone mothers [7.9 (95% CI: 7.6; 8.3)], and Allophone mothers [8.3 (95% CI: 8.0; 8.5)] (Figure 11 and Appendix 3).

**Figure 11 Small-for-gestational-age birth rates by linguistic community, Québec, 1989-2010**



**3.3.2 SMALL-FOR-GESTATIONAL-AGE BIRTH RATES FOR FRANCOPHONES BY SELECTED SOCIOECONOMIC CHARACTERISTICS**

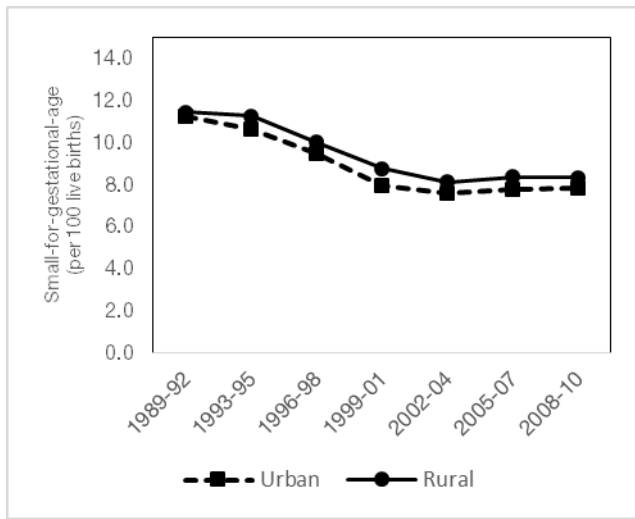
Figures 12, 13, and 14 show the change in small-for-gestational-age birth rates per 100 live births to Francophone mothers by place of residence, level of neighbourhood deprivation, and immigrant status from 1989–1992 to 2008–2010.

These figures show that there were no statistically significant variations between rates for Francophone mothers living in urban and rural areas during these periods (Figure 12). In 2008–2010 their respective rates per 100 live births were 7.8 (95% CI: 7.7; 8.0) and 8.3 (95% CI: 8.0; 8.6).

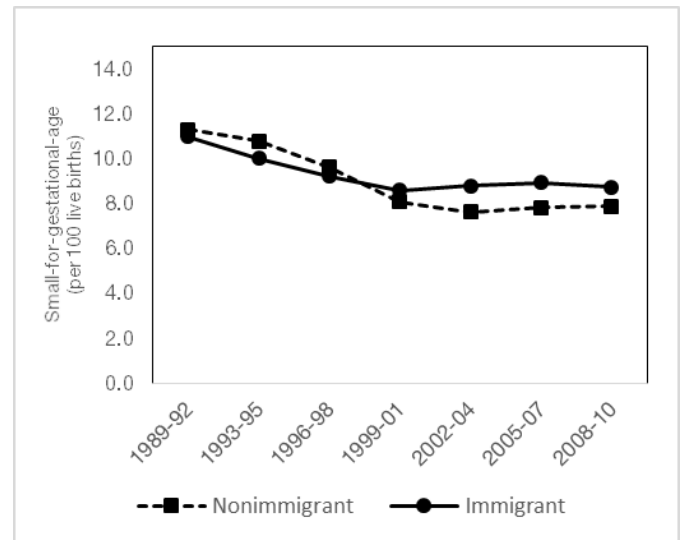
The rate for mothers living in highly deprived neighbourhoods (quintile 5) was statistically higher than the rate for mothers living in highly privileged neighbourhoods (quintile 1) (Figure 13). In 2008–2010 the rate per 100 live births to Francophone mothers living in highly deprived neighbourhoods was 8.9 (95% CI: 8.6; 9.2), compared to 7.1 (95% CI: 6.7; 7.4) for mothers living in highly privileged neighbourhoods.

There was no statistically significant variation between rates for immigrant and nonimmigrant Francophone mothers for the period from 1989–1992 to 1999–2001. However in 2008–2010, the rate per 100 live births for nonimmigrant Francophone mothers was 7.9 (95% CI: 7.8; 8.0), which was statistically lower than the rate for immigrant Francophone mothers [8.7 (95% CI: 8.3; 9.2)] (Figure 14).

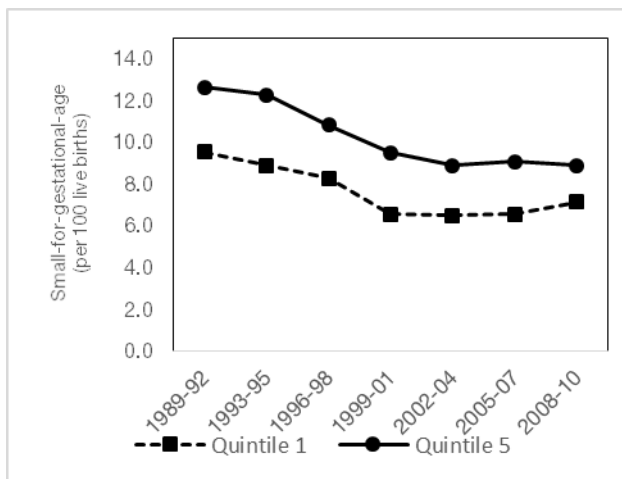
**Figure 12 Small-for-gestational-age birth rates for Francophone mothers by place of residence, 1989-2010**



**Figure 14 Small-for-gestational-age birth rates for Francophone mothers by immigrant status, Québec, 1989-2010**



**Figure 13 Small-for-gestational-age birth rates for Francophone mothers by level of neighbourhood material deprivation, Québec, 1989-2010**



**3.3.3 SMALL-FOR-GESTATIONAL-AGE BIRTH RATES FOR ANGLOPHONES BY SELECTED SOCIOECONOMIC CHARACTERISTICS**

Figures 15, 16, and 17 show changes in small-for-gestational-age birth rates per 100 live births to Anglophone mothers by place of residence, level of neighbourhood deprivation, and immigrant status from 1989–1992 to 2008–2010.

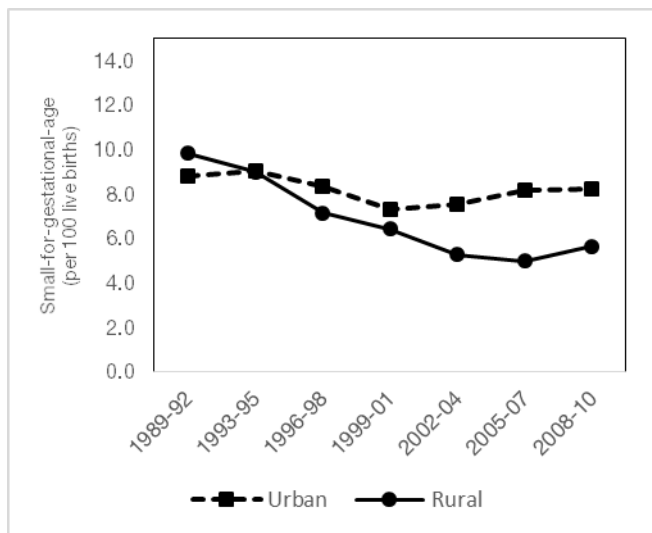
Over all these periods, rates for Anglophone mothers in urban areas were higher than rates for Anglophone mothers in rural areas (Figure 15), and the gap widened over time. In 2008–2010 the rate per 100 live births to Anglophone mothers in urban areas was 8.2 (95% CI: 7.9; 8.6), while the rate for Anglophone mothers in rural areas was 5.7 (95% CI: 4.8; 6.5). It should be noted that the rate in rural areas is based on only 145 small-for-gestational-age births to Anglophone mothers over the 2008–2010 period.

Up until 2002–2004, Anglophone mothers living in highly deprived neighbourhoods (quintile 5) had higher rates than those living in highly privileged neighbourhoods (quintile 1) (Figure 16). But rates have increased since 2002–2004 and the gap has narrowed over time. In 2008–2010, the rate per 100 live births to Anglophone mothers living in highly privileged neighbourhoods was 7.7 (95% CI: 7.1; 8.4), which is

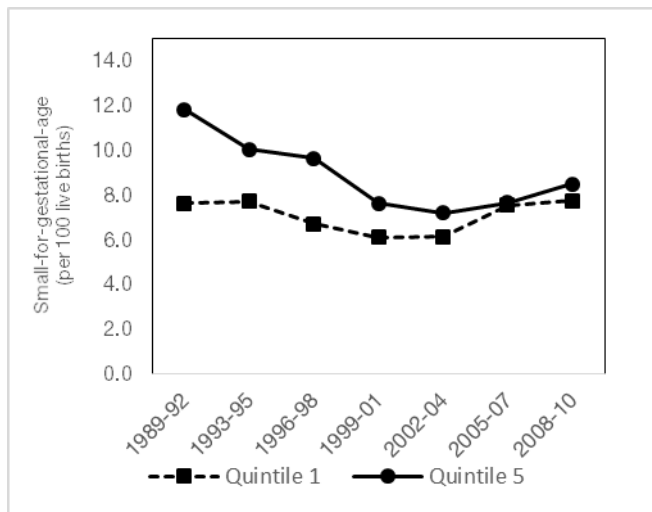
comparable to the rate for Anglophone mothers living in highly deprived neighbourhoods [8.5 (95% CI: 7.6; 9.3)].

Between 1989–1992 and 2008–2010, the rate per 100 live births was higher for immigrant Anglophone mothers than nonimmigrant Anglophone mothers (Figure 17): 10.2 (95% CI: 9.4; 11.0) and 7.1 (95% CI: 6.6; 7.5), respectively for the 2008–2010 period.

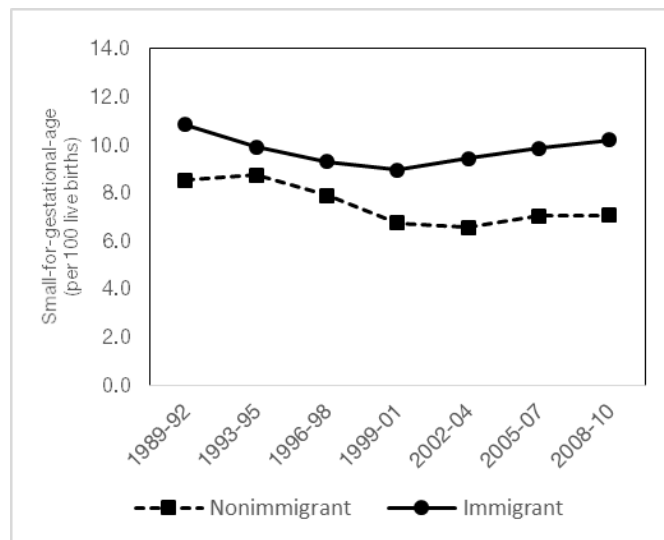
**Figure 15 Small-for-gestational-age birth rates for Anglophone mothers by place of residence, Québec, 1989-2010**



**Figure 16 Small-for-gestational-age birth rates for Anglophone mothers by level of neighbourhood material deprivation, Québec, 1989-2010**



**Figure 17 Small-for-gestational-age birth rates for Anglophone mothers by immigrant status, Québec, 1989-2010**



**3.3.4 SMALL-FOR-GESTATIONAL-AGE BIRTH RATES FOR ALLOPHONES BY SELECTED SOCIODEMOGRAPHIC CHARACTERISTICS**

Figures 18, 19, and 20 show the change in small-for-gestational-age birth rates per 100 live births to Allophone mothers by place of residence, level of neighbourhood deprivation, and immigrant status from 1989–1992 to 2008–2010.

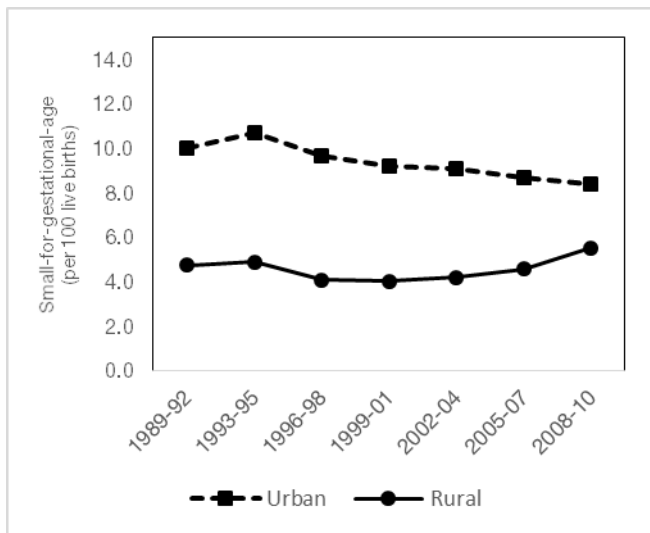
During these periods, rates were higher for Allophone mothers living in urban areas than Allophone mothers living in rural areas (Figure 18). The gap between the two groups has narrowed over time. In 2008–2010 the rate for Allophone mothers living in urban areas was 8.4 (95% CI: 8.1; 8.7), while the rate for Allophone mothers living in rural areas was 5.5 (95% CI: 4.5; 6.6). The rate is based on only 111 small-for-gestational-age births to Allophone mothers living in rural areas between 2008 and 2010.



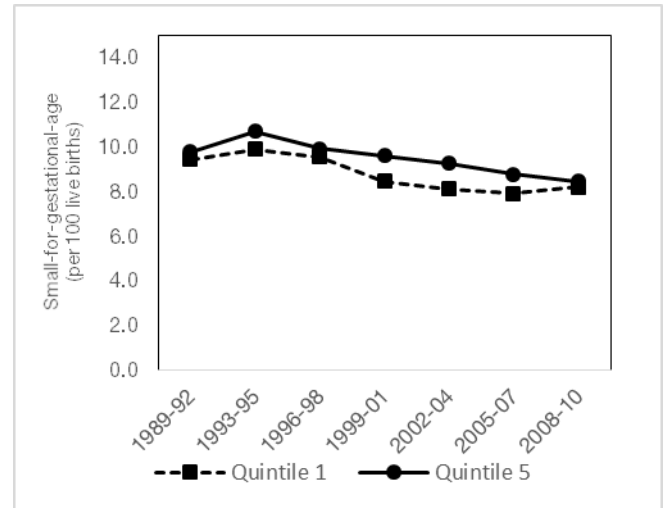
Rates were generally higher for Allophone mothers living in highly deprived neighbourhoods (quintile 5) than those living in highly privileged neighbourhoods (quintile 1) (Figure 19). However the gap has narrowed in recent years, such that there was no statistically significant variation between the rate for Allophone mothers living in highly privileged neighbourhoods [8.2 (95% CI: 7.5; 8.9)] and the rate for Allophone mothers living in highly deprived neighbourhoods [8.5 (95% CI: 8.0; 9.0)] over the 2008–2010 period.

Although the gap has tended to narrow over time, small-for-gestational-age birth rates for immigrant Allophone mothers were higher than rates for nonimmigrant Allophone mothers from 1989–1992 to 2008–2010. In 2008–2010 the rate for immigrant Allophones [8.6 (95% CI: 8.3; 8.9)] was higher than the rate for nonimmigrant Allophones [6.8 (95% CI: 6.2; 7.4)] (Figure 20).

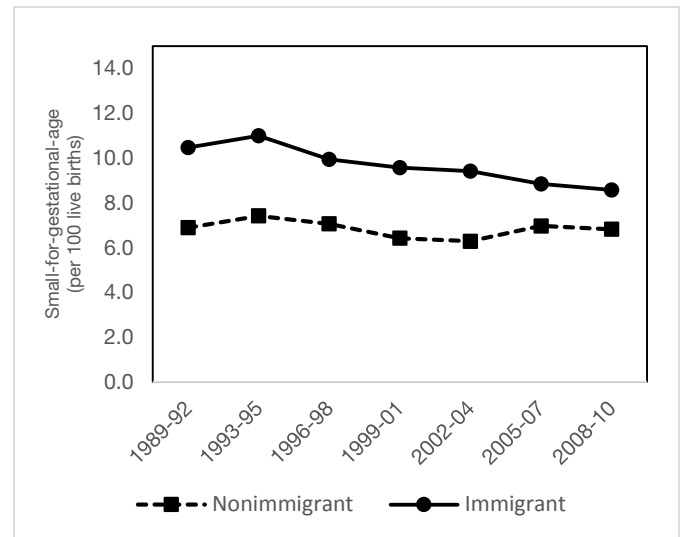
**Figure 18 Small-for-gestational-age birth rates for Allophone mothers by place of residence, Québec, 1989-2010**



**Figure 19 Small-for-gestational-age birth rates for Allophone mothers by level of neighbourhood material deprivation, Québec, 1989-2010**



**Figure 20 Small-for-gestational-age birth rates for Allophone mothers by immigrant status, Québec, 1989-2010**



## 4 Analytical Limitations

The use of administrative records such as the birth register has a number of advantages, including the inclusion of precise birth-related data (e.g., birth weight and gestational age) for all of Québec that has no selection bias since it is not self-reported. Reliable, statistically tested results can be produced using the large data sample. Nonetheless, certain data source and analytical limitations must be kept in mind. There may be errors in recording mothers' first languages or the place of birth, or such information may be missing. During the period studied, the mother's first language was missing for 2.6% of births and the place of birth was missing for 0.5% of births.

We considered two aspects of the mother's place of residence (urban or rural and the level of neighbourhood material deprivation) in this report. The place of residence was recorded in the birth register at the time of birth. But it is possible that the mother only lived there for a short time before giving birth, meaning she had less exposure to certain characteristics of the neighbourhood than a mother who lived there for a longer period of time.

In addition, this report did not examine the contribution of risk factors for preterm or small-for-gestational-age births such as lifestyle habits during pregnancy, e.g., smoking or alcohol consumption (not available in records). Combining data from official records with studies providing such missing information would provide a fuller picture of the determinants of perinatal health inequalities between linguistic communities.

It should be noted that technological and medical advances over the years may have helped better determine the gestational age of fetuses and prevented the use of certain obstetric procedures (e.g., planned caesareans or induced labor) before the 37th week of pregnancy or when fetuses were small for their gestational age.

Another limitation to consider is that linguistic communities can be made up of a range of cultural subgroups. This is particularly true for Allophones, who form a very heterogeneous group. As a result the group includes a wide variety of behaviors, lifestyles, and access to and use of care that may affect the birth indicators examined in this report.

## 5 Interpretation

The perinatal health profile of linguistic communities that emerges from our report is consistent with earlier results (Auger, Park, and Daniel, 2013; Auger, Park, and Harper, 2012). Analysis of birth data since 1989–1992 has led to the following observations:

- Overall preterm birth rates increased for all linguistic communities from 1989 and stabilized after 2002. Rates for Anglophones, Francophones, and Allophones were comparable for the 2008–2010 period. This contrasts with the more favorable situation observed for Anglophones in Québec with regard to many health indicators, despite their minority language status. For example, preventable mortality (Trempe et al., 2013), suicide (Burrows et al., 2013), and trauma (Burrows, Auger, and Lo, 2015) rates are lower for Anglophones than Francophones.
- Like previous work (Auger, Park, and Daniel, 2013; Auger, Park, and Harper, 2012), this report shows that the small-for-gestational-age birth rate has decreased from 10.9% in 1989–1992 to 8.0% in 2008–2010. At the same time, a Canadian Institute for Health Information analysis indicates an increase in small-for-gestational-age birth rates in a number of Canadian provinces since 2006. The data presented in this report suggest levels in Québec have remained stable since 2006. This stability partly explains the lower rate in Québec (about 8%), compared with Ontario and Alberta (about 9%) (Canadian Institute for Health Information, 2012).

Further analysis has identified some disparities in preterm and small-for-gestational-age birth rates based on selected sociodemographic characteristics, which vary from one linguistic community to another.

- Rates for the two perinatal health indicators are only higher among Francophones and Allophones for mothers living in highly deprived neighbourhoods compared with mothers living in highly privileged neighbourhoods. Although such gaps were observed for Anglophone mothers, they were not statistically significant for the 2008–2010 period.
- Higher rates in rural areas were only observed among minority language communities (Anglophones and Allophones). Caution should be

used when interpreting these results given the very small numbers of preterm and small-for-gestational-age births to Anglophone and Allophone mothers in rural areas.

- The analysis shows that small-for-gestational-age birth rates are generally higher for immigrant mothers than nonimmigrant mothers across all three linguistic communities. This highlights the importance of considering both language and immigrant status when examining linguistic communities.

In conclusion, we were able to discern trends in preterm and small-for-gestational-age birth rates going back three decades, both for Québec's population as a whole and for its linguistic communities. Although this report is encouraging, we note that some subgroups based on first language, mother's immigrant status, and place of residence are still disadvantaged.

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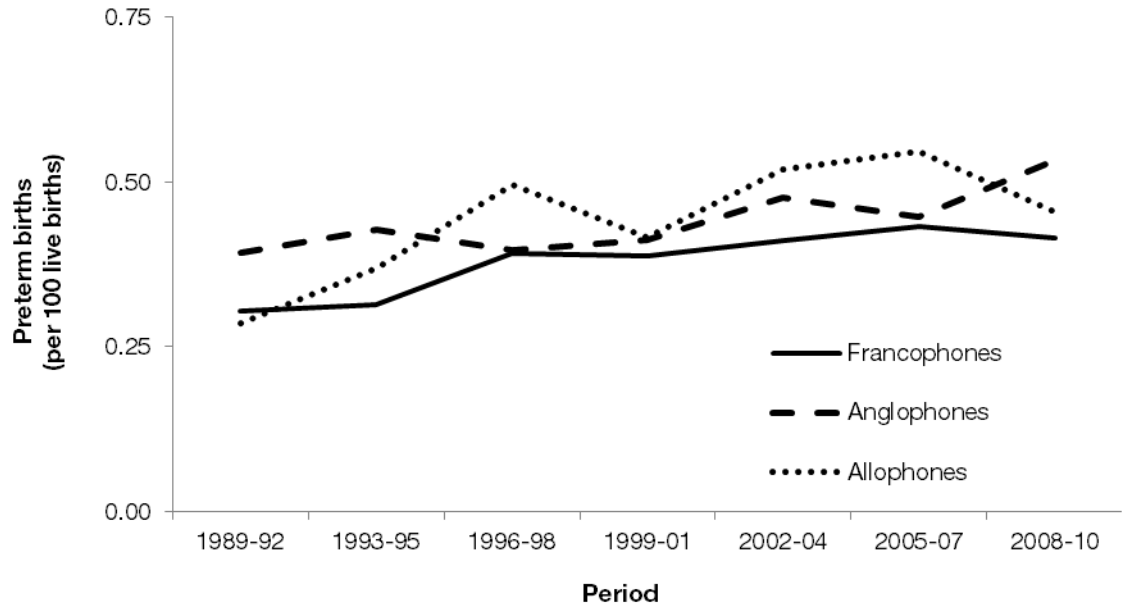
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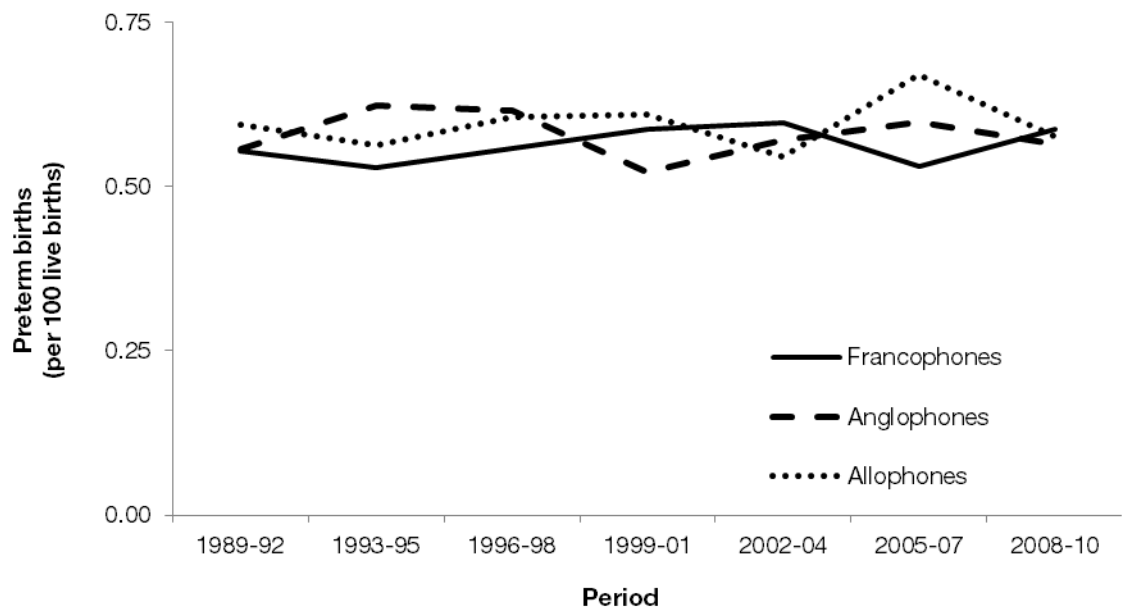
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## Appendix 1 Preterm birth rates by gestational age and mother's first language, Québec, 1989-2010

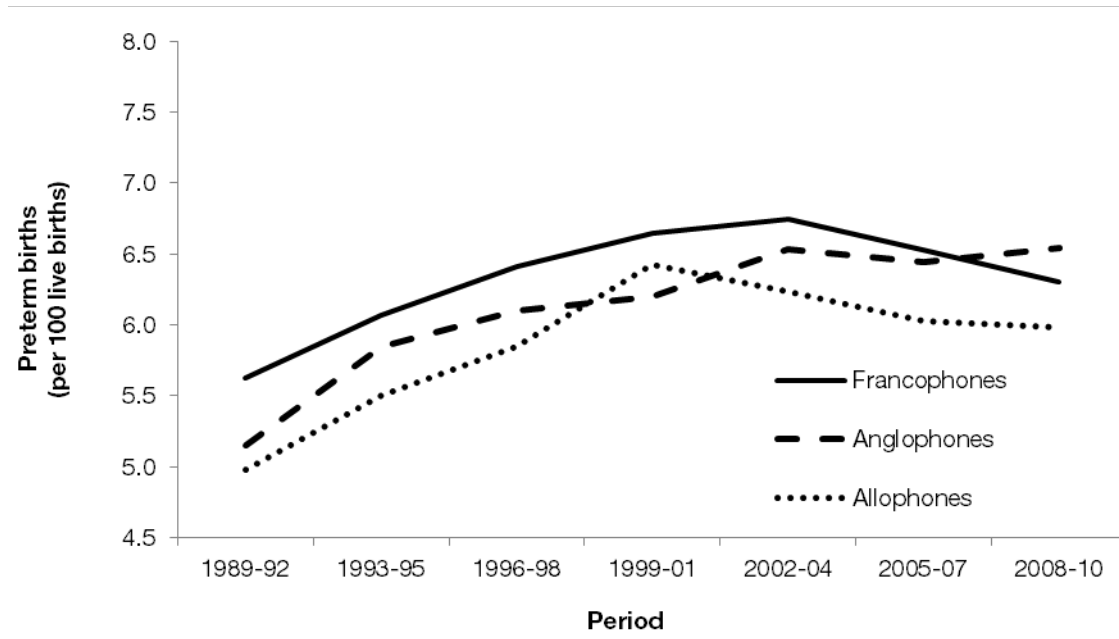
**Figure A1** Preterm birth rates for births with a gestation period of less than 28 weeks by linguistic community, Québec, 1989-2010



**Figure A2** Preterm birth rates for births with a gestation period of 28 to 31 weeks by linguistic community, Québec, 1989-2010



**Figure A3** Preterm birth rates for births with a gestation period of 32 to 36 weeks by linguistic community, Québec, 1989-2010



## Appendix 2 Preterm birth rates (< 37 weeks gestation) by sociodemographic characteristics and mother's first language, Québec, 2008-2010

	Rate of preterm births per 100 live births (95% confidence interval)			
	Francophones	Anglophones	Allophones	All
<b>Mother's place of residence</b>				
Urban	7.30 (7.17; 7.43)	7.58 (7.20; 7.95)	6.88 (6.62; 7.13)	7.31 (7.20; 7.42)
Rural	7.36 (7.11; 7.60)	8.10 (7.04; 9.15)	9.34 (8.07; 10.62)	7.51 (7.27; 7.74)
<b>Level of neighbourhood material deprivation</b>				
Quintile 1 – Privileged	6.84 (6.57; 7.11)	7.57 (6.89; 8.25)	6.81 (6.18; 7.44)	6.99 (6.77; 7.22)
Quintile 2	7.03 (6.78; 7.28)	7.26 (6.50; 8.01)	6.57 (5.98; 7.16)	7.07 (6.85; 7.28)
Quintile 3	7.46 (7.20; 7.72)	7.53 (6.64; 8.43)	6.64 (6.03; 7.25)	7.39 (7.17; 7.62)
Quintile 4	7.20 (6.95; 7.46)	7.63 (6.72; 8.55)	7.02 (6.42; 7.61)	7.21 (6.99; 7.44)
Quintile 5 – Deprived	8.08 (7.79; 8.36)	8.17 (7.32; 9.02)	7.53 (7.05; 8.01)	8.03 (7.80; 8.26)
<b>Immigrant status</b>				
Nonimmigrant	7.30 (7.18; 7.42)	7.93 (7.50; 8.36)	7.51 (6.88; 8.14)	7.40 (7.29; 7.51)
Immigrant	7.52 (7.06; 7.98)	7.04 (6.39; 7.69)	6.93 (6.65; 7.21)	7.16 (6.95; 7.38)
<b>Gestational age</b>				
< 28 weeks	0.41 (0.39; 0.44)	0.53 (0.44; 0.63)	0.45 (0.39; 0.52)	0.44 (0.41; 0.46)
28–31 weeks	0.59 (0.55; 0.62)	0.57 (0.47; 0.67)	0.58 (0.50; 0.65)	0.60 (0.57; 0.63)
32–36 weeks	6.30 (6.19; 6.41)	6.55 (6.22; 6.87)	5.98 (5.75; 6.22)	6.30 (6.21; 6.40)
<b>All</b>	7.30 (7.19; 7.42)	7.64 (7.29; 8.00)	7.01 (6.76; 7.27)	7.34 (7.24; 7.44)

## Appendix 3 Small-for-gestational-age birth rates by sociodemographic characteristics and mother's first language, Québec, 2008-2010

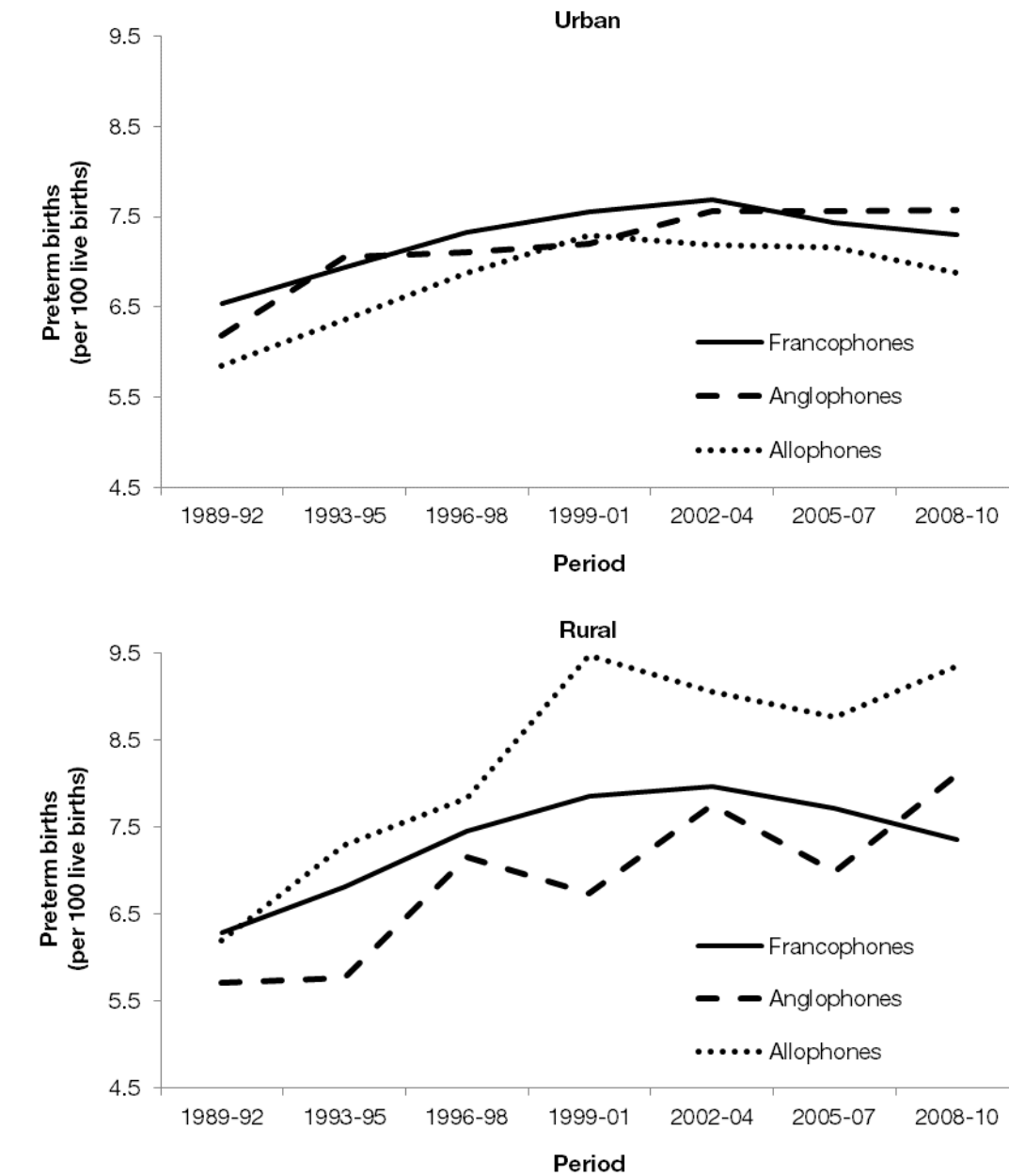
	Small-for-gestational-age birth rate per 100 live births (95% confidence interval)			
	Francophones	Anglophones	Allophones	All
<b>Mother's place of residence</b>				
Urban	7.85 (7.71; 7.98)	8.24 (7.85; 8.63)	8.41 (8.13; 8.70)	8.01 (7.89; 8.12)
Rural	8.31 (8.05; 8.57)	5.65 (4.75; 6.54)	5.54 (4.54; 6.55)	8.03 (7.78; 8.27)
<b>Level of neighbourhood material deprivation</b>				
Quintile 1 – Privileged	7.13 (6.86; 7.41)	7.74 (7.06; 8.43)	8.20 (7.51; 8.89)	7.33 (7.10; 7.56)
Quintile 2	7.47 (7.21; 7.72)	7.79 (7.01; 8.57)	7.69 (7.05; 8.33)	7.55 (7.33; 7.78)
Quintile 3	7.80 (7.54; 8.06)	7.98 (7.06; 8.90)	7.64 (6.99; 8.28)	7.81 (6.99; 8.04)
Quintile 4	8.33 (8.05; 8.60)	7.95 (7.01; 8.88)	8.98 (8.32; 9.65)	8.42 (8.18; 8.66)
Quintile 5 – Deprived	8.88 (8.58; 9.17)	8.47 (7.60; 9.34)	8.46 (7.95; 8.96)	8.80 (8.56; 9.04)
<b>Immigrant status</b>				
Nonimmigrant	7.89 (7.77; 8.02)	7.05 (6.64; 7.45)	6.82 (6.22; 7.43)	7.80 (7.68; 7.91)
Immigrant	8.74 (8.25; 9.24)	10.19 (9.42; 10.96)	8.58 (8.28; 8.89)	8.83 (8.59; 9.07)
<b>All</b>	7.95 (7.83; 8.07)	7.94 (7.58; 8.30)	8.26 (7.98; 8.53)	8.01 (7.91; 8.11)



## Appendix 4 Preterm birth rates for linguistic communities by selected sociodemographic characteristics

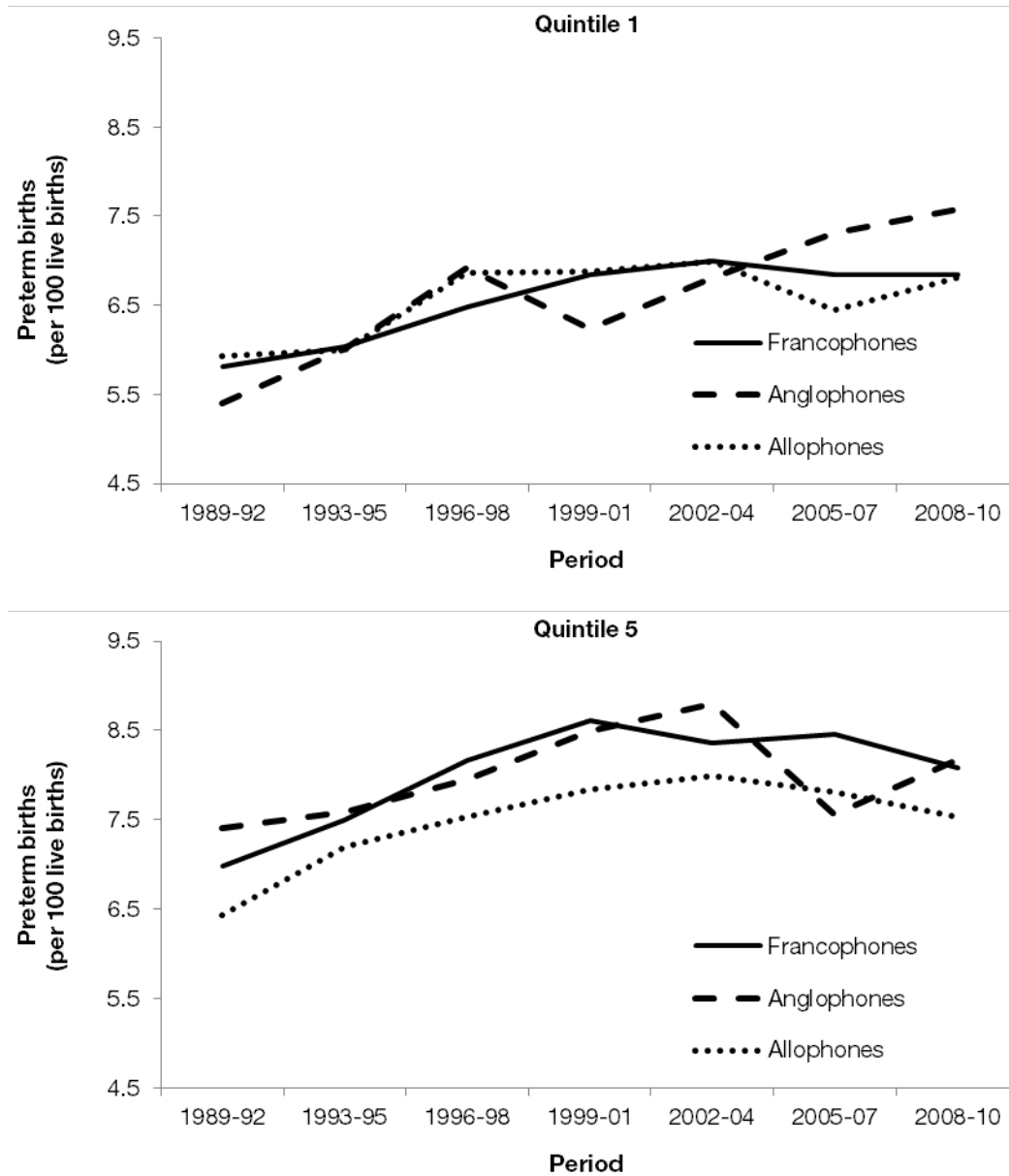
### PLACE OF RESIDENCE

Figure A4 Preterm birth rates (< 37 weeks gestation) for linguistic communities by place of residence, Québec, 1989-2010



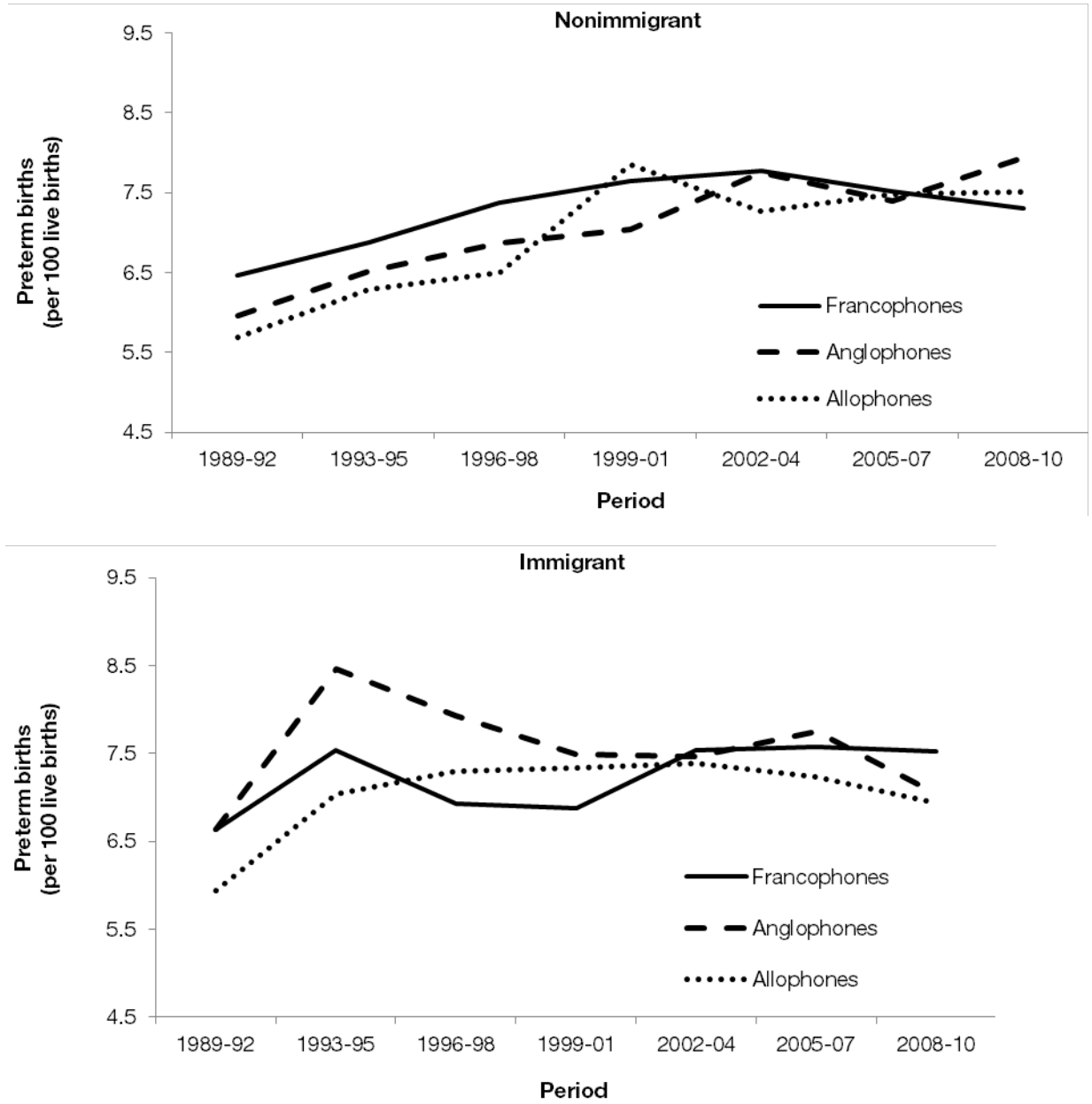
**MATERIAL DEPRIVATION**

**Figure A5 Preterm birth rates (< 37 weeks gestation) for linguistic communities by level of neighbourhood material deprivation, Québec, 1989-2010**



**IMMIGRANT STATUS**

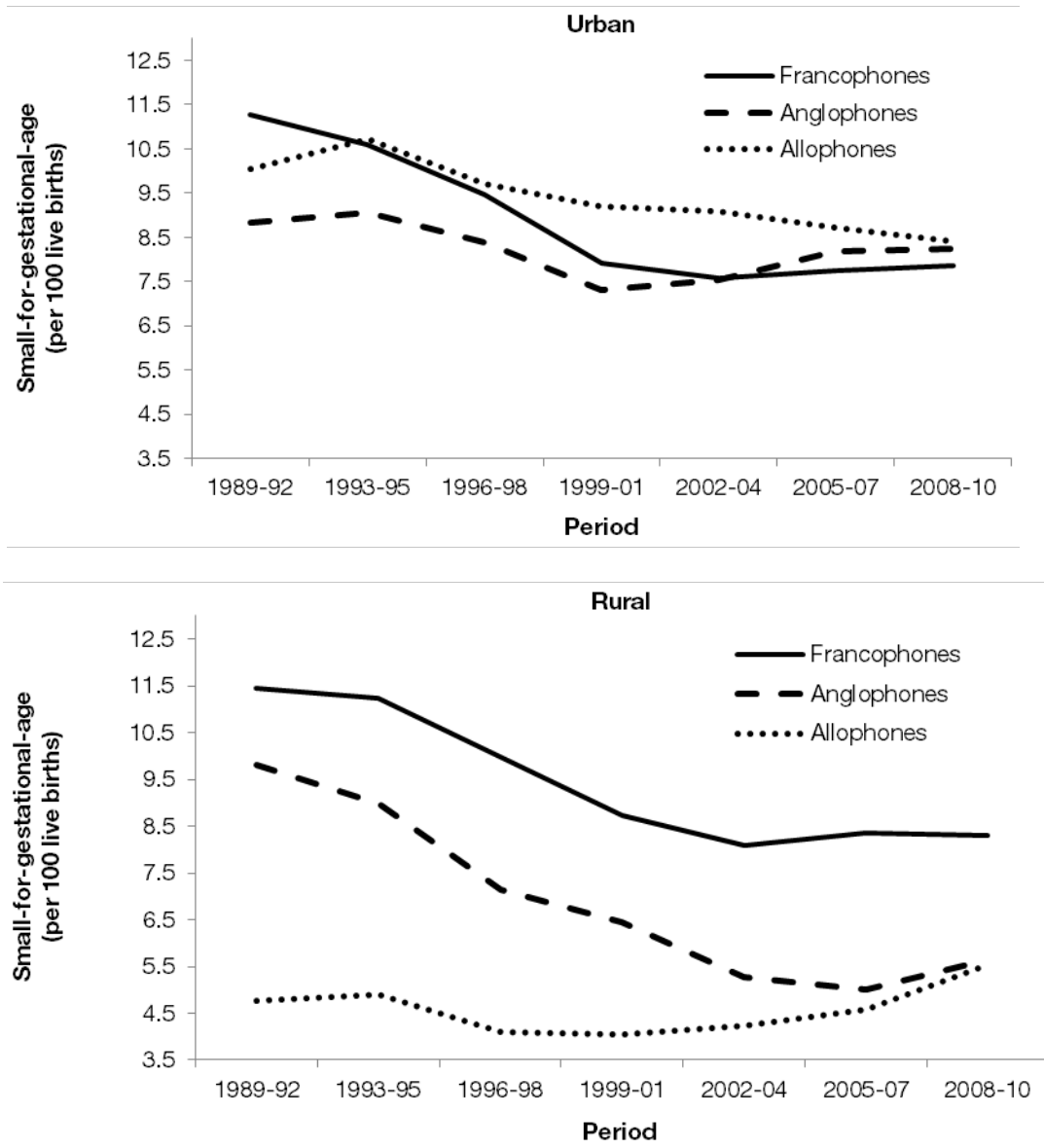
**Figure A6** Preterm birth rates (< 37 weeks gestation) for linguistic communities by immigrant status, Québec, 1989-2010



## Appendix 5 Small-for-gestational-age birth rates for various linguistic communities by sociodemographic characteristics

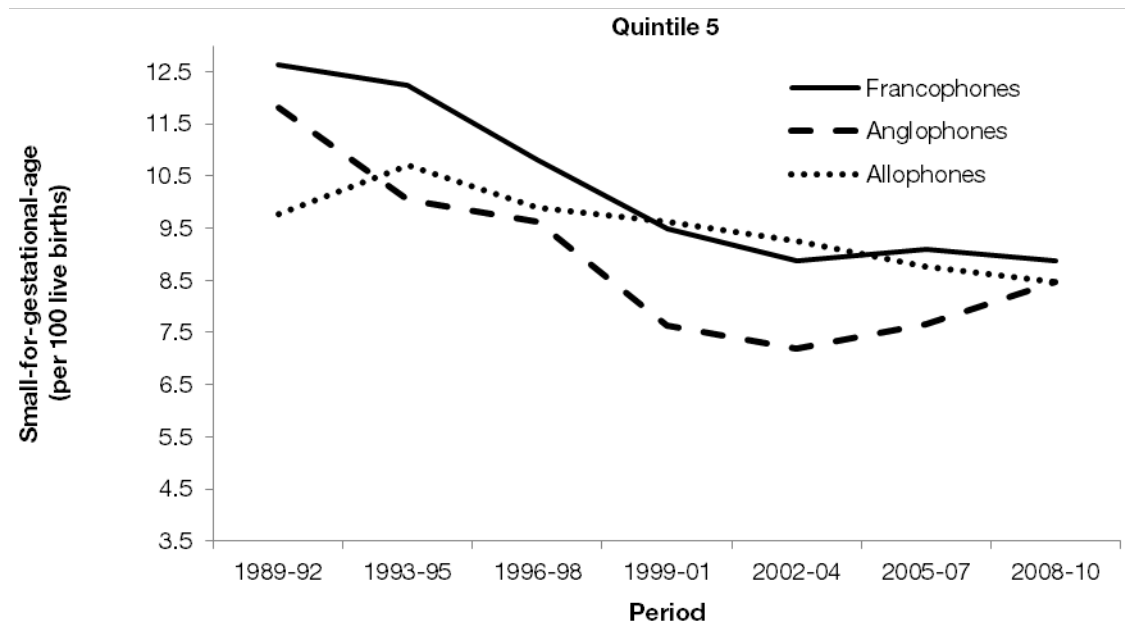
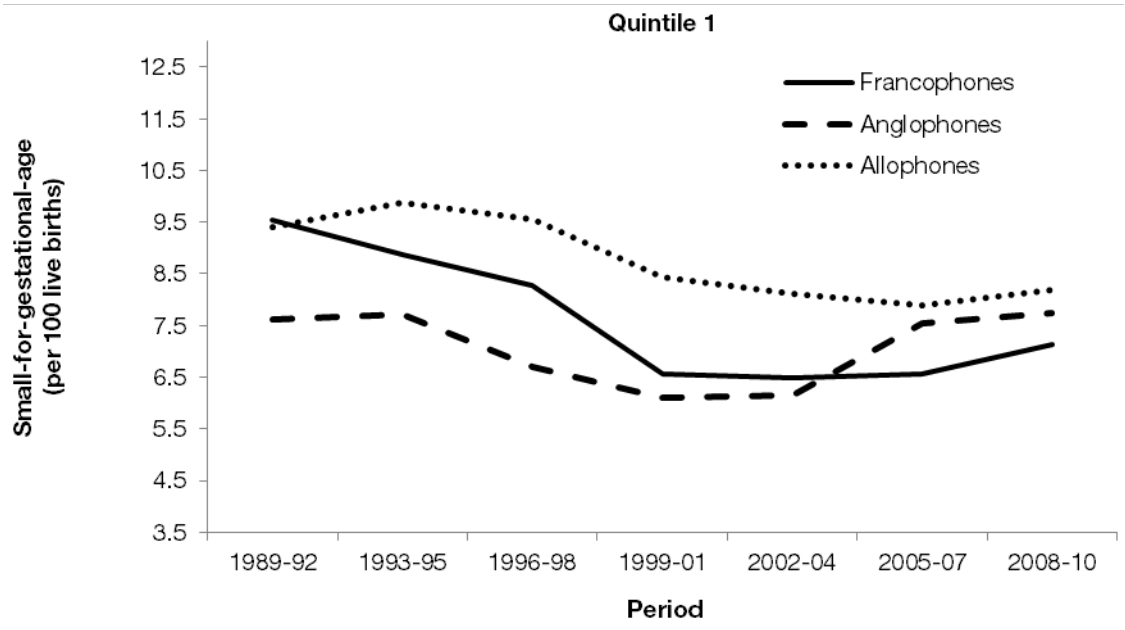
### PLACE OF RESIDENCE

Figure A7 Small-for-gestational-age birth rates for linguistic communities by place of residence, Québec, 1989-2010



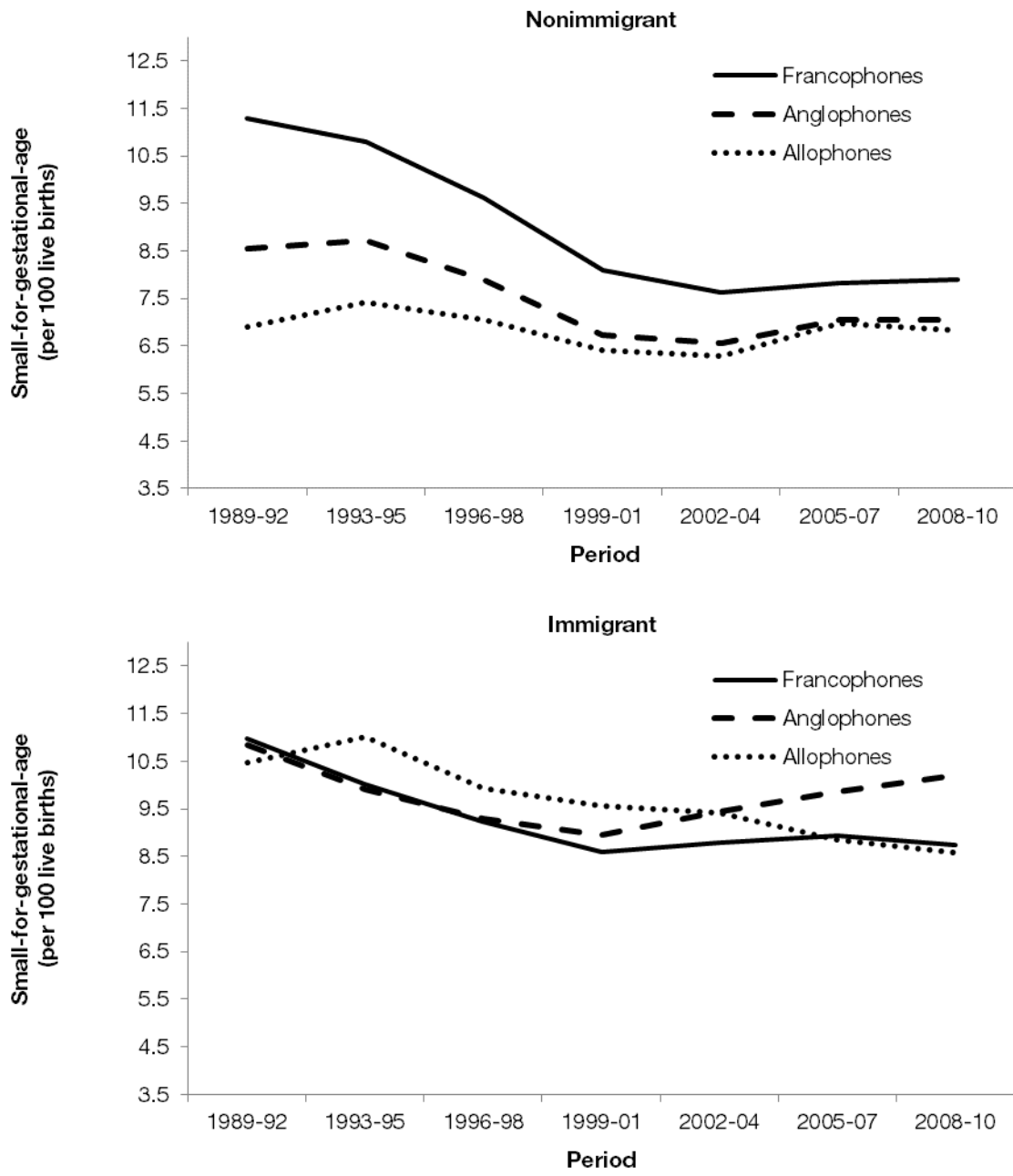
**MATERIAL DEPRIVATION**

**Figure A8 Small-for-gestational-age birth rates for linguistic communities by level of neighbourhood material deprivation, Québec, 1989-2010**



**IMMIGRANT STATUS**

**Figure A9 Small-for-gestational-age birth rates for linguistic communities by immigrant status, Québec, 1989-2010**





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