# Pregnancy outcomes in Anglophones of Quebec : Recent research results

## QUESCREN Lunch & Learn

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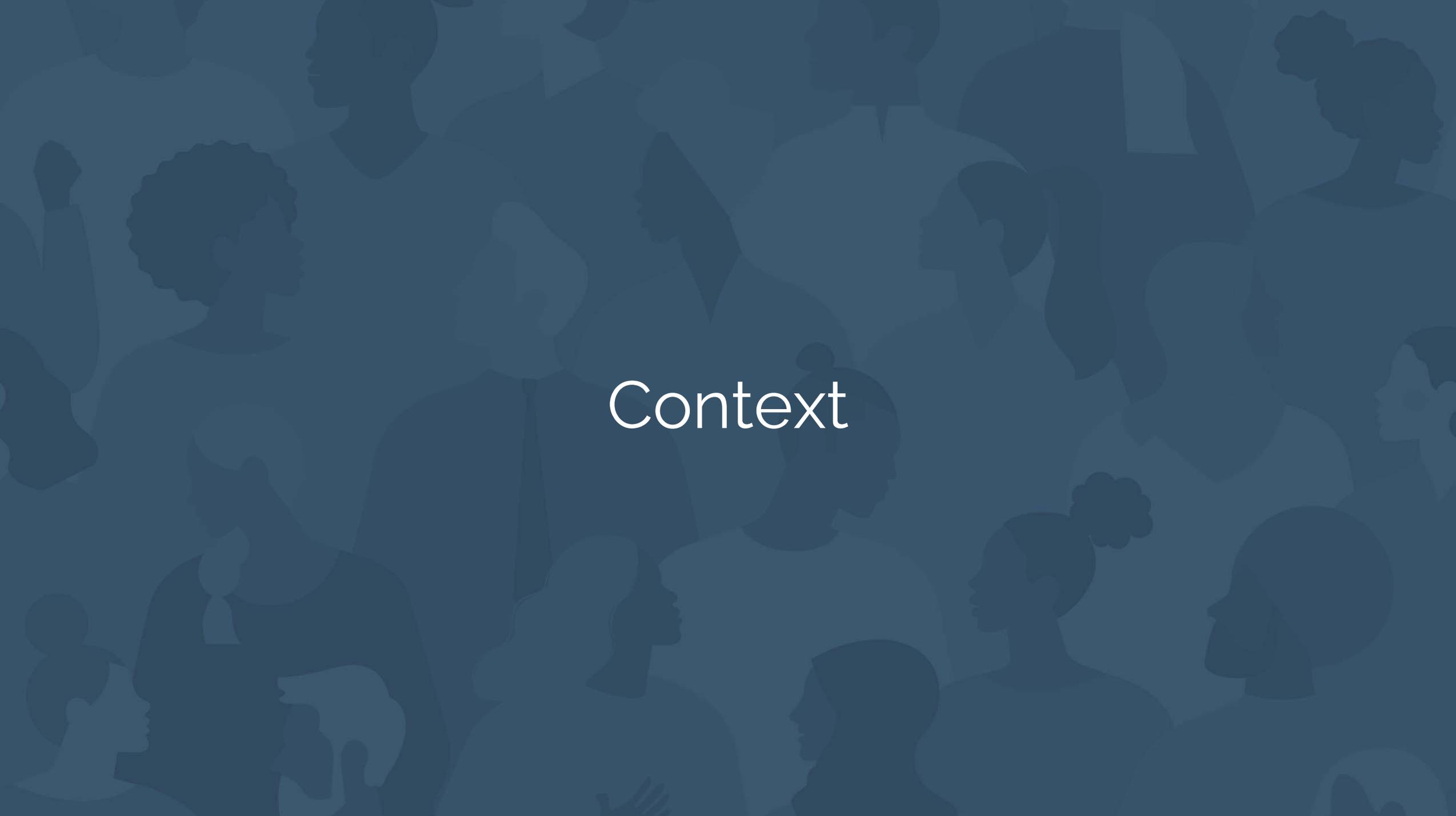
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# Outline

- Context
- Study #1: Impact of place of birth on rates of stillbirth and preterm birth
- Study #2: Hospital characteristics and risk of stillbirth and preterm birth among Anglophones in Montreal
- Future research
- Q&A

# Acknowledgments

Context

# Context

- Population health surveillance team
  - Double mandate
  - Maternal-infant health surveillance
    - Monitor the health of pregnant populations
    - Understand health needs
    - Identify emerging inequality
    - Use administrative health data
  - Research on maternal and infant health

# Context

- Our previous studies suggest that there may be emerging pregnancy disparities among Quebec's Anglophones.
  - Stillbirth (death of fetus in uterus )
  - Preterm birth (infant born before 37 weeks gestation)
    - Stillbirth and preterm birth are indicators of perinatal health.

# Context

| | Preterm birth rate (per 100 births) | | | Stillbirth rate (per 1,000 births) | |
| --- | --- | --- | --- | --- | --- |
| | Anglo | Franco | | Anglo | Franco |
| Time period | | | Time period | | |
| 1981-1990 | 6.1 | 6.5 | 1989-1992 | 4.7 | 5.1 |
| 1991-2000 | 7.1 | 7.6 | 1999-2001 | 3.8 | 3.8 |
| 2001-2010 | 7.6 | 7.3 | 2008-2010 | 4.4 | 3.3 |

# Rationale

- Could access-related issues explain some of the perinatal health inequality in Quebec's Anglophones?
  - Almost all deliveries take place in hospital.
  - Care related barriers related to language.
  - Use an epidemiological approach (not the organization of obstetric care).

Study #1: Role of place of birth

# Hypothesis

- Longer travel times to reach the place of birth can affect the timing of birth

  o Anglophones may chose to travel farther for a hospital

  o Could delay delivery and lead to stillbirth

    - Risk of stillbirth increases when it takes longer to get to hospital

# Objective

To evaluate whether distance travelled to reach the place of birth contributes to the risk of preterm birth and stillbirth in Anglophones compared with Francophones.

# Methods

- **Data:** Vital statistics for Québec, 1998-2019
  - Live birth and stillbirth registration certificates
- **Study design:** Retrospective cohort study
- **Population:** 1,170,842 births among urban Quebec residents
  - Anglo and Franco only

# Methods

- **Exposures:**
  1. Self-reported maternal language: French or English
  2. Distance between residence and place of birth: <10, 10-29.9, or ≥30 km
- **Outcomes:** Preterm birth and stillbirth

# Methods

- **Statistical analysis**
  - Regression models to estimate risk ratios and 95% confidence intervals (CI).

$$\text{Risk ratio} = \frac{Risk\ of\ stillbirth\ in\ Anglophones}{Risk\ of\ stillbirth\ in\ Francophones}$$

  - Adjusted for maternal age, parity, country of origin, education, material deprivation, and time period.

# Results

**Table 1** Frequency of preterm birth and stillbirth by distance to hospital

| | Preterm birth, n (%) | | Stillbirth, n (%) | |
|---|---|---|---|---|
| | Anglophone | Francophone | Anglophone | Francophone |
| **Distance to hospital** | | | | |
| <10 km | 5,363 (3.8) | 33,758 (3.3) | 392 (0.3) | 1,729 (0.2) |
| <30 km | 9,799 (6.9) | 62,358 (6.1) | 643 (0.5) | 3,182 (0.3) |
| ≥30 km | 812 (0.6) | 10,201 (1.0) | 55 (0.04) | 626 (0.1) |

**Table 2** Interaction of language with distance to hospital in the association with preterm birth and stillbirth

| Distance to hospital | Risk ratio (95% confidence interval) Anglophone vs Francophone | |
| --- | --- | --- |
| | Preterm birth | Stillbirth |
| <10 km | 1.07 (1.04-1.11) | 1.18 (1.05-1.33) |
| <30 km | 1.08 (1.06-1.11) | 1.07 (0.97-1.17) |
| ≥30 km | 0.69 (0.64-0.75) | 0.63 (0.46-0.86) |
| *P* value (interaction with language) | <0.0001 | 0.001 |

# Conclusion

- Anglophones who deliver close to home have a greater risk of preterm birth and stillbirth, compared with Francophones.

- Anglophones who travel farther have lower risks.

- Longer travel times does not explain why Anglophones have more stillbirths.

  - Other factor?

# Limitations

- Misclassification : self-reported mother tongue to identify maternal language.

- Distances may be misestimated : postal codes to calculate distance based on road maps.

- Could not account for individual income and employment.
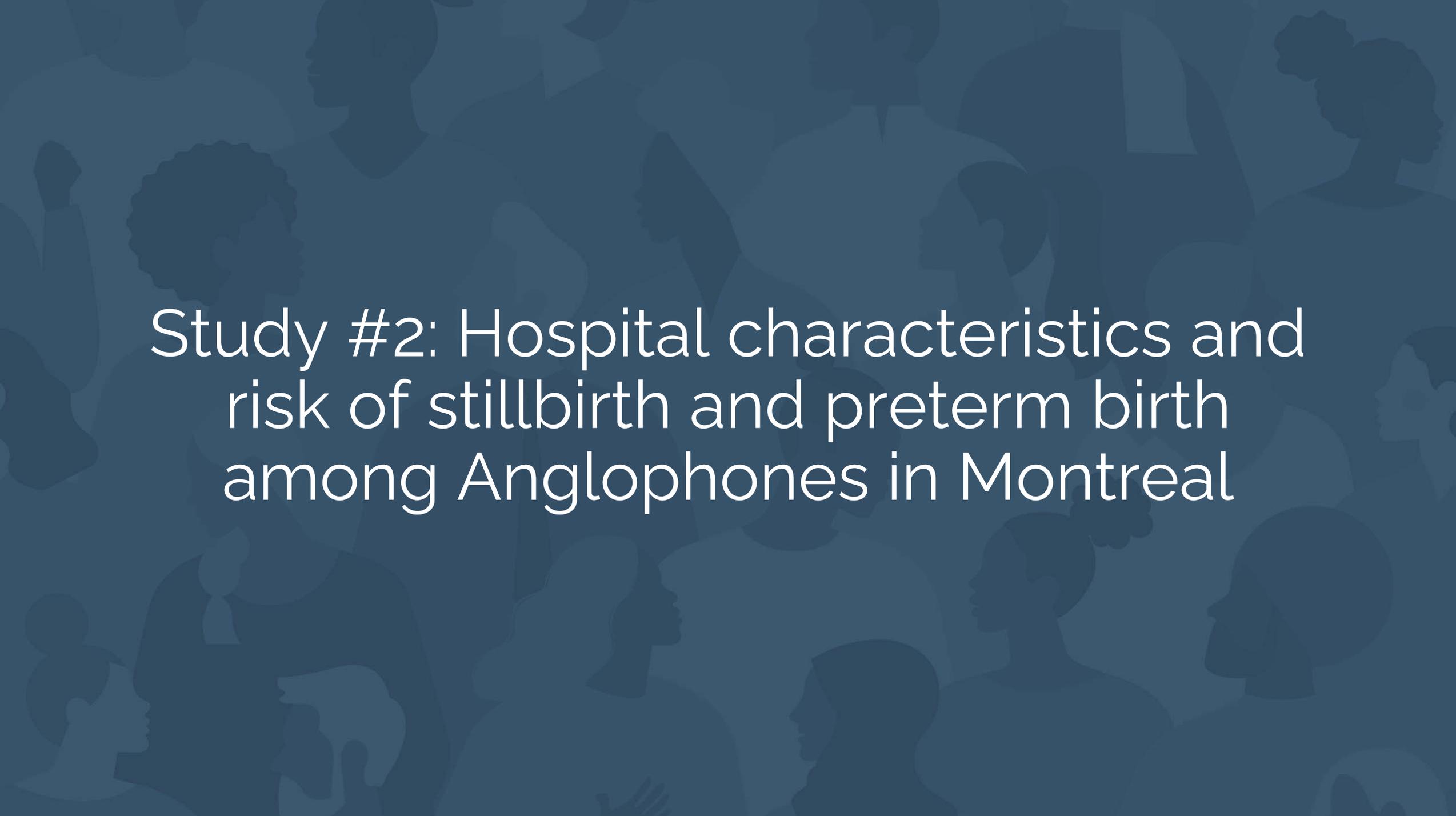
Study #2: Hospital characteristics and risk of stillbirth and preterm birth among Anglophones in Montreal

# Hypothesis

- Language barriers may be associated with adverse birth outcomes.

- We hypothesized that delivery delays may be more likely among Anglophones who use French hospitals as opposed to English hospitals.
  - Fine balance between preterm birth and stillbirth

# Objective

To determine the relationship between the language of a hospital and the risks of preterm birth and stillbirth among Anglophones in Montreal.

# Methods

- **Data:** Vital statistics for Québec, 1998-2019
  - Live birth and stillbirth registration certificates
- **Study design:** Retrospective cohort study
- **Population:** 124,760 births among Anglophones in metropolitan Montreal
  - Anglo only

# Methods

- **Exposure:** Primary language of the hospital used for delivery (English vs. French)
  - We are comparing Anglos who use local hospitals versus hospitals that are further from home
- **Outcomes:** Preterm birth and stillbirth

# Methods

- **Statistical analysis:**
  - Risk ratios and 95% confidence intervals (CI)

$$\text{Risk ratio} = \frac{Risk\ of\ stillbirth\ in\ French\ hospital}{Risk\ of\ stillbirth\ in\ local\ hospital}$$

  - Adjusted for maternal age, parity, country of origin, education, material deprivation, and time period.

# Results

**Table 1** Rates between type of hospital and birth outcomes

|  | Total no. (%) | |
|---|---|---|
|  | Preterm birth | Stillbirth |
| Farther French hospital | 1,730 (7.7) | 132 (0.6) |
| Farther English hospital | 6,270 (8.4) | 330 (0.4) |
| Closest hospital to home | 1,691 (6.3) | 94 (0.3) |

# Results

**Table 2** Association between type of hospital and birth outcomes

|  | Risk ratio (95% CI) | |
|---|---|---|
|  | Preterm birth | Stillbirth |
| Farther **French** hospital | 1.2 (1.1-1.3) | 1.7 (1.3-2.2) |
| Farther **English** hospital | 1.4 (1.3-1.4) | 1.4 (1.1-1.7) |
| Closest hospital to home | Reference | Reference |

# Results

**Table 3** Association between type of hospital and birth outcomes stratified by maternal education and origin

| | Risk ratio (95% CI) | |
|---|---|---|
| | Preterm birth | Stillbirth |
| Farther **French** hospital | | |
| No high school | 1.1 (0.9-1.4) | 3.0 (1.1-8.3) |
| High school diploma | 1.2 (1.1-1.4) | 2.2 (1.4-3.2) |
| University | 1.3 (1.1-1.4) | 1.5 (0.9-2.4) |
| Farther **English** hospital | | |
| No high school | 1.4 (1.1-1.8) | 1.4 (0.5-4.2) |
| High school diploma | 1.3 (1.2-1.4) | 1.6 (1.1-2.4) |
| University | 1.5 (1.4-1.6) | 1.1 (0.7-1.7) |
| Closest hospital to home | Reference | Reference |

# Limitations

- Similar to other study
- No data on level of care of hospitals
  - May influence choice of hospital
- No certainty that preterm infant will survive or be healthy

# Conclusion

- Anglophones who use French hospitals have a greater risk of stillbirth than preterm birth.

- In contrast, Anglophones who use English hospitals have similar risks of preterm birth and stillbirth.

- The disparity is greater for socioeconomically disadvantaged Anglos.

- Language barriers? Other factors delaying delivery?

# Future research

# Future research

- Attempt to get a better understanding of what types of pregnancy complications occur in Anglophones
  - Gestational diabetes
  - Preeclampsia
- Link vital statistics data with hospital data

# Gestational diabetes is increasing over time for the entire population, but is rising more rapidly among Anglophones

|  | Rate of gestational diabetes (per 100 births) | |
|---|---|---|
|  | Anglophone | Francophone |
| Time period |  |  |
| 2008-2011 | 6.8 | 5.5 |
| 2012-2015 | 9.1 | 7.7 |
| 2016-2020 | 12.9 | 10.7 |

# Acknowledgement

## Underlying Causes of Ethnocultural Inequality in Pregnancy Outcomes: Role of Hospital Proximity

Nathalie Auger[1,2,3,4] · Marianne Bilodeau-Bertrand[1,2] · Nahantara Lafleur[1,2] · Antoine Lewin[5,6]

# Acknowledgement

# Questions

# Results

## Table 3 Association between type of hospital and birth outcomes stratified by maternal education and origin

| | Risk ratio (95% CI) | |
|---|---|---|
| | Preterm birth | Stillbirth |
| **Farther French hospital** | | |
| No high school | 1.1 (0.9-1.4) | 3.0 (1.1-8.3) |
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| **Farther English hospital** | | |
| No high school | 1.4 (1.1-1.8) | 1.4 (0.5-4.2) |
| High school diploma | 1.3 (1.2-1.4) | 1.6 (1.1-2.4) |
| University | 1.5 (1.4-1.6) | 1.1 (0.7-1.7) |
| Closest hospital to home | Reference | Reference |

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