Comparison of black–white disparities in preterm birth between Canada and the United States

Britt McKinnon PhD, Seungmi Yang PhD, Michael S. Kramer MD, Tracey Bushnik MBA, Amanda J. Sheppard PhD, Jay S. Kaufman PhD

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Abstract

Background: A higher risk of preterm birth among black women than among white women is well established in the United States. We compared differences in preterm birth between non-Hispanic black and white women in Canada and the US, hypothesizing that disparities would be less extreme in Canada given the different historical experiences of black populations and Canada's universal health care system.

Methods: Using data on singleton live births in Canada and the US for 2004–2006, we estimated crude and adjusted risk ratios and risk differences in preterm birth (< 37 wk) and very preterm birth (< 32 wk) among non-Hispanic black versus non-Hispanic white women in each country. Adjusted models for the US were standardized to the covariate distribution of the Canadian cohort.

Results: In Canada, 8.9% and 5.9% of infants born to black and white mothers, respectively, were preterm; the corresponding figures in the

US were 12.7% and 8.0%. Crude risk ratios for preterm birth among black women relative to white women were 1.49 (95% confidence interval [CI] 1.32 to 1.66) in Canada and 1.57 (95% CI 1.56 to 1.58) in the US (p value for heterogeneity [p_H] = 0.3). The crude risk differences for preterm birth were 2.94 (95% CI 1.91 to 3.96) in Canada and 4.63 (95% CI 4.56 to 4.70) in the US (p_H = 0.003). Adjusted risk ratios for preterm birth (p_H = 0.1) were slightly higher in Canada than in the US, whereas adjusted risk differences were similar in both countries. Similar patterns were observed for racial disparities in very preterm birth.

Interpretation: Relative disparities in preterm birth and very preterm birth between non-Hispanic black and white women were similar in magnitude in Canada and the US. Absolute disparities were smaller in Canada, which reflects a lower overall risk of preterm birth in Canada than in the US in both black and white populations.

In the United States, a higher risk of preterm birth among black women than among white women is well established.[1–3] This racial disparity is of great concern because preterm birth is a leading cause of perinatal mortality and is predictive of developmental problems and adverse health outcomes later in life.[4] The underlying causes of the racial disparity in preterm birth in the US are not well understood, although research has suggested contributing roles for a wide range of factors, including socioeconomic disadvantage,[5] poor neighbourhood conditions (e.g., poverty, crime),[5,6] lack of access to health care,[7] psychosocial stress,[8] racial discrimination[9] and adverse health behaviours.[10]

Rates of preterm birth have consistently been lower in Canada than in the US.[11,12] However, in contrast to the US, little is known about differences in rates by race or ethnicity in Canada. There is evidence that African-born and Caribbean-born

women in the provinces of Quebec and Ontario have higher rates of preterm birth than Canadian-born women.[13–15] Although the magnitude of these differences is smaller than the disparity in preterm births between black and white women in the US,[16] foreign-born black women in the US have been found to be at lower risk of preterm birth than US-born black women.[17,18]

In both Canada and the US, socioeconomic conditions at both individual and neighbourhood levels are important predictors of preterm birth.[19–21] Although the income gap between black and white people is markedly smaller in Canada than in the US,[22] black populations in both countries have lower education levels, higher unemployment rates and a greater likelihood of living in low-quality neighbourhoods compared with white populations.[23] Canada and the US share similar social and economic influences, yet the historical experiences of black

populations and the social welfare systems (e.g., universal health care) are quite different in the 2 countries. Black people constitute about 13% of the total US population, but only about 3% of the Canadian population.[24,25] The overwhelming majority of Canada's black population are immigrants who entered the country after 1960 and their descendants, whereas more than 85% of black Americans can trace their ancestry 3 or more generations in the US, with most being descendants of slaves.[22]

The objectives of our study are twofold. First, using data from a new cohort linking birth registrations with information from the 2006 Canadian long-form census, we present Canada-wide estimates of differences in preterm birth rates between black and white populations. Second, we use comparable methodology to compare racial differences in preterm birth rates between Canada and the US. Given different historical experiences of black populations in the 2 countries, as well as Canada's commitment to universal health care and its general perception as a more egalitarian society than the US,[22] we hypothesized that we would observe smaller racial disparities in the rates in Canada than in the US.

Methods

Study design
We included data on singleton live births in Canada and the US between May 2004 and May 2006. The Canadian data were collected from a linked cohort combining the Canadian Live Birth, Infant Death and Stillbirth Database with 2006 Canadian census data. Approval for this linkage was granted by Statistics Canada's Executive Management Board, and ethics approval for the study was obtained from the Pediatric Research Ethics Board of the Research Institute of the McGill University Health Centre.

Study cohort
Linkage of the Canadian data was based on the child's date of birth and sex, the mother's date of birth, the father's date of birth and the postal code of the mother's residence at the time of birth. Completion of the 2006 census was mandatory for all Canadian residents, and 90.5% of births were linked to a census record. In addition to the mandatory short-form census questionnaire, a long-form questionnaire was distributed randomly to 1 in 5 private households (with oversampling in remote northern areas and Indian reserves). For our study cohort, we included births from all Canadian provinces and territories that could be linked to a long-form census questionnaire. As such, we used an approximate 20% sample of

births in Canada over the 2-year study period. Data for US births were obtained from the National Center for Health Statistics linked birth–infant death cohort data files.

Gestational age for Canada is based on a clinical estimate of gestational duration, supplied by the physician responsible for delivery. The US data files contain 2 estimates of gestational age: a clinical/obstetric estimate and an estimate based on the date of the mother's last menstrual period. Although the menstrual-based estimate is frequently used for official US statistics and research, it tends to overestimate preterm birth rates compared with the clinical/obstetric estimates.[26] To be comparable with the Canadian data, we restricted the US analysis to the 93.2% of births in our sample with a clinical/obstetric estimate of gestational age. We excluded births with a weight of less than 500 g or a gestational age of less than 20 weeks,[27] as well as those with biologically implausible combinations of birth weight and gestational age.[28] Infants were categorized as very preterm (< 32 wk), preterm (< 37 wk) or term (37–41 wk).

We restricted our sample to births to non-Hispanic black and non-Hispanic white women. For Canada, these women were identified from the census question on visible minority status, which identifies "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in color." The question asks: "Is this person: White, Chinese, South Asian, Black, Filipino, Latin American, Southeast Asian, Arab, West Asian, Japanese, Korean, other (specify)?" Given the separate category for Latin American, the white and black categories refer primarily to non-Hispanic individuals. People who reported both "black" and "white" were also included in the "black" category. US birth certificates include information on maternal race and Hispanic origin. We included infants born to black or white women who did not report being of Hispanic origin.

Statistical analysis
We used logistic regression to estimate black–white differences in the risk of preterm birth (< 37 wk v. 37–41 wk) and very preterm birth (< 32 wk v. 33–41 wk), separately for each country. To facilitate interpretation and report effects on the absolute probability scale, we calculated average marginal effects estimated from the regression coefficients.[29] We estimated crude and adjusted risk differences and risk ratios for preterm birth and very preterm birth for infants born to black versus white women.

We present 2 sets of covariate-adjusted estimates. In the first multivariable model, we

adjusted for maternal age (< 20, 20–34 or ≥ 35 yr), marital status (legally married v. not legally married), maternal education (< 12, 12–15 or ≥ 16 yr), birth order (first-born, second, or third or later), infant sex, and paternal information (nonmissing v. missing on birth registration). In the US, missing paternal information on birth registration is associated with an increased risk of preterm birth and other adverse birth outcomes.[30] In addition to the aforementioned list of covariates, the second model included maternal nativity (native born v. foreign born) and was

estimated for the entire Canadian sample and for US births that occurred in 2004 (29.5% of the total US sample). As of 2005, the National Center for Health Statistics no longer releases maternal birthplace in the publicly available files.

To facilitate comparability, we standardized adjusted models for the US to the covariate distribution of the Canadian study population.[29] Specifically, we estimated risk ratios and risk differences for preterm birth between black and white women in each country under a hypothetical scenario in which both populations had Canada's

Table 1: Characteristics of singleton live births to non-Hispanic black and non-Hispanic white women in Canada and the United States, 2004–2006

Characteristic	Canada*; no. (%) of live births			United States; no. (%) of live births		
	Black $n = 3\,811$	White $n = 87\,234$	Total $n = 91\,045$	Black $n = 1\,039\,642$	White $n = 4\,029\,625$	Total $n = 5\,069\,267$
Gestational age, wk						
20–28	29 (0.8)	182 (0.2)	211 (0.2)	11 224 (1.1)	12 347 (0.3)	23 571 (0.5)
28–31	39 (1.1)	390 (0.5)	429 (0.5)	15 046 (1.5)	23 379 (0.6)	38 425 (0.8)
32–33	43 (1.2)	529 (0.6)	572 (0.6)	15 654 (1.5)	32 207 (0.8)	47 861 (0.9)
34–36	212 (5.8)	3 962 (4.6)	4 174 (4.7)	89 114 (8.6)	254 587 (6.3)	343 701 (6.8)
37–41	3 462 (90.5)	81 622 (93.4)	85 084 (93.3)	902 220 (86.8)	3 682 951 (91.4)	4 585 171 (90.4)
≥ 42	26 (0.6)	549 (0.6)	575 (0.6)	6 384 (0.6)	24 154 (0.6)	30 538 (0.6)
Maternal age, yr						
< 20	161 (4.8)	2 442 (3.4)	2 603 (3.5)	182 477 (17.6)	309 780 (7.7)	492 257 (9.7)
20–24	590 (16.4)	12 900 (15.8)	13 490 (15.8)	341 018 (32.8)	942 409 (23.4)	1 283 427 (25.3)
25–29	1 046 (27.7)	28 290 (32.2)	29 336 (32.0)	251 820 (24.2)	1 146 411 (28.4)	1 398 231 (27.6)
30–34	1 141 (29.5)	28 706 (32.1)	29 847 (32.0)	161 107 (15.5)	1 011 299 (25.1)	1 172 406 (23.1)
35–39	710 (17.4)	12 518 (13.8)	13 228 (13.9)	81 486 (7.8)	509 839 (12.6)	591 325 (11.7)
≥ 40	163 (4.2)	2 378 (2.7)	2 541 (2.8)	21 734 (2.1)	109 887 (2.7)	131 621 (2.6)
Live birth order						
First-born	1 508 (41.3)	40 085 (47.4)	41 593 (47.1)	407 178 (39.2)	1 687 801 (41.9)	2 094 979 (41.3)
Second	1 191 (30.7)	31 548 (35.7)	32 739 (35.5)	300 115 (28.9)	1 343 462 (33.3)	1 643 577 (32.4)
Third or later	1 112 (28.0)	15 601 (17.0)	16 713 (17.4)	332 349 (32.0)	998 362 (24.8)	1 330 711 (26.2)
Maternal education, yr						
< 12	617 (16.3)	10 323 (11.4)	10 940 (11.6)	249 862 (24.0)	471 337 (11.7)	721 199 (14.2)
12–15	2 507 (65.8)	50 759 (59.1)	53 266 (59.4)	655 150 (63.0)	2 162 146 (53.7)	2 817 296 (55.6)
≥ 16	687 (18.0)	26 152 (29.5)	26 839 (29.0)	134 630 (13.0)	1 396 142 (34.6)	1 530 772 (30.2)
Marital status						
Unmarried	1 797 (47.7)	30 794 (36.6)	32 591 (37.1)	730 454 (70.3)	1 041 893 (25.9)	1 772 347 (35.0)
Married	2 014 (52.3)	56 440 (63.4)	58 454 (62.9)	309 188 (29.7)	2 987 732 (74.1)	3 296 920 (65.0)
Paternal information						
Not missing	3 467 (90.7)	84 940 (97.2)	88 407 (97.0)	666 140 (64.1)	3 667 329 (91.0)	4 333 469 (85.5)
Missing	344 (9.3)	2 294 (2.8)	2 638 (3.0)	373 502 (35.9)	362 296 (9.0)	735 798 (14.5)
Maternal nativity†						
Native born	923 (24.6)	79 232 (90.8)	80 155 (87.9)	266 654 (87.2)	1 123 481 (94.6)	1 390 126 (93.1)
Foreign born	2 888 (75.4)	8 002 (9.2)	10 890 (12.1)	39 206 (12.8)	63 927 (5.4)	103 133 (6.9)

*For Canada, frequency counts are unweighted and percentages are weighted. Percentages may not sum to 100 due to rounding.
†For US, maternal nativity available only for births in 2004 ($n = 1\,493\,259$).

distribution of measured covariates (e.g., maternal age, education, nativity). For example, although 9.7% of women were less than 20 years of age in the US cohort, we estimated adjusted risk ratios and risk differences for the US for the scenario where just 3.5% of the women were less than 20 (i.e., Canada's age distribution). As a sensitivity analysis, we also generated estimates for both countries standardized to the covariate distribution of the US black study population.

We used the χ^2 test for formal statistical comparison of homogeneity of the estimated risk ratios and risk differences between Canada and the US.[31] We applied a cohort weight for analyses using the Canadian data, and we used bootstrap weights to estimate variance. These weights were developed from the census household weight, which adjusts for the census sampling design and nonresponse, and they were calibrated to adjust for missed linkages.

We performed all analyses using Stata version 14.1 (StataCorp).

Results

The Canadian sample comprised 91 045 births, of which 4.2% were to women who reported "black" visible minority status. The US sample included just over 5 million births, with 20.5% born to non-Hispanic black women. Overall, preterm birth rates were 6.0% in Canada and 9.0% in the US; very preterm birth rates were 0.7% and 1.3%, respectively. In Canada, 8.9% of infants born to black women were preterm, as compared with 5.9% of infants born to white women. Corresponding figures in the US were markedly higher, at 12.7% and 8.0%, respectively.

The distribution of selected characteristics of the births to black and white women in each country are presented in Table 1. The US had a higher proportion of births to women less than 20 years of age (9.7% v. 3.5% in Canada). An even starker contrast was observed between the proportion of black women less than 20 in the US and Canada (17.6% v. 4.8%, respectively). Black women in Canada were more likely to be married than black women in the US (52.3% v. 29.7%) and had slightly higher education levels. Finally, we observed large differences in maternal nativity in the black populations between both countries: in the US, 87.2% of the black women were native born, as compared with 24.6% of black women in Canada.

The cumulative proportions of births by gestational age in the black and white cohorts in each country are shown in Figure 1. The proportion of preterm births (< 37 weeks' gestation) was consistently highest among US black women and lowest among Canadian white women. The crude rates of preterm birth by maternal and paternal sociodemographic characteristics are presented in Table 2. The same information for very preterm birth rates is shown in Table A of Appendix 1 (available at www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.150464/-/DC1). In both countries, black women had higher rates of preterm birth than white women across nearly all covariate categories, although in Canada no significant racial disparity was observed among women less than 25 years of age or with less than 12 years of education. In general, expected patterns emerged for known maternal risk factors for preterm birth, including younger and older age, being unmarried and low education level. Lower rates of preterm birth were observed among foreign-born than among native-born women in both countries, with the exception of foreign-born black women in Canada, who displayed no preterm birth advantage compared with native-born black women.

Crude and adjusted risk ratios and risk differences for preterm birth and very preterm birth between non-Hispanic black and non-Hispanic white women are shown in Table 3. Crude risk ratios for preterm birth were similar between the 2 countries, with ratios among black women relative to white women of 1.49 (95% confidence interval [CI] 1.32 to 1.66) in Canada and 1.57 (95% CI 1.56 to 1.58) in the US (*p* value for heterogeneity [p_H] = 0.3). Risk ratios were substantially higher for very preterm birth and were again similar between the 2 countries: 2.70 (95%
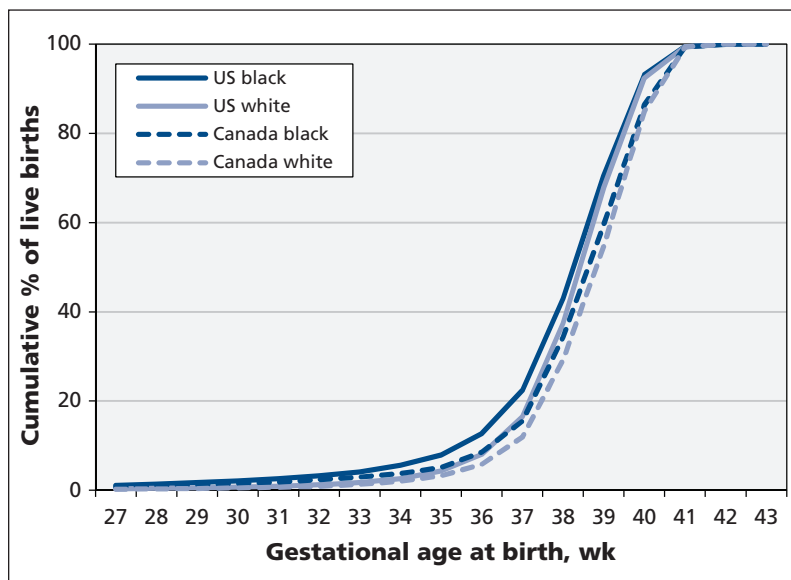

Figure 1: Cumulative proportion of singleton live births, by gestational age, to non-Hispanic black and non-Hispanic white women in Canada and the United States, 2004–2006. The graph is truncated at 27 weeks because the small number of births before 27 weeks among black women in Canada could not be released for confidentiality reasons.

CI 1.95 to 3.44) in Canada and 2.81 (95% CI 2.77 to 2.86) in the US (p_H = 0.8). The 2 adjusted models — the first without and the second including maternal nativity — produced similar estimates. Adjustment (with US estimates standardized to the covariate distribution of the Canadian sample) tended to reduce relative disparities for preterm birth in the US. Adjusted risk ratios for preterm birth from the model that included maternal nativity were slightly higher in Canada than in the US (p_H = 0.1).

The risk differences show a somewhat different picture of racial disparities between the 2 countries than the risk ratios. Crude risk differences for preterm birth were 2.94 (95% CI 1.91 to 3.96) in Canada and 4.63 (95% CI 4.56 to 4.70) in the US (p_H = 0.003), whereas crude risk differences for very preterm birth were 1.22 (95% CI 0.71 to 1.73) in Canada and 1.67 (95% CI 1.64 to 1.70) in the US (p_H = 0.08). Adjusted risk differences in the US were substantially reduced from the crude estimates and were similar in magnitude to the adjusted Canadian estimates.

All of the estimates in Table 3 were unchanged when we imputed the 6.8% of the US sample missing a clinical/obstetric estimate for gestational age with the menstrual-based estimate (available for 85% of the missing observations) (see Table B in Appendix 1).

To facilitate comparability of estimates

Table 2: Crude rates of preterm birth among singleton live births to non-Hispanic black and non-Hispanic white women in Canada and the United States, 2004–2006

Characteristic	Crude rate in Canada, % (95% CI)			Crude rate in US, % (95% CI)		
	Black	White	Black–white difference	Black	White	Black–white difference
Maternal age, yr						
< 20	9.6 (5.0 to 14.2)	8.1 (7.0 to 9.3)	1.5 (–3.4 to 6.3)	12.8 (12.6 to 13.0)	9.8 (9.7 to 9.9)	3.0 (2.8 to 3.2)
20–24	6.3 (4.2 to 8.4)	6.3 (5.8 to 6.7)	0.0 (–2.0 to 2.2)	12.1 (12.0 to 12.2)	8.5 (8.4 to 8.5)	3.6 (3.5 to 3.8)
25–29	8.0 (6.2 to 9.8)	5.7 (5.4 to 6.0)	2.3 (0.4 to 4.1)	12.1 (12.0 to 12.2)	7.7 (7.6 to 7.7)	4.4 (4.3 to 4.6)
30–34	8.8 (7.1 to 10.6)	5.8 (5.5 to 6.1)	3.1 (1.3 to 4.8)	13.0 (12.9 to 13.2)	7.5 (7.4 to 7.5)	5.6 (5.4 to 5.8)
35–39	11.2 (8.4 to 14.1)	5.9 (5.4 to 6.3)	5.4 (2.6 to 8.2)	15.1 (14.9 to 15.4)	8.2 (8.1 to 8.2)	7.0 (6.7 to 7.2)
≥ 40	16.0 (10.1 to 21.9)	8.6 (7.3 to 9.9)	7.4 (1.3 to 13.4)	17.6 (17.1 to 18.1)	9.6 (9.5 to 9.8)	7.9 (7.4 to 8.5)
Live birth order						
First-born	10.1 (8.5 to 11.8)	7.2 (7.0 to 7.4)	2.9 (1.3 to 4.6)	12.3 (12.2 to 12.4)	8.8 (8.7 to 8.8)	3.6 (3.4 to 3.7)
Second	8.0 (6.2 to 9.9)	4.7 (4.4 to 5.0)	3.3 (1.5 to 5.2)	11.8 (11.7 to 11.9)	7.1 (7.1 to 7.2)	4.7 (4.6 to 4.8)
Third or later	8.2 (6.5 to 10.0)	5.4 (5.1 to 5.8)	2.8 (1.0 to 4.5)	14.0 (13.9 to 14.2)	8.2 (8.2 to 8.3)	5.8 (5.7 to 6.0)
Sex of infant						
Female	9.9 (8.3 to 11.4)	5.5 (5.3 to 5.8)	4.3 (2.8 to 5.9)	12.7 (12.6 to 12.8)	7.6 (7.6 to 7.7)	5.1 (5.0 to 5.2)
Male	8.1 (6.7 to 9.4)	6.4 (6.2 to 6.7)	1.6 (0.3 to 2.9)	12.8 (12.7 to 12.8)	8.5 (8.5 to 8.6)	4.2 (4.1 to 4.3)
Maternal education, no. of years						
< 12	7.7 (5.5 to 10.0)	7.0 (6.4 to 7.5)	0.8 (–1.5 to 3.1)	14.1 (13.9 to 14.2)	10.2 (10.1 to 10.3)	3.9 (3.7 to 4.0)
12–15	9.3 (8.1 to 10.6)	6.1 (5.9 to 6.4)	3.2 (1.9 to 4.5)	12.6 (12.5 to 12.7)	8.5 (8.4 to 8.5)	4.1 (4.0 to 4.2)
≥ 16	8.6 (6.3 to 10.8)	5.4 (5.1 to 5.7)	3.2 (1.0 to 5.4)	10.8 (10.7 to 11.0)	6.8 (6.7 to 6.8)	4.1 (3.9 to 4.2)
Marital status						
Unmarried	9.5 (8.0 to 11.0)	6.6 (6.3 to 6.9)	2.9 (1.4 to 4.5)	13.2 (13.2 to 13.3)	9.6 (9.5 to 9.6)	3.7 (3.6 to 3.8)
Married	8.4 (7.1 to 9.8)	5.7 (5.5 to 5.9)	2.8 (1.4 to 4.1)	11.5 (11.4 to 11.6)	7.6 (7.5 to 7.6)	4.0 (3.8 to 4.1)
Paternal information						
Not missing	8.8 (7.7 to 9.9)	6.0 (5.8 to 6.1)	2.8 (1.7 to 3.9)	10.8 (10.5 to 11.1)	7.8 (7.7 to 7.8)	3.0 (2.7 to 3.4)
Missing	10.4 (7.1 to 13.8)	7.7 (6.4 to 8.9)	2.8 (–0.9 to 6.4)	12.0 (11.9 to 12.1)	8.9 (8.7 to 9.1)	3.1 (2.9 to 3.3)
Maternal nativity*						
Native born	8.3 (6.3 to 10.2)	6.1 (5.9 to 6.3)	2.2 (0.2 to 4.1)	13.1 (13.0 to 13.2)	8.1 (8.1 to 8.2)	5.0 (4.9 to 5.1)
Foreign born	9.2 (8.0 to 10.4)	4.9 (4.4 to 5.4)	4.2 (2.9 to 5.6)	9.6 (9.3 to 9.9)	6.1 (5.9 to 6.3)	3.5 (3.1 to 3.8)

Note: CI = confidence interval.
*For US, maternal nativity available only for births in 2004 (*n* = 1 493 259).

between the 2 countries, we chose to standardize the US estimates to the covariate distribution of the Canadian study population. However, as a sensitivity analysis, we also generated estimates for both countries standardized to the covariate distribution of the US black population (see Table C in Appendix 1). The risk ratios were nearly identical regardless of whether the estimates were standardized to the Canadian population or to the US black population. However, the risk differences in both countries increased in magnitude when the US black population was used as the standard population.

Unweighted risk ratios and risk differences in Canada were similar to the weighted estimates (see Table D in Appendix 1).

Interpretation

We found that relative differences in preterm and very preterm birth rates between black and white women in Canada were similar in magnitude to the racial disparities observed in the US study cohort. The absolute difference in preterm birth was narrower in Canada than in the US, which reflects the lower overall preterm birth rates in Canada among black and white women. In both countries, the racial disparity in preterm birth persisted after we controlled for available sociodemographic variables.

Although the published evidence is limited on racial differences in preterm birth outside the US, studies from the United Kingdom and the Netherlands found narrower gaps in preterm birth rates between black and white women than were evident in our Canadian and US estimates.[32–34] Research conducted outside the US has tended to focus more on differences by maternal country of birth as opposed to race or ethnicity, with consistently higher preterm birth risks reported among women born in sub-Saharan Africa and the Caribbean than among women born in France, Canada or the Netherlands.[13,15,35]

In the US, foreign-born black women have considerably lower preterm birth risk than native-born black women,[17,36] but it is not known whether this pattern holds in other countries. We detected no advantage in preterm birth risk among foreign-born versus native-born black women in Canada, with our results instead suggesting higher preterm and very preterm birth risk among foreign-born black women than among native-born black women in Canada (preterm birth rate 9.2% v. 8.3%; very preterm birth 2.1% v. 1.4%). These estimates, however, are not statistically different from each other, owing at least in part to the relatively small number of Canadian-born black women in our study. Still, it appears that foreign-born black women in Canada and the US have similar absolute risks of preterm birth (9.2% and 9.6%, respectively), whereas the risk among native-born black women is considerably lower in Canada than in the US (8.3% v. 13.1%). The explanation for why we did not observe a "healthy immigrant effect" in terms of preterm birth among black women in Canada is not clear. One possibility is that black immigrants in Canada may be a more

Table 3: Relative and absolute differences in preterm and very preterm births among non-Hispanic black women relative to non-Hispanic white women in Canada and the United States, 2004–2006

Measure; outcome	Crude			Adjusted*			Adjusted†		
	Canada	US	p_H value‡	Canada	US§	p_H value‡	Canada	US§	p_H value‡
Risk ratio (95% CI)									
Preterm birth (< 37 v. 37–41 wk)	1.49 (1.32 to 1.66)	1.57 (1.56 to 1.58)	0.3	1.46 (1.29 to 1.63)	1.41 (1.40 to 1.42)	0.5	1.60 (1.39 to 1.81)	1.45 (1.44 to 1.47)	0.1
Very preterm birth (< 32 v. 32–41 wk)	2.70 (1.95 to 3.44)	2.81 (2.77 to 2.86)	0.8	2.61 (1.88 to 3.35)	2.36 (2.31 to 2.40)	0.5	2.62 (1.83 to 3.41)	2.43 (2.36 to 2.52)	0.6
Risk difference (95% CI)									
Preterm birth (< 37 v. 37–41 wk)	2.94 (1.91 to 3.96)	4.63 (4.56 to 4.70)	0.003	2.76 (1.74 to 3.78)	3.41 (3.33 to 3.48)	0.2	3.59 (2.32 to 4.85)	3.57 (3.43 to 3.70)	1.0
Very preterm birth (< 32 v. 32–41 wk)	1.22 (0.71 to 1.73)	1.67 (1.64 to 1.70)	0.08	1.16 (0.66 to 1.67)	1.31 (1.28 to 1.35)	0.6	1.17 (0.62 to 1.71)	1.32 (1.25 to 1.38)	0.6

Note: CI = confidence interval.
*Term birth = 37–41 wk, preterm = < 37 wk, very preterm = < 32 wk.
*Adjusted for maternal age, maternal education, marital status, birth order, sex of child and missing paternal information.
†Adjusted for maternal age, maternal education, marital status, birth order, sex of child, missing paternal information and maternal nativity. For the US sample, the estimates include only births in 2004 (n = 1 493 259).
‡p_H = p value for χ^2 test for heterogeneity of the risk ratios or risk differences.
§Adjusted US estimates are standardized to the covariate distribution of the Canadian study population.

disadvantaged population than black immigrants in the US — for example, a higher proportion of Africans have come to Canada as refugee claimants compared with the proportion in the US.[23]

Limitations

We linked birth registry data to a random 20% sample of households that completed the long-form component of the mandatory 2006 census. As such, our results are representative of the Canadian national population, with the only limitation being the reduced sample size that decreased the precision of our estimates. With the birth–census cohort, were were able to link more than 90% of the births to a census record, and preterm birth rates estimated for the cohort were consistent with those calculated for all Canadian births over the same period.[37] However, births to women less than 25 years of age and to women not born in Canada were less likely to be linked to census data. As such, the linkage rate may have been lower for births to black women, who were considerably more likely to be foreign born than the white women in the study cohort. Because foreign-born black women appeared to have a slightly higher risk of preterm birth than native-born black women in Canada, the lower linkage rate among foreign-born women may have resulted in slightly underestimated risk ratios and risk differences between the black and white study populations.

Another important limitation of our study is the documented poor quality of birth registration data from Ontario, Canada's most populous province. Fees for obtaining birth certificates in Ontario led to underregistration of live births, especially for infants who died, compared with other provinces.[11] Given that more than half of Canada's black population lives in Ontario, we conducted our main analyses for the national population (including Ontario) and performed a sensitivity analysis to assess the effect of excluding Ontario on our results (see Table E in Appendix 1). It is reassuring that both the crude and adjusted risk ratios and risk differences for preterm birth were similar whether Ontario data were included or excluded. The crude estimates for very preterm birth also did not differ significantly, although slightly larger adjusted risk ratios and risk differences for very preterm birth were observed when Ontario data were excluded. This suggests that we may have missed some infants born very preterm (likely some unlinked infant deaths).

Further limitations include the slight differences in race and ethnicity categories used to identify black and white women between the 2 countries, and the lack of comparable information for both countries on parental socioeconomic position and other potentially important covariates (e.g., quality of prenatal care).

Finally, the data we used were from a decade ago. Although we cannot rule out changes in racial disparities in preterm birth and very preterm birth in Canada over the past decade, evidence from the US suggests that disparities have been stable over this period.[12]

Conclusion

Relative disparities in preterm birth and very preterm birth between non-Hispanic black and white women in Canada mirrored those in the US. This observation was contrary to our hypothesis, which was based on the different historical experiences of black populations in the 2 countries and evidence that socioeconomic and racial disparity in health and access to health care tend to be less extreme in Canada. Absolute disparities were smaller in Canada than in the US, which reflects the lower overall risk of preterm birth in Canada in both black and white populations.

Our findings do not provide insight into the specific mechanisms underlying the racial differences in preterm birth, nor whether those mechanisms are likely to be similar or different in the 2 countries. The limited evidence available has not identified genetic differences that explain the racial disparities in preterm birth.[38] Previous studies have suggested complex roles for a range of socioeconomic factors at the individual-, household- and neighbourhood-levels.[5,39] Stress and adverse experiences throughout life, including racial discrimination, are also biologically plausible factors that may contribute to the observed social patterning of racial disparities in preterm birth in the US.[38] Although we hypothesized that the different historical and social context in Canada would mitigate racial disparities in preterm birth, our findings suggest a possible etiologic role for socioeconomic disadvantage and racial discrimination in Canada as well.

Further research is needed to understand the biological and social determinants of differences in preterm birth risk between black and white women in both Canada and the US, as well as the mechanisms by which 2 different national contexts gave rise to similar patterns of relative disparity in preterm birth. Given the large racial disparity in preterm birth rates that we observed in Canada, further research should examine potential determinants (e.g., socioeconomic disadvantage, discrimination, residential segregation, health behaviours) of this disparity, as well as the association between racial disparity and other perinatal outcomes in Canada.

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Affiliations: Department of Epidemiology, Biostatistics and Occupational Health (McKinnon, Yang, Kramer, Kaufman), McGill University Faculty of Medicine, Montréal, Que.; Institute for Health and Social Policy (McKinnon, Kaufman), McGill University, Montréal, Que.; Department of Pediatrics (Kramer), McGill University Faculty of Medicine, Montréal, Que.; Health Analysis Division (Bushnik), Statistics Canada, Ottawa, Ont.; AboutKidsHealth (Sheppard), The Hospital for Sick Children, Toronto, Ont.; Dalla Lana School of Public Health (Sheppard), University of Toronto, Toronto, Ont.