

Appendix – Description of administrative data sources used in the study

Vital Statistics databases contain all registered live births (Canadian Vital Statistics-Birth), stillbirths (Canadian Vital Statistics-Stillbirth), and deaths (Canadian Vital Statistics-Death) occurring in Canada received annually from the provincial and territorial offices, including live births and stillbirth of Canadian parents occurring in US up to 2011 and deaths of Canadians in US up to 2009. Incorrect or questionable data are validated against images of the original registration forms where available and key information such as age, sex, and province or territory of residence is imputed at Statistics Canada.¹⁻³

The IMDB includes all immigrants admitted to Canada since 1952 and all non-permanent residents since 1980 with information on their characteristics at admission including admission category for those immigrated since 1980 from Immigration, Refugees and Citizenship Canada and on their income from the Canada Revenue Agency tax files since 1982. The IMDB is updated annually to increase and ensure correct record linkages at Statistics Canada. The overall linkage rate between IRCC immigration file and the SDLE DRD was 97.1%, and 85.3% of immigrants who landed from 1980 to 2020 were linked to at least one tax record.⁴

References

1. Statistics Canada. Canadian Vital Statistics-Birth database (CVSB): Data dictionary and user guide, 2019.
2. Statistics Canada. Canadian Vital Statistics-Stillbirth database (CVSS): Data dictionary and user guide, 2019.
3. Statistics Canada. Canadian Vital Statistics-Death database (CVSD): Data dictionary and user guide. 2019
4. Statistics Canada. Longitudinal Immigration Database (IMDB) Technical Report, 2021. Catalogue no. 11-633-X—No. 046., 2022.

Appendix 1, as submitted by the authors. Appendix to: Yang S, Shapiro GD, Ng E, et al. Birth and postnatal outcomes among infants of immigrant parents of different admission categories and parents born in Canada: a population-based retrospective study. *CMAJ* 2024. doi: 10.1503/cmaj.230878. Copyright © 2024 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at cmajgroup@cmaj.ca.

eTable 1. Risk ratios (95% CI) and risk differences (95% CI) for alternative stillbirth definition by nativity and immigration category, singleton births in Canada, 1993 – 2017

Stillbirth ≥25 weeks	Economic class immigrants	Family class immigrants	Refugees	3 immigrant groups combined
Number of events	2,070	2,860	810	5,730
Rates per 1000 births (95%CI)	3.4 (3.2-3.5)	3.5 (3.4-3.6)	3.7 (3.4-4.0)	3.5 (3.4-3.6)
Ref: Canadian-born women (n=18,590, 3.1 (3.0-3.1) per 1000)				
Risk ratios				
Crude RR (95% CI)	1.10 (1.05, 1.15)	1.14 (1.10, 1.19)	1.21 (1.13, 1.30)	1.13 (1.10, 1.17)
Adjusted RR (95% CI) ^a	1.12 (1.04, 1.21)	1.10 (1.02, 1.18)	1.20 (1.06, 1.35)	1.12 (1.06, 1.19)
Risk differences				
Crude RD (95% CI)	0.30 (0.15, 0.45)	0.43 (0.29, 0.56)	0.63 (0.38, 0.89)	0.41 (0.31, 0.51)
Adjusted RD (95% CI) ^a	0.24 (0.07, 0.41)	0.20 (0.04, 0.36)	0.39 (0.11, 0.68)	0.24 (0.11, 0.38)
Ref: Economic class				
Risk ratios				
Adjusted RR (95% CI) ^b		0.96 (0.87, 1.07)	1.12 (0.96, 1.31)	
Adjusted RR (95% CI) ^c		0.95 (0.85, 1.06)	1.08 (0.92, 1.28)	
Risk differences				
Adjusted RD (95% CI) ^b		-0.07 (-0.27, 0.12)	0.23 (-0.09, 0.56)	
Adjusted RD (95% CI) ^c		-0.09 (-0.29, 0.12)	0.16 (-0.17, 0.49)	

All models account for clustering by birthing parents. Ontario births in 1998 and 1999 are excluded. Risk differences shown as per 1,000.

^a Models include birthing parent and non-birthing parent age, parity, marital status, non-birthing parent's nativity, and year and province/territory of birth.

^b Models include world region of origin, delay from landing to birth, and knowledge of official languages at landing (English and/or French vs. neither) in addition to the covariates described above.

^c Models include all variables from partially adjusted models in *b* above as well as log-transformed income and income-squared.

eTable 2. Number and rates (95% CI) of adverse birth and post-natal outcomes by immigration category among first singleton births in Canada to nulliparous birthing parents, 1993 – 2017 (for postnatal deaths, 1993 – 2018) (n=3,436,700)

	Economic class immigrants	Family class immigrants	Refugees	All immigrants combined	Canadian-born women
PTB, all (<37 weeks)	n=16,980 6.6 (6.5, 6.7)	n=24,170 6.8 (6.7, 6.9)	n=5,760 7.4 (7.2, 7.6)	n=46,920 6.8 (6.7, 6.8)	n=181,990 6.7 (6.7, 6.7)
Moderate-Late PTB (32 – 36 weeks)	n=14,750 5.8 (5.7, 5.9)	n=20,880 5.9 (5.8, 6.0)	n=4,900 6.4 (6.2, 6.5)	n=40,530 5.9 (5.8, 6.0)	n=159,020 5.9 (5.9, 5.9)
Early PTB (<32 weeks)	n=2,240 0.9 (0.9, 1.0)	n=3,300 1.0 (0.9, 1.0)	n=850 1.2 (1.1, 1.2)	n=6,400 1.0 (1.0, 1.0)	n=22,960 0.9 (0.9, 0.9)
SGA birth	n=36,960 14.3 (14.2, 14.5)	n=56,670 15.9 (15.8, 16.0)	n=10,570 13.6 (13.4, 13.9)	n=104,200 15.1 (15.0, 15.1)	n=276,520 10.2 (10.1, 10.2)
LGA birth	n=13,670 5.3 (5.2, 5.4)	n=18,580 5.2 (5.1, 5.3)	n=5,110 6.6 (6.4, 6.8)	n=37,380 5.4 (5.3, 5.5)	n=230,540 8.5 (8.5, 8.5)
Stillbirth	n=1,390 5.4 (5.2, 5.7)	n=1,940 5.6 (5.4, 5.9)	n=510 6.8 (6.2, 7.4)	n=3,840 5.7 (5.5, 5.9)	n=12,100 4.5 (4.5, 4.6)
Stillbirth ≥25 weeks	n=780 3.1 (2.9, 3.3)	n=1,100 3.2 (3.0, 3.4)	n=270 3.6 (3.2, 4.0)	n=2,140 3.2 (3.1, 3.3)	n=7,490 2.8 (2.8, 2.9)
Infant mortality, all	n=600 2.3 (2.2, 2.5)	n=820 2.3 (2.2, 2.5)	n=180 2.4 (2.1, 2.8)	n=1,620 2.3 (2.2, 2.5)	n=7,720 2.8 (2.8, 2.9)
Neonatal mortality	n=440 1.7 (1.6, 1.9)	n=570 1.6 (1.5, 1.8)	n=140 1.7 (1.5, 2.0)	n=1,160 1.7 (1.6, 1.8)	n=5,410 2.0 (1.9, 2.0)
Post-neonatal mortality	n=160 0.6 (0.5, 0.7)	n=260 0.7 (0.6, 0.8)	n=60 0.7 (0.5, 0.9)	n=460 0.7 (0.6, 0.7)	n=2,310 0.9 (0.8, 0.9)

Data shown are N (%) or N (per 1,000) for fatal outcomes. Ns are randomly rounded up or down to the nearest 10 according to Statistics Canada disclosure regulations.

eTable 3. Number and rates (95% CI) of adverse perinatal outcomes by birthing parent immigration category, stratified by duration between landing and birth

	Economic class immigrants	Family class immigrants	Refugees	All immigrants combined
PTB, all (<37 weeks)	n=16,980 6.6 (6.5, 6.7)	n=24,170 6.8 (6.7, 6.9)	n=5,760 7.4 (7.2, 7.6)	n=46,920 6.8 (6.7, 6.8)
<6 years	n=19,540 6.1 (6.0, 6.2)	n=27,250 6.1 (6.0, 6.2)	n=5,920 7.2 (7.0, 7.3)	n=52,720 6.2 (6.1, 6.2)
6-9 years	n=7,410 6.3 (6.2, 6.4)	n=11,700 6.3 (6.2, 6.5)	n=3,080 6.7 (6.4, 6.9)	n=22,190 6.4 (6.3, 6.5)
10+ years	n=11,530 6.3 (6.2, 6.4)	n=15,570 7.4 (7.3, 7.6)	n=6,850 7.0 (6.9, 7.2)	n=33,930 6.9 (6.9, 7.0)
Moderate-Late PTB (32 – 36 weeks)				
<6 years	n=17,030 5.3 (5.3, 5.4)	n=24,060 5.4 (5.3, 5.5)	n=5,170 6.3 (6.1, 6.5)	n=46,250 5.5 (5.4, 5.5)
6-9 years	n=6,390 5.5 (5.4, 5.6)	n=10,240 5.6 (5.5, 5.7)	n=2,670 5.8 (5.6, 6.1)	n=19,300 5.6 (5.5, 5.7)
10+ years	n=10,100 5.6 (5.5, 5.7)	n=13,130 6.4 (6.2, 6.5)	n=5,890 6.1 (5.9, 6.2)	n=29,120 6.0 (5.9, 6.1)
Early PTB (<32 weeks)				
<6 years	n=2,520 0.8 (0.8, 0.9)	n=3,180 0.8 (0.7, 0.8)	n=770 1.0 (0.9, 1.1)	n=6,460 0.8 (0.8, 0.8)
6-9 years	n=1,030 0.9 (0.9, 1.0)	n=1,460 0.8 (0.8, 0.9)	n=400 0.9 (0.8, 1.0)	n=2,890 0.9 (0.8, 0.9)
10+ years	n=1,420 0.8 (0.8, 0.9)	n=2,430 1.2 (1.2, 1.3)	n=960 1.1 (1.0, 1.1)	n=4,820 1.0 (1.0, 1.1)
SGA birth				
<6 years	n=36,560 11.4 (11.3, 11.5)	n=58,540 13.1 (13.0, 13.2)	n=8,410 10.2 (10.0, 10.4)	n=103,510 12.2 (12.1, 12.2)
6-9 years	n=11,960 10.2 (10.0, 10.4)	n=20,280 11.0 (10.9, 11.2)	n=4,560 9.9 (9.6, 10.2)	n=36,810 10.6 (10.5, 10.7)
10+ years	n=19,710 10.8 (10.7, 10.9)	n=23,280 11.1 (11.0, 11.3)	n=10,030 10.3 (10.1, 10.5)	n=53,020 10.8 (10.8, 10.9)
LGA birth				
<6 years	n=23,190 7.2 (7.1, 7.3)	n=30,070 6.7 (6.7, 6.8)	n=7,930 9.6 (9.4, 9.8)	n=61,170 7.2 (7.1, 7.2)
6-9 years	n=9,670 8.2 (8.1, 8.4)	n=14,870 8.1 (8.0, 8.2)	n=4,570 9.9 (9.6, 10.2)	n=29,100 8.4 (8.3, 8.5)
10+ years	n=13,950 7.6 (7.5, 7.8)	n=17,270 8.3 (8.1, 8.4)	n=8,280 8.5 (8.3, 8.7)	n=39,520 8.1 (8.0, 8.2)
Stillbirth				
<6 years	n=1,940 6.1 (5.8, 6.4)	n=2,450 5.6 (5.4, 5.8)	n=570 7.0 (6.5, 7.6)	n=4,940 5.9 (5.8, 6.1)
6-9 years	n=700 6.1 (5.6, 6.5)	n=1,150 6.5 (6.1, 6.9)	n=280 6.6 (5.9, 7.4)	n=2,150 6.4 (6.1, 6.6)
10+ years	n=1,010 6.1 (5.6, 6.5)	n=1,510 6.5 (6.1, 6.9)	n=660 6.6 (5.9, 7.4)	n=3,190 6.4 (6.1, 6.6)

Appendix 1, as submitted by the authors. Appendix to: Yang S, Shapiro GD, Ng E, et al. Birth and postnatal outcomes among infants of immigrant parents of different admission categories and parents born in Canada: a population-based retrospective study. *CMAJ* 2024. doi: 10.1503/cmaj.230878. Copyright © 2024 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at cmajgroup@cmaj.ca.

	Economic class immigrants	Family class immigrants	Refugees	All immigrants combined
Stillbirth ≥25 weeks	5.6 (5.2, 5.9)	7.4 (7.0, 7.7)	6.8 (6.3, 7.4)	6.6 (6.4, 6.8)
<6 years	n=1,160 3.7 (3.5, 3.9)	n=1,450 3.3 (3.2, 3.5)	n=340 4.3 (3.9, 4.8)	n=2,950 3.6 (3.4, 3.7)
6-9 years	n=380 3.4 (3.1, 3.8)	n=650 3.6 (3.4, 3.9)	n=150 3.4 (2.9, 4.0)	n=1,170 3.5 (3.3, 3.7)
10+ years	n=510 2.8 (2.6, 3.0)	n=760 3.7 (3.4, 4.0)	n=320 3.3 (3.0, 3.7)	n=1,570 3.3 (3.1, 3.4)
Infant mortality, all				
<6 years	n=780 2.4 (2.2, 2.6)	n=960 2.1 (2.0, 2.3)	n=220 2.6 (2.3, 3.0)	n=1,960 2.3 (2.2, 2.4)
6-9 years	n=290 2.4 (2.1, 2.7)	n=410 2.2 (2.0, 2.5)	n=100 2.2 (1.9, 2.7)	n=800 2.3 (2.1, 2.5)
10+ years	n=430 2.4 (2.2, 2.6)	n=610 2.9 (2.7, 3.1)	n=260 2.6 (2.3, 3.0)	n=1,300 2.6 (2.5, 2.8)
Neonatal mortality				
<6 years	n=550 1.7 (1.6, 1.9)	n=610 1.4 (1.3, 1.5)	n=140 1.6 (1.4, 1.9)	n=1,310 1.5 (1.5, 1.6)
6-9 years	n=200 1.7 (1.5, 2.0)	n=260 1.4 (1.2, 1.6)	n=60 1.4 (1.1, 1.8)	n=520 1.5 (1.4, 1.6)
10+ years	n=310 1.7 (1.5, 1.9)	n=410 1.9 (1.8, 2.1)	n=170 1.7 (1.5, 2.0)	n=890 1.8 (1.7, 1.9)
Post-neonatal mortality				
<6 years	n=220 0.7 (0.6, 0.8)	n=350 0.8 (0.7, 0.9)	n=90 1.0 (0.8, 1.2)	n=640 0.8 (0.7, 0.8)
6-9 years	n=80 0.7 (0.5, 0.8)	n=150 0.9 (0.7, 1.0)	n=30 0.8 (0.6, 1.1)	n=280 0.8 (0.7, 0.9)
10+ years	n=140 0.7 (0.6, 0.9)	n=200 1.0 (0.8, 1.1)	n=80 0.9 (0.7, 1.1)	n=420 0.9 (0.8, 0.9)

eTable 4. Association between immigrant category and post-neonatal mortality with adjustment for various combinations of covariates

Adjustment	Economic class immigrants	Family class immigrants	Refugees
None	0.66 (0.60, 0.73)	0.79 (0.73, 0.86)	0.86 (0.75, 0.99)
Birthing parent's age	0.78 (0.70, 0.86)	0.85 (0.78, 0.92)	0.92 (0.80, 1.06)
Non-birthing parent's age	0.79 (0.71, 0.87)	0.92 (0.84, 0.99)	0.96 (0.83, 1.12)
Parity	0.66 (0.60, 0.73)	0.78 (0.72, 0.85)	0.81 (0.70, 0.93)
Marital status	0.83 (0.75, 0.91)	0.98 (0.90, 1.06)	1.01 (0.87, 1.17)
Non-birthing parent's nativity	0.74 (0.66, 0.83)	0.92 (0.83, 1.01)	0.98 (0.83, 1.16)
Region of birth	0.70 (0.64, 0.77)	0.86 (0.79, 0.93)	0.93 (0.81, 1.07)
Year of birth	0.71 (0.64, 0.78)	0.81 (0.75, 0.88)	0.89 (0.78, 1.03)
Birthing parent characteristics (age, parity, marital status)	0.93 (0.84, 1.03)	0.98 (0.90, 1.06)	0.96 (0.83, 1.12)
Non-birthing parent characteristics (age, nativity)	0.79 (0.71, 0.89)	0.95 (0.86, 1.05)	1.00 (0.84, 1.18)
Birth characteristics (region of birth, year of birth)	0.76 (0.69, 0.84)	0.88 (0.81, 0.95)	0.97 (0.84, 1.12)
Characteristics of both parents	0.93 (0.82, 1.05)	1.03 (0.93, 1.14)	1.00 (0.84, 1.19)
Birthing parent and birth characteristics	1.04 (0.94, 1.15)	1.10 (1.01, 1.20)	1.09 (0.94, 1.26)
All	1.01 (0.89, 1.14)	1.11 (1.00, 1.23)	1.08 (0.90, 1.29)

Reference category is Canadian-born birthing-parents. All models account for clustering by birthing-parent. Models in the top portion of the table (rows 2-8) are adjusted for only one covariate.

eTable 5. Cause-specific infant mortality rate by immigrant category, N (rate per 1000 live births)

Cause	Economic class	Family class	Refugees	Canadian-born
All infant deaths	1,510 (2.4)	1,970 (2.3)	580 (2.5)	18,980 (3.0)
Congenital anomalies	480 (0.8)	580 (0.7)	160 (0.7)	5,390 (0.9)
Asphyxia-related conditions	160 (0.3)	170 (0.2)	50 (0.2)	1,770 (0.3)
Immaturity-related conditions	340 (0.5)	480 (0.6)	140 (0.6)	3,970 (0.6)
Infections	90 (0.1)	160 (0.2)	30 (0.1)	1,230 (0.2)
Sudden infant death syndrome (SIDS)	40 (0.1)	50 (0.1)	10 (0.04)	1,530 (0.2)
Other unexplained infant death	50 (0.1)	50 (0.1)	30 (0.1)	1,050 (0.2)
External causes	30 (0.05)	40 (0.05)	20 (0.1)	380 (0.1)
Others	320 (0.5)	440 (0.5)	140 (0.6)	3,660 (0.6)

eTable 6. Crude associations (risk ratios (95% CI)) between covariates and outcomes in models comparing immigrant birthing parents to the Canadian-born, singleton births in Canada, 1993 – 2017 for **non-fatal outcomes**

	PTB	Moderate-Late PTB	Early PTB	SGA birth	LGA birth
Birthing parent age at delivery (reference category: <25)					
25-29	0.91 (0.90, 0.91)	0.91 (0.90, 0.92)	0.80 (0.79, 0.82)	0.85 (0.84, 0.85)	1.15 (1.14, 1.15)
30-34	0.90 (0.89, 0.91)	0.90 (0.89, 0.91)	0.84 (0.82, 0.86)	0.78 (0.77, 0.78)	1.31 (1.30, 1.32)
35-39	1.04 (1.03, 1.05)	1.04 (1.03, 1.05)	1.07 (1.04, 1.09)	0.79 (0.78, 0.79)	1.41 (1.40, 1.42)
40+	1.30 (1.28, 1.32)	1.28 (1.26, 1.30)	1.48 (1.42, 1.54)	0.87 (0.85, 0.88)	1.41 (1.39, 1.43)
Parity (reference category: 0)					
1	0.77 (0.77, 0.78)	0.79 (0.78, 0.79)	0.67 (0.65, 0.68)	0.62 (0.62, 0.63)	1.54 (1.53, 1.55)
2+	0.93 (0.92, 0.94)	0.94 (0.93, 0.95)	0.87 (0.86, 0.89)	0.61 (0.60, 0.61)	1.79 (1.78, 1.80)
Birthing parent marital status (reference category: married)					
Unmarried	1.19 (1.18, 1.20)	1.18 (1.17, 1.19)	1.35 (1.32, 1.37)	1.21 (1.20, 1.21)	0.85 (0.85, 0.85)
Non-birthing parent age at delivery (reference category: <25)					
25-29	0.91 (0.90, 0.92)	0.92 (0.91, 0.93)	0.79 (0.77, 0.81)	0.89 (0.89, 0.90)	1.09 (1.08, 1.10)
30-34	0.86 (0.85, 0.87)	0.87 (0.86, 0.88)	0.74 (0.72, 0.76)	0.83 (0.83, 0.84)	1.20 (1.19, 1.21)
35-39	0.90 (0.89, 0.91)	0.90 (0.89, 0.91)	0.83 (0.80, 0.85)	0.82 (0.81, 0.83)	1.29 (1.28, 1.30)
40-44	1.00 (0.98, 1.01)	0.99 (0.98, 1.01)	0.98 (0.94, 1.01)	0.84 (0.84, 0.85)	1.32 (1.31, 1.33)
45+	1.11 (1.09, 1.13)	1.09 (1.07, 1.11)	1.23 (1.17, 1.28)	0.91 (0.90, 0.92)	1.30 (1.28, 1.32)
Non-birthing parent nativity (reference category: Canadian- born)					
Foreign-born	1.05 (1.04, 1.06)	1.03 (1.03, 1.04)	1.18 (1.15, 1.20)	1.40 (1.39, 1.40)	0.72 (0.71, 0.72)
Place of birth (reference category: Quebec)					
Atlantic	1.04 (1.02, 1.05)	1.02 (1.01, 1.03)	1.17 (1.13, 1.21)	0.92 (0.91, 0.93)	1.43 (1.41, 1.44)

	PTB	Moderate-Late PTB	Early PTB	SGA birth	LGA birth
Ontario	1.06 (1.05, 1.06)	1.05 (1.04, 1.06)	1.10 (1.07, 1.12)	1.02 (1.02, 1.03)	1.23 (1.22, 1.24)
Western excluding BC	1.10 (1.09, 1.11)	1.08 (1.07, 1.09)	1.27 (1.24, 1.30)	1.00 (0.99, 1.01)	1.21 (1.20, 1.22)
British Columbia	0.95 (0.94, 0.96)	0.95 (0.94, 0.96)	0.98 (0.95, 1.01)	0.89 (0.88, 0.89)	1.24 (1.23, 1.25)
Territories	1.03 (0.98, 1.07)	1.08 (1.03, 1.13)	0.78 (0.67, 0.91)	0.71 (0.68, 0.74)	1.64 (1.59, 1.69)
Year of birth (reference category: 1993-1997)					
1998-2002	0.94 (0.93, 0.95)	0.93 (0.92, 0.94)	1.01 (0.98, 1.03)	0.84 (0.83, 0.84)	1.14 (1.13, 1.14)
2003-2007	0.98 (0.98, 0.99)	0.98 (0.97, 0.99)	1.06 (1.03, 1.08)	0.82 (0.81, 0.82)	1.10 (1.09, 1.10)
2008-2012	0.97 (0.96, 0.98)	0.96 (0.95, 0.97)	1.04 (1.02, 1.07)	0.84 (0.83, 0.84)	1.06 (1.05, 1.06)
2013-2017	0.97 (0.96, 0.98)	0.95 (0.94, 0.96)	1.08 (1.05, 1.10)	0.86 (0.85, 0.86)	1.02 (1.01, 1.02)

eTable 7. Adjusted associations (risk ratios (95% CI)) between covariates and outcomes in adjusted models comparing immigrants to the Canadian-born (results shown in Figure 3), singleton births in Canada, 1993 – 2017 for **non-fatal outcomes**

	PTB	Moderate-Late PTB	Early PTB	SGA birth	LGA birth
Birthing parent age at delivery (reference category: <25)					
25-29	1.01 (1.00, 1.03)	1.01 (1.00, 1.03)	0.99 (0.96, 1.02)	0.95 (0.94, 0.96)	1.03 (1.02, 1.04)
30-34	1.08 (1.07, 1.09)	1.07 (1.05, 1.08)	1.13 (1.09, 1.18)	0.95 (0.94, 0.96)	1.08 (1.07, 1.09)
35-39	1.26 (1.24, 1.28)	1.24 (1.22, 1.26)	1.41 (1.35, 1.47)	1.00 (0.98, 1.01)	1.11 (1.10, 1.13)
40+	1.54 (1.50, 1.57)	1.50 (1.47, 1.54)	1.87 (1.76, 1.98)	1.07 (1.05, 1.09)	1.11 (1.09, 1.13)
Parity (reference category: 0)					
1	0.75 (0.75, 0.76)	0.76 (0.76, 0.77)	0.64 (0.63, 0.65)	0.62 (0.61, 0.62)	1.53 (1.52, 1.54)
2+	0.85 (0.84, 0.86)	0.86 (0.86, 0.87)	0.75 (0.74, 0.77)	0.58 (0.58, 0.59)	1.78 (1.77, 1.79)
Birthing parent marital status (reference category: married)					
Unmarried	1.22 (1.21, 1.23)	1.20 (1.19, 1.22)	1.44 (1.40, 1.47)	1.28 (1.27, 1.28)	0.90 (0.89, 0.90)
Non-birthing parent age at delivery (reference category: <25)					
25-29	0.99 (0.98, 1.01)	1.00 (0.99, 1.01)	0.92 (0.89, 0.96)	1.04 (1.03, 1.05)	0.95 (0.95, 0.96)
30-34	0.95 (0.93, 0.96)	0.96 (0.94, 0.97)	0.86 (0.83, 0.90)	1.06 (1.05, 1.07)	0.94 (0.93, 0.95)
35-39	0.95 (0.93, 0.96)	0.95 (0.94, 0.97)	0.90 (0.86, 0.94)	1.07 (1.06, 1.09)	0.95 (0.94, 0.96)
40-44	0.98 (0.96, 1.00)	0.98 (0.96, 1.00)	0.96 (0.91, 1.01)	1.07 (1.06, 1.09)	0.98 (0.97, 1.00)
45+	1.03 (1.01, 1.06)	1.02 (1.00, 1.04)	1.10 (1.04, 1.17)	1.08 (1.06, 1.10)	1.02 (1.00, 1.03)
Non-birthing parent nativity (reference category: Canadian- born)					
Foreign-born	1.03 (1.02, 1.04)	1.01 (1.00, 1.03)	1.16 (1.12, 1.19)	1.25 (1.24, 1.26)	0.83 (0.82, 0.83)
Place of birth (reference category: Quebec)					
Atlantic	1.10 (1.08, 1.11)	1.07 (1.05, 1.09)	1.33 (1.28, 1.39)	1.00 (0.99, 1.01)	1.35 (1.34, 1.36)

Appendix 1, as submitted by the authors. Appendix to: Yang S, Shapiro GD, Ng E, et al. Birth and postnatal outcomes among infants of immigrant parents of different admission categories and parents born in Canada: a population-based retrospective study. *CMAJ* 2024. doi: 10.1503/cmaj.230878. Copyright © 2024 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at cmajgroup@cmaj.ca.

	PTB	Moderate-Late PTB	Early PTB	SGA birth	LGA birth
Ontario	1.09 (1.08, 1.10)	1.08 (1.07, 1.09)	1.15 (1.12, 1.19)	1.04 (1.03, 1.05)	1.24 (1.23, 1.25)
Western excluding BC	1.16 (1.15, 1.17)	1.14 (1.13, 1.15)	1.39 (1.35, 1.43)	1.10 (1.09, 1.11)	1.15 (1.14, 1.15)
British Columbia	0.99 (0.97, 1.00)	0.98 (0.97, 0.99)	1.02 (0.99, 1.06)	0.88 (0.87, 0.89)	1.27 (1.26, 1.29)
Territories	0.90 (0.85, 0.96)	0.95 (0.89, 1.01)	0.62 (0.50, 0.77)	0.78 (0.74, 0.82)	1.54 (1.49, 1.60)
Year of birth (reference category: 1993-1997)					
1998-2002	0.96 (0.96, 0.97)	0.96 (0.95, 0.97)	1.02 (0.99, 1.05)	0.82 (0.81, 0.83)	1.14 (1.14, 1.15)
2003-2007	1.00 (0.99, 1.00)	0.99 (0.98, 1.00)	1.02 (1.00, 1.06)	0.78 (0.78, 0.79)	1.11 (1.10, 1.12)
2008-2012	0.97 (0.96, 0.98)	0.97 (0.96, 0.98)	1.01 (0.98, 1.04)	0.80 (0.80, 0.81)	1.06 (1.05, 1.06)
2013-2017	0.96 (0.95, 0.97)	0.95 (0.94, 0.96)	1.02 (0.99, 1.05)	0.84 (0.83, 0.84)	0.98 (0.98, 0.99)

eTable 8. Crude associations (risk ratios (95% CI)) between covariates and outcomes in models comparing immigrant birthing parents to the Canadian-born, singleton births in Canada, 1993 – 2017 (for postnatal deaths, 1993 – 2018) for **fatal outcomes**

	Stillbirth	Infant mortality	Neonatal mortality	Post-neonatal mortality
Birthing parent age at delivery (reference category: <25)				
25-29	0.82 (0.80, 0.84)	0.69 (0.67, 0.72)	0.84 (0.80, 0.88)	0.51 (0.48, 0.54)
30-34	0.87 (0.85, 0.89)	0.65 (0.63, 0.68)	0.83 (0.79, 0.87)	0.44 (0.41, 0.46)
35-39	1.14 (1.11, 1.18)	0.77 (0.73, 0.80)	1.01 (0.96, 1.07)	0.46 (0.43, 0.50)
40+	1.72 (1.64, 1.80)	1.07 (1.00, 1.15)	1.41 (1.30, 1.54)	0.65 (0.57, 0.74)
Parity (reference category: 0)				
1	0.89 (0.87, 0.91)	0.90 (0.87, 0.92)	0.80 (0.77, 0.83)	1.12 (1.06, 1.18)
2+	1.32 (1.29, 1.35)	1.28 (1.24, 1.32)	1.10 (1.06, 1.15)	1.76 (1.66, 1.86)
Birthing parent marital status (reference category: married)				
Unmarried	1.52 (1.49, 1.56)	1.36 (1.32, 1.40)	1.18 (1.14, 1.22)	1.75 (1.67, 1.83)
Non-birthing parent age at delivery (reference category: <25)				
25-29	0.77 (0.74, 0.81)	0.75 (0.71, 0.78)	0.89 (0.84, 0.94)	0.57 (0.53, 0.62)
30-34	0.75 (0.72, 0.78)	0.66 (0.63, 0.69)	0.81 (0.77, 0.86)	0.47 (0.43, 0.50)
35-39	0.85 (0.82, 0.89)	0.69 (0.66, 0.72)	0.89 (0.84, 0.95)	0.45 (0.42, 0.49)
40-44	1.06 (1.01, 1.11)	0.79 (0.74, 0.84)	1.02 (0.94, 1.10)	0.52 (0.47, 0.57)
45+	1.30 (1.22, 1.39)	1.01 (0.93, 1.09)	1.30 (1.19, 1.43)	0.65 (0.57, 0.74)
Non-birthing parent nativity (reference category: Canadian- born)				
Foreign-born	0.97 (0.94, 0.99)	0.85 (0.82, 0.87)	0.86 (0.82, 0.89)	0.82 (0.77, 0.87)
Place of birth (reference category: Quebec)				

	Stillbirth	Infant mortality	Neonatal mortality	Post-neonatal mortality
Atlantic	1.59 (1.53, 1.66)	1.22 (1.15, 1.29)	1.25 (1.17, 1.34)	1.15 (1.04, 1.27)
Ontario	1.27 (1.23, 1.31)	0.80 (0.77, 0.84)	0.76 (0.72, 0.79)	0.89 (0.83, 0.94)
Western excluding BC	1.70 (1.65, 1.75)	1.72 (1.66, 1.78)	1.71 (1.63, 1.78)	1.75 (1.64, 1.86)
British Columbia	1.56 (1.51, 1.61)	1.02 (0.97, 1.07)	0.97 (0.92, 1.03)	1.11 (1.02, 1.20)
Territories	1.84 (1.62, 2.08)	1.72 (1.46, 1.99)	1.03 (0.80, 1.33)	3.14 (2.56, 3.87)
Year of birth (reference category: 1993-1997)				
1998-2002	1.21 (1.17, 1.25)	0.86 (0.83, 0.90)	0.91 (0.86, 0.95)	0.80 (0.75, 0.86)
2003-2007	1.28 (1.24, 1.32)	0.83 (0.80, 0.86)	0.94 (0.89, 0.99)	0.67 (0.62, 0.71)
2008-2012	1.22 (1.18, 1.26)	0.84 (0.80, 0.87)	0.94 (0.89, 0.99)	0.68 (0.64, 0.73)
2013-2017	1.20 (1.16, 1.23)	0.81 (0.78, 0.85)	0.96 (0.92, 1.01)	0.59 (0.55, 0.63)

eTable 9. Adjusted associations (risk ratios (95% CI)) between covariates and outcomes in adjusted models comparing immigrant birthing parents to the Canadian-born (results shown in Figure 3), singleton births in Canada, 1993 – 2017 (for postnatal deaths, 1993 – 2018) for **fatal outcomes**

	Stillbirth	Infant mortality	Neonatal mortality	Post-neonatal mortality
Birthing parent age at delivery (reference category: <25)				
25-29	0.92 (0.88, 0.97)	0.80 (0.76, 0.84)	0.92 (0.86, 0.98)	0.62 (0.58, 0.68)
30-34	0.98 (0.93, 1.04)	0.79 (0.74, 0.83)	0.95 (0.89, 1.03)	0.55 (0.50, 0.60)
35-39	1.24 (1.17, 1.32)	0.86 (0.80, 0.92)	1.12 (1.03, 1.21)	0.52 (0.46, 0.58)
40+	1.70 (1.56, 1.85)	1.16 (1.06, 1.28)	1.52 (1.36, 1.71)	0.69 (0.58, 0.82)
Parity (reference category: 0)				
1	0.90 (0.87, 0.93)	0.93 (0.90, 0.97)	0.80 (0.76, 0.83)	1.30 (1.22, 1.38)
2+	1.25 (1.21, 1.30)	1.23 (1.18, 1.28)	0.96 (0.92, 1.01)	2.06 (1.92, 2.20)
Birthing parent marital status (reference category: married)				
Unmarried	1.38 (1.33, 1.43)	1.18 (1.14, 1.23)	1.06 (1.01, 1.11)	1.45 (1.36, 1.54)
Non-birthing parent age at birth (reference category: <25)				
25-29	0.90 (0.85, 0.95)	0.92 (0.87, 0.97)	1.01 (0.94, 1.09)	0.79 (0.72, 0.86)
30-34	0.89 (0.84, 0.95)	0.88 (0.83, 0.94)	0.96 (0.89, 1.05)	0.77 (0.69, 0.85)
35-39	0.93 (0.87, 0.99)	0.93 (0.87, 1.00)	1.04 (0.95, 1.14)	0.77 (0.69, 0.86)
40-44	1.04 (0.96, 1.12)	1.02 (0.94, 1.11)	1.14 (1.03, 1.27)	0.86 (0.75, 0.99)
45+	1.16 (1.06, 1.27)	1.25 (1.13, 1.38)	1.38 (1.22, 1.56)	1.08 (0.91, 1.28)
Non-birthing parent nativity (reference category: Canadian-born)				
Foreign-born	1.12 (1.07, 1.17)	1.01 (0.96, 1.06)	1.00 (0.94, 1.07)	1.01 (0.93, 1.10)
Place of birth (reference: Quebec)				

	Stillbirth	Infant mortality	Neonatal mortality	Post-neonatal mortality
Atlantic	2.06 (1.97, 2.16)	1.24 (1.16, 1.32)	1.25 (1.16, 1.35)	1.20 (1.07, 1.34)
Ontario	0.17 (0.16, 0.19)	0.84 (0.80, 0.88)	0.75 (0.71, 0.79)	1.03 (0.95, 1.11)
Western excluding BC	2.22 (2.14, 2.31)	1.71 (1.64, 1.78)	1.70 (1.61, 1.79)	1.70 (1.57, 1.83)
British Columbia	1.14 (1.08, 1.19)	0.99 (0.94, 1.05)	0.88 (0.82, 0.94)	1.23 (1.12, 1.36)
Territories	2.48 (2.14, 2.87)	1.36 (1.09, 1.69)	0.92 (0.66, 1.28)	2.15 (1.60, 2.86)
Year of birth (reference category: 1993-1997)				
1998-2002	1.11 (1.06, 1.17)	0.84 (0.80, 0.88)	0.87 (0.82, 0.92)	0.78 (0.73, 0.84)
2003-2007	1.48 (1.42, 1.55)	0.80 (0.77, 0.84)	0.88 (0.83, 0.93)	0.68 (0.63, 0.74)
2008-2012	1.12 (1.07, 1.17)	0.82 (0.78, 0.86)	0.90 (0.86, 0.96)	0.69 (0.64, 0.74)
2013-2017	1.05 (1.00, 1.10)	0.77 (0.74, 0.81)	0.89 (0.84, 0.94)	0.59 (0.54, 0.64)

eTable 10. Crude associations (risk ratios (95% CI)) between covariates and outcomes in models comparing family class immigrants and refugees to economic immigrants, singleton births in Canada, 1993 – 2017 for **non-fatal outcomes**

	PTB	Moderate-Late PTB	Early PTB	SGA birth	LGA birth
Birthing parent age at delivery (reference category: <25)					
25-29	1.03 (1.00, 1.06)	1.02 (0.99, 1.05)	1.10 (1.01, 1.19)	0.94 (0.92, 0.96)	1.11 (1.08, 1.14)
30-34	1.18 (1.15, 1.22)	1.16 (1.12, 1.19)	1.38 (1.27, 1.51)	0.94 (0.92, 0.96)	1.21 (1.17, 1.24)
35-39	1.44 (1.40, 1.49)	1.40 (1.35, 1.45)	1.89 (1.72, 2.08)	0.97 (0.95, 0.99)	1.28 (1.24, 1.32)
40+	1.78 (1.71, 1.86)	1.73 (1.66, 1.81)	2.38 (2.12, 2.67)	1.02 (0.99, 1.06)	1.27 (1.22, 1.32)
Parity (reference category: 0)					
1	0.81 (0.80, 0.83)	0.83 (0.82, 0.84)	0.68 (0.65, 0.71)	0.62 (0.62, 0.63)	1.46 (1.44, 1.48)
2+	0.81 (0.79, 0.82)	0.83 (0.81, 0.85)	0.65 (0.61, 0.68)	0.54 (0.54, 0.55)	1.72 (1.69, 1.75)
Birthing parent marital status (reference category: married)					
Unmarried	1.13 (1.11, 1.16)	1.10 (1.07, 1.13)	1.40 (1.31, 1.48)	1.08 (1.05, 1.10)	0.92 (0.90, 0.94)
Non-birthing parent age at birth (reference category: <25)					
25-29	0.98 (0.94, 1.02)	0.98 (0.93, 1.02)	0.97 (0.86, 1.10)	1.02 (0.99, 1.05)	1.04 (0.99, 1.08)
30-34	0.94 (0.90, 0.98)	0.94 (0.90, 0.99)	0.89 (0.79, 1.01)	1.04 (1.01, 1.07)	1.04 (1.00, 1.09)
35-39	0.97 (0.92, 1.01)	0.96 (0.91, 1.01)	0.97 (0.86, 1.10)	1.04 (1.01, 1.08)	1.09 (1.04, 1.14)
40-44	0.99 (0.94, 1.03)	0.98 (0.93, 1.03)	1.03 (0.90, 1.17)	1.04 (1.01, 1.07)	1.13 (1.07, 1.18)
45+	1.00 (0.95, 1.05)	0.98 (0.93, 1.03)	1.12 (0.97, 1.29)	1.04 (0.99, 1.08)	1.18 (1.12, 1.24)
Non-birthing parent nativity (reference category: Canadian- born)					
Foreign-born	1.05 (1.03, 1.07)	1.02 (1.00, 1.04)	1.29 (1.21, 1.38)	1.19 (1.17, 1.21)	0.83 (0.82, 0.85)
Place of birth (reference category: Quebec)					
Atlantic	1.16 (1.07, 1.25)	1.18 (1.08, 1.28)	1.08 (0.87, 1.34)	1.14 (1.07, 1.20)	1.07 (1.01, 1.14)
Ontario	1.13 (1.11, 1.16)	1.15 (1.12, 1.18)	1.02 (0.96, 1.07)	1.14 (1.12, 1.16)	1.00 (0.98, 1.02)

	PTB	Moderate-Late PTB	Early PTB	SGA birth	LGA birth
Western excluding BC	1.25 (1.22, 1.28)	1.24 (1.21, 1.28)	1.32 (1.23, 1.41)	1.26 (1.24, 1.29)	0.89 (0.87, 0.91)
British Columbia	0.98 (0.96, 1.01)	0.99 (0.96, 1.02)	0.92 (0.86, 0.99)	0.99 (0.97, 1.01)	0.99 (0.97, 1.01)
Territories	0.82 (0.64, 1.05)	0.89 (0.69, 1.15)	*	1.03 (0.88, 1.21)	1.28 (1.08, 1.51)
Year of birth (reference category: 1993-1997)					
1998-2002	0.72 (0.70, 0.74)	0.69 (0.67, 0.71)	1.03 (0.95, 1.11)	0.91 (0.89, 0.93)	0.95 (0.93, 0.97)
2003-2007	0.70 (0.68, 0.71)	0.66 (0.65, 0.68)	1.00 (0.92, 1.08)	0.88 (0.86, 0.89)	0.89 (0.87, 0.91)
2008-2012	0.69 (0.67, 0.71)	0.66 (0.64, 0.68)	0.98 (0.91, 1.06)	0.88 (0.87, 0.90)	0.86 (0.84, 0.88)
2013-2017	0.69 (0.68, 0.71)	0.66 (0.64, 0.68)	0.98 (0.91, 1.06)	0.91 (0.90, 0.93)	0.79 (0.77, 0.80)
World region of origin					
Africa & the Middle East	1.10 (1.07, 1.13)	1.07 (1.04, 1.10)	1.33 (1.23, 1.43)	1.28 (1.25, 1.31)	0.84 (0.82, 0.85)
Southern Asia	1.47 (1.43, 1.51)	1.47 (1.43, 1.52)	1.54 (1.42, 1.66)	2.03 (1.99, 2.07)	0.56 (0.55, 0.57)
Eastern Asia	0.97 (0.94, 1.00)	0.98 (0.95, 1.01)	0.93 (0.85, 1.01)	1.31 (1.28, 1.34)	0.57 (0.55, 0.58)
Oceania and other Asia	1.52 (1.48, 1.56)	1.54 (1.50, 1.58)	1.47 (1.36, 1.58)	1.65 (1.62, 1.69)	0.64 (0.63, 0.66)
South & Central America	1.49 (1.45, 1.53)	1.43 (1.39, 1.48)	2.00 (1.85, 2.16)	1.44 (1.41, 1.47)	0.82 (0.80, 0.84)
United States or other	0.98 (0.93, 1.04)	0.98 (0.92, 1.04)	0.97 (0.81, 1.15)	1.02 (0.97, 1.07)	1.03 (1.00, 1.07)
Duration between landing and birth (reference category: <2 years)					
2-3 years	1.03 (1.01, 1.06)	1.04 (1.01, 1.06)	0.99 (0.92, 1.06)	0.94 (0.93, 0.95)	1.08 (1.05, 1.10)
4-5 years	1.06 (1.03, 1.08)	1.06 (1.03, 1.09)	1.06 (0.98, 1.14)	0.92 (0.90, 0.93)	1.11 (1.08, 1.13)
6-9 years	1.07 (1.05, 1.10)	1.07 (1.04, 1.10)	1.09 (1.02, 1.17)	0.93 (0.92, 0.95)	1.10 (1.08, 1.13)
10+ years	1.20 (1.17, 1.23)	1.19 (1.15, 1.22)	1.30 (1.22, 1.40)	1.02 (1.00, 1.03)	1.05 (1.03, 1.08)
Knowledge of official languages at landing (reference category: English and/or French)					
Neither English nor French	1.00 (0.98, 1.01)	1.01 (0.99, 1.03)	0.91 (0.87, 0.96)	0.95 (0.94, 0.97)	1.03 (1.01, 1.05)
Income	1.32 (1.22, 1.42)	1.25 (1.16, 1.36)	2.09 (1.65, 2.65)	1.10 (1.05, 1.16)	1.33 (1.24, 1.42)

Appendix 1, as submitted by the authors. Appendix to: Yang S, Shapiro GD, Ng E, et al. Birth and postnatal outcomes among infants of immigrant parents of different admission categories and parents born in Canada: a population-based retrospective study. *CMAJ* 2024. doi: 10.1503/cmaj.230878. Copyright © 2024 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at cmajgroup@cmaj.ca.

	PTB	Moderate-Late PTB	Early PTB	SGA birth	LGA birth
Income squared	0.98 (0.98, 0.99)	0.99 (0.98, 0.99)	0.96 (0.95, 0.97)	0.99 (0.99, 1.00)	0.99 (0.98, 0.99)

eTable 11. Adjusted risk ratios (95% CI) for covariates in fully adjusted models comparing family class immigrants and refugees to economic immigrants (Figure 4), singleton births in Canada, 1993 – 2017 for **non-fatal outcomes**

	PTB	Moderate-Late PTB	Early PTB	SGA birth	LGA birth
Birthing parent age at delivery (reference category: <25)					
25-29	1.03 (1.00, 1.06)	1.02 (0.99, 1.05)	1.10 (1.01, 1.19)	0.94 (0.92, 0.96)	1.11 (1.08, 1.14)
30-34	1.18 (1.15, 1.22)	1.16 (1.12, 1.19)	1.38 (1.27, 1.51)	0.94 (0.92, 0.96)	1.21 (1.17, 1.24)
35-39	1.44 (1.40, 1.49)	1.40 (1.35, 1.45)	1.89 (1.72, 2.08)	0.97 (0.95, 0.99)	1.28 (1.24, 1.32)
40+	1.78 (1.71, 1.86)	1.73 (1.66, 1.81)	2.38 (2.12, 2.67)	1.02 (0.99, 1.06)	1.27 (1.22, 1.32)
Parity (reference category: 0)					
1	0.81 (0.80, 0.83)	0.83 (0.82, 0.84)	0.68 (0.65, 0.71)	0.62 (0.62, 0.63)	1.46 (1.44, 1.48)
2+	0.81 (0.79, 0.82)	0.83 (0.81, 0.85)	0.65 (0.61, 0.68)	0.54 (0.54, 0.55)	1.72 (1.69, 1.75)
Birthing parent marital status (reference category: married)					
Unmarried	1.13 (1.11, 1.16)	1.10 (1.07, 1.13)	1.40 (1.31, 1.48)	1.08 (1.05, 1.10)	0.92 (0.90, 0.94)
Non-birthing parent age at delivery (reference category: <25)					
25-29	0.98 (0.94, 1.02)	0.98 (0.93, 1.02)	0.97 (0.86, 1.10)	1.02 (0.99, 1.05)	1.04 (0.99, 1.08)
30-34	0.94 (0.90, 0.98)	0.94 (0.90, 0.99)	0.89 (0.79, 1.01)	1.04 (1.01, 1.07)	1.04 (1.00, 1.09)
35-39	0.97 (0.92, 1.01)	0.96 (0.91, 1.01)	0.97 (0.86, 1.10)	1.04 (1.01, 1.08)	1.09 (1.04, 1.14)
40-44	0.99 (0.94, 1.03)	0.98 (0.93, 1.03)	1.03 (0.90, 1.17)	1.04 (1.01, 1.07)	1.13 (1.07, 1.18)
45+	1.00 (0.95, 1.05)	0.98 (0.93, 1.03)	1.12 (0.97, 1.29)	1.04 (0.99, 1.08)	1.18 (1.12, 1.24)
Non-birthing parent nativity (reference category: Canadian- born)					
Foreign-born	1.05 (1.03, 1.07)	1.02 (1.00, 1.04)	1.29 (1.21, 1.38)	1.19 (1.17, 1.21)	0.83 (0.82, 0.85)
Place of birth (reference category: Quebec)					
Atlantic	1.16 (1.07, 1.25)	1.18 (1.08, 1.28)	1.08 (0.87, 1.34)	1.14 (1.07, 1.20)	1.07 (1.01, 1.14)

	PTB	Moderate-Late PTB	Early PTB	SGA birth	LGA birth
Ontario	1.13 (1.11, 1.16)	1.15 (1.12, 1.18)	1.02 (0.96, 1.07)	1.14 (1.12, 1.16)	1.00 (0.98, 1.02)
Western excluding BC	1.25 (1.22, 1.28)	1.24 (1.21, 1.28)	1.32 (1.23, 1.41)	1.26 (1.24, 1.29)	0.89 (0.87, 0.91)
British Columbia	0.98 (0.96, 1.01)	0.99 (0.96, 1.02)	0.92 (0.86, 0.99)	0.99 (0.97, 1.01)	0.99 (0.97, 1.01)
Territories	0.82 (0.64, 1.05)	0.89 (0.69, 1.15)	*	1.03 (0.88, 1.21)	1.28 (1.08, 1.51)
Year of birth (reference category: 1993-1997)					
1998-2002	0.72 (0.70, 0.74)	0.69 (0.67, 0.71)	1.03 (0.95, 1.11)	0.91 (0.89, 0.93)	0.95 (0.93, 0.97)
2003-2007	0.70 (0.68, 0.71)	0.66 (0.65, 0.68)	1.00 (0.92, 1.08)	0.88 (0.86, 0.89)	0.89 (0.87, 0.91)
2008-2012	0.69 (0.67, 0.71)	0.66 (0.64, 0.68)	0.98 (0.91, 1.06)	0.88 (0.87, 0.90)	0.86 (0.84, 0.88)
2013-2017	0.69 (0.68, 0.71)	0.66 (0.64, 0.68)	0.98 (0.91, 1.06)	0.91 (0.90, 0.93)	0.79 (0.77, 0.80)
World region of origin					
Africa & the Middle East	1.10 (1.07, 1.13)	1.07 (1.04, 1.10)	1.33 (1.23, 1.43)	1.28 (1.25, 1.31)	0.84 (0.82, 0.85)
Southern Asia	1.47 (1.43, 1.51)	1.47 (1.43, 1.52)	1.54 (1.42, 1.66)	2.03 (1.99, 2.07)	0.56 (0.55, 0.57)
Eastern Asia	0.97 (0.94, 1.00)	0.98 (0.95, 1.01)	0.93 (0.85, 1.01)	1.31 (1.28, 1.34)	0.57 (0.55, 0.58)
Oceania and other Asia	1.52 (1.48, 1.56)	1.54 (1.50, 1.58)	1.47 (1.36, 1.58)	1.65 (1.62, 1.69)	0.64 (0.63, 0.66)
South & Central America	1.49 (1.45, 1.53)	1.43 (1.39, 1.48)	2.00 (1.85, 2.16)	1.44 (1.41, 1.47)	0.82 (0.80, 0.84)
United States or other	0.98 (0.93, 1.04)	0.98 (0.92, 1.04)	0.97 (0.81, 1.15)	1.02 (0.97, 1.07)	1.03 (1.00, 1.07)
Duration between landing and birth (reference category: <2 years)					
2-3 years	1.03 (1.01, 1.06)	1.04 (1.01, 1.06)	0.99 (0.92, 1.06)	0.94 (0.93, 0.95)	1.08 (1.05, 1.10)
4-5 years	1.06 (1.03, 1.08)	1.06 (1.03, 1.09)	1.06 (0.98, 1.14)	0.92 (0.90, 0.93)	1.11 (1.08, 1.13)
6-9 years	1.07 (1.05, 1.10)	1.07 (1.04, 1.10)	1.09 (1.02, 1.17)	0.93 (0.92, 0.95)	1.10 (1.08, 1.13)
10+ years	1.20 (1.17, 1.23)	1.19 (1.15, 1.22)	1.30 (1.22, 1.40)	1.02 (1.00, 1.03)	1.05 (1.03, 1.08)
Knowledge of official languages at landing (reference category: English and/or French)					
Neither English nor French	1.00 (0.98, 1.01)	1.01 (0.99, 1.03)	0.91 (0.87, 0.96)	0.95 (0.94, 0.97)	1.03 (1.01, 1.05)

Appendix 1, as submitted by the authors. Appendix to: Yang S, Shapiro GD, Ng E, et al. Birth and postnatal outcomes among infants of immigrant parents of different admission categories and parents born in Canada: a population-based retrospective study. *CMAJ* 2024. doi: 10.1503/cmaj.230878. Copyright © 2024 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at cmajgroup@cmaj.ca.

	PTB	Moderate-Late PTB	Early PTB	SGA birth	LGA birth
Income	1.32 (1.22, 1.42)	1.25 (1.16, 1.36)	2.09 (1.65, 2.65)	1.10 (1.05, 1.16)	1.33 (1.24, 1.42)
Income squared	0.98 (0.98, 0.99)	0.99 (0.98, 0.99)	0.96 (0.95, 0.97)	0.99 (0.99, 1.00)	0.99 (0.98, 0.99)

eTable 12. Crude associations (risk ratios (95% CI)) between covariates and outcomes in models comparing family class immigrants and refugees to economic immigrants, singleton births in Canada, 1993 – 2017 (for postnatal deaths, 1993 – 2018) for **fatal outcomes**

	Stillbirth	Infant mortality	Neonatal mortality	Post-neonatal mortality
Birthing parent age at delivery (reference category: <25)				
25-29	0.84 (0.78, 0.90)	0.94 (0.84, 1.06)	1.05 (0.91, 1.22)	0.79 (0.65, 0.95)
30-34	0.93 (0.87, 0.99)	1.00 (0.90, 1.12)	1.12 (0.97, 1.29)	0.83 (0.70, 0.99)
35-39	1.19 (1.11, 1.28)	1.23 (1.09, 1.38)	1.47 (1.27, 1.70)	0.88 (0.72, 1.06)
Parity (reference category: 0)				
1	0.85 (0.81, 0.89)	0.89 (0.83, 0.96)	0.81 (0.74, 0.89)	1.08 (0.95, 1.23)
2+	1.17 (1.12, 1.24)	1.17 (1.09, 1.27)	1.01 (0.91, 1.11)	1.59 (1.40, 1.82)
Birthing parent marital status (reference category: married)				
Unmarried	1.29 (1.20, 1.39)	1.13 (1.02, 1.24)	1.15 (1.02, 1.30)	1.07 (0.90, 1.27)
40+	1.73 (1.58, 1.89)	1.76 (1.52, 2.04)	2.07 (1.72, 2.48)	1.32 (1.03, 1.70)
Non-birthing parent age at delivery (reference category: <25)				
25-29	0.75 (0.65, 0.87)	0.87 (0.72, 1.05)	1.00 (0.78, 1.27)	0.69 (0.51, 0.94)
30-34	0.77 (0.67, 0.88)	0.91 (0.76, 1.08)	0.98 (0.78, 1.24)	0.80 (0.60, 1.06)
35-39	0.86 (0.75, 0.99)	0.96 (0.80, 1.15)	1.10 (0.87, 1.38)	0.77 (0.58, 1.02)
40-44	1.04 (0.90, 1.20)	1.08 (0.90, 1.31)	1.23 (0.97, 1.57)	0.87 (0.64, 1.18)
45+	1.28 (1.11, 1.49)	1.41 (1.16, 1.72)	1.64 (1.28, 2.11)	1.08 (0.78, 1.49)
Non-birthing parent nativity (reference category: Canadian- born)				
Foreign-born	1.18 (1.09, 1.27)	1.03 (0.94, 1.13)	0.97 (0.87, 1.08)	1.19 (1.01, 1.39)
Place of birth (reference category: Quebec)				

	Stillbirth	Infant mortality	Neonatal mortality	Post-neonatal mortality
Atlantic	1.29 (1.07, 1.57)	1.15 (0.86, 1.55)	1.31 (0.92, 1.87)	0.88 (0.52, 1.51)
Ontario	1.26 (1.19, 1.33)	0.74 (0.68, 0.80)	0.74 (0.67, 0.83)	0.72 (0.63, 0.83)
Western excluding BC	1.36 (1.27, 1.46)	1.50 (1.37, 1.65)	1.76 (1.57, 1.97)	1.05 (0.90, 1.24)
British Columbia	1.30 (1.21, 1.39)	0.84 (0.75, 0.94)	0.90 (0.79, 1.03)	0.74 (0.61, 0.89)
Territories	1.27 (0.70, 2.29)	1.35 (0.60, 3.05)	*	*
Year of birth (reference category: 1993-1997)				
1998-2002	1.29 (1.20, 1.40)	0.92 (0.82, 1.04)	0.92 (0.79, 1.07)	0.93 (0.77, 1.12)
2003-2007	1.29 (1.20, 1.39)	0.95 (0.85, 1.06)	0.99 (0.86, 1.14)	0.87 (0.73, 1.05)
2008-2012	1.22 (1.14, 1.31)	1.04 (0.94, 1.16)	1.14 (1.00, 1.30)	0.88 (0.74, 1.05)
2013-2017	1.28 (1.20, 1.37)	1.09 (0.99, 1.21)	1.25 (1.11, 1.42)	0.83 (0.70, 0.99)
World region of origin				
Africa & the Middle East	1.25 (1.17, 1.34)	1.21 (1.08, 1.34)	1.15 (1.01, 1.31)	1.32 (1.09, 1.58)
Southern Asia	1.34 (1.25, 1.43)	0.99 (0.89, 1.11)	0.90 (0.78, 1.03)	1.20 (0.99, 1.46)
Eastern Asia	0.87 (0.80, 0.94)	0.81 (0.71, 0.93)	0.79 (0.67, 0.92)	0.87 (0.69, 1.10)
Oceania and other Asia	1.17 (1.09, 1.26)	1.27 (1.14, 1.43)	1.25 (1.09, 1.43)	1.33 (1.09, 1.62)
South & Central America	1.32 (1.22, 1.42)	1.39 (1.24, 1.56)	1.52 (1.33, 1.74)	1.11 (0.90, 1.38)
United States or other	0.92 (0.79, 1.06)	1.10 (0.90, 1.36)	1.02 (0.79, 1.33)	1.28 (0.90, 1.81)
Duration between landing and birth (reference category: <2 years)				
2-3 years	0.96 (0.90, 1.03)	1.01 (0.91, 1.13)	1.01 (0.89, 1.15)	1.02 (0.85, 1.23)
4-5 years	0.93 (0.86, 1.00)	1.03 (0.92, 1.15)	1.05 (0.92, 1.21)	0.98 (0.80, 1.19)
6-9 years	1.03 (0.97, 1.10)	1.01 (0.91, 1.12)	1.00 (0.88, 1.14)	1.03 (0.86, 1.24)
10+ years	1.07 (1.01, 1.14)	1.17 (1.06, 1.28)	1.19 (1.06, 1.34)	1.12 (0.95, 1.33)
Knowledge of official languages at landing				

	Stillbirth	Infant mortality	Neonatal mortality	Post-neonatal mortality
(reference category: English and/or French)				
Neither English nor French	0.91 (0.88, 0.95)	0.88 (0.82, 0.94)	0.78 (0.72, 0.85)	1.10 (0.99, 1.23)
Income	0.99 (0.97, 1.01)	1.03 (0.99, 1.06)	1.09 (1.05, 1.15)	0.91 (0.86, 0.95)
Income squared	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)	1.00 (1.00, 1.01)	0.99 (0.99, 1.00)

* Estimate not computed due to empty cells.

eTable 13. Adjusted associations (risk ratios (95% CI)) between covariates and outcomes in fully adjusted models comparing family class immigrants and refugees to economic immigrants (Figure 4), singleton births in Canada, 1993 – 2017 (for postnatal deaths, 1993 – 2018) for **fatal outcomes**

	Stillbirth	Infant mortality	Neonatal mortality	Post-neonatal mortality
Birthing parent age at delivery (reference category: <25)				
25-29	0.87 (0.76, 0.99)	0.94 (0.81, 1.10)	1.13 (0.92, 1.38)	0.71 (0.56, 0.90)
30-34	1.03 (0.89, 1.18)	1.06 (0.90, 1.24)	1.28 (1.03, 1.58)	0.78 (0.61, 1.00)
35-39	1.37 (1.17, 1.59)	1.18 (0.99, 1.41)	1.55 (1.23, 1.95)	0.74 (0.55, 0.98)
40+	1.84 (1.53, 2.22)	1.59 (1.28, 1.97)	2.14 (1.64, 2.80)	0.94 (0.65, 1.34)
Parity (reference category: 0)				
1	0.92 (0.85, 1.00)	0.84 (0.76, 0.91)	0.74 (0.66, 0.82)	1.08 (0.93, 1.27)
2+	1.09 (0.99, 1.20)	0.95 (0.85, 1.05)	0.78 (0.69, 0.89)	1.39 (1.16, 1.68)
Birthing parent marital status (reference category: married)				
Unmarried	1.21 (1.08, 1.36)	1.00 (0.88, 1.14)	0.99 (0.84, 1.16)	1.03 (0.82, 1.28)
Non-birthing parent age at delivery (reference category: <25)				
25-29	0.92 (0.75, 1.14)	0.99 (0.78, 1.27)	1.01 (0.74, 1.38)	0.93 (0.63, 1.38)
30-34	0.90 (0.73, 1.12)	1.04 (0.81, 1.33)	1.00 (0.73, 1.37)	1.07 (0.73, 1.57)
35-39	0.93 (0.75, 1.15)	1.04 (0.80, 1.34)	1.06 (0.77, 1.48)	0.94 (0.63, 1.41)
40-44	1.00 (0.80, 1.26)	1.14 (0.87, 1.48)	1.13 (0.81, 1.59)	1.10 (0.72, 1.67)
45+	1.11 (0.87, 1.41)	1.32 (1.00, 1.75)	1.32 (0.93, 1.89)	1.27 (0.81, 1.98)
Non-birthing parent nativity (reference category: Canadian- born)				
Foreign-born	1.27 (1.14, 1.41)	1.08 (0.97, 1.21)	1.07 (0.94, 1.22)	1.12 (0.92, 1.37)

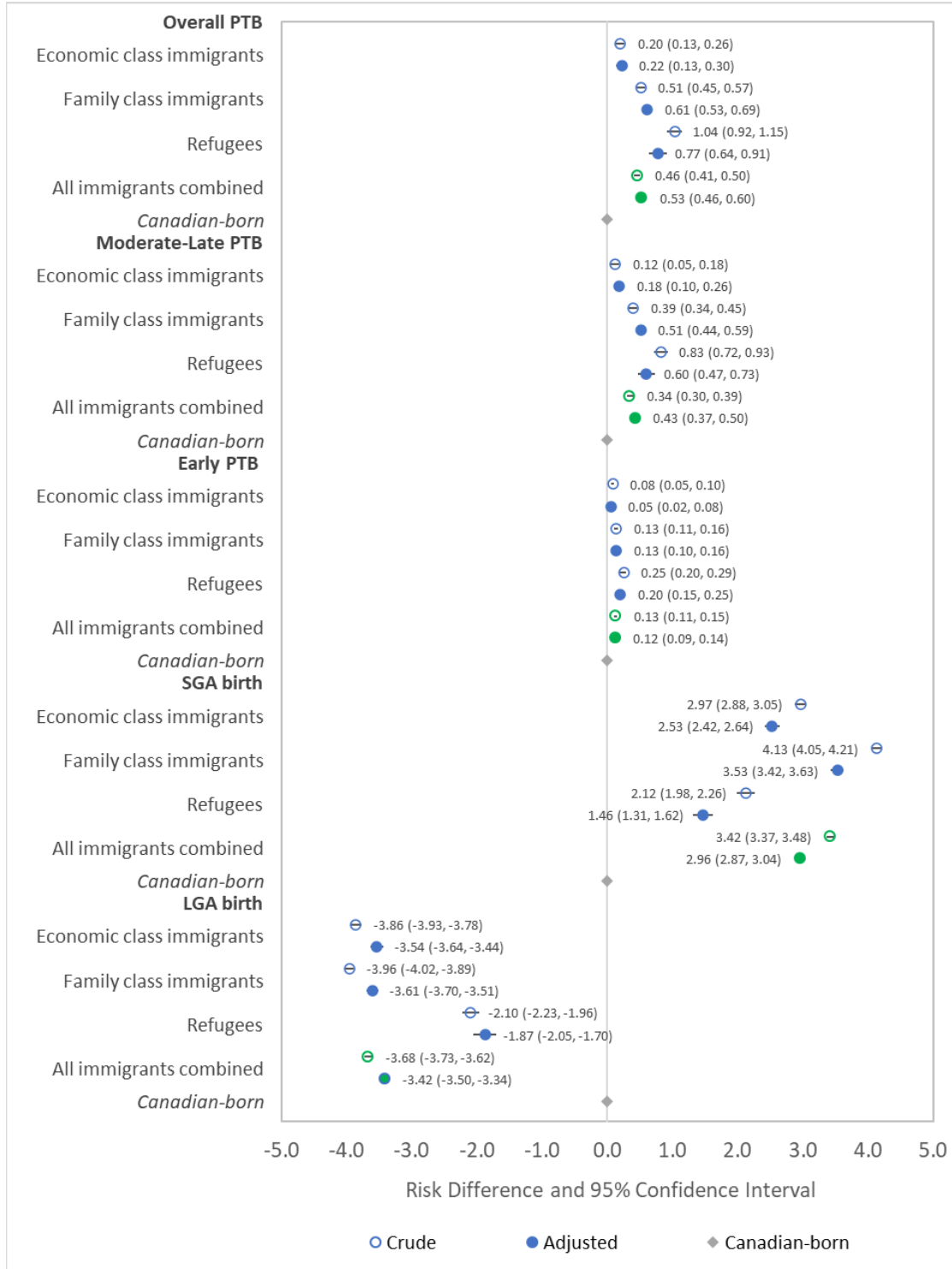
	Stillbirth	Infant mortality	Neonatal mortality	Post-neonatal mortality
Place of birth (reference category: Quebec)				
Atlantic	1.66 (1.31, 2.10)	1.56 (1.12, 2.18)	1.79 (1.19, 2.70)	1.21 (0.67, 2.16)
Ontario	0.14 (0.12, 0.15)	0.79 (0.71, 0.88)	0.82 (0.72, 0.94)	0.72 (0.61, 0.87)
Western excluding BC	1.62 (1.49, 1.77)	1.70 (1.51, 1.90)	2.08 (1.80, 2.39)	1.11 (0.91, 1.36)
British Columbia	0.96 (0.87, 1.06)	0.91 (0.79, 1.04)	0.98 (0.83, 1.17)	0.78 (0.62, 0.99)
Territories	1.71 (0.88, 3.31)	1.58 (0.65, 3.86)	*	*
Year of birth (reference category: 1993-1997)				
1998-2002	1.58 (1.36, 1.83)	0.90 (0.78, 1.05)	0.85 (0.71, 1.03)	0.99 (0.78, 1.27)
2003-2007	2.17 (1.89, 2.49)	0.92 (0.80, 1.06)	0.89 (0.75, 1.06)	0.97 (0.77, 1.23)
2008-2012	1.28 (1.12, 1.48)	0.97 (0.85, 1.11)	0.97 (0.82, 1.15)	0.96 (0.76, 1.21)
2013-2017	1.24 (1.08, 1.42)	0.90 (0.78, 1.03)	0.92 (0.78, 1.09)	0.84 (0.67, 1.06)
World region of origin				
Africa & the Middle East	1.13 (1.00, 1.27)	1.20 (1.04, 1.37)	1.16 (0.98, 1.37)	1.27 (1.00, 1.61)
Southern Asia	1.31 (1.15, 1.48)	1.09 (0.94, 1.25)	1.04 (0.87, 1.23)	1.17 (0.91, 1.50)
Eastern Asia	0.76 (0.66, 0.88)	0.88 (0.75, 1.03)	0.80 (0.66, 0.97)	1.06 (0.80, 1.40)
Oceania and other Asia	1.01 (0.89, 1.13)	1.25 (1.09, 1.43)	1.15 (0.98, 1.36)	1.44 (1.14, 1.83)
South & Central America	1.07 (0.94, 1.22)	1.50 (1.31, 1.73)	1.73 (1.47, 2.05)	1.07 (0.83, 1.40)
United States or other	0.84 (0.65, 1.07)	1.09 (0.85, 1.42)	1.07 (0.78, 1.46)	1.15 (0.74, 1.78)
Duration between landing and birth (reference category: <2 years)				
2-3 years	0.95 (0.85, 1.06)	1.08 (0.95, 1.24)	1.05 (0.90, 1.24)	1.13 (0.90, 1.43)
4-5 years	0.87 (0.77, 0.98)	1.10 (0.96, 1.27)	1.11 (0.94, 1.32)	1.07 (0.83, 1.38)
6-9 years	1.00 (0.89, 1.12)	1.05 (0.92, 1.21)	1.03 (0.87, 1.21)	1.11 (0.87, 1.41)
10+ years	0.96 (0.85, 1.08)	1.22 (1.08, 1.41)	1.21 (1.03, 1.43)	1.29 (1.01, 1.64)

	Stillbirth	Infant mortality	Neonatal mortality	Post-neonatal mortality
Knowledge of official languages at landing (reference category: English and/or French)				
Neither English nor French	0.94 (0.87, 1.01)	0.97 (0.89, 1.06)	0.94 (0.85, 1.05)	1.02 (0.88, 1.17)
Income	1.80 (1.25, 2.58)	1.74 (1.10, 2.76)	1.75 (0.97, 3.15)	1.90 (0.90, 4.10)
Income squared	0.97 (0.95, 0.99)	0.97 (0.95, 0.99)	0.97 (0.94, 1.00)	0.96 (0.92, 1.00)

* Estimate not computed due to empty cell

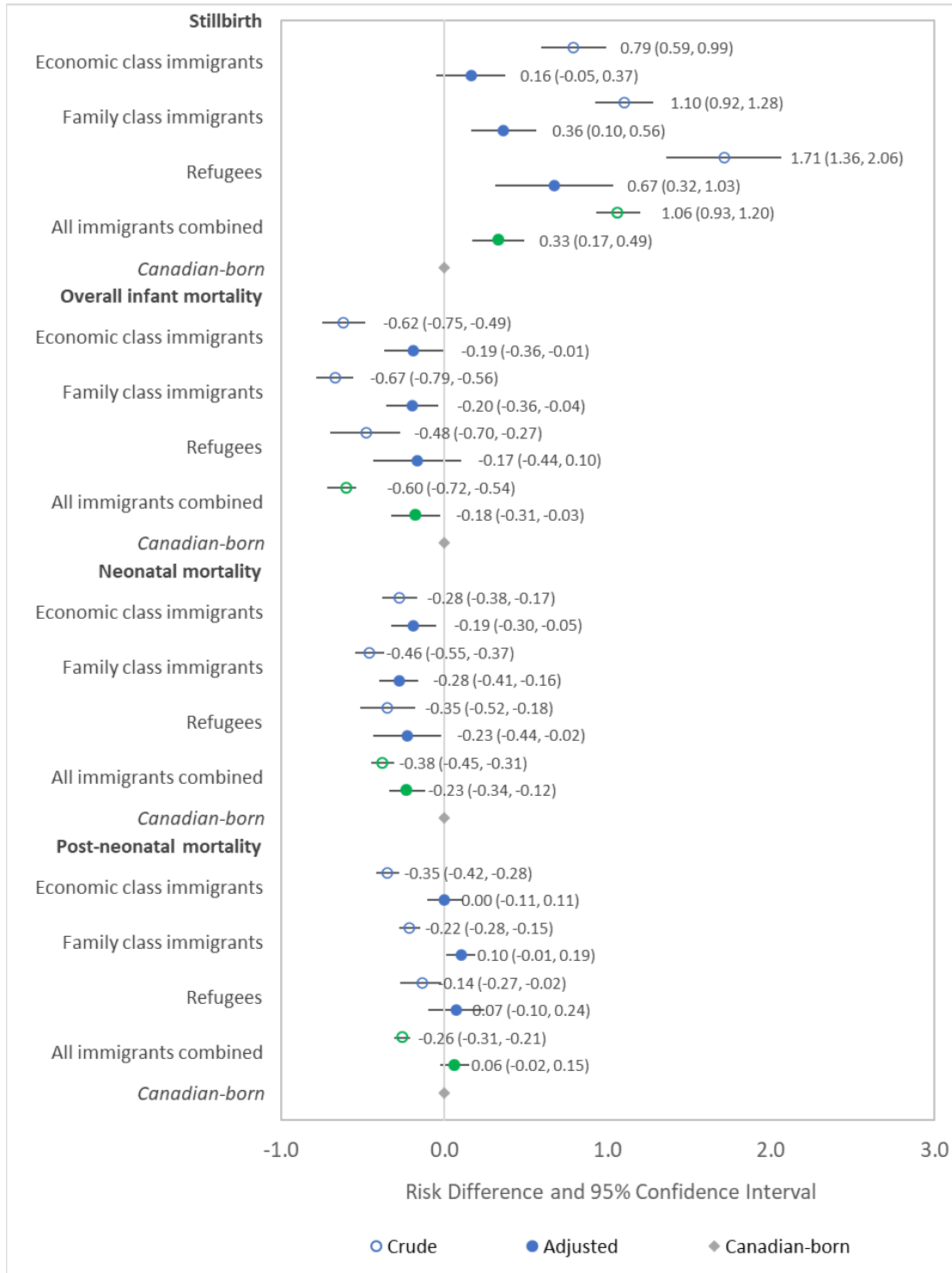
eFigure 1. Risk differences with 95% CIs for adverse birth outcomes of immigrants (vs. Canadian-born women) by immigrant category, singleton births in Canada, 1993 – 2017 (for postnatal deaths, 1993 – 2018).

A. Non-fatal outcomes



Appendix 1, as submitted by the authors. Appendix to: Yang S, Shapiro GD, Ng E, et al. Birth and postnatal outcomes among infants of immigrant parents of different admission categories and parents born in Canada: a population-based retrospective study. *CMAJ* 2024. doi: 10.1503/cmaj.230878. Copyright © 2024 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at cmajgroup@cmaj.ca.

B. Fatal outcomes

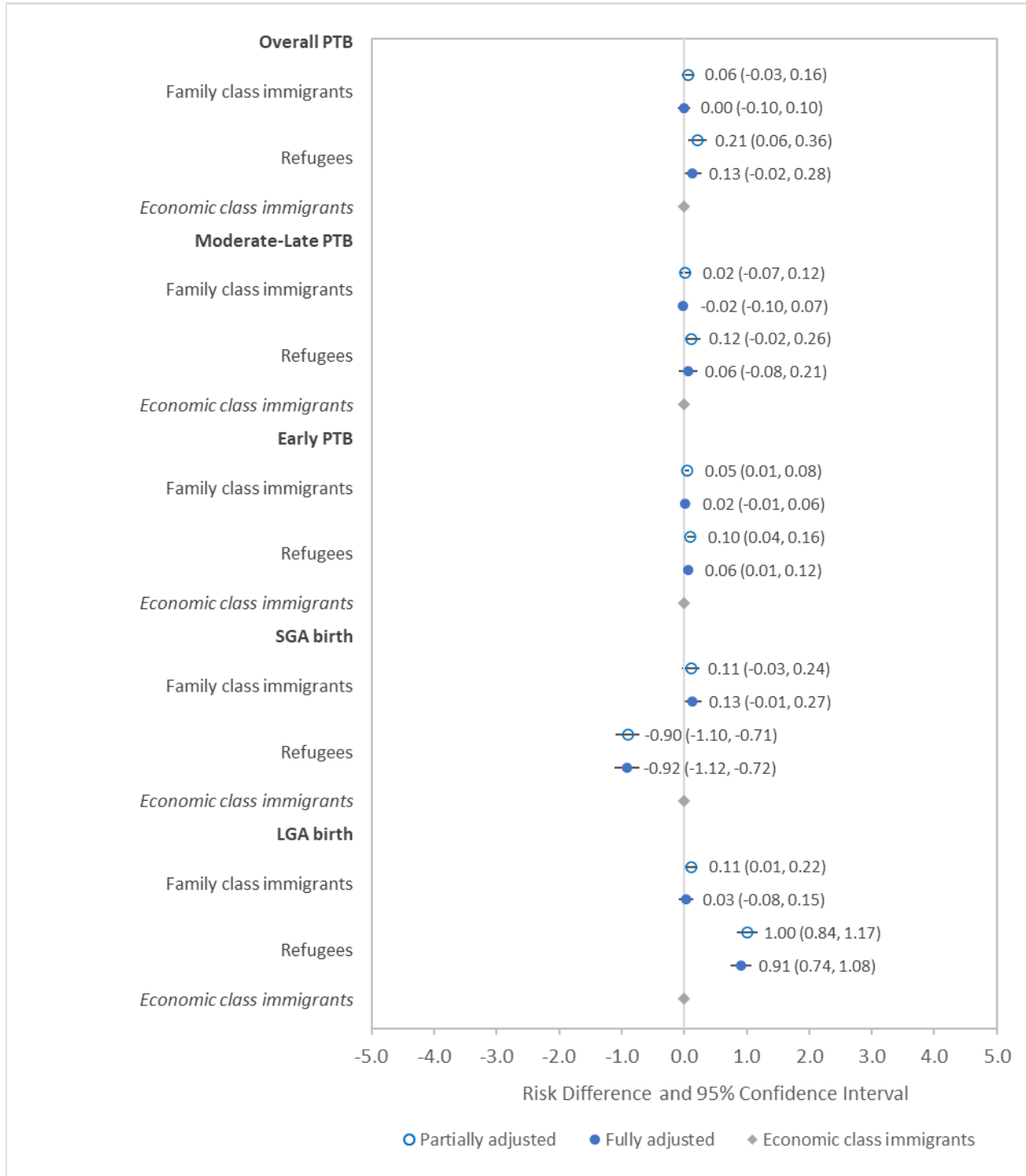


All models account for clustering by mother. Adjusted models include maternal and paternal age, parity, marital status, paternal nativity, and year and region of birth. Ontario births in 1998 and 1999 are excluded from analyses for stillbirth. Risk differences shown as percent for non-fatal outcomes and per 1,000 for fatal outcomes.

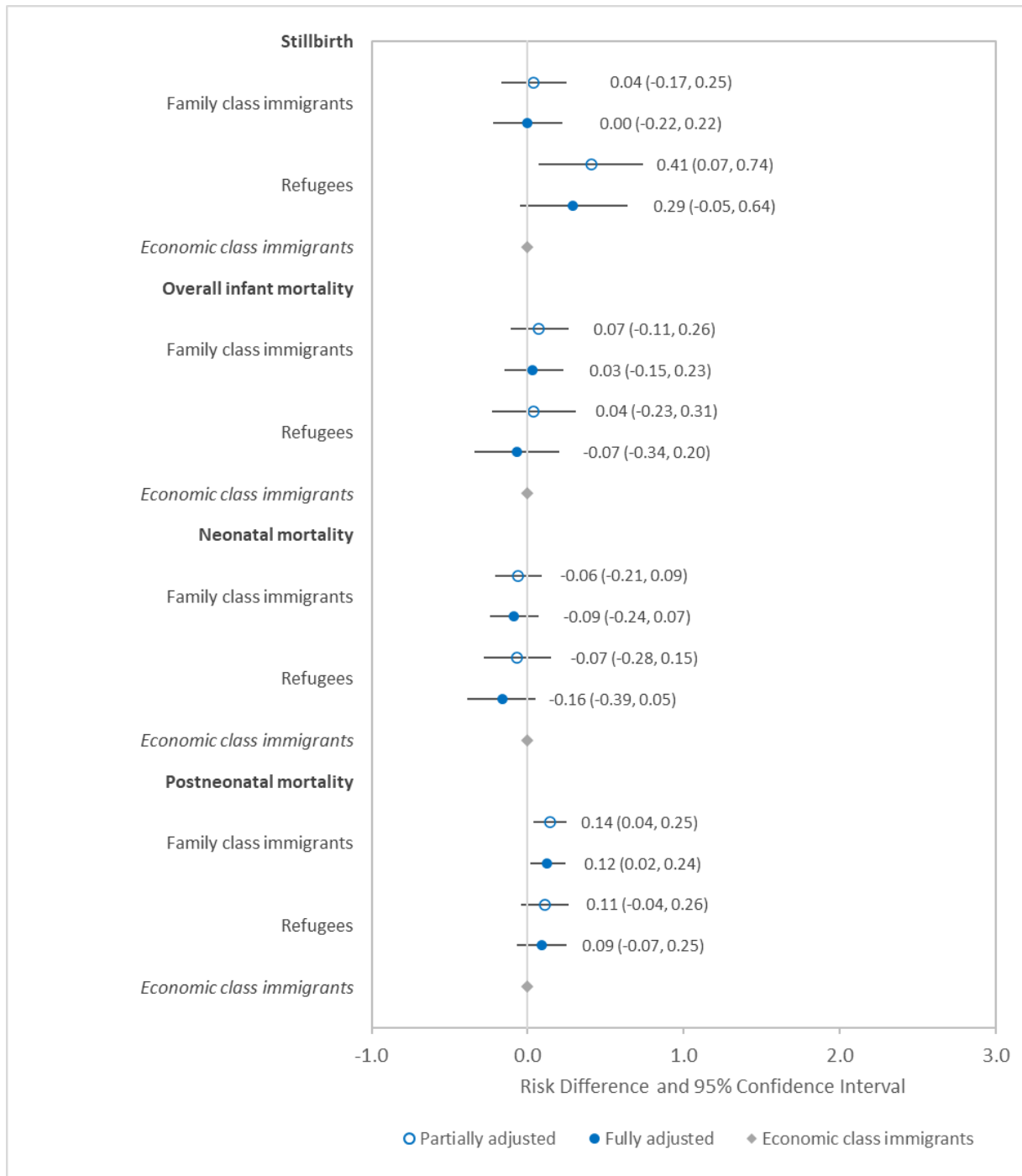
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eFigure 2. Adjusted risk differences with 95% CIs for adverse birth outcomes by immigration category among immigrant birthing parents (vs. economic class immigrants), singleton births in Canada, 1993 – 2017 (for postnatal deaths, 1993 – 2018).

A. Non-fatal outcomes



B. Fatal outcomes



Partially adjusted models include birthing parent's age, parity, and marital status, non-birthing parent's age and nativity, year and region of birth, world region of origin, duration from landing to birth, and knowledge of official languages at landing (English and/or French vs. neither). Fully adjusted models include all variables from partially adjusted models as well as log-transformed income and income-squared. All models account for clustering by mother. Ontario births in 1998 and 1999 are excluded from analyses for stillbirth. Risk differences shown as percent for non-fatal outcomes and per 1,000 for fatal outcomes.

Appendix 1, as submitted by the authors. Appendix to: Yang S, Shapiro GD, Ng E, et al. Birth and postnatal outcomes among infants of immigrant parents of different admission categories and parents born in Canada: a population-based retrospective study. *CMAJ* 2024. doi: 10.1503/cmaj.230878. Copyright © 2024 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at cmajgroup@cmaj.ca.

