APPENDIX A: Inclusion/exclusion variables and ICD 10-CA codes

Variables	Available in the PDR Checklist and/or as ICD 10-CA Codes
BC Health Service Delivery Area (resident)	Grouped into the following categories: • BC Resident • All other categories (excluded)
Number of births	Grouped into the following categories: • Singleton • All other categories (excluded)
Maternal diseases of the circulatory system and blood/blood forming organs	Codes beginning with: O99.1 Other disease of the blood and blood-forming organs and certain disorders involving the immune mechanism complicating pregnancy O99.4 Disease of the circulatory system complicating pregnancy O99.8 Other specified disease and conditions complicating pregnancy, childbirth and the puerperium
Pre-existing hypertension complicating pregnancy, hypertensive heart disease, hypertension secondary to renal disease	Codes beginning with: O10.1 Pre-existing hypertensive heart disease complicating pregnancy, childbirth, and the puerperium O10.2 Pre-existing hypertensive renal disease complicating pregnancy, childbirth and the puerperium O10.3 Pre-existing hypertensive heart and renal disease complicating pregnancy, childbirth and the puerperium O10.4 Pre-existing secondary hypertension complicating pregnancy, childbirth and the puerperium O10.9 Unspecified pre-existing hypertension complicating pregnancy, childbirth and the puerperium
Antihypertensive drugs, hypertensive chronic renal disease, hypertension due to other causes	Grouped into the following categories: • Yes (excluded) • No
Diabetes mellitus (insulin dependent), diabetes mellitus (non-insulin dependent)	Grouped into the following categories: • Yes (excluded) • No Codes beginning with: O24.5 Pre-existing type 1 diabetes mellitus in pregnancy O24.6 Pre-existing type 2 diabetes mellitus in pregnancy O24.7 Pre-existing diabetes mellitus of other or unspecified type in pregnancy

Liver disorders	Codes beginning with: O26.6 Liver disorders in pregnancy, childbirth and the puerperium
Tuberculosis, malaria	Codes beginning with: O98.0 Tuberculosis complicating pregnancy, childbirth and the puerperium O98.6 Protozoal diseases complicating pregnancy, childbirth and the puerperium
Number of previous pre-term deliveries	Grouped into the following categories: • ≤ 1 • >1 (excluded)
Previous cesarean deliveries	Grouped into the following categories: • ≤ 2 • >2 (excluded)
Number of spontaneous abortions	Grouped into the following categories: • ≤ 2 • >2 (excluded)
Pre-eclampsia, eclampsia, or either superimposed on pre-existing hypertension	Codes beginning with: O11 Pre-existing hypertensive disorder with superimposed proteinuria O14 Gestational hypertension with significant proteinuria O15 Eclampsia O16 Unspecified maternal hypertension
Hemorrhage from placenta previa	Codes beginning with: O44.1 Placenta praevia with haemorrhage
Rh immunoglobulin given or isoimmunization	Grouped into the following categories: • Yes (excluded) • No Codes beginning with: O36.0 Maternal care for rhesus isoimmunization O36.1 Maternal care of other isoimmunization
Incompetent cervix	Codes beginning with: O34.3 Maternal care for cervical incompetence
Severe hyperemesis	O21.1 Hyperemesis gravidarum with metabolic disturbance
Maternal age	Grouped into the following categories: • ≥ 14 years • < 14 years (excluded)
Delivery date/Infant birth date	Grouped into the following categories: • 1 Jan. 2005 to 31 Dec. 2012 • All other categories (excluded)
Variables	**Codes available in the MSP Payment Information File**
General practitioner routine antenatal visit	Claim specialty code "General Practice" and fee item code: • 14090 prenatal visit complete exam or

	• 14091 prenatal visit subsequent exam or • 04717 prenatal office visit complex obstetrical patient
Obstetrician routine antenatal visit	Claim specialty code "Obstetrician" and fee item code: • 14090 prenatal visit complete exam or • 14091 prenatal visit subsequent exam or • 04717 prenatal office visit complex obstetrical patient
Full or partial trimester of midwifery care	Fee item code: • 36010 midwife phase 1 (1rst trimester) total care • 36014 midwife phase 1 (1rst trimester) trans. to other 40% • 36016 midwife phase 1 (1rst trimester) trans. to other 60% • 36020 midwife phase 2 (2nd trimester) total care • 36024 midwife phase 2 (2nd trimester) trans. to other 40% • 36026 midwife phase 2 (2nd trimester) trans. to other 60% • 36030 midwife phase 3 (3rd trimester) total care • 36034 midwife phase 3 (3rd trimester) trans. to other 40% • 36036 midwife Phase 3 (3rd trimester) trans. to other 60%
MSP regular premium subsidy assistance	Subsidy code: • A (100%), B (80%), F (60%), G (40%), H (100% paid by social services)

APPENDIX B: Covariate description, data source, and ICD 10-CA codes

Variable	Description	PDR Checklist or ICD 10-CA Codes	Data Source
Maternal age	Age at date of delivery	Grouped into the following categories: • 14-19 • 20-24 • 25-29 • 30-34 • 35-39 • ≥ 40	PDR
Parity		Grouped into the following categories: • Nulliparous • Multiparous	PDR
Medical risk	Maternal disease of the respiratory or digestive system, and endocrine, nutritional, or metabolic disease	O99.5 Diseases of the respiratory system complicating pregnancy, childbirth and the puerperium O99.6 Disease of the digestive system complicating pregnancy, childbirth and the puerperium O99.2 Endocrine, nutritional and metabolic disease complicating pregnancy, childbirth and the puerperium	PDR
Prior obstetric risk	Has had at least one of the following conditions in past pregnancy: neonatal death, stillbirth, infant with major congenital anomaly, or 1 preterm delivery	Grouped into the following categories: • Yes • No	PDR
Mental disorder or illness	Anxiety, depression, bipolar, postpartum depression, other and unknown mental disorders	Grouped into the following categories: • Yes • No	PDR

		Codes beginning with: F20 Paranoid schizophrenia F21 Schizotypal disorder F22 Delusional disorders F23 Brief psychotic disorder F24 Shared psychotic disorder F25 Schizoaffective disorder F28 Other psychotic disorder not due to a substance or known physiological condition F29 Unspecified psychosis not due to a substance or known physiological condition F30 Manic episode F31 Biopolar disorder F32 Major depressive disorder, single episode F33 Major depressive disorder, recurrent F34 Persistent mood [affective] disorders F39 Unspecified mood [affective] disorder F40 Phobic anxiety disorders F41 Anxiety disorder F42 Obsessive-compulsive disorder F43 Acute stress reaction O99.3 Mental disorders and disease of the nervous system complicating pregnancy, childbirth and the puerperium	
Receiving social assistance	Regular MSP subsidy assistance paid for by the Ministry of Employment and Income Assistance	Grouped into the following categories: - MSP subsidy assistance code H (100% subsidy) - All other categories (excluded)	MSP Payment Information File
Pre-pregnancy BMI	Ratio of a women's pre-pregnancy weight (kg) to height (m)	Grouped into the following categories: - Underweight (<18.5) - Normal (18.5-24.9) - Overweight (25-29.9) - Obese (≥ 30) - Unknown	PDR
Smoking status		Grouped into the following categories: - Never - Former - Current - Unknown	PDR

Substance use	Heroin/opioids, cocaine, methadone, solvents, prescription, marijuana, other, unknown drugs	Grouped into the following categories: • Yes • No or blank	PDR
		Codes beginning with: F11 Opioid dependence, abuse, use F12 Cannabis dependence, abuse, use F13 Sedative, hypnotic or anxiolytic dependence, abuse, use F14 Cocaine dependence, abuse, use F15 Other stimulant dependence, abuse, use F16 Hallucinogen dependence, abuse, use F18 Inhalant dependence, abuse, use F19 Other psychoactive substance dependence, abuse, use	
Alcohol use	Alcohol during pregnancy identified as a risk by care provider	Grouped into the following categories: • Yes • No or blank	PDR
		Codes beginning with: F10 Alcohol dependence, abuse, use with alcohol-induced disorder	
Antepartum morbidity	Hypertension (≥ 140/90) during pregnancy, pregnancy induced hypertension, gestational diabetes insulin dependent, non-insulin dependent, IUGR identified as a risk during the antenatal period, antepartum hemorrhage ≥ 20 weeks	Grouped into the following categories: • Yes • No	PDR
		Codes beginning with: O13 Gestational hypertension w/o significant proteinuria O24.8 Diabetes mellitus arising in pregnancy (gestational) O99.0 Anemia complicating pregnancy, childbirth and the puerperium O99.0 Maternal care for restricted fetal growth O98.4 Viral hepatitis complicating pregnancy, childbirth and the puerperium O98.5 Other viral diseases complicating pregnancy, childbirth and the puerperium O98.8 Other maternal infectious and parasitic disease complicating pregnancy, childbirth and the puerperium O98.9 Unspecified maternal infectious or parasitic disease complicating pregnancy, childbirth and the puerperium O44.0 Placenta previa specified as without	

		haemorrhage O40 Polyhydramnios O41 Oligohydramnios O98.1 Syphilis complicating pregnancy, childbirth and the puerperium O98.2 Gonorrhoea complicating pregnancy, childbirth and the puerperium O98.3 Other infections with a predominantly sexual mode of transmission complicating pregnancy, childbirth and the puerperium O98.7 Human immunodeficiency disease complicating pregnancy, childbirth and the puerperium O45 Premature separation of placenta	
Delivery Year		Grouped into the following categories: • 2005 • 2006 • 2007 • 2008 • 2009 • 2010 • 2011 • 2012	PDR
Neighbour-hood SEP	Assigned on the basis of residence, reflects the average single-person income in a geographical area populated by approximately 400-700 people	Grouped into the following categories: • High • Low/Medium	Population Data BC, Consolid-ation File
Urban/rural residence	Population estimates (2009) of LHAs	Grouped into the following categories: • Urban • Rural • Unknown	BC Stats
LHA socioecono-mic index	LHAs in BC ranked according to area-level socioeconomic status, based on six indicators: human economic hardship, crime concerns, health problems,	Grouped into the following categories: • High • Medium • Low • Unknown	BC Stats and a number of social ministries[a]

	education concerns, children at risk, and youth at risk		
LHA income inequality	LHAs in BC ranked according to area-level income inequality	Grouped into the following categories: • High • Medium • Low • Unknown	BC Stats
Northern residence	Residing in the Northern Health Authority at delivery	Grouped into the following categories: • Yes • No	PDR
Gestational age at birth, in completed weeks	Calculated by algorithm incorporating last menstrual period, first ultrasound, infant exam, and maternal chart[b]	Used for coding small-for-gestational-age and preterm birth	PDR
Small-for-gestational-age birth	Based on admission weight in grams and infant's gestational age at birth in completed weeks (20 to 44 weeks)	Grouped according to Kierans' sex-specific birth weight standards[c]	PDR
Preterm birth	Infant's gestational age at birth in completed weeks	Grouped into the following categories: • 20 to 36 weeks • Other (excluded)	PDR

[a] BC Stats. Socio-economic indices: LHA indices reports. Human economic hardship: income inequality measure. 2013 [cited 2014 Nov 4]. From: http://www.bcstats.gov.bc.ca/StatisticsBySubject/SocialStatistics/SocioEconomicProfilesIndices/SocioEconomicIndices/LHAReports.aspx.

[b] Algorithm for the estimation of gestational age. Canadian Perinatal Surveillance System. Ottawa: Public Health Agency of Canada; 2010.

[c] Kierans W, Kramer M, Wilkins R, et al. Charting birth outcome in British Columbia: determinants of optimal health and ultimate risk--an expansion and update. Vancouver, BC: British Columbia Vital Statistics Agency; 2008 [cited 2017 Feb 16]. From: http://www.perinatalservicesbc.ca/Documents/Resources/HealthPromotion/BirthCharts/ChartingBirthOutcomeReport.pdf.

Appendix C: Sensitivity analyses

Table 1: Adjusted odds ratios with and without control for antepartum morbidity

Antenatal Model	Without Control for Antepartum Morbidity OR (95% CI)	With Control for Antepartum Morbidity OR (95% CI)
Small-for-Gestational-Age Birth (< 10th percentile)[a]		
MW vs. GP	0·71 (0·62-0·82)	0·77 (0·67-0·89)
MW vs. OB	0·59 (0·50-0·69)	0·68 (0·59-0·80)
GP vs. OB	0·83 (0·76-0·91)	0·88 (0·80-0·96)
Preterm Birth (< 37 weeks gestation)[b]		
MW vs. GP	0·74 (0·63-0·86)	0·80 (0·69-0·93)
MW vs. OB	0·53 (0·45-0·62)	0·61 (0·51-0·71)
GP vs. OB	0·72 (0·65-0·79)	0·75 (0·69-0·83)
Low Birth Weight (<2500 g.)[c]		
MW vs. GP	0·66 (0·53-0·82)	0·80 (0·64-0·99)
MW vs. OB	0·43 (0·34-0·54)	0·58 (0·46-0·74)
GP vs. OB	0·65 (0·58-0·74)	0·73 (0·64-0·83)
All models adjusted for maternal age, parity, pre-pregnancy BMI, infant sex, smoking status and substance use. [a]Model also adjusted for mental illness, and LHA socioeconomic rank. [b]Model also adjusted for medical risk, prior obstetric risk, delivery year, receipt of social assistance, alcohol use, mental illness, neighbourhood SEP, LHA socioeconomic rank, LHA income inequality, and northern residence. [c]Model also adjusted for prior obstetric risk.		

Table 2: Adjusted odds ratios for full study population excluding pregnancies in which mothers had prior medical or obstetric risk (n=55,041)

Antenatal Model	OR (95% CI)
Small-for-Gestational-Age Birth (< 10th percentile)[a]	
MW vs. GP	0·71 (0·61-0·82)
MW vs. OB	0·59 (0·51-0·70)
GP vs. OB	0·84 (0·77-0·93)
Preterm Birth (< 37 weeks gestation)[b]	
MW vs. GP	0·72 (0·61-0·84)
MW vs. OB	0·52 (0·43-0·61)
GP vs. OB	0·72 (0·65-0·80)
Low Birth Weight (<2500 g.)	
MW vs. GP	0·66 (0·53-0·82)
MW vs. OB	0·44 (0·35-0·56)
GP vs. OB	0·67 (0·59-0·76)
All models adjusted for maternal age, parity, pre-pregnancy BMI, infant sex, smoking status and substance use. [a]Model also adjusted for mental illness, and LHA socioeconomic rank. [b]Model also adjusted for delivery year, receipt of social assistance, alcohol use, mental illness, neighbourhood SEP, LHA socioeconomic rank, LHA income inequality, and northern residence.	