

## Supplementary tables

Supplemental Table 1. Definitions and sources of variables

	Definition	Source
Maternal age (years)	Mother's age (in years) calculated at date of delivery.	BCPDR
Nullipara	Mother has never delivered a baby of at least 500 grams birth weight or at least 20 weeks gestation in a previous pregnancy.	BCPDR
Pre-existing diabetes	Pre-existing diabetes mellitus Type 1 or Type 2, insulin used.	BCPDR
	Pre-existing diabetes mellitus Type 1 or Type 2, insulin not used; or 'E10','E11', 'O245','O246','O247'	ICD-10
Chronic hypertension	'O10','O11'	ICD-10
Prior stillbirth /neonatal death	Mother had at least one prior live born infant, who died within the first 28 days of life.	BCPDR
	Mother had at least one prior stillbirth or intrauterine death documented.	
IVF conception	Mother had in-vitro fertilization to achieve the current pregnancy.	BCPDR
Multiple gestation	The incremental sequence number of babies born from the current pregnancy. Should be used with multiple_birth_count. Along with mother_id, required to link to MULTIPLE_LABOURS.	BCPDR

Antepartum bleeding		
< 20 weeks	Mother had any antepartum bleeding in pregnancy < 20 weeks gestation.	BCPDR
Antepartum		
bleeding or hemorrhage ≥ 20 weeks	Mother had any antepartum hemorrhage or bleeding in pregnancy ≥ 20 weeks gestation, including bleeding from cervical polyps.	BCPDR
Intrauterine Growth Restriction <sup>a</sup>		
	Health care provider identified intrauterine growth restriction (IUGR) during the antenatal period.	BCPDR
	Baby may or may not be appropriately grown at birth.	
Gestational Hypertension		
	Care provider diagnosed mother with gestational hypertension during the current pregnancy.	BCPDR
Gestational Diabetes		
	Gestational diabetes, insulin dependent.	BCPDR
	Gestational diabetes, non-insulin dependent.	
Proteinuria		
	Care provider diagnosed proteinuria (>+1g/L) during the current pregnancy.	BCPDR
Alcohol use		
	Care provider lists mother's use of alcohol as a risk factor in this pregnancy.	BCPDR

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	Mother used any of the following substances at any time during the current pregnancy:	
Substance use	heroin/opioids, cocaine, methadone, solvents, or marijuana; OR care provider lists use of prescription, 'other', or unknown other drug as a risk to the pregnancy.	BCPDR
Smoking	Mother smoked tobacco products during pregnancy.	BCPDR
Gestational age at delivery	Algorithm-based estimate of gestational age at delivery. Uses last menstrual period, first ultrasound (<20 weeks), clinical estimate from newborn exam, and documentation from maternal chart.	BCPDR
HELLP syndrome	Mother was diagnosed with HELLP Syndrome (H-hemolysis, EL-elevated liver enzymes, LP-low platelet count)	BCPDR

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<sup>a</sup>Ultrasound diagnosed intra-uterine growth restriction (IUGR)

Supplemental Table 2. Rates of HELLP syndrome by Body-Mass-Index category and hazard ratios with 95% confidence intervals

	Underweight	Normal BMI	Overweight	Obese
<i>All pregnancies</i>				
N cases (rate per thousand) <sup>a</sup>	43 (1.9)	587 (2.5)	272 (3.2)	214 (4.0)
Crude HR <sup>b</sup>	0.78 (0.57-1.06)	Ref	1.29 (1.12-1.49)	1.62 (1.39-1.90)
<i>Early-onset HELLP (&lt; 34 wks)</i>				
N cases (rate per thousand) <sup>a</sup>	8 (0.4)	125 (0.5)	73 (0.9)	69 (1.3)
Crude HR <sup>b</sup>	0.66 (0.32-1.35)	Ref	1.62 (1.21-2.16)	2.37 (1.77-3.18)
<i>Late-onset HELLP (≥ 34 wks)</i>				
N cases (rate per thousand) <sup>a</sup>	35 (1.6)	462 (2.0)	199 (2.4)	145 (2.8)
Crude HR <sup>b</sup>	0.81 (0.57-1.14)	Ref	1.21 (1.02-1.42)	1.42 (1.17-1.71)

<sup>a</sup>Rates are per 1000 ongoing pregnancies at 20 weeks (early-onset HELLP) and at 34 weeks gestation (late-onset HELLP).

<sup>b</sup>HR = hazard ratio, with 95% confidence interval in parentheses, unless otherwise specified

Supplemental Table 3. Maternal demographic and clinical characteristics by early- vs late-onset HELLP syndrome; British Columbia,

2008/09-2019/20<sup>a</sup>

	Early-onset HELLP n =275	Late-onset HELLP n = 841
Pre-pregnancy BMI category		
Underweight	8 (2.9)	35 (4.2)
Normal weight	125 (45.5)	462 (54.9)
Overweight	73 (26.6)	199 (23.7)
Obese	69 (25.1)	145 (17.2)
Maternal age (years)		
< 25	30 (10.9)	97 (11.5)
25-34	158 (57.5)	512 (60.9)
≥ 35	87 (31.6)	232 (27.6)
Nullipara	188 (68.4)	629 (74.8)
Chronic diabetes	6 (2.2)	14 (1.7)

Chronic hypertension	19 (6.9)	20 (2.4)
Prior stillbirth /neonatal death <sup>b</sup>	<5 (<1.8)	<5 (<0.5)
IVF conception <sup>c</sup>	19 (6.9)	73 (8.7)
Multiple gestation	33 (12.0)	91 (10.8)
Bleeding (< 20 weeks)	12 (4.4)	10 (1.2)
Antepartum bleeding/hemorrhage (≥ 20 weeks)	15 (5.5)	12 (1.4)
Alcohol use <sup>b</sup>	<5 (<1.8)	10 (1.2)
Substance use	14 (5.1)	25 (3.0)
Smoking	14 (5.1)	36 (4.3)

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<sup>a</sup>Data shown as n(%)

<sup>b</sup>Information on cell numbers <5 was suppressed due to confidentiality reasons.

<sup>c</sup>IVF = in vitro fertilization

Supplemental Table 4. Cases of HELLP syndrome at each gestational age (rate per 1000 ongoing pregnancies)<sup>a</sup>

Gestational age (weeks)	Underweight n = 22,392	Normal BMI n = 231,517	Overweight n = 83,864	Obese n = 54,168
20-21	<5/22392 (<0.22)	<5/231517 (<0.02)	<5/83864 (<0.06)	<5/54168 (<0.09)
22-23	<5/22379 (<0.22)	<5/231351 (<0.02)	<5/83796 (<0.06)	<5/54108 (<0.09)
24-25	<5/22356 (<0.22)	6/231174 (0.03)	<5/83720 (<0.06)	5/54023 (0.09)
26-27	<5/22332 (<0.22)	14/230958 (0.06)	8/83609 (0.10)	6/53926 (0.11)
28-29	<5/22289 (0.04)	16/230635 (0.07)	14/83471 (0.17)	6/53810 (0.11)
30-31	<5/22232 (0.13)	22/230136 (0.10)	18/83269 (0.22)	23/53631 (0.43)
32-33	<5/22133 (0.14)	66/229249 (0.29)	29/82870 (0.35)	27/53303 (0.51)
34-35	10/21902 (0.46)	116/227212 (0.51)	58/81998 (0.71)	42/52652 (0.80)
36-37	13/21247 (0.61)	154/221075 (0.70)	70/79515 (0.88)	55/50825 (1.08)
38-39	11/17845 (0.62)	131/189757 (0.69)	56/66951 (0.84)	36/40911 (0.88)
≥ 40	<5/6278 (<0.80)	61/73662 (0.83)	15/26327 (0.57)	12/15135 (0.79)

<sup>a</sup>Information on cell numbers <5 was suppressed due to confidentiality reasons.

## Supplemental Table 5. Demographic and clinical characteristics of women missing pre-pregnancy BMI, live births and stillbirths, British

Columbia, 200/09-2019/20<sup>a</sup>

	BMI not missing	BMI missing
	n = 391,941	n = 132,536
Maternal age (years)		
< 25	47030 (12.0)	20134 (15.2)
25-34	247268 (63.1)	78660 (59.4)
≥ 35	97643 (24.9)	33742 (25.5)
Nullipara	189513 (48.4)	53789 (40.6)
Pre-existing diabetes	2397 (0.6)	913 (0.7)
Chronic hypertension	2847 (0.7)	890 (0.7)
Prior stillbirth /neonatal death	3794 (1.0)	1734 (1.3)
IVF conception <sup>b</sup>	11549 (3.0)	3877 (2.9)
Multiple gestation		
Twins	5806 (1.5)	2478 (1.9)



Triplets/Quadruplets	82 (0)	27 (0)
Antepartum bleeding/hemorrhage		
< 20 weeks	7337 (1.9)	1813 (1.4)
≥ 20 weeks	5659 (1.4)	1496 (1.1)
Intrauterine Growth Restriction <sup>c</sup>	8857 (2.3)	2471 (1.9)
Gestational Hypertension	21124 (5.4)	6623 (5.0)
Gestational Diabetes	44172 (11.3)	13248 (10.0)
Proteinuria	21124 (5.4)	6623 (5.0)
Alcohol use	4162 (1.1)	1845 (1.4)
Substance use	15701 (4.0)	6758 (5.1)
Smoking	26401 (6.7)	10435 (7.9)
Second-hand smoke	26319 (6.7)	7565 (5.7)

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<sup>a</sup>Data shown as n(%)

<sup>b</sup>IVF = in vitro fertilization

<sup>c</sup>Ultrasound diagnosed intra-uterine growth restriction (IUGR)

Supplemental Table 6. Hazard Ratios and 95% confidence intervals using imputed data for missing values of BMI

	Underweight	Normal BMI	Overweight	Obese
Early-onset HELLP (< 34 wks)				
N cases (rate per thousand) <sup>a</sup>	8 (0.4)	164 (0.5)	137 (0.9)	71 (1.3)
Adjusted HR <sup>b</sup>	0.76 (0.43-1.33)	Ref	1.54 (1.19-2.00)	2.06 (1.53-2.78)
Late-onset HELLP (≥ 34 wks)				
N cases (rate per thousand) <sup>a</sup>	35 (1.6)	572 (1.9)	376 (2.6)	148 (2.8)
Adjusted HR <sup>b</sup>	0.96 (0.51-1.8)	Ref	1.24 (0.92-1.66)	1.46 (1.03-2.08)

<sup>a</sup>Rates are per 1000 ongoing pregnancies at 20 weeks (early-onset HELLP syndrome) and at 34 weeks gestation (late-onset HELLP syndrome).

<sup>b</sup>HR = hazard ratio, with 95% confidence interval in parentheses, unless otherwise specified. Adjusted for nulliparity, maternal age, chronic diabetes, chronic hypertension, in vitro fertilization, antepartum bleeding/hemorrhage, gestational diabetes, alcohol, substance use, smoking during pregnancy, prior pregnancy outcomes, and multiple gestation.