Appendix 1. Gestational Age Assignment Algorithm

<u>Tier 1</u>: In deliveries after 2011 in which the maternal record is linked to the neonatal record, gestational age was assigned based on the use of a neonatal ICD code identifying gestational age at delivery. ICD-10-CM codes specified a specific week of delivery. For ICD-9-CM codes that provide a gestational age range rather than specified week, the median was taken (i.e., ICD-9 code 765.24 = 27.5 weeks).

ICD-9 Code	Description:	Assigned GA:
765.21	Less than 24 completed weeks of gestation	23
765.22	24 completed weeks of gestation	24
765.23	25-26 completed weeks of gestation	25.5
765.24	27-28 completed weeks of gestation	27.5
765.25	29-30 completed weeks of gestation	29.5
765.26	31-32 completed weeks of gestation	31.5
765.27	33-34 completed weeks of gestation	33.5
765.28	35-36 completed weeks of gestation	35.5
765.29	37 or more completed weeks of gestation	38
766.21	Post-term infant, 40-42 weeks	41
766.22	Post-term infant, 42+ weeks	42
ICD-10 Code	Description:	Assigned
		GA:
P07.21	Preterm, less than 23 completed weeks	22
P07.22	Preterm, 23w0d to 23w6d	23
P07.23	Preterm, 24w0d to 24w6d	24
P07.24	Preterm, 25w0d to 25w6d	25
P07.25	Preterm, 26w0d to 26w6d	26
P07.26	Preterm, 27w0d to 27w6d	27
P07.31	Preterm, 28w0d to 28w6d	28
P07.32	Preterm, 29w0d to 29w6d	29
P07.33	Preterm, 30w0d to 30w6d	30
P07.34	Preterm, 31w0d to 31w6d	31
P07.35	Preterm, 32w0d to 32w6d	32
P07.36	Preterm, 33w0d to 33w6d	33
P07.37	Preterm, 34w0d to 34w6d	34
P07.38	Preterm, 35w0d to 35w6d	35
P07.39	Preterm, 36w0d to 36w6d	36
P08.21	Post-term, 40-42 weeks	41
P08.22	Post-term, over 42 weeks	42

<u>Tier 2</u>: For deliveries before 2011, or for deliveries in 2011 or after without linked neonatal records identifying gestational age, this tier was applied. In this tier, gestational age is based on antepartum procedures using maternal record diagnoses and procedure codes.

For a given maternal record, the date of delivery is identified as the end of pregnancy (EOP). Antenatal procedure codes and their associated dates are collected from the 9 months preceding the EOP date. In this tier, the gestational age is calculated by subtracting the EOP date from the procedure date. If there are multiple procedures, the mean gestational age will be used. If the standard deviation of gestational age among multiple procedures is greater than 2, the neonate will not be assigned a gestational age using this method.

Antenatal Procedure:	ICD-9 Codes:	CPT Codes:	ICD-10 Codes:	Assigned GA:
Nuchal Translucency		76813	Z36.82	12.5
Chorionic villus sampling (CVS)	V28.89, 75.33	59015, 88267		11
Pregnancy-associated plasma protein A (PAPP-A)		84163		12
Alpha fetoprotein (AFP)	V28.1	82105	Z36.1	17
Inhibin-A		86336		17
Triple screen		81510		16
Group B strep culture	V28.6	87081	Z36.85	36
Anatomical survey ultrasound	V28.3	76805, 76811	Z36.3	20
Rubella antibody	V73.3	86762	Z11.59	8
Hepatitis B surface antigen	V73.89	87341	Z11.59	8
Amniocentesis	75.1	59012, 88267, 88269		16
Gestational diabetes screening		82950		26

<u>Tier 3</u>: If gestational age was not determined by tiers one or two, the following method will be applied. The median national value for gestational age for specified ICD codes will be used as per below.

Pregnancy Type:	ICD-9 Codes:	ICD-10 Codes:	Assigned GA:
Stillbirth	V27.1	Z37.1	28
Full-term birth	650	O80, O82, Z38	40
Full-term birth	649.8	O75.82	38
Post-term pregnancy, 40-42 weeks	645.1	O48.0	41
Post-term pregnancy, 42+ weeks	645.2	O48.1	42

Appendix 2. International Classification of Diseases (ICD), 9th and 10th Revisions, and Medications Used for Identification of Outcomes Based on Established Literature

Mental Health Disorders, Suicide, and Self-injury by ICD Codes²⁻⁵

Diagnosis:	ICD 9:	ICD 10:
Depression	296.2, 296.3, 300.4, 301.12, 311x	F32.x, F33.x, F34.1, F34.8
Anxiety	300.00, 300.01, 300.02, 300.09	F41
Post-traumatic stress disorder	309.81	F43.10, F43.11, F43.12
Psychosis	298.0, 298.1, 298.2, 298.3,	F20.3, F20.9, F25.0, F25.1,
	298.4, 295.0 – 298.9, 299.10,	F25.8, F25.9, F29
	299.11	
Adjustment disorder	308, 309.0, 309.1, 309.24,	F43.20, F43.21, F43.22, F43.23,
	309.28, 309.4, 309.9	F43.24, F43.25, F43.29
Suicide & Self-inflicted injury	E950.0, E950.1, E950.2,	X71.0xx, X71.1xx, X71.2xx,
	E950.3, E950.4, E950.5,	X71.3xx, X71.8xx, X71.9xx,
	E950.6, E950.7, E950.8,	X72.xxx, X73.0xx, X73.1xx,
	E950.9, E951.0, E951.1,	X73.2xx, X73.8xx, X73.9xx,
	E951.8, E952.0, E952.1,	X74.01x, X74.02x, X74.09x,
	E952.8, E952.9, E953.0,	X74.8xx, X74.9xx, X75.xxx,
	E953.1, E953.8, E953.9, E954,	X76.xxx, X77.0xx, X77.1xx,
	E955.0, E955.1, E955.2,	X77.2xx, X77.3xx, X77.8xx,
	E955.3, E955.4, E955.5,	X77.9xx, X78.0xx, X78.1xx,
	E955.6, E955.7, E955.9, E956,	X78.2xx, X78.8xx, X78.9xx, X79.xxx, X80.xxx, X81.0xx,
	E957.0, E957.1, E957.2, E958.0, E958.1, E958.2,	X81.1xx, X81.8xx, X82.0xx,
	E958.3, E958.4, E958.5,	X82.1xx, X82.2xx, X82.8xx,
	E958.6, E958.7, E958.8,	X83.0xx, X83.1xx, X83.2xx,
	E958.9, E959	X83.8xx, T36.0x2, T36.1x2,
	2300.0, 2303	T36.2x2, T36.3x2, T36.4x2,
		T36.5x2, T36.6x2, T36.7x2,
		T36.8x2, T36.92x, T37.0x2,
		T37.1x2, T37.2x2, T37.3x2,
		T37.4x2, T37.5x2, T37.8x2,
		T37.92x, T38.0x2, T38.1x2,
		T38.2x2, T38.3x2, T38.4x2,
		T38.5x2, T38.6x2, T38.7x2,
		T38.802, T38.812, T38.892,
		T38.902, T38.992, T39.012,
		T39.092, T39.1x2, T39.2x2,
		T39.312, T39.392, T39.4x2,
		T39.8x2, T39.92x, T40.0x2,
		T40.1x2, T40.2x2, T40.3x2,
		T40.4x2, T40.4x2, T40.5x2,
		T40.602, T40.692, T40.7x2,
		T40.8x2, T40.902, T40.992,
		T41.0x2, T41.1x2, T41.202,
		T41.292, T41.3x2, T41.42x,

Bruno AM, Horns JJ, Allshouse AA, Metz TD, Debbink ML, Smid MC. Association between periviable delivery and new onset or exacerbation of existing mental health disorders. Obstet Gynecol 2023;141.

The authors provided this information as a supplement to their article.

T41.5x2, T42.0x2, T42.1x2,
T42.2x2, T42.3x2, T42.4x2,
T42.5x2, T42.6x2, T42.72x,
T42.8x2, T43.012, T43.022,
T43.1x2, T43.202, T43.212,
T43.222, T43.292, T43.3x2,
T43.222, T43.232, T43.3X2, T43.4x2, T43.502, T43.602,
R43.612, T43,632, T43.692,
T43.8x2, T43.92x, T44.0x2,
T44.1x2, T44.2x2, T44.3x2,
T44.4x2, T44.5x2, T44.6x2,
Trr.7x2, T44.8x2, T44.902,
T44.992, T45.0x2, T45.1x2,
T45.2x2, T45.3x2, T45.4x2,
T45.512, T45.522, T45.602,
T45.612, T45.622, T45.692,
T45.7x2, T45.8x2, T45.92x,
T46.0x2, T46.1x2, T46.2x2,
T46.3x2, T46.4x2, T46.5x2,
T46.6x2, T46.7x2, T46.8x2,
T46.902, T46.992, T47.0x2,
T47.1x2, T47.2x2, T47.3x2,
T47.4x2, T47.5x2, T47.6x2,
T47.7x2, T47.8x2, T47.92x,
T48.0x2, T48.1x2, T48.202,
T48.292, T48.3x2, T48.4x2,
T48.5x2, T48.6x2, T48.902,
T48.992, T49.0x2, T49.1x2,
T49.1x2, T49.2x2, T49.3x2,
T49.4x2, T49.5x2, T49.6x2,
T49.7x2, T49.8x2, T49.92x,
T50.0x2, T50.0x2, T50.1x2,
T50.2x2, T50.3x2, T50.4x2,
T50.5x2, T50.6x2, T50.7x2,
T50.8x2, T50.902, T50.992,
T50.A12, T50.A22, T50.A92,
T50.B12, T50.B92, T50.Z12,
T50.Z92, T51.0x2, T51.1x2,
T51.2x2, T51.3x2, T51.8x2,
T51.2x2, T51.3x2, T51.0x2, T51.0x2, T51.92x, T52.0x2, T52.1x2,
T52.2x2, T52.3x2, T52.4x2,
T52.8x2, T52.92x, T53.0x2, T53.1x2, T53.2x2, T53.3x2,
T53.4x2, T53.5x2, T53.6x2,
T53.7x2, T53.92x, T54.0x2,
T54.1x2, T54.2x2, T54.3x2,
T54.92x, T55.0x2, T55.1x2,
T56.0x2, T56.1x2, T56.2x2,
T56.3x2, T56.4x2, T56.5x2,
T56.6x2, T56.7x2, T56.812,
T56.892, T56.92x, T57.0x2,
T57.1x2, T57.2x2, T57.3x2,

Bruno AM, Horns JJ, Allshouse AA, Metz TD, Debbink ML, Smid MC. Association between periviable delivery and new onset or exacerbation of existing mental health disorders. Obstet Gynecol 2023;141. The authors provided this information as a supplement to their article.

	T57.8x2, T57.92x, T58.02x,
	T58.12x, T58.2x2, T58.8x2,
	T58.92x, T59.0x2, T59.1x2,
	T59.2x2, T59.3x2, T59.4x2,
	T59.5x2, T59.6x2, T59.7x2,
	T59.812, T59.892, T59.92x,
	T60.0x2, T60.1x2, T60.2x2,
	T60.3x2, T60.4x2, T60.8x2,
	T60.92x, T61.02x, T61.12x,
	T61.772, T61.782, T61.8x2,
	T61.92x, T62.0x2, T62.1x2,
	T62.2x2, T62.8x2, T62.92x,
	T63.002, T63.012, T63.022,
	T63.032, T63.042, T63.062,
	T63.072, T63.082, T63.092,
	T63.112, T63.122, T63.192,
	T63.2x2, T63.302, T63.312,
	T63.322, T63.332, T63.392,
	T63.412, T63.422, T63.432,
	T63.442, T63.452, T63.462,
	T63.482, T63.512, T63.592,
	T63.612, T63.622, T63.632,
	T63.692, T63.712, T63.792,
	T63.812, T63.822, T63.832,
	T63.892, T63.92x, T64.02x,
	T64.82x, T65.0x2, T65.1x2,
	T65.212, T65.222, T65.292,
	T65.3x2, T65.4x2, T65.5x2,
	T65.6x2, T65.812, T65.822,
	T65.832, T65.892, T65.92x,
	T71.112, T71.122, T71.132,
	T71.152, T71.162, T71.192,
	T71.222, T71.232, T14.91
International Classification of Disco	(100)

International Classification of Diseases (ICD)

Psychotropic Medications⁶

Class:	Medications:
Antidepressants	Amitriptyline; Bupropion; Citalopram; Clomipramine; Desipramine; Desvenlafaxine; Doxepin; Duloxetine; Escitalopram; Fluoxetine; Fluvoxamine; Imipramine; Mirtazapine; Nefazodone; Nortriptyline; Paroxetine; Phenelzine; Protriptyline; Sertraline; Tranylcypromine; Trazodone; Venlafaxine; Vilazodone
Antipsychotics	Aripiprazole; Asenapine; Chlorpromazine; Clozapine; Fluphenazine; Haloperidol; Lithium; Loxapine; Lurasidone; Olanzapine; Paliperidone; Perphenazine; Pimozide; Prochlorperazine; Quetiapine; Thioridazine; Trifluoperazine; Ziprasidone
Anxiolytics	Alprazolam; Buspirone; Chloral Hydrate; Chlordiazepoxide; Clorazepate; Diazepam; Estazolam; Eszopiclone; Flurazepam; Lorazepam; Melatonin; Meprobamate; Methscopolamine; Midazolam; Oxazepam; Phenobarbital; Quazepam; Ramelteon; Scopolamine; Secobarbital; Temazepam; Triazolam; Zaleplon; Zolpidem
Stimulants	Amphetamine; Armodafinil; Atomoxetine; Dexmethylphenidate; Dextroamphetamine; Lisdexamfetamine; Methamphetamine; Methylphenidate; Modafinil

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Appendix 3. Maternal Comorbidity Index Identification Using International Classification of Diseases (ICD), 9th and 10th Revision Codes⁷

Indicator:	ICD 9:	ICD 10:
Pulmonary hypertension	416.0x, 416.8x, 416.9x	I27.0, I27.2x, I27.81, I27.89,
		127.9
Placenta previa	641.0x, 641.1x	O44.x
Sickle cell disease	282.4x, 282.6x	D57.1x, D57.2x, D57.8x,
		D57.4x
Gestational hypertension	642.3x	O13
Mild preeclampsia	642.4x, 642.7x	O14.0x
Severe preeclampsia/eclampsia	642.5x, 642.6x	O14.1x, O15.1, O15.2
Chronic renal disease	581.x-583.x, 585.x, 587.x, 588.x,	N18.x, I12.9, I12.0
	646.2x	
Preexisting hypertension	401.x-405.x, 642.9x-642.2x,	O16
	642.7x	
Chronic ischemic heart disease	412.x-414.x	125.9
Congenital heart disease	745.x-747.4x, 648.5x	Q24.9, Q24.8, Q22.3
Systemic lupus erythematosus	710.0x	M32.9
Human immunodeficiency virus	042.x, V08.x	B20
Multiple gestation	V27.2-V27.8, 651.x	O30.9
Drug abuse	304.x, 305.2x-305.9x, 648.3x	F18, F19
Alcohol abuse	291.xx, 303.xx, 305.0x	F10, Z71.41
Tobacco use	305.1x, 649.0x	F17.2, O99.33, Z72.0
Cardiac valvular disease	394.x-397.x, 424.x	102, 108, 138
Chronic congestive heart failure	428.22, 428.23, 428.32, 428.33,	150.2, 150.3, 150.4
	428.42, 428.43	
Asthma	493.x	J30.1, J44.9, J45.x
Preexisting diabetes mellitus	250.x, 648.9x	O24.31, O24.01, O24.11,
		E10, E11
Gestational diabetes mellitus	648.8x	O24.42x, O24.41x, O24.43x
Obesity	278.0x, 649.1x, V85.3, V85.4	O99.2, E66
Cystic fibrosis	277.0x	E84
Previous cesarean delivery	654.2x	O34.2

International Classification of Diseases (ICD)

Appendix 4. Sensitivity Analysis Limited to Individuals With Retained Commercial Insurance in MarketScan for a Full 365 Days Postpartum

Baseline Characteristics for the Analytic Population With Retained Commercial Insurance in MarketScan for a Full 365 Days Postpartum by Periviable or Nonperiviable Delivery

Characteristic	Full Cohort (N=1,341,606)	Periviable delivery	Non-periviable delivery	р
		(n=9,424)	(n=1,332,182)	
Age (years)	31 (27-35)	30 (25-34)	31 (28-35)	<0.001
Urban residence	1,176,842 (87.72)	7,634 (81.01)	1,169,208 (87.77)	<0.001
Region				
Northeast	237,330 (17.69)	1,111 (11.79)	236,219 (17.73)	<0.001
Midwest	299,321 (22.31)	1,943 (20.62)	297,378 (22.32)	
South	520,200 (38.77)	4,259 (45.19)	515,941 (38.73)	
West	259,287 (19.33)	1,903 (20.19)	257,384 (19.32)	
Unknown	25,468 (1.90)	208 (2.21)	25,260 (1.90)	
Gestational age (delivery, in weeks)	37.7 (35.2-39.0)	24 (23.0-24.5)	37.7 (35.3-39.0)	<0.001
Mode of delivery	,	,	,	
Cesarean	471,050 (35.11)	4,381 (46.49)	466,669 (35.03)	<0.001
Spontaneous vaginal delivery	812,781 (60.58)	4,673 (49.59)	808,108 (60.66)	
Operative vaginal delivery	54,083 (4.03)	230 (2.44)	53,853 (4.04)	
Unknown	3,692 (0.28)	140 (1.49)	3,552 (0.27)	
Severe maternal morbidity*	15,503 (1.16)	378 (4.01)	15,125 (1.14)	<0.001
Maternal Comorbidity Index*	486,169 (36.24)	4,091 (43.41)	482,078 (36.19)	<0.001
Maternal comorbidities				
Hypertensive disorders of pregnancy	93,441 (6.96)	1,105 (11.73)	92,336 (6.93)	<0.001
Pre-existing hypertension	69,299 (5.17)	1,111 (11.79)	68,188 (5.12)	<0.001
Gestational diabetes	188,219 (14.03)	1,227 (13.02)	186,992 (14.04)	0.005
Pre-existing diabetes	52,536 (3.92)	597 (6.33)	51,939 (3.90)	<0.001
Mental health history	, ,	,	,	
Depression	42,010 (3.13)	384 (4.07)	41,626 (3.12)	<0.001
Anxiety	40,052 (2.99)	338 (3.59)	39,714 (2.98)	0.001
Psychosis	819 (0.06)	11 (0.12)	808 (0.06)	0.047
Posttraumatic stress disorder	2,639 (0.20)	19 (0.20)	2,620 (0.20)	>.99
Adjustment disorder	25,371 (1.89)	202 (2.14)	25,169 (1.89)	0.077
Pregnancy complications	, ,	, ,	, ,	
Fetal growth restriction	172,295 (12.84)	1,604 (17.02)	170,691 (12.81)	<0.001
Assisted reproductive technology (ART)	12,517 (0.93)	163 (1.73)	12,354 (0.93)	<0.001
Placental abruption	15,808 (1.18)	631 (6.70)	15,177 (1.14)	<0.001

Presented as n(%) for categorical data or median (interquartile range) for continuous data

^{*}Presence of at least 1 component

Primary and Secondary Mental Health Outcomes in 12 Months After Delivery Among Individuals

With Retained Commercial Insurance in MarketScan for a Full 365 Days Postpartum With and

Without Periviable Delivery

Outcome	Periviable delivery	Non-periviable delivery	Unadjusted IRR (95% CI)	Adjusted IRR (95% CI)
	(n=9,424)	(n=1,332,182)		
Composite primary outcome	1,526 (16.19)	176,886 (13.28)	1.22 (1.07-1.38)	1.15 (1.09-1.22)
ED visit (all)	85 (0.90)	7,768 (0.58)	1.55 (0.71-2.87)	1.23 (0.93-1.58)
Suicide attempt/self-harm	1 (0.01)	123 (0.01)	†	†
Depression	42 (0.45)	3,913 (0.29)	†	†
Anxiety	49 (0.52)	4,438 (0.33)	†	†
PTSD	2 (0.02)	102 (0.01)	†	†
Psychosis	5 (0.05)	257 (0.02)	†	†
Adjustment disorder	7 (0.07)	464 (0.03)	†	†
New psychotropic medication	916 (9.72)	104,187 (7.82)	1.24 (1.05-1.46)	1.17 (1.09-1.25)
New behavioral therapy visits	900 (9.55)	107,652 (8.08)	1.18 (1.05-1.33)	1.12 (1.04-1.22)
Inpatient psychiatry services	31 (0.33)	1,975 (0.15)	2.22 (0.76-4.91)	1.68 (1.04-2.54)

Data as n(%); Unadjusted and adjusted incident rate ratio (IRR)

Adjusted for delivery mode, maternal age, severe maternal morbidity (SMM), maternal comorbidity index (MCI), and mental health history

ED, emergency department; PTSD, posttraumatic stress disorder

[†]Unable to report secondary to low numbers

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