

Pregnancy Outcomes in Women with Multiple Sclerosis: Web Material

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Web Table 1. Codes Used to Identify Baseline Characteristics, Chronic Conditions, and Outcomes

Characteristic, Condition, or Outcome	Code(s)^a
Multiple sclerosis	340.xx
Previous cesarean delivery	654.2x
Multifetal pregnancies	V27.2x – V27.7x, 651.xx
Preexisting diabetes mellitus	250.xx, 648.0x
Chronic renal disease	581.xx-583.xx, 585.xx, 587.xx, 588.x, 646.2x
Preexisting hypertension	401.xx-405.xx, 642.0x-642.2x, 642.7x
Asthma	493.x
Thyroid disorders	240.x-246.x, 648.1x
Chronic lower gastrointestinal conditions	555.xx, 556.xx, 564.1x
Alcohol/ substance abuse	291.xx, 292.xx, 303.xx, 304.xx, 305.0x, 305.2x-305.9x, 357.5x, 425.5x, 571.0x – 571.3x, 648.3x, 655.5x, 965.0x, E860.0, V11.3
Depression	296.2x, 296.3x, 300.4x, 311.xx, 298.0x, 309.0x, 309.1x
Bipolar disorder	296.0x, 296.1x, 296.4x, 296.5x, 296.6x, 296.7x, 296.8x, 296.99
Anxiety disorders	293.84, 300.0x, 300.2x, 300.3x, 309.24, 308.0x, 309.81, 313.0x
Infections	
Otitis media	382.0x, 382.4, 382.9
Upper respiratory tract	Streptococcal sore throat: 034.0 Nasopharyngitis: 460 Sinusitis: 461.xx Pharyngitis: 462 Tonsillitis: 463 Laryngitis and tracheitis: 464.xx Laryngopharyngitis: 465.0 Unspecified acute upper respiratory infection: 465.8, 465.9
Lower respiratory tract	Pneumonia: 003.22, 055.0, 073.0, 115.05, 115.15, 115.95, 480.x-486, 487.0, 517.1, Tuberculosis: 011.xx, 647.3x Other pulmonary infections: 031.0, 122.1 Bronchitis and bronchiolitis: 466.xx, 490 Empyema: 510.x, Pleurisy: 511.0-511.1, 511.9, Abscess of lung and mediastinum: 513.x
Influenza	487.x-488.xx
Gastroenteritis	Cholera: 001.xx Typhoid and paratyphoid fever: 002.x Salmonella: 003.0, 003.8, 003.9 Shigellosis: 004.x Other food poisoning (bacterial): 005.xx Acute amebic dysentery without mention of abscess: 006.0

	Chronic intestinal amebiasis without mention of abscess: 006.1 Amebic nondysenteric colitis: 006.2 Amebiasis, unspecified: 006.9 Other intestinal infections: 007.x, 008.xx, 009.x
Genitourinary	Candidiasis: 112.1-112.2 Urinary tract infection: 590.xx, 595.0, 599.0 Vaginitis and vulvovaginitis: 616.1x Other genitourinary tract infections 646.6x
Sexually transmitted	Genital herpes: 054.1x Human papillomavirus: 078.11, 079.4, 795.05, 795.09, 795.15 Chlamydia: 078.88, 079.88, 079.98, Syphilis: 091.xx-097.xx, 647.0x Gonorrhea: 098.xx, 647.1x Other venereal diseases: 099.xx, 647.2x Trichomoniasis: 131.xx
Skin and soft tissues	Erysipelas: 035 Gangrene: 040.0, 785.4 Viral warts: 078.10, 078.12, 078.19 Dermatophytosis and dermatomycosis: 110.xx, 111.xx Abscess and cellulitis: 373.13, 566, 616.4, 681.xx, 682.x Cellulitis: 528.3 Infections of breast: 611.0, 675.xx, Curbuncle and furuncle: 680.xx Lymphadenitis: 683 Impetigo: 684 Pilonidal cyst: 685.0 Pyoderma: 686.0x Other local skin infections: 686.8, 686.9 Infective myositis: 728.0 Necrotizing fasciitis: 728.86 Wound infection: 985.3 Infection of amputation stump: 997.62, Post-operative infection: 998.51, 998.59
Cesarean delivery	669.7x, 74.0-74.2, 74.4, 74.99; Current Procedural Terminology: ^b 59510, 59514, 59515
Preterm delivery	362.20, 362.22-362.27, 644.2x, 651.0x-651.2x, 651.8x-651.9x, 662.3x, 765.0x-765.1x, 765.21-765.28, 776.6, v27.2-v27.7, v31.xx-v37.xx, v91.xx; Current Procedural Terminology: ^b 00836, 49491-49492 67229; diagnosis-related group: 790-792
Poor fetal growth	656.5x, 764.0x, 764.1x, 764.9x
Preeclampsia	642.4x-642.7x
Chorioamnionitis	658.4x, 659.3x
Postpartum hemorrhage	666.0x-666.3x
Stillbirth ^c	646.01, 651.31, 651.41, 651.51, 651.61, 656.40, 656.41, V27.1, V27.3- V27.7, V32.xx, V35.xx, V36.xx

^a *International Classification of Diseases, Ninth Revision, Current Modification* codes unless otherwise indicated.

^b Current Procedural Terminology codes only available in Truven Health MarketScan Database.

^c Stillbirth variable underwent additional cleaning steps in the Truven Health MarketScan Database.

Web Table 2. Demographic Characteristics of Women Included and Excluded from the Truven Health MarketScan Commercial Claims and Encounters Database (United States, 2011–2015, *n* = 1,830,941)

Demographic Characteristic Ascertained at Delivery ^a	Women Included (<i>n</i> = 1,102,604)		Women Excluded (<i>n</i> = 728,337)	
	No.	%	No.	%
Age at delivery, years ^b	30.3 (5.6)		29.6 (5.4)	
Year of delivery				
2011	5,321	0.5	171,430	23.5
2012	374,645	34.0	169,944	23.3
2013	284,019	25.8	147,857	20.3
2014	286,750	26.0	173,262	23.8
2015	151,869	13.8	65,844	9.0
Region				
Northeast	199,289	18.1	129,788	17.8
Midwest	243,267	22.1	160,492	22.0
South	404,577	36.7	269,358	37.0
West	232,614	21.1	152,307	20.9
Unknown	22,857	2.1	16,392	2.3
Previous cesarean delivery	198,749	18.0	118,017	16.2
Multifetal pregnancies	28,744	2.6	14,916	2.0
Preexisting diabetes mellitus	17,024	1.5	10,101	1.4
Chronic renal disease	3,320	0.3	2,024	0.3
Preexisting hypertension	40,530	3.7	23,471	3.2
Asthma	26,248	2.4	17,229	2.4
Thyroid disorders	46,468	4.2	27,522	3.8
Chronic lower gastrointestinal conditions	3,915	0.4	2,231	0.3
Alcohol/substance abuse	4,074	0.4	3,034	0.4
Depression	15,564	1.4	10,996	1.5
Bipolar disorder	2,143	0.2	1,561	0.2
Anxiety disorders	13,678	1.2	8,883	1.2

^a Outcomes are not mutually exclusive.

^b Values are expressed as mean (standard deviation).

Web Table 3. Risk Ratios and 95% Confidence Intervals of Pregnancy Outcomes by Multiple Sclerosis Status (Truven Health MarketScan Commercial Claims and Encounters Database, United States, 2011–2015, $n = 1,102,604$; Nationwide Inpatient Sample, United States, 2007–2011, $n = 4,186,816$)

Pregnancy Outcome	Truven Health MarketScan Commercial Claims and Encounters Database			Nationwide Inpatient Sample			
	Unadjusted	Model 1	Model 2	Unadjusted	Model 1	Model 2	Model 3
Cesarean delivery	1.12 [1.05-1.19]	1.04 [0.97-1.11]	1.02 [0.96-1.08]	1.28 [1.22-1.34]	1.16 [1.09-1.22]	1.14 [1.08-1.20]	1.14 [1.08-1.20]
Preterm delivery (overall)	1.27 [1.12-1.44]	1.19 [1.04-1.35]	1.13 [0.99-1.28]	1.32 [1.17-1.49]	1.30 [1.16-1.44]	1.24 [1.11-1.37]	1.23 [1.10-1.37]
Among vaginal deliveries	1.26 [1.00-1.54]	1.21 [0.98-1.47]	1.17 [0.90-1.40]	1.24 [1.02-1.47]	1.30 [1.08-1.55]	1.25 [1.03-1.50]	1.24 [1.01-1.46]
Among cesarean deliveries	1.21 [1.02-1.43]	1.16 [0.96-1.38]	1.10 [0.92-1.30]	1.24 [1.05-1.43]	1.21 [1.02-1.39]	1.18 [0.99-1.36]	1.16 [0.97-1.36]
Poor fetal growth	1.01 [0.84-1.18]	1.03 [0.87-1.19]	1.00 [0.84-1.16]	1.14 [0.85-1.44]	1.23 [0.94-1.54]	1.17 [0.89-1.50]	1.15 [0.89-1.46]
Preeclampsia	0.98 [0.76-1.22]	0.98 [0.77-1.23]	0.86 [0.67-1.04]	0.99 [0.80-1.19]	1.00 [0.80-1.19]	0.93 [0.75-1.13]	0.93 [0.75-1.13]
Chorioamnionitis	0.94 [0.70-1.20]	0.98 [0.75-1.30]	0.96 [0.69-1.26]	0.79 [0.52-1.08]	0.89 [0.59-1.20]	0.88 [0.58-1.20]	0.94 [0.61-1.25]
Postpartum hemorrhage	0.66 [0.38-0.99]	0.67 [0.41-0.95]	0.67 [0.37-0.98]	1.18 [0.92-1.48]	1.20 [0.93-1.50]	1.18 [0.94-1.45]	1.20 [0.96-1.48]
Stillbirth	0.86 [0.24-1.50]	0.82 [0.23-1.52]	0.79 [0.24-1.39]	0.98 [0.52-1.53]	0.96 [0.50-1.48]	0.92 [0.49-1.35]	0.91 [0.49-1.44]
Infant malformations ^a	0.87 [0.59-1.14]	0.85 [0.59-1.12]	0.84 [0.57-1.13]	NA	NA	NA	NA

NA, not available.

Model 1: Adjusted for year, age, region at delivery, and insurance type (private vs. public; Nationwide Inpatient Sample only).

Model 2: Adjusted for year, age, region at delivery, insurance type (private vs. public; Nationwide Inpatient Sample only), preexisting diabetes, chronic renal disease, preexisting hypertension, asthma, thyroid disorders, depression, and substance abuse.

Model 3: Adjusted for year, age, region at delivery, insurance type (private vs. public; Nationwide Inpatient Sample only), preexisting diabetes, chronic renal disease, preexisting hypertension, asthma, thyroid disorders, depression, substance abuse, location of hospital at delivery, race, and quartile of median household income for patient's zip code.

^a In a subcohort of women with continuous enrollment in the 30 days after delivery and a linked infant with continuous enrollment in the 90 days after delivery or evidence of neonatal death (902 women with MS; 604,808 women without MS).

Web Table 4. Demographic Characteristics of Women with Multiple Sclerosis by Prescription Drug Benefit Coverage Status (Truven Health MarketScan Commercial Claims and Encounters Database, United States, 2011–2015, *n* = 1,439)

Demographic Characteristic	Women with Prescription Coverage (<i>n</i> = 1,168)		Women without Prescription Coverage (<i>n</i> = 271)	
	No.	%	No.	%
Age at delivery, years ^a	32.6 (4.8)		32.5 (5.4)	
Year of delivery				
2011	<11	NA	<11	NA
2012	378	32.4	110	40.6
2013	280	24.0	67	24.7
2014	338	28.9	82	30.3
2015	164	14.0	11	4.1
Region				
Northeast	274	23.5	89	32.8
Midwest	241	20.6	45	16.6
South	400	34.2	80	29.5
West	242	20.7	44	16.2
Unknown	11	0.9	13	4.8
Previous cesarean delivery	247	21.1	62	22.9
Multifetal pregnancies	38	3.3	<11	NA
Preexisting diabetes mellitus	65	5.6	13	4.8
Chronic renal disease	17	1.5	<11	NA
Preexisting hypertension	110	9.4	31	11.4
Asthma	65	5.6	23	8.5
Thyroid disorders	137	11.7	38	14.0
Alcohol/substance abuse	76	6.5	21	7.7
Depression	107	9.2	33	12.2
Bipolar disorder	<11	NA	<11	NA
Anxiety disorders	113	9.7	22	8.1
No. of health service dates during pregnancy ^a	22 (11)		22 (12)	

NA, not available.

^a Values are expressed as mean (standard deviation).