**Supplemental Digital Content 1**

**Table 1. Indicators of Labor**

Labor indicators were assembled based on a prior algorithm for identifying the presence of labor in administrative data [21], augmented with clinical expertise about other diagnoses and birth certificate variables that signal labor (e.g., induction of labor, augmentation of labor, vaginal delivery) [18].

|  |  |  |
| --- | --- | --- |
| **Condition** | **ICD-9 code; data source** | **N\* (% of labored)** |
| Vaginal delivery | 650; birth certificate | 1,584,142 (72.40) |
| Fetal distress | 656.3x | 39,378 (1.80) |
| Labor abnormalities | cephalopelvic disproportion (653.x, birth certificate) | 140,263 (6.41) |
| obstructed labor (660.x) | 157,894 (7.22) |
| abnormality of the forces of labor (661.x) | 349,099 (15.95) |
| long labor (662.x, birth certificate) | 87,659 (4.01) |
| failed mechanical induction of labor (659.0) | 3,381 (0.15) |
| failed induction of labor (659.1) | 57,711 (2.64) |
| precipitous or other dysfunctional labor (birth certificate) | 56,263 (2.57) |
| Cord prolapse | 663.0x, birth certificate | 5,844 (0.27) |
| Breech converted to vertex | 652.1x | 1,251 (0.06) |
| Uterine rupture | 655.1x; birth certificate | 385 (0.02) |
| Failed forceps or vacuum | 660.7x; birth certificate (2005-2012 only) | 19,399 (0.89) |
| Failed forceps | ICD procedure code 73.3 | 1,271 (0.06) |
| Amniotomy | 658.3x; ICD procedure code 73.0, 73.01, 73.09 | 514,108 (23.49) |
| Augmentation of labor | Birth certificate | 449,614 (20.55) |
| Induction of labor | ICD procedure code 73.1, 73.4; birth certificate | 596,211 (27.25) |
| **TOTAL** |  | 2,188,161 |

\* Women could have more than one indicator of labor; counts presented are not unique diagnoses.

**Table 2. Medically Indicated Cesarean Delivery**

Medical indications for cesarean delivery were based on a prior algorithm for identifying medically indicated cesarean deliveries in administrative data [21] and a list of ICD-9 codes that classify contraindications for vaginal delivery [20], and were augmented with clinical expertise about other diagnoses and birth certificate variables that would comprise a medical indication for cesarean (e.g. addition of birth certificate information regarding a herpes outbreak, abnormal fetal heart tracings, cephalopelvic disproportion, cord prolapse, failure to progress, fetal distress, placental abruption, and myomectomy as indications for cesarean are novel to this study).

|  |  |  |
| --- | --- | --- |
| **Condition** | **ICD-9 code; Data source** | **N\* (% of medical indications for cesarean)** |
| Abnormal fetal heart tracings | 659.7x | 450,476 (47.08) |
| Active herpes outbreak | Herpetic vulvolvaginitis† (054.11) | 440 (0.05) |
| Herpetic ulceration of the vulva† (054.12) | 876 (0.09) |
| Genital herpes (birth certificate) | 15,522 (1.62) |
| Cephalopelvic disproportion | Fetopelvic disproportion (653.4x, birth certificate) | 124,212 (12.98) |
| Unusually large fetus causing disproportion (653.5x) | 11,576 (1.21) |
| Cord prolapse | 663.0x, birth certificate | 5,844 (0.61) |
| Failure to progress | Primary uterine inertia (661.0x), secondary uterine inertia (661.1x), other and unspecified uterine inertia (661.2x) | 322,610 (33.72) |
| Unspecified abnormality of labor (661.9x) | 3,062 (0.32) |
| Prolonged labor (662x, birth certificate) | 87,659 (9.16) |
| Fetal distress | 656.3x, birth certificate | 53,376 (5.58) |
| Fetal macrosomia | Exceptionally large baby (766.0, birth certificate) | 182,534 (19.08) |
| Other "heavy-for-dates" infants (766.1) | 90,775 (9.49) |
| Placental abruption | Premature separation of placenta (641.2x) | 21,034 (2.20) |
| Fetal-maternal hemorrhage (656.0x) | 53 (0.01) |
| Other forms placental separation and hemorrhage affecting fetus or newborn (762.1) | 1,504 (0.16) |
| Myomectomy | ICD-9 procedure code† 68.29 | 2,987 (0.31) |
| **TOTAL** |  | 956,761 |

**\*** Women could have more than one medical indication for cesarean delivery; counts presented are not unique diagnoses.

† From maternal discharge data only.

**Table 3. Disability-related ICD-9 codes used in the study [6]**

|  |  |  |  |
| --- | --- | --- | --- |
| **ICD-9 code** | **Condition** | **Total****Count** | **Unique diagnosis count** |
| **PHYSICAL DISABILITIES** |  |  |
| **Miscellaneous Physical Disabilities** |  |  |
| 138 | Late effects of polio | 105 | 72 |
| V46.3 | Wheelchair dependence | 9 | 1 |
| V46.8 | Dependence on other enabling machine | 5 | 5 |
|  |  |   |   |
| **Nervous System Disabilities** |  |  |
| ***Hereditary and Degenerative Diseases of Central Nervous System*** |  |
| 237.7 | Neurofibromatosis (von Recklinghausen’s Disease) | 154 | 147 |
| 331.89 | Cerebral ataxia | 1 | 1 |
| 332.0-332.1 | Parkinson’s Disease | 10 | 9 |
| 333 | Other extrapyramidal disease and abnormal movement disorders | 163 | 146 |
| 334 | Spinocerebellar disease | 16 | 12 |
| 335.1 | Spinal muscular atrophy | 9 | 7 |
| 335.2 | Motor neuron disease | 5 | 5 |
| 335.8, 335.9 | Other anterior horn cell diseases | 0 | 0 |
| 336 | Other diseases of the spinal cord  | 42 | 33 |
| 337 | Disorders of the autonomic nervous system | 127 | 109 |
| ***Other Disorders of the Central Nervous System*** |  |  |
| 340 | Multiple Sclerosis | 745 | 720 |
| 341 | Other demyelinating diseases of CNS | 16 | 13 |
| 342 | Hemiplegia and hemiparesis | 77 | 51 |
| 343 | Infantile cerebral palsy | 369 | 300 |
| 344 | Other paralytic syndromes | 223 | 133 |
| 345 | Epilepsy | 3,617 | 3,483 |
| ***Peripheral Nervous System Disorders*** |  |  |
| 353 | Nerve root and plexus disorders | 85 | 82 |
| 356 | Hereditary and idiopathic peripheral neuropathy | 161 | 147 |
| 357 | Inflammatory and toxic neuropathy | 122 | 94 |
| 358 | Myasthenia gravis | 176 | 169 |
| 359 | Muscular dystrophies and other myopathies | 105 | 102 |
|  |  |   |   |
| **Diseases of the Musculoskeletal System and Connective Tissue** |  |  |
| 253.0 | Acromegaly and gigantism  | 8 | 6 |
| 438 | Late effects of cerebrovascular disease | 100 | 81 |
| 714 | Rheumatoid arthritis | 1,361 | 1,324 |
| 715 | Osteoarthrosis | 175 | 152 |
| 717 | Internal derangement of the knee | 32 | 30 |
| 720 | Ankylosing spondylitis and other inflammatory spondylopathies | 109 | 100 |
| 721 | Spondylosis and allied disorders | 160 | 137 |
| 722 | Disc disorders | 1,279 | 1,210 |
| 723 | Other disorders of the cervical region | 432 | 413 |
| 725 | Polymyalgia rheumatica | 2 | 2 |
| 728 | Disorders of muscle ligament and fascia | 317 | 286 |
| 732 | Osteochondropathies | 45 | 42 |
|  |  |   |   |
| **Injuries** |  |  |
| 806 | Fracture of the vertebral column with spinal cord injury | 6 | 5 |
| 905 | Late effect of musculoskeletal and connective tissue injuries | 189 | 176 |
| 907 | Late effect of injury to the nervous system | 113 | 50 |
| 928 | Crushing injury of the lower limb | 1 | 1 |
| 952 | Spinal cord injury | 9 | 8 |
| 736.89 | Other acquired limb deformity of unspecified limb | 8 | 2 |
| V49.6 | Amputation of upper limb | 20 | 17 |
| V49.7 | Amputation of lower limb | 84 | 69 |
|  |  |   |   |
| **Congenital Anomalies** |  |  |
| 277.0 | Cystic fibrosis | 119 | 117 |
| 253.4 | Pituitary dwarfism | 8 | 8 |
| 259.4 | Dwarfism, not elsewhere classified | 30 | 24 |
| 741 | Spina Bifida | 276 | 247 |
| 742 | Other congenital anomalies of nervous system | 80 | 69 |
| 754.8 | Larsen syndrome | 22 | 19 |
| 755.2 | Congenital reduction deformities of upper limb | 26 | 18 |
| 755.3 | Congenital reduction deformities of lower limb | 17 | 9 |
| 755.1 | Syndactyly | 7 | 6 |
| 755.55 | Acrocephalosyndactyly (Apert syndrome) | 6 | 4 |
| 754.51-754.7 | Club foot, other congenital valgus deformities of feet | 28 | 22 |
| 756 | Other congenital musculoskeletal anomalies  | 730 | 687 |
|  |  |   |   |
| **HEARING DISABILITIES** |  |  |
| 389.0 | Conductive hearing loss | 20 | 19 |
| 389.1 | Sensorineural hearing loss | 36 | 32 |
| 389.2 | Mixed conductive and sensorineural hearing loss | 8 | 7 |
| 389.7 | Deaf, nonspeaking, not elsewhere classifiable | 226 | 218 |
| 389.8 | Other specified forms of hearing loss | 77 | 72 |
| 389.9 | Unspecified hearing loss | 764 | 719 |
| 744.0 | Congenital anomalies of ear causing impairment of hearing | 5 | 5 |
| **VISION DISABILITIES** |  |  |
| 360 | Disorders of the globe | 20 | 17 |
| 362 | Other retinal disorders | 472 | 406 |
| 363 | Chorioretinal inflammation, other disorders of choroid | 23 | 19 |
| 364 | Disorders of iris and ciliary body | 0 | 0 |
| 365 | Glaucoma | 133 | 116 |
| 366 | Cataract | 14 | 6 |
| 369 | Blindness and low vision | 265 | 202 |
| 377.7 | Disorders of visual cortex | 11 | 11 |
|  |  |  |
| **INTELLECTUAL AND DEVELOPMENTAL DISABILITIES** |  |  |
| 279.11 | DiGeorge syndrome (22q11.2 deletion) | 11 | 9 |
| 299 | Pervasive developmental disorders | 44 | 65 |
| 317 | Mild intellectual disabilities | 140 | 120 |
| 318 | Other specified intellectual disabilities | 16 | 10 |
| 319 | Unspecified intellectual disabilities | 242 | 206 |
| 330 | Cerebral degenerations usually manifest in childhood | 22 | 22 |
| 758.0-758.3 | Chromosomal anomalies for which a developmental disability is typically present | 64 | 62 |
| 758.5 | Other conditions due to autosomal anomalies | 26 | 22 |
| 758.89 | Other conditions due to chromosomal anomalies | 15 | 15 |
| 758.9 | Conditions due to anomaly of unspecified chromosome | 9 | 9 |
| 759.5 | Tuberous sclerosis | 20 | 17 |
| 759.6 | Other harmatoses | 17 | 15 |
| 759.7 | Multiple congenital anomalies not otherwise specified | 0 | 0 |
| 759.8 | Other specified congenital anomalies | 243 | 219 |
| 760.71 | Alcohol affecting fetus or newborn via placenta or breast milk | 4 | 3 |

**Table 4. Other uses of ICD-9 codes in the study.**

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| --- |
| **Mental Health Diagnoses** |
| 295 | Schizophrenic disorders |
| 296.0 | Bipolar I disorder, single manic episode |
| 296.1 | Manic disorder, recurrent episode |
| 296.2 | Major depressive disorder, single episode |
| 296.3 | Major depressive disorder, recurrent episode |
| 296.4-296.6 | Bipolar I disorder (most recent episode manic [296.4], depressed [296.5], mixed [296.6]) |
| 296.7 | Bipolar I disorder, most recent episode unspecified |
| 296.8 | Other and unspecified bipolar disorders |
| 297 | Delusional disorders |
| 298 | Other nonorganic psychoses |
| 300 | Anxiety disorders |
| 311 | Depressive disorder, not elsewhere classified |
|  |
| **Other uses of ICD-9 codes** |
| 410.0, 642.0-642.2 | Chronic hypertension |
| 642.3 – 642.5 | Gestational hypertension or preeclampsia |
| 250 | Chronic diabetes |
| 648.0, 648.8 | Gestational diabetes |
| 669.7, 763.4, procedure code 74 | Cesarean delivery |
| 652.0, 652.2, 652.3, 654.4, 669.6 | Non-cephalic presentation |