IN THIS UPDATE

See the Key Terms for the new Diabetes and Hypertension dashboard filters.

SC BIRTH OUTCOMES DASHBOARD

About the Data

December 2023

boi.ifsreports.com

Data from April 1, 2020 – March 31, 2023

All data reflects post-ICD-10 time periods and is reported using federal fiscal years and quarters (Q2, 2020 – Q1, 2023).

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at the University of South Carolina

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Acknowledgments

The South Carolina Birth Outcomes Initiative (SCBOI) Interactive Dashboard was developed under contract with the South Carolina Department of Health & Human Services. We wish to acknowledge the valuable contributions made by staff of the University of South Carolina, Institute for Families in Society in the development of this product.

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For Additional Information

Contact the support team at **ifsreports@mailbox.sc.edu**.

Data Caveats (FAQs)

What do these SCBOI data represent?

The data reflect point-in-time UB-04 data provided by individual hospitals to the SC Revenue and Fiscal Affairs Office (SCRFA) as of October 04, 2023. They may differ from a review of internal hospital medical records.

Notes: *All data presented for Q1 2023 are preliminary. Outcomes presented as of Q2 2020 occurred during the COVID-19 pandemic; caution should be taken when comparing these rates to prior. Due to missing data linkages, the percentage of Medicaid may be higher than reported.*

What accounts for differences in denominators?

The number of births and maternal deliveries used to calculate each maternal and newborn measure or characteristic may vary due to missing data and/or measure restrictions. Newborn measures were per neonate live birth from birth records with or without linkage to a UB-04 newborn hospitalization. The maternal measures were per UB-04 deliveries with linkage to a live birth from birth records. One delivery was counted regardless of plurality.

How were demographic data determined?

Maternal demographics, such as maternal age and residence, were as of the day of delivery.

What does it mean when there is no data for a measure?

A value of 0.00% may indicate zero births in the quarter matching the measure criteria, or an actual value of zero for a specific table result. For additional interpretation, refer to the numerators and denominators.

What measure definitions were used in this report?

The most recent definitions for newborn and maternal measures were used and applied across all time periods. Exclusions for the early elective measures could not be made for active labor and prior uterine surgery.

How are unknown and missing data treated?

Unknown and missing values are not presented in the portal for visual presentation. These data are, however, included in statewide and hospital totals. Therefore, subtotals in charts may not add to 100%.

What hospital information is presented in this report?

Hospital data in this report reflect naming, perinatal levels, mergers, and closures identified by SCDHEC as of May 2023.

Key Terms

GENERAL

Age – Maternal age on the day of delivery as identified on the hospital UB-04 record and categorized as ages <20, 20-24, 25-29, 30-34, and 35+.

Birthweight – Newborn birthweight designated on the birth record and categorized as very low (<1,500 grams), moderately low (1,500-2,499 grams), and not low birthweight (2,500+ grams).

C-Sections – Final route identified on the birth record as cesarean or vaginal and cesarean was used as the primary source of information for this measure. If mode of delivery was missing from the birth record, the following codes from the maternal hospital UB-04 record were used to identify cesareans: APR-DRG code (540), MS-DRG codes (765, 766, 783, 784, 785, 786, 787, 788), or ICD-10-PCS codes (10D00Z0, 10D00Z1, 10D00Z2).

Deliveries – Maternal deliveries were flagged if one of the below billing codes existed on the maternal hospital UB-04 record:

- ICD-10-CM: Z37.0, Z37.1, Z37.2, Z37.3, Z37.4, Z37.50, Z37.51, Z37.52, Z37.53, Z37.54, Z37.59, Z37.60, Z37.61, Z37.62, Z37.63, Z37.64, Z37.69, Z37.7, Z37.9, O75.82, O80, O82;
- ICD-10-PCS: 10D00Z0, 10D00Z1, 10D00Z2, 10D07Z3, 10D07Z4, 10D07Z5, 10D07Z6, 10D07Z7, 10D07Z8, 10E0XZZ;
- MS-DRG: 765, 766, 767, 768, 774, 775, 783, 784, 785, 786, 787, 788, 796, 797, 798, 805, 806, 807

The delivery hospitalization included the maternal UB-04 record with the delivery flag and any hospitalization records within 0-1 day.

Delivery Exclusions – Records with delivery codes were excluded if they had any of the following ICD-10 codes indicating ectopic pregnancies, miscarriage, or abortion:

- ICD-10-CM: O00, O01, O02, O03, O04, O05, O06, O07, O08
- ICD-10-PCS: 10A0

Records were also not flagged as the unique delivery record if occurring less than 7 months away from the previous delivery record or having the below DRGs identifying false labor, threatened abortion, antepartum admission, or postpartum admission:

- MS-DRG: 778, 780, 781, 782, 817,818, 819, 831, 832, 833, 769, 776
- APR-DRG: 563, 565, 566, 561.

NEW **Diabetes** – Inclusive of any chronic or gestational diabetes identified during the 12 months prior to or at the time of delivery using ICD-10 codes or DRG codes from emergency department and/or inpatient hospital records or information provided from birth records.

- *Chronic diabetes* was identified by diagnosis or DRG codes if having any type 1 (O24.0 & E10), type 2 (O24.1, E11 & Z79.4), or other/unspecified diabetes (ICD10 - O24.3, O24.8, O24.9, E08, E09, E13; APRDRG -199, MSDRG-304,305) or by birth record if having any pre-pregnancy diabetes flag.

- *Gestational diabetes* was identified by the diagnosis code O244 or by birth record (flag).

First-Time Moms – Identified when previous live births (now living or dead) from the birth record were zero.

Gestational Age – Identified by the gestation on the birth record as Preterm: <37 weeks, Early-Term: 37-38 weeks, Term: 39 weeks, and Term+: 40+ weeks. When gestation was missing, this field was populated using the Z3A codes from the maternal hospital UB-04 record.

NEW

Hypertension – Inclusive of any chronic or pregnancy induced hypertension identified during the 12 months prior to or at the time of delivery using ICD-10 codes or DRG codes from emergency department and/or inpatient hospital records or information provided from birth records.
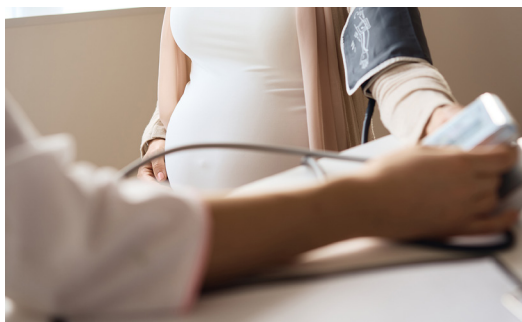
- *Chronic hypertension* was identified by any ICD-CM-10 codes for hypertensive diseases (I10-I16), postprocedural hypertension (I97.3), pre-existing hypertension complicating pregnancy, childbirth, and the puerperium (O10), or any APR-DRG & MS-DRG codes for hypertension (APR-DRG: 199; MS-DRG: 304, 305) or by birth record if having any pre-pregnancy hypertension flag.

- *Pregnancy induced hypertension* was identified by any ICD-CM-10 codes for hypertension in pregnancy (O13, O16) or preeclampsia (O11, O14, O15) or by birth record (flag).

Maternal – Represents all maternal deliveries and not unique mothers.

Number of Babies (Births) – Represents all newborn birth records.

Parity – Number of previous live births (now living or dead) as designated on the birth record and categorized as Nulliparous (zero), One, Two, or Three+.

Payment Source – Payor detailed on the hospital UB-04 record and categorized as Private Insurance (Commercial Insurance or Health Maintenance Organization); Medicaid, and Other (Self-pay, Indigent/ Charitable Organization, Medicare, Worker's Compensation, Other Government, Not verified Medicaid, and Not Stated on hospital record). Medicaid delivery payment was verified through linkage with Medicaid recipient records.

Perinatal Level – SCDHEC hospital designation as of May 2023. The level corresponds with the level of services provided: Level I (basic care for normal uncomplicated pregnancies), Level II (specialty care for both normal and selected high risk obstetrical and neonatal patients), Level III (subspecialty care for mothers and infants at less than 32 weeks gestation, estimated fetal weight less than 1,500 grams, and anticipated complex medical or surgical conditions regardless of gestation age), and Level IV (complex care for the most complex and critically ill newborn infants and have pediatric medical and surgical specialty consultants available 24 hours a day). It may vary from the level submitted with the hospital record, and for the protection of hospital-level data, Levels III and IV are presented as III+.

Perinatal Region – SCDHEC perinatal region designation based on maternal county of residence. Each region has a regional perinatal center (RPC), and all other perinatal hospitals in a respective region maintain a relationship with its designated RPC for consultation, transport, transfer when appropriate, and continuing education. The five regions are Regions I/II (Upstate), Region III (Midlands), Region IV (Pee Dee), and Region V (Lowcountry).

Key Terms | GENERAL (continued)

Plurality – Obtained using the birth month, birth year, and mother's identification number from the birth records as Singleton (1 newborn) and Multiples (> 1 newborn).

Race – Maternal race as identified on the birth record as **non-Hispanic Black**, **non-Hispanic White**, **Hispanic**, and **non-Hispanic Other** (which includes **Multiple Race** and **Unknown**). Maternal race was also extracted from the maternal delivery hospitalization data when the delivery was not linked to a birth record, or the birth record was missing race.

Residence – Rural or urban status identified by a crosswalk using the zip code provided on the maternal hospital UB-04 record. The crosswalk is based on the US Census Bureau 2010 Decennial Census (Summary File 1: Table P2, Urban and Rural). Non-SC zip codes were classified into an *Out-of-state/Unknown* group. **Please note: Rural and urban boundaries are subject to change as new federal crosswalks using the 2020 Census become available.**

State – Represents all deliveries occurring in SC birthing facilities. This excludes out-of-hospital births such as home births and those occurring in freestanding birthing facilities. It includes births for some out-of-state residents.

Year, Quarter – All data reflects post-ICD-10 time periods and is reported using calendar years and quarters (Q2, 2020 – Q1, 2023).

OUTCOMES

Labor & Delivery

Total C-Section – Percent of total deliveries identified as cesarean on the birth record or via APR-DRG, MS-DRG, or ICD-10-PCS codes.

Total Primary C-Section – Percent of deliveries without a prior cesarean identified as cesarean on the birth record or via APR-DRG, MS-DRG, or ICD-10-PCS codes.

Primary C-Section (TJC PC-02, NTSV) – This Joint Commission PC-02 Cesarean Birth Measure reflects cesareans identified by ICD-10-PCS codes (Appendix A, Table 11.06, v2023B1) among deliveries limited to gestation at least 37 weeks, first-time mothers (nulliparous), singleton, ages 10 to 64, and excluding multiple gestations and other presentations (Appendix A, Table 11.09, v2023B1).

Primary C-section (TJC PC-02, NTSV) among mothers with Cardiac Conditions at delivery – The rate of PC-02 Cesarean births among people with cardiac conditions at the time of delivery. Such cardiac conditions may include congenital heart disease, cardiac valve disorders, cardiomyopathies, arrhythmias, coronary artery disease, pulmonary hypertension, and aortic dissection.

Newborn Outcomes

Birthweight
- Not Low Birthweight – 2,500+ grams
- Moderately Low Birthweight – 1,500-2,499 grams
- Very Low Birthweight – < 1,500 grams

Gestational Age
- Gestation < 37 Weeks – Preterm
- Gestation 37-38 Weeks – Early-Term
- Gestation 39 Weeks – Term
- Gestation 40+ Weeks – Term+

Alliance for Innovation on Maternal Health (AIM)

Severe maternal morbidity (SMM) refers to life-threatening outcomes of labor and delivery. UB-04 all-payer billing data were used to calculate delivery-related SMM using ICD-10 codes associated with 21 SMM conditions, such as heart failure, renal failure, sepsis, shock, embolism, and respiratory ventilation.

This measure was then calculated for three delivery subpopulations:

Maternal Hemorrhage was identified if any of the following were present at the time of delivery:
- Presence of an Abruption, Previa, or Antepartum hemorrhage diagnosis code
- Presence of transfusion procedure code without a sickle cell crisis diagnosis code
- Presence of a Postpartum hemorrhage diagnosis code

Severe Hypertension/Preeclampsia accounts for obstetric patients with a diagnosis code for:
- Severe Preeclampsia
- Eclampsia
- Preeclampsia superimposed on pre-existing hypertension

Cardiac Conditions in Obstetric Care (CCOC) were identified if any of the following diagnosis codes were present at the time of delivery:
- Congenital Heart Disease
- Cardiac Valve Disorders
- Cardiomyopathies
- Arrhythmias
- Coronary Artery Disease
- Pulmonary Hypertension
- Other/not specified cardiac conditions

The 11/29/2022 AIM Data Collection Plan and 04/06/2023 AIM SMM Codes List were used to calculate these outcomes. To review the specific codes, please visit: https://saferbirth.org/aim-data/resources/.

More information about the AIM initiative can be found here: https://www.schealthviz.sc.edu/aim.

NOTE: *Given inconsistent coding of transfusions at the hospital level after the implementation of ICD-10 and less risk of maternal mortality for transfusion-only patients, as of October 1, 2022, these measures are no longer reported for patients whose only indicant of SMM was a transfusion. This will result in a decrease of SMM rates statewide.*

Data Sources

Maternal and newborn data were inclusive of hospitalizations from April 1, 2020, to March 31, 2023. SCRFA pulled all data records as of October 4, 2023. These data were restricted to only deliveries and births occurring in SC birthing facilities (i.e., data for births and deliveries among SC residents occurring outside the state of SC, at home, or in a freestanding birthing center were not included).

The maternal and newborn data were derived from three sources:

1. **South Carolina Revenue and Fiscal Affairs Office, Health and Demographics, all-payer uniform billing data for inpatient discharges (UB-04)**
   - Used as the base for maternal age, payment, residence, and measures of maternal quality as defined by billing codes submitted on the hospital record.

2. **South Carolina Department of Health and Environmental Control, Division of Biostatistics, Vital Statistics**
   - Used to establish maternal race, gestation, birthweight, singleton, parity, and mode of delivery.
   - Based on birth records submitted to SCDHEC by delivering hospitals in South Carolina.

Data Sources (continued)

3. **South Carolina Department of Health & Human Services, Medicaid recipient records**
    - Used to verify Medicaid as the payer.

In this report, all available information of births and pregnancies were obtained from UB-04 and birth records data. Birth data from birth records were linked to UB-04 newborn hospitalization data, and UB-04 maternal delivery data was linked to maternal pregnancy data from the birth record.
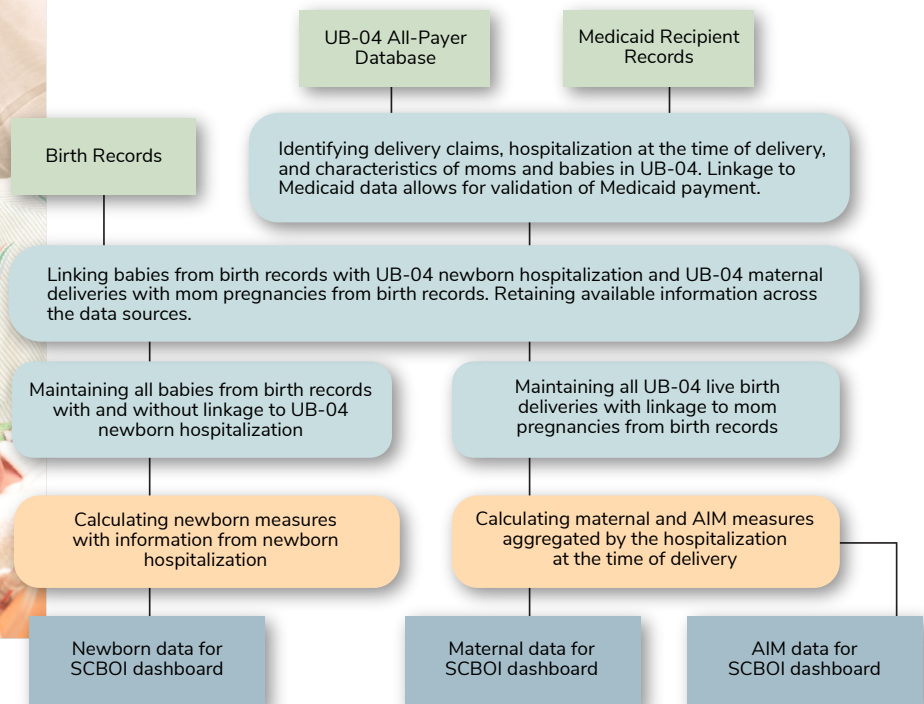
The Joint Commission PC-02 measure does not require this linkage of maternal hospital events with vital statistics, as some states are not set up for this level of data sharing. Linking newborn and maternal delivery UB-04 hospital data with birth records allows maximum use of the available data for newborn and maternal measures with improved accuracy of results.

BOI DATA PROCESSING FLOWCHART
Events from April 1, 2020 – March 31, 2023, Inclusive

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- UB-04 All-Payer Database
- Medicaid Recipient Records
- Birth Records
- Identifying delivery claims, hospitalization at the time of delivery, and characteristics of moms and babies in UB-04. Linkage to Medicaid data allows for validation of Medicaid payment.
- Linking babies from birth records with UB-04 newborn hospitalization and UB-04 maternal deliveries with mom pregnancies from birth records. Retaining available information across the data sources.
- Maintaining all babies from birth records with and without linkage to UB-04 newborn hospitalization
- Maintaining all UB-04 live birth deliveries with linkage to mom pregnancies from birth records
- Calculating newborn measures with information from newborn hospitalization
- Calculating maternal and AIM measures aggregated by the hospitalization at the time of delivery
- Newborn data for SCBOI dashboard
- Maternal data for SCBOI dashboard
- AIM data for SCBOI dashboard

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