

Expanded Health Data from the New Birth Certificate, 2005

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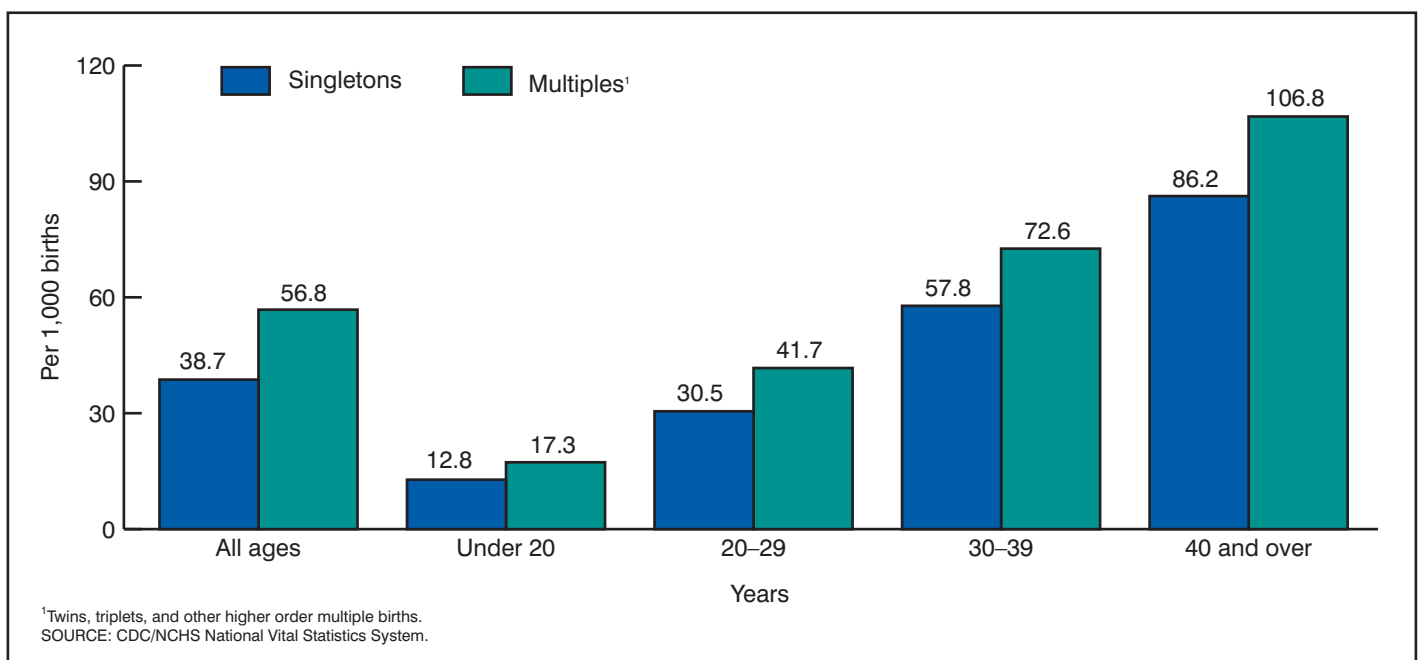


Figure 1. Rates of gestational diabetes by age of mother and plurality: 12-state reporting area, 2005

Abstract

Objectives—This report presents data for 2005 on checkbox items exclusive to the 2003 U.S. Standard Certificate of Live Birth. Information is shown for checkboxes in the following categories: Risk factors in this pregnancy, Obstetric procedures, Characteristics of labor and delivery, Method of delivery, Abnormal conditions of the newborn, and Congenital anomalies of the newborn. These categories are included on both the 1989 and the 2003 U.S. Standard Certificate of Live Birth; however, many of the specific checkbox items were modified, or are new to the 2003 certificate. Data on selected new checkbox items are presented in this report.

Methods—Descriptive tabulations are presented on births occurring in 2005 to residents of the 12 states (Florida, Idaho, Kansas, Kentucky, Nebraska, New Hampshire, New York (excluding New York City), Pennsylvania, South Carolina, Tennessee, Texas, and Washington), which implemented the 2003 U.S. Standard Certificate of Live Birth as of January 1, 2005.

Results—There were 1,268,502 births to residents of the 12-state area in 2005 (31 percent of all U.S. births). Gestational and pre-pregnancy diabetes were reported at rates of 39.3 and 6.9 per 1,000. Infants of women with diabetes, especially pre-pregnancy diabetes, were more likely to be high birthweight and to be admitted to a neonatal intensive care unit (NICU) than infants of women without diabetes. The rate of

cervical cerclage was 3.7 per 1,000; this procedure was used more frequently in twin and higher order births than in singleton births. Almost all attempts at forceps or vacuum delivery (almost 99 percent) were successful. Almost one-third of all women who had a cesarean delivery had attempted a trial of labor. Antibiotics were given to 17 percent of women during labor. Steroids (glucocorticoids) for fetal lung maturation were received prior to delivery by 1 percent of all mothers. Surfactant replacement therapy was received by newborns at a rate of 3.7 per 1,000; rates were higher for infants delivered very preterm (less than 32 weeks of gestation). Large differences by race and Hispanic origin were seen for the receipt of steroids and for surfactant replacement therapy. More than 6 percent of all infants were admitted to a NICU. Nearly one-half of all singleton infants admitted to a NICU were delivered at term. Cyanotic congenital heart disease (56.9 per 100,000 infants) and hypospadias (126.2 per 100,000 male births only) were among the most frequently reported congenital anomalies.

Keywords: births • birth certificate • maternal and infant health • pregnancy risk factors • labor and delivery

Introduction

This report presents data for 2005 on selected items from the 2003 Revision of the U.S. Standard Certificate of Live Birth. (See [Tables 1–6, A–D, and Figures 1–7](#). Items discussed in this report are shown in [Figure 2](#) and in bold in [Tables 1–6](#).) The 2003 revision provides an important opportunity to enhance the content and quality of birth certificate data. (Detailed information on the 2003 revision is available elsewhere (1,2).) As of January 1, 2005, 12 states had implemented the revision: Florida, Idaho, Kansas, Kentucky, Nebraska, New Hampshire, New York (excluding New York City), Pennsylvania, South Carolina, Tennessee, Texas, and Washington. This report presents 2005 data for the 12-state reporting area on the following maternal, labor and delivery, and newborn items: Risk factors in this pregnancy, Obstetric procedures, Characteristics of labor and delivery, Method of delivery, Abnormal conditions of the newborn, and Congenital anomalies of the newborn ([Figure 2](#)). Except for small differences in wording, these categories are included on both the 1989 and the 2003 U.S. Standard Certificate of Live Birth. Many of the specific checkboxes included in these categories, however, were modified, or are entirely new to the 2003 certificate. Selected new checkbox items are the focus of this report. Data on births occurring in 2004 to the residents of the seven states that implemented the 2003 U.S. Standard Certificate of Live Birth as of January 1, 2004, were presented in a previous report (3). A number of other items new to the U.S. Standard Certificate of Live Birth and collected by the 12-state reporting area are not presented in this report. Some examples are breastfeeding, sources of payment for the delivery, the receipt of Women, Infants, and Children (WIC) food for this pregnancy, and maternal morbidity (including uterine rupture).

A recent report presented 2005 data on items collected on both the 1989 and the 2003 U.S. Standard Certificates of Live Birth (4). “Births: Final Data for 2005” (4) presents national data for checkbox items that are comparable between birth certificate revisions (e.g., prepregnancy and gestational hypertension).

Methods

Data are based on 100 percent of births registered in the 12 states that implemented the 2003 revision of the birth certificate as of January 1, 2005: Florida, Idaho, Kansas, Kentucky, New Hampshire, Nebraska, New York (excluding New York City), Pennsylvania, South Carolina, Tennessee, Texas, and Washington. One additional state, Vermont, implemented the revised birth certificate in 2005, but after January 1; data for this state are not shown. The 1,268,502 births to residents of the 12 states ([Table A](#)) represent 31 percent of all U.S. 2005 births. Selected demographic characteristics for the 12-state area are slightly but substantively different from those for the entire United States, suggesting that results for this limited reporting area may not be generalizable to the country as a whole; see [Table B](#). Race and Hispanic origin are reported independently on the birth certificate. This report includes data for non-Hispanic white, non-Hispanic black, and Hispanic births. Information on American Indian or Alaska Native, Asian or Pacific Islander, and Hispanic subgroup births are not shown because of the small numbers of births for this reporting area for many items. See “[Technical Notes](#).”

A number of the obstetric procedures, characteristics of labor and delivery, and abnormal conditions of the newborn presented in this report are related to the risk of preterm and low birthweight delivery. To assist the reader in assessing the risk of these adverse pregnancy outcomes for the groups shown, preterm and low birthweight rates by maternal age and race and Hispanic origin are presented for this reporting area in [Table C](#). [Tables 1–6](#) show data for selected checkbox items based on the 2003 revised birth certificate; items new to the certificate and discussed in this report are bolded for ease of reference.

Results

Risk factors in this pregnancy

The revised 2003 Standard Certificate of Live Birth includes nine specific pregnancy risk factors ([Figure 2](#)); data for seven risk factors are shown in [Table 1](#). Information differentiating between prepregnancy and gestational diabetes is new to the 2003 revised certificate and is presented below. Information on pregnancy risk factors was missing for 2.4 percent of records for the 12-state area for 2005; for information by state; see [Table D](#).

Prepregnancy diabetes (DM), that is, glucose intolerance requiring treatment diagnosed *prior* to pregnancy, was reported among less than 1 percent (6.9 per 1,000) of women who gave birth in the 12-state reporting area. Levels of DM increased steadily with advancing maternal age; women aged 40 years and over were five times more likely than those under 20 years of age to have DM ([Table 1](#)). This large difference observed in DM rates by maternal age holds even when multiple births are excluded (data not shown). Non-Hispanic black women were substantially more likely than non-Hispanic white and Hispanic women to be diagnosed with diabetes *prior* to pregnancy, but were less likely to develop diabetes *during* pregnancy ([Table 1](#)).

Nearly 4 percent (39.3 per 1,000) of all women were reported to have developed diabetes *during* pregnancy. Rates of **gestational diabetes** (GDM), defined as glucose intolerance requiring treatment developed during pregnancy, also differed widely by age of mother,

MEDICAL AND HEALTH INFORMATION		
<p>41. RISK FACTORS IN THIS PREGNANCY (Check all that apply)</p> <p>Diabetes</p> <ul style="list-style-type: none"> <input type="checkbox"/> Prepregnancy (Diagnosis prior to this pregnancy) <input type="checkbox"/> Gestational (Diagnosis in this pregnancy) <p>Hypertension</p> <ul style="list-style-type: none"> <input type="checkbox"/> Prepregnancy (Chronic) <input type="checkbox"/> Gestational (PIH, preeclampsia) <input type="checkbox"/> Eclampsia <ul style="list-style-type: none"> <input type="checkbox"/> Previous preterm birth <input type="checkbox"/> Other previous poor pregnancy outcome (Includes perinatal death, small-for-gestational age/intrauterine growth restricted birth) <p><input type="checkbox"/> Pregnancy resulted from infertility treatment-If yes, check all that apply:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Fertility-enhancing drugs, Artificial insemination or Intrauterine insemination <input type="checkbox"/> Assisted reproductive technology (e.g., in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT)) <p><input type="checkbox"/> Mother had a previous cesarean delivery If yes, how many _____</p> <p><input type="checkbox"/> None of the above</p>	<p>43. OBSTETRIC PROCEDURES (Check all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Cervical cerclage <input type="checkbox"/> Tocolysis <p>External cephalic version:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Successful <input type="checkbox"/> Failed <input type="checkbox"/> None of the above 	<p>46. METHOD OF DELIVERY</p> <p>A. Was delivery with forceps attempted but unsuccessful? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>B. Was delivery with vacuum extraction attempted but unsuccessful? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>C. Fetal presentation at birth</p> <ul style="list-style-type: none"> <input type="checkbox"/> Cephalic <input type="checkbox"/> Breech <input type="checkbox"/> Other <p>D. Final route and method of delivery (Check one)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Vaginal/Spontaneous <input type="checkbox"/> Vaginal/Forceps <input type="checkbox"/> Vaginal/Vacuum <input type="checkbox"/> Cesarean <p>If cesarean, was a trial of labor attempted? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>42. INFECTIONS PRESENT AND/OR TREATED DURING THIS PREGNANCY (Check all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Gonorrhea <input type="checkbox"/> Syphilis <input type="checkbox"/> Chlamydia <input type="checkbox"/> Hepatitis B <input type="checkbox"/> Hepatitis C <input type="checkbox"/> None of the above 	<p>44. ONSET OF LABOR (Check all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Premature Rupture of the Membranes (prolonged \geq 12 hrs.), <input type="checkbox"/> Precipitous Labor (<3 hrs.) <input type="checkbox"/> Prolonged Labor (\geq 20 hrs.) <input type="checkbox"/> None of the above 	<p>47. MATERNAL MORBIDITY (Check all that apply) (Complications associated with labor and delivery)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Maternal transfusion <input type="checkbox"/> Third or fourth degree perineal laceration <input type="checkbox"/> Ruptured uterus <input type="checkbox"/> Unplanned hysterectomy <input type="checkbox"/> Admission to intensive care unit <input type="checkbox"/> Unplanned operating room procedure following delivery <input type="checkbox"/> None of the above
NEWBORN INFORMATION		
<p>48. NEWBORN MEDICAL RECORD NUMBER: _____</p> <p>49. BIRTHWEIGHT (grams preferred, specify unit)</p> <p>_____</p> <p><input type="checkbox"/> grams <input type="checkbox"/> lb/oz</p> <p>50. OBSTETRIC ESTIMATE OF GESTATION: _____ (completed weeks)</p> <p>51. APGAR SCORE:</p> <p>Score at 5 minutes: _____</p> <p>If 5 minute score is less than 6,</p> <p>Score at 10 minutes: _____</p> <p>52. PLURALITY - Single, Twin, Triplet, etc. (Specify) _____</p> <p>53. IF NOT SINGLE BIRTH - Born First, Second, Third, etc. (Specify) _____</p>	<p>54. ABNORMAL CONDITIONS OF THE NEWBORN (Check all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Assisted ventilation required immediately following delivery <input type="checkbox"/> Assisted ventilation required for more than six hours <input type="checkbox"/> NICU admission <input type="checkbox"/> Newborn given surfactant replacement therapy <input type="checkbox"/> Antibiotics received by the newborn for suspected neonatal sepsis <input type="checkbox"/> Seizure or serious neurologic dysfunction <input type="checkbox"/> Significant birth injury (skeletal fracture(s), peripheral nerve injury, and/or soft tissue/solid organ hemorrhage which requires intervention) <input type="checkbox"/> None of the above 	<p>55. CONGENITAL ANOMALIES OF THE NEWBORN (Check all that apply)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Anencephaly <input type="checkbox"/> Meningocele/Spina bifida <input type="checkbox"/> Cyanotic congenital heart disease <input type="checkbox"/> Congenital diaphragmatic hernia <input type="checkbox"/> Omphalocele <input type="checkbox"/> Gastroschisis <input type="checkbox"/> Limb reduction defect (excluding congenital amputation and dwarfing syndromes) <input type="checkbox"/> Cleft Lip with or without Cleft Palate <input type="checkbox"/> Cleft Palate alone <input type="checkbox"/> Down Syndrome <ul style="list-style-type: none"> <input type="checkbox"/> Karyotype confirmed <input type="checkbox"/> Karyotype pending <input type="checkbox"/> Suspected chromosomal disorder <ul style="list-style-type: none"> <input type="checkbox"/> Karyotype confirmed <input type="checkbox"/> Karyotype pending <input type="checkbox"/> Hypospadias <input type="checkbox"/> None of the anomalies listed above

NOTE: Shaded portions are items shown in this report.

Figure 2. 2003 U.S. Standard Certificate of Live Birth, medical, health, and newborn sections.

from a low of 12.9 per 1,000 for mothers under 20 years of age, to a high of 95.0 per 1,000 for mothers aged 45 years and over (Table 1 and data not shown).

Multiple gestational pregnancy is a known risk factor for GDM. Overall, and at each age group, women who gave birth to twins and higher order multiples were more likely to develop GDM than mothers of singletons; see Figure 1. However, the risk of developing diabetes during pregnancy increased with maternal age regardless of plurality.

Women who develop diabetes before or during pregnancy are more likely to suffer medical complications during pregnancy (5) and their infants are at increased risk of obesity, glucose intolerance, and of developing diabetes as they age (6). Women who develop GDM during pregnancy are also more likely to develop type 2 (insulin resistant) diabetes later in life (6,7). Congenital anomalies occur more often among newborns of women with prepregnancy diabetes (8).

Table A. Number and percentage of live births: Total of 12 reporting states and each state, 2005

	Number	Percent
Total	1,268,502	100
Florida	226,240	18
Idaho	23,062	2
Kansas	39,888	3
Kentucky	56,444	4
Nebraska	26,145	2
New Hampshire	14,420	1
New York ¹	128,844	10
Pennsylvania	145,383	12
South Carolina	57,711	5
Tennessee	81,747	6
Texas	385,915	30
Washington	82,703	7

¹Excludes New York City.

The elevated risk of high birthweight and NICU admission of infants born to mothers with diabetes compared with those born without diabetes and the important differences in risk of these outcomes by type of diabetes are illustrated in **Figure 3**. Women with prepregnancy diabetes were nearly four times as likely to give birth to an infant weighing 4,500 grams or more (at least 9 lb 15 oz), and were 3.6 times as likely to have an infant admitted to an NICU. Women who developed diabetes during pregnancy were less likely than their counterparts with diabetes prior to pregnancy to have a high birthweight or an NICU-admitted infant, but their risk was, nonetheless, much higher than for women reported with neither GDM or DM.

Obstetric procedures

The three specific obstetric procedures reported on the 2003 revision of the birth certificate are used to prevent premature labor (tocolysis) or delivery (cervical cerclage) or to change fetal position if the fetus is not in vertex presentation (external cephalic version) (**Table 2**). Two are newly reported on the 2003 Revision of the U.S. Standard Certificate of Live Birth: cervical cerclage and external cephalic version. Information on these procedures was missing on

Table B. Percentage of live births by selected demographic and health characteristics: United States and total of 12 reporting states, 2005

Characteristic of mother	12 states ¹	United States
Non-Hispanic white ²	56.6	**55.5
Non-Hispanic black ²	13.6	**14.2
Hispanic ³	26.1	**24.0
American Indian or Alaska Native ⁴	0.5	**1.1
Asian or Pacific Islander	3.7	**5.6
Unmarried women	37.2	**36.9
Mothers under age 20 years	11.0	**10.2
Mothers aged 40 years and over	2.5	**2.7
Preterm ⁵	13.1	**12.7
Low birthweight ⁶	8.3	**8.2
Multiple births ⁷	32.6	**33.8

** Difference significant at p = 0.05.

¹Florida, Idaho, Kansas, Kentucky, Nebraska, New Hampshire, New York (excludes New York City), Pennsylvania, South Carolina, Tennessee, Texas, and Washington.

²Race and Hispanic origin are reported separately on birth certificates. Race categories are consistent with the 1977 Office of Management and Budget (OMB) standards. All states in the 12-state reporting area reported multiple-race data for 2005. The multiple-race data for these were bridged to the single-race categories of the 1977 OMB standards for comparability with other states; see "Technical Notes."

³Includes persons of Hispanic origin of any race.

⁴Includes births to Aleuts and Eskimos.

⁵Born prior to 37 completed weeks of gestation.

⁶Birthweight of less than 2,500 grams (5 lb 8 oz).

⁷Includes births in twin, triplet, and higher order multiple deliveries.

2.4 percent of all records for the 12-state reporting area for 2005; see **Table D** for state-specific information.

Cervical cerclage is circumferential banding or suture of the cervix to prevent or treat early dilation of the cervix (e.g., incompetent cervix) in an attempt to avoid premature delivery. The efficacy of cervical cerclage in prolonging pregnancy is unclear; randomized clinical trials testing the efficacy of the procedure are ongoing (9,10).

The rate of cervical cerclage was 3.7 per 1,000 births for the 12-state reporting area. Rates generally increased steadily by maternal age. Non-Hispanic black women were about twice as likely to have cervical cerclage (6.7 per 1,000) as non-Hispanic white (3.5) and Hispanic (2.5) women.

Cervical cerclage was also reportedly used much more frequently in triplet/+ (10.3 percent) and twin (1.3 percent) deliveries than in

Table C. Percentage of births by gestational age and birthweight categories, by maternal race and Hispanic origin and maternal age: Total of 12 reporting states, 2005

Characteristic of mother	Gestational age		Birthweight	
	Very preterm ¹	Preterm ²	Very low birthweight ³	Low birthweight ⁴
All births	2.1	13.1	1.5	8.3
Race and ethnicity:				
Non-Hispanic white	1.7	12.0	1.2	7.4
Non-Hispanic black	4.1	18.5	3.2	14.0
Hispanic	1.9	13.0	1.2	7.3
Age of mother:				
Less than 20 years	2.8	15.0	1.8	10.2
20–24 years	2.1	13.0	1.4	8.3
25–29 years	1.9	12.1	1.4	7.5
30–34 years	1.9	12.6	1.4	7.6
35–39 years	2.2	14.3	1.6	8.7
40–54 years	2.9	17.0	2.1	11.0

¹Born prior to 32 completed weeks of gestation.

²Born prior to 37 completed weeks of gestation.

³Birthweight of less than 1,500 grams (3 lb 4 oz).

⁴Birthweight of less than 2,500 grams (5 lb 8 oz).

Table D. Percentage of birth records on which specified items were not stated: Total of 12 reporting states and each state, 2005

[By place of residence]

Area	Pregnancy risk factors	Obstetric procedures	Characteristics of labor and delivery	Method of delivery			Congenital anomalies	Abnormal conditions of newborn
				Attempted forceps	Attempted vacuum	Trial of labor		
Total of reporting areas ¹	2.4	2.4	2.2	4.8	5.0	3.8	2.5	2.7
Florida	0.8	0.3	0.8	1.1	1.1	3.9	0.8	1.0
Idaho	3.2	3.1	3.0	3.2	3.2	0.3	3.1	3.2
Kansas	3.7	3.7	3.7	3.7	3.7	-	3.7	3.7
Kentucky	4.4	4.4	4.3	4.2	4.2	7.3	4.4	4.2
Nebraska	4.0	4.0	3.9	3.9	3.9	-	3.9	4.0
New Hampshire	10.9	12.2	11.7	10.9	10.9	-	14.1	15.0
New York (excluding New York City)	7.8	8.1	6.7	9.5	12.1	0.0	8.3	9.3
Pennsylvania	2.2	2.2	2.2	2.2	2.2	8.7	2.2	2.2
South Carolina	5.0	5.0	5.0	5.0	5.0	0.0	5.0	5.0
Tennessee	0.6	0.6	0.6	0.6	0.6	0.4	0.6	0.6
Texas	0.3	0.3	0.3	6.1	6.1	5.6	0.3	0.3
Washington	3.7	5.1	3.6	10.7	10.6	-	4.6	5.1

- Quantity zero.

0.0 Quantity more than zero but less than 0.05

¹Data are for states using the 2003 Standard Certificate of Live Birth. Births to residents of states using the 2003 Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth are coded as not stated. See "Technical Notes."

singleton deliveries (0.3 percent) (data not shown). The higher rate of cerclage among multiples is likely associated with their much higher risk of preterm birth.

External cephalic version (ECV) is a procedure in which external manipulation is used to convert a fetus from a nonvertex presentation (i.e., the presenting part of the infant's body was other than the upper or back part of the head) to a vertex presentation, so that the infant is in vertex presentation at delivery. ECV was performed for less than

1 percent of births at a rate of 5.4 per 1,000. The procedure was reported to be successful (i.e., the fetus was converted to a vertex presentation) more than 80 percent of the time (81.3 percent) (Table 2); for information on the variation of ECV rates by state see "Discussion."

A successful ECV may increase the likelihood of a vaginal delivery. Among women who had an ECV, the rate of cesarean delivery was much lower for those with a successful ECV (26 percent) than for those with a failed ECV (92 percent) (data not shown).

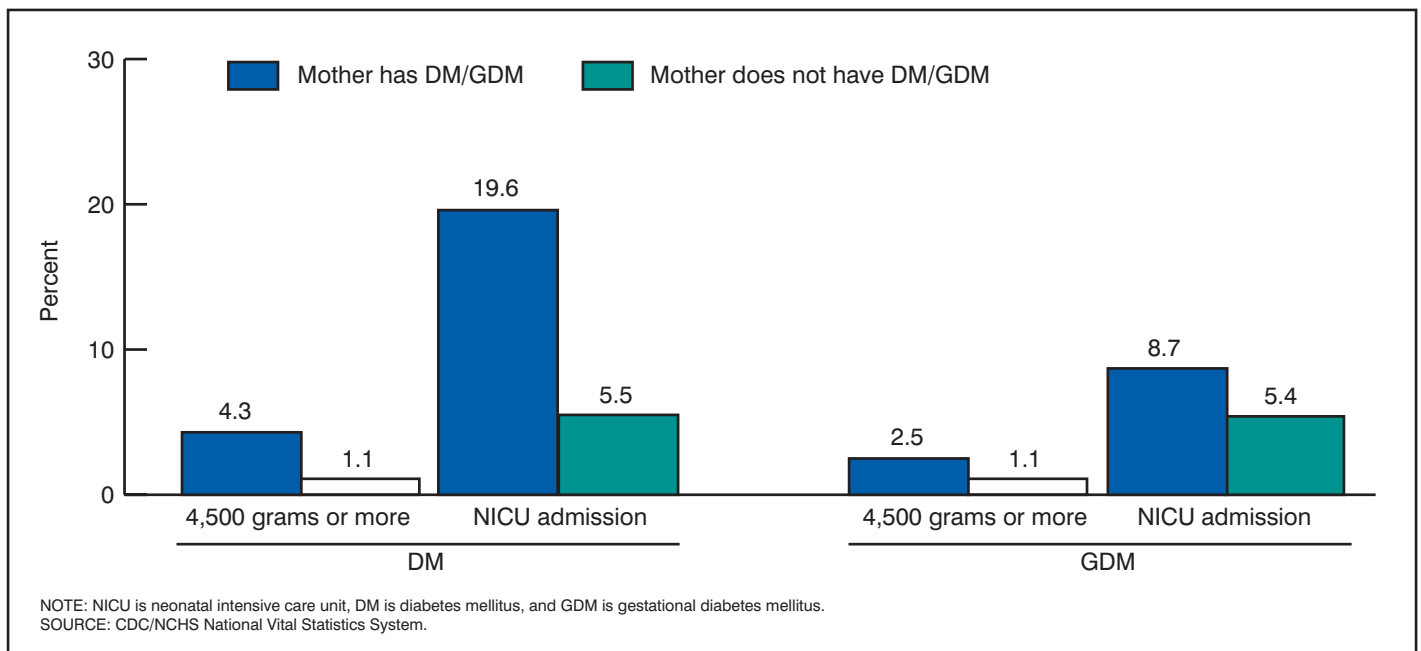


Figure 3. Percentage of singleton infants born at 4,500 grams and higher and percentage admitted to a neonatal intensive care unit according to whether the mother had prepregnancy or gestational diabetes: 12-state reporting area, 2005

Characteristics of labor and delivery

Nine characteristics of labor and delivery are presented in [Table 3](#). Seven of these are newly reported on the 2003 Revision of the U.S. Standard Certificate of Live Birth: augmentation of labor, nonvertex presentation, steroids (glucocorticoids) for fetal lung maturation received by the mother prior to delivery, antibiotics received by the mother during labor, chorioamnionitis, fetal intolerance of labor, and epidural or spinal anesthesia. Information on characteristics of labor and delivery was missing on 2.2 percent of all records for 2005; variations in levels of missing data by state are shown in [Table D](#).

About 2 percent of all births (18.1 per 1,000) were in **nonvertex presentation** (i.e., the presenting part of the infant's body was other than the upper or back part of the head). The rate of nonvertex presentation rose steadily with increasing maternal age ranging from 11.5 per 1,000 for mothers under age 20 to 30.7 per 1,000 for mothers aged 40 years and over. This pattern by maternal age was seen for all racial and Hispanic origin groups. There is evidence for underreporting of nonvertex presentation in these new data, see "[Technical Notes](#)."

The rate for **steroids (glucocorticoids) for fetal lung maturation received by the mother prior to delivery** was 9.9 per 1,000 (1 percent) of all births in the reporting area. Steroids are considered a beneficial medication for infants at risk of preterm delivery; they are used to treat neonatal respiratory distress syndrome, thereby reducing the risk of neonatal mortality (11). As would be expected, delivery at earlier gestational ages was strongly associated with higher levels of steroid receipt. Among mothers of preterm infants of less than 34 weeks of gestation, 14.3 percent (143 per 1,000) received steroids, compared with 3 percent of mothers of infants delivered late preterm (34–36 weeks) and only 0.2 percent of mothers of infants delivered at term or greater ([Figure 4](#)).

Overall, non-Hispanic black women were much more likely to receive this therapy (14.4 per 1,000 compared with 10.8 and 6.0 per 1,000 for non-Hispanic white and Hispanic women). However,

non-Hispanic white mothers were more likely than non-Hispanic black mothers to have received steroids at preterm gestational age categories less than 34 and 34–36 weeks ([Figure 4](#)).

Seventeen percent of mothers received **antibiotics during labor** (170.6 per 1,000). Antibiotics are given to mothers at risk of preterm labor, preterm premature rupture of the membranes (PROM), and other risk factors (such as Group B streptococcus) to prevent neonatal morbidity and mortality (12,13). About 40 percent of mothers with PROM received antibiotics during labor (data not shown).

The youngest mothers (under 20 years of age) were most likely to receive antibiotics compared with mothers in other age groups. Non-Hispanic black mothers were much more likely than non-Hispanic white and Hispanic mothers to receive antibiotics (22 compared with 18 percent for non-Hispanic white and 13 percent for Hispanic women); rates were higher for non-Hispanic black mothers for all age categories ([Table 3](#)). Although antibiotics were more likely to be administered to mothers of infants born preterm (25 percent) about 16 percent of mothers of infants born at term (37 or more weeks gestation) received antibiotics (data not shown).

Epidural or spinal anesthesia was received by more than two-thirds (667.3 per 1,000 or 67 percent) of all mothers. Very little difference in use was reported by age; between 65 and 69 percent of mothers in each age group received anesthetics to control the pain of labor. Anesthesia was received by more non-Hispanic white mothers (71 percent) than non-Hispanic black (65 percent) and Hispanic (58 percent) mothers.

Method of delivery

Of the five items shown under method of delivery in [Table 4](#), three, attempted but unsuccessful forceps delivery, attempted but unsuccessful vacuum delivery, and trial of labor attempted prior to cesarean delivery are newly reported on the 2003 Revision of the U.S. Standard Certificate of Live Birth. Information on attempted forceps or attempted vacuum delivery was missing for about

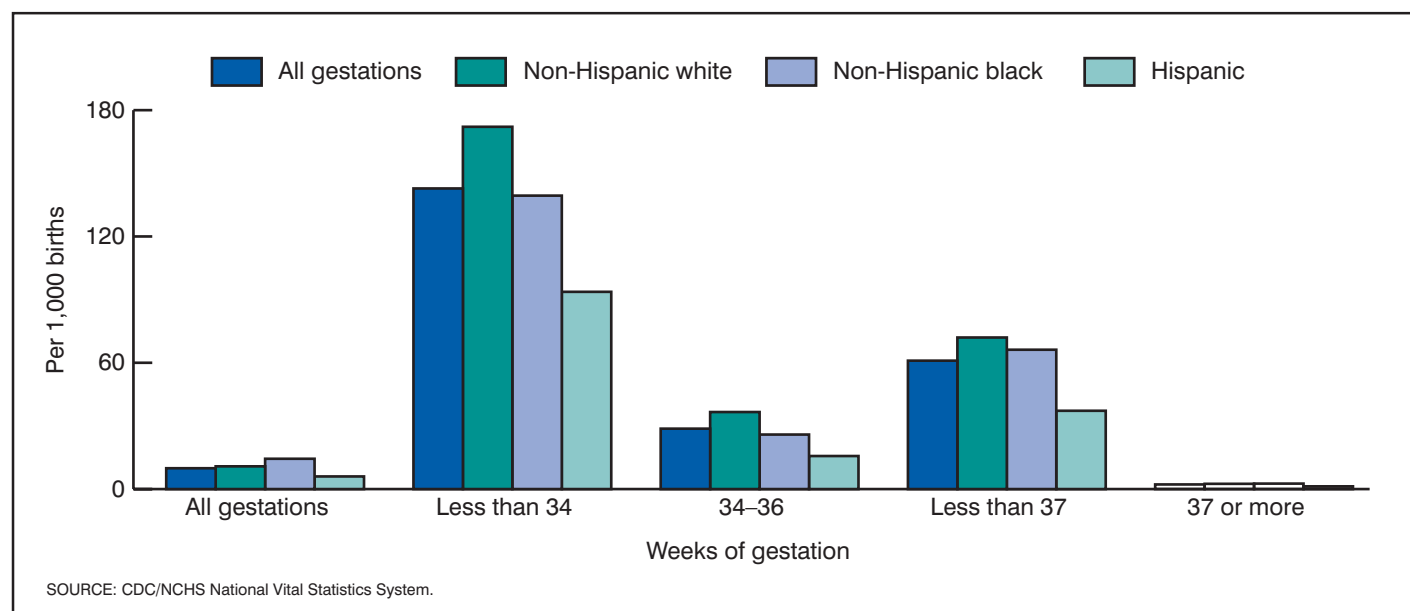


Figure 4. Steroids for fetal lung maturation received by the mother prior to delivery, by gestational age, and race and Hispanic origin, 12-state reporting area, 2005

5 percent of records; the rate of missing information for attempted trial of labor was 3.8 percent. State specific information on missing data is shown in [Table D](#).

Forceps and vacuum extraction are used to assist vaginal delivery. Almost all (about 99 percent) of deliveries using either forceps or vacuum resulted in a successful vaginal delivery. Unsuccessful attempts at delivery with **forceps** (0.6 percent) or **vacuum** (1.1 percent) were quite rare. Rates were similar regardless of mother's age or race and Hispanic origin.

The new birth certificate also includes an item on **whether a trial of labor was attempted prior to cesarean delivery** (i.e., whether there was an attempt at a vaginal delivery). A trial of labor may be contraindicated in the presence of certain medical conditions (e.g., placenta previa, eclampsia, and nonvertex presentation at delivery).

A trial of labor was reportedly attempted among 30.8 percent of all women who had a cesarean delivery ([Table 4](#)). Levels were slightly higher for non-Hispanic black women (31.7 percent) compared with non-Hispanic white (30.8) and Hispanic women (29.8). Overall, and for all racial and Hispanic origin groups, rates of attempted trial of labor generally decreased with increasing maternal age; rates for women under age 20 were more than twice the rates for women aged 35 and over.

It is useful to examine separately women having their first (primary) cesarean delivery who also may be assumed to be at low risk for a cesarean delivery (women with singleton, term births in vertex presentation (head down position in the birth canal)) (14). About one-half (53.7 percent) of these women were reported to have attempted a trial of labor. Attempts at a trial of labor were comparatively rare among women having a repeat cesarean. Only 5.6 percent of low-risk women having a repeat cesarean delivery were reported to have undertaken a trial of labor. Non-Hispanic white women having a repeat cesarean delivery attempted a trial labor less frequently (4.7 percent) than non-Hispanic black (7.2 percent) and Hispanic (6.7 percent) women. ([Figure 5](#)).

Abnormal conditions of the newborn

The 2003 U.S. Standard Certificate of Live Birth includes seven specific abnormal conditions of the newborn, five of these conditions are new to the birth certificate and are discussed below: Assisted ventilation required immediately following delivery, assisted ventilation required for more than 6 hours, an NICU admission (admission to a neonatal intensive care unit), surfactant replacement therapy, and antibiotics received by newborn for suspected neonatal sepsis ([Table 5](#) and [Figure 2](#)). Information on whether a specific abnormal condition was present was missing for 2.5 percent of all records for the 12-state reporting area; however, sizable differences in levels of missing data are observed by state, see [Table D](#).

Just over 5 percent of all infants (or 52.3 per 1,000 births) were reported to have required **assisted ventilation immediately following delivery**. One percent of infants (10.4 per 1,000) required **assisted ventilation for more than 6 hours after delivery**. As noted, of the infants who received ventilation immediately after delivery, one out of every five continued to receive breathing assistance for more than 6 hours.

Assisted ventilation is standard therapy for newborns in respiratory distress; prolonged ventilation of 6 hours or more suggests an infant in severe respiratory failure. Indeed, for the 12-state reporting area, most infants (86 percent) who required ventilation of more than 6 hours were also reported to have been admitted to an NICU (data not shown).

Infants born to mothers aged 35 years and over tended to be most likely to require both levels of assisted ventilation. Infants born to non-Hispanic black mothers were more likely than non-Hispanic white and Hispanic infants to need this therapy both immediately after delivery, and for at least 6 hours following delivery; ventilation rates were substantially lower for Hispanic births at all maternal ages ([Table 5](#)).

Newborns received **surfactant replacement therapy** at the rate of 3.7 per 1,000. Surfactant replacement has been shown to be

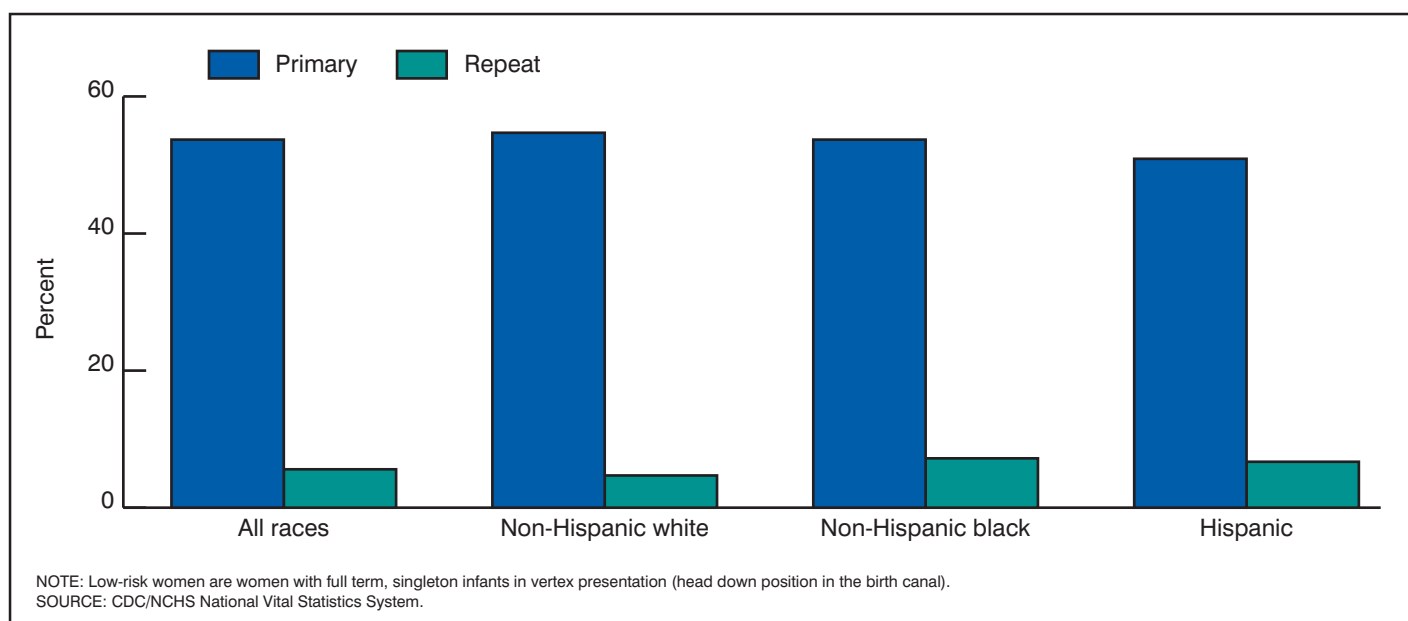


Figure 5. Trial of labor attempted prior to primary or repeat cesarean delivery, for low-risk women, by race and Hispanic origin, 12-state reporting area, 2005

effective in the prevention and treatment of respiratory distress in preterm infants, and also in the treatment of term infants suffering with meconium aspiration syndrome (15). Nearly 100 out of every 1,000 infants delivered very preterm (less than 32 weeks of gestation) received surfactant therapy compared with fewer than 1 of every 1,000 term infants (data not shown).

Non-Hispanic black newborns were more likely than non-Hispanic white and Hispanic newborns overall to receive surfactant therapy. However, when examined by gestational age, non-Hispanic white infants born at less than 37 weeks were more likely than their non-Hispanic black and Hispanic counterparts to receive surfactant. See **Figure 6**; (data for 34–36 weeks of gestation not shown).

The receipt of surfactant therapy was also associated with admission to an NICU and the need for assisted ventilation. Nearly all infants reported to have received surfactant were admitted to an NICU (94 percent); two-thirds of all infants who received surfactant also received assisted ventilation for more than 6 hours (data not shown).

Newborns were given **antibiotics for suspected neonatal sepsis** at the rate of 19.3 per 1,000, or about 2 percent of births. This therapy is typically provided to infants for bacterial infections acquired before or during delivery, such as those resulting from PROM before the onset of labor. (A separate item under “Characteristics of labor and delivery” captures whether *the mother* has been given antibiotics during labor to prevent maternal and neonatal infection.) Infants born to mothers 25–34 years of age were the least likely to receive antibiotics for suspected sepsis. By race and Hispanic origin, rates were lowest among Hispanic infants.

Infants were **admitted to an NICU** at the rate of 65.7 per 1,000 in the 12-state reporting area in 2005. Large differences are observed in NICU admission rates by maternal race and Hispanic origin. Overall, non-Hispanic black infants were at least one-third more likely to be admitted to an NICU than non-Hispanic white and Hispanic infants (**Table 5**).

The gestational age distribution of singleton NICU-admitted births is presented in **Figure 7**. Of all NICU-admitted singleton births, slightly

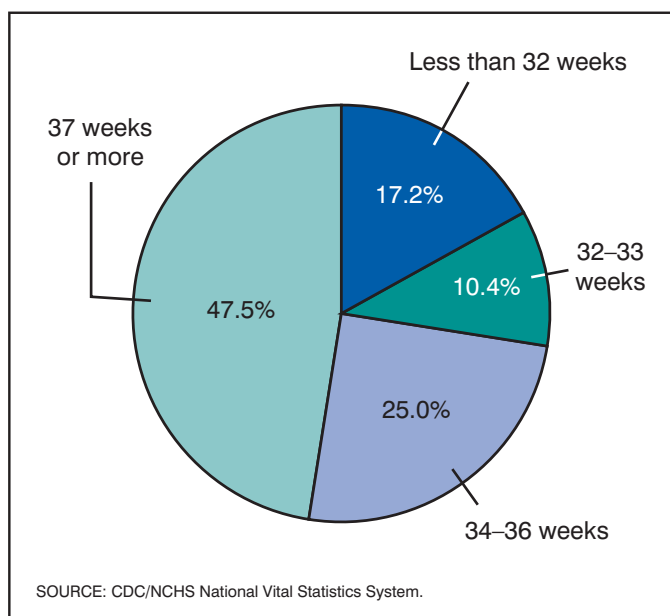


Figure 7. Distribution of singleton births admitted to a neonatal intensive care unit by gestational age: 12-reporting area: 2005

more than one-half were delivered preterm (52.5 percent); slightly less than one-half (47.5 percent) were delivered at term (37 and greater weeks of gestation) (**Figure 7**). The sizable proportion of singleton term births admitted to an NICU may be partly explained by the fact that although term births are less likely than preterm births to require NICU care (3 percent of all term compared with 26 percent of preterm newborns were admitted to an NICU), the vast majority of *all* singleton births (86 percent) are born at term or greater. Important differences were observed in the characteristics of term infants admitted to an NICU, compared with term infants who were not. For example, 26 percent of term infants admitted to an NICU were reported to require assisted

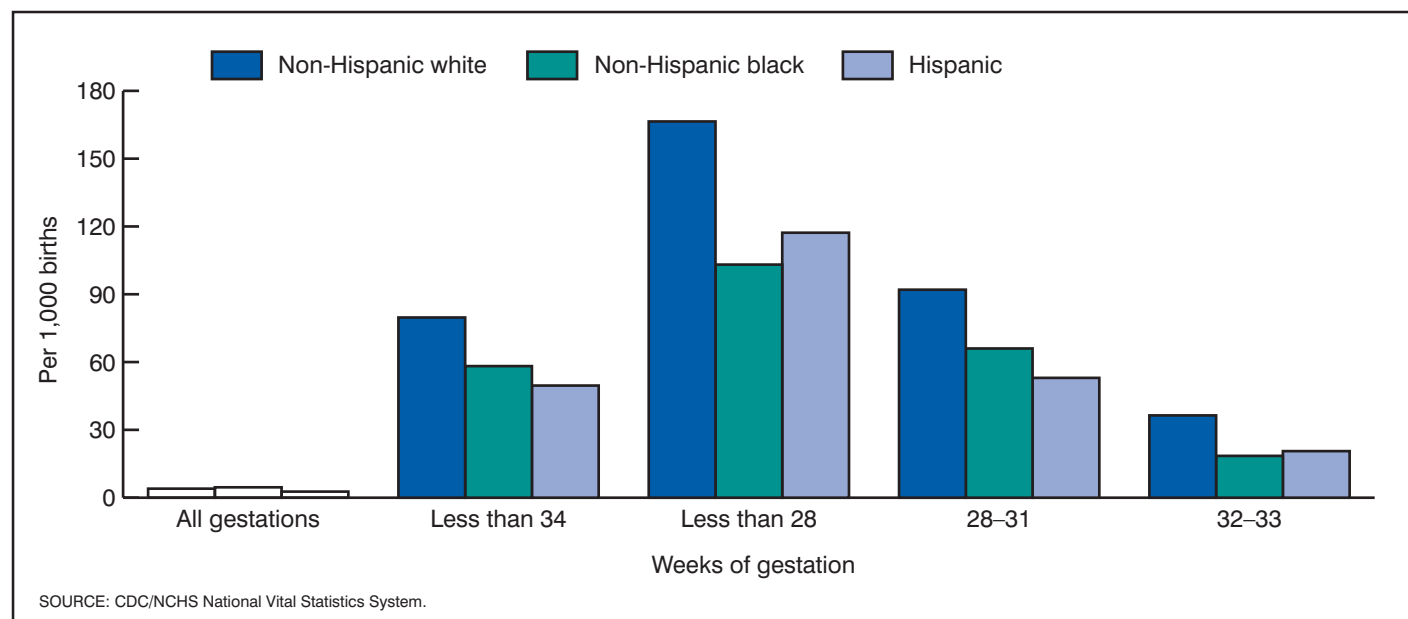


Figure 6. Rate of surfactant therapy by gestational age and race and Hispanic origin of mother: 12-state reporting area, 2005

ventilation immediately after delivery compared with 3 percent of term infants who did not go to an NICU; 22 percent of term NICU-admitted infants received antibiotics for suspected neonatal sepsis, compared with less than 1 percent of term non-NICU-admitted infants (data not shown).

Congenital anomalies

Congenital anomalies are the foremost cause of infant death in the United States (16). Infants with congenital anomalies are likely to have anatomic defects or metabolic disorders (17). Of the 12 congenital anomalies in [Table 6](#), five (cyanotic congenital heart disease, limb reduction defect, cleft palate alone, suspected chromosomal disorder, and hypospadias) are new to the 2003 revised certificate. Information on congenital anomalies was missing for 2.7 percent of all births in the 12-state reporting area for 2005; see [Table D](#) for variations by state. Due to the small numbers of anomalies reported, detailed information by race and Hispanic origin is not shown; overall levels shown should be interpreted with caution. See “[Technical Notes](#).”

Hypospadias (malformation of the penis, usually correctable by surgery) and **cyanotic congenital heart disease** (heart malformations resulting in lack of oxygen) were among the most frequently reported anomalies. Among male births, hypospadias was reported at a rate of 126.2 per 100,000. These data suggest higher rates for babies born to mothers aged 25 years and over, although differences by age were not statistically significant. It has been suggested that primiparity, older maternal age and high body mass index (BMI) may be risk factors for hypospadias (18).

The rate for cyanotic congenital heart disease was 56.9 per 100,000 births ([Table 6](#)). Rates for mothers age 40 and over were higher than rates for mothers in all other age groups. The etiology of most congenital heart disease is not known; research is now focused on genetic factors (17).

The overall rate of **suspected chromosomal disorder** (malformations caused by detectable defects in chromosome structure) was 42.8 per 100,000 births. Rates for suspected chromosomal disorder were highest for older mothers, with rates for mothers 40 years of age and over two to three times higher than rates for younger mothers. An item indicating whether the karyotype for the suspected disorder was confirmed, (i.e., tested positive) is also included on the new certificate. One-fourth of suspected chromosomal disorders were reported as “confirmed” either prenatally, or in the short time between delivery and completion of the birth certificate (approximately within 24 to 48 hours) (data not shown).

Discussion

This is the second report on data exclusive to the revised 2003 U.S. Standard Certificate of Live Birth. The 1.2 million births available for the 12-state reporting area, over twice the number of births available for the previous report of these data (3), allows for more in-depth analysis of a number of potentially very informative new items. Among the important findings in this report, for example, are the large differences seen by race and Hispanic origin in the receipt of many procedures and treatments used to prevent or ameliorate the effect of preterm delivery. Overall levels for cervical cerclage,

steroids, antibiotics, assisted ventilation, surfactant replacement, and NICU admission were substantially higher for non-Hispanic black mothers and their infants compared with their non-Hispanic white and Hispanic counterparts. The higher rates among black infants are not unexpected given their much higher rate of preterm birth; see [Table C](#). (The preterm birth rate for this 12-state reporting area was at least 40% higher for non-Hispanic black infants compared with non-Hispanic white and Hispanic infants.) However, when several of these treatments are examined by gestational age, a somewhat different pattern emerges. Among pregnancies ending before 37 weeks of gestation (preterm), non-Hispanic white mothers and their infants were more likely than non-Hispanic blacks and Hispanics to receive steroids or surfactant replacement therapy ([Figures 4 and 6](#)). Such differences may be explained by differential reporting by race and Hispanic origin on the birth certificate, or by differences in access to perinatal care. Once data for a wider, more representative reporting area become available, it will be possible to better disentangle differences in receipt of care by race and Hispanic origin.

The new birth certificate also captures information on both prepregnancy (DM) and gestational diabetes (GDM) (the 1989 revision of the birth certificate does not differentiate between the two). Findings for this report suggest that the distinction between DM and GDM is useful in assessing newborn risk. One of every five infants delivered to a mother with DM was admitted to an NICU compared with 6 of every 100 infants of mothers without diabetes. Women who developed diabetes during pregnancy were less likely than their counterparts with diabetes prior to pregnancy to have a high birthweight or NICU-admitted infant, but their risk was, nonetheless, much higher than women reported with neither GDM or DM. This information may assist neonatal clinicians as they plan for the delivery of infants of women with these risk factors.

A number of the other new items provide important information on measures used to assist or enhance the likelihood of vaginal delivery and may be useful in informing the debate surrounding the steady rise in cesarean deliveries and the controversy regarding the best delivery options for a woman with a previous cesarean delivery (19,20). These data suggest that a trial of labor was not attempted among substantial proportions of women assumed to be at low risk for cesarean delivery who delivered by cesarean. A trial of labor was not reported for 46 percent of low-risk women having their first cesarean and 94 percent of low-risk women with a previous cesarean did not attempt a trial of labor. It is important to note that women considered to be “low risk” (i.e., those with a full term singleton infant in vertex presentation) may have other medical indications that would preclude a trial of labor.

Data for the 12 states shown in this report should not be considered representative of the United States as a whole. Comparison of selected health and demographic characteristics for the 12-state area with those for the entire United States show small but substantive differences between the two. Younger mothers and Hispanic mothers, in particular, are somewhat overrepresented ([Table B](#)).

Marked differences are also observed in levels for some items shown in this report compared with those shown in an earlier report based on 2004 data for a seven-state area (3). Differences between reports are more pronounced for less frequently reported items and reflect changes in reporting areas represented in the two reports and the year-to-year variation sometimes seen in state-specific rates. One of the more pronounced examples is for the item “external cephalic

version” or ECV. The ECV rate reported here for the 12-state area is 5.4 per 1,000. This compares with a rate of 3.4 for the 2004 seven-state area. By state, ECV rates for 2005 ranged from a low of 0.9, to a high of 18.1 per 1,000. The wide range in ECV levels by state may reflect differences in completeness of state reporting or real differences in obstetric practice. The overall 2005 ECV level is also heavily influenced by data from Texas, which revised its birth certificate beginning in 2005, and accounts for 30 percent of all births for the 2005 reporting area. When Texas, which had a comparatively high ECV rate (10.4) is excluded; the ECV rate for the 11-state area drops from 5.4 to 3.1 per 1,000. Levels for other items such as gestational diabetes and epidural or spinal anesthesia during labor, which occur more frequently, are more stable among states and between years.

Comparison of levels for selected items from the revised certificate with those reported from other data sources yield mixed results. Although patterns by age and race are generally consistent with those expected, these new data may underrepresent actual prevalence (3). For example, the rate of pregnancies complicated by gestational diabetes reported here (3.9 percent) is higher than earlier studies based on the National Hospital Discharge Survey (21) and the National Survey of Family Growth (5) (2.8 and 3.6 percent), but lower than estimates from the American Diabetes Association (7 percent) (6). The level reported for hypospadias (for males only), was 126.2 per 100,000 for this 12-state reporting area; other sources report levels ranging from 190 to 500 (17,22,23).

Several items in this report, particularly those performed or occurring less frequently (e.g., cervical cerclage, ECV, and assisted ventilation) lack appropriate surveillance sources with which these data may be compared. It can therefore be difficult to assess the completeness and accuracy of these data. Many of the medical and health checkbox items from the 1989 certificate have been shown to be underreported (24,25). An overarching goal for the 2003 revision was to improve data quality (2). Studies are ongoing to assess if, indeed, the quality of birth data has been enhanced.

When considering data quality, it is important to note that 2005 marks the first year of implementation of the new certificates for 5 of the 12 reporting areas. Due to the challenges inherent in the first years of data collection, data quality may suffer initially as hospitals and states become familiar with the new items and new collection processes.

The next report in this series will show 2006 data for 19 states comprising an estimated 49 percent of all U.S. births. For 2007, these numbers rise to 22 states and more than one-half (53 percent) of all births. The larger reporting areas should increase the strength and reliability of these data. However, national information on many new and modified items will not be available until all reporting areas have adopted the new certificate. The vast majority of states plan to implement the new certificates by the end of 2009. However, a number of areas, still have no specific plans to do so, and it is therefore likely to be some years before national data are available based on the 2003 birth certificate.

Data for 2005 from the revised birth certificate provide valuable information that may be used to assist clinicians, program planners, and public health practitioners as they explore ways to target preventive and treatment services, allocate resources for pregnant women and newborns, and assess possible disparities in the receipt of care. This data source should become increasingly useful as adoption of the new certificate becomes more widespread.

References

1. National Center for Health Statistics. 2003 revision of the U.S. Standard Certificate of Live Birth. 2003. Available from: http://www.cdc.gov/nchs/vital_certs_rev.htm.
2. National Center for Health Statistics. Report of the Panel to Evaluate the U.S. Standard Certificates and Reports. National Center for Health Statistics. 2000. Available from: http://www.cdc.gov/nchs/data/dvs/panelreport_acc.pdf.
3. Martin JA, Menacker F. Expanded health data from the new birth certificate, 2004. National vital statistics reports; vol 55 no 12. Hyattsville, MD: National Center for Health Statistics, 2007.
4. Martin JA, Hamilton BE, Sutton PD, et al. Births: Final data for 2005. National vital statistics reports; vol 56 no 6. Hyattsville, MD: National Center for Health Statistics. 2007.
5. Saydah SH, Chandra A, Eberhardt MS. Pregnancy experience among women with and without gestational diabetes in the U.S., 1995 National Survey of Family Growth. *Diabetes Care* 28 (5) 2005.
6. American Diabetes Association. Gestational diabetes mellitus. *Diabetes Care* 26. suppl1, 2003.
7. Kim C, Newton KM, Knopp RH. Gestational diabetes and the incidence of type 2 diabetes: a systematic review. *Diabetes Care* 25: 1862–8. 2002.
8. Macintosh MC, Fleming KM, Bailey JA, et al. Perinatal mortality and congenital anomalies in babies of women with type 1 or type 2 diabetes in England, Wales, and Northern Ireland: population based study. *BMJ* 333(177):1–6. 2006.
9. Vidaeff AC, Ramin SM. From concept to practice: The recent history of preterm delivery prevention. Part I: Cervical competence. *Am J Perinatol* 22(1):3–13. 2006.
10. Secher NJ, McCormack T, Weber T, et al. Cervical occlusion in women with cervical insufficiency: Protocol for a randomized, controlled trial with cerclage, with and without cervical occlusion. *BJOG* 114(5):649 e1–6. 2007.
11. American College of Obstetricians and Gynecologists. Management of preterm labor. ACOG Practice Bulletin, No 43. May 2003.
12. Cunningham FG, Gant NF, Leveno KJ, Gilstrap LC, Hauth JC, Wenstrom KD. Eds. *Williams Obstetrics* (21st edition). New York, New York: McGraw-Hill Medical Publishing Division. 2001.
13. CDC. Perinatal Group B streptococcal disease after universal screening recommendations—United States, 2003–2005. *MMWR* 56(28):a701–5. 2007.
14. U.S. Department of Health and Human Services. *Tracking Healthy People 2010*. Washington, DC: U.S. Government Printing Office. B16–20. November 2000.
15. Hermansen CI, Lorah KN. Respiratory distress in the newborn. *Am Fam Phys* 76(7):988:994. 2007.
16. Mathews TJ, Mac Dorman MF. Infant mortality statistics from the 2004 period linked birth/infant death data set. National vital statistics reports; vol 55 no 14. Hyattsville, MD: National Center for Health Statistics, 2007.
17. Behrman RE, Kliegman RM, Jenson HB, Eds. *Nelson Textbook of Pediatrics* (17th edition). Philadelphia, Pennsylvania: W. B. Saunders Company. 2004.
18. Carmichael SL, Shaw GM, Laurent C, et al. Maternal reproductive and demographic characteristics as risk factors for hypospadias. *Paediatr Perinat Epidemiol* 21:210–18. 2007.
19. Guise JM, McDonagh M, Hashima J, et al. Vaginal births after cesarean (VBAC). Evidence Report/Technology Assessment No. 71 (Prepared by the Oregon Health and Science University Evidence-based Practice Center under contract No. 209–977–0018. AHRQ

- publication No. 03–E018. Rockville, MD. Agency for Healthcare Research and Quality. March 2003.
20. Yeh J, Wactawski-Wende J, Shelton JA, Reschke J. Temporal trends in the rates of trial of labor in low-risk pregnancies and their impact on rates and success of vaginal birth after cesarean delivery. *Am J Obstet Gynecol* 194(1):144–55. 2006.
 21. Danel I, Berg C, Johnson CH, Atrash H. Magnitude of maternal morbidity during labor and delivery: United States, 1993–1997. *Am J Public Health* 93(4):631–4. 2003.
 22. Porter MP, Khurram F, Grady RW, Mueller BA. Hypospadias in Washington State: Maternal Risk Factors and Prevalence Trends. *Pediatrics* 115:495–99. 2005.
 23. Carmichael S, Shaw GM, Laurent C, et al. Maternal progestin intake and risk of hypospadias. *Arch Pediatr Adolesc Med* 159:957–62. 2005.
 24. DiGiuseppe DL, Aron DC, Ranbom L, et al. Reliability of birth certificate data: A multi-hospital comparison to medical records information. *Matern Child Health J* 2002 6(3): 169–79.
 25. Lydon-Rochelle MT, Holt VL, Cardenas V, et al. The reporting of pre-existing maternal medical conditions and complications of pregnancy on birth certificates and in hospital discharge data. *Am J Obstet Gynecol* 193:125–34. 2005.
 26. National Center for Health Statistics. Guide to completing the facility worksheets for the certificate of live birth and report of fetal death (2003 revision). 2006. Available from: <http://www.cdc.gov/nchs/data/dvs/GuidetoCompleteFacilityWks.pdf>.
 27. Office of Management and Budget. Revisions to the standards for the classification of federal data on race and ethnicity. *Federal Register* 62FR58781–58790. October 30, 1997. Available from: <http://www.whitehouse.gov/omb/fedreg/ombdir15.html>.
 28. Office of Management and Budget. Race and ethnic standards for federal statistics and administrative reporting. *Statistical Policy Directive* 15. May 12, 1977.
 29. National Center for Health Statistics. Computer edits for natality data, effective 1993. Instruction manual, part 12. Hyattsville, MD: National Center for Health Statistics. 1995.
 30. National Center for Health Statistics. Computer edits for natality data, effective 2003. Instruction manual, part 12. Hyattsville, MD: National Center for Health Statistics. Forthcoming.
 31. Honein JA, Paulozzi LJ, Watkins ML. Maternal smoking and birth defects: Validity of birth data for effect estimation. *Public Health Rep* 116:327–35. 2001.
 32. Schaefer-Graf UM, Buchanan TA, Xiang A, et al. Patterns of congenital anomalies and relationship to initial maternal fasting glucose levels in pregnancies complicated by type 2 and gestational diabetes. *Am J Obstet Gynecol* 182(2):313–20. 2000.

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Table 1. Number and rate of live births by pregnancy risk factors, by age and race and Hispanic origin of mother: Total of 12 reporting states, 2005

[Rates are number of live births with specified risk factor per 1,000 live births in specified group]

Risk factor and race and Hispanic origin of mother	All births ¹	Factor reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated ²
All races ³										
Diabetes	1,268,502	57,143	46.1	15.5	28.2	44.3	61.8	80.7	103.8	29,907
Prepregnancy (diagnosis prior to this pregnancy) . . .	1,268,502	8,500	6.9	2.6	4.5	6.7	8.4	12.2	16.5	29,907
Gestational (diagnosis in this pregnancy)	1,268,502	48,643	39.3	12.9	23.7	37.6	53.4	68.5	87.3	29,907
Hypertension	1,268,502	72,388	58.4	56.2	52.8	56.4	59.9	69.5	89.4	29,907
Prepregnancy (chronic)	1,268,502	15,109	12.2	4.8	7.6	11.3	15.3	22.1	33.7	29,907
Gestational (PIH, preeclampsia)	1,268,502	57,279	46.2	51.4	45.3	45.1	44.6	47.5	55.7	29,907
Previous preterm birth	1,268,502	25,094	20.3	7.1	19.6	22.5	22.1	24.8	25.9	29,907
Other previous poor pregnancy outcome	1,268,502	27,181	21.9	6.8	17.7	22.7	26.2	32.6	42.1	29,907
Mother had a previous cesarean delivery ⁴	1,268,502	142,347	114.5	29.0	85.6	114.0	150.1	183.1	195.3	25,499
Non-Hispanic white ⁵										
Diabetes	714,257	31,468	45.4	18.4	29.5	43.0	55.2	69.9	89.0	21,610
Prepregnancy (diagnosis prior to this pregnancy) . . .	714,257	4,349	6.3	3.1	4.6	6.1	6.9	9.2	12.5	21,610
Gestational (diagnosis in this pregnancy)	714,257	27,119	39.2	15.2	25.0	36.9	48.3	60.6	76.5	21,610
Hypertension	714,257	43,145	62.3	60.5	58.8	62.3	61.6	67.2	81.6	21,610
Prepregnancy (chronic)	714,257	8,562	12.4	4.7	7.9	11.5	14.6	20.0	27.2	21,610
Gestational (PIH, preeclampsia)	714,257	34,583	49.9	55.8	50.9	50.8	47.0	47.2	54.3	21,610
Previous preterm birth	714,257	15,020	21.7	7.6	20.9	23.0	22.7	26.1	27.4	21,610
Other previous poor pregnancy outcome	714,257	17,706	25.6	8.7	20.2	24.5	29.3	36.8	48.4	21,610
Mother had a previous cesarean delivery ⁴	714,257	76,220	109.6	22.9	75.1	100.7	140.2	173.7	189.7	19,064
Non-Hispanic black ⁵										
Diabetes	171,054	7,524	44.7	14.6	28.4	46.9	74.5	100.3	121.7	2,889
Prepregnancy (diagnosis prior to this pregnancy) . . .	171,054	1,652	9.8	3.2	6.0	10.0	16.0	24.6	27.3	2,889
Gestational (diagnosis in this pregnancy)	171,054	5,872	34.9	11.4	22.5	36.9	58.4	75.6	94.4	2,889
Hypertension	171,054	12,841	76.4	65.5	61.4	72.6	95.9	120.0	152.3	2,889
Prepregnancy (chronic)	171,054	3,802	22.6	6.8	12.7	22.4	38.4	57.0	80.3	2,889
Gestational (PIH, preeclampsia)	171,054	9,039	53.8	58.7	48.8	50.2	57.4	63.0	72.0	2,889
Previous preterm birth	171,054	4,956	29.5	9.1	27.3	39.0	38.3	36.6	36.5	2,889
Other previous poor pregnancy outcome	171,054	4,672	27.8	8.3	23.9	35.5	38.5	40.7	40.6	2,889
Mother had a previous cesarean delivery ⁴	171,054	20,571	121.9	34.1	105.3	143.1	173.5	205.4	213.1	2,357

See footnotes at end of table.

Table 1. Number and rate of live births by pregnancy risk factors, by age and race and Hispanic origin of mother: Total of 12 reporting states, 2005—Con.

[Rates are number of live births with specified risk factor per 1,000 live births in specified group]

Risk factor and race and Hispanic origin of mother	All births ¹	Factor reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated ²
Hispanic ⁶										
Diabetes	329,276	14,401	44.2	12.7	25.2	43.6	69.2	96.1	131.4	3,246
Prepregnancy (diagnosis prior to this pregnancy) . . .	329,276	2,102	6.4	1.7	3.5	6.4	9.4	15.7	23.0	3,246
Gestational (diagnosis in this pregnancy)	329,276	12,299	37.7	11.1	21.7	37.2	59.8	80.4	108.4	3,246
Hypertension	329,276	14,447	44.3	46.5	38.9	39.2	47.2	60.6	85.2	3,246
Prepregnancy (chronic)	329,276	2,343	7.2	3.9	4.3	6.4	9.7	15.5	28.6	3,246
Gestational (PIH, preeclampsia)	329,276	12,104	37.1	42.6	34.5	32.8	37.4	45.1	56.6	3,246
Previous preterm birth	329,276	4,336	13.3	5.3	13.1	15.3	15.0	17.4	17.4	3,246
Other previous poor pregnancy outcome	329,276	3,919	12.0	3.9	9.9	13.8	14.8	19.3	25.6	3,246
Mother had a previous cesarean delivery ⁴	329,276	40,179	122.9	33.0	94.3	136.2	176.1	209.7	209.8	2,421

¹Total number of births to residents of areas reporting specified pregnancy risk factor.

²No response reported for pregnancy risk factor item; includes births to residents of states using the 2003 Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth.

³Includes other races not shown.

⁴Differences in not stated levels for this risk factor compared with other risk factors are the result of editing procedures; see "Technical Notes."

⁵Race and Hispanic origin are reported separately on birth certificates. Persons of Hispanic origin may be of any race. Race categories are consistent with the 1977 Office of Management and Budget (OMB) standards. All states in the 12-state reporting area reported multiple-race data for 2005. These multiple-race data were bridged to the single-race categories of the 1977 OMB standards for comparability with other states; see "Technical Notes."

⁶Includes all persons of Hispanic origin of any race.

NOTE: Includes Florida, Idaho, Kansas, Kentucky, Nebraska, New Hampshire, New York (excluding New York City), Pennsylvania, South Carolina, Tennessee, Texas, and Washington.

Table 2. Rates of obstetric procedures by age and race and Hispanic origin of mother: Total of 12 reporting states, 2005

[Rates are number of live births with specified obstetric procedure per 1,000 live births in specified group]

Obstetric procedure and race and Hispanic origin of mother	All births ¹	Procedure reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated ²
All races ³										
Cervical cerclage	1,268,502	4,549	3.7	1.6	2.7	3.6	4.7	5.7	6.5	30,552
Tocolysis	1,268,502	18,994	15.3	17.2	16.1	15.1	14.7	14.0	13.7	30,552
External cephalic version	1,268,502	6,660	5.4	6.0	5.6	5.3	5.2	4.9	5.1	30,552
Percent successful⁴	1,268,502	5,417	81.3	85.3	83.4	80.9	77.8	79.7	78.8	30,552
Non-Hispanic white ⁵										
Cervical cerclage	714,257	2,453	3.5	1.4	2.5	3.3	4.4	5.4	5.9	22,194
Tocolysis	714,257	12,284	17.7	22.9	19.8	17.3	16.4	14.8	14.4	22,194
External cephalic version	714,257	3,261	4.7	5.1	4.6	4.7	4.8	4.6	4.4	22,194
Percent successful⁴	714,257	2,375	72.8	74.6	72.4	72.5	71.5	76.1	72.3	22,194
Non-Hispanic black ⁵										
Cervical cerclage	171,054	1,123	6.7	2.1	4.4	7.9	11.1	13.1	12.3	2,726
Tocolysis	171,054	2,669	15.9	16.3	16.1	16.1	15.9	13.4	12.9	2,726
External cephalic version	171,054	1,681	10.0	10.3	10.9	10.2	8.9	7.9	5.9	2,726
Percent successful⁴	171,054	1,594	94.8	93.2	95.6	95.0	93.4	97.0	100.0	2,726
Hispanic ⁶										
Cervical cerclage	329,276	809	2.5	1.4	2.1	2.7	3.0	3.3	4.1	3,250
Tocolysis	329,276	3,359	10.3	11.1	9.9	9.9	10.1	11.7	10.4	3,250
External cephalic version	329,276	1,399	4.3	4.6	4.2	4.4	3.9	4.1	5.6	3,250
Percent successful⁴	329,276	1,183	84.6	87.7	86.4	85.1	81.2	77.5	81.8	3,250

¹Total number of births to residents of areas reporting specified obstetric procedure.

²No response reported for obstetric procedure item; includes births to residents of states using the 2003 Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth.

³Includes other races not shown.

⁴Percentage successful external cephalic version (ECV) is the number of successful ECVs per 100 live births to women with an attempted ECV in specified group.

⁵Race and Hispanic origin are reported separately on birth certificates. Persons of Hispanic origin may be of any race. Race categories are consistent with the 1977 Office of Management and Budget (OMB) standards. All states in the 12-state reporting area reported multiple-race data for 2005. These multiple-race data were bridged to the single-race categories of the 1977 OMB standards for comparability with other states; see "Technical Notes."

⁶Includes all persons of Hispanic origin of any race.

NOTE: Includes Florida, Idaho, Kansas, Kentucky, Nebraska, New Hampshire, New York (excluding New York City), Pennsylvania, South Carolina, Tennessee, Texas, and Washington.

Table 3. Number and rate of live births by characteristics of labor and delivery, by age and race and Hispanic origin of mother: Total of 12 reporting states, 2005

[Rates are number of live births with specified characteristic per 1,000 live births in specified group]

Labor and delivery characteristic and race and Hispanic origin of mother	All births ¹	Characteristic reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated ²
All races ³										
Induction of labor	1,268,502	322,247	259.9	267.8	266.0	267.6	252.7	239.2	227.8	28,462
Augmentation of labor	1,268,502	267,743	215.9	266.5	235.8	216.8	193.1	173.9	154.5	28,462
Nonvertex presentation	1,268,502	22,497	18.1	11.5	13.8	17.4	22.3	26.2	30.7	28,462
Steroids (glucocorticoids) for fetal lung maturation	1,268,502	12,245	9.9	10.8	9.2	9.5	9.8	10.8	14.4	28,462
Antibiotics received by mother during labor	1,268,502	211,544	170.6	192.1	173.0	166.5	163.6	167.0	170.7	28,462
Clinical chorioamnionitis during labor	1,268,502	13,669	11.0	17.2	12.6	10.4	8.9	7.5	7.3	28,462
Moderate or heavy meconium staining of amniotic fluid	1,268,502	52,536	42.4	48.0	43.5	41.6	40.1	40.5	41.1	28,462
Fetal intolerance of labor	1,268,502	62,040	50.0	56.2	49.8	48.7	48.3	50.3	53.0	28,462
Epidural or spinal anesthesia during labor	1,268,502	827,498	667.3	664.6	651.1	662.1	684.3	687.7	668.4	28,462
Non-Hispanic white ⁴										
Induction of labor	714,257	206,411	297.6	325.2	315.8	308.5	282.1	262.8	246.6	20,760
Augmentation of labor	714,257	150,383	216.8	272.9	240.4	222.5	195.5	177.9	157.8	20,760
Nonvertex presentation	714,257	15,036	21.7	15.0	16.3	20.5	25.4	28.8	34.5	20,760
Steroids (glucocorticoids) for fetal lung maturation	714,257	7,477	10.8	12.1	10.3	10.5	10.5	11.1	14.6	20,760
Antibiotics received by mother during labor	714,257	121,782	175.6	197.0	176.0	174.0	171.9	172.4	173.9	20,760
Clinical chorioamnionitis during labor	714,257	6,378	9.2	13.6	10.4	9.3	7.9	6.9	6.7	20,760
Moderate or heavy meconium staining of amniotic fluid	714,257	27,138	39.1	42.4	40.2	38.8	37.7	38.8	38.4	20,760
Fetal intolerance of labor	714,257	37,372	53.9	63.7	54.9	53.2	51.1	52.5	53.8	20,760
Epidural or spinal anesthesia during labor	714,257	495,705	714.8	728.6	701.9	711.7	726.0	719.8	694.6	20,760
Non-Hispanic black ⁴										
Induction of labor	171,054	37,550	223.0	236.2	221.7	222.1	223.2	206.7	196.2	2,655
Augmentation of labor	171,054	37,059	220.1	269.2	235.5	211.8	182.5	158.6	144.6	2,655
Nonvertex presentation	171,054	2,767	16.4	10.8	14.1	16.2	21.5	26.6	30.5	2,655
Steroids (glucocorticoids) for fetal lung maturation	171,054	2,430	14.4	15.0	12.9	14.3	14.4	17.9	22.0	2,655
Antibiotics received by mother during labor	171,054	37,402	222.1	251.4	228.5	211.7	201.7	205.2	201.2	2,655
Clinical chorioamnionitis during labor	171,054	1,970	11.7	17.6	12.5	10.1	8.3	7.2	7.9	2,655
Moderate or heavy meconium staining of amniotic fluid	171,054	9,013	53.5	59.2	52.2	51.0	53.4	55.5	49.0	2,655
Fetal intolerance of labor	171,054	10,716	63.6	72.9	62.4	60.6	60.8	62.4	66.0	2,655
Epidural or spinal anesthesia during labor	171,054	109,636	651.0	671.6	650.7	638.5	647.9	652.7	644.8	2,655

See footnotes at end of table.

Table 3. Number and rate of live births by characteristics of labor and delivery, by age and race and Hispanic origin of mother: Total of 12 reporting states, 2005

[Rates are number of live births with specified characteristic per 1,000 live births in specified group]

Labor and delivery characteristic and race and Hispanic origin of mother	All births ¹	Characteristic reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated ²
Hispanic ⁵										
Induction of labor	329,276	67,473	206.8	224.4	210.8	204.9	195.0	194.9	196.4	2,998
Augmentation of labor	329,276	67,875	208.0	257.8	225.5	199.3	179.0	162.1	140.1	2,998
Nonvertex presentation	329,276	3,678	11.3	7.9	9.1	10.8	14.5	17.8	19.4	2,998
Steroids (glucocorticoids) for fetal lung maturation	329,276	1,950	6.0	6.9	5.3	5.2	6.3	7.6	9.4	2,998
Antibiotics received by mother during labor	329,276	43,794	134.2	151.0	135.6	127.5	126.4	135.0	145.7	2,998
Clinical chorioamnionitis during labor	329,276	4,356	13.4	20.8	15.8	11.3	9.4	7.2	7.8	2,998
Moderate or heavy meconium staining of amniotic fluid	329,276	14,059	43.1	47.4	43.8	42.7	40.6	38.8	44.7	2,998
Fetal intolerance of labor	329,276	11,049	33.9	37.3	33.3	31.1	33.6	37.4	41.3	2,998
Epidural or spinal anesthesia during labor	329,276	188,046	576.3	589.3	566.0	561.5	585.9	609.0	604.6	2,998

¹Total number of births to residents of areas reporting specified labor and delivery characteristic.

²No response reported for characteristic of labor and delivery item; includes births to residents of states using the 2003 Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth.

³Includes other races not shown.

⁴Race and Hispanic origin are reported separately on birth certificates. Persons of Hispanic origin may be of any race. Race categories are consistent with the 1977 Office of Management and Budget (OMB) standards. All states in the 12-state reporting area reported multiple-race data for 2005. These multiple-race data were bridged to the single-race categories of the 1977 OMB standards for comparability with other states; see "Technical Notes."

⁵Includes all persons of Hispanic origin of any race.

NOTE: Includes Florida, Idaho, Kansas, Kentucky, Nebraska, New Hampshire, New York (excluding New York City), Pennsylvania, South Carolina, Tennessee, Texas, and Washington.

Table 4. Live births by method of delivery, by age and race and Hispanic origin of mother: Total of 12 reporting states, 2005

[Percentages are number of live births with specified method of delivery per 100 live births in specified group]

Method of delivery and race and Hispanic origin of mother	All births	Method reported	All ages ¹	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated ²
All races³				Percent						
Attempted forceps/unsuccessful.	1,268,502	7,165	0.6	0.7	0.6	0.6	0.5	0.5	0.5	60,764
Attempted vacuum extraction/unsuccessful.	1,268,502	13,141	1.1	1.5	1.2	1.0	1.0	0.9	1.0	64,046
Fetal presentation at birth										
Cephalic.	1,268,502	1,129,245	92.9	94.3	94.0	93.1	92.0	91.2	89.9	53,433
Breech.	1,268,502	48,608	4.0	2.9	3.2	3.9	4.7	5.2	6.1	53,433
Other	1,268,502	37,216	3.1	2.8	2.8	2.9	3.3	3.6	4.0	53,433
Final route and method of delivery										
Vaginal/Spontaneous	1,268,502	787,723	63.4	70.1	67.9	64.6	59.5	54.3	48.8	26,632
Vaginal/Forceps	1,268,502	12,094	1.0	1.3	1.0	1.0	0.9	0.8	0.8	26,632
Vaginal/Vacuum	1,268,502	46,650	3.8	5.4	3.9	3.6	3.3	3.2	3.1	26,632
Cesarean	1,268,502	395,403	31.8	23.2	27.2	30.9	36.3	41.8	47.4	26,632
Cesarean/trial of labor attempted⁴.	395,403	117,119	30.8	50.0	36.3	30.5	25.6	23.1	22.7	15,029
Non-Hispanic white⁵										
Attempted forceps/unsuccessful.	714,257	3,784	0.6	0.7	0.6	0.6	0.5	0.5	0.5	30,504
Attempted vacuum extraction/unsuccessful.	714,257	7,035	1.0	1.5	1.2	1.0	0.9	0.9	0.9	32,902
Fetal presentation at birth										
Cephalic.	714,257	637,768	93.1	94.9	94.4	93.4	92.2	91.4	90.2	29,515
Breech.	714,257	29,304	4.3	3.2	3.5	4.2	4.8	5.3	6.0	29,515
Other	714,257	17,670	2.6	1.9	2.1	2.4	2.9	3.3	3.7	29,515
Final route and method of delivery										
Vaginal/Spontaneous	714,257	437,940	63.1	69.2	67.6	64.8	60.0	55.4	49.9	19,747
Vaginal/Forceps	714,257	7,664	1.1	1.7	1.2	1.1	1.0	0.8	0.9	19,747
Vaginal/Vacuum	714,257	28,818	4.1	6.2	4.6	4.1	3.6	3.4	3.3	19,747
Cesarean	714,257	220,088	31.7	22.9	26.6	30.0	35.4	40.4	45.9	19,747
Cesarean/trial of labor attempted⁴.	220,088	65,882	30.8	52.5	38.2	31.6	25.8	22.8	22.6	6,201
Non-Hispanic black⁵										
Attempted forceps/unsuccessful.	171,054	885	0.5	0.6	0.5	0.5	0.5	0.5	0.7	5,640
Attempted vacuum extraction/unsuccessful.	171,054	1,456	0.9	1.0	0.9	0.9	0.8	0.8	0.9	5,916
Fetal presentation at birth										
Cephalic.	171,054	155,640	93.7	95.3	94.3	93.5	92.3	91.3	89.5	4,866
Breech.	171,054	5,611	3.4	2.4	2.8	3.5	4.3	5.1	7.0	4,866
Other	171,054	4,937	3.0	2.4	2.9	3.0	3.4	3.6	3.5	4,866
Final route and method of delivery										
Vaginal/Spontaneous	171,054	105,709	62.7	69.1	66.0	62.6	56.9	50.2	44.9	2,462
Vaginal/Forceps	171,054	1,227	0.7	1.1	0.8	0.6	0.6	0.5	*	2,462
Vaginal/Vacuum	171,054	5,254	3.1	5.0	3.1	2.5	2.4	2.3	2.2	2,462
Cesarean	171,054	56,402	33.5	24.9	30.2	34.2	40.1	47.1	52.5	2,462
Cesarean/trial of labor attempted⁴.	56,402	17,006	31.7	49.4	34.3	28.7	25.9	22.7	21.7	2,777

See footnotes at end of table.

Table 4. Live births by method of delivery, by age and race and Hispanic origin of mother: Total of 12 reporting states, 2005—Con.

[Percentages are number of live births with specified method of delivery per 100 live births in specified group]

Method of delivery and race and Hispanic origin of mother	All births	Method reported	All ages ¹	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated ²
Hispanic ⁶										
Attempted forceps/unsuccessful.	329,276	2,199	0.7	0.9	0.7	0.7	0.6	0.5	0.7	20,670
Attempted vacuum extraction/unsuccessful.	329,276	4,052	1.3	1.7	1.4	1.2	1.2	1.1	1.1	21,063
Fetal presentation at birth										
Cephalic.	329,276	288,435	92.0	92.8	92.9	92.3	91.0	90.0	88.6	15,928
Breech.	329,276	11,617	3.7	3.0	3.1	3.6	4.5	5.3	6.1	15,928
Other	329,276	13,296	4.2	4.2	4.1	4.1	4.5	4.7	5.3	15,928
Final route and method of delivery										
Vaginal/Spontaneous	329,276	211,814	64.8	71.7	69.2	65.2	58.9	52.8	47.2	2,596
Vaginal/Forceps	329,276	2,519	0.8	1.2	0.8	0.7	0.6	0.6	0.5	2,596
Vaginal/Vacuum	329,276	9,633	2.9	4.6	3.2	2.5	2.3	2.3	2.2	2,596
Cesarean	329,276	102,714	31.4	22.6	26.8	31.6	38.2	44.4	50.1	2,596
Cesarean/trial of labor attempted⁴.	102,714	28,949	29.8	47.1	34.0	27.5	23.8	23.1	22.8	5,536

^{*} Figure does not meet standards of reliability or precision; based on fewer than 20 births in the numerator.

¹Total number of births to residents of areas reporting the specified item.

²No response reported for method of delivery item; includes births to residents of states using the 2003 Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth.

³Includes other races not shown.

⁴Cesarean/trial of labor attempted is number of women who attempted a trial of labor prior to cesarean delivery per 100 cesarean births. ⁵Race and Hispanic origin are reported separately on birth certificates. Persons of Hispanic origin may be of any race. Race categories are consistent with the 1977 Office of Management and Budget (OMB) standards. All states in the 12-state reporting area reported multiple-race data for 2005. These multiple-race data were bridged to the single-race categories of the 1977 OMB standards for comparability with other states; see "Technical Notes."

⁶Includes all persons of Hispanic origin of any race.

NOTE: Includes Florida, Idaho, Kansas, Kentucky, Nebraska, New Hampshire, New York (excluding New York City), Pennsylvania, South Carolina, Tennessee, Texas, and Washington.

Table 5. Abnormal conditions of the newborn, by age and race and Hispanic origin of mother: Total of 12 reporting states, 2005

[Rates are number of live births with specified condition per 1,000 live births in specified group]

Abnormal condition and race and Hispanic origin of mother	All births ¹	Condition reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated ²
All races ³										
Assisted ventilation required immediately following delivery	1,268,502	64,649	52.3	53.9	49.6	50.9	53.2	56.4	62.5	31,612
Assisted ventilation required for more than six hours	1,268,502	12,916	10.4	11.4	10.3	10.0	9.8	11.6	13.7	31,612
NICU admission	1,268,502	81,202	65.7	66.5	60.5	62.5	66.5	77.2	93.9	31,612
Surfactant replacement therapy given to newborn	1,268,502	4,546	3.7	4.0	3.6	3.6	3.3	3.9	4.8	31,612
Antibiotics received by newborn for suspected neonatal sepsis	1,268,502	23,876	19.3	23.4	19.9	18.5	17.6	18.8	21.6	31,612
Seizure or serious neurologic dysfunction	1,268,502	407	0.3	0.4	0.3	0.4	0.2	0.3	*	31,612
Significant birth injury	1,268,502	756	0.6	0.7	0.7	0.6	0.5	0.6	1.0	31,612
Non-Hispanic white ⁴										
Assisted ventilation required immediately following delivery	714,257	38,715	56.0	56.6	53.6	54.4	56.9	59.4	66.2	22,432
Assisted ventilation required for more than six hours	714,257	7,621	11.0	11.8	11.3	10.7	10.0	12.0	13.8	22,432
NICU admission	714,257	45,318	65.5	64.6	60.8	62.4	66.4	74.8	90.1	22,432
Surfactant replacement therapy given to newborn	714,257	2,750	4.0	4.4	4.1	4.0	3.5	4.1	5.2	22,432
Antibiotics received by newborn for suspected neonatal sepsis	714,257	13,800	19.9	24.0	21.1	19.4	18.3	19.3	21.9	22,432
Seizure or serious neurologic dysfunction	714,257	272	0.4	0.6	0.4	0.4	0.3	0.4	*	22,432
Significant birth injury	714,257	470	0.7	0.9	0.7	0.7	0.6	0.6	*	22,432
Non-Hispanic black ⁴										
Assisted ventilation required immediately following delivery	171,054	9,954	59.2	58.1	55.3	59.4	63.3	68.8	63.5	2,908
Assisted ventilation required for more than six hours	171,054	2,308	13.7	13.7	13.3	13.1	14.5	16.1	15.9	2,908
NICU admission	171,054	14,673	87.3	82.8	79.3	85.3	93.5	115.6	129.7	2,908
Surfactant replacement therapy given to newborn	171,054	766	4.6	4.8	3.9	5.0	4.7	4.8	*	2,908
Antibiotics received by newborn for suspected neonatal sepsis	171,054	3,355	20.0	22.1	19.3	18.9	19.1	21.9	22.7	2,908
Seizure or serious neurologic dysfunction	171,054	57	0.3	*	*	*	*	*	*	2,908
Significant birth injury	171,054	73	0.4	*	0.5	*	*	*	*	2,908
Hispanic ⁵										
Assisted ventilation required immediately following delivery	329,276	13,449	41.3	48.5	39.6	39.0	39.8	43.0	50.2	3,913
Assisted ventilation required for more than six hours	329,276	2,516	7.7	9.7	6.8	7.1	7.6	8.8	11.8	3,913
NICU admission	329,276	17,954	55.2	58.3	49.5	51.7	57.0	69.4	88.2	3,913
Surfactant replacement therapy given to newborn	329,276	894	2.7	3.3	2.6	2.4	2.7	3.4	3.8	3,913
Antibiotics received by newborn for suspected neonatal sepsis	329,276	5,825	17.9	23.6	18.3	16.4	15.1	16.5	20.8	3,913
Seizure or serious neurologic dysfunction	329,276	64	0.2	*	*	0.3	*	*	*	3,913
Significant birth injury	329,276	190	0.6	0.6	0.6	0.5	0.5	*	*	3,913

* Figure does not meet standards of reliability or precision; based on fewer than 20 births in the numerator.

¹Total number of births to residents of areas reporting specified abnormal condition

²No response reported for abnormal condition of the newborn item. Includes births to residents of states using the 2003 Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth.

³Includes other races not shown.

⁴Race and Hispanic origin are reported separately on birth certificates. Persons of Hispanic origin may be of any race. Race categories are consistent with the 1977 Office of Management and Budget (OMB) standards. All states in the 12-state reporting area reported multiple-race data for 2005. These multiple-race data were bridged to the single-race categories of the 1977 OMB standards for comparability with other states; see "Technical Notes."

⁵Includes all persons of Hispanic origin of any race.

NOTE: Includes Florida, Idaho, Kansas, Kentucky, Nebraska, New Hampshire, New York (excluding New York City), Pennsylvania, South Carolina, Tennessee, Texas, and Washington.

Table 6. Number and rate of live births by congenital anomaly of the newborn, by age of mother: Total of 12 reporting states, 2005

[Rates are number of live births with specified anomaly per 100,000 live births in specified group]

Congenital anomaly	All births ¹	Congenital anomaly reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated ²
Total										
Anencephaly	1,268,502	158	12.8	*	17.0	9.8	13.2	*	*	33,842
Menigocele or spina bifida	1,268,502	216	17.5	17.4	14.8	19.1	15.8	23.8	*	33,842
Cyanotic congenital heart disease	1,268,502	702	56.9	59.4	48.7	54.0	57.5	68.5	107.6	33,842
Congenital diaphragmatic hernia	1,268,502	190	15.4	*	15.4	13.4	17.6	20.1	*	33,842
Omphalocele	1,268,502	119	9.6	*	7.7	8.9	9.9	*	*	33,842
Gastroschisis	1,268,502	349	28.3	105.1	37.3	15.2	7.3	*	*	33,842
Limb reduction defect	1,268,502	282	22.8	26.8	25.0	23.0	20.5	17.9	*	33,842
Cleft lip with or without cleft palate	1,268,502	779	63.1	74.6	72.1	62.3	55.7	41.7	84.0	33,842
Cleft palate alone	1,268,502	319	25.8	24.6	30.8	26.0	21.6	22.3	*	33,842
Down syndrome	1,268,502	695	56.3	35.5	32.1	30.7	48.0	140.0	403.4	33,842
Suspected chromosomal disorder	1,268,502	529	42.8	31.2	36.7	40.3	35.9	61.8	171.4	33,842
Hypospadias³	1,268,502	798	64.6	61.6	59.5	67.4	67.4	67.8	*	33,842
Males only⁴	649,802	798	126.2	120.2	116.1	131.4	131.9	132.3	*	17,422

* Figure does not meet standards of reliability or precision; based on fewer than 20 births in the numerator.

¹Total number of births to residents of areas reporting specified congenital anomaly.

²No response reported for congenital anomaly of the newborn item; includes births to residents of states using the 2003 Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth.

³Denominator includes both male and female births.

⁴Denominator includes males only.

NOTE: Includes Florida, Idaho, Kansas, Kentucky, Nebraska, New Hampshire, New York (excluding New York City), Pennsylvania, South Carolina, Tennessee, Texas, and Washington.

Technical Notes

Sources of data

Data in this report are based on 100 percent of births registered in the 12 states; Florida, Idaho, Kansas, Kentucky, Nebraska, New Hampshire, New York (excluding New York City), Pennsylvania, South Carolina, Tennessee, Texas, and Washington, which implemented the 2003 U.S. Standard Certificate of Live Birth as of January 1, 2005. One additional state, Vermont, implemented the revised birth certificate in 2005, but after January 1; data for this state are not presented. The 1,268,502 births to residents of the 12 states comprise 31 percent of all U.S. 2005 births, see [Table A](#).

The 2003 Revision of the U.S. Standard Certificate of Live Birth

The 2003 revision of the birth certificate is seen as an important opportunity to improve data quality, primarily through the development of detailed, standardized collection techniques. For example, detailed requirements for electronic birth registration systems, separate worksheets for the mother and the hospital staff, and a comprehensive guidebook for birthing facilities were developed (1,26). The new electronic systems incorporate standardized data-collection instruments, improved methods for capturing data, immediate query of suspect data, query and edit guidelines, and detailed item definitions. The guidebook for birthing facilities, available both electronically and in hard copy, includes detailed item definitions, recommended sources and common key words and abbreviations to help hospital staff accurately and completely report the necessary information. See http://www.cdc.gov/nchs/vital_certs_rev.htm for more information on the 2003 revision.

A number of items new to the U.S. Standard Certificate of Live Birth and collected by the 12-state reporting area are not presented in this report. Some examples of the new items not shown are: breastfeeding, sources of payment for the delivery, the receipt of WIC food for the pregnancy, and maternal morbidity (including uterine rupture).

Age of mother

Age of mother is computed from the mother's and infant's dates of birth as reported on the birth certificate. Births reported to occur to mothers younger than age 10 or older than age 54 years are imputed according to the age of mother from the previous records with the same race and total birth order (total of live births and fetal deaths).

Hispanic origin

Race and Hispanic origin are reported separately on the birth certificate. Data shown by race include persons of Hispanic or non-Hispanic origin. Data shown for Hispanic persons include all persons of Hispanic origin of any race. Data are shown separately for non-Hispanic white women because there are substantial differences in childbearing patterns between Hispanic and non-Hispanic white women.

Single, multiple, and "bridged" race

The 2003 revision of the U.S. Standard Certificate of Live Birth allows the reporting of more than one race (multiple races) for each

parent (1). Accordingly, multiple-race data were reported by each of the states included in this report. Race data for 2005 from the vital records of the majority of states, however, are still based on the 1989 revision of the U.S. Standard Certificate of Live Birth. The 1989 revision follows the 1977 Office of Management and Budget (OMB) standard that allows only a single race to be reported (27,28). In order to provide uniformity and comparability of the data during the transition period, before all or most of the data are available in the new multiple race format, it was necessary to "bridge" the responses of those who reported more than one race (multiple race) to one, single race. Information on the processing and tabulation of data by race is presented in a recent report (4).

Gestational age

The primary measure used to determine the gestational age of the newborn is the interval between the first day of the mother's last normal menstrual period (LMP) and the date of birth. It is subject to error for several reasons, including imperfect maternal recall or misidentification of the LMP because of post conception bleeding, delayed ovulation, or intervening early miscarriage. These data are edited for LMP-based gestational ages that are clearly inconsistent with the infant's plurality and birthweight, but reporting problems for this item persist and may occur more frequently among some subpopulations and among births with shorter gestations (4,29).

Risk factors in the pregnancy

Data on whether the mother had a previous cesarean delivery are edited for consistency between this item and the number of previous cesarean deliveries reported, and to include only women reported to have a second or higher order birth (30).

Characteristics of labor and delivery

The 2003 U.S. Standard Certificate of Live Birth includes the item "**non-vertex presentation**" under the category "Characteristics of Labor and Delivery." Nonvertex presentation is defined as any presentation other than vertex (i.e., any presentation other than the upper or back part of the baby's head) (26). Also included on the 2003 certificate under the category "Method of Delivery—Final presentation at birth," are the items "breech" and "other" (non-cephalic) presentation. Although "breech" and "other" presentations in the Method of Delivery item are by definition subsets of "nonvertex presentation," the individual and combined levels for "breech" and "other" presentations were higher than those for "non-vertex presentation" in "Characteristics of Labor and Delivery," suggesting that the latter item is underreported.

Congenital anomalies

Historically, congenital anomalies have been underreported on the birth certificate (31). This has been attributable, at least in part, to the inclusion of anomalies on the 1989 U.S. Standard Certificate of Live Birth, which may have been difficult to detect within the short period between birth and completion of the child's birth certificate

(32). The 2003 Revision of the U.S. Standard Certificate of Live Birth attempted to improve reporting of congenital anomalies by including only those diagnosable within 24 hours of birth using conventional, widely available diagnostic techniques (2). As more data based on the revised certificate become available, it will be possible to determine whether this change has had the intended effect.

Data for the congenital anomaly “**Hypospadias**,” are edited to exclude this condition where the record was coded female.

Computations of percentages and percent distributions

Births for which a particular characteristic is unknown were subtracted from the figures for total births that were used as denominators before percentages and percent distributions were computed. The percentage of records with missing information for each item is shown by state in [Table D](#). These levels include all births to residents in the reporting area, occurring outside of the reporting area (i.e., in a jurisdiction which has not adopted the 2003 U.S. Standard Certificate of Live Birth). This percentage was 2.0 percent for the 12-state reporting area for 2005 with levels ranging from 0.3 (Florida and Texas) to 7.0 percent for New York State (excluding New York City) and 10.9 (New Hampshire).

The comparatively high level of unknown data for New Hampshire strongly reflects the fact that 10.5 percent of births to New Hampshire residents occurred out of state, in states that have not yet implemented the 2003 Revision of the U.S. Standard Certificate of Live Birth. For example, by residence, the percentage unknown for New Hampshire for obstetric procedures was 12.2 percent ([Table D](#)). However, when the unknown rate was examined by occurrence (i.e., only for births that occurred in the state) the unknown rate decreased to 1.4 percent (data not shown). Similarly, the high level for New York reflects the 7.0 percent of births to New York State residents that occurred either in New York City or in other states that have not yet implemented the revised certificate. Again, when the same item was examined by occurrence, there was a marked decrease in the rate of unknowns.

Random variation and significance testing for natality data

The number of births reported for an area is essentially a complete count, because more than 99 percent of all births are registered. Although this number is not subject to sampling error, it may be affected by nonsampling errors in the registration process such as mistakes in recording the mother’s residence or age during the registration process.

When the number of births is used for analytic purposes (that is, the comparison of numbers, rates, and percentages over time, for different areas, or between different groups), the number of events that *actually* occurred can be thought of as one outcome in a large series of possible results that *could have* occurred under the same (or similar) circumstances. When considered in this way, the number of births is subject to random variation and a probable range of values can be estimated from the actual figures, according to certain statistical assumptions. For further information see the “[Technical Notes](#)” of “Births: Final Data for 2005” (4).

Definitions of selected medical terms

Definitions for the data items exclusive to the 2003 revision and discussed in this report are shown below. Detailed definitions, recommended sources, and keywords for the medical and health data items are available in the “Guide to Completing the Facility Worksheets for the Certificate of Live Birth and Report of Fetal Death” (26).

Risk factors in this pregnancy

Diabetes—Glucose intolerance requiring treatment.

Prepregnancy (chronic)—Diagnosis before this pregnancy.

Gestational (PIH, preeclampsia)—Diagnosis during this pregnancy.

Obstetric procedures

Cervical cerclage—Circumferential banding or suture of the cervix to prevent or treat passive dilation.

External cephalic version—Attempted conversion of a fetus from a non-vertex to a vertex presentation by external manipulation.

Characteristics of labor and delivery

Nonvertex presentation—Includes any nonvertex fetal presentation, that is, presentation of a part of the infant’s body other than the upper and back part of the infant’s head.

Steroids (glucocorticoids) for fetal lung maturation received by the mother before delivery—Medications given to the mother before delivery specifically to accelerate fetal lung maturation in anticipation of preterm delivery (e.g., betamethasone, dexamethasone).

Antibiotics received by the mother during delivery—Antibacterial medication given systemically (intravenous or intramuscular) to the mother between the onset of labor and the actual delivery (e.g., ampicillin, clindamycin).

Epidural or spinal anesthesia during labor—Administration to the mother of a regional anesthetic to control the pain of labor. The distribution of the analgesic effect is limited to the lower body.

Method of delivery

Was delivery with forceps attempted but unsuccessful?—Obstetric forceps were applied to the fetal head in an unsuccessful attempt at vaginal delivery.

Was delivery with vacuum extraction attempted but unsuccessful?—Ventouse or vacuum cup was applied to the fetal head in an unsuccessful attempt at vaginal delivery.

If cesarean, was a trial of labor attempted?—if the delivery was cesarean, whether prior to the cesarean delivery labor was allowed, augmented, or induced, with plans for a vaginal delivery.

Abnormal Conditions of the newborn

Assisted ventilation required immediately following delivery—Infant given minimal breaths for any duration with bag and mask or bag and endotracheal tube within the first several minutes from birth. Excludes free flow oxygen only, and laryngoscopy for aspiration of meconium.

Assisted ventilation required for more than 6 hours—Infant given mechanical ventilation (breathing assistance) by any method for more than 6 hours.

Surfactant replacement therapy—Endotracheal instillation of a surface-active suspension for treating surfactant deficiency due to preterm birth or pulmonary injury resulting in respiratory distress.

NICU (neonatal intensive care unit) admission—Admission of the newborn into a facility or unit staffed and equipped to provide continuous mechanical ventilatory support at any time during the infant's hospital stay following delivery.

Congenital anomalies

Cleft palate alone—Incomplete fusion of the palatal shelves. May be limited to the soft palate, or may extend into the hard palate.

Cyanotic heart disease—Congenital heart defects resulting in lack of oxygen that cause cyanosis.

Hypospadias—Incomplete closure of the male urethra resulting in the urethral meatus opening on the ventral surface of the penis.

Limb reduction defect—Complete or partial absence of a portion of an extremity, secondary to failure to develop. Excludes congenital amputation and dwarfing syndromes.

Suspected chromosomal disorder—Includes any constellation of congenital malformations resulting from, or compatible with, known syndromes caused by detectable defects in chromosome structure.

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