

## Expanded Data From the New Birth Certificate, 2008

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### Abstract

*Objectives*—This report presents data for selected items exclusive to the 2003 U.S. Standard Certificate of Live Birth as well as key items considered not comparable between the 1989 (unrevised) and 2003 (revised) versions for states and territories that implemented the

2003 revision as of January 1, 2008. Information is shown for educational attainment, tobacco use during pregnancy, month prenatal care began, and 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.”

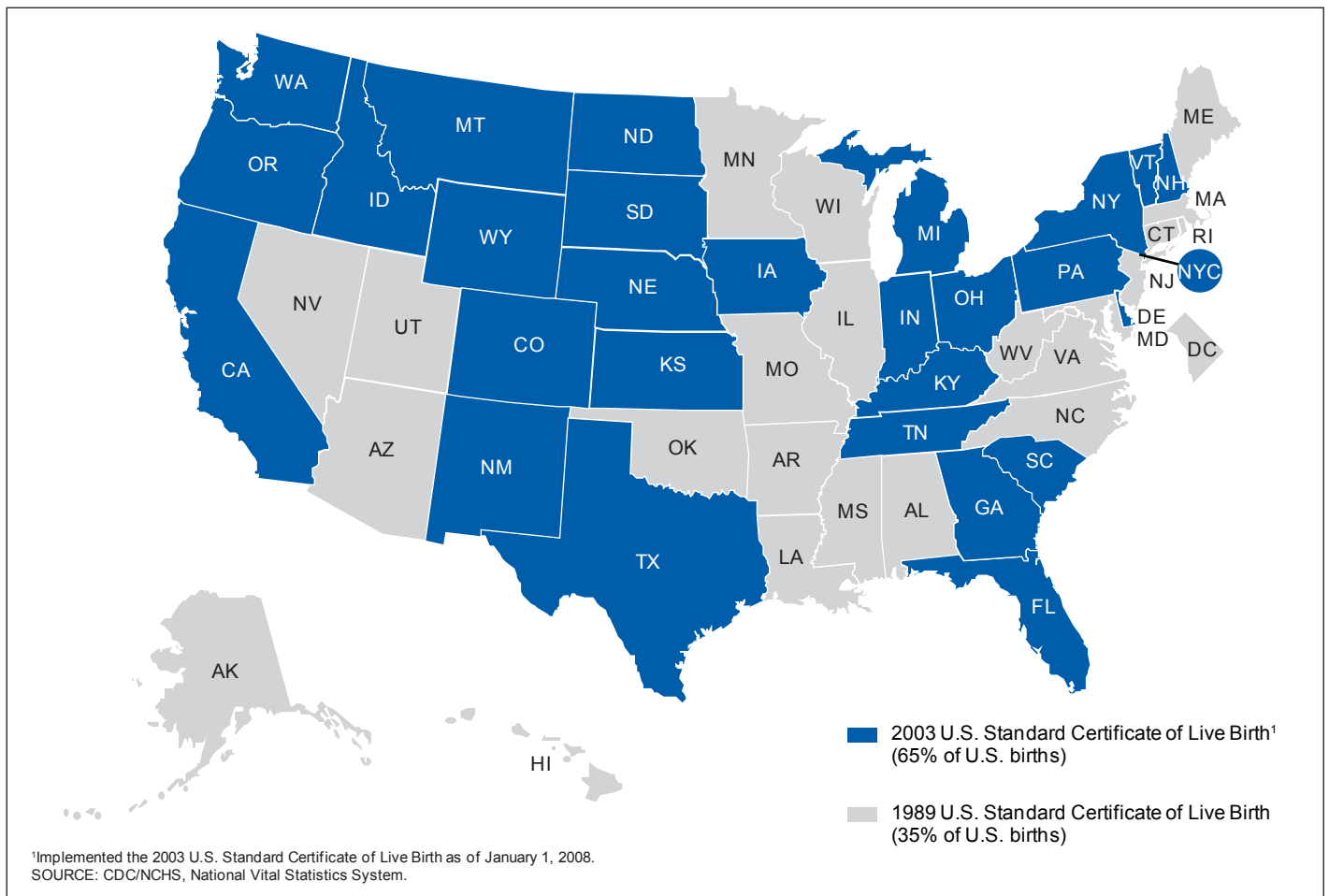


Figure 1. Birth certificate revision status, by state: United States, 2008

**Methods**—Descriptive statistics are presented on births occurring in 2008 to residents of the 27 states that implemented the revised birth certificate.

**Results**—There were 2,748,302 births to residents of the 27-state reporting area, representing 65 percent of 2008 U.S. births. About 78 percent of women had at least a high school diploma; 24.5 percent had an advanced education. One out of 10 women smoked during pregnancy (24-state reporting area) and one out of five smokers quit while pregnant. Almost three-quarters of women began prenatal care in the first trimester of pregnancy. The rate of prepregnancy diabetes was 6.5 per 1,000 and gestational diabetes was 40.6; risk of both types rose with maternal age. Nearly one out of four women had a primary cesarean delivery; less than 1 out of 10 women had a vaginal birth after cesarean delivery. About 27 percent of women attempted a trial of labor before a cesarean delivery. Seven percent of all infants were admitted to a neonatal intensive care unit.

**Keywords:** educational attainment • tobacco use during pregnancy • pregnancy risk factors • labor and delivery

## Introduction

This report presents data for selected items exclusive to the 2003 U.S. Standard Certificate of Live Birth (1) as well as key items considered not comparable between the 1989 (unrevised) and 2003 (revised) versions for the states that implemented the 2003 revision of the birth certificate as of January 1, 2008 (Figure 1). This report is a supplement to “Births: Final Data for 2008” (2), which presents national data for items considered comparable between the revisions. The items discussed in this report are shown in Figure 2 and in bold in Tables 1–10 (see also Tables A–D, Internet tables I–1 through I–5, and Figures 3 and 4).

The 2003 revision provides an important opportunity to enhance the content and quality of birth certificate data. As of January 1, 2008, 27 states and Puerto Rico had implemented the revision. The 27 states represent 65 percent of all 2008 U.S. births. More detail on the 2003 revision is available elsewhere (1,3).

This report presents 2008 data for the 27-state reporting area on educational attainment of the mother, tobacco use during pregnancy (24 states), month prenatal care began, primary cesarean, and vaginal birth after cesarean (VBAC) delivery. These items, while on the 1989 version of the birth certificate, are not comparable between versions due to wording and format changes. Data for these key noncomparable items were previously reported in “Births: Final Data” (data years 2004–2007) (4–7).

Also included in this report are items from the following maternal, labor and delivery, and newborn 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” (Figure 2). Except for small differences in wording, these categories are included on both the 1989 and the 2003 U.S. Standard Certificates of Live Birth; however, many of the specific checkboxes included in these categories were modified or are entirely new to the 2003 certificate. Selected new (not modified) checkboxes are the focus of this report.

Additional items exclusive to the U.S. Standard Certificate of Live Birth and collected by the 27-state reporting area are not presented in this report. Some examples are: mother’s height (used to compute body

mass index), the receipt of WIC food for the pregnancy, source of payment for the delivery, infertility treatment, maternal infections, maternal morbidity (including uterine rupture), and breastfeeding.

## Methods

Data are based on 100 percent of births registered in the 27 states that implemented the 2003 revision of the birth certificate as of January 1, 2008: California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York (including New York City), North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. The 2,748,302 births to residents of the 27 states (Table I–1) represent 65 percent of all 2008 U.S. births. Data for Puerto Rico are also shown in selected state-specific tables.

Data for the items included in this report are missing for births to residents of the revised 27-state reporting area that occurred outside the reporting area (i.e., in a jurisdiction that has not adopted the 2003 U.S. Standard Certificate of Live Birth). Data for such cases are excluded from the analyses. The percentage of records with unknown data for each item is shown by state in Table I in the “Technical Notes” section.

Results for this limited reporting area are not generalizable to the country as a whole because they are not a random sample of all births. The race and Hispanic origin distributions of births for the 27-state area are substantively different from those of the entire United States. In particular, Hispanic groups are overrepresented in these data whereas non-Hispanic white and non-Hispanic black births are underrepresented. Further, the Hispanic population composition in the reporting area differs from that of the United States with relatively more births to Mexican and Cuban women and fewer births to Puerto Rican and Central and South American women (Table II). Differences between the 27-state reporting area and the United States in the distributions of births by maternal age, marital status, and infant characteristics, while statistically significant, are smaller.

Race and Hispanic origin are reported independently on the birth certificate. In this report, detailed results are presented for the three largest single-race and Hispanic-origin groups (non-Hispanic single-race white, non-Hispanic single-race black, and Hispanic). Selected data are also presented for non-Hispanic single-race American Indian or Alaska Native (AIAN) and non-Hispanic single-race Asian women, as well as for Mexican, Puerto Rican, Cuban, and Central and South American women (Tables A, B, and C). Results are not shown for Native Hawaiian or Other Pacific Islander women because of small numbers; Hawaii has yet to adopt the revised birth certificate. For ease of writing, all references to race groups (e.g., white or black) are single race and non-Hispanic, except for Table II in the “Technical Notes.”

Tables 4–10 show data for selected checkbox items based on the 2003 revised birth certificate; checkboxes new to the certificate and discussed in this report are bolded for ease of reference. Tables I–2 through I–5 present state estimates for selected items presented in this report; these tables are available from: [http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59\\_07\\_tables.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_07_tables.pdf).

Data for these checkbox items were presented in previous reports for states that implemented the 2003 U.S. Standard Certificate of Live Birth in 2006 (19 states), 2005 (12 states), and 2004 (7 states) (8–10). Tabulated data for 2007 for the 22 revised states are available in the

**Demographic Information**

<p>20. MOTHER'S EDUCATION (Check the box that best describes the highest degree or level of school completed at the time of delivery)</p> <p><input type="checkbox"/> 8th grade or less</p> <p><input type="checkbox"/> 9th-12th grade, no diploma</p> <p><input type="checkbox"/> High school graduate or GED completed</p> <p><input type="checkbox"/> Some college credit but no degree</p> <p><input type="checkbox"/> Associate degree (e.g., AA, AS)</p> <p><input type="checkbox"/> Bachelor's degree (e.g., BA, AB, BS)</p> <p><input type="checkbox"/> Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA)</p> <p><input type="checkbox"/> Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)</p>	<p>21. MOTHER OF HISPANIC ORIGIN? (Check the box that best describes whether the mother is Spanish/Hispanic/Latina. Check the "No" box if mother is not Spanish/Hispanic/Latina)</p> <p><input type="checkbox"/> No, not Spanish/Hispanic/Latina</p> <p><input type="checkbox"/> Yes, Mexican, Mexican American, Chicana</p> <p><input type="checkbox"/> Yes, Puerto Rican</p> <p><input type="checkbox"/> Yes, Cuban</p> <p><input type="checkbox"/> Yes, other Spanish/Hispanic/Latina (Specify) _____</p>	<p>22. MOTHER'S RACE (Check one or more races to indicate what the mother considers herself to be)</p> <p><input type="checkbox"/> White</p> <p><input type="checkbox"/> Black or African American</p> <p><input type="checkbox"/> American Indian or Alaska Native (Name of the enrolled or principal tribe) _____</p> <p><input type="checkbox"/> Asian Indian</p> <p><input type="checkbox"/> Chinese</p> <p><input type="checkbox"/> Filipino</p> <p><input type="checkbox"/> Japanese</p> <p><input type="checkbox"/> Korean</p> <p><input type="checkbox"/> Vietnamese</p> <p><input type="checkbox"/> Other Asian (Specify) _____</p> <p><input type="checkbox"/> Native Hawaiian</p> <p><input type="checkbox"/> Guamanian or Chamorro</p> <p><input type="checkbox"/> Samoan</p> <p><input type="checkbox"/> Other Pacific Islander (Specify) _____</p> <p><input type="checkbox"/> Other (Specify) _____</p>
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**Medical and Health Information**

29a. DATE OF FIRST PRENATAL CARE VISIT MM / DD / YYYY <input type="checkbox"/> No Prenatal Care		29b. DATE OF LAST PRENATAL CARE VISIT MM / DD / YYYY		30. TOTAL NUMBER OF PRENATAL VISITS FOR THIS PREGNANCY _____ (If none, enter A0".)	
31. MOTHER'S HEIGHT _____ (feet/inches)		32. MOTHER'S PREPREGNANCY WEIGHT _____ (pounds)		33. MOTHER'S WEIGHT AT DELIVERY _____ (pounds)	
34. DID MOTHER GET WIC FOOD FOR HERSELF DURING THIS PREGNANCY? <input type="checkbox"/> Yes <input type="checkbox"/> No		35. NUMBER OF PREVIOUS LIVE BIRTHS (Do not include this child)		36. NUMBER OF OTHER PREGNANCY OUTCOMES (spontaneous or induced losses or ectopic pregnancies)	
35a. Now Living Number _____ <input type="checkbox"/> None		35b. Now Dead Number _____ <input type="checkbox"/> None		36a. Other Outcomes Number _____ <input type="checkbox"/> None	
37. CIGARETTE SMOKING BEFORE AND DURING PREGNANCY For each time period, enter either the number of cigarettes or the number of packs of cigarettes smoked. IF NONE, ENTER A0".		38. PRINCIPAL SOURCE OF PAYMENT FOR THIS DELIVERY			
Average number of cigarettes or packs of cigarettes smoked per day.		<input type="checkbox"/> Private Insurance		<input type="checkbox"/> Medicaid	
# of cigarettes		<input type="checkbox"/> Self-pay		<input type="checkbox"/> Other	
# of packs		(Specify) _____			
Three Months Before Pregnancy _____ OR _____					
First Three Months of Pregnancy _____ OR _____					
Second Three Months of Pregnancy _____ OR _____					
Third Trimester of Pregnancy _____ OR _____					
41. RISK FACTORS IN THIS PREGNANCY (Check all that apply)		43. OBSTETRIC PROCEDURES (Check all that apply)		46. METHOD OF DELIVERY	
Diabetes <input type="checkbox"/> Prepregnancy (Diagnosis prior to this pregnancy) <input type="checkbox"/> Gestational (Diagnosis in this pregnancy)		<input type="checkbox"/> Cervical cerclage <input type="checkbox"/> Tocolysis		A. Was delivery with forceps attempted but unsuccessful? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Hypertension <input type="checkbox"/> Prepregnancy (Chronic) <input type="checkbox"/> Gestational (PIH, preeclampsia) <input type="checkbox"/> Eclampsia		External cephalic version: <input type="checkbox"/> Successful <input type="checkbox"/> Failed <input type="checkbox"/> None of the above		B. Was delivery with vacuum extraction attempted but unsuccessful? <input type="checkbox"/> Yes <input type="checkbox"/> No	
<input type="checkbox"/> Previous preterm birth		44. ONSET OF LABOR (Check all that apply)		C. Fetal presentation at birth <input type="checkbox"/> Cephalic <input type="checkbox"/> Breech <input type="checkbox"/> Other	
<input type="checkbox"/> Other previous poor pregnancy outcome (Includes perinatal death, small-for-gestational age/intrauterine growth restricted birth)		<input type="checkbox"/> Premature Rupture of the Membranes (prolonged, >12 hrs.)		D. Final route and method of delivery (Check one) <input type="checkbox"/> Vaginal/Spontaneous <input type="checkbox"/> Vaginal/Forceps <input type="checkbox"/> Vaginal/Vacuum <input type="checkbox"/> Cesarean If cesarean, was a trial of labor attempted? <input type="checkbox"/> Yes <input type="checkbox"/> No	
<input type="checkbox"/> Pregnancy resulted from infertility treatment-If yes, check all that apply: <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))		<input type="checkbox"/> Precipitous Labor (<3 hrs.)			
<input type="checkbox"/> Assisted reproductive technology (e.g., in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT))		<input type="checkbox"/> Prolonged Labor (<20 hrs.)			
<input type="checkbox"/> Mother had a previous cesarean delivery If yes, how many _____		<input type="checkbox"/> None of the above		47. MATERNAL MORBIDITY (Check all that apply) (Complications associated with labor and delivery)	
<input type="checkbox"/> None of the above		45. CHARACTERISTICS OF LABOR AND DELIVERY (Check all that apply)		<input type="checkbox"/> Maternal transfusion	
42. INFECTIONS PRESENT AND/OR TREATED DURING THIS PREGNANCY (Check all that apply)		<input type="checkbox"/> Induction of labor		<input type="checkbox"/> Third or fourth degree perineal laceration	
<input type="checkbox"/> Gonorrhea		<input type="checkbox"/> Augmentation of labor		<input type="checkbox"/> Ruptured uterus	
<input type="checkbox"/> Syphilis		<input type="checkbox"/> Non-vertex presentation		<input type="checkbox"/> Unplanned hysterectomy	
<input type="checkbox"/> Chlamydia		<input type="checkbox"/> Steroids (glucocorticoids) for fetal lung maturation received by the mother prior to delivery		<input type="checkbox"/> Admission to intensive care unit	
<input type="checkbox"/> Hepatitis B		<input type="checkbox"/> Antibiotics received by the mother during labor		<input type="checkbox"/> Unplanned operating room procedure following delivery	
<input type="checkbox"/> Hepatitis C		<input type="checkbox"/> Clinical chorioamnionitis diagnosed during labor or maternal temperature ≥38°C (100.4°F)		<input type="checkbox"/> None of the above	
<input type="checkbox"/> None of the above		<input type="checkbox"/> Moderate/heavy meconium staining of the amniotic fluid			
		<input type="checkbox"/> Fetal intolerance of labor such that one or more of the following actions was taken: in-utero resuscitative measures, further fetal assessment, or operative delivery			
		<input type="checkbox"/> Epidural or spinal anesthesia during labor			
		<input type="checkbox"/> None of the above			

See footnote at end of figure.

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

**Newborn Information**

48. NEWBORN MEDICAL RECORD NUMBER	54. ABNORMAL CONDITIONS OF THE NEWBORN (Check all that apply)	55. CONGENITAL ANOMALIES OF THE NEWBORN (Check all that apply)
49. BIRTHWEIGHT (grams preferred, specify unit)  _____ 9 grams 9 lb/oz _____		
50. OBSTETRIC ESTIMATE OF GESTATION:  _____ (completed weeks)		
51. APGAR SCORE: Score at 5 minutes: _____ If 5 minute score is less than 6, Score at 10 minutes: _____		
52. PLURALITY - Single, Twin, Triplet, etc. (Specify) _____		
53. IF NOT SINGLE BIRTH - Born First, Second, Third, etc. (Specify) _____	<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	<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 <input type="checkbox"/> Karyotype confirmed <input type="checkbox"/> Karyotype pending <input type="checkbox"/> Suspected chromosomal disorder <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.  
SOURCE: CDC/NCHS, National Vital Statistics System.

**Figure 2. Medical, health, and newborn sections of the 2003 U.S. Standard Certificate of Live Birth—Con.**

2007 User Guide (11). Due to the change in reporting area, marked differences in rates for some items between this and prior reports may be observed, especially for rare events (e.g., congenital anomalies).

**Results**

**Educational attainment**

The **educational attainment** item on the 2003 U.S. Standard Certificate of Live Birth asks for the highest degree or level of school completed by the mother at the time of birth (e.g., high school diploma, bachelor's degree, etc.). In 2008, 77.8 percent of women who gave birth had completed a secondary education (high school diploma or higher), and 24.5 percent had an advanced education (bachelor's degree or higher) (Table 1). Trend analysis of educational attainment for 2003–2008 is compromised by the changing composition of the reporting areas using the 2003 standard certificate. However, revised and unrevised birth certificate data as well as other sources indicate that the educational attainment of women giving birth, and of all U.S. women in general, has risen over the last few decades, although the increase has slowed somewhat over the last decade (6,7,12–14).

Maternal education has long been considered an important factor in fertility and maternal and infant health and has been shown to have a profound effect on the number of births and the risk of adverse birth outcomes. Women with higher educational attainment are more likely to desire and give birth to fewer children and are less likely to engage in behaviors detrimental to their health and pregnancy (15).

Differences among racial and Hispanic-origin groups in educational attainment are substantial for the 27-state revised area. When levels of secondary education are compared, 88.7 percent of white mothers had a high school diploma or higher compared with 77.3 percent of black and 56.3 percent of Hispanic mothers. Differences in the levels of advanced education are more pronounced; 33.9 percent of white mothers compared with 12.2 percent of black and 8.3 percent of

Hispanic mothers reported having a bachelor's degree or higher. Asian mothers had the highest level of advanced education with 55.2 percent reporting at least a bachelor's degree, whereas AIAN mothers had the lowest level, 6.0 percent (Table A). Among the specified Hispanic groups, advanced education levels ranged from 5.8 percent for Mexican mothers to 24.2 percent for Cuban mothers. For educational attainment of mother by state, see Table I-2.

**Table A. Births, by educational attainment and race and Hispanic origin of mother: Total of 27 reporting states, 2008**

Race and Hispanic origin of mother	All births	Percent	
		High school diploma or higher <sup>1</sup>	Bachelor's degree or higher <sup>2</sup>
All races and origins <sup>3</sup> . . . . .	2,748,302	77.8	24.5
Non-Hispanic:			
White <sup>4</sup> . . . . .	1,366,527	88.7	33.9
Black <sup>4</sup> . . . . .	349,243	77.3	12.2
American Indian or Alaska Native <sup>4</sup> . . . . .	16,494	69.8	6.0
Asian <sup>4</sup> . . . . .	147,132	90.9	55.2
Hispanic <sup>5</sup> . . . . .	787,484	56.3	8.3
Mexican . . . . .	529,677	51.1	5.8
Puerto Rican . . . . .	43,484	72.2	12.6
Cuban . . . . .	14,627	88.5	24.2
Central and South American . . . . .	98,171	59.0	14.6

<sup>1</sup>Includes General Educational Development.  
<sup>2</sup>Includes Bachelor of Arts, Bachelor of Science, Master of Arts, Master of Science, Doctor of Philosophy, Doctor of Education, Doctor of Medicine, Doctor of Dental Surgery, Doctor of Veterinary Medicine, Doctor of Laws, and Juris Doctor.  
<sup>3</sup>Includes other races not shown separately and origin not stated.  
<sup>4</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see "Technical Notes." Data by race are non-Hispanic and exclude mothers reporting multiple races.  
<sup>5</sup>Includes all persons of Hispanic origin of any race and of other Hispanic groups.

NOTE: Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming.

## Tobacco use during pregnancy

Information on **smoking during pregnancy** based on the 2003 revision was reported for 24 states (Florida, Georgia, and Michigan reported this information, but not in a format compatible with the U.S. standard). Women who reported smoking any number of cigarettes during any trimester of pregnancy were considered “smokers.” Results for this 24-state reporting area are not generalizable to the country as a whole because they are not a random sample of all births. These results may underestimate the prevalence of tobacco use during pregnancy because underreporting of cigarette smoking is higher among pregnant smokers than among nonpregnant smokers (16).

For the 24-state reporting area, the overall smoking rate was 9.7 percent (**Tables 2 and B**). For this reporting area in 2008, the highest rates were for AIAN (19.2 percent) and white (15.5) women. The lowest rates were observed for Mexican (1.4 percent), Asian (1.0), and Central and South American (0.7) women. Smoking rates among the three largest groups by age of mother were highest for white women under age 20 (29.2) and aged 20–24 (26.2) (**Table 2**).

Among the 24 states, three had rates greater than 20 percent (Kentucky, Vermont, and Wyoming) and five had rates under 10 percent (California, Colorado, New Mexico, New York, and Texas) (**Table I-3**). The lower maternal smoking rates in Texas and California have a large impact on the overall rate for the total reporting area. Over one-half of all births in both states were to Hispanic women and their rates of smoking during pregnancy were 1.5 percent in Texas and 0.9 percent in California (**Table I-3**). The rate for the 22 states (excluding California and Texas) was 14.2 percent, 46 percent higher than that of the full reporting area (data not shown).

Women who quit smoking during pregnancy have been shown to lower their risk of delivering preterm and small for gestational age infants (17). The revised birth certificate collects maternal smoking status by trimester of pregnancy and thus allows for a calculation of women who quit smoking. Women who reported smoking only in the first trimester, or in the first and second trimesters but not in the third trimester, were considered to have quit smoking. For more information on quitting tobacco use during pregnancy, shown here for the first time, see the “**Technical Notes**” section.

These data show that one of every five women quit smoking while pregnant in 2008. While Asian women and Hispanic women had low rates of smoking during pregnancy, those who smoked had high rates of quitting (40.2 and 31.6 percent, respectively) (**Tables 2 and B**). White women and black women had the lowest quitting rates (18.3 and 21.8 percent, respectively). Among the three largest racial and ethnic groups the highest rates of quitting were observed for the youngest women and the lowest rates for the oldest women (**Table 2**).

## Month prenatal care began

Less than three-fourths (71.0 percent) of women in the 2008 27-state reporting area began prenatal care in the first trimester of pregnancy and 7 percent of mothers began care late (third trimester) or had no prenatal care at all (**Tables 3 and C**). Timely prenatal care can improve pregnancy outcomes by assessing maternal and fetal risk, and offering advice and treatment (18). Preconception care, which promotes the health of women prior to pregnancy, is also recommended (19).

**Table B. Births, by smoking status during pregnancy and race and Hispanic origin of mother: Total of 24 reporting states, 2008**

Race and Hispanic origin of mother	All births	Smoker <sup>1</sup>	Quit smoking <sup>2</sup>
		Percent	
All races and origins <sup>3</sup> . . . . .	2,249,127	9.7	19.8
Non-Hispanic:			
White <sup>4</sup> . . . . .	1,116,123	15.5	18.3
Black <sup>4</sup> . . . . .	228,759	8.7	21.8
American Indian or Alaska Native <sup>4</sup> . . . . .	15,405	19.2	26.0
Asian <sup>4</sup> . . . . .	131,675	1.0	40.2
Hispanic <sup>5</sup> . . . . .	686,729	2.1	31.6
Mexican . . . . .	490,296	1.4	34.1
Puerto Rican . . . . .	29,926	9.2	26.9
Cuban . . . . .	2,715	6.5	31.8
Central and South American . . . . .	70,061	0.7	43.5

<sup>1</sup>Includes smoking during any trimester of pregnancy; see “Technical Notes.”

<sup>2</sup>Includes women who quit smoking in the first or second trimester of pregnancy; see “Technical Notes.”

<sup>3</sup>Includes other races not shown separately and origin not stated.

<sup>4</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see “Technical Notes.” Data by race are non-Hispanic and exclude mothers reporting multiple races.

<sup>5</sup>Includes all persons of Hispanic origin of any race and of other Hispanic groups.

NOTE: Includes California, Colorado, Delaware, Idaho, Indiana, Iowa, Kansas, Kentucky, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming.

The 2003 revision of the birth certificate introduced substantive changes to information on the timing of prenatal care (3,6). Accordingly, prenatal care data based on the 1989 and 2003 U.S. Standard Certificates of Live Birth are not directly comparable. Prenatal care data based on the revised certificate show a markedly less favorable picture of prenatal care utilization in the United States than data from the unrevised certificate. Most of the difference, however, appears to be attributable to changes in reporting and *not* to changes in prenatal care utilization. For information on how prenatal care information based on the 2003 birth certificate is collected and measured, see the “**Technical Notes**” section.

The percentage of women with timely entry into prenatal care improved in the United States during the 1990s and continued through 2003 (13). Although trend analysis of birth certificate-based prenatal care data are compromised by the changing composition of the revised and unrevised reporting areas beginning in 2003, revised data suggest that timely care has not improved in more recent years (7). Among the 22 states for which revised data are available for both 2007 and 2008, levels of first trimester care, and late and no care were essentially unchanged (**Table D**).

Early initiation into prenatal care was less common among AIAN (53.3 percent), black (60.2 percent), and Hispanic women (64.7 percent), compared with white (76.7 percent) and Asian (77.9 percent) women (**Tables 3 and C**). Among the Hispanic subgroups, levels of first trimester care ranged from 63.5 percent for Mexican women to 81.3 percent for Cuban mothers. Large differences among groups in prenatal care utilization have long been observed in earlier-year national birth certificate data (12).

By state, the percentage of mothers beginning care in the first trimester of pregnancy ranged from over 80 percent in California, New

**Table C. Selected medical and health characteristics of births, by race and Hispanic origin of mother: Total of 27 reporting states, 2008**

Race and Hispanic origin of mother	All births	Prenatal care		Method of delivery	Diabetes	
		First trimester care	Late or no care <sup>1</sup>	Primary cesarean delivery <sup>2</sup>	Prepregnancy <sup>3</sup>	Gestational <sup>4</sup>
		Percent		Per 1,000		
All races and origins <sup>5</sup>	2,748,302	71.0	7.0	23.8	6.5	40.6
Non-Hispanic:						
White <sup>6</sup>	1,366,527	76.7	4.8	24.1	5.9	39.1
Black <sup>6</sup>	349,243	60.2	11.3	26.4	9.2	34.9
American Indian or Alaska Native <sup>6</sup>	16,494	53.3	13.4	18.8	17.7	50.3
Asian <sup>6</sup>	147,132	77.9	4.7	25.0	5.9	70.6
Hispanic <sup>7</sup>	787,484	64.7	9.2	21.9	6.4	40.2
Mexican	529,677	63.5	9.6	20.0	6.6	41.3
Puerto Rican	43,484	66.7	7.8	25.8	8.4	45.8
Cuban	14,627	81.3	3.3	43.0	5.8	36.8
Central and South American	98,171	65.9	9.2	24.0	4.6	37.9

<sup>1</sup>Refers to care beginning in third trimester or no care.

<sup>2</sup>Primary cesarean rate is the number of women having a cesarean delivery per 100 births to women without a previous cesarean.

<sup>3</sup>Refers to diagnosis prior to this pregnancy.

<sup>4</sup>Refers to diagnosis in this pregnancy.

<sup>5</sup>Includes other races not shown separately and origin not stated.

<sup>6</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see "Technical Notes." Data by race are non-Hispanic and exclude mothers reporting multiple races.

<sup>7</sup>Includes all persons of Hispanic origin of any race and of other Hispanic groups.

NOTE: Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming.

Hampshire, and Vermont to less than 60 percent in Texas (**Table I-4**). In Puerto Rico, three-quarters of all mothers received timely prenatal care.

## Risk factors in this pregnancy

The 2003 revised birth certificate includes nine specific pregnancy risk factors (**Figure 2** and **Table 4**). Two items, **prepregnancy diabetes (DM)** and **gestational diabetes (GDM)**, are discussed below. Information differentiating between these different types of diabetes is new to the revised birth certificate. Both DM and GDM carry potentially serious long-term consequences for mother and newborn (20,21). The risk for poor outcomes can be moderated, however, with diagnosis and treatment (18,21,22). Preconception care is recommended for women who have or are at risk of diabetes (19).

The rate of DM—a diagnosis of glucose intolerance *prior* to pregnancy (23)—was 6.5 per 1,000 women in the 27-state reporting area. The prevalence of DM rose steadily with maternal age, from 2.3 per 1,000 mothers under age 20 to 14.9 for women aged 40 and over (**Table 4**). Among the three largest racial and ethnic groups, black women were more likely than white and Hispanic women to have DM both overall (9.2 compared with 5.9 and 6.4 per 1,000, respectively) and in all age groups. Among all racial and ethnic groups, the risk of DM was highest among AIAN mothers (17.7) (**Table C**).

GDM—diagnosis of glucose intolerance *during* pregnancy (23)—was reported at a rate of 40.6 per 1,000 or about 4 percent of all mothers in the reporting area. The risk for GDM also increased markedly with advancing maternal age (**Table 4**). Influencing the higher rates of older mothers is their greater likelihood of having a multiple

birth, as women with multiple-gestation pregnancies are more likely to develop diabetes. The higher risk of GDM among older mothers is only modestly ameliorated when only singleton births are examined, however (data not shown) (9).

Wide differences in GDM risk were also observed by race and Hispanic origin. Among the three largest racial and ethnic groups, Hispanic mothers (40.2 per 1,000) and white mothers (39.1) were more likely *overall* to develop GDM compared with black mothers (34.9). About 7 percent of Asian (70.6 per 1,000) and 5 percent of AIAN (50.3 per 1,000) women in this reporting area were diagnosed with diabetes during pregnancy (**Table C**). Among the Hispanic subgroups, Puerto Rican women were more likely to develop GDM (45.8).

Trend analysis of diabetes type is compromised by the changing composition of the revised and unrevised reporting area. Data for both the revised (*combined* DM and GDM) and unrevised (total diabetes only; diabetes type not differentiated) reporting areas suggest, however, that the overall rate of diabetes during pregnancy has been on the rise in the United States for more than a decade (7).

## Obstetric procedures

Three obstetric procedures are reported on the 2003 U.S. Standard Certificate of Live Birth: cervical cerclage, tocolysis, and external cephalic version (ECV). Cervical cerclage and ECV are unique to the 2003 revision; national data on tocolysis are available from: [http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59\\_01\\_tables.pdf#tableI06](http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_01_tables.pdf#tableI06) (2).

**Table D. Timing of prenatal care and primary cesarean and vaginal birth after previous cesarean, by race and Hispanic origin of mother: 22 (revised) states, 2007 and 2008**

[Figures are per 100 births in specified groups]

Race and Hispanic origin of mother	Timing of prenatal care			
	First trimester		Late or none <sup>1</sup>	
	2008	2007	2008	2007
All races and origins <sup>2</sup>	70.7	70.8	7.0	7.1
White <sup>3</sup>	76.2	76.3	5.0	5.0
Black <sup>3</sup>	59.0	59.0	11.7	11.8
Hispanic <sup>4</sup>	64.7	64.7	9.1	9.3

Race and Hispanic origin of mother	Method of delivery			
	Primary cesarean <sup>5</sup>		Vaginal birth after previous cesarean <sup>6</sup>	
	2008	2007	2008	2007
All races and origins <sup>2</sup>	23.6	23.4	8.0	8.3
White <sup>3</sup>	24.0	23.9	8.3	8.4
Black <sup>3</sup>	26.0	25.7	9.6	9.9
Hispanic <sup>4</sup>	21.9	21.6	7.2	7.4

<sup>1</sup>Refers to care beginning in third trimester or no care.<sup>2</sup>Includes races other than white and black and origin not stated.<sup>3</sup>Race and Hispanic origin are reported separately on birth certificates. Race categories are consistent with the 1997 Office of Management and Budget standards. Data by race are non-Hispanic and exclude mothers reporting multiple races.<sup>4</sup>Includes all persons of Hispanic origin of any race.<sup>5</sup>Primary cesarean rate is the number of women having a cesarean delivery per 100 births to women without a previous cesarean.<sup>6</sup>Vaginal birth after cesarean delivery rate is the number of women having a vaginal delivery per 100 births to women with a previous cesarean delivery.

NOTE: Data are for all reporting areas that had implemented the 2003 U.S. Standard Certificate of Live Birth as of January 1, 2007: California, Colorado, Delaware, Florida, Idaho, Indiana, Iowa, Kansas, Kentucky, Nebraska, New Hampshire, New York (excluding New York City), North Dakota, Ohio, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming.

**Cervical cerclage**—banding or suture of the cervix to prevent or treat passive dilation and avoid premature delivery (23)—was reported at a rate of 3.0 per 1,000 births (Table 5). Cervical cerclage rates rose steadily by maternal age; the rate for women aged 40–54 (5.1 per 1,000) was more than three times the rate for women under age 20 (1.5). Rates also differed by race and Hispanic origin; black women (6.8) were more than twice as likely to have cervical cerclage as white women (2.9) and four times as likely as Hispanic women (1.7) to have this procedure. Among women who had cervical cerclage, more than one-half (60.8 percent) delivered at term (37 or more completed weeks of gestation) (data not shown).

**External cephalic version (ECV)** involves external manipulation to change fetal position from nonvertex (i.e., the presenting part of the infant's body is not the upper or back part of the head) to vertex (top of the head facing in a downward position in the birth canal), so that the infant is in vertex presentation at delivery (23). ECV data for 2008 (Table 5) excludes data for Georgia, Michigan, and Ohio due to compromised data quality for these states (see "Technical Notes" for more details). ECV was performed in 2.1 per 1,000 births in the 24-state reporting area in 2008. White women were more likely to have ECV (2.5 per 1,000) compared with black (1.3) and Hispanic (1.7) women. Use of ECV increased with increasing maternal age.

More than one-half of ECVs were successful (56.7 percent). Success rates varied by maternal age; women aged 40–54 had the lowest success rates (52.3 percent). Hispanic women (69.4 percent) and black women (63.4) were more likely to have a successful ECV compared with white women (50.6). This may be related to the increased likelihood of white women to give birth at older ages (when the success

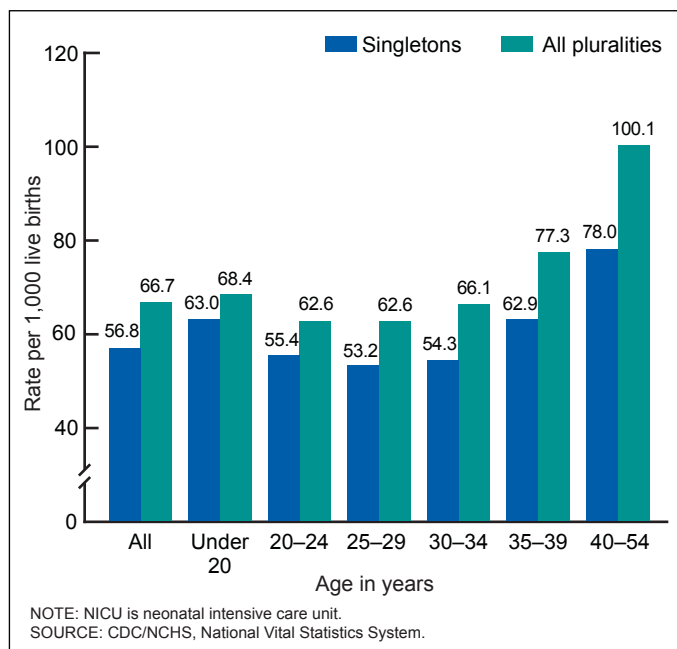
rate of ECV is lower) than black and Hispanic women (2). Women with a successful ECV were more than five times as likely to have a vaginal delivery (77.8 percent) as women with a failed ECV (14.9) (data not shown).

## Characteristics of labor and delivery

The 2003 revision of the U.S. Standard Certificate of Live Birth includes four new items (of the nine characteristics listed in Table 6): nonvertex presentation (not discussed below or shown in Table 6, see "Technical Notes"), steroids (glucocorticoids) for fetal lung maturation received by the mother prior to delivery, antibiotics received by the mother during labor, and epidural or spinal anesthesia.

Antenatal steroid treatment reduces the risk and severity of later development of respiratory distress syndrome and related complications in the infant, thus reducing infant mortality (24). **Steroids for fetal lung maturation were received by the mother prior to delivery** for 9.5 out of every 1,000 live births. Rates were highest for women aged 40–54 (14.0 per 1,000 compared with 9.1–10.4 for women under age 40). Receipt of steroids varied by race and Hispanic origin; black women (13.8 per 1,000) and white women (11.1) were more than twice as likely to receive steroids as Hispanic women (5.3). Receipt of antenatal steroids decreased with increasing gestational age; treatment rates for preterm deliveries varied by race and Hispanic origin (data not shown). For more detail and discussion on differences by gestational age and race, see "Expanded Health Data From the New Birth Certificate, 2006" (8).

**Antibiotics during labor** reduce the risk of neonatal morbidity and mortality from such complications as preterm labor, premature



**Figure 3. NICU admission, by age of mother and plurality: 27-state reporting area, 2008**

rupture of membranes (PROM), and certain infections (25,26). Just over 15 percent (156.6 per 1,000) of all mothers received antibiotics during labor. Rates of treatment ranged from 114.0 per 1,000 Hispanic mothers to 197.4 per 1,000 for black mothers. Women under age 20 were most likely to receive antibiotics in all racial and ethnic groups (Table 6).

Nearly two out of three mothers received **epidural or spinal anesthesia** for pain relief (650.9 per 1,000), with little variation among maternal age groups (Table 6). Receipt of epidural or spinal anesthesia was most common among white mothers (707.0 per 1,000), followed by black (678.8) and Hispanic (541.4) women. More detail on epidural or spinal anesthesia use among singleton vaginal deliveries is available in a recent report (27).

## Method of delivery

Three of the five checkboxes shown under method of delivery are newly reported on the 2003 U.S. Standard Certificate of Live Birth. Trial of labor attempted prior to cesarean delivery is discussed below (Table 7). Attempted but unsuccessful delivery by forceps or by vacuum extraction are new but are not discussed below and are not shown in Table 7 (see “Technical Notes”). Data on primary cesarean and vaginal birth after cesarean delivery are not comparable between the 2003 (revised) and the 1989 (unrevised) versions of the birth certificate (see “Technical Notes”).

The **primary cesarean rate** (the percentage of cesarean deliveries per 100 women without a previous cesarean) for the 27 revised states was 23.8 in 2008 (Table 8). For the 22 states with more than 1 year of revised data, the primary cesarean rate increased approximately 1 percent from 2007 to 2008 (Table D). The primary cesarean delivery rate has been increasing since the mid-1990s (13,28) and may be influenced by shifts in demographics, maternal choice, medicolegal pressures, and other nonclinical factors (29–31).

Black women in the 27-state reporting area in 2008 were more likely to have a primary cesarean (26.4 percent) compared with white women (24.1) and Hispanic women (21.9). Among the Hispanic subgroups, more than two out of five Cuban women (43.0 percent) had a primary cesarean compared with approximately one out of four Puerto Rican (25.8) and Central and South American (24.0) women and one out of five Mexican women (20.0) (Table C). Rates of primary cesarean increased with advancing maternal age, ranging from 21.0 percent for women under age 20 to 37.8 percent for women aged 40–54. Primary cesarean rates varied by state, ranging from 16.6 percent in Idaho to 28.9 percent in Florida. In 20 of the 27 revised states, at least one out of five women who had not had a prior cesarean delivered by cesarean; in 7 states, one out of four women had their first cesarean delivery (Table I–5).

In 2008, less than 1 out of 10 women with a previous cesarean (8.4 percent) had a **vaginal birth after cesarean delivery (VBAC)** in the 27 revised states (Table 8). For the 22 states that have comparable data for 2007, the overall VBAC rate decreased slightly from 8.3 percent in 2007 to 8.0 percent in 2008 (Table D). In other words, women in the 22-state reporting area who had previously delivered by cesarean had less than a 1 in 10 chance of a subsequent vaginal delivery.

VBAC rates varied with maternal age, ranging from 7.8 to 8.7 percent. Black women had the highest rate of VBAC (9.4 percent) compared with white (8.6) and Hispanic women (7.7). There was large variation in rates of VBAC by state; VBAC was nearly four times as common in Colorado (16.3 percent) as in California (4.4 percent) (see Table I–5).

The item “**trial of labor was attempted prior to cesarean delivery**” provides information on whether vaginal delivery was attempted among women who had a cesarean delivery. This topic is of interest due to the increasing cesarean delivery rate, the decreasing rate of VBAC, and the risk for ill effects on the newborn of delivery without undergoing labor (32).

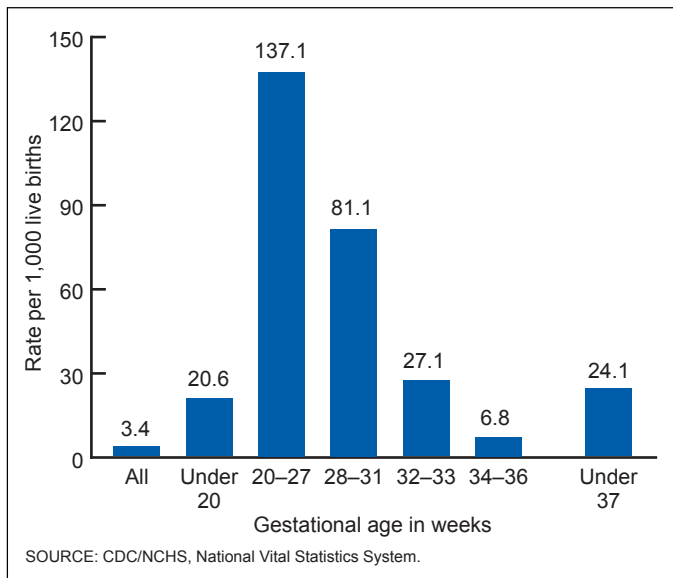
Data for the reporting area showed that just over one out of four women delivering by cesarean (26.8 percent) experienced a trial of labor (Table 7). Black women (30.2 percent) and white women (29.1) were more likely to attempt labor before a cesarean delivery than Hispanic women (21.4). Rates of attempted trial of labor generally decreased with advancing maternal age. Women under age 20 were at least twice as likely to attempt a trial of labor as women aged 35 and over (45 percent compared with approximately 19 percent).

## Abnormal conditions of the newborn

The 2003 U.S. Standard Certificate of Live Birth captures seven specific abnormal conditions of the newborn. Five of these conditions are new to the birth certificate and are discussed below (Table 9, Figures 3 and 4). All five of these conditions or treatments occur more frequently among preterm (less than 37 weeks of gestation) and low birthweight (less than 2,500 grams) infants. Accordingly, abnormal condition rates by age and race and Hispanic origin are influenced by each group’s gestational age and birthweight distributions. For gestational age and birthweight data by age and race and Hispanic origin of mother, see “Births: Final Data for 2008” (2).

Just over 4 percent (41.0 per 1,000) of all infants in the reporting area received **assisted ventilation immediately following delivery**—manual breaths with bag and mask, or bag and endotracheal tube (23). About one of every five newborns who received immediate ventilation





**Figure 4. Surfactant replacement therapy, by gestational age: 27-state reporting area, 2008**

went on to require **assisted ventilation for more than 6 hours after delivery** (8.8 per 1,000 of *all* births). Assisted ventilation is standard therapy for newborns with spontaneous breathing difficulties; assisted ventilation by mechanical means of 6 hours or more suggests an infant in severe respiratory distress.

Infants born to black mothers of all age groups were generally more likely than white infants and Hispanic infants to require ventilation therapy of both shorter and longer durations. Assisted ventilation was substantially less common among Hispanic infants (Table 9).

A **neonatal intensive care unit**, or NICU, is a facility or unit staffed and equipped to provide continuous mechanical ventilatory support for the newborn. Nearly 7 percent of newborns (66.7 per 1,000) in the 27-state reporting area were admitted to a NICU in 2008. Infants born to older mothers were most likely to receive NICU care: 10 percent of infants born to women aged 40 and over compared with 6–7 percent of infants to mothers in their 20s and 30s. The higher risk of NICU admission among older mothers is reduced, but not erased, when only singleton births are examined (Figure 3).

Differences in NICU admission were also observed by race and Hispanic origin. Overall, black infants were about 40 percent more likely than white and approximately 60 percent more likely than Hispanic infants to be admitted to a NICU (Table 9).

In 2008, 3.4 of every 1,000 infants born in the 27-state reporting area received **surfactant replacement therapy**. Surfactant replacement therapy substantially reduces morbidity and mortality among infants suffering from respiratory distress syndrome, meconium aspiration syndrome, and other pulmonary complications; such conditions are more common among preterm infants (33). The rate of surfactant use among all preterm births was 24.1 per 1,000; infants delivered at 20–27 weeks were the most likely to receive this therapy (137.1) (Figure 4).

Black infants were somewhat more likely (4.6 per 1,000) than white infants (4.1) and more than twice as likely as Hispanic infants (1.8) to receive surfactant therapy (Table 9). However, at each gestational age under 42 weeks, white infants were more likely than black

and especially Hispanic infants to receive this therapy (singletons only; data not shown).

Newborns received **antibiotics for suspected neonatal sepsis** at a rate of 17.3 per 1,000 births. This therapy is typically given for bacterial infections acquired around delivery, such as those resulting from PROM. Infants born to younger and older mothers were somewhat more likely to receive antibiotics for this purpose. By race and Hispanic origin, antibiotic treatment rates were highest among black (20.3 per 1,000) and white (19.2) infants and substantially lower among Hispanic newborns (13.4).

## Congenital anomalies

Congenital anomalies are a major cause of neonatal deaths, physical defects, and metabolic diseases in the United States (34,35). For infants born with congenital anomalies, early ascertainment and medical treatment are critical for the best outcomes (36). Information is collected on 12 congenital anomalies, 5 of which are new to the 2003 revision of the certificate. Three items are discussed below: cyanotic congenital heart disease, hypospadias, and suspected chromosomal disorder (Table 10 and Figure 2). Congenital anomalies are rare and are subject to underreporting on the birth certificate; thus, these data should be interpreted with caution (see “Technical Notes”) (37,38).

**Cyanotic congenital heart disease**, which is caused by a lack of oxygen resulting in heart malformations, was reported in 45.4 per 100,000 births. Risk increased with maternal age, affecting 38.0 per 100,000 births to mothers under 20, compared with 100.1 for births to mothers aged 40 and over. Risk was lower for Hispanic infants (25.9 per 100,000) compared with white (57.7) and black (45.6) infants (data not shown). The cause remains unknown; research on the etiology of congenital heart disease is now focused on genetic factors (35).

Overall, 40.5 per 100,000 live births were reported to have a **suspected chromosomal disorder**—malformation caused by detectable defects in chromosome structure (23). For infants born to mothers under age 35, the rates of suspected chromosomal disorder were all less than 40 per 100,000 compared with 51.2 infants born to mothers aged 35–39 and 153.6 infants born to mothers aged 40 and over. White infants had the highest risk of suspected chromosomal disorders (51.0 per 100,000) compared with black (29.6) and Hispanic (30.0) infants (data not shown).

**Hypospadias** is a malformation of the penis (23) (correctable by surgery) that occurred in 103.8 per 100,000 male births in the reporting area. Rates are lowest for births to teens and women aged 40 and over (Table 10). By race, white male infants were at higher risk of hypospadias (151.6 per 100,000) than their black (77.9) and Hispanic (44.8) counterparts (data not shown). Known risk factors for hypospadias include primiparity and high body mass index (39).

## Comments

This report serves as a supplement to “Births: Final Data for 2008” by presenting data for items that are exclusive to the 2003 U.S. Standard Certificate of Live Birth and also key items considered not comparable between the 2003 and 1989 birth certificates. These data now encompass a 27-state reporting area and include nearly

two-thirds (65 percent) of all U.S. births, allowing for analysis of smaller, more specific racial and ethnic groups such as AIAN and Asian women as well as Hispanic subgroups. This report illustrates, for example, the large differences seen by race and Hispanic origin in educational attainment, tobacco use during pregnancy, initiation of prenatal care, and in the receipt of many procedures and treatments used to prevent or ameliorate the effect of preterm delivery.

The 2003 version of the birth certificate captures tobacco use in each of the three trimesters of pregnancy, making it possible to determine whether a woman quit smoking during the course of her pregnancy. The 2008 data year is the first for which these data have been reported and shows that overall, about one out of five smokers in the 24-state reporting area quit during pregnancy; white women were the least likely to quit (18 percent) smoking during pregnancy. Quitting smoking during pregnancy can lead to lower risk of poor outcomes for the infant compared with women who smoke throughout pregnancy (17). Information on which groups are most likely to smoke and least likely to quit may help focus antismoking efforts on those who need the most help.

Also new to this report is the presentation of rates of DM and GDM for AIAN and Asian women, as well as the Hispanic subgroups in the 27-state reporting area (Table C). These data show that nearly 2 percent of AIAN women have DM compared with less than 1 percent for all other groups. AIAN women also had comparatively high rates (5 percent) of GDM compared with other race and Hispanic groups (3.5–4.6 percent); Asian women had the highest rates of GDM (7 percent). Births to women with DM and GDM are more likely to be high risk with long-term consequences (20,21); having more information about which groups are most affected may help direct efforts to ameliorate poor outcomes.

Although nearly two-thirds of all U.S. births are reported using the revised birth certificate, births in this reporting area are not a random sample and results are not generalizable to the entire United States. In particular, the racial and ethnic composition of the revised reporting area differs significantly from the country as a whole (Table II). Hispanic persons are overrepresented in the revised reporting area (28.9 percent compared with 24.7 for the entire United States). Further, the composition of the Hispanic population differs from the United States. Whereas the Mexican population of the revised reporting area is more comparable to that of the United States than in past years (8), there continue to be relatively fewer Hispanic persons of Puerto Rican (5.5 percent compared with 6.6) and Central and South American (12.5 percent compared with 14.9) origins in the overall population than in the 27-state reporting area.

Comparison of these vital statistics data with other data sources yields varied results. For example, the level of epidural/spinal anesthesia use reported in the 27-state reporting area is 61 percent (ranging by state from 22 to 78 percent (data not shown) (26); this is consistent with rates based on other sources (40–43). Similarly, results for GDM for the revised reporting area (4.1 percent) are also comparable with other sources of data (44–46). Rates of some variables, however, such as hypospadias, are lower than results from other sources (103.8 per 100,000 male deliveries compared with 360–760 per 100,000) (47–48). Comparable data sources are not available for a number of items, such as cyanotic congenital heart disease, assisted ventilation, and cervical cerclage. Studies designed to assess the quality of these data are ongoing.

Another limitation of these data is that analysis of year-to-year trends for the items included in this report is not possible due to the changing reporting area. It is also important to note that five reporting areas (five states and New York City) implemented the 2003 birth certificate in 2008 and are reporting revised data for the first time. Due to 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.

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**Table 1. Educational attainment of mother, by age and Hispanic origin and race of mother: Total of 27 reporting states, 2008**

Educational attainment and race and Hispanic origin of mother	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years
<b>All races<sup>1</sup></b>				<b>Percent</b>			
Total . . . . .	100.0	100.0	100.0	100.0	100.0	100.0	100.0
12th grade or less with no diploma . . . . .	22.2	57.5	25.6	17.3	13.5	13.1	14.7
High school graduate <sup>2</sup> . . . . .	27.0	33.7	39.5	25.6	17.8	16.7	17.8
Some college credit, but no degree . . . . .	19.6	8.5	25.8	22.2	17.0	15.5	15.5
Associate's degree <sup>3</sup> . . . . .	6.8	0.3	4.7	8.9	8.5	8.5	8.2
Bachelor's degree <sup>4</sup> . . . . .	16.3	0.0	4.1	19.4	26.9	27.5	25.8
Master's degree <sup>5</sup> . . . . .	6.4	*	0.3	5.6	12.8	13.9	12.6
Doctorate or professional degree <sup>6</sup> . . . . .	1.8	*	0.0	1.0	3.5	4.8	5.3
				<b>Number</b>			
All births . . . . .	2,748,302	289,202	684,971	769,935	613,235	316,488	74,471
Not stated <sup>7</sup> . . . . .	52,906	4,488	11,131	14,108	12,984	7,736	2,459
<b>White<sup>8</sup></b>				<b>Percent</b>			
Total . . . . .	100.0	100.0	100.0	100.0	100.0	100.0	100.0
12th grade or less with no diploma . . . . .	11.3	50.0	17.2	7.2	3.7	3.2	3.7
High school graduate <sup>2</sup> . . . . .	24.7	39.1	40.7	23.0	14.3	13.4	14.7
Some college credit, but no degree . . . . .	21.4	10.5	29.5	23.9	17.5	16.1	16.4
Associate's degree <sup>3</sup> . . . . .	8.7	0.4	6.4	11.2	10.0	9.6	9.3
Bachelor's degree <sup>4</sup> . . . . .	22.5	*	5.7	26.1	34.0	34.0	32.7
Master's degree <sup>5</sup> . . . . .	9.1	*	0.4	7.4	16.5	17.9	16.5
Doctorate or professional degree <sup>6</sup> . . . . .	2.3	–	0.0	1.3	4.0	5.7	6.7
				<b>Number</b>			
All births . . . . .	1,366,527	103,622	313,625	404,436	333,446	171,589	39,809
Not stated <sup>7</sup> . . . . .	9,276	707	1,851	2,443	2,358	1,446	471
<b>Black<sup>8</sup></b>				<b>Percent</b>			
Total . . . . .	100.0	100.0	100.0	100.0	100.0	100.0	100.0
12th grade or less with no diploma . . . . .	22.7	55.4	20.5	15.3	12.0	11.4	13.9
High school graduate <sup>2</sup> . . . . .	34.7	34.9	42.9	32.5	27.4	25.7	27.1
Some college credit, but no degree . . . . .	24.6	9.4	29.7	28.9	25.5	22.4	20.8
Associate's degree <sup>3</sup> . . . . .	5.9	0.2	3.7	8.0	9.6	10.2	10.0
Bachelor's degree <sup>4</sup> . . . . .	8.4	*	3.0	11.7	16.3	18.4	16.7
Master's degree <sup>5</sup> . . . . .	3.1	*	0.2	3.1	7.5	9.5	9.2
Doctorate or professional degree <sup>6</sup> . . . . .	0.6	*	0.0	0.5	1.6	2.4	2.4
				<b>Number</b>			
All births . . . . .	349,243	58,110	109,188	88,153	56,649	29,446	7,697
Not stated <sup>7</sup> . . . . .	4,175	627	1,136	1,035	787	456	134

See footnotes at end of table.

**Table 1. Educational attainment of mother, by age and Hispanic origin and race of mother: Total of 27 reporting states, 2008—Con.**

Educational attainment and race and Hispanic origin of mother	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years
Hispanic <sup>9</sup>				Percent			
Total . . . . .	100.0	100.0	100.0	100.0	100.0	100.0	100.0
12th grade or less with no diploma . . . . .	43.7	65.9	40.8	39.4	39.2	40.1	43.3
High school graduate <sup>2</sup> . . . . .	29.2	27.9	36.2	29.0	24.1	22.4	21.9
Some college credit, but no degree . . . . .	14.9	6.0	18.2	17.2	14.7	13.2	12.8
Associate's degree <sup>3</sup> . . . . .	3.8	0.2	2.8	5.1	5.5	5.4	5.0
Bachelor's degree <sup>4</sup> . . . . .	6.1	0.0	1.8	7.5	11.5	12.5	11.0
Master's degree <sup>5</sup> . . . . .	1.7	*	0.1	1.5	3.9	4.9	4.3
Doctorate or professional degree <sup>6</sup> . . . . .	0.5	*	0.0	0.3	1.1	1.6	1.8
				Number			
All births . . . . .	787,484	112,705	221,920	210,785	150,512	74,250	17,312
Not stated <sup>7</sup> . . . . .	12,437	1,555	3,260	3,366	2,549	1,331	376

0.0 Quantity more than zero but less than 0.5.

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

– Quantity zero.

<sup>1</sup>Includes other races not shown and origin not stated.<sup>2</sup>Includes General Educational Development.<sup>3</sup>Includes Associate in Arts and Associate in Science.<sup>4</sup>Includes Bachelor of Arts and Bachelor of Science.<sup>5</sup>Includes Master of Arts and Master of Science.<sup>6</sup>Includes Doctor of Philosophy, Doctor of Education, Doctor of Medicine, Doctor of Dental Surgery, Doctor of Veterinary Medicine, Doctor of Laws, and Juris Doctor.<sup>7</sup>No response reported for education attainment of mother item; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 U.S. Standard Certificate of Live Birth.<sup>8</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see "Technical Notes." Data by race are non-Hispanic and exclude mothers reporting multiple races.<sup>9</sup>Includes all persons of Hispanic origin of any race.

NOTES: Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. Births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth (0.6 percent) are included in the "not stated" category. See "Technical Notes."

**Table 2. Smoking during pregnancy, by age and race and Hispanic origin of mother: Total of 24 reporting states, 2008**

Smoking status and race and Hispanic origin of mother	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years
Smoked during pregnancy							
All races <sup>1</sup>							
Percent							
Smoked during pregnancy . . . . .	9.7	13.0	15.0	9.7	5.6	4.9	4.6
Number							
Total births . . . . .	2,249,127	235,109	556,565	630,201	504,994	260,671	61,587
Smokers <sup>2</sup> . . . . .	215,546	30,097	82,138	60,006	27,861	12,635	2,809
Not stated <sup>3</sup> . . . . .	36,348	3,545	8,577	10,142	8,371	4,540	1,173
White <sup>4</sup>							
Percent							
Smoked during pregnancy . . . . .	15.5	29.2	26.2	14.5	8.0	7.1	6.6
Number							
Total birth . . . . .	1,116,123	83,301	254,544	330,778	273,916	140,859	32,725
Smokers <sup>2</sup> . . . . .	171,488	24,149	66,044	47,531	21,706	9,920	2,138
Not stated <sup>3</sup> . . . . .	7,928	699	2,069	2,394	1,708	864	194
Black <sup>4</sup>							
Percent							
Smoked during pregnancy . . . . .	8.7	5.7	10.0	10.4	8.1	6.8	6.3
Number							
Total birth . . . . .	228,759	37,669	71,763	57,782	37,137	19,291	5,117
Smokers <sup>2</sup> . . . . .	19,731	2,121	7,117	5,910	2,966	1,298	319
Not stated <sup>3</sup> . . . . .	2,736	442	866	692	438	230	68
Hispanic <sup>5</sup>							
Percent							
Smoked during pregnancy . . . . .	2.1	2.1	2.7	2.1	1.4	1.3	1.3
Number							
Total birth . . . . .	686,729	101,378	195,032	183,060	129,096	63,273	14,890
Smokers <sup>2</sup> . . . . .	13,926	2,147	5,229	3,793	1,773	800	184
Not stated <sup>3</sup> . . . . .	9,453	1,401	2,654	2,511	1,727	910	250
Quit smoking							
All races <sup>1</sup>							
Percent							
Quit smoking . . . . .	19.8	23.2	20.2	19.1	18.6	17.0	13.9
Number							
Smokers <sup>2</sup> . . . . .	215,546	30,097	82,138	60,006	27,861	12,635	2,809
Quitters <sup>5</sup> . . . . .	42,627	6,966	16,550	11,426	5,155	2,140	390
Unknown if quit . . . . .	512	71	167	141	80	42	11
White <sup>4</sup>							
Percent							
Quit smoking . . . . .	18.3	20.9	18.5	17.7	17.3	16.0	12.8
Number							
Smokers <sup>2</sup> . . . . .	171,488	24,149	66,044	47,531	21,706	9,920	2,138
Quitters <sup>5</sup> . . . . .	31,278	5,039	12,214	8,417	3,750	1,585	273
Unknown if quit . . . . .	278	46	87	81	38	20	6
Black <sup>4</sup>							
Percent							
Quit smoking . . . . .	21.8	28.1	23.6	20.7	18.5	15.9	13.3
Number							
Smokers <sup>2</sup> . . . . .	19,731	2,121	7,117	5,910	2,966	1,298	319
Quitters <sup>5</sup> . . . . .	4,275	593	1,674	1,218	544	204	42
Unknown if quit . . . . .	99	7	32	22	21	14	3

See footnotes at end of table.

**Table 2. Smoking during pregnancy, by age and race and Hispanic origin of mother: Total of 24 reporting states, 2008—Con.**

Smoking status and race and Hispanic origin of mother	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years
				Quit smoking			
Hispanic <sup>5</sup>				Percent			
Quit smoking . . . . .	31.6	37.8	32.4	29.7	28.8	26.3	24.0
				Number			
Smokers <sup>2</sup> . . . . .	13,926	2,147	5,229	3,793	1,773	800	184
Quitters <sup>6</sup> . . . . .	4,375	808	1,684	1,122	508	209	44
Unknown if quit . . . . .	68	8	25	17	12	5	1

<sup>1</sup>Includes other races not shown and origin not stated.

<sup>2</sup>Includes smoking during any trimester of pregnancy; see "Technical Notes."

<sup>3</sup>No response reported for smoking during pregnancy item; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 U.S. Standard Certificate of Live Birth.

<sup>4</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see "Technical Notes." Data by race are non-Hispanic and exclude mothers reporting multiple races.

<sup>5</sup>Includes all persons of Hispanic origin of any race.

<sup>6</sup>Includes women who quit smoking in the first or second trimester of pregnancy; see "Technical Notes."

NOTES: Includes California, Colorado, Delaware, Idaho, Indiana, Iowa, Kansas, Kentucky, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. Births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth (0.7 percent) are included in the "not stated" category. See "Technical Notes."



**Table 3. Month prenatal care began, by age and race and Hispanic origin of mother: Total of 27 reporting states, 2008**

Month care began and race and Hispanic origin of mother	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years
<b>All races<sup>1</sup></b>				<b>Percent</b>			
1st trimester . . . . .	71.0	54.0	63.2	73.9	79.1	79.2	76.2
2nd trimester . . . . .	22.0	34.0	27.7	20.0	16.1	16.1	18.3
Late or no care . . . . .	7.0	12.0	9.1	6.1	4.8	4.7	5.5
3rd trimester . . . . .	5.1	8.9	6.7	4.4	3.4	3.3	3.9
No care . . . . .	1.9	3.0	2.4	1.7	1.4	1.4	1.6
				<b>Number</b>			
Total . . . . .	2,748,302	289,202	684,971	769,935	613,235	316,488	74,471
Not stated <sup>2</sup> . . . . .	178,325	20,067	44,692	47,717	39,013	21,586	5,250
<b>White<sup>3</sup></b>				<b>Percent</b>			
1st trimester . . . . .	76.7	59.3	67.5	79.0	84.0	83.8	80.5
2nd trimester . . . . .	18.5	32.0	25.6	16.7	12.9	13.0	15.4
Late or no care . . . . .	4.8	8.7	6.9	4.3	3.2	3.2	4.1
3rd trimester . . . . .	3.7	7.0	5.5	3.2	2.3	2.3	3.0
No care . . . . .	1.1	1.7	1.5	1.0	0.8	0.9	1.2
				<b>Number</b>			
Total . . . . .	1,366,527	103,622	313,625	404,436	333,446	171,589	39,809
Not stated <sup>2</sup> . . . . .	62,119	4,687	13,807	17,117	15,573	8,781	2,154
<b>Black<sup>3</sup></b>				<b>Percent</b>			
1st trimester . . . . .	60.2	47.7	56.4	64.8	68.3	68.4	65.0
2nd trimester . . . . .	28.4	37.2	31.3	25.3	22.4	22.4	24.6
Late or no care . . . . .	11.3	5.1	12.2	9.9	9.3	9.2	10.4
3rd trimester . . . . .	7.7	10.6	8.2	6.7	6.3	5.9	6.5
No care . . . . .	3.7	4.5	4.0	3.2	3.0	3.3	4.0
				<b>Number</b>			
Total . . . . .	349,243	58,110	109,188	88,153	56,649	29,446	7,697
Not stated <sup>2</sup> . . . . .	36,838	6,464	11,455	9,003	5,929	3,175	812
<b>Hispanic<sup>4</sup></b>				<b>Percent</b>			
1st trimester . . . . .	64.7	52.6	60.7	67.6	71.3	71.4	69.7
2nd trimester . . . . .	26.1	34.1	28.7	24.3	21.7	21.5	23.1
Late or no care . . . . .	9.2	13.3	10.6	8.1	7.0	7.0	7.2
3rd trimester . . . . .	6.6	9.7	7.6	5.7	4.9	4.9	5.2
No care . . . . .	2.7	3.6	3.0	2.4	2.1	2.1	2.0
				<b>Number</b>			
Total . . . . .	787,484	112,705	221,920	210,785	150,512	74,250	17,312
Not stated <sup>2</sup> . . . . .	50,508	7,057	14,368	13,554	9,423	4,946	1,160

<sup>1</sup>Includes other races not shown and origin not stated.<sup>2</sup>No response reported for timing of prenatal care; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 U.S. Standard Certificate of Live Birth.<sup>3</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see "Technical Notes." Data by race are non-Hispanic and exclude mothers reporting multiple races.<sup>4</sup>Includes all persons of Hispanic origin of any race.

NOTES: Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. Births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth (0.6 percent) are included in the "not stated" category. See "Technical Notes."

**Table 4. Pregnancy risk factors, by age and race and Hispanic origin of mother: Total of 27 reporting states, 2008**

[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 <sup>1</sup>	Factor reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated <sup>2</sup>
All races <sup>3</sup>			Per 1,000							
Diabetes										
<b>Prepregnancy (diagnosis prior to this pregnancy) . . .</b>	<b>2,748,302</b>	<b>17,688</b>	<b>6.5</b>	<b>2.3</b>	<b>4.2</b>	<b>6.1</b>	<b>8.3</b>	<b>11.3</b>	<b>14.9</b>	<b>38,770</b>
<b>Gestational (diagnosis in this pregnancy) . . . . .</b>	<b>2,748,302</b>	<b>110,140</b>	<b>40.6</b>	<b>12.7</b>	<b>23.7</b>	<b>38.5</b>	<b>54.2</b>	<b>70.6</b>	<b>88.6</b>	<b>38,770</b>
Hypertension										
Prepregnancy (chronic) . . . . .	2,748,302	29,989	11.1	4.5	6.8	10.0	13.6	19.4	30.6	38,770
Gestational (PIH, preeclampsia) . . . . .	2,748,302	104,850	38.7	41.3	38.0	37.8	37.0	40.7	50.2	38,770
Eclampsia <sup>4</sup> . . . . .	2,128,437	3,818	1.8	2.6	1.9	1.6	1.6	1.8	2.2	30,752
Previous preterm birth . . . . .	2,748,302	50,575	18.7	6.4	17.1	20.6	21.0	23.0	23.5	38,770
Other previous poor pregnancy outcome . . . . .	2,748,302	50,811	18.8	6.7	15.1	19.2	22.1	27.0	32.5	38,770
Mother had a previous cesarean delivery <sup>5</sup> . . . . .	1,782,194	346,180	196.4	117.8	163.4	184.0	214.8	247.5	254.7	19,811
White <sup>6</sup>										
Diabetes										
<b>Prepregnancy (diagnosis prior to this pregnancy) . . .</b>	<b>1,366,527</b>	<b>7,979</b>	<b>5.9</b>	<b>2.3</b>	<b>4.3</b>	<b>5.6</b>	<b>6.9</b>	<b>8.5</b>	<b>10.4</b>	<b>8,697</b>
<b>Gestational (diagnosis in this pregnancy) . . . . .</b>	<b>1,366,527</b>	<b>53,107</b>	<b>39.1</b>	<b>15.0</b>	<b>25.3</b>	<b>36.6</b>	<b>47.3</b>	<b>60.7</b>	<b>74.6</b>	<b>8,697</b>
Hypertension										
Prepregnancy (chronic) . . . . .	1,366,527	15,902	11.7	5.1	7.5	10.7	13.8	18.3	27.0	8,697
Gestational (PIH, preeclampsia) . . . . .	1,366,527	59,692	44.0	47.2	45.0	44.6	40.7	43.2	52.5	8,697
Eclampsia <sup>4</sup> . . . . .	947,743	1,905	2.0	2.7	2.2	1.9	1.8	2.0	2.4	6,995
Previous preterm birth . . . . .	1,366,527	28,742	21.2	7.0	19.2	22.3	23.1	25.6	26.6	8,697
Other previous poor pregnancy outcome . . . . .	1,366,527	31,636	23.3	8.5	18.4	22.6	26.3	32.9	40.5	8,697
Mother had a previous cesarean delivery <sup>5</sup> . . . . .	871,960	165,349	190.4	105.2	153.0	172.2	206.3	242.8	252.6	3,396
Black <sup>6</sup>										
Diabetes										
<b>Prepregnancy (diagnosis prior to this pregnancy) . . .</b>	<b>349,243</b>	<b>3,139</b>	<b>9.2</b>	<b>2.8</b>	<b>5.5</b>	<b>9.2</b>	<b>14.0</b>	<b>21.9</b>	<b>26.4</b>	<b>8,702</b>
<b>Gestational (diagnosis in this pregnancy) . . . . .</b>	<b>349,243</b>	<b>11,892</b>	<b>34.9</b>	<b>11.5</b>	<b>20.9</b>	<b>37.7</b>	<b>54.9</b>	<b>72.2</b>	<b>88.1</b>	<b>8,702</b>
Hypertension										
Prepregnancy (chronic) . . . . .	349,243	7,749	22.8	7.5	11.8	22.2	36.0	54.2	81.3	8,702
Gestational (PIH, preeclampsia) . . . . .	349,243	16,738	49.2	48.9	44.7	47.5	54.1	57.5	64.9	8,702
Eclampsia <sup>4</sup> . . . . .	259,004	761	3.0	3.9	2.9	2.6	2.8	3.5	3.8	8,292
Previous preterm birth . . . . .	349,243	9,599	28.2	9.0	24.7	35.2	36.6	39.4	35.4	8,702
Other previous poor pregnancy outcome . . . . .	349,243	8,064	23.7	9.0	20.6	27.8	31.5	33.6	35.2	8,702
Mother had a previous cesarean delivery <sup>5</sup> . . . . .	228,425	44,549	198.1	125.4	176.4	198.8	219.0	249.6	248.8	3,523
Hispanic <sup>7</sup>										
Diabetes										
<b>Prepregnancy (diagnosis prior to this pregnancy) . . .</b>	<b>787,484</b>	<b>5,003</b>	<b>6.4</b>	<b>1.8</b>	<b>3.3</b>	<b>5.7</b>	<b>10.0</b>	<b>14.0</b>	<b>20.4</b>	<b>5,195</b>
<b>Gestational (diagnosis in this pregnancy) . . . . .</b>	<b>787,484</b>	<b>31,442</b>	<b>40.2</b>	<b>11.1</b>	<b>22.0</b>	<b>38.6</b>	<b>61.4</b>	<b>84.1</b>	<b>110.2</b>	<b>5,195</b>
Hypertension										
Prepregnancy (chronic) . . . . .	787,484	4,588	5.9	2.6	3.6	4.9	8.1	12.0	22.2	5,195
Gestational (PIH, preeclampsia) . . . . .	787,484	22,350	28.6	32.3	26.5	24.9	28.7	34.9	46.2	5,195
Eclampsia <sup>4</sup> . . . . .	721,835	942	1.3	2.0	1.3	1.0	1.2	1.5	1.5	4,736
Previous preterm birth . . . . .	787,484	9,136	11.7	4.4	10.7	13.4	14.3	14.8	15.4	5,195
Other previous poor pregnancy outcome . . . . .	787,484	7,933	10.1	3.7	8.1	11.0	13.0	16.1	17.4	5,195
Mother had a previous cesarean delivery <sup>5</sup> . . . . .	533,199	109,848	207.0	127.0	174.2	201.2	233.6	260.7	266.2	2,618

<sup>1</sup>Refers to total number of births to residents of areas reporting specified pregnancy risk factor.<sup>2</sup>No response reported for pregnancy risk factor item; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 U.S. Standard Certificate of Live Birth.<sup>3</sup>Includes other races not shown and origin not stated.<sup>4</sup>Excludes data for Idaho, Kentucky, Michigan, Nebraska, New York City, Pennsylvania, South Carolina, Tennessee, and Washington, which did not report eclampsia.<sup>5</sup>Excludes women who have not had a previous pregnancy and for whom total birth order is unknown.<sup>6</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see "Technical Notes." Data by race are non-Hispanic and exclude mothers reporting multiple races.<sup>7</sup>Includes all persons of Hispanic origin of any race.

NOTES: PIH is pregnancy-induced hypertension. Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. Births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth (0.6 percent) are included in the "not stated" category. See "Technical Notes."

**Table 5. Obstetric procedures, by age and race and Hispanic origin of mother: Total of 27 reporting states, 2008**

[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 <sup>1</sup>	Procedure reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated <sup>2</sup>
All races <sup>3</sup>										
<b>Cervical cerclage</b> . . . . .	<b>2,748,302</b>	<b>8,201</b>	<b>3.0</b>	<b>1.5</b>	<b>2.2</b>	<b>3.0</b>	<b>3.6</b>	<b>4.8</b>	<b>5.1</b>	<b>50,668</b>
Tocolysis . . . . .	2,748,302	28,482	10.6	11.2	10.7	10.3	10.5	10.4	10.7	50,668
<b>External cephalic version<sup>4</sup></b> . . . . .	<b>2,331,751</b>	<b>4,845</b>	<b>2.1</b>	<b>1.5</b>	<b>1.8</b>	<b>2.1</b>	<b>2.4</b>	<b>2.5</b>	<b>3.1</b>	<b>20,471</b>
<b>Percent successful<sup>5</sup></b> . . . . .	<b>2,331,751</b>	<b>2,745</b>	<b>56.7</b>	<b>58.5</b>	<b>60.8</b>	<b>55.7</b>	<b>55.8</b>	<b>54.1</b>	<b>52.3</b>	<b>20,471</b>
White <sup>6</sup>										
<b>Cervical cerclage</b> . . . . .	<b>1,366,527</b>	<b>3,985</b>	<b>2.9</b>	<b>1.5</b>	<b>2.1</b>	<b>2.8</b>	<b>3.3</b>	<b>4.8</b>	<b>4.7</b>	<b>14,020</b>
Tocolysis . . . . .	1,366,527	16,773	12.4	14.6	13.0	12.1	12.0	11.5	12.1	14,020
<b>External cephalic version<sup>4</sup></b> . . . . .	<b>1,110,125</b>	<b>2,754</b>	<b>2.5</b>	<b>1.7</b>	<b>2.1</b>	<b>2.5</b>	<b>2.8</b>	<b>2.9</b>	<b>3.5</b>	<b>4,106</b>
<b>Percent successful<sup>5</sup></b> . . . . .	<b>1,110,125</b>	<b>1,393</b>	<b>50.6</b>	<b>44.1</b>	<b>50.9</b>	<b>49.1</b>	<b>52.0</b>	<b>52.3</b>	<b>51.3</b>	<b>4,106</b>
Black <sup>6</sup>										
<b>Cervical cerclage</b> . . . . .	<b>349,243</b>	<b>2,295</b>	<b>6.8</b>	<b>3.0</b>	<b>4.4</b>	<b>7.4</b>	<b>10.3</b>	<b>13.5</b>	<b>12.7</b>	<b>12,200</b>
Tocolysis . . . . .	349,243	4,441	13.2	14.3	13.1	12.8	12.9	13.2	12.9	12,200
<b>External cephalic version<sup>4</sup></b> . . . . .	<b>256,544</b>	<b>322</b>	<b>1.3</b>	<b>1.0</b>	<b>1.2</b>	<b>1.1</b>	<b>1.4</b>	<b>1.6</b>	<b>*</b>	<b>728</b>
<b>Percent successful<sup>5</sup></b> . . . . .	<b>256,544</b>	<b>204</b>	<b>63.4</b>	<b>75.6</b>	<b>60.0</b>	<b>64.9</b>	<b>59.0</b>	<b>58.3</b>	<b>*</b>	<b>728</b>
Hispanic <sup>7</sup>										
<b>Cervical cerclage</b> . . . . .	<b>787,484</b>	<b>1,344</b>	<b>1.7</b>	<b>0.9</b>	<b>1.4</b>	<b>1.8</b>	<b>2.2</b>	<b>2.5</b>	<b>2.7</b>	<b>7,461</b>
Tocolysis . . . . .	787,484	4,903	6.3	6.5	6.0	6.1	6.4	6.9	6.4	7,461
<b>External cephalic version<sup>4</sup></b> . . . . .	<b>745,834</b>	<b>1,278</b>	<b>1.7</b>	<b>1.4</b>	<b>1.6</b>	<b>1.7</b>	<b>1.9</b>	<b>2.0</b>	<b>2.5</b>	<b>2,478</b>
<b>Percent successful<sup>5</sup></b> . . . . .	<b>745,834</b>	<b>887</b>	<b>69.4</b>	<b>64.9</b>	<b>73.7</b>	<b>70.0</b>	<b>67.5</b>	<b>69.3</b>	<b>58.5</b>	<b>2,478</b>

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

<sup>1</sup>Refers to total number of births to residents of areas reporting specified obstetric procedure.<sup>2</sup>No response reported for obstetric procedure item; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 U.S. Standard Certificate of Live Birth.<sup>3</sup>Includes other races not shown and origin not stated.<sup>4</sup>Excludes data for Georgia, Ohio, and Michigan (see "Technical Notes").<sup>5</sup>Refers to the number of successful external cephalic versions (ECVs) per 100 live births to women with an attempted ECV in specified group.<sup>6</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see "Technical Notes." Data by race are non-Hispanic and exclude mothers reporting multiple races.<sup>7</sup>Includes all persons of Hispanic origin of any race.

NOTES: Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. Births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth (0.6 percent) are included in the "not stated" category. See "Technical Notes."

**Table 6. Characteristics of labor and delivery, by age and race and Hispanic origin of mother: Total of 27 reporting states, 2008**

[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 <sup>1</sup>	Characteristic reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated <sup>2</sup>
All races <sup>3</sup>										
Induction of labor . . . . .	2,748,302	625,402	230.5	249.7	243.2	237.4	217.8	202.2	191.6	34,786
Augmentation of labor . . . . .	2,748,302	547,253	201.7	254.0	224.3	203.2	180.0	157.7	139.2	34,786
<b>Steroids (glucocorticoids) for fetal lung maturation . . .</b>	<b>2,748,302</b>	<b>25,798</b>	<b>9.5</b>	<b>10.1</b>	<b>9.1</b>	<b>9.2</b>	<b>9.1</b>	<b>10.4</b>	<b>14.0</b>	<b>34,786</b>
<b>Antibiotics received by mother during labor . . . . .</b>	<b>2,748,302</b>	<b>424,901</b>	<b>156.6</b>	<b>172.3</b>	<b>160.1</b>	<b>154.4</b>	<b>152.3</b>	<b>150.0</b>	<b>149.2</b>	<b>34,786</b>
Clinical chorioamnionitis during labor . . . . .	2,748,302	28,562	10.5	15.2	11.6	10.1	9.3	8.3	7.2	34,786
Moderate/heavy meconium staining of amniotic fluid . . . . .	2,748,302	115,913	42.7	47.7	44.1	42.4	40.9	40.0	40.5	34,786
Fetal intolerance of labor . . . . .	2,748,302	126,188	46.5	55.1	47.5	44.9	43.9	44.7	48.7	34,786
<b>Epidural or spinal anesthesia during labor . . . . .</b>	<b>2,748,302</b>	<b>1,766,290</b>	<b>650.9</b>	<b>657.0</b>	<b>644.6</b>	<b>646.6</b>	<b>656.8</b>	<b>659.2</b>	<b>647.1</b>	<b>34,786</b>
White <sup>4</sup>										
Induction of labor . . . . .	1,366,527	377,696	277.8	326.6	304.0	287.2	256.8	233.9	215.6	7,130
Augmentation of labor . . . . .	1,366,527	286,557	210.8	275.0	241.3	216.7	187.5	163.3	143.2	7,130
<b>Steroids (glucocorticoids) for fetal lung maturation . . .</b>	<b>1,366,527</b>	<b>15,085</b>	<b>11.1</b>	<b>12.8</b>	<b>10.9</b>	<b>10.9</b>	<b>10.3</b>	<b>11.4</b>	<b>15.2</b>	<b>7,130</b>
<b>Antibiotics received by mother during labor . . . . .</b>	<b>1,366,527</b>	<b>234,964</b>	<b>172.8</b>	<b>191.1</b>	<b>174.8</b>	<b>171.5</b>	<b>170.5</b>	<b>167.5</b>	<b>165.2</b>	<b>7,130</b>
Clinical chorioamnionitis during labor . . . . .	1,366,527	12,067	8.9	11.9	9.6	8.8	8.3	7.5	7.3	7,130
Moderate/heavy meconium staining of amniotic fluid . . . . .	1,366,527	51,959	38.2	41.2	38.7	37.6	37.9	37.7	37.9	7,130
Fetal intolerance of labor . . . . .	1,366,527	68,267	50.2	63.5	53.1	49.1	46.5	46.7	50.3	7,130
<b>Epidural or spinal anesthesia during labor . . . . .</b>	<b>1,366,527</b>	<b>961,070</b>	<b>707.0</b>	<b>741.5</b>	<b>709.2</b>	<b>702.2</b>	<b>705.4</b>	<b>702.6</b>	<b>680.7</b>	<b>7,130</b>
Black <sup>4</sup>										
Induction of labor . . . . .	349,243	72,907	213.1	228.8	217.3	213.3	203.9	188.7	194.7	7,169
Augmentation of labor . . . . .	349,243	70,389	205.8	258.8	223.8	196.5	170.2	148.3	137.9	7,169
<b>Steroids (glucocorticoids) for fetal lung maturation . . .</b>	<b>349,243</b>	<b>4,716</b>	<b>13.8</b>	<b>13.5</b>	<b>12.6</b>	<b>13.1</b>	<b>14.4</b>	<b>17.7</b>	<b>20.9</b>	<b>7,169</b>
<b>Antibiotics received by mother during labor . . . . .</b>	<b>349,243</b>	<b>67,534</b>	<b>197.4</b>	<b>225.2</b>	<b>208.1</b>	<b>188.3</b>	<b>178.9</b>	<b>173.3</b>	<b>169.6</b>	<b>7,169</b>
Clinical chorioamnionitis during labor . . . . .	349,243	3,679	10.8	14.9	11.9	9.3	8.3	8.5	6.1	7,169
Moderate/heavy meconium staining of amniotic fluid . . . . .	349,243	18,179	53.1	53.7	53.2	52.9	52.9	52.4	54.9	7,169
Fetal intolerance of labor . . . . .	349,243	19,299	56.4	66.6	56.0	52.7	53.2	55.1	56.0	7,169
<b>Epidural or spinal anesthesia during labor . . . . .</b>	<b>349,243</b>	<b>232,183</b>	<b>678.8</b>	<b>694.0</b>	<b>684.1</b>	<b>671.1</b>	<b>668.5</b>	<b>672.5</b>	<b>674.6</b>	<b>7,169</b>
Hispanic <sup>5</sup>										
Induction of labor . . . . .	787,484	133,514	170.5	194.5	177.3	166.3	158.0	155.6	152.0	4,571
Augmentation of labor . . . . .	787,484	143,773	183.6	232.9	200.7	175.6	159.1	143.6	127.0	4,571
<b>Steroids (glucocorticoids) for fetal lung maturation . . .</b>	<b>787,484</b>	<b>4,143</b>	<b>5.3</b>	<b>5.7</b>	<b>5.1</b>	<b>4.8</b>	<b>5.3</b>	<b>5.8</b>	<b>8.2</b>	<b>4,571</b>
<b>Antibiotics received by mother during labor . . . . .</b>	<b>787,484</b>	<b>89,238</b>	<b>114.0</b>	<b>127.3</b>	<b>116.5</b>	<b>110.0</b>	<b>108.4</b>	<b>109.7</b>	<b>109.2</b>	<b>4,571</b>
Clinical chorioamnionitis during labor . . . . .	787,484	8,948	11.4	18.1	13.3	10.0	8.3	7.4	6.0	4,571
Moderate/heavy meconium staining of amniotic fluid . . . . .	787,484	35,924	45.9	50.2	47.0	46.0	43.3	41.9	41.7	4,571
Fetal intolerance of labor . . . . .	787,484	28,771	36.7	41.4	36.0	33.1	37.1	39.8	44.9	4,571
<b>Epidural or spinal anesthesia during labor . . . . .</b>	<b>787,484</b>	<b>423,856</b>	<b>541.4</b>	<b>564.7</b>	<b>538.2</b>	<b>527.2</b>	<b>541.7</b>	<b>552.2</b>	<b>554.0</b>	<b>4,571</b>

<sup>1</sup>Refers to total number of births to residents of areas reporting specified labor and delivery characteristic.<sup>2</sup>No response reported for characteristics of labor and delivery item; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 U.S. Standard Certificate of Live Birth.<sup>3</sup>Includes other races not shown and origin not stated.<sup>4</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see "Technical Notes." Data by race are non-Hispanic and exclude mothers reporting multiple races.<sup>5</sup>Includes all persons of Hispanic origin of any race.

NOTES: Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. Births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth (0.6 percent) are included in the "not stated" category. See "Technical Notes."

**Table 7. Method of delivery, by age and race and Hispanic origin of mother: Total of 27 reporting states, 2008**

[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 <sup>1</sup>	Method reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated <sup>2</sup>
All races <sup>3</sup>			Percent							
Fetal presentation at birth										
Cephalic . . . . .	2,748,302	2,451,079	93.4	94.6	94.3	93.7	92.8	91.6	89.6	123,924
Breech . . . . .	2,748,302	92,888	3.5	2.4	2.7	3.4	4.1	4.9	6.4	123,924
Other . . . . .	2,748,302	80,411	3.1	3.0	2.9	3.0	3.1	3.4	4.0	123,924
Final route and method of delivery										
Vaginal/spontaneous . . . . .	2,748,302	1,733,750	63.6	71.4	67.8	64.8	60.3	54.1	47.6	20,651
Vaginal/forceps . . . . .	2,748,302	18,599	0.7	0.9	0.7	0.7	0.6	0.6	0.5	20,651
Vaginal/vacuum . . . . .	2,748,302	87,816	3.2	4.6	3.4	3.1	2.9	2.6	2.5	20,651
Cesarean . . . . .	2,748,302	887,486	32.5	23.1	28.0	31.4	36.3	42.7	49.4	20,651
<b>Cesarean/trial of labor attempted<sup>4</sup></b> . . . . .	<b>887,486</b>	<b>231,584</b>	<b>26.8</b>	<b>44.6</b>	<b>32.3</b>	<b>26.8</b>	<b>22.5</b>	<b>19.6</b>	<b>19.3</b>	<b>24,495</b>
White <sup>5</sup>										
Fetal presentation at birth										
Cephalic . . . . .	1,366,527	1,244,747	93.5	95.0	94.6	93.8	92.9	91.8	89.7	35,307
Breech . . . . .	1,366,527	52,874	4.0	2.8	3.1	3.7	4.4	5.2	6.7	35,307
Other . . . . .	1,366,527	33,599	2.5	2.2	2.2	2.4	2.7	3.0	3.5	35,307
Final route and method of delivery										
Vaginal/spontaneous . . . . .	1,366,527	862,244	63.2	70.2	67.5	65.1	60.9	54.9	48.1	2,799
Vaginal/forceps . . . . .	1,366,527	11,726	0.9	1.2	1.0	0.9	0.7	0.7	0.6	2,799
Vaginal/vacuum . . . . .	1,366,527	48,374	3.5	5.5	4.1	3.5	3.0	2.7	2.6	2,799
Cesarean . . . . .	1,366,527	441,384	32.4	23.0	27.5	30.5	35.3	41.7	48.7	2,799
<b>Cesarean/trial of labor attempted<sup>4</sup></b> . . . . .	<b>441,384</b>	<b>125,547</b>	<b>29.1</b>	<b>51.5</b>	<b>36.6</b>	<b>30.0</b>	<b>24.4</b>	<b>20.9</b>	<b>20.4</b>	<b>9,503</b>
Black <sup>5</sup>										
Fetal presentation at birth										
Cephalic . . . . .	349,243	309,917	93.3	94.8	94.1	93.3	92.2	90.5	89.4	17,026
Breech . . . . .	349,243	10,118	3.0	2.1	2.5	3.0	3.9	5.0	5.8	17,026
Other . . . . .	349,243	12,182	3.7	3.1	3.5	3.7	3.9	4.5	4.8	17,026
Final route and method of delivery										
Vaginal/spontaneous . . . . .	349,243	216,592	62.1	69.7	65.3	62.0	57.1	50.1	45.5	704
Vaginal/forceps . . . . .	349,243	1,721	0.5	0.7	0.5	0.4	0.4	0.3	*	704
Vaginal/vacuum . . . . .	349,243	8,514	2.4	3.8	2.6	2.0	1.8	1.7	1.7	704
Cesarean . . . . .	349,243	121,712	34.9	25.7	31.6	35.5	40.7	47.9	52.5	704
<b>Cesarean/trial of labor attempted<sup>4</sup></b> . . . . .	<b>121,712</b>	<b>34,442</b>	<b>30.2</b>	<b>47.8</b>	<b>33.2</b>	<b>27.3</b>	<b>24.4</b>	<b>22.3</b>	<b>22.9</b>	<b>7,647</b>
Hispanic <sup>6</sup>										
Fetal presentation at birth										
Cephalic . . . . .	787,484	690,143	93.2	94.0	93.9	93.3	92.6	91.6	89.4	47,090
Breech . . . . .	787,484	21,705	2.9	2.1	2.4	2.8	3.5	4.3	5.7	47,090
Other . . . . .	787,484	28,546	3.9	3.8	3.7	3.8	3.9	4.2	4.9	47,090
Final route and method of delivery										
Vaginal/spontaneous . . . . .	787,484	511,418	65.1	73.2	69.2	65.6	59.9	54.0	47.8	2,038
Vaginal/forceps . . . . .	787,484	3,488	0.4	0.7	0.5	0.4	0.4	0.4	0.3	2,038
Vaginal/vacuum . . . . .	787,484	20,351	2.6	4.1	2.7	2.3	2.1	2.1	2.0	2,038
Cesarean . . . . .	787,484	250,189	31.9	22.1	27.6	31.8	37.6	43.6	50.0	2,038
<b>Cesarean/trial of labor attempted<sup>4</sup></b> . . . . .	<b>250,189</b>	<b>52,152</b>	<b>21.4</b>	<b>35.7</b>	<b>25.2</b>	<b>19.6</b>	<b>17.0</b>	<b>15.8</b>	<b>15.8</b>	<b>6,075</b>

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

<sup>1</sup>Refers to total number of births to residents of areas reporting the specified item.<sup>2</sup>No response reported for method of delivery item; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 U.S. Standard Certificate of Live Birth.<sup>3</sup>Includes other races not shown and origin not stated.<sup>4</sup>Refers to the number of women who attempted a trial of labor prior to cesarean delivery per 100 cesarean births.<sup>5</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see "Technical Notes." Data by race are non-Hispanic and exclude mothers reporting multiple races.<sup>6</sup>Includes all persons of Hispanic origin of any race.

NOTES: Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. Births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth (0.6 percent) are included in the "not stated" category. See "Technical Notes."

**Table 8. Primary cesarean delivery and vaginal birth after previous cesarean delivery, by age and race and Hispanic origin of mother: Total of 27 reporting states, 2008**

[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	Total <sup>1</sup>	Method reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years
All races <sup>2</sup>			Percent						
Primary cesarean <sup>3</sup>	2,359,169	561,235	23.8	21.0	21.2	22.5	25.4	30.0	37.8
Vaginal birth after cesarean delivery <sup>4</sup>	350,385	29,287	8.4	8.1	7.8	8.6	8.7	8.1	8.3
White <sup>5</sup>			Percent						
Primary cesarean <sup>3</sup>	1,191,092	286,957	24.1	21.3	21.5	22.8	25.2	29.6	37.6
Vaginal birth after cesarean delivery <sup>4</sup>	167,058	14,314	8.6	6.9	6.9	8.7	9.2	8.7	9.3
Black <sup>5</sup>			Percent						
Primary cesarean <sup>3</sup>	294,751	77,959	26.4	23.5	24.1	25.5	29.7	36.2	41.8
Vaginal birth after cesarean delivery <sup>4</sup>	45,639	4,297	9.4	10.4	8.9	9.6	10.0	8.9	8.9
Hispanic <sup>6</sup>			Percent						
Primary cesarean <sup>3</sup>	671,436	147,098	21.9	19.7	19.9	20.6	24.2	29.0	36.5
Vaginal birth after cesarean delivery <sup>4</sup>	110,834	8,488	7.7	7.8	7.9	8.0	7.4	7.1	6.9

<sup>1</sup>Total for primary cesarean is the number of women delivering without a previous cesarean. Total for vaginal birth after cesarean delivery is the number of women delivering after a previous cesarean.<sup>2</sup>Includes other races not shown and origin not stated.<sup>3</sup>Primary cesarean rate is the number of women having a cesarean delivery per 100 births to women without a previous cesarean.<sup>4</sup>Vaginal birth after cesarean delivery rate is the number of women having a vaginal delivery per 100 births to women with a previous cesarean delivery.<sup>5</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see "Technical Notes." Data by race are non-Hispanic and exclude mothers reporting multiple races.<sup>6</sup>Includes all persons of Hispanic origin of any race.

NOTE: Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming.

**Table 9. Abnormal conditions of the newborn, by age and race and Hispanic origin of mother: Total of 27 reporting states, 2008**

[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 <sup>1</sup>	Condition reported	All ages	Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–54 years	Not stated <sup>2</sup>
All races <sup>3</sup>			Per 1,000							
Assisted ventilation required immediately following delivery . . . . .	2,748,302	110,715	41.0	44.2	40.1	39.2	40.5	43.1	49.1	45,689
Assisted ventilation required for more than 6 hours . . . . .	2,748,302	23,697	8.8	9.8	8.5	8.3	8.5	9.2	11.9	45,689
NICU admission . . . . .	2,748,302	180,274	66.7	68.4	62.6	62.6	66.1	77.3	100.1	45,689
Surfactant replacement therapy given to newborn . . . . .	2,748,302	9,139	3.4	3.7	3.2	3.2	3.3	3.6	4.8	45,689
Antibiotics received by newborn for suspected neonatal sepsis . . . . .	2,748,302	46,874	17.3	21.0	18.2	16.4	15.9	16.7	19.9	45,689
Seizure or serious neurologic dysfunction . . . . .	2,748,302	754	0.3	0.3	0.3	0.2	0.3	0.3	0.4	45,689
Significant birth injury . . . . .	2,748,302	1,881	0.7	0.7	0.7	0.7	0.6	0.7	1.0	45,689
White <sup>4</sup>										
Assisted ventilation required immediately following delivery . . . . .	1,366,527	61,396	45.3	49.7	44.3	43.7	44.8	47.4	54.0	12,072
Assisted ventilation required for more than 6 hours . . . . .	1,366,527	13,479	10.0	11.7	9.9	9.6	9.5	10.0	13.1	12,072
NICU admission . . . . .	1,366,527	89,207	65.9	66.1	61.5	62.4	65.0	75.7	99.3	12,072
Surfactant replacement therapy given to newborn . . . . .	1,366,527	5,606	4.1	5.0	4.0	4.0	3.9	4.3	5.5	12,072
Antibiotics received by newborn for suspected neonatal sepsis . . . . .	1,366,527	25,987	19.2	24.1	20.8	18.5	17.2	18.1	22.2	12,072
Seizure or serious neurologic dysfunction . . . . .	1,366,527	481	0.4	0.4	0.4	0.3	0.3	0.3	*	12,072
Significant birth injury . . . . .	1,366,527	998	0.7	0.9	0.8	0.7	0.6	0.6	1.0	12,072
Black <sup>4</sup>										
Assisted ventilation required immediately following delivery . . . . .	349,243	17,584	51.9	52.2	49.2	50.3	54.2	58.3	62.8	10,184
Assisted ventilation required for more than 6 hours . . . . .	349,243	4,071	12.0	12.0	11.3	11.3	13.0	13.8	16.9	10,184
NICU admission . . . . .	349,243	31,483	92.9	87.2	85.5	87.6	100.9	120.7	133.8	10,184
Surfactant replacement therapy given to newborn . . . . .	349,243	1,576	4.6	4.7	4.3	4.2	5.1	6.1	5.6	10,184
Antibiotics received by newborn for suspected neonatal sepsis . . . . .	349,243	6,887	20.3	21.9	20.6	18.0	20.8	22.1	20.9	10,184
Seizure or serious neurologic dysfunction . . . . .	349,243	77	0.2	0.4	*	*	0.4	*	*	10,184
Significant birth injury . . . . .	349,243	160	0.5	0.6	0.4	0.4	0.6	*	*	10,184
Hispanic <sup>5</sup>										
Assisted ventilation required immediately following delivery . . . . .	787,484	24,601	31.5	35.3	30.8	28.9	31.4	33.9	38.5	6,835
Assisted ventilation required for more than 6 hours . . . . .	787,484	4,674	6.0	7.1	5.6	5.4	5.8	7.0	8.2	6,835
NICU admission . . . . .	787,484	44,993	57.6	60.3	53.1	53.2	59.2	69.3	88.4	6,835
Surfactant replacement therapy given to newborn . . . . .	787,484	1,397	1.8	2.0	1.8	1.5	1.8	1.9	3.6	6,835
Antibiotics received by newborn for suspected neonatal sepsis . . . . .	787,484	10,476	13.4	17.4	13.6	12.0	12.2	13.0	15.6	6,835
Seizure or serious neurologic dysfunction . . . . .	787,484	144	0.2	0.2	0.2	0.2	0.2	*	*	6,835
Significant birth injury . . . . .	787,484	471	0.6	0.6	0.6	0.6	0.6	0.6	*	6,835

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

<sup>1</sup>Refers to total number of births to residents of areas reporting specified abnormal condition.

<sup>2</sup>No response reported for abnormal conditions of the newborn item; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 U.S. Standard Certificate of Live Birth.

<sup>3</sup>Includes other races not shown and origin not stated.

<sup>4</sup>Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1997 Office of Management and Budget standards; see "Technical Notes." Data by race are non-Hispanic and exclude mothers reporting multiple races.

<sup>5</sup>Includes all persons of Hispanic origin of any race.

NOTES: Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. Births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth (0.6 percent) are included in the "not stated" category. See "Technical Notes."

**Table 10. Congenital anomaly of the newborn, by age of mother: Total of 27 reporting states, 2008**

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

Congenital anomaly	All births <sup>1</sup>	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 <sup>2</sup>
Total										
Anencephaly . . . . .	2,748,302	372	13.8	16.5	13.2	17.1	10.6	11.6	*	50,501
Menigocele or spina bifida . . . . .	2,748,302	402	14.9	16.5	14.9	14.8	15.3	12.6	*	50,501
<b>Cyanotic congenital heart disease . . . . .</b>	<b>2,748,302</b>	<b>1,225</b>	<b>45.4</b>	<b>38.0</b>	<b>38.5</b>	<b>42.9</b>	<b>45.5</b>	<b>60.3</b>	<b>100.1</b>	<b>50,501</b>
Congenital diaphragmatic hernia. . . . .	2,748,302	293	10.9	10.6	11.0	12.0	9.8	10.6	*	50,501
Omphalocele . . . . .	2,748,302	193	7.2	7.7	6.8	5.7	5.8	11.0	*	50,501
Gastroschisis . . . . .	2,748,302	790	29.3	95.0	52.2	15.5	5.3	*	*	50,501
Limb reduction defect . . . . .	2,748,302	438	16.2	18.3	20.2	16.5	12.5	13.5	*	50,501
Cleft lip with or without cleft palate . . . . .	2,748,302	1,396	51.7	59.1	55.0	52.8	44.2	52.2	42.5	50,501
Cleft palate alone . . . . .	2,748,302	596	22.1	23.6	25.1	20.8	18.3	23.8	*	50,501
Down syndrome . . . . .	2,748,302	1,298	48.1	28.2	22.0	22.8	44.2	119.2	359.3	50,501
<b>Suspected chromosomal disorder . . . . .</b>	<b>2,748,302</b>	<b>1,093</b>	<b>40.5</b>	<b>36.6</b>	<b>37.6</b>	<b>31.8</b>	<b>37.4</b>	<b>51.2</b>	<b>153.6</b>	<b>50,501</b>
<b>Hypospadias<sup>3</sup> . . . . .</b>	<b>2,748,302</b>	<b>1,434</b>	<b>53.2</b>	<b>46.1</b>	<b>52.6</b>	<b>56.1</b>	<b>54.5</b>	<b>54.8</b>	<b>37.0</b>	<b>50,501</b>
<b>Males only<sup>4</sup> . . . . .</b>	<b>1,406,875</b>	<b>1,434</b>	<b>103.8</b>	<b>89.8</b>	<b>103.0</b>	<b>109.6</b>	<b>106.3</b>	<b>106.9</b>	<b>72.2</b>	<b>25,868</b>

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

<sup>1</sup>Refers to total number of births to residents of areas reporting specified congenital anomaly.<sup>2</sup>No response reported for congenital anomaly of the newborn item; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 U.S. Standard Certificate of Live Birth.<sup>3</sup>Denominator includes both male and female births.<sup>4</sup>Denominator includes males only.

NOTES: Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. Births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 Standard Certificate of Live Birth (0.6 percent) are included in the "not stated" category. See "Technical Notes."



## Technical Notes

### Sources of data

Data in this report are based on 100 percent of births registered in the 27 states (California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York (including New York City), North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming) that implemented the 2003 U.S. Standard Certificate of Live Birth as of January 1, 2008. The 2,748,302 births to residents of the 27 states comprise 65 percent of all U.S. 2008 births ([Table I-1](#)).

Information on the percentage of records with missing information for the items included in this report is shown by state in [Table I](#). Data for the items included in this report are missing for births to residents of the revised 27-state reporting area that occurred outside the reporting area (i.e., in a jurisdiction that has not adopted the 2003 U.S. Standard Certificate of Live Birth). Data for such cases are excluded from the analyses.

### Generalizability of data

Because births in the revised reporting area are not a random sample of all births, the findings are not generalizable to the entire United States. Of note, the race and Hispanic-origin distributions of births for the 27-state reporting area are substantively different from those for the entire United States ([Table II](#)). 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. However, it is not possible to compare the revised reporting area and entire United States without using bridged-race categories because many states that have not yet revised do not collect multiple race information. Information on the processing and tabulation of data by race is presented in recent reports (2,49,50).

### 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 data collection techniques. A number of topics new to the U.S. Standard Certificate of Live Birth and collected by the 27-state reporting area are not presented in this report. Some examples are: mother's height (used to compute body mass index), the receipt of WIC food for the pregnancy, source of payment for the delivery, infertility treatment, maternal infections, maternal morbidity (including uterine rupture), and breastfeeding.

### 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.

### Race of mother

Race of mother as collected on the 2003 standard certificate of live birth and presented in this report is consistent with the 1997 Office of Management and Budget standards (51). These standards require federal agencies to use a minimum set of five races for the identification of race [American Indian or Alaska Native (AIAN), Asian, black or African American, Native Hawaiian or Other Pacific Islander (NHOPI), and white] and allow respondents to select one or more races. In this report, detailed results are presented for the three largest single-race and Hispanic-origin groups (non-Hispanic single-race white, non-Hispanic single-race black, and Hispanic). Selected summary results are presented for non-Hispanic single-race AIAN and non-Hispanic single-race Asian women, as well as for Mexican, Puerto Rican, and Cuban, and Central and South American women. Results are not shown for NHOPI women because of small numbers; Hawaii has yet to adopt the revised birth certificate. For more information on single- and multiple-race reporting, see "Characteristics of births to single- and multiple-race women: California, Hawaii, Pennsylvania, Utah, and Washington, 2003" (50).

### Age of mother

Age of mother is computed in most cases from the mother's and infant's dates of birth as reported on the birth certificate. Beginning in 2003 for births occurring in states using the 2003 birth certificate (revised), age of mother is imputed for ages 8 and under and 65 and over (a mother's age of 9 is recoded as 10). A review and verification of unedited data for several years including 2007 showed that the vast majority of births reported as occurring to women aged 50 and over were to women aged 50–54. In this report, tables showing data for women aged 40–54 include births to mothers up to age 64.

In 2008, age of mother was not reported on 0.01 percent of the records; for these records age of mother was imputed according to the last record with the same race and total birth order.

### Educational attainment of mother

The revised 2003 certificate item asks for the highest degree or level of school completed at the time of the birth ([Figure 2](#)). Levels of educational attainment shown in this report include "12th grade or less with no diploma," "high school graduate" (includes General Educational Development), "some college credit, but not a degree," "Associate's degree" (includes Associate in Arts and Associate in Science), "Bachelor's degree" (includes Bachelor of Arts and Bachelor of Science), "Master's degree" (includes Master of Arts and Master of Science), and "Doctorate or professional degree" (includes Doctor of Philosophy, Doctor of Education, Doctor of Medicine, Doctor of Dental Surgery, Doctor of Veterinary Medicine, Doctor of Laws, and Juris Doctor).

### Tobacco use during pregnancy

The 2003 revision of the birth certificate includes an item on maternal smoking status before and during pregnancy ([Figure 2](#)).

**Table I. Birth records for which data were not stated and resident births occurring in unrevised states: Total of 27 reporting states and New York City, 2008**

[By place of residence]

Area	Educational attainment	Tobacco use during pregnancy <sup>1</sup>	Month prenatal care began	Pregnancy risk factors	Obstetric procedures	Characteristics of labor and delivery	Method of delivery					Abnormal conditions of newborn	Births occurring in unrevised states <sup>2</sup>
							Attempted forceps	Attempted vacuum	Final route and method of delivery	Trial of labor	Congenital anomalies		Percent
Total of reporting areas <sup>3</sup>	1.9	1.6	6.5	1.4	1.8	1.3	4.0	3.9	0.8	1.6	1.8	1.7	0.6
California	3.3	2.1	5.7	0.1	0.1	0.1	8.5	8.2	0.1	0.1	0.1	0.1	0.1
Colorado	1.3	0.4	2.5	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.1	0.1	0.1
Delaware	2.4	2.1	10.5	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0
Florida	0.9	---	5.7	0.5	0.5	0.3	0.7	0.7	0.2	1.4	0.6	0.3	0.2
Georgia	5.2	---	38.9	11.5	18.3	10.4	15.5	15.4	1.6	9.9	12.7	12.6	0.2
Idaho	2.4	1.5	1.7	1.4	1.4	1.4	1.5	1.6	1.3	1.4	1.4	1.4	1.3
Indiana	0.9	0.8	1.2	0.6	0.6	0.6	1.6	1.6	0.7	1.4	0.6	0.6	0.6
Iowa	1.5	1.5	1.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Kansas	3.6	3.8	4.8	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Kentucky	1.1	0.8	3.6	1.0	1.0	0.7	0.6	0.7	0.7	0.7	0.8	0.8	0.6
Michigan	1.0	---	3.8	1.1	1.4	0.5	0.8	0.7	0.3	0.9	3.2	2.5	0.3
Montana	0.9	1.2	6.3	2.3	4.0	0.9	0.1	0.1	0.1	0.1	1.4	2.3	0.1
Nebraska	0.1	0.1	2.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
New Hampshire	9.4	10.8	12.7	8.7	9.4	9.1	8.7	8.7	8.7	8.7	14.2	13.6	8.7
New Mexico	1.8	1.2	24.6	0.4	2.4	0.4	1.8	1.7	0.5	0.8	0.4	2.2	0.4
New York (excluding New York City)	2.5	1.8	5.5	2.0	2.8	1.7	4.8	4.8	2.2	2.3	4.1	3.6	1.7
New York City	0.9	0.5	1.6	0.4	0.8	0.6	3.0	3.7	0.7	0.8	1.3	0.5	0.4
North Dakota	2.6	2.1	3.2	1.9	1.9	1.9	2.1	2.1	1.9	1.9	1.9	1.9	1.9
Ohio	1.8	1.9	8.0	2.1	1.1	1.6	1.3	1.3	1.2	1.2	3.2	2.2	1.1
Oregon	0.6	1.1	1.1	0.1	0.1	0.6	4.8	4.6	0.1	0.2	0.1	0.1	0.1
Pennsylvania	2.5	3.8	7.4	1.6	1.6	1.6	1.7	1.7	1.7	4.4	1.7	1.6	1.6
South Carolina	3.3	5.1	3.6	3.0	3.1	2.9	3.0	3.0	3.0	3.1	3.0	3.0	2.9
South Dakota	0.9	1.7	1.4	0.9	1.0	0.8	0.6	0.6	0.6	0.6	0.6	0.8	0.6
Tennessee	0.9	0.6	5.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Texas	0.3	0.2	1.5	0.2	0.2	0.2	2.4	2.5	0.2	1.1	0.2	0.2	0.2
Vermont	1.6	1.6	1.3	0.9	1.0	0.8	0.9	0.9	0.7	0.7	1.2	1.0	0.7
Washington	1.1	1.0	6.4	1.1	1.7	1.0	1.0	1.0	0.0	0.1	2.3	1.8	0.0
Wyoming	3.8	8.5	3.5	2.9	2.9	2.8	2.9	2.9	2.8	3.9	2.9	2.9	2.8

--- Data not available.

0.0 Quantity more than zero but less than 0.05.

<sup>1</sup>Excludes data for Florida, Georgia, and Michigan. Florida and Michigan smoking data are not comparable with the 2003 U.S. Standard Certificate of Live Birth. Georgia data are not reliable.

<sup>2</sup>The percentage of resident births occurring in states using the 1989 U.S. Standard Certificate of Live Birth. In tabulations, these records are coded as not stated.

<sup>3</sup>Data are for states using the 2003 U.S. Standard Certificate of Live Birth. Births to residents of states using the 2003 U.S. Standard Certificate of Live Birth occurring in states using the 1989 U.S. Standard Certificate of Live Birth are coded as not stated. See "Technical Notes."

NOTE: The percentage nonresponse is the same for all specific checkboxes within a category except for the category "method of delivery," which allows for nonresponse for each specific checkbox shown.

**Table II. Live births, by selected demographic and health characteristics: United States and total of 27 revised states, 2008**

Characteristic of mother	27 states <sup>1</sup>		United States	
	Number	Percent	Number	Percent
Race or Hispanic origin of mother				
All races and origins <sup>2</sup> . . . . .	2,748,302	100.00	4,247,694	100.00
Non-Hispanic . . . . .	1,934,436	**71.07	3,173,629	75.30
White <sup>3</sup> . . . . .	1,396,403	**51.30	2,267,817	53.81
Black <sup>3</sup> . . . . .	361,056	**13.26	623,029	14.78
American Indian or Alaska Native <sup>3,4</sup> . . . . .	18,884	**0.69	42,466	1.01
Asian or Pacific Islander <sup>3</sup> . . . . .	158,093	**5.81	240,317	5.70
Hispanic <sup>5</sup> . . . . .	787,484	**28.93	1,041,239	24.70
Mexican . . . . .	529,677	**19.46	684,883	16.25
Puerto Rican . . . . .	43,484	**1.60	69,015	1.64
Cuban . . . . .	14,627	**0.54	16,718	0.40
Central or South American . . . . .	98,171	**3.61	155,578	3.69
Other and Unknown Hispanic . . . . .	101,525	**3.73	115,045	2.73
Age of mother				
Under 20 years . . . . .	289,202	**10.52	440,522	10.37
20–24 years . . . . .	684,971	**24.92	1,052,184	24.77
25–29 years . . . . .	769,935	**28.01	1,195,774	28.15
30–34 years . . . . .	613,235	**22.31	956,716	22.52
35–39 years . . . . .	316,488	11.52	488,875	11.51
40–54 years . . . . .	74,471	**2.71	113,623	2.67
Unmarried women . . . . .	1,128,808	**41.07	1,726,566	40.65
Characteristic of infant or delivery				
Very preterm <sup>6</sup> . . . . .	53,275	**1.94	84,224	1.99
Preterm <sup>7</sup> . . . . .	333,732	**12.16	523,033	12.33
Very low birthweight <sup>8</sup> . . . . .	38,939	**1.42	61,773	1.46
Low birthweight <sup>9</sup> . . . . .	221,003	**8.05	347,209	8.19
4,000 grams or more <sup>10</sup> . . . . .	208,994	7.61	323,822	7.63
Multiple births <sup>11,12</sup> . . . . .	91,357	**33.24	144,928	34.12

\*\* Difference significant at  $p = 0.05$ .

<sup>1</sup>Includes California, Colorado, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Michigan, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming.

<sup>2</sup>Includes Hispanic origin not stated.

<sup>3</sup>Race 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 27-state reporting area reported multiple-race data for 2008. 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."

<sup>4</sup>Includes births to Aleut and Eskimo persons.

<sup>5</sup>Includes persons of Hispanic origin of any race.

<sup>6</sup>Refers to birth prior to 32 completed weeks of gestation.

<sup>7</sup>Refers to birth prior to 37 completed weeks of gestation.

<sup>8</sup>Refers to birthweight of less than 1,500 grams (3 pounds, 4 ounces).

<sup>9</sup>Refers to birthweight of less than 2,500 grams (5 pounds, 8 ounces).

<sup>10</sup>Equivalent to 8 pounds, 14 ounces.

<sup>11</sup>Includes births in twin, triplet, and higher-order multiple deliveries.

<sup>12</sup>Refers to the number of live births in multiple deliveries per 1,000 live births.

This report presents the percentage of women who smoked during pregnancy and the percentage who quit smoking during pregnancy. Information on whether the mother smoked in the 3 months before pregnancy is not currently available and is not shown.

Women who report smoking any number of cigarettes during any trimester of pregnancy are considered "smokers." Women who report smoking only in the first trimester, or in the first and second trimesters but not the third trimester, are considered to have quit smoking. If smoking status during any trimester of pregnancy is unknown, quitting status is tabulated as "unknown."

Data based on the 2003 revised smoking item are available for all of 2008 for 24 states: California, Colorado, Delaware, Idaho, Indiana,

Iowa, Kansas, Kentucky, Montana, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. The tobacco use item for Florida, which implemented the revised birth certificate as of January 1, 2004, and for Michigan, which implemented the revised certificate as of January 1, 2008, do not follow the standard format. As a result, tobacco use data for Florida and Michigan are not comparable with either the 2003 revised or 1989 unrevised data (see below) and are not included in the 2008 data files. Reliable data on tobacco use were not available for Georgia for 2008. See "User Guide to the 2008 Public Use File" (49).

## Prenatal care

Information on the timing of prenatal care from the revised birth certificate is based on the difference between the date of the first prenatal visit and the date of the last normal menses. The recommended source for these dates is the mother's prenatal care records. When the day of the date of the first prenatal visit is unknown, the day is imputed based on the previous record with same month of first prenatal visit. This imputation was made for 7.4 percent of births occurring in this reporting area for 2008. When the date of the last normal menses is incomplete or invalid, the obstetric estimate of gestation is used.

Prenatal care information based on the 2003 U.S. Standard Certificate of Live Birth suggests a markedly less favorable picture of prenatal care utilization in the United States than data from the 1989 certificate. Most of the difference, however, can be attributed to changes in reporting and *not* to changes in prenatal care utilization (6).

## Obstetric procedures

The incidence of external cephalic version was inaccurately reported in three states (Georgia, Michigan, and Ohio) in 2008. See "User Guide to the 2008 Public Use File" (49). Accordingly, data for these states have been excluded from the tables (Table 5) as well as analysis and discussion in this report. The data are, however, available in the public-use files.

## Method of delivery

Rates of primary cesarean and vaginal birth after cesarean (VBAC) delivery are derived from two items: "final route and method of delivery" to establish the type of delivery (vaginal or cesarean) and "mother had a previous cesarean delivery," which is located in the "risk factors in this pregnancy" category. The primary cesarean rate relates the number of women having a first cesarean delivery to all women giving birth who have never had a cesarean delivery. The denominator for this rate includes the sum of primary cesareans and vaginal births without previous cesarean. The rate of VBAC delivery is computed by relating all VBAC deliveries to the sum of VBAC and repeat cesarean deliveries, that is, to women with a previous cesarean delivery (6).

## Congenital anomalies

Historically, congenital anomalies have been underreported on the birth certificate (37,38). 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 (52). 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 (3). 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 hypospadias are edited to exclude this condition where the record was coded "female."

## Special note

Selected other items new to the 2003 revision of the U.S. Standard Certificate of Live Birth are not presented in this report: "non-vertex presentation" from the "characteristics of labor and delivery" category and "was delivery with forceps attempted but unsuccessful" and "was delivery with vacuum extraction attempted but unsuccessful" from the "method of delivery" category. These items are excluded because of concerns with quality; see the "Quality of data" section of "User Guide to the 2008 Public Use File" (49).

## 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 I and includes all births to residents in the reporting area that occurred outside of the reporting area (i.e., in a jurisdiction that has not adopted the 2003 U.S. Standard Certificate of Live Birth). This percentage was 0.6 for the 27-state reporting area for 2008 with levels ranging from 0.05 percent (Nebraska and Washington) to 8.7 percent for New Hampshire (data not shown).

The comparatively high level of missing data for New Hampshire reflects the fact that 9.5 percent of births to New Hampshire residents occurred not in New Hampshire, but in states (mostly in Massachusetts) 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 9.4 percent (Table I). However, when the unknown rate was examined by occurrence (i.e., only for births that occurred in the state), the unknown rate decreased to 0.8 percent (data not shown).

## Random variation and significance testing for natality data

For information and discussion on random variation and significance testing for natality data, see "User Guide to the 2008 Natality Public Use File" (49).

## Definitions of selected medical terms

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" (23).

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