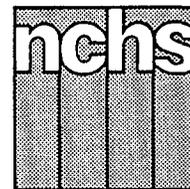


Monthly Vital Statistics Report



Final Data From the CENTERS FOR DISEASE CONTROL AND PREVENTION/National Center for Health Statistics

Advance Report of Maternal and Infant Health Data From the Birth Certificate, 1990

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life-style risk factors of pregnancy and birth, obstetric procedures performed, method of delivery, abnormal conditions and congenital anomalies of the newborn, expanded information on birth attendant and place of delivery, and questions on the Hispanic origin of the parents. This major enhancement of medical and health data available on an annual basis for mothers and babies greatly expands the scope of information on pregnancy outcome in the United States (1,2).

The new information was first presented in an earlier report (3). This is the second report focusing on the new data. Expanded information on 1990 births by attendant and place of delivery as well as Hispanic origin of the parents was also presented in an earlier report (4).

The data available for 1989 and subsequent years reflect a significant departure from prior years in birth certificate content and format. Checkboxes are used extensively to obtain the detailed medical and health data

requested. Uniform reporting and a clear focus on the requested data are facilitated by this new format.

As of 1990, all States (except Oklahoma) and the District of Columbia had implemented the new birth certificate. Oklahoma revised its certificate as of 1991. Although most States adopted the revision in its entirety, there are some exceptions. Some States did not include every item in their revisions: Items such as tobacco and alcohol use are not reported by every State. In addition, some States reporting a given item did not include every checkbox for that item. As a consequence, the total number of births in the areas reporting each factor or condition and the number of births for which the information is not stated will vary to reflect the differing number of States reporting the specific factor or condition. These variations are indicated in the tables.

Now that the new medical and health data have been available for 2 years, some improvements have been

Introduction

Beginning with the 1989 data year, information has been available on a large number of important maternal and infant health factors affecting birth outcome. These include medical and

Acknowledgments

This report was prepared in the Division of Vital Statistics. Stephanie J. Ventura, Selma M. Taffel, and T. J. Mathews of the Natality, Marriage, and Divorce Statistics Branch wrote the report. Donna Wright prepared statistical tables and Thomas Dunn provided content review. Manju Sharma provided computer programming support. The Registration Methods Branch and the Technical Services Branch provided consultation to State vital statistics offices regarding collection of the birth certificate data on which this report is based. This report was edited by Arlett Brown and typeset by Zung T. N. Le of the Publications Branch, Division of Data Services.



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service
Centers for Disease Control and Prevention
National Center for Health Statistics



observed in the reporting completeness, and additional improvements are anticipated in future years as physicians, midwives, medical records personnel, and others become familiar with the birth certificate form. For all of these items except maternal weight gain, the percent of records with information not reported did not exceed 4 percent in 1990, about the same as in 1989 for States that provided data for the entire year (3). The number of births for which the information was not reported is shown in the tables for all items except weight gain.

Except for congenital anomalies, rates for medical and health information reported in the five checkbox items are expressed as the number of births with the specific factor per 1,000 total live births in the specified group; rates for congenital anomalies are expressed per 100,000 total live births in the specified group. Brief medical definitions for each of the factors as well as definitions of the rates by method of delivery are presented in the "Technical notes."

All data are shown by race of mother. For ease in writing, the terms "mothers" and "women" are used interchangeably for "births" or "infants," for example, "births to black mothers" or "black infants." Although data are shown by age and race in the tables and figures, this does not imply that differences shown are racial or genetic per se. Differences between white women and women of other races are often due to the lower income and educational levels of minority women, their limited access to health care and health insurance, the neighborhoods in which they live, and other factors.

Medical risk factors

The presence of certain medical risk factors during pregnancy is often indicative of the potential for adverse pregnancy outcome, in particular low birthweight (weight of less than 2,500 grams or 5 lb 8 oz), and some birth defects (5). Low birthweight and birth defects in turn are among the leading causes of infant death (6) and are also implicated in infant and childhood morbidity. Information on the presence of

certain medical risk factors such as diabetes and anemia can be used to identify pregnant women who may require special prenatal care interventions (5,7). The presence or absence of medical risk factors was not reported for 3 percent of births in the reporting area comprised of 49 States and the District of Columbia. Oklahoma did not report this information.

The most frequently reported risk factor in 1990 as in 1989 was pregnancy-associated hypertension, with a rate of 27.2 cases per 1,000 total live births (table 1). High rates were also reported for diabetes and anemia, 21.3 and 18.2, respectively.

Young mothers under 20 years of age were at substantially elevated risk of anemia (27.7) and pregnancy-associated hypertension (32.1). The rates for pregnancy-associated hypertension generally declined with advancing maternal age, through ages 25–34 years (rates of 25.2–25.3) and then increased to 37.1 for mothers aged 40–49 years. A similar pattern of occurrence by maternal age was observed for anemia, acute or chronic lung disease, hydramnios/oligohydramnios, and eclampsia.

Rates for other medical risk factors increased steadily as age of mother advanced. For example, the rate for diabetes increased from 7.4 for mothers under 20 to 61.9 for mothers aged 40–49 years. Other risk factors with this pattern of occurrence by age include cardiac disease, chronic hypertension, incompetent cervix, previous infant of 4,000 grams (8 lb 14 oz) or more, previous preterm or small-for-gestational age (SGA) infant, Rh sensitization, and uterine bleeding. The rate for genital herpes also increased with age, but peaked at ages 35–39 years.

White and black mothers had relatively similar rates for many of the medical risk factors, and the patterns of the rates by age were comparable in many cases. Some important variations were noted, however. The overall prevalence of anemia for black mothers was more than twice that for white mothers, 34.7 compared with 14.6. The racial disparity in the rates persisted in all age groups and was greatest at ages

where the rates were relatively low, 25–29 and 30–34 years.

Chronic hypertension was also reported substantially more often for black than for white mothers, 10.8 compared with 5.7 overall. Rates for black mothers under age 30 were 1.5–2 times those for white mothers, but at ages 30 and older, the rates for black mothers were three times those for white mothers. Black mothers also were more likely to have eclampsia and to have had a previous preterm or SGA infant.

White mothers had a higher overall rate of diabetes than did black mothers (21.5 compared with 17.7), but there was a substantial difference in the pattern by age: White mothers under 25 years of age were more likely to have diabetes than comparable black mothers, but at ages 30 and over, the pattern was reversed, with black mothers having substantially higher rates than white mothers.

White mothers were nearly three times as likely to have had a previous infant weighing 4,000 grams or more. This is not unexpected because white babies are generally twice as likely as black babies to weigh 4,000 grams or more (12.2 percent compared with 5.2 percent in 1990) (4).

Overall rates for genital herpes were similar for white and black women, but there was a distinctive difference in the patterns by age. Rates for white women rose steadily with age, reaching a peak at ages 35–39, while rates for black women were highest for mothers under age 25, and declined steadily thereafter.

Many of the medical risk factors are associated with a sharply elevated risk of low birthweight, 15–29 percent. These include hydramnios, chronic and pregnancy-associated hypertension, eclampsia, incompetent cervix, previous SGA infant, and uterine bleeding. (Tabular data are not included in this report.) By contrast, diabetes is associated with higher-than-average birthweight. In 1990, 17 percent of babies born to diabetic mothers weighed 4,000 grams or more compared with 11 percent of all births. Mothers who have previously given birth to an infant weighing 4,000 grams or more are at

43 percent risk of another heavier-than-average baby.

The likelihood of a preterm birth (gestation of less than 37 completed weeks) was 20 percent or greater for mothers with hydramnios, eclampsia, incompetent cervix, previous SGA infant, and uterine bleeding compared with 11 percent for all births.

Tobacco use during pregnancy

Cigarette smoking during pregnancy has long been associated with reduced infant birthweight (8,9), intra-uterine growth retardation, and preterm birth. Low birthweight in turn is one of the major predictors of infant mortality and infant and childhood morbidity. Sudden infant death syndrome (SIDS) in particular is highly associated with low birthweight (10-12). Additionally, maternal smoking during pregnancy has been shown in many studies to be associated with a sharply elevated risk of SIDS even after other risk factors such as low birthweight have been taken into account (10,11). Finally, past studies have estimated that the number of infant deaths could be reduced by 10 percent if pregnant women did not smoke (11,13). The mechanisms through which tobacco use adversely affects pregnancy outcome have been reviewed elsewhere (8,14).

The birth certificates of 45 States and the District of Columbia reported tobacco use during pregnancy in 1990. The information was not available for California, Indiana, New York, Oklahoma, and South Dakota. The mother's smoking status was not reported on 4 percent of the birth certificates in the reporting States (table 2).

Smoking during pregnancy was reported by 18.4 percent of women giving birth in 1990 compared with 19.5 percent in 1989. These levels are comparable to those reported in the 1988 National Maternal and Infant Health Survey (NMIHS) (15). As in 1989, white mothers in 1990 were more likely to smoke than were black mothers, 19.4 percent compared with 15.9 percent. The smoking rate was highest for mothers aged 18-19 years (22.5 percent) and lowest for teenage

mothers under 15 years (7.5 percent) and for mothers in their forties (12.3 percent).

The same variation in smoking by age was observed for white mothers, but for black mothers, smoking was most prevalent at ages 25-34 years, with rates of 21.1-22.5 percent compared with 9 percent or less for teenage mothers.

Among all mothers who smoked, a majority (59 percent) smoked no more than half a pack of cigarettes (10 or fewer) per day. One in five smoked five cigarettes or less daily. However, more than a third smoked 16 cigarettes or more per day. Younger mothers tended to smoke fewer cigarettes; of teenage mothers who smoked, two-thirds smoked half a pack or less per day. The average number of cigarettes smoked increased steadily with advancing maternal age.

White mothers were not only more likely than black mothers to smoke during pregnancy, but those who were smokers smoked much more. Thirty-seven percent of white women compared with 21 percent of black women smoked 16 cigarettes or more per day. Conversely, 33 percent of black mothers compared with 17 percent of white mothers smoked five cigarettes or fewer per day.

Several studies have indicated that Hispanic women are much less likely to smoke than non-Hispanic women (16-18). Birth registration data corroborate these findings (table 3). Overall, 7 percent of Hispanic mothers were reported to have smoked during pregnancy compared with 21 percent of white non-Hispanic and 16 percent of black non-Hispanic mothers. Mexican, Cuban, and Central and South American women were particularly unlikely to smoke, 3-6 percent compared with Puerto Rican mothers, 14 percent.

The highest smoking rates for Hispanic women overall were for mothers aged 18-34 years, 7 percent. There was very little variation by age in the percent of smokers for Mexican, Cuban, and Central and South American mothers. Among Puerto Rican mothers, the percent of smokers varied more, 7-14 percent. By contrast, the proportion of smokers among non-Hispanic

women varied substantially according to mother's age. Among white non-Hispanic mothers, the proportion ranged from 13 percent (mothers 35 and older) to 33 percent (mothers aged 18-19 years). Among black non-Hispanic mothers, the proportion ranged from 2 percent (teenagers under 15 years) to 23 percent (women aged 30-34).

Maternal smoking is relatively rare among Asian women. The proportions in 1990 were 2 percent for Chinese mothers, 4-5 percent for Filipino and other Asian and Pacific Islander mothers, and 8 percent for Japanese mothers. (Tabular data are not presented in this report.)

Among mothers giving birth in 1990, one-third with 9-11 years of education were reported to have smoked during pregnancy, seven times the rate reported for college graduates, 5 percent (table 4). Women with a grade school education or less (0-8 years) and women who were high school graduates were about equally likely to smoke, 19 and 21 percent, respectively. The relationship of maternal smoking and educational attainment is similar for white and black mothers. However, white mothers with 12 years or fewer of schooling were 47-80 percent more likely than their black counterparts to smoke. For women with 1 year or more of college, however, the proportions of smokers were similar for white and black mothers.

Among mothers who smoked, those who had completed the fewest years of formal education smoked the most. In 1990, 48 percent of mothers with a grade school education or less smoked at least half a pack of cigarettes per day compared with 29 percent of mothers who were college graduates. The relationship between the number of cigarettes smoked and educational attainment was similar for white and black mothers. In each educational attainment category, white mothers smoked more cigarettes than black mothers, but the racial disparity narrowed as educational attainment advanced.

Maternal smoking has a severe adverse impact on infant birthweight. Babies born to mothers who smoke are

at substantially elevated risk of low birthweight (11.3 percent) compared with babies born to nonsmokers (6.1 percent) (table 5). Although the risk of low birthweight tends to decline with advancing maternal age, the disparity in low birthweight by maternal smoking status actually increases with increasing maternal age. For example, among mothers 18–19 years, 11 percent of births to smokers compared with 9 percent of births to nonsmokers weighed less than 2,500 grams (5 lb 8 oz). Among mothers aged 25 years and older, however, the incidence of low birthweight was more than twice as high for births to smokers, 11–16 percent compared with 5–7 percent. The relationship of maternal smoking and low birthweight can be viewed in another way: Although mothers who smoke account for 18 percent of all births, they account for 28 percent of all low-birthweight births.

White and black infants alike were adversely affected if their mothers smoked during pregnancy. Among white mothers, 9.4 percent of smokers compared with 4.8 percent of nonsmokers gave birth to a low-birthweight infant. The proportions for births to black mothers were 21.2 percent for smokers and 11.7 percent for nonsmokers. The differential by smoking status was substantial for white and black mothers in all age groups and tended to increase as age of mother advanced. Regardless of age and smoking status, however, black babies were at considerably elevated risk of low birthweight compared with white babies.

Another aspect of maternal smoking that affects the levels of low birthweight is the number of cigarettes smoked daily during pregnancy (9). Although the differential in low birthweight is greatest when smokers as a group and nonsmokers are compared, heavier smoking tends to elevate the low-birthweight levels even further. In 1990 the incidence of low birthweight increased from 10 percent for births to mothers who smoked five cigarettes or fewer to 14 percent for births to mothers who smoked 1 1/2–2 packs daily. For white mothers with comparable smoking levels, the increase was

from 8 to 12 percent, and for black mothers, the increase was from 18 to 32 percent. Babies born to the heaviest smokers among white and black women alike were at two to three times the risk of low birthweight as were babies born to nonsmokers.

Alcohol use during pregnancy

The use of alcohol during pregnancy is another risk factor for birth outcome. Numerous studies have indicated that heavy maternal drinking can lead to a series of adverse effects. The most notable of these is fetal alcohol syndrome, which is characterized by growth retardation, facial malformations, and dysfunctions of the central nervous system, including mental retardation and behavioral disorders (19). Additionally, infant birthweight can be compromised by alcohol use, regardless of whether the mother also smoked, or of other characteristics (20).

In 1990, 46 States and the District of Columbia reported alcohol use on the birth certificates. The States not providing this information were California, New York, Oklahoma, and South Dakota. The item on the birth certificate asked if the mother used alcohol during pregnancy and if so, the average number of drinks per week. Four percent of the birth certificates in the reporting areas did not report this information.

In 1990, 3.3 percent of the births were to mothers who reported alcohol use (table 6). Black mothers were slightly more likely than white mothers to have used alcohol, 3.7 percent compared with 3.2 percent. Only 1.6 percent of all Hispanic mothers reported alcohol use, with the proportion ranging from 0.9 percent for Cuban mothers to 2.9 percent for Puerto Rican mothers (table 7). These percents are all slightly lower than the figures reported in 1989 (3).

Alcohol use during pregnancy appears to be substantially underreported. Evidence from other studies based on personal interviews and written questionnaires suggests alcohol use of perhaps 20 percent or more during pregnancy (21,22). It may be that the birth certificate question,

focusing as it does on the number of drinks per week, tends to discourage reporting of alcohol use by women who have perhaps one or two drinks per month.

Alcohol use is directly associated with maternal age. The rate of use by mothers aged 30 years and older was twice that reported by teenage mothers. Although white teens were more likely than black teens to report alcohol use, the racial differential reversed at ages 20–39 years.

Black women were not only more likely than white women to report alcohol use, they reported a substantially larger number of drinks per week. For example, 40 percent of black women who drank during pregnancy compared with 17 percent of white women reported three drinks per week or more. Conversely, 68 percent of white women compared with 39 percent of black women reported one drink per week or less. This differential in number of drinks per week was observed in all age groups.

There is no clear pattern in alcohol use according to the mother's education. The range in the percents is very small (data not shown separately). Among women with 9–11 years of schooling, 4.0 percent reported alcohol use compared with 2.3 percent of those with a grammar school education or less. Some of this disparity by educational attainment may reflect the low rates of alcohol use by Hispanic women whose educational attainment is often more limited.

Although alcohol use is substantially underreported on the birth certificate, even the limited use that is reported is associated with a severe detrimental impact on infant birthweight. Additionally, the effect is aggravated by heavier drinking. The percent low birthweight was 11.4 percent for drinkers compared with 6.9 percent for nondrinkers. Among births to mothers who drank, the low-birthweight proportion nearly tripled as the number of drinks increased, from 8.1 percent of births to mothers having one drink or less to 23.3 percent of births to mothers having five drinks or more. This relationship was observed for mothers in all age and racial groups. However, the

impact of alcohol use on low-birthweight rates was particularly severe for black babies. For example, nearly one-third of births to black women in their thirties who used alcohol were of low birthweight compared with 13–14 percent of nondrinkers of the same age. (Tabular data are not shown in this report.) The proportions of low birthweight for babies born to white women in their thirties were 7–8 percent for drinkers and 5–6 percent for nondrinkers.

Maternal weight gain

There is a large body of evidence indicating that weight gain during pregnancy is an important determinant of both fetal growth and birthweight (23). From 1974 to 1989, the medical community recommended a weight gain of 22–27 pounds for a full-term pregnancy (24,25). In 1990 the National Academy of Sciences recommended that weight gain be geared to the mother's weight and height, and that for an optimum pregnancy outcome, an average size mother should gain 25–35 pounds during a normal pregnancy (23).

An item on weight gain during pregnancy was included on the 1989 U.S. Standard Certificate of Live Birth. In 1990, 48 States and the District of Columbia reported this information; California and Oklahoma birth certificates lacked the item. Information on weight gain was not reported for 13 percent of the birth certificates in the reporting area. Before 1989 national information on maternal weight gain was available from the 1980 National Natality Survey and the 1988 National Maternal and Infant Health Survey, conducted by the National Center for Health Statistics (NCHS). Information from these surveys indicated that there are large disparities in maternal weight gain by the mother's age, marital status, and educational attainment. Teenage mothers, mothers in the oldest years of childbearing, unmarried mothers, and mothers with less than a high school education were most likely to have an inadequate weight gain; and black mothers gained far less than white mothers, even when differences in ges-

tational age and socioeconomic status were considered (26,27). Information from live birth certificates on weight gain confirms these findings. (Data on weight gain by age, marital status, and educational attainment are shown elsewhere (28).) Additionally, in 1988, a significantly higher proportion of black than white mothers reported advice that did not meet the then current standard for maternal weight gain (29).

Data from birth certificates indicate that weight gain was virtually the same for mothers giving birth in 1990 as in 1989. In 1990 the median weight gain was 30.4 pounds; in 1989 it was 30.3 pounds. In 1990, one of five mothers (20 percent) gained less than 21 pounds and 28 percent gained at least 36 pounds. As would be expected, as gestational period lengthens, median weight gain increases, and the likelihood of a weight gain of less than 21 pounds lessens (table 8).

Black mothers have a lower median weight gain than white mothers (28.1 pounds compared with 30.6 pounds) and are far more likely to gain less than 21 pounds (30 percent compared with 18 percent). This racial disparity is seen for all periods of gestation. For example, for gestations of 40 weeks and over, the median weight gain for black mothers was 30.2 pounds, about one-half pound less than that of white mothers (30.9 pounds), and 26 percent of black mothers compared with 16 percent of white mothers gained less than 21 pounds. In addition, the lower overall weight gain of black mothers reflects the fact that they are more likely to deliver prematurely (before 37 completed weeks of gestation). In 1990, 18.8 percent of black births were premature, more than double the proportion of white births born prematurely (8.9 percent) (4).

Low birthweight (less than 2,500 grams or 5 lbs 8 oz) is associated with a greatly elevated risk of infant morbidity and mortality. Regardless of period of gestation, low birthweight declines substantially as weight gain increases (table 9). For all gestational ages combined low birthweight declined from 15.8 percent for weight gains of less than 16 pounds to 4.0–4.2 percent for gains of 31 pounds or more. For

premature births the comparable decline in low birthweight with added weight gain was from 58.0 percent to approximately 31 percent; for gestations of 40 weeks or longer the decline in low birthweight was from 3.5 percent to 1 percent.

The risk of a low-birthweight outcome was consistently higher for black than for white births regardless of maternal weight gain, and this racial disparity increased as gestational period lengthened (table 9). However, the decline in low birthweight with added weight gain was still notable for black as well as for white births. For example, for gestational ages of 40 completed weeks and over the risk of low birthweight for black births declined from 6.2 percent for gains of less than 16 pounds to about 2 percent for gains of 31 pounds or more. The comparable decline in low birthweight for white births was from 2.7 percent to about 1 percent.

The weight gain of mothers of Hispanic origin was reported by 47 States and the District of Columbia in 1990. New Hampshire did not require the reporting of Hispanic origin, and as indicated earlier, California and Oklahoma did not require the reporting of maternal weight gain.

As noted for white and black births, increases in maternal weight gain for Hispanic mothers are associated with very substantial declines in the risk of a low-birthweight outcome (table 10). For all Hispanic origins combined the overall decline in low birthweight was from 12.0 percent for weight gains of less than 16 pounds to approximately 4 percent for gains of at least 31 pounds.

Although a sharp decline in low birthweight with added weight gain is evident for all Hispanic groups, for weight gains of less than 31 pounds, Mexican and Central and South American mothers are generally less likely to give birth to a low-birthweight infant than Puerto Rican, Cuban, or other Hispanic mothers. This probably reflects differences in tobacco use and in prepregnancy weight, both important determinants of infant birthweight. A smaller proportion of Mexican and Central and South Amer-

ican mothers reported smoking during pregnancy (table 3), and Mexican women in the childbearing ages are disproportionately overweight (30).

Obstetric procedures

The U.S. Standard Certificate of Live Birth includes six checkboxes for obstetric procedures. Data for 1990 were reported by 49 States and the District of Columbia, an increase of 2 States from the previous year. Data were not available for Oklahoma. Information was not reported for 2–3 percent of the births in the reporting area. The rates for these procedures can be examined by maternal and infant characteristics and measurements of birth outcome.

The most prevalent procedure reported in 1990 was electronic fetal monitoring (EFM), done for 73 percent of all live births (table 11) compared with 68 percent in 1989. At least 70 percent of mothers in all age groups received this procedure, with the highest level (74 percent) for the youngest age group (less than 20 years of age). All age groups experienced increases in EFM compared with 1989, ranging from 5 percent for mothers less than 20 years of age to 9 percent for those 40–49 years of age. This pattern of increases in EFM was observed for both white and black mothers, although the increases for black mothers were less pronounced.

Of the mothers who had live births in 1990, 52 percent received ultrasound compared with 48 percent in 1989. Increases from 1989 by age ranged from 6 to 10 percent. For mothers in all age groups, at least 50 percent had ultrasound, with mothers 35–39 years of age having the highest level (54 percent). The variation in the receipt of ultrasound by age for white mothers was small (52–55 percent). For black mothers the levels were slightly lower than for white mothers and also showed a small range by age (47–51 percent).

In 1990 the overall rates of stimulation of labor and induction of labor were 114 and 95 per 1,000 live births, respectively. Mothers 25–29 years of age had the highest rate of stimulation of labor (117 per thousand) and

mothers under 20 years had the lowest rate (110 per thousand). As observed for all races, both black and white mothers 25–29 years of age had the highest rates (103 and 120, respectively). Induction of labor rates had a slightly larger range by age, from 82 for the youngest mothers to 105 for the oldest mothers. This same pattern is seen for both black and white mothers. The rates of both of these procedures increased from 1989 for all but one age group, 40–49 years of age.

Amniocentesis, a procedure performed between the 15th and 16th week of gestation to detect genetic disorders, was reported for 33 of every 1,000 live births in 1990, an increase of 3 percent over 1989. The rate of amniocentesis for the oldest age group (40–49 years of age) was 14 times the rate for the youngest mothers (194 compared with 14 per 1,000 live births). Similar differences by age were observed for white mothers. For black mothers the difference between the oldest and youngest age groups was tenfold (108 compared with 11 per 1,000 live births). White mothers were nearly twice as likely as black mothers to have had amniocentesis (36 compared with 19 per 1,000 live births). The difference between the rates for white and black mothers was smallest for mothers 25–29 years of age (20 compared to 16 per 1,000 live births) and largest for those 40–49 years of age (209 compared to 108 per 1,000 live births).

Tocolysis was the least prevalent of these procedures and showed no change from the previous year (16 per 1,000 live births). Black mothers were more likely than white mothers to have received tocolysis (19 compared with 16 per 1,000 live births). This represents an increase in the difference between white and black mothers over 1989, caused by an increase in the rate for black mothers and a decline for white mothers. By age, the highest rates in 1990 were for black and white mothers under 20 years of age (20 and 19 per 1,000 live births).

Rates for these procedures vary by the education of mother and birthweight and gestation of the infant (data not shown here). All but one of these procedures, tocolysis, had higher rates

for mothers with 13 years of education or more compared with mothers who had less schooling. The same pattern is observed for black and white mothers except for ultrasound. For this procedure, white mothers with 13 years of education or more had a slightly lower rate than mothers with 12 years of education. Mothers giving birth to low-birthweight infants (less than 2,500 grams) or preterm infants (less than 37 completed weeks of gestation) were much more likely to have had amniocentesis or tocolysis. However, these mothers were less likely to have had labor induced or stimulated.

Complications of labor and/or delivery

In 1990, 49 States and the District of Columbia collected data on various specified complications of labor and/or delivery. Data are not obtainable from Oklahoma. Less than 3 percent of the birth certificates from the reporting area failed to provide information on complications.

Six complications were reported at a rate greater than or equal to 30 per 1,000 live births: Meconium, moderate/heavy (60 per 1,000), fetal distress (43 per 1,000), breech/malpresentation (38 per 1,000), cephalopelvic disproportion (37 per 1,000), premature rupture of membrane (33 per 1,000), and dysfunctional labor (30 per 1,000). The least common complications were anesthetic complication and seizures during labor, which occurred less than once per 1,000 live births (table 12).

Febrile and cord prolapse were the only complications with higher rates in 1990 than in 1989. There were no changes in the rates for placenta previa, dysfunctional labor, and anesthetic complications. The remaining 10 complications had lower rates in 1990. For white mothers the increases and decreases were the same as for all races. For black mothers 14 complications had lower rates in 1990; only cord prolapse was higher than in 1989.

Distinctions by age of mother were observed in the rates of three of the six most prevalent complications. Meconium and fetal distress had the highest rates for the youngest (under 20 years

of age) and oldest (40–49 years of age) mothers and the lowest rates for mothers in the middle years (25–34 years of age). Breech/malpresentation had the highest rates for the oldest mothers and the lowest rates for the youngest mothers. Although not a frequent complication, placenta previa had the greatest contrast between older and younger mothers (10 and 1 per 1,000 live births, respectively).

Of the six most prevalent complications, four occurred more often to mothers with 13 years of education or more and two, meconium and fetal distress, occurred most often to mothers with less than 12 years of education (data not shown here). The same pattern is observed for white mothers. For black mothers there was no trend by educational attainment for premature rupture of membrane and, in direct contrast to white mothers, the highest rates for fetal distress occurred to mothers with the most education.

Only four complications (meconium, prolonged labor, dysfunctional labor, and cephalopelvic disproportion) had lower rates for low-birthweight infants (less than 2,500 grams) as compared with infants weighing 2,500 grams or more. Of the remaining 11 complications, which had higher complication rates for low-birthweight infants, 4 (premature rupture of membrane, abruptio placenta, placenta previa, and breech/malpresentation) had rates at least four times those of infants weighing 2,500 grams or more. These same four complications with considerable differences by birthweight also had large differences (three to seven times) in rates for those born preterm (less than 37 completed weeks of gestation) when compared with term births.

Method of delivery

An item on method of delivery was included in the 1989 revised U.S. Standard Certificate of Live Birth to expand information available from periodic surveys. Since 1965, national and regional trends in cesarean delivery have been available from the National Hospital Discharge Survey (NHDS), conducted annually by NCHS. From this source,

it was determined that the rate of cesarean delivery (number of cesarean deliveries per 100 total deliveries) increased steadily from 1965 to 1986 (from 4.5 to 24.1 percent) and then reached a plateau at about the 1986 level (31,32). However, no data for States or smaller geographic areas and only limited information on maternal characteristics are available from this survey. Additionally, because maternal and infant records are sampled independently, cesarean rates for infant characteristics cannot be determined.

In 1990, 49 States and the District of Columbia included an item on method of delivery on their birth certificates. The item was not included on the birth certificate of Oklahoma. Only 2.1 percent of the births in the reporting area lacked information on method of delivery. The overall cesarean rate derived from live birth certificates (percent of all live births by cesarean delivery) in 1990 was 22.7 (table 13), almost identical to the 1989 rate of 22.8. The primary rate for 1990 (first cesareans per 100 live births to women who had no previous cesarean) derived from live birth certificates was 16.0, also almost identical to the 1989 rate of 16.1. The national objectives for health promotion and disease prevention for the year 2000 that pertain to cesarean delivery are to reduce the overall cesarean delivery rate to no more than 15 and the primary rate to no more than 12 (33). A recent study indicates that the U.S. cesarean rate is the third highest among 21 reporting countries, exceeded only by Brazil and Puerto Rico (34).

The rate of vaginal birth after a previous cesarean delivery (VBAC) has risen steadily in the last few decades. However, the U.S. rate is still much lower than rates in many European countries (34). In 1990, of women who had a previous cesarean, 19.9 percent delivered vaginally. The comparable rate from the 1990 NHDS was 20.4 percent (32). In 1982 (35), 1985 (36), and 1988 (37) the American College of Obstetricians and Gynecologists issued increasingly liberalized guidelines for VBAC to reduce the overall cesarean rate. The year 2000 objective is to

increase the national VBAC rate to 35 percent (33).

The overall cesarean rate rises rapidly with advancing age and is twice as high for women in their forties as for teenage mothers (32.3 compared with 16.6) (table 13). The primary rate also increases with age, from 14.7 for teenagers to 23.5 for women in their forties. These increases are partly explained by the higher educational attainment of older mothers; cesarean rates are higher for mothers with 12 years or more of schooling than for mothers with lower educational attainment. For example, for mothers 30–39 years of age with 12 years or more of schooling, the cesarean rates were 26 to 30 compared with 22 to 25 for mothers with less than 12 years of education (table not shown).

The rate of vaginal birth after a previous cesarean delivery declines with added age. Of the teenagers who had a previous cesarean delivery, one in four delivered vaginally in 1990 compared with one in five mothers in their twenties and early thirties and less than one in six mothers aged 40–49 (table 13).

The overall cesarean rate for white women was less than 1 percentage point higher than for black women (23.0 compared with 22.1 percent). However, for mothers 25 years and older, black women were more likely to have a cesarean delivery than white women. Similarly, although the primary cesarean rate for white mothers was slightly higher than for black mothers (16.1 compared with 15.7), the rate for black women was substantially higher for ages 30 years and older. The overall VBAC rates were also similar for white and black women (19.7 compared with 20.3), but white women aged 30 years and older were more likely to have a VBAC delivery (table 13).

The risk of a cesarean delivery was substantially higher than average in the presence of certain medical risk factors related to pregnancy (table 14). The cesarean rate was more than 40 for the following indications: eclampsia (52.3), genital herpes (46.0), hydramnios/oligohydramnios (45.6), and chronic hypertension (41.4). Likewise, there was a greatly elevated risk of a cesarean delivery (rate of 40 or more)

for 10 of the 14 complications of labor or delivery identified on the birth certificate. The rate was particularly high for cephalopelvic disproportion (97.7), breech/malpresentation (84.5), placenta previa (82.3), dysfunctional labor (65.2), and fetal distress (62.6). Medical risks and complications with higher than average overall cesarean rates were also associated with elevated primary rates and reduced rates of VBAC (table 14).

Tocolysis and ultrasound performed during pregnancy were associated with higher than average cesarean rates (31.1 and 26.3, respectively), although cesarean rates for induction of labor (21.9) and electronic fetal monitoring (21.7) were slightly lower than the average rate of 22.7 (table 14).

For a number of years, there has been a growing deficit in the number of births on weekends and holidays, regardless of mode of delivery. This has been attributed to the rise in cesarean deliveries, particularly repeat cesareans, which are often scheduled, and to an increase in the induction of labor for vaginal births. The index of occurrence can be used to measure the magnitude of the weekend deficit. It relates the average number of births on a given day of the week to the average daily number of births for the year. The index for all births occurring on Sunday is 78.9, meaning that there are 21 percent fewer births on Sunday than the daily average (table 15). Similarly, the index for Saturday is 86.1, or 14 percent fewer births than the daily average.

The weekend deficits for births by cesarean delivery, particularly repeat cesareans, are especially large. There were 30 percent fewer primary and 61 percent fewer repeat cesareans on Sundays than the daily averages, and 18 percent fewer primary and 55 percent fewer repeat cesareans on Saturdays than the daily averages.

For vaginal births, the indexes for Sunday and Saturday were 84.9 and 91.4, respectively. The weekend deficit of vaginal births reflects the less frequent induction of labor on these days. In 1990, 9.6 percent of all vaginal births were induced, but only 4.8 percent of those occurring on Sundays and 7.5 per-

cent of those occurring on Saturdays were induced.

Information from the NHDS shows that concomitant with the rise in cesarean deliveries during the early and mid-1980's, there was a large decline in forceps deliveries and an increase in vacuum extraction deliveries (38). Information on the rates of forceps and vacuum extraction deliveries determined from 1989 and 1990 live birth certificates indicates that these diverse trends have continued, but that both of these methods of delivery are used relatively infrequently. In 1990, 5.1 percent of births were delivered by forceps (compared with 5.5 percent in 1989) and 3.9 percent were by vacuum extraction (compared with 3.5 percent in 1989). In 1990 both of these procedures were more frequently performed for white than for black births (5.5 percent compared with 3.4 percent for forceps, and 4.2 percent compared with 2.3 percent for vacuum deliveries) (table not shown).

Abnormal conditions of the newborn

There were eight abnormal conditions of the newborn listed on the U.S. Standard Certificate of Live Birth in 1990. Data on these conditions were collected by 49 States and the District of Columbia. Data were not available for Oklahoma. The percent of birth certificates from the reporting area that failed to provide any information on abnormal conditions was between 3 and 4 percent.

The abnormal conditions with the highest rates per 1,000 live births were assisted ventilation less than 30 minutes (13 per 1,000), assisted ventilation 30 minutes or longer (7 per 1,000), and hyaline membrane disease/respiratory distress syndrome (RDS) (6 per 1,000).

Data from 1989 suggested substantial underreporting on the birth certificate for birth injuries and fetal alcohol syndrome. This situation did not change in 1990. The identification of fetal alcohol syndrome can often occur after the birth certificate has been completed. Some physicians that suspect

fetal alcohol syndrome do not make the diagnosis (39).

The rates for abnormal conditions in 1990, as in 1989, were higher for black births than for white births for all conditions except assisted ventilation less than 30 minutes and birth injuries. The highest rates by age for anemia and hyaline membrane disease/RDS were observed for the youngest mothers (under 20 years of age). Assisted ventilation 30 minutes or longer, meconium aspiration, and assisted ventilation less than 30 minutes had the highest rates for both the oldest (40-49 years of age) and youngest (under 20 years of age) mothers (table 16).

All but one abnormal condition, birth injury, was more frequent among low-birthweight infants (less than 2,500 grams) compared with infants weighing 2,500 grams or more. There were very large differences between low-birthweight infants and those of higher weight in the rates of hyaline membrane disease/RDS (56 and 2 per 1,000 live births, respectively) and assisted ventilation 30 minutes or longer (62 and 3 per 1,000 live births, respectively). Although less pronounced, the rates of the same two conditions that had the largest differences by birthweight also had the largest differences between preterm births (less than 37 completed weeks gestation) and term births (37 completed weeks gestation or more) (data not shown here).

Congenital anomalies

Congenital anomalies are responsible for a substantial number of fetal and infant deaths. They are also important contributors to childhood morbidity and to shortened life expectancy (40).

Because of the importance of national, uniformly collected data on congenital defects, the 1989 revised U.S. Standard Certificate of Live Birth included a checkbox item for reporting congenital anomalies of the newborn. In 1990, 47 States and the District of Columbia reported this item; information was not available for births in New Mexico, New York, and Oklahoma. The item was not completed for 4 per-

cent of the birth certificates in the reporting area.

Year-to-year changes in the occurrence of specific congenital anomalies should be interpreted with caution. Variations in malformation incidence can be caused by differences in reporting practices and to random fluctuations due to small numbers of events, as well as to actual changes in the frequency of occurrence.

For many of the anomalies, rates are lower for black than for white births (table 17). Polydactyly/Syndactyly/Adactyly is a notable exception. In 1990, the rate for this group of anomalies was 223.8 for black babies, 3 1/2 times the rate for white births (64.7).

As shown in table 17, the risk of the occurrence of an anomaly is often strongly associated with a mother's age. There was a decline in risk for mothers 30 years and older compared with teenage mothers and mothers in their early twenties for anencephalus, hydrocephalus, "other central nervous system anomalies," omphalocele, "other gastrointestinal anomalies," and clubfoot. However, the risk of Down's syndrome and other chromosomal anomalies rose rapidly with increased maternal age. For mothers 40 years and older, the rate was 421.2 for Down's syndrome, 11 times as high as the rate for mothers under 20 years of age (36.7); for other chromosomal anomalies, the rate was 127.1 for older mothers, 3 times the rate of 37.8 for teenage mothers.

The incidence of some anomalies also differed markedly by the sex of the child (data not shown in this report). The rate for urogenital anomalies was far higher for male than for female babies: for malformed genitalia the rate was 141.8 for male births compared with 16.8 for female births; for renal agenesis, 12.2 for male births compared with 5.8 for female births; and for other urogenital anomalies, 222.4 for male births and 38.4 for female births. Urogenital anomalies accounted for 1 of 4 anomalies for male births, but for only 1 of 10 anomalies for female births.

Weight at birth is also highly associated with the occurrence of congenital malformations (detailed data not shown). For all anomalies included in

this report, rates were far higher for babies of low birthweight (under 2,500 grams or 5 lb 8 oz) than for babies with more adequate birthweight, and were particularly high for infants with very low birthweights (less than 1,500 grams or 3 lb 4 oz). Rates of anencephalus, microcephalus, rectal atresia/stenosis, tracheo-esophageal fistula/esophageal atresia, omphalocele/gastroschisis, and renal agenesis were 8 to 29 times as high for babies of low birthweight than for babies weighing 3,500 grams or more (7 lb 12 oz).

Babies born prematurely (before 37 completed weeks of gestation) are very likely to have a low or very low birthweight. There is a greatly elevated risk for all the congenital anomalies included in this report for babies born prematurely, consistent with their reduced birthweight.

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Table 1. Live births with selected medical risk factors and rates for selected medical risk factors, by age and race of mother: Total of 49 reporting States and the District of Columbia, 1990

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

Medical risk factor and race of mother	All births ¹	Medical risk factor reported	All ages	Age of mother						Not stated
				Under 20 years	20-24 years	25-29 years	30-34 years	35-39 years	40-49 years	
All races²	Number			Rate						Number
Anemia	4,110,563	72,563	18.2	27.7	21.8	15.5	13.6	14.5	15.8	130,863
Cardiac disease	4,110,563	13,457	3.4	2.3	2.6	3.4	4.2	5.0	6.0	130,863
Acute or chronic lung disease	4,110,563	12,102	3.0	3.5	2.9	2.8	3.1	3.6	4.0	130,863
Diabetes	4,110,563	84,615	21.3	7.4	13.7	20.9	29.4	43.0	61.9	130,863
Genital herpes ^{3,4}	3,631,762	27,539	7.8	5.5	6.6	7.7	9.5	10.8	8.4	89,720
Hydramnios/Oligohydramnios ³	3,948,185	22,633	5.9	6.1	5.7	5.5	6.1	7.0	9.4	124,844
Hemoglobinopathy ³	3,948,185	1,584	0.4	0.5	0.5	0.4	0.4	0.4	*	124,844
Hypertension, chronic	4,110,563	25,961	6.5	2.6	4.2	5.8	8.6	15.1	26.2	130,863
Hypertension, pregnancy-associated	4,110,563	108,351	27.2	32.1	27.5	25.3	25.2	30.1	37.1	130,863
Eclampsia	4,110,563	15,797	4.0	6.4	4.1	3.2	3.3	4.0	5.6	130,863
Incompetent cervix ³	3,948,185	13,083	3.4	2.2	2.8	3.4	4.4	5.1	5.7	124,844
Previous infant 4000+ grams ³	3,948,185	40,014	10.5	1.7	6.6	11.2	15.8	19.1	22.6	124,844
Previous preterm or small-for-gestational-age infant ³	3,948,185	45,810	12.0	5.9	11.6	12.1	13.9	16.6	18.9	124,844
Renal disease	4,110,563	8,790	2.2	3.1	2.5	2.0	1.8	1.8	1.7	130,863
Rh sensitization ⁵	4,071,543	24,044	6.1	4.7	5.7	6.4	6.6	6.8	7.2	131,786
Uterine bleeding ⁴	3,794,140	30,645	8.3	6.2	7.3	8.3	9.8	10.5	11.2	95,752
White										
Anemia	3,252,473	46,132	14.6	21.8	17.2	12.7	11.8	12.5	13.7	101,039
Cardiac disease	3,252,473	11,029	3.5	2.3	2.6	3.5	4.3	5.1	6.1	101,039
Acute or chronic lung disease	3,252,473	9,024	2.9	3.1	2.7	2.6	3.0	3.5	4.0	101,039
Diabetes	3,252,473	67,890	21.5	8.3	14.3	20.7	28.5	40.8	59.0	101,039
Genital herpes ^{3,4}	2,843,857	22,286	8.0	4.4	6.1	8.0	10.4	12.2	9.4	67,239
Hydramnios/Oligohydramnios ³	3,110,009	17,262	5.7	6.1	5.5	5.3	5.8	6.8	8.8	96,143
Hemoglobinopathy ³	3,110,009	640	0.2	0.2	0.2	0.2	0.2	0.2	*	96,143
Hypertension, chronic	3,252,473	18,057	5.7	2.3	3.8	5.1	7.3	12.2	21.5	101,039
Hypertension, pregnancy-associated	3,252,473	87,016	27.6	33.1	28.7	25.9	25.0	29.6	36.1	101,039
Eclampsia	3,252,473	11,384	3.6	5.6	3.9	3.0	3.1	3.7	5.0	101,039
Incompetent cervix ³	3,110,009	10,586	3.5	2.6	2.9	3.3	4.3	5.3	6.1	96,143
Previous infant 4000+ grams ³	3,110,009	35,933	11.9	2.0	7.5	12.3	17.3	21.1	25.6	96,143
Previous preterm or small-for-gestational-age infant ³	3,110,009	34,224	11.4	5.1	10.6	11.3	13.2	16.1	18.3	96,143
Renal disease	3,252,473	7,106	2.3	3.5	2.6	2.0	1.9	1.8	1.5	101,039
Rh sensitization ⁵	3,217,724	21,673	7.0	5.8	6.6	7.2	7.4	7.5	8.0	101,887
Uterine bleeding ⁴	2,986,321	25,335	8.7	6.4	7.6	8.6	10.1	10.8	11.6	72,148
Black										
Anemia	679,236	22,705	34.7	40.2	37.9	31.6	27.1	28.3	27.7	25,775
Cardiac disease	679,236	2,023	3.1	2.3	2.7	3.4	3.6	5.4	7.2	25,775
Acute or chronic lung disease	679,236	2,669	4.1	4.3	3.9	3.8	4.1	4.9	5.4	25,775
Diabetes	679,236	11,585	17.7	5.2	10.8	20.7	32.6	49.9	77.1	25,775
Genital herpes ^{3,4}	619,329	4,605	7.7	8.2	8.8	7.2	6.3	5.0	4.6	19,262
Hydramnios/Oligohydramnios ³	662,688	4,383	6.9	6.0	6.6	6.9	7.8	8.8	13.7	24,735
Hemoglobinopathy ³	662,688	797	1.2	1.2	1.4	1.2	1.1	1.0	*	24,735
Hypertension, chronic	679,236	7,070	10.8	3.5	5.8	10.8	20.2	38.5	66.7	25,775
Hypertension, pregnancy-associated	679,236	17,911	27.4	30.2	24.3	24.6	29.3	38.3	49.4	25,775
Eclampsia	679,236	3,888	5.9	8.4	5.2	4.8	5.3	6.2	10.8	25,775
Incompetent cervix ³	662,688	2,045	3.2	1.3	2.5	4.2	5.6	4.5	5.0	24,735
Previous infant 4000+ grams ³	662,688	2,743	4.3	1.0	3.2	5.6	7.7	9.1	9.6	24,735
Previous preterm or small-for-gestational-age infant ³	662,688	9,671	15.2	7.8	15.3	17.6	20.2	20.7	21.6	24,735
Renal disease	679,236	1,378	2.1	2.3	2.2	2.1	1.6	2.1	*	25,775
Rh sensitization ⁵	675,894	2,030	3.1	2.7	3.1	3.3	3.4	3.8	5.4	25,859
Uterine bleeding ⁴	635,877	4,227	6.9	5.9	6.4	7.0	8.2	9.4	8.8	20,302

¹Total number of births to residents of areas reporting specified medical risk factor²Includes races other than white and black.³New York City (but not New York State) reports this risk factor.⁴Texas does not report this risk factor.⁵Kansas does not report this risk factor.

NOTE: Excludes data for Oklahoma, which did not require reporting of medical risk factors

Table 2. Number of live births by smoking status of mother, percent smokers, and percent distribution by average number of cigarettes smoked by mothers per day, according to age and race of mother: Total of 45 reporting States and the District of Columbia, 1990

Smoking status, smoking measure, and race of mother	Age of mother										
	All ages	Under 15 years	15-19 years							35-39 years	40-49 years
			Total	15-17 years	18-19 years	20-24 years	25-29 years	30-34 years			
Number											
All races ¹											
Total	3,103,146	9,316	404,409	142,181	262,228	824,541	954,363	651,077	225,704	33,736	
Smoker	551,080	673	81,125	24,121	57,004	175,392	165,336	95,789	28,803	3,962	
Nonsmoker	2,437,784	8,309	309,073	112,970	196,103	619,916	754,631	530,214	187,364	28,277	
Not stated	114,282	334	14,211	5,090	9,121	29,233	34,396	25,074	9,537	1,497	
White											
Total	2,443,822	3,535	264,695	84,647	180,048	620,227	788,908	550,146	188,729	27,582	
Smoker	455,940	540	69,911	20,743	49,168	146,105	135,591	77,487	23,123	3,183	
Nonsmoker	1,899,598	2,845	185,457	60,749	124,708	452,733	625,839	451,907	157,664	23,153	
Not stated	88,284	150	9,327	3,155	6,172	21,389	27,478	20,752	7,942	1,246	
Black											
Total	557,392	5,567	129,517	53,984	75,533	180,432	133,583	76,977	27,060	4,256	
Smoker	85,002	114	9,419	2,780	6,639	26,066	27,020	16,639	5,082	662	
Nonsmoker	450,942	5,286	115,632	49,415	66,217	147,454	101,042	57,194	20,904	3,430	
Not stated	21,448	167	4,466	1,789	2,677	6,912	5,521	3,144	1,074	164	
Percent											
Smoker ¹	18.4	7.5	20.8	17.6	22.5	22.1	18.0	15.3	13.3	12.3	
White	19.4	16.0	27.4	25.5	28.3	24.4	17.8	14.6	12.8	12.1	
Black	15.9	2.1	7.5	5.3	9.1	15.0	21.1	22.5	19.6	16.2	
Percent distribution											
All races ¹											
Smoker	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1-5 cigarettes	19.9	36.7	24.5	28.1	23.0	20.1	18.7	18.4	18.1	17.5	
6-10 cigarettes	39.2	42.2	42.9	43.1	42.9	40.4	38.5	36.6	34.5	32.2	
11-15 cigarettes	6.6	3.5	5.4	4.9	5.6	6.4	7.1	7.0	6.6	6.2	
16-20 cigarettes	28.2	14.5	23.5	20.9	24.6	28.0	29.1	29.8	30.7	31.8	
21-30 cigarettes	4.3	*	2.6	2.1	2.8	3.6	4.6	5.5	6.4	7.0	
31-40 cigarettes	1.6	*	0.8	0.6	0.9	1.2	1.7	2.4	3.2	4.2	
41 cigarettes or more	0.3	*	0.2	0.2	0.2	0.2	0.3	0.3	0.5	1.0	
White											
Smoker	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1-5 cigarettes	17.2	31.2	21.4	24.8	20.0	17.0	16.2	16.2	16.1	15.3	
6-10 cigarettes	38.4	45.3	43.4	44.0	43.2	39.8	37.2	35.2	32.9	30.1	
11-15 cigarettes	7.2	*	5.8	5.4	6.0	7.1	7.8	7.7	7.1	6.7	
16-20 cigarettes	30.4	17.0	25.5	22.6	26.6	30.5	31.6	31.8	32.5	34.0	
21-30 cigarettes	4.8	*	2.9	2.3	3.1	4.0	5.2	6.2	7.3	8.1	
31-40 cigarettes	1.7	*	0.8	0.7	0.9	1.3	1.8	2.6	3.5	4.6	
41 cigarettes or more	0.3	*	0.2	0.2	0.2	0.2	0.3	0.4	0.5	1.1	
Black											
Smoker	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1-5 cigarettes	32.7	62.0	44.5	49.2	42.5	35.9	30.1	27.4	26.2	25.9	
6-10 cigarettes	43.4	27.0	40.2	37.5	41.3	43.4	45.3	42.7	41.2	41.9	
11-15 cigarettes	3.4	*	2.5	1.9	2.8	2.9	3.6	4.2	4.4	4.5	
16-20 cigarettes	17.4	*	10.9	9.9	11.3	15.3	17.8	21.6	23.3	21.7	
21-30 cigarettes	1.9	*	1.0	0.9	1.1	1.4	1.9	2.6	2.7	*	
31-40 cigarettes	1.1	*	0.7	*	0.7	0.9	1.2	1.3	1.8	*	
41 cigarettes or more	0.2	*	*	*	*	0.2	0.2	0.2	0.4	*	

¹Includes races other than white and black

NOTE: Excludes data for California, Indiana, New York, Oklahoma, and South Dakota, which did not require reporting of tobacco use during pregnancy

Table 3. Number of live births by smoking status of mother and percent smokers, by age and Hispanic origin of mother and by race of mother for mothers of non-Hispanic origin: Total of 44 reporting States and the District of Columbia, 1990

Smoking status and origin of mother	Age of mother									
	All ages	Under 15 years	15-19 years			20-24 years	25-29 years	30-34 years	35-39 years	40-49 years
			Total	15-17 years	18-19 years					
All origins ¹										
Total	3,085,577	9,308	403,151	141,833	261,318	820,762	948,126	646,459	224,227	33,544
Smoker	547,433	671	80,640	23,993	56,647	174,265	164,170	95,139	28,608	3,940
Nonsmoker	2,423,903	8,303	308,303	112,751	195,552	617,272	749,568	526,264	186,085	28,108
Not stated	114,241	334	14,208	5,089	9,119	29,225	34,388	25,056	9,534	1,496
Hispanic										
Total	294,372	1,354	52,092	20,029	32,063	93,445	81,152	46,292	16,766	3,271
Smoker	18,742	56	3,352	1,202	2,150	6,122	5,171	2,928	954	159
Nonsmoker	259,529	1,212	45,719	17,612	28,107	82,134	71,642	40,967	14,942	2,913
Not stated	16,101	86	3,021	1,215	1,806	5,189	4,339	2,397	870	199
Mexican										
Total	180,257	863	33,600	12,863	20,737	59,297	48,218	26,758	9,677	1,844
Smoker	8,891	30	1,565	591	974	2,891	2,454	1,417	452	82
Nonsmoker	160,251	782	29,944	11,432	18,512	52,840	42,745	23,685	8,622	1,633
Not stated	11,115	51	2,091	840	1,251	3,566	3,019	1,656	603	129
Puerto Rican										
Total	34,128	224	7,676	3,128	4,548	11,821	8,497	4,243	1,364	303
Smoker	4,325	12	877	304	573	1,563	1,139	564	149	21
Nonsmoker	27,571	196	6,249	2,586	3,663	9,460	6,830	3,424	1,150	262
Not stated	2,232	16	550	238	312	798	528	255	65	20
Cuban										
Total	9,758	15	755	247	508	1,915	3,813	2,280	842	138
Smoker	618	1	49	15	34	129	232	141	58	8
Nonsmoker	9,002	14	697	229	468	1,762	3,532	2,102	767	128
Not stated	138	-	9	3	6	24	49	37	17	2
Central and South American										
Total	32,026	58	2,790	891	1,899	8,533	10,410	6,975	2,706	554
Smoker	933	-	75	20	55	229	288	234	88	19
Nonsmoker	29,939	56	2,631	844	1,787	7,992	9,744	6,490	2,515	511
Not stated	1,154	2	84	27	57	312	378	251	103	24
Other and unknown Hispanic										
Total	38,203	194	7,271	2,900	4,371	11,879	10,214	6,036	2,177	432
Smoker	3,975	13	786	272	514	1,310	1,058	572	207	29
Nonsmoker	32,766	164	6,198	2,521	3,677	10,080	8,791	5,266	1,888	379
Not stated	1,462	17	287	107	180	489	365	198	82	24
Non-Hispanic										
Total ²	2,764,498	7,890	347,519	120,531	226,988	720,375	859,082	594,396	205,324	29,912
Smoker	523,694	611	76,488	22,551	53,937	166,451	157,581	91,403	27,424	3,736
Nonsmoker	2,146,873	7,044	260,387	94,321	166,066	530,916	672,630	481,338	169,614	24,944
Not stated	93,931	235	10,644	3,659	6,985	23,008	28,871	21,655	8,286	1,232
White										
Total	2,122,358	2,198	210,817	64,158	146,659	521,150	698,363	496,426	169,440	23,964
Smoker	430,418	487	65,572	19,266	46,306	137,773	128,375	73,405	21,838	2,968
Nonsmoker	1,622,383	1,648	139,153	43,045	96,108	367,716	547,624	405,428	140,810	20,004
Not stated	69,557	63	6,092	1,847	4,245	15,661	22,364	17,593	6,792	992
Black										
Total	547,245	5,504	127,597	53,219	74,378	177,412	130,850	75,277	26,465	4,140
Smoker	83,803	108	9,255	2,727	6,528	25,692	26,653	16,426	5,015	654
Nonsmoker	443,171	5,236	114,135	48,802	65,333	145,176	98,972	55,890	20,436	3,326
Not stated	20,271	160	4,207	1,690	2,517	6,544	5,225	2,961	1,014	160

Table 3. Number of live births by smoking status of mother and percent smokers, by age and Hispanic origin of mother and by race of mother for mothers of non-Hispanic origin: Total of 44 reporting States and the District of Columbia, 1990—Con.

Smoking status and origin of mother	Age of mother									
	All ages	Under 15 years	15–19 years			20–24 years	25–29 years	30–34 years	35–39 years	40–49 years
			Total	15–17 years	18–19 years					
				Percent						
All origins ¹ . . .	18 4	7 5	20 7	17 5	22 5	22 0	18 0	15 3	13 3	12 3
Hispanic	6 7	4 4	6 8	6 4	7 1	6 9	6 7	6 7	6 0	5 2
Mexican	5 3	3 7	5 0	4 9	5 0	5 2	5 4	5 6	5 0	4 8
Puerto Rican	13 6	*	12 3	10 5	13 5	14 2	14 3	14 1	11 5	7 4
Cuban	6 4	*	6 6	*	6 8	6 8	6 2	6 3	7 0	*
Central and South American	3 0	*	2 8	2 3	3 0	2 8	2 9	3 5	3 4	*
Other and unknown Hispanic	10 8	*	11 3	9 7	12 3	11 5	10 7	9 8	9 9	7 1
Non-Hispanic ²	19 6	8 0	22 7	19 3	24 5	23 9	19 0	16 0	13 9	13 0
White	21 0	22 8	32 0	30 9	32 5	27 3	19 0	15 3	13 4	12 9
Black	15 9	2 0	7 5	5 3	9 1	15 0	21 2	22 7	19 7	16 4

¹Includes origin not stated

²Includes races other than white and black

NOTE: Excludes data for California, Indiana, New Hampshire, New York, Oklahoma, and South Dakota, which did not require reporting of either Hispanic origin of mother or tobacco use during pregnancy

Table 4. Number of live births, percent of mothers who smoked cigarettes during pregnancy and percent distribution of average number of cigarettes smoked by mothers per day, according to educational attainment and race of mother: Total of 44 reporting States and the District of Columbia, 1990

Smoking measure and race of mother	Total	Years of school completed by mother					
		0-8 years	9-11 years	12 years	13-15 years	16 years or more	Not stated
All births							
All races ¹	3,023,895	134,771	513,526	1,172,144	617,975	541,781	43,698
White	2,373,156	107,413	349,282	904,320	500,125	480,535	31,481
Black	554,484	19,761	149,604	235,766	101,301	38,723	9,329
Percent							
Smoker ¹	18.4	19.2	33.3	21.2	12.7	4.5	16.8
White	19.3	21.3	38.8	23.0	13.0	4.5	17.0
Black	15.9	12.7	21.5	15.6	12.1	5.9	19.8
All races ¹ Percent distribution							
Smoker	100.0	100.0	100.0	100.0	100.0	100.0	100.0
10 cigarettes or less	59.0	52.5	57.3	58.5	62.5	70.8	59.1
11-20 cigarettes	34.8	38.0	35.8	35.6	32.2	25.1	34.6
21 cigarettes or more	6.2	9.5	6.9	5.9	5.3	4.1	6.3
White							
Smoker	100.0	100.0	100.0	100.0	100.0	100.0	100.0
10 cigarettes or less	55.4	49.9	52.8	55.1	59.5	69.8	55.1
11-20 cigarettes	37.7	39.9	39.5	38.4	34.6	25.9	37.5
21 cigarettes or more	6.9	10.2	7.7	6.5	5.8	4.3	7.4
Black							
Smoker	100.0	100.0	100.0	100.0	100.0	100.0	100.0
10 cigarettes or less	76.0	71.4	74.9	77.0	77.3	78.7	69.6
11-20 cigarettes	20.8	23.8	21.3	20.3	20.2	18.4	27.1
21 cigarettes or more	3.2	4.9	3.8	2.7	2.5	2.9	3.3

¹Includes races other than white and black

NOTE: Excludes data for California, Indiana, New York, Oklahoma, South Dakota, and Washington, which did not require reporting of either tobacco use during pregnancy or educational attainment of mother

Table 5. Percent low birthweight by smoking status, age, and race of mother: Total of 45 reporting States and the District of Columbia, 1990

[Low birthweight is defined as weight of less than 2,500 grams (5 lb 8 oz)]

Smoking status and race of mother	Age of mother									
	All ages	Under 15 years	15-19 years			20-24 years	25-29 years	30-34 years	35-39 years	40-49 years
			Total	15-17 years	18-19 years					
All races ¹	7.2	13.7	9.7	10.6	9.1	7.3	6.3	6.4	7.5	8.5
Smoker	11.3	15.8	11.2	11.7	10.9	10.2	10.9	12.5	15.0	16.2
Nonsmoker	6.1	13.4	9.2	10.3	8.5	6.4	5.1	5.2	6.2	7.3
Not stated	9.3	17.3	12.1	13.8	11.2	9.6	8.2	8.5	9.6	10.5
White	5.8	10.6	7.8	8.6	7.4	5.9	5.1	5.3	6.3	7.5
Smoker	9.4	15.4	10.3	11.0	10.0	8.7	8.9	10.0	12.4	14.4
Nonsmoker	4.8	9.5	6.7	7.6	6.3	4.9	4.2	4.4	5.4	6.5
Not stated	7.5	15.1	9.8	11.3	9.1	7.7	6.5	7.2	8.3	8.8
Black	13.3	15.7	13.7	14.0	13.4	12.4	13.1	14.4	15.3	15.6
Smoker	21.2	19.5	18.1	17.2	18.5	18.8	21.5	24.1	27.1	25.9
Nonsmoker	11.7	15.5	13.2	13.7	12.8	11.1	10.6	11.4	12.3	13.2
Not stated	16.7	19.8	17.0	18.4	16.1	15.4	16.8	17.5	18.3	24.5

¹Includes races other than white and black

NOTE: Excludes data for California, Indiana, New York, Oklahoma, and South Dakota, which did not require reporting of tobacco use during pregnancy

Table 6. Number of live births by drinking status of mother, percent drinkers, and percent distribution by average numbers of drinks per week, according to age and race of mother: Total of 46 reporting States and the District of Columbia, 1990

Drinking status, drinking measure, and race of mother	Age of mother										
	All ages	Under 15 years	15-19 years								
			Total	15-17 years	18-19 years	20-24 years	25-29 years	30-34 years	35-39 years	40-49 years	
Number											
All races ¹											
Total	3,189,360	9,524	416,744	146,311	270,433	849,898	981,555	666,713	230,500	34,426	
Drinker	101,329	80	7,391	2,129	5,262	22,295	32,968	27,081	10,079	1,435	
Nondrinker	2,959,930	9,067	393,279	138,436	254,843	794,681	910,083	611,621	209,865	31,334	
Not stated	128,101	377	16,074	5,746	10,328	32,922	38,504	28,011	10,556	1,657	
White											
Total	2,519,599	3,638	274,431	87,673	186,758	642,180	813,669	564,411	193,068	28,202	
Drinker	78,050	45	5,346	1,554	3,792	15,729	25,234	22,048	8,434	1,214	
Nondrinker	2,341,350	3,414	258,234	82,445	175,789	601,949	757,366	518,985	175,801	25,601	
Not stated	100,199	179	10,851	3,674	7,177	24,502	31,069	23,378	8,833	1,387	
Black											
Total	566,865	5,671	132,027	55,061	76,966	183,632	135,700	78,098	27,425	4,312	
Drinker	20,321	26	1,651	444	1,207	5,731	6,893	4,439	1,403	178	
Nondrinker	523,617	5,465	125,608	52,702	72,906	170,504	122,903	70,314	24,863	3,960	
Not stated	22,927	180	4,768	1,915	2,853	7,397	5,904	3,345	1,159	174	
Percent											
Drinker ¹	3.3	0.9	1.8	1.5	2.0	2.7	3.5	4.2	4.6	4.4	
White	3.2	1.3	2.0	1.9	2.1	2.5	3.2	4.1	4.6	4.5	
Black	3.7	0.5	1.3	0.8	1.6	3.3	5.3	5.9	5.3	4.3	
Percent distribution											
All races ¹											
Drinker	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1 drink or less	61.9	65.9	62.0	63.6	61.4	60.1	62.4	63.0	61.6	58.4	
2 drinks	16.4	*	15.4	15.6	15.3	16.1	16.1	16.8	17.4	17.1	
3-4 drinks	10.4	*	10.3	9.8	10.5	11.2	10.1	9.9	10.5	10.6	
5 drinks or more	11.3	*	12.3	11.0	12.8	12.6	11.4	10.2	10.6	14.0	
White											
Drinker	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1 drink or less	68.0	*	65.7	65.3	65.9	67.4	69.6	68.4	65.5	60.7	
2 drinks	15.3	*	13.8	14.2	13.6	14.2	14.7	15.9	17.1	17.4	
3-4 drinks	8.7	*	9.1	9.4	9.0	8.9	8.1	8.7	9.4	9.4	
5 drinks or more	8.1	*	11.4	11.1	11.5	9.5	7.5	7.0	8.0	12.4	
Black											
Drinker	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1 drink or less	39.0	*	50.5	59.8	47.2	41.3	36.8	35.8	37.9	41.2	
2 drinks	21.1	*	20.4	18.9	21.0	21.3	21.3	21.5	19.3	16.0	
3-4 drinks	16.9	*	14.6	10.7	16.1	17.3	17.2	16.5	17.1	17.6	
5 drinks or more	23.1	*	14.4	10.7	15.8	20.2	24.7	26.3	25.7	25.2	

¹Includes races other than white and black.

NOTE: Excludes data for California, New York, Oklahoma, and South Dakota, which did not require reporting of alcohol use during pregnancy.

Table 7. Number of live births by drinking status of mother and percent drinkers, by Hispanic origin of mother and by race of mother for mothers of non-Hispanic origin: Total of 45 reporting States and the District of Columbia, 1990

Drinking status of mother	All origins ¹	Origin of mother								
		Hispanic						Non-Hispanic		
		Total	Mexican	Puerto Rican	Cuban	Central and South American	Other and unknown Hispanic	Total ²	White	Black
Number										
Total	3,171,791	296,228	181,612	34,376	9,771	32,081	38,388	2,848,555	2,196,291	556,631
Drinker	100,304	4,561	2,266	943	82	335	935	94,462	71,711	19,963
Nondrinker	2,943,435	272,713	165,782	31,084	9,548	30,553	35,746	2,650,199	2,046,668	515,173
Not stated	128,052	18,954	13,564	2,349	141	1,193	1,707	103,894	77,912	21,495
Percent										
Drinker	3.3	1.6	1.3	2.9	0.9	1.1	2.5	3.4	3.4	3.7

¹Includes origin not stated.

²Includes races other than white and black

NOTE: Excludes data for California, New Hampshire, New York, Oklahoma, and South Dakota, which did not require reporting of either alcohol use during pregnancy or Hispanic origin of mother

Table 8. Number of live births and percent distribution by weight gain during pregnancy and median weight gain, according to period of gestation and race of mother: Total of 48 reporting States and the District of Columbia, 1990

Period of gestation and race of mother ¹	All births	Weight gain during pregnancy									Median weight gain
		Total	Less than 16 pounds	16-20 pounds	21-25 pounds	26-30 pounds	31-35 pounds	36-40 pounds	41-45 pounds	46 pounds or more	
All races ²											
All gestational periods ³	3,497,935	100.0	9.2	11.2	15.7	20.8	14.8	12.5	6.2	9.7	30.4
Under 37 weeks	374,531	100.0	17.2	15.6	16.5	18.2	11.1	9.3	4.5	7.6	26.3
37-39 weeks	1,434,635	100.0	8.9	11.5	16.5	21.4	14.9	12.1	5.9	8.8	30.3
40 weeks and over	1,669,964	100.0	7.7	9.9	14.9	20.8	15.5	13.5	6.8	10.9	30.7
White											
All gestational periods ³	2,749,497	100.0	7.8	10.3	15.7	21.4	15.6	13.0	6.5	9.8	30.6
Under 37 weeks	243,182	100.0	14.0	14.5	16.9	19.2	12.3	10.0	5.0	8.1	27.9
37-39 weeks	1,118,183	100.0	7.7	10.7	16.6	22.0	15.7	12.6	6.1	8.8	30.4
40 weeks and over	1,374,935	100.0	6.8	9.3	14.9	21.2	16.2	13.8	7.0	10.9	30.9
Black											
All gestational periods ³	630,249	100.0	15.5	14.8	15.3	18.0	11.0	10.5	5.0	9.8	28.1
Under 37 weeks	118,926	100.0	24.4	18.0	15.4	15.9	8.4	7.8	3.4	6.6	24.7
37-39 weeks	263,126	100.0	14.4	14.9	15.8	18.7	11.3	10.6	5.0	9.3	28.3
40 weeks and over	243,318	100.0	12.6	13.3	14.8	18.3	11.9	11.6	5.8	11.7	30.2

¹Expressed in completed weeks

²Includes races other than white and black

³Includes births with period of gestation not stated

NOTE: Excludes data for California and Oklahoma, which did not require reporting of weight gain during pregnancy.

Table 9. Percent low birthweight by weight gain during pregnancy, by period of gestation, and race of mother: Total of 48 reporting States and the District of Columbia, 1990

[Low birthweight is defined as weight of less than 2,500 grams (5 lb 8 oz)]

Period of gestation and race of mother ¹	Weight gain during pregnancy									
	Total	Less than 16 pounds	16-20 pounds	21-25 pounds	26-30 pounds	31-35 pounds	36-40 pounds	41-45 pounds	46 pounds or more	Not stated
All gestational periods ²										
All races ³	7.2	15.8	10.5	7.0	5.3	4.2	4.1	4.0	4.2	10.9
White	5.8	12.8	8.9	6.0	4.5	3.7	3.5	3.6	3.8	8.4
Black	13.3	23.4	16.3	12.2	9.8	7.8	7.4	6.5	6.3	17.8
Under 37 weeks										
All races ³	41.6	58.0	46.8	39.0	34.2	31.1	30.2	30.7	30.6	49.1
White	40.0	58.0	46.9	38.7	33.8	30.9	30.0	31.2	30.9	46.6
Black	45.5	58.9	47.7	40.6	35.9	32.4	31.1	30.5	30.2	53.2
37-39 weeks										
All races ³	4.6	8.2	6.5	4.8	3.8	3.2	3.2	3.1	3.4	6.0
White	3.9	6.7	5.5	4.1	3.3	2.9	2.8	2.8	3.2	4.8
Black	7.7	11.9	9.6	7.9	6.5	5.3	5.2	4.6	4.4	9.3
40 weeks and over										
All races ³	1.6	3.5	2.6	1.8	1.3	1.1	1.0	0.9	0.9	2.4
White	1.3	2.7	2.0	1.5	1.1	0.9	0.8	0.8	0.8	1.8
Black	3.6	6.2	5.0	3.6	2.9	2.4	2.2	1.8	1.6	4.6

¹Expressed in completed weeks

²Includes births with period of gestation not stated

³Includes races other than white and black

NOTE: Excludes data for California and Oklahoma, which did not require reporting of weight gain during pregnancy

Table 10. Percent low birthweight by weight gain during pregnancy and Hispanic origin of mother, and by race of mother for mothers of non-Hispanic origin: Total of 47 reporting States and the District of Columbia, 1990

[Low birthweight is defined as weight of less than 2,500 grams (5 lb 8 oz)]

Origin of mother	Weight gain during pregnancy									
	Total	Less than 16 pounds	16-20 pounds	21-25 pounds	26-30 pounds	31-35 pounds	36-40 pounds	41-45 pounds	46 pounds or more	Not stated
All origins ¹	7.2	15.8	10.5	7.1	5.3	4.2	4.1	4.0	4.2	10.9
Hispanic	6.7	12.0	8.3	6.2	4.9	4.1	4.0	3.8	3.8	8.5
Mexican	6.0	10.5	7.4	5.6	4.4	3.8	3.8	3.7	3.4	7.3
Puerto Rican	9.1	16.3	11.5	8.0	6.3	5.3	4.7	3.6	5.1	12.1
Cuban	5.6	13.4	10.2	5.9	4.7	4.1	3.1	*	3.2	8.7
Central and South American	6.0	11.3	7.3	6.1	4.6	3.7	3.9	3.8	3.9	7.1
Other and unknown Hispanic	7.4	14.0	9.1	7.1	5.6	4.5	4.3	4.8	3.4	10.6
Non-Hispanic ²	7.2	16.2	10.8	7.1	5.3	4.2	4.1	4.0	4.2	11.4
White	5.7	12.9	9.0	6.0	4.5	3.7	3.5	3.5	3.8	8.2
Black	13.4	23.5	16.4	12.3	9.8	7.9	7.4	6.5	6.3	17.9

¹Includes origin not stated

²Includes races other than white and black

NOTE: Excludes data for California, New Hampshire, and Oklahoma, which did not require reporting of either weight gain during pregnancy or Hispanic origin of mother.

Table 11. Live births with selected obstetric procedures and rates for selected obstetric procedures, by age and race of mother: Total of 49 reporting States and the District of Columbia, 1990

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

Obstetric procedure and race of mother	All births ¹	Obstetric procedure reported	All ages	Age of mother						Not stated
				Under 20 years	20-24 years	25-29 years	30-34 years	35-39 years	40-49 years	
All races ²				Rate						Number
Amniocentesis	4,110,563	133,868	33.4	13.8	16.5	19.3	33.1	156.3	193.9	103,783
Electronic fetal monitoring	4,110,563	2,933,662	732.2	741.1	735.7	735.9	726.0	711.6	702.4	103,783
Induction of labor	4,110,563	381,975	95.3	81.6	92.1	99.7	98.9	100.6	104.7	103,783
Stimulation of labor	4,110,563	456,556	113.9	109.9	112.7	116.9	114.5	111.9	112.0	103,783
Tocolysis	4,110,563	63,973	16.0	19.3	16.7	14.9	14.8	15.6	15.0	103,783
Ultrasound ³	3,914,773	2,000,944	524.7	506.2	517.6	531.0	530.7	537.8	528.7	101,499
White				Rate						Number
Amniocentesis	3,252,473	114,750	36.2	15.0	17.5	19.9	34.7	167.6	208.7	78,737
Electronic fetal monitoring	3,252,473	2,342,253	738.0	746.9	741.2	742.4	732.7	717.4	708.9	78,737
Induction of labor	3,252,473	326,384	102.8	90.6	100.8	106.4	104.5	105.9	110.4	78,737
Stimulation of labor	3,252,473	371,460	117.0	114.1	116.1	119.5	117.0	114.8	115.4	78,737
Tocolysis	3,252,473	49,597	15.6	19.1	16.4	14.6	14.6	15.5	14.9	78,737
Ultrasound ³	3,105,232	1,627,757	537.5	523.6	531.2	542.4	541.0	547.7	538.7	77,127
Black				Rate						Number
Amniocentesis	679,236	12,569	19.1	11.2	13.0	16.0	22.4	81.8	108.3	20,789
Electronic fetal monitoring	679,236	475,588	722.3	733.3	724.5	717.7	712.6	710.1	712.5	20,789
Induction of labor	679,236	44,114	67.0	62.3	63.6	68.9	73.1	79.5	88.6	20,789
Stimulation of labor	679,236	66,707	101.3	101.0	101.2	103.3	99.7	99.6	94.2	20,789
Tocolysis	679,236	12,212	18.5	20.0	18.8	17.9	17.3	17.5	17.2	20,789
Ultrasound ³	635,916	295,727	480.3	467.3	474.6	485.8	492.9	506.8	505.4	20,206

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

²Includes races other than white and black

³Illinois does not report this procedure.

NOTE: Excludes data for Oklahoma, which did not require reporting of obstetric procedures

Table 12. Live births with selected complications of labor and/or delivery and rates for selected complications by age and race of mother: Total of 49 reporting States and the District of Columbia, 1990

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

Complication and race of mother	All births ¹	Complication reported	All ages	Age of mother						Not stated
				Under 20 years	20-24 years	25-29 years	30-34 years	35-39 years	40-49 years	
All races ²	Number			Rate						Number
Febrile	4,110,563	47,889	12.0	15.7	12.7	11.4	10.4	10.5	10.4	121,736
Meconium, moderate/heavy	4,110,563	241,088	60.4	66.3	62.0	58.1	57.7	61.4	65.4	121,736
Premature rupture of membrane	4,110,563	133,176	33.4	33.8	31.7	32.4	34.6	38.0	40.7	121,736
Abruptio placenta	4,110,563	24,892	6.2	6.1	6.0	6.0	6.4	7.7	9.3	121,736
Placenta previa	4,110,563	14,348	3.6	1.3	2.3	3.5	5.1	7.1	10.0	121,736
Other excessive bleeding	4,110,563	21,266	5.3	4.9	5.1	5.1	5.6	6.6	8.1	121,736
Seizures during labor	4,110,563	1,705	0.4	0.8	0.5	0.3	0.3	0.3	0.6	121,736
Precipitous labor	4,110,563	72,311	18.1	14.1	17.4	18.0	20.2	21.4	22.1	121,736
Prolonged labor	4,110,563	42,642	10.7	12.2	11.2	10.5	9.6	10.2	11.6	121,736
Dysfunctional labor	4,110,563	117,937	29.6	29.0	29.5	30.0	28.9	30.2	34.0	121,736
Breech/Malpresentation	4,110,563	152,603	38.3	30.1	32.9	39.2	43.7	49.0	55.0	121,736
Cephalopelvic disproportion ^{3,4}	3,631,762	132,047	37.2	36.4	37.1	39.0	35.8	36.1	36.7	85,631
Cord prolapse	4,110,563	12,148	3.0	2.8	3.0	3.0	3.2	3.4	4.3	121,736
Anesthetic complication ⁴	3,794,140	2,087	0.6	0.4	0.5	0.6	0.6	0.8	0.9	90,077
Fetal distress ⁴	3,794,140	158,680	42.8	49.2	44.1	40.2	39.9	45.0	56.1	90,077
White										
Febrile	3,252,473	35,378	11.2	14.1	12.0	10.9	9.8	10.0	9.9	94,882
Meconium, moderate/heavy	3,252,473	175,218	55.5	59.1	56.4	53.7	54.1	57.7	61.8	94,882
Premature rupture of membrane	3,252,473	101,170	32.0	32.1	30.2	31.0	33.3	37.2	40.6	94,882
Abruptio placenta	3,252,473	18,979	6.0	6.0	5.7	5.7	6.1	7.3	9.0	94,882
Placenta previa	3,252,473	11,115	3.5	1.3	2.2	3.4	4.9	6.7	9.5	94,882
Other excessive bleeding	3,252,473	16,679	5.3	5.1	5.1	5.0	5.4	6.4	7.8	94,882
Seizures during labor	3,252,473	1,232	0.4	0.7	0.4	0.3	0.3	0.3	0.6	94,882
Precipitous labor	3,252,473	54,555	17.3	12.5	15.8	17.1	19.8	21.3	22.0	94,882
Prolonged labor	3,252,473	34,773	11.0	13.1	11.7	10.7	9.8	10.6	11.7	94,882
Dysfunctional labor	3,252,473	97,026	30.7	31.4	31.0	30.9	29.4	31.2	34.5	94,882
Breech/Malpresentation	3,252,473	127,111	40.3	33.5	35.1	40.6	44.6	49.7	55.0	94,882
Cephalopelvic disproportion ^{3,4}	2,843,857	108,093	38.9	38.7	39.9	40.4	36.5	37.2	36.4	65,047
Cord prolapse	3,252,473	9,569	3.0	2.7	2.9	2.9	3.2	3.3	4.4	94,882
Anesthetic complication ⁴	2,986,321	1,671	0.6	0.5	0.5	0.6	0.6	0.8	0.8	68,642
Fetal distress ⁴	2,986,321	118,893	40.7	48.0	42.7	38.1	37.6	42.3	54.6	68,642
Black										
Febrile	679,236	10,195	15.5	19.4	15.3	13.8	13.8	13.1	12.8	22,955
Meconium, moderate/heavy	679,236	56,633	86.3	83.3	84.5	87.7	88.9	95.4	94.4	22,955
Premature rupture of membrane	679,236	26,595	40.5	37.7	37.6	41.4	46.8	48.3	48.5	22,955
Abruptio placenta	679,236	4,986	7.6	6.5	7.2	7.8	8.6	10.6	12.6	22,955
Placenta previa	679,236	2,416	3.7	1.5	2.7	4.1	6.5	8.4	10.1	22,955
Other excessive bleeding	679,236	2,943	4.5	3.8	4.2	4.5	5.3	6.3	5.8	22,955
Seizures during labor	679,236	402	0.6	1.0	0.6	0.5	0.4	*	*	22,955
Precipitous labor	679,236	14,046	21.4	17.3	22.6	22.8	22.7	22.1	21.0	22,955
Prolonged labor	679,236	5,600	8.5	9.8	8.5	8.3	7.5	7.3	8.6	22,955
Dysfunctional labor	679,236	16,494	25.1	24.3	24.5	25.9	25.9	25.5	31.6	22,955
Breech/Malpresentation	679,236	19,502	29.7	22.4	25.2	32.2	39.1	47.1	56.6	22,955
Cephalopelvic disproportion ^{3,4}	619,329	18,007	29.9	32.6	28.2	30.8	29.0	26.4	32.4	17,496
Cord prolapse	679,236	2,163	3.3	3.0	3.1	3.3	3.8	4.0	4.9	22,955
Anesthetic complication ⁴	635,877	326	0.5	0.4	0.5	0.6	0.7	0.8	*	18,250
Fetal distress ⁴	635,877	33,733	54.6	53.1	51.0	54.4	58.9	68.3	74.1	18,250

¹Total number of births to residents of areas reporting specified complication.

²Includes races other than white and black.

³New York City (but not New York State) reports this complication

⁴Texas does not report this complication.

NOTE: Excludes data for Oklahoma, which did not require reporting of complications of labor and/or delivery

Table 13. Live births by method of delivery, and rates of cesarean delivery and vaginal birth after previous cesarean delivery, by age and race of mother: Total of 49 reporting States and the District of Columbia, 1990

Age and race of mother	All births	Births by method of delivery						Cesarean delivery rate			Rate of vaginal birth after previous cesarean ⁴
		Vaginal		Cesarean			Not stated	Total ¹	Primary ²	Repeat ³	
		Total	After previous cesarean	Total	Primary	Repeat					
All races ⁵	4,110,563	3,111,421	84,299	914,096	575,066	339,030	85,046	22.7	16.0	37.1	19.9
Under 20 years	525,779	429,660	4,091	85,253	73,283	11,970	10,866	16.6	14.7	14.0	25.5
20-24 years	1,078,851	842,633	18,497	214,145	145,856	68,289	22,073	20.3	15.0	31.9	21.3
25-29 years	1,263,051	948,891	28,223	288,066	175,350	112,716	26,094	23.3	16.0	39.1	20.0
30-34 years	877,893	638,511	24,091	221,178	121,404	99,774	18,204	25.7	16.5	45.1	19.4
35-39 years	315,107	218,652	8,329	89,689	49,363	40,326	6,766	29.1	19.0	45.0	17.1
40-49 years	49,882	33,074	1,068	15,765	9,810	5,955	1,043	32.3	23.5	37.8	15.2
White	3,252,473	2,453,857	67,191	732,713	458,656	274,057	65,903	23.0	16.1	37.4	19.7
Under 20 years	354,021	288,876	2,255	58,095	50,957	7,138	7,050	16.7	15.1	12.3	24.0
20-24 years	826,121	643,641	13,239	166,231	115,213	51,018	16,249	20.5	15.5	30.7	20.6
25-29 years	1,040,031	780,480	23,084	238,583	145,220	93,363	20,968	23.4	16.1	39.1	19.8
30-34 years	732,360	533,369	20,672	183,867	99,755	84,112	15,124	25.6	16.3	45.7	19.7
35-39 years	259,740	180,687	7,038	73,399	39,754	33,645	5,654	28.9	18.6	45.8	17.3
40-49 years	40,200	26,804	903	12,538	7,757	4,781	858	31.9	23.0	38.1	15.9
Black	679,236	516,581	13,496	146,472	93,476	52,996	16,183	22.1	15.7	36.2	20.3
Under 20 years	156,666	127,684	1,742	25,369	20,775	4,594	3,613	16.6	14.2	18.1	27.5
20-24 years	215,477	167,691	4,598	42,569	26,751	15,818	5,217	20.2	14.1	37.2	22.5
25-29 years	167,098	123,786	4,019	39,184	22,974	16,210	4,128	24.0	16.1	41.4	19.9
30-34 years	98,828	69,946	2,260	26,572	15,172	11,400	2,310	27.5	18.3	42.9	16.5
35-39 years	35,404	23,859	776	10,758	6,472	4,286	787	31.1	21.9	39.8	15.3
40-49 years	5,763	3,615	101	2,020	1,332	688	128	35.8	27.5	34.1	12.8

¹Percent of all live births that are by cesarean delivery

²Number of primary cesareans per 100 live births to women who have not had a previous cesarean.

³Percent of all cesareans that are repeat cesareans

⁴Number of vaginal births after previous cesarean delivery per 100 live births to women with a previous cesarean delivery

⁵Includes races other than white and black

NOTE: Excludes data for Oklahoma, which did not require reporting of method of delivery.

Table 14. Rates of cesarean delivery and vaginal birth after previous cesarean delivery, by selected medical risk factors, complications of labor and/or delivery, and obstetric procedures: Total of 49 reporting States and the District of Columbia, 1990

Medical risk factor, complication, and obstetric procedure	All births with specified condition and/or procedure	Cesarean delivery rate			Rate of vaginal birth after previous cesarean ⁴
		Total ¹	Primary ²	Repeat ³	
Medical risk factors					
Anemia	72,563	25.8	18.5	37.3	21.8
Cardiac disease	13,457	26.7	19.8	35.0	23.0
Acute or chronic lung disease	12,102	29.8	22.1	35.8	20.8
Diabetes	84,615	37.2	27.4	38.9	14.4
Genital herpes ^{5,6}	27,539	46.0	40.6	24.7	22.8
Hydramnios/Oligohydramnios ⁵	22,633	45.6	40.2	22.5	15.4
Hemoglobinopathy ⁵	1,584	26.6	19.6	35.8	26.5
Hypertension, chronic	25,961	41.4	32.2	35.2	12.8
Eclampsia	15,797	52.3	48.7	15.6	12.6
Incompetent cervix ⁵	13,083	29.9	22.5	34.9	22.3
Renal disease	8,790	28.3	21.0	35.3	20.0
Rh sensitization ⁷	24,044	24.4	17.1	38.5	22.3
Uterine bleeding ⁶	30,645	33.8	26.5	31.8	17.4
Complications of labor and/or delivery					
Febrile	47,889	36.4	34.4	13.0	39.4
Premature rupture of membrane	133,176	29.3	25.9	18.5	30.1
Abruptio placenta	24,892	57.7	53.8	18.8	15.6
Placenta previa	14,348	82.3	78.2	25.3	2.7
Other excessive bleeding	21,266	28.3	21.6	32.8	24.6
Seizures during labor	1,705	47.0	44.8	11.4	24.2
Precipitous labor (less than 3 hours)	72,311	1.5	1.1	24.6	87.0
Prolonged labor (more than 20 hours)	42,642	40.4	39.3	8.4	41.7
Dysfunctional labor	117,937	65.2	63.4	11.4	16.9
Breech/Malpresentation	152,603	84.5	83.0	13.4	4.7
Cephalopelvic disproportion ^{8,9}	132,047	97.7	97.5	14.4	1.1
Cord prolapse	12,148	59.5	56.9	12.5	13.0
Anesthetic complications ⁹	2,087	51.8	44.2	30.1	14.4
Fetal distress ⁹	158,680	62.6	60.6	11.9	16.6
Obstetric procedures					
Electronic fetal monitoring	2,933,662	21.7	16.2	32.4	25.3
Induction of labor	381,975	21.9	20.5	11.3	50.7
Stimulation of labor	456,556	17.9	16.5	12.2	58.5
Tocolysis	63,973	31.1	25.2	28.0	20.6
Ultrasound ¹⁰	2,000,944	26.3	18.7	37.9	19.2

¹Percent of all live births that are by cesarean delivery²Number of primary cesareans per 100 live births to women who have not had a previous cesarean³Percent of all cesareans that are repeat cesareans⁴Number of vaginal births after previous cesarean delivery per 100 live births to women with a previous cesarean delivery⁵New York City (but not New York State) reports this risk factor⁶Texas does not report this risk factor⁷Kansas does not report this risk factor⁸New York City (but not New York State) reports this complication⁹Texas does not report this complication¹⁰Illinois does not report this procedure

NOTE: Excludes data for Oklahoma, which did not require reporting of method of delivery, medical risk factors, complications of labor and/or delivery, and obstetric procedures

Table 15. Live births by day of week and index of occurrence by method of delivery, day of week, and race of mother: Total of 49 reporting States and the District of Columbia, 1990

Day of week and race of mother	All births	Index of occurrence ¹				
		Total ²	Vaginal	Method of delivery		
				Total	Primary	Repeat
All races ³	4,110,563	100.0	100.0	100.0	100.0	100.0
Sunday	470,912	78.9	84.9	58.6	70.2	38.9
Monday	606,619	103.6	102.2	108.3	100.0	122.4
Tuesday	635,929	108.6	106.2	116.6	112.7	123.2
Wednesday	628,024	107.2	105.2	114.2	111.2	119.4
Thursday	628,440	107.3	105.2	114.3	110.1	121.5
Friday	636,324	108.7	105.1	120.6	114.6	130.7
Saturday	504,315	86.1	91.4	68.2	81.8	45.1
White	3,252,473	100.0	100.0	100.0	100.0	100.0
Sunday	364,414	77.2	83.4	56.4	68.7	35.8
Monday	482,147	104.1	102.4	109.4	100.6	124.1
Tuesday	507,260	109.5	107.1	117.6	113.6	124.2
Wednesday	499,983	107.9	105.9	114.6	111.7	119.5
Thursday	500,285	108.0	105.8	115.2	110.8	122.5
Friday	507,180	109.5	105.7	121.7	115.1	132.7
Saturday	391,204	84.4	90.0	66.0	80.2	42.3
Black	679,236	100.0	100.0	100.0	100.0	100.0
Sunday	84,412	85.6	90.7	67.6	76.3	52.4
Monday	98,308	101.6	101.0	103.9	97.7	115.0
Tuesday	101,885	105.3	103.2	112.6	109.1	118.9
Wednesday	101,328	104.7	102.5	112.4	109.1	118.3
Thursday	101,434	104.8	103.1	110.9	107.5	116.8
Friday	102,236	105.7	102.6	116.0	112.7	121.9
Saturday	89,633	92.6	97.1	77.1	88.1	57.7

¹Index is the ratio of the average number of births by a specified method of delivery on a given day of the week to the average daily number of births by a specified method of delivery for the year, multiplied by 100

²Includes method of delivery not stated

³Includes races other than white and black.

NOTE: Excludes data for Oklahoma, which did not require reporting of method of delivery

Table 16. Live births with selected abnormal conditions of the newborn and rates for selected abnormal conditions of the newborn, by age and race of mother: Total of 49 reporting States and the District of Columbia, 1990

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

Abnormal condition and race of mother	All births ¹	Abnormal condition reported	All ages	Age of mother						Not stated
				Under 20 years	20-24 years	25-29 years	30-34 years	35-39 years	40-49 years	
All races ²										
Anemia	4,110,563	6,926	17	23	19	15	15	15	15	147,864
Birth injury ³	3,677,106	7,077	20	19	19	21	21	19	18	115,592
Fetal alcohol syndrome ^{4,5}	3,875,290	524	01	01	01	01	02	02	*	144,105
Hyaline membrane disease/RDS	4,110,563	23,680	60	77	63	55	53	57	55	147,864
Meconium aspiration syndrome ⁵	3,948,185	11,408	30	33	31	28	29	33	37	142,841
Assisted ventilation less than 30 min ⁶	3,812,987	46,943	128	135	129	125	126	127	141	140,924
Assisted ventilation 30 min or longer ⁶	3,812,987	26,341	72	91	74	64	66	75	86	140,924
Seizures	4,110,563	3,462	09	10	09	08	08	08	10	147,864
White										
Anemia	3,252,473	4,919	16	20	17	14	14	14	14	116,628
Birth injury ³	2,883,983	6,143	22	22	22	22	22	21	18	90,320
Fetal alcohol syndrome ^{4,5}	3,046,697	292	01	*	01	01	01	01	*	113,697
Hyaline membrane disease/RDS	3,252,473	18,626	59	79	63	56	52	57	54	116,628
Meconium aspiration syndrome ⁵	3,110,009	8,344	28	29	29	26	28	30	34	112,473
Assisted ventilation less than 30 min ⁶	3,031,747	37,749	129	140	131	126	127	128	143	112,033
Assisted ventilation 30 min or longer ⁶	3,031,747	19,953	68	89	70	62	63	71	83	112,033
Seizures	3,252,473	2,514	08	09	08	08	08	08	10	116,628
Black										
Anemia	679,236	1,779	27	32	29	23	24	22	*	26,664
Birth injury ³	625,485	633	10	10	10	12	10	09	*	21,597
Fetal alcohol syndrome ^{4,5}	655,514	173	03	02	01	03	04	06	*	25,903
Hyaline membrane disease/RDS	679,236	4,482	69	76	65	64	71	72	58	26,664
Meconium aspiration syndrome ⁵	662,688	2,568	40	41	39	38	39	54	54	25,883
Assisted ventilation less than 30 min ⁶	615,921	7,199	122	118	121	122	126	128	141	24,364
Assisted ventilation 30 min or longer ⁶	615,921	5,549	94	97	91	88	97	113	117	24,364
Seizures	679,236	813	12	12	11	14	13	12	*	26,664

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

²Includes races other than white and black

³Massachusetts and Texas do not report this condition

⁴Wisconsin does not report this condition

⁵New York City (but not New York State) reports this condition

⁶New York State and New York City do not report this condition

NOTE: Excludes data for Oklahoma, which did not require reporting of abnormal conditions of the newborn

Table 17. Live births with selected congenital anomalies and rates for selected congenital anomalies, by age and race of mother: Total of 47 reporting States and the District of Columbia, 1990

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

Congenital anomaly and race of mother	All births ¹	Congenital anomaly reported	All ages	Age of mother						Not stated
				Under 20 years	20-24 years	25-29 years	30-34 years	35-39 years	40-49 years	
All races²				Rate						Number
Anencephalus	3,785,585	634	17.5	20.5	20.4	16.3	15.4	11.0	*	154,333
Spina bifida/Meningocele	3,785,585	938	25.8	24.0	28.5	25.8	25.4	21.0	*	154,333
Hydrocephalus	3,785,585	1,090	30.0	37.8	32.1	27.0	26.7	29.1	*	154,333
Microcephalus	3,785,585	354	9.7	14.6	9.7	8.2	8.9	10.3	*	154,333
Other central nervous system anomalies	3,785,585	942	25.9	28.3	28.3	25.6	22.6	22.5	*	154,333
Heart malformations	3,785,585	4,676	128.8	119.8	124.3	129.5	131.7	136.6	209.4	154,333
Other circulatory/respiratory anomalies	3,785,585	4,995	137.6	142.8	136.0	135.3	131.6	152.1	188.2	154,333
Rectal atresia/stenosis	3,785,585	388	10.7	12.4	9.6	11.9	9.6	9.6	*	154,333
Tracheo-esophageal fistula/Esophageal atresia	3,785,585	574	15.8	18.3	14.9	12.7	17.9	18.0	*	154,333
Omphalocele/Gastroschisis	3,785,585	874	24.1	46.6	29.9	17.3	14.9	16.6	*	154,333
Other gastrointestinal anomalies	3,785,585	1,334	36.7	41.5	39.7	34.6	35.1	30.2	*	154,333
Malformed genitalia	3,785,585	2,936	80.9	79.5	82.0	80.9	79.6	76.2	120.0	154,333
Renal agenesis	3,785,585	328	9.0	9.5	9.9	8.6	8.8	7.7	*	154,333
Other urogenital anomalies	3,785,585	4,818	132.7	131.4	132.3	127.9	142.8	128.1	129.4	154,333
Cleft lip/palate	3,785,585	3,190	87.8	83.7	90.0	84.1	88.5	100.5	89.4	154,333
Polydactyly/Syndactyly/Adactyly	3,785,585	3,280	90.3	121.9	97.7	83.8	77.9	68.5	105.9	154,333
Club foot ³	3,785,585	2,616	72.0	79.9	75.2	70.5	65.6	73.3	61.2	154,333
Diaphragmatic hernia ³	3,785,585	621	17.1	20.5	14.8	18.1	15.6	19.9	*	154,333
Other musculoskeletal/integumental anomalies ³	3,785,585	7,672	211.3	210.7	200.4	208.0	222.9	229.0	225.9	154,333
Down's syndrome	3,785,585	1,977	54.4	36.7	37.7	39.9	63.0	123.3	421.2	154,333
Other chromosomal anomalies	3,785,585	1,604	44.2	37.8	42.0	39.5	46.2	63.7	127.1	154,333
White										
Anencephalus	3,009,144	505	17.5	21.2	20.8	16.1	15.0	11.5	*	120,168
Spina bifida/Meningocele	3,009,144	800	27.7	27.4	30.8	27.7	25.9	22.2	*	120,168
Hydrocephalus	3,009,144	858	29.7	35.6	32.9	27.7	25.9	28.4	*	120,168
Microcephalus	3,009,144	272	9.4	12.8	9.7	7.7	9.4	10.7	*	120,168
Other central nervous system anomalies	3,009,144	760	26.3	28.4	29.3	24.9	24.5	22.7	*	120,168
Heart malformations	3,009,144	3,768	130.4	121.7	123.8	131.2	133.2	140.4	217.6	120,168
Other circulatory/respiratory anomalies	3,009,144	4,068	140.8	151.0	141.7	136.6	132.4	157.7	185.7	120,168
Rectal atresia/stenosis	3,009,144	331	11.5	15.0	10.6	12.3	9.8	10.2	*	120,168
Tracheo-esophageal fistula/Esophageal atresia	3,009,144	495	17.1	20.0	16.9	13.2	19.6	19.5	*	120,168
Omphalocele/Gastroschisis	3,009,144	694	24.0	53.3	30.8	17.1	14.3	15.5	*	120,168
Other gastrointestinal anomalies	3,009,144	1,083	37.5	45.2	41.3	34.3	35.7	30.6	*	120,168
Malformed genitalia	3,009,144	2,526	87.4	88.9	90.7	85.2	85.6	81.3	136.3	120,168
Renal agenesis	3,009,144	282	9.8	11.2	11.0	9.0	9.2	*	*	120,168
Other urogenital anomalies	3,009,144	4,230	146.4	153.2	145.4	141.5	155.2	136.8	136.3	120,168
Cleft lip/palate	3,009,144	2,789	96.5	103.6	103.4	89.6	93.6	100.4	98.6	120,168
Polydactyly/Syndactyly/Adactyly	3,009,144	1,869	64.7	74.9	66.7	63.6	61.4	56.0	75.4	120,168
Club foot ³	3,009,144	2,269	78.5	95.1	84.2	74.9	69.6	77.7	72.5	120,168
Diaphragmatic hernia ³	3,009,144	537	18.6	25.3	16.1	19.3	17.0	19.1	*	120,168
Other musculoskeletal/integumental anomalies ³	3,009,144	6,122	211.9	203.7	201.5	208.3	226.7	227.9	229.2	120,168
Down's syndrome	3,009,144	1,656	57.3	36.8	40.6	41.4	66.1	126.1	423.5	120,168
Other chromosomal anomalies	3,009,144	1,309	45.3	39.3	43.4	40.3	46.9	63.5	127.6	120,168

See footnotes at end of table

Table 17. Live births with selected congenital anomalies and rates for selected congenital anomalies, by age and race of mother: Total of 47 reporting States and the District of Columbia, 1990—Con.

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

Congenital anomaly and race of mother	All births ¹	Congenital anomaly reported	All ages	Age of mother						Not stated
				Under 20 years	20–24 years	25–29 years	30–34 years	35–39 years	40–49 years	
				Rate						
Black	Number			Rate						Number
Anencephalus	615,384	101	17.2	17.2	17.0	16.9	*	*	*	28,782
Spina bifida/Meningocele	615,384	120	20.5	17.2	23.3	18.3	24.2	*	*	28,782
Hydrocephalus	615,384	189	32.2	42.2	29.7	21.8	35.2	*	*	28,782
Microcephalus	615,384	64	10.9	17.2	*	*	*	*	*	28,782
Other central nervous system anomalies	615,384	144	24.5	26.4	23.3	31.0	*	*	*	28,782
Heart malformations	615,384	725	123.6	112.9	128.3	126.1	122.4	120.6	*	28,782
Other circulatory/respiratory anomalies	615,384	708	120.7	123.7	114.0	123.3	120.0	127.5	*	28,782
Rectal atresia/stenosis	615,384	40	6.8	*	*	*	*	*	*	28,782
Tracheo-esophageal fistula/Esophageal atresia	615,384	62	10.6	*	*	*	*	*	*	28,782
Omphalocele/Gastroschisis	615,384	154	26.3	30.7	29.2	21.8	*	*	*	28,782
Other gastrointestinal anomalies	615,384	212	36.1	35.0	36.6	38.0	35.2	*	*	28,782
Malformed genitalia	615,384	334	56.9	62.9	55.1	60.6	48.5	*	*	28,782
Renal agenesis	615,384	37	6.3	*	*	*	*	*	*	28,782
Other urogenital anomalies	615,384	448	76.4	82.2	83.2	57.1	81.2	82.7	*	28,782
Cleft lip/palate	615,384	246	41.9	37.2	36.0	44.4	41.2	96.5	*	28,782
Polydactyly/Syndactyly/Adactyly	615,384	1,313	223.8	233.8	222.1	225.4	217.0	172.3	*	28,782
Club foot ³	615,384	279	47.6	46.5	44.5	50.0	50.9	*	*	28,782
Diaphragmatic hernia ³	615,384	64	10.9	*	*	*	*	*	*	28,782
Other musculoskeletal/integumental anomalies ³	615,384	1,195	203.7	222.3	191.4	197.9	201.2	224.0	*	28,782
Down's syndrome	615,384	248	42.3	37.2	29.2	31.0	47.3	120.6	501.7	28,782
Other chromosomal anomalies	615,384	238	40.6	35.7	38.2	39.4	41.2	*	*	28,782

¹Total number of births to residents of areas reporting specified congenital anomaly.²Includes races other than white and black.³Figures shown for the number of congenital anomalies reported and rates are in error; see Technical Notes

NOTE: Excludes data for New Mexico, New York, and Oklahoma, which did not require reporting of congenital anomalies.

Technical notes

Source of data

Data shown in this report are based on 100 percent of the birth certificates in all States and the District of Columbia. The data are provided to the National Center for Health Statistics through the Vital Statistics Cooperative Program. Information in this report on selected maternal and infant health characteristics was derived from items on the 1989 revision of the U.S. Standard Certificate of Live Birth, shown in figure 1.

Race of mother

Birth data are tabulated by the race of the mother as reported directly on the birth certificate. If race of mother was not stated, it was imputed as that of the father, if known. If neither race was stated, race of mother was imputed as the race of the mother on the preceding record with known race.

Definitions of medical terms

The following definitions are adapted and abbreviated from a set of definitions compiled by a committee of Federal and State health statistics officials for the Association for Vital Records and Health Statistics (41).

Medical risk factors for this pregnancy

Anemia—Hemoglobin level of less than 10.0 g/dL during pregnancy, or a hematocrit of less than 30 percent during pregnancy.

Cardiac disease—Disease of the heart.

Acute or chronic lung disease—Disease of the lungs during pregnancy.

Diabetes—Metabolic disorder characterized by excessive discharge of urine and persistent thirst; includes juvenile onset, adult onset, and gestational diabetes during pregnancy.

Genital herpes—Infection of the skin of the genital area by herpes simplex virus.

Hydramnios/Oligohydramnios—Any noticeable excess (hydramnios) or

lack (oligohydramnios) of amniotic fluid.

Hemoglobinopathy—A blood disorder caused by alteration in the genetically determined molecular structure of hemoglobin (for example, sickle cell anemia).

Hypertension, chronic—Blood pressure persistently greater than 140/90, diagnosed prior to onset of pregnancy or before the 20th week of gestation.

Hypertension, pregnancy-associated—An increase in blood pressure of at least 30 mm hg systolic or 15 mm hg diastolic on two measurements taken 6 hours apart after the 20th week of gestation.

Eclampsia—The occurrence of convulsions and/or coma unrelated to other cerebral conditions in women with signs and symptoms of preeclampsia.

Incompetent cervix—Characterized by painless dilation of the cervix in the second trimester or early in the third trimester of pregnancy, with premature expulsion of membranes through the cervix and ballooning of the membranes into the vagina, followed by rupture of the membranes and subsequent expulsion of the fetus.

Previous infant 4,000+ grams—The birthweight of a previous live-born child was over 4,000 grams (8 lbs 14 oz).

Previous preterm or small-for-gestational-age infant—Previous birth of an infant prior to term (before 37 completed weeks of gestation) or of an infant weighing less than the 10th percentile for gestational age using a standard weight for age chart.

Renal disease—Kidney disease.

Rh Sensitization—The process or state of becoming sensitized to the Rh factor as when an Rh-negative woman is pregnant with an Rh-positive fetus.

Uterine bleeding—Any clinically significant bleeding during the pregnancy taking into consideration the stage of pregnancy; any second or third trimester bleeding of the uterus prior to the onset of labor.

Obstetric procedures

Amniocentesis—Surgical trans-abdominal perforation of the uterus to obtain amniotic fluid to be used in the

detection of genetic disorders, fetal abnormalities, and fetal lung maturity.

Electronic fetal monitoring—Monitoring with external devices applied to the maternal abdomen or with internal devices with an electrode attached to the fetal scalp and a catheter through the cervix into the uterus, to detect and record fetal heart tones and uterine contractions.

Induction of labor—The initiation of uterine contractions before the spontaneous onset of labor by medical and/or surgical means for the purpose of delivery.

Stimulation of labor—Augmentation of previously established labor by use of oxytocin.

Tocolysis—Use of medications to inhibit preterm uterine contractions to extend the length of pregnancy and, therefore, avoid a preterm birth.

Ultrasound—Visualization of the fetus and the placenta by means of sound waves.

Complications of labor and/or delivery

Febrile—A fever greater than 100 degrees F. or 38 C. occurring during labor and/or delivery.

Meconium, moderate/heavy—Meconium consists of undigested debris from swallowed amniotic fluid, various products of secretion, excretion and shedding by the gastrointestinal tract; moderate to heavy amounts of meconium in the amniotic fluid noted during labor and/or delivery.

Premature rupture of membranes (more than 12 hours)—Rupture of the membranes at any time during pregnancy and more than 12 hours before the onset of labor.

Abruptio placenta—Premature separation of a normally implanted placenta from the uterus.

Placenta previa—Implantation of the placenta over or near the internal opening of the cervix.

Other excessive bleeding—The loss of a significant amount of blood from conditions other than abruptio placenta or placenta previa.

Seizures during labor—Maternal seizures occurring during labor from any cause.

<p>38a. MEDICAL RISK FACTORS FOR THIS PREGNANCY (Check all that apply)</p> <p>Anemia (Hct. <30/Hgb <10) 01 <input type="checkbox"/></p> <p>Cardiac disease 02 <input type="checkbox"/></p> <p>Acute or chronic lung disease 03 <input type="checkbox"/></p> <p>Diabetes 04 <input type="checkbox"/></p> <p>Genital herpes 05 <input type="checkbox"/></p> <p>Hydramnios/Oligohydramnios 06 <input type="checkbox"/></p> <p>Hemoglobinopathy 07 <input type="checkbox"/></p> <p>Hypertension, chronic 08 <input type="checkbox"/></p> <p>Hypertension, pregnancy-associated 09 <input type="checkbox"/></p> <p>Eclampsia 10 <input type="checkbox"/></p> <p>Incompetent cervix 11 <input type="checkbox"/></p> <p>Previous infant 4000+ grams 12 <input type="checkbox"/></p> <p>Previous preterm or small-for-gestational-age infant 13 <input type="checkbox"/></p> <p>Renal disease 14 <input type="checkbox"/></p> <p>Rh sensitization 15 <input type="checkbox"/></p> <p>Uterine bleeding 16 <input type="checkbox"/></p> <p>None 00 <input type="checkbox"/></p> <p>Other 17 <input type="checkbox"/></p> <p>(Specify) _____</p>	<p>40. COMPLICATIONS OF LABOR AND/OR DELIVERY (Check all that apply)</p> <p>Ferrie (>100°F, or 38°C) 01 <input type="checkbox"/></p> <p>Meconium, moderate/heavy 02 <input type="checkbox"/></p> <p>Premature rupture of membrane (>12 hours) 03 <input type="checkbox"/></p> <p>Abruptio placenta 04 <input type="checkbox"/></p> <p>Placenta previa 05 <input type="checkbox"/></p> <p>Other excessive bleeding 06 <input type="checkbox"/></p> <p>Seizures during labor 07 <input type="checkbox"/></p> <p>Precipitous labor (<3 hours) 08 <input type="checkbox"/></p> <p>Prolonged labor (>20 hours) 09 <input type="checkbox"/></p> <p>Dysfunctional labor 10 <input type="checkbox"/></p> <p>Breech/Malpresentation 11 <input type="checkbox"/></p> <p>Cephalopelvic disproportion 12 <input type="checkbox"/></p> <p>Cord prolapse 13 <input type="checkbox"/></p> <p>Anesthetic complications 14 <input type="checkbox"/></p> <p>Fetal distress 15 <input type="checkbox"/></p> <p>None 00 <input type="checkbox"/></p> <p>Other 16 <input type="checkbox"/></p> <p>(Specify) _____</p>	<p>43. CONGENITAL ANOMALIES OF CHILD (Check all that apply)</p> <p>Anencephalus 01 <input type="checkbox"/></p> <p>Spina bifida/Meningocele 02 <input type="checkbox"/></p> <p>Hydrocephalus 03 <input type="checkbox"/></p> <p>Microcephalus 04 <input type="checkbox"/></p> <p>Other central nervous system anomalies (Specify) 05 <input type="checkbox"/></p> <p>Heart malformations 06 <input type="checkbox"/></p> <p>Other circulatory/respiratory anomalies (Specify) 07 <input type="checkbox"/></p> <p>Rectal atresia/stenosis 08 <input type="checkbox"/></p> <p>Tracheo-esophageal fistula/ Esophageal atresia 09 <input type="checkbox"/></p> <p>Omphalocele/ Gastroschisis 10 <input type="checkbox"/></p> <p>Other gastrointestinal anomalies (Specify) 11 <input type="checkbox"/></p> <p>Malformed genitalia 12 <input type="checkbox"/></p> <p>Renal agenesis 13 <input type="checkbox"/></p> <p>Other urogenital anomalies (Specify) 14 <input type="checkbox"/></p> <p>Cleft lip/palate 15 <input type="checkbox"/></p> <p>Polydactyly/Syndactyly/Adactyly 16 <input type="checkbox"/></p> <p>Club foot 17 <input type="checkbox"/></p> <p>Diaphragmatic hernia 18 <input type="checkbox"/></p> <p>Other musculoskeletal/integumental anomalies (Specify) 19 <input type="checkbox"/></p> <p>Down's syndrome 20 <input type="checkbox"/></p> <p>Other chromosomal anomalies (Specify) 21 <input type="checkbox"/></p> <p>None 00 <input type="checkbox"/></p> <p>Other 22 <input type="checkbox"/></p> <p>(Specify) _____</p>
<p>38b. OTHER RISK FACTORS FOR THIS PREGNANCY (Complete all items)</p> <p>Tobacco use during pregnancy Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Average number cigarettes per day _____</p> <p>Alcohol use during pregnancy Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Average number drinks per week _____</p> <p>Weight gained during pregnancy _____ lbs</p>	<p>41. METHOD OF DELIVERY (Check all that apply)</p> <p>Vaginal 01 <input type="checkbox"/></p> <p>Vaginal birth after previous C-section 02 <input type="checkbox"/></p> <p>Primary C-section 03 <input type="checkbox"/></p> <p>Repeat C-section 04 <input type="checkbox"/></p> <p>Forceps 05 <input type="checkbox"/></p> <p>Vacuum 06 <input type="checkbox"/></p>	
<p>39. OBSTETRIC PROCEDURES (Check all that apply)</p> <p>Amniocentesis 01 <input type="checkbox"/></p> <p>Electronic fetal monitoring 02 <input type="checkbox"/></p> <p>Induction of labor 03 <input type="checkbox"/></p> <p>Stimulation of labor 04 <input type="checkbox"/></p> <p>Tocolysis 05 <input type="checkbox"/></p> <p>Ultrasound 06 <input type="checkbox"/></p> <p>None 00 <input type="checkbox"/></p> <p>Other 07 <input type="checkbox"/></p> <p>(Specify) _____</p>	<p>42. ABNORMAL CONDITIONS OF THE NEWBORN (Check all that apply)</p> <p>Anemia (Hct <39/Hgb <13) 01 <input type="checkbox"/></p> <p>Birth injury 02 <input type="checkbox"/></p> <p>Fetal alcohol syndrome 03 <input type="checkbox"/></p> <p>Hyaline membrane disease/RDS 04 <input type="checkbox"/></p> <p>Meconium aspiration syndrome 05 <input type="checkbox"/></p> <p>Assisted ventilation <30 min 06 <input type="checkbox"/></p> <p>Assisted ventilation ≥30 min 07 <input type="checkbox"/></p> <p>Seizures 08 <input type="checkbox"/></p> <p>None 00 <input type="checkbox"/></p> <p>Other 09 <input type="checkbox"/></p> <p>(Specify) _____</p>	

Figure 1. New maternal and infant health items from the 1989 revision of the U.S. Standard Certificate of Live Birth

Precipitous labor (less than 3 hours)—Extremely rapid labor and delivery lasting less than 3 hours.

Prolonged labor (more than 20 hours)—Abnormally slow progress of labor lasting more than 20 hours.

Dysfunctional labor—Failure to progress in a normal pattern of labor.

Breech/Malpresentation—At birth, the presentation of the fetal buttocks rather than the head, or other malpresentation.

Cephalopelvic disproportion—The relationship of the size, presentation and position of the fetal head to the maternal pelvis, which prevents dilation of the cervix and/or descent of the fetal head.

Cord prolapse—Premature expulsion of the umbilical cord in labor before the fetus is delivered.

Anesthetic complications—Any complication during labor and/or delivery brought on by an anesthetic agent or agents.

Fetal distress—Signs indicating fetal hypoxia (deficiency in amount of oxygen reaching fetal tissues).

Abnormal conditions of the newborn

Anemia—Hemoglobin level of less than 13.0 g/dL or a hematocrit of less than 39 percent.

Birth injury—Impairment of the infant's body function or structure due to adverse influences that occurred at birth.

Fetal alcohol syndrome—A syndrome of altered prenatal growth and development occurring in infants born of women who consumed excessive amounts of alcohol during pregnancy.

Hyaline membrane disease/RDS—A disorder primarily of prematurity, manifested clinically by respiratory distress and pathologically by pulmonary hyaline membranes and incomplete expansion of the lungs at birth.

Meconium aspiration syndrome—Aspiration of meconium by the fetus or newborn, affecting the lower respiratory system.

Assisted ventilation (less than 30 minutes)—A mechanical method of assisting respiration for newborns with respiratory failure.

Assisted ventilation (30 minutes or more)—Newborn placed on assisted ventilation for 30 minutes or longer.

Seizures—A seizure of any etiology.

Congenital anomalies of child

Anencephalus—Absence of the cerebral hemispheres.

Spina bifida/meningocele—Developmental anomaly characterized by defective closure of the bony encasement of the spinal cord, through which the cord and meninges may or may not protrude.

Hydrocephalus—Excessive accumulation of cerebrospinal fluid within the

ventricles of the brain with consequent enlargement of the cranium.

Microcephalus—A significantly small head.

Other central nervous system anomalies—Other specified anomalies of the brain, spinal cord, and nervous system.

Heart malformations—Congenital anomalies of the heart.

Other circulatory/respiratory anomalies—Other specified anomalies of the circulatory and respiratory systems.

Rectal atresia/stenosis—Congenital absence, closure, or narrowing of the rectum.

Tracheo-esophageal fistula/Esophageal atresia—An abnormal passage between the trachea and the esophagus; esophageal atresia is the congenital absence or closure of the esophagus.

Omphalocele/Gastroschisis—An omphalocele is a protrusion of variable amounts of abdominal viscera from a midline defect at the base of the umbilicus. In gastroschisis, the abdominal viscera protrude through an abdominal wall defect, usually on the right side of the umbilical cord insertion.

Other gastrointestinal anomalies—Other specified congenital anomalies of the gastrointestinal system.

Malformed genitalia—Congenital anomalies of the reproductive organs.

Renal agenesis—One or both kidneys are completely absent.

Other urogenital anomalies—Other specified congenital anomalies of the organs concerned in the production and excretion of urine, together with organs of reproduction.

Cleft lip/palate—Cleft lip is a fissure or elongated opening of the lip; cleft palate is a fissure in the roof of the mouth. These are failures of embryonic development.

Polydactyly/Syndactyly/Adactyly—Polydactyly is the presence of more than five digits on either hands and/or feet; syndactyly is having fused or webbed fingers and/or toes; adactyly is the absence of fingers and/or toes.

Table A. Corrected numbers and rates for club foot, diaphragmatic hernia, and other musculoskeletal/integumental anomalies, 1990

	All races		White		Black	
	Number reported	Rate ¹	Number reported	Rate ¹	Number reported	Rate ¹
Club foot	2,277	62.7	1,986	68.7	231	39.4
Diaphragmatic hernia	514	14.2	427	14.8	65	11.1
Other musculoskeletal/integumental anomalies	8,118	223.6	6,515	225.5	1,242	211.7

¹Rate per 100,000 total live births

Club foot—Deformities of the foot, which is twisted out of shape or position.

Diaphragmatic hernia—Herniation of the abdominal contents through the diaphragm into the thoracic cavity usually resulting in respiratory distress.

Other musculoskeletal/integumental anomalies—Other specified congenital anomalies of the muscles, skeleton, or skin.

Down's syndrome—The most common chromosomal defect with most cases resulting from an extra chromosome (trisomy 21).

Other chromosomal anomalies—All other chromosomal aberrations.

Method of delivery

Several rates are computed for method of delivery. The overall cesarean section rate or *total cesarean* rate is computed as the percent of all births that were delivered by cesarean section. The *primary cesarean* rate is a measure that relates the number of women having a primary cesarean delivery to all women giving birth who have never had a cesarean delivery. The denominator for this rate includes all births less those with method of delivery classified as repeat cesarean, vaginal birth after previous cesarean, or method not stated. The *repeat cesarean* rate is the percent of all cesarean deliveries that were to women having their second (or subsequent) cesarean delivery. The rate for *vaginal birth after previous cesarean* (VBAC) delivery is computed by relating all VBAC deliveries to the sum of VBAC and repeat cesarean deliv-

eries, that is, to women with a previous cesarean section.

Congenital anomalies

Because of a processing error for births occurring in Texas, the number of club foot, diaphragmatic hernia, and other musculoskeletal/integumental anomalies shown in table 17 are incorrect. The correct numbers and rates for these anomalies for all ages combined are shown in table A.

Computation of percent, percent distributions, and medians

Births with unknown medical and life-style risk factors of pregnancy and birth, obstetric procedures, abnormal conditions and congenital anomalies of infant, and method of delivery were subtracted from the figures for total births that were used as denominators before percents, percent distributions, and medians were computed. Computations of median weight gain were based on ungrouped data. An asterisk is shown in place of any derived statistic based on fewer than 20 births in the numerator or denominator.

Random variation

Although the birth data in this report are not subject to sampling error, they may be affected by random variation in the number of births involved. Many of the checkbox items refer to extremely rare events. When the number of events is small, perhaps less than 100, and the probability of such an event is small, considerable caution must be observed in interpreting the data.

Suggested citation

National Center for Health Statistics. Advance report of maternal and infant health data from the birth certificate, 1990. Monthly vital statistics report; vol 42 no 2, suppl. Hyattsville, Maryland; Public Health Service. 1993

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DHHS Publication No. (PHS) 93-1120