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Births to 10–14 Year-Old Mothers, 1990–2002: Trends and Health Outcomes

by Fay Menacker, Dr.P.H.; Joyce A. Martin, M.P.H.; Marian F. MacDorman, Ph.D.; and Stephanie J. Ventura, M.A., Division of Vital Statistics

Abstract

Objectives—This report presents the number and rate of U.S. births for 10–14 year olds, for 1990–2002 by race and Hispanic origin and by State. Pregnancy risk factors and outcomes by selected maternal and infant characteristics are shown.

Methods—Tabular and graphical descriptions of births and infant deaths to 10–14 year olds are presented based on information reported on birth and death certificates for the United States and each State.

Results—7,315 females aged 10–14 years delivered a live birth in 2002. The rate of births to 10–14 year olds was 0.7 per 1,000 in 2002, half of the rate during 1989–94. This rate peaked in 1989 (1.4 per 1,000). For 1990–94 the rate remained at 1.4, and then began a steady decline to 0.7 per 1,000 in 2002. Large declines in young teenage childbearing were seen among all racial and ethnic subgroups, as well as almost all States. These young mothers were least likely to receive timely prenatal care compared with mothers of older age groups. Compared with infants of mothers aged 20–39 years, infants of the youngest mothers experienced almost twice the rates of preterm delivery (21.3 percent) and low birthweight (12.6 percent). The infant mortality rate (15.4 per 1,000) was two to three times higher than that for infants of mothers aged 20–44 years.

Keywords: early teenage pregnancy • State-specific birth rates • race and Hispanic origin • maternal characteristics • infant characteristics • infant mortality

Introduction

Trends and variations in teenage pregnancy and childbearing as well as maternal and infant outcomes continue to be of great public health interest (1–11). Most publications on teenage birth focus on teens 15–19 years of age. However, younger teens are also at risk for pregnancy and at high risk for adverse outcomes (i.e., a greater risk of repeat teenage pregnancy, sexually transmitted disease, and infant health problems) (12–14). Therefore, the focus of this report is on childbearing among early adolescents aged 10–14 years. Trends in pregnancy and live birth rates for early adolescents aged 10–14 years between 1990 and 2002, as well as data on selected pregnancy risk factors and maternal and infant health outcomes are presented.

Sources and Methods

Data in this report are drawn from birth and death certificates filed for all infants born in the United States. The information is transmitted by the States and territories to the Centers for Disease Control and Prevention's National Center for Health Statistics (NCHS) through the Vital Statistics Cooperative Program (VSCP). This report includes mortality data from the 1999–2001 period linked birth/infant death files. In the linked files the information from the death certificate is linked to the information from the birth certificate for each infant under 1 year of age who died in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, or Guam during a given year. U.S. and State-level birth rates in this report are computed on the basis of population denominators provided by the U.S. Census Bureau. Intercensal population estimates are used for 1991–99.

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Population estimates for 2000 through 2002 are based on counts from the 2000 census. Population-based birth rates shown in this report may differ from rates computed on the basis of other population estimates; see "Technical Notes." Where appropriate, 3 years of data were combined for the periods 1990–92 and 2000–2002 to generate statistically reliable rates. Multiple births, which have contributed importantly to recent increases in preterm birth and low birthweight (LBW), occur at much greater frequency among older than young mothers. Therefore, for comparisons of birth outcomes by maternal age in this report, data are presented for singleton births only. Any differences noted in the text are statistically significant.

Results

Birth trends among young teenagers

During the years 1990–2002 in the United States, almost 137,000 youngsters aged 10–14 years delivered a live birth. The annual number of births to young teens has declined steadily from a peak of 12,901 in 1994 to the current low of 7,315. The birth rate in 2002 was 0.7 live births per 1,000 females aged 10–14 years, lower than in 2001 (0.8), 2000 (0.9), one-half that of 1990 (1.4) (**table 1 and table A**) (14) and the lowest level since 1946 (0.7) (15).

The impact of the declining birth rate has been substantial. If the 1990 rate had held through 2002, there would have been 34,336 additional births to the youngest teens. The decline in the number of births to these youngsters occurred in spite of the 16 percent rise in the population of females aged 10–14 years and is due solely to the decline in their birth rate (16).

Birth rates by race and ethnicity

The birth rate for young teens fell in all racial and ethnic groups by 29 to 63 percent between 1990 and 2002. The rate for black young teenagers declined most steeply, from 4.9 per 1,000 in 1990 to 1.8 in 2002.

Despite the large decreases, rates in 2002 for the youngest non-Hispanic black (1.9 per 1,000) and Hispanic young teens (1.4) remained consistently higher than for other groups. The rates for Asian or Pacific Islander (API) and non-Hispanic white young teens continued to be the lowest (0.3 and 0.2 respectively). Between 1990 and 2002, the rate for API young teens decreased from 0.7 to 0.3. The rate for non-Hispanic white young teens decreased from 0.5 to 0.2 (**tables 1, A, and figure 1**).

Patterns by age

Birth rates for all teenagers have declined since 1990 (**figure 2**). In considering birth rates to young teenagers 10–14 years, it is important to note that the vast majority, over 97 percent of births to the youngest teenage mothers, are to 13–14 year olds. In 2002, of the 7,315 births to 10–14 year olds, 208 were to 10–12 year olds and 7,107 were to 13–14 year olds. Birth rates for ages 10–12 and 13–14 years are shown separately for illustrative purposes in **table A**; rates by race and Hispanic origin for ages 13–14 years are shown in **figure 3**. Although the levels of the rates differed substantially by age, the trends for both age groups are similar. Moreover, the trends in the rates for 13–14 year olds and for the full age group 10–14 years are essentially the same, each declining about 50 percent from 1990 to 2002 (**tables A and 1**).

Young teenage birth rates by State

Birth rates to the youngest teenagers varied by State and territory, ranging in 2000–2002 from 0.2 per 1,000 (Maine) to 2.0 (Mississippi and the District of Columbia). The highest rates are in the South and Southwest. Trends in rates for the youngest mothers could be reliably computed for 47 States and the District of Columbia for both 1990–92 and 2000–2002 (**table 2**). Among these States, rates fell significantly between these periods in 36 States and the District of Columbia (**table 2 and figure 4**).

As noted earlier, in the Nation overall, rates for Hispanic and black young teenagers are higher than for non-Hispanic white young teenagers (**table 1 and figures 1 and 3**). Thus, States with a relatively high proportion of young Hispanic or black populations would be expected to have the highest rates. It is important to keep this in mind when comparing birth rates to young teenagers across States (17).

Pregnancy risk factors

Lack of prenatal care, inadequate weight gain, and smoking during pregnancy are considered risk factors for poor infant outcomes, including LBW, preterm birth, and infant mortality (4,14, 18–21). Certain medical risk factors can influence maternal and infant health.

Among all age groups, the youngest teenagers had the lowest levels of timely **prenatal care (table 3 and figure 5)**. They were least likely to begin prenatal care in the first trimester (47.1 percent). In contrast, at least 78 percent of women aged 20 years and over received first trimester prenatal care. Young teenagers were most likely to receive late prenatal care (11.6 percent) and no prenatal care (4.4 percent).

Within each race or ethnic group, the youngest teens were least likely to begin prenatal care in the first trimester, and most likely to receive late or no care. Timely prenatal care was highest among non-Hispanic white young adolescents (53.6 percent) and lowest among non-Hispanic black young adolescents (41.4 percent) (**table 3**).

Mother's **weight gain during pregnancy** is important to pregnancy outcome. Inadequate weight gain (i.e., weight gain of less than 16 pounds) has been associated with a number of poor pregnancy outcomes, including LBW (22,23), a major risk factor for infant mortality. The youngest mothers were more likely to have inadequate weight gain than other mothers under age 20 years (13.0 compared with 10.6 percent). Compared with the rate for young teens (13.0), the rate of inadequate weight gain for women in their twenties and thirties ranged from 11.3 to 12.8 percent. Levels of inadequate weight gain were highest for women aged 40 years and over. The youngest non-Hispanic black mothers were more likely to gain less than 16 pounds during pregnancy (15.3 percent) than their non-Hispanic white (8.9) or Hispanic counterparts (12.8) (**table 3**).

Smoking during pregnancy is known as a preventable cause of many adverse pregnancy outcomes, including LBW and infant mortality (24–26). Overall, the youngest adolescents were less likely to smoke (6.3 percent) than women in all other age groups. They were two to three times less likely to smoke than older teenage mothers or mothers

Table A. Number and rate of live births to young teenagers 10–14 years, 10–12 years, and 13–14 years, by race and Hispanic origin of mother: United States, 1990, 1995, 2000, and 2002.

[Rates per 1,000 women in specified group. Rates for 1995 and 2000 have been revised and may differ from final birth rates previously published]

Age, race, and Hispanic origin of mother	2002		2000		1995		1990	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
All races								
10–14 years	(7,315)	0.7	(8,519)	0.9	(12,242)	1.3	(11,657)	1.4
10–12 years	(208)	0.0	(242)	0.0	(279)	0.0	(386)	0.1
13–14 years	(7,107)	1.7	(8,277)	2.1	(11,963)	3.2	(11,271)	3.5
Non-Hispanic white								
10–14 years	(1,493)	0.2	(1,840)	0.3	(2,711)	0.4	(2,602)	0.5
10–12 years	(27)	0.0	(28)	0.0	(37)	0.0	(70)	0.0
13–14 years	(1,466)	0.6	(1,812)	0.7	(2,674)	1.1	(2,532)	1.2
Non-Hispanic black								
10–14 years	(3,132)	1.9	(3,736)	2.4	(5,822)	4.2	(6,204)	5.0
10–12 years	(118)	0.1	(150)	0.1	(168)	0.2	(218)	0.3
13–14 years	(3,014)	4.7	(3,586)	6.0	(5,654)	10.1	(5,986)	12.6
American Indian[1]								
10–14 years	(133)	0.9	(160)	1.1	(203)	1.6	(155)	1.6
10–12 years	(5)	*	(2)	*	(7)	*	(2)	*
13–14 years	(128)	2.1	(158)	2.7	(196)	4.0	(153)	4.1
Asian or Pacific Islander								
10–14 years	(110)	0.3	(112)	0.3	(258)	0.7	(180)	0.7
10–12 years	(3)	*	(3)	*	(4)	*	(9)	*
13–14 years	(107)	0.6	(109)	0.7	(254)	1.7	(171)	1.6
Hispanic[2]								
10–14 years	(2,421)	1.4	(2,638)	1.7	(3,187)	2.6	(2,346)	2.4
10–12 years	(54)	0.1	(57)	0.1	(62)	0.1	(78)	0.1
13–14 years	(2367)	3.6	(2,581)	4.4	(3125)	6.3	(2,268)	6.0

0.0 Quantity more than zero but less than 0.5.

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

[1]Includes births to Aleuts and Eskimos.

[2]Includes all persons of Hispanic origin of any race.

NOTES: For 1990, excludes data for New Hampshire and Oklahoma, which did not report Hispanic origin on the birth certificate.

in their twenties. In addition, young mothers who did smoke, generally smoked fewer cigarettes than their older counterparts (14,24,27). There was variation by race and ethnicity in smoking among young teens. The youngest non-Hispanic white teens were eight to nine times more likely to smoke (19.4 percent) than non-Hispanic black and Hispanic young teens (2.3 and 2.1 percent respectively) (**table 3**).

Maternal medical risk factors also can have a significant influence on pregnancy complications and infant survival. Of selected risk factors examined, the rate of anemia for mothers aged 10–14 years (3.8 percent) was higher than the rate for mothers at all older ages, especially those aged 30 years and over. The rates for mothers in their twenties and thirties ranged from 1.9 to 3.0 percent. The rate of pregnancy-associated hypertension for the youngest teens (5.3) was over 40 percent higher than the rates for mothers in their twenties and thirties (3.4 to 3.7 percent). Their rate of eclampsia (0.7) was significantly higher than the rates for older mothers (**table 3**).

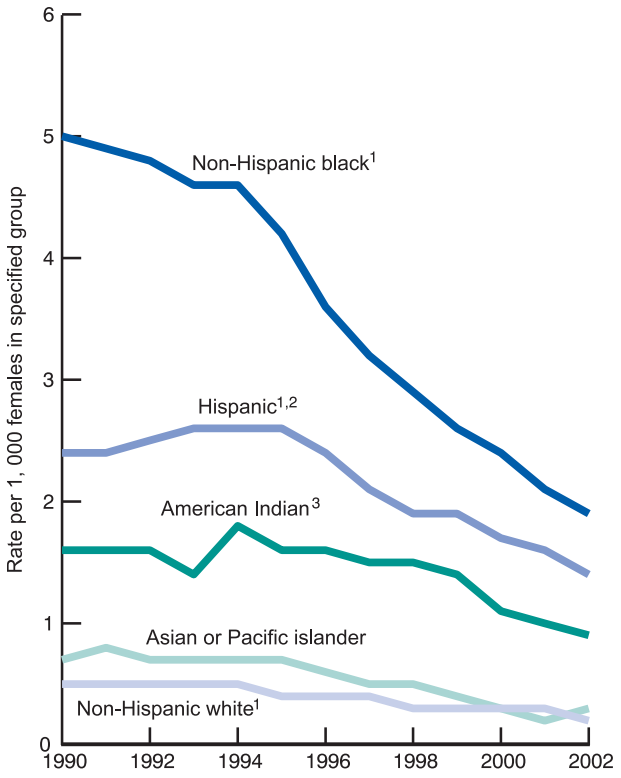
As would be expected, these young mothers had the lowest rate of the age-related chronic condition diabetes (0.5). Their rate of chronic hypertension (0.2) was also lower than that of older mothers.

Infant outcomes

Preterm and low birthweight (LBW)

Gestational age and birthweight are considered among the most critical newborn outcomes. Infants born preterm (prior to 37 completed weeks of gestation), and especially those born very preterm (at less than 32 completed weeks of gestation), are clearly at greater risk for disability and death. Generally, infants born to the youngest and oldest mothers are at greatest risk for preterm birth and LBW.

For 2000–2002, the rate of **preterm singleton births** to infants of the youngest teens was 21.3 percent, 33 percent higher than the rate for infants of mothers aged 45 years and over (16.0 percent) and about twice the rates for infants of mothers aged 20–39 years, which ranged from 9.2 to 10.7 percent (**table 4**). Infants of the youngest mothers also had the highest rate of **very preterm birth** overall (5.3 percent), a rate at least double that for infants of their counterparts aged 18 years and over (**table 4 and figure 6**).



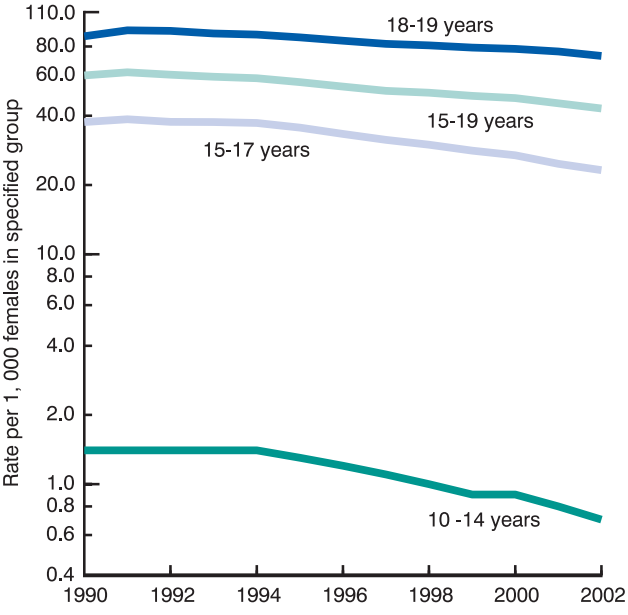
[1]Births rates for 1990 exclude data for New Hampshire and Oklahoma, which did not report Hispanic origin. For 1991 and 1992 excludes data for New Hampshire, which did not report Hispanic origin.

[2]Includes all persons of Hispanic origin of any race.

[3]Includes births to Aleuts and Eskimos.

NOTE: Race categories are consistent with the 1977 Office of Management and Budget guidelines, see "Technical Notes."

Figure 1. Birth rates for young teens aged 10–14 years by race and Hispanic origin of mother: United States, 1990–2002



NOTES: Denominators for population-based rates for 1991-2002 are inter- and postcensal estimates that incorporate the 2000 census. Rates for 1991-2001 have been revised and may differ from those previously published. See "Technical Notes." Rates are plotted on a log scale.

Figure 2. Birth rates for females aged 10–19 years: United States, 1990–2002

Among non-Hispanic black mothers under age 45 years, the youngest teens had the highest rate of preterm birth (24.3 percent) a rate over 60 percent higher than the rates for infants of mothers in their twenties. The rate for non-Hispanic white young teens (18.3) was double the rate for their 25 to 39 year-old counterparts. For the youngest Hispanic mothers, the rate (19.0) was close to double that of Hispanic mothers aged 20–39 years (**table 4; see figure 7 for ages 10–14 years**).

The rate of **LBW** for singleton births to mothers aged 10–14 years (12.6 percent) was the highest for any age group, more than twice the overall rate (6.1 percent), and 27 percent higher than the rate for mothers aged 45–54 years. The age-specific pattern was similar for **very low birthweight (VLBW)**. Overall, the rate for young teens (2.8) was the highest, more than twice the total rate and substantially higher than the rates for other age groups (**table 4 and figure 6**).

The age-specific patterns for LBW were similar for non-Hispanic white and Hispanic births (**table 4 and figure 7**), with LBW rates about twice the rates for mothers in their twenties and thirties. Among non-Hispanic black births, the range in rates by maternal age was narrower.

As noted above, infants of the youngest teens were at elevated risk for **VLBW** (2.8) compared with the rates for infants of older mothers (**table 4 and figure 6**). Among non-Hispanic white births, the rate for infants of the youngest teens (2.6) was higher than the rates for older mothers, and over three times higher than the rate for births to mothers aged 25–39 years. In contrast, among infants of non-Hispanic black and Hispanic mothers, the rates for infants of the youngest teens, (3.4 and 2.1 respectively) were not significantly different from the rates for the oldest mothers.

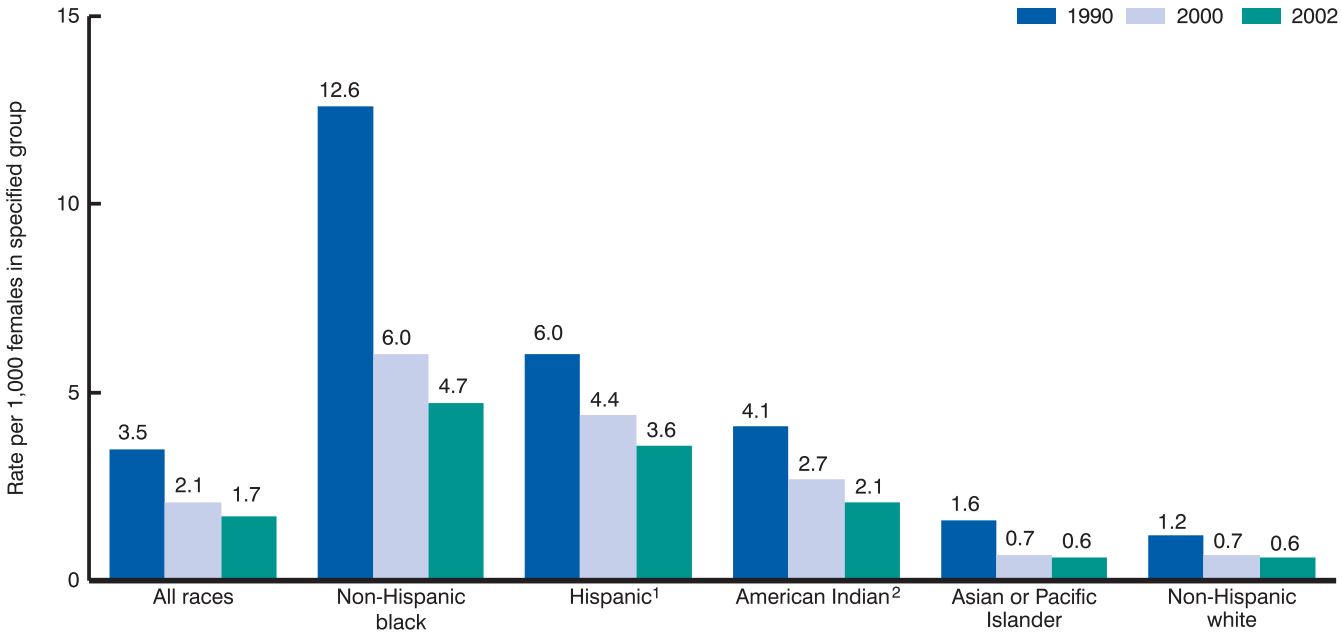
Multiple births

Multiple births are associated with childbearing at older ages, as well as with the use of fertility therapies, also more common in older women (14). Therefore, younger mothers are much less likely to have a multiple birth. For 2000–2002, the youngest teens had a low rate of multiple births (1.2) compared with women aged 30–44, whose rates ranged from 4.1 to 5.3 percent. The rates for women aged 15–29 years ranged from 1.6 to 3.0 percent. The rate for the youngest teens (1.2) was especially striking when compared with the rate for mothers aged 45–54 years (20.2 percent). Within each race or ethnic group, the rate for the youngest teens was much lower than the rate for women 45 years of age and over (**table 4**). There were no higher order (triplet/ +) births to the youngest teens in 2002.

Late fetal, perinatal, and infant mortality rates for youngest teens

Table 5 presents infant mortality rates for singleton births from the 1999–2001 linked birth/infant death files. All measures of perinatal loss, late fetal (the number of fetal deaths at 28 weeks or more gestation per 1,000 live births plus late fetal deaths), perinatal (the number of late fetal deaths plus early neonatal deaths per 1,000 live births plus fetal deaths), and infant mortality (the number of deaths to live-born children less than 1 year of age) were elevated for young teenage mothers compared with mothers in their twenties.

The rate for early neonatal mortality (deaths at less than 7 days), for infants born to mothers aged 10–14 years (8.9) was twice that of



[1]Includes all persons of Hispanic origin of any race. Birth rates for 1990 exclude data for New Hampshire and Oklahoma, which did not report Hispanic origin.
[2]Includes births to Aleuts and Eskimos.
NOTE: Race categories are consistent with the 1977 Office of Management and Budget guidelines, see "Technical Notes."

Figure 3. Birth rates by race and Hispanic origin for young teenagers 13–14 years: United States, 1990, 2000, and 2002

mothers aged 15–19 (4.1). This may reflect young teenage mothers' greater risk of preterm and LBW birth because many very preterm and LBW infants die shortly after birth.

The risk of late neonatal death (deaths at 7 to less than 28 days) for the youngest teens was 1.5 compared with 1.2 for older teens. Rates for mothers aged 20 years and over ranged from 1.1 to 0.7. The youngest teens had the highest rate of postneonatal death (5.0.); the rate for mothers aged 15–19 years was 3.8. The rate for infants of mothers aged 45–54 years was 3.2.

Although infants born to young teenage mothers were at the highest risk of infant mortality among all maternal age groups, late fetal and perinatal mortality rates were higher for mothers aged 45–54 years than for young teenage mothers (**table 5 and figure 6**).

Infants of young non-Hispanic black teenage mothers had an infant mortality rate of 16.6, compared with 15.9 for young non-Hispanic white teenage mothers and 13.5 for young Hispanic teenage mothers. The perinatal mortality rate for infants of young non-Hispanic black teenage mothers was 14.3, compared with 12.3 for infants of non-Hispanic white mothers and 10.6 for infants of Hispanic mothers (**figure 7**). The variations by maternal age were similar for non-Hispanic white and Hispanic births. Differences were much narrower for non-Hispanic black births (**table 5**).

Leading causes of infant death—**Table 6** presents singleton infant mortality rates by maternal age for the five leading causes of death from the 1999–2001 linked birth/infant death files. Together, the leading causes of death for the total population, Congenital malformations, deformations, and chromosomal abnormalities (congenital malformations), (22 percent of all infant deaths) Disorders related to short gestation and low birthweight, not elsewhere classified (low birthweight) (14 percent of infant deaths), Sudden infant death syndrome (SIDS), Newborn affected by maternal complications of pregnancy (maternal complications, and Accidents (unintentional injuries)) accounted for 54 percent of all infant deaths.

The pattern of leading causes of death was quite different for mothers aged 10–14 years compared with older mothers. Among the youngest mothers, the leading cause of infant death was LBW, which accounted for 22 percent of all deaths to infants of 10–14 year olds. Congenital malformations was second, accounting for 13 percent of all infant deaths followed by SIDS, which accounted for 10 percent. Two causes that were not among the five leading causes of death for the total population, together accounted for the next largest share of deaths to infants of young teenage mothers (9 percent). These were Respiratory distress of newborn and Newborn affected by complications of placenta, cord and membranes. The fourth and fifth leading causes for the total population—maternal complications and unintentional injuries—were not among the five leading causes of death for infants of young teen mothers. Together the five leading causes for infants of young teenage mothers accounted for 51 percent of infant deaths; the other 49 percent of infant deaths were due to other specific causes of death not among the five leading causes.

As discussed in the previous section, the singleton infant mortality rate for mothers aged 10–14 years was 2.5 times the rate for mothers at all ages combined. However, this ratio was considerably higher for some causes of death. Most notably, the infant mortality rate from LBW was 339.0 infant deaths per 100,000 live births for young teen mothers, nearly four times the rate of 87.9 for all ages combined. The SIDS rate for young teenage mothers was 2.7 times the rate for all ages combined, and the rate for congenital malformations was 1.5 times higher. Statistically reliable infant mortality rates could not be computed for young teen mothers for other causes because of the small number of infant deaths.

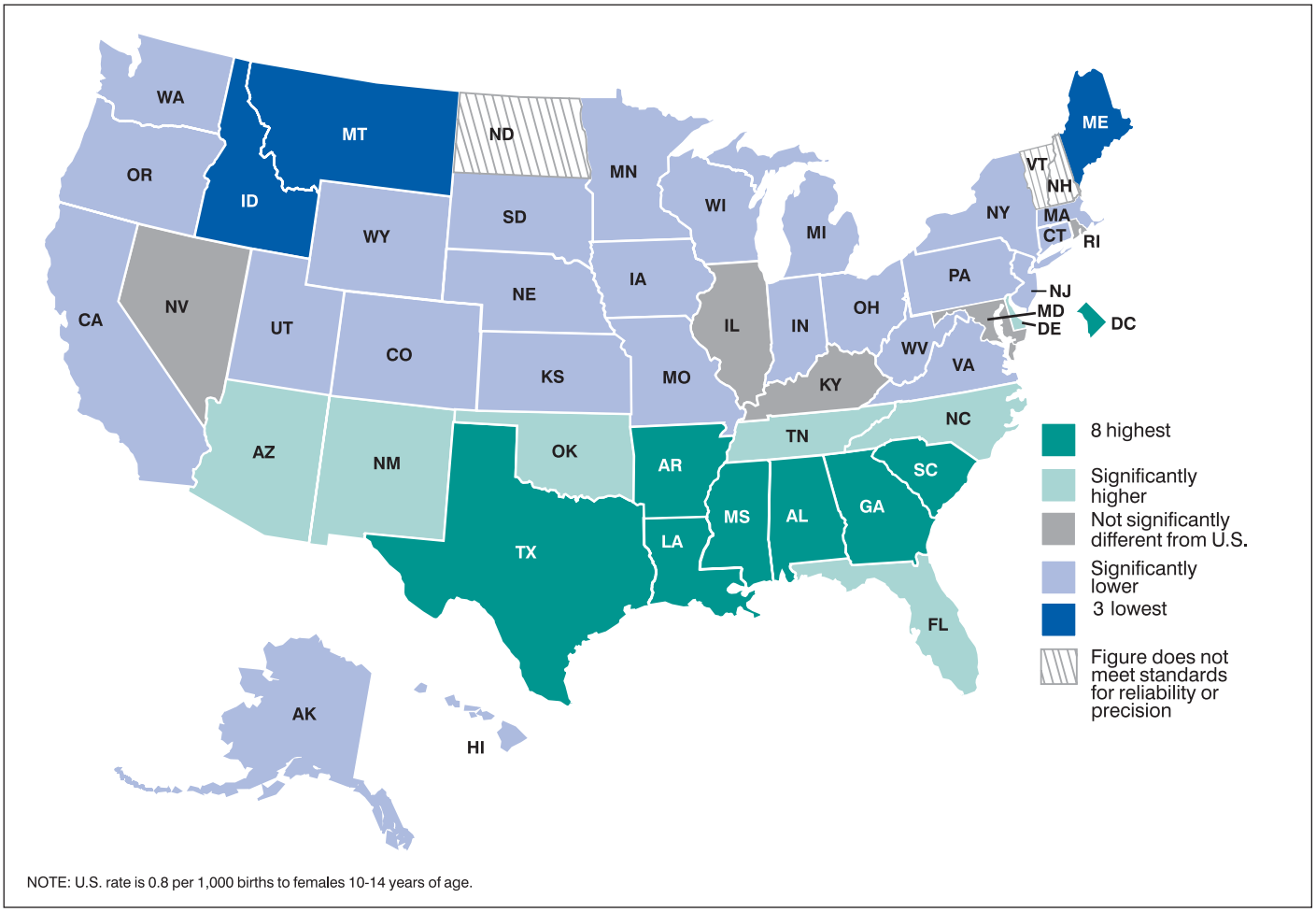


Figure 4. Birth rates for young teenagers 10–14 years by State: United States, combined years, 2000–2002

Discussion

As noted previously, the number and rate of births to the youngest teens have declined substantially in recent years, and the latest data show that this trend is continuing for older teens as well (14). However, not all pregnancies end in live births. About two-fifths of the pregnancies among 10–14 year olds in 2000 ended in a live birth, two-fifths ended in induced abortion, and about one in six ended in a fetal loss (28). These proportions have been fairly stable since 1976, when this series of national pregnancy estimates was inaugurated (3). In 2000 an estimated 21,000 pregnancies occurred among young teenagers 10–14 years, about one-fourth fewer than in 1990 (29,000).

The pregnancy rate for young teenagers 10–14 years was 2.1 per 1,000 females in 2000. The rate has dropped steeply since 1990, when it was 3.5 per 1,000. The highest rate recorded was in 1985–86, when it was 3.6.

During the decade 1990–2000, pregnancy rates declined by about one-half for young non-Hispanic white and black teenagers, and by about 25 percent for Hispanic young teenagers. The reductions in overall pregnancy rates for young non-Hispanic white and black teenagers are reflected in sharp and steady declines for live births and induced abortions. Among Hispanic young teenagers, the declines began later in the decade. Although rates fell for all population subgroups, the pregnancy rate remains substantially higher for young non-Hispanic black teenagers (5.9 per 1,000) than for young Hispanic (3.0) or young non-Hispanic white teenagers (0.8) (**figure 8**).

Despite the declines discussed above, more than 7,000 young adolescents gave birth in 2002, and these young women and their infants are at highest risk for the most adverse birth outcomes, regardless of race or Hispanic origin.

Young maternal age is an important influence on pregnancy outcome (29). This may be due in part to biologic immaturity (30). This analysis of national birth data showed that compared with mothers in their twenties and thirties, the youngest mothers are less likely to receive adequate prenatal care and to have higher levels of anemia and pregnancy-associated hypertension. Their infants are much more likely to experience higher rates of preterm delivery and LBW, outcomes known to be associated with infant mortality.

The much higher infant mortality rate from the cause of death LBW relates directly to the young teen mother's higher risk of delivering a LBW or preterm infant (see previous sections). Most studies of SIDS have documented much higher SIDS rates for mothers under age 20 years (31,32). Although the reasons for this increased risk are not completely understood, they may relate, in part, to the higher risk factor profile for teenage births, as well as a greater tendency for teenage mothers to use the prone sleep position (31,32). A study of specific types of congenital malformations found elevated incidence rates for mothers under age 20 years for only 2 of 43 malformations studied (33).

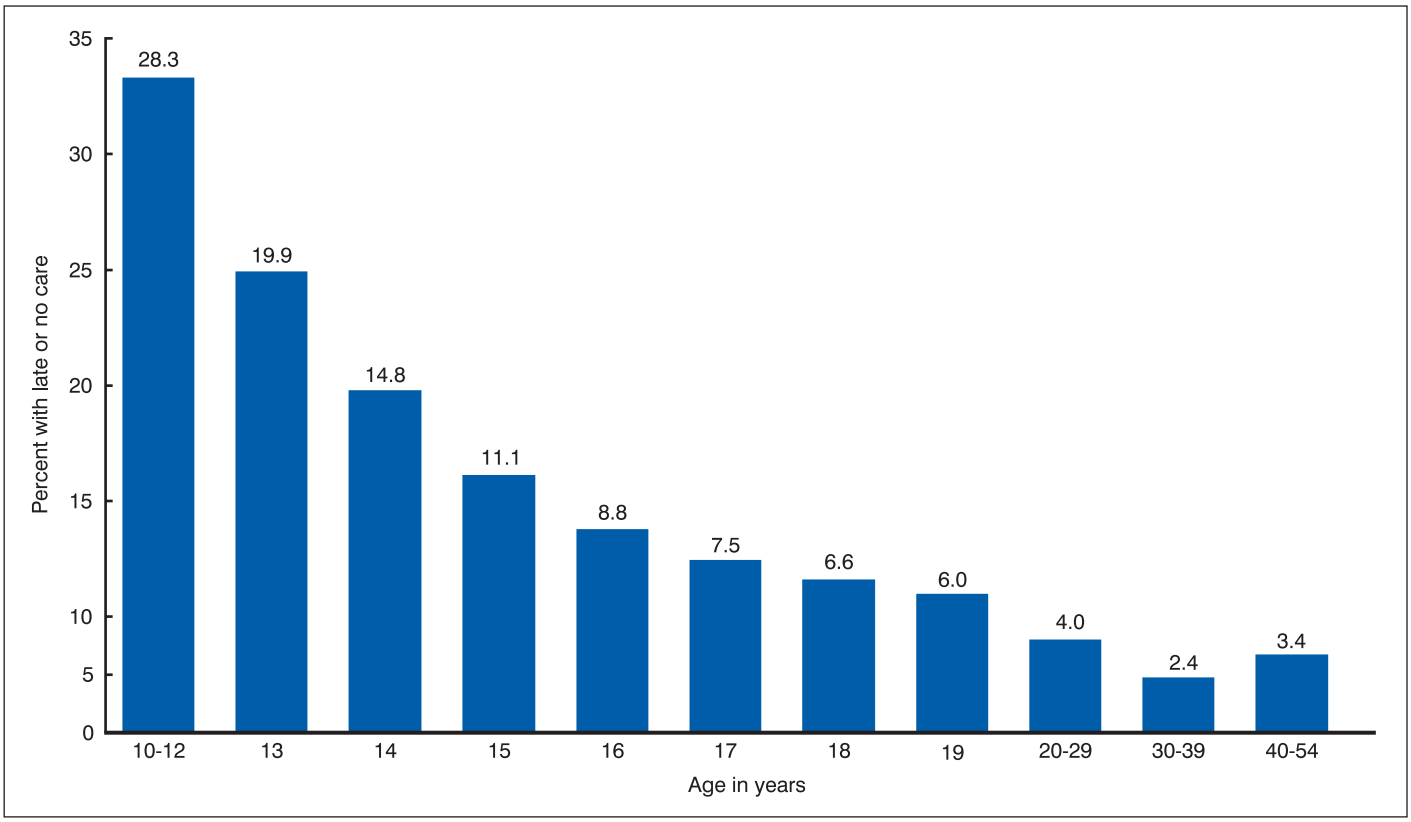


Figure 5. Percent of mothers with late or no prenatal care, by age of mother: United States, combined years, 2000–2002

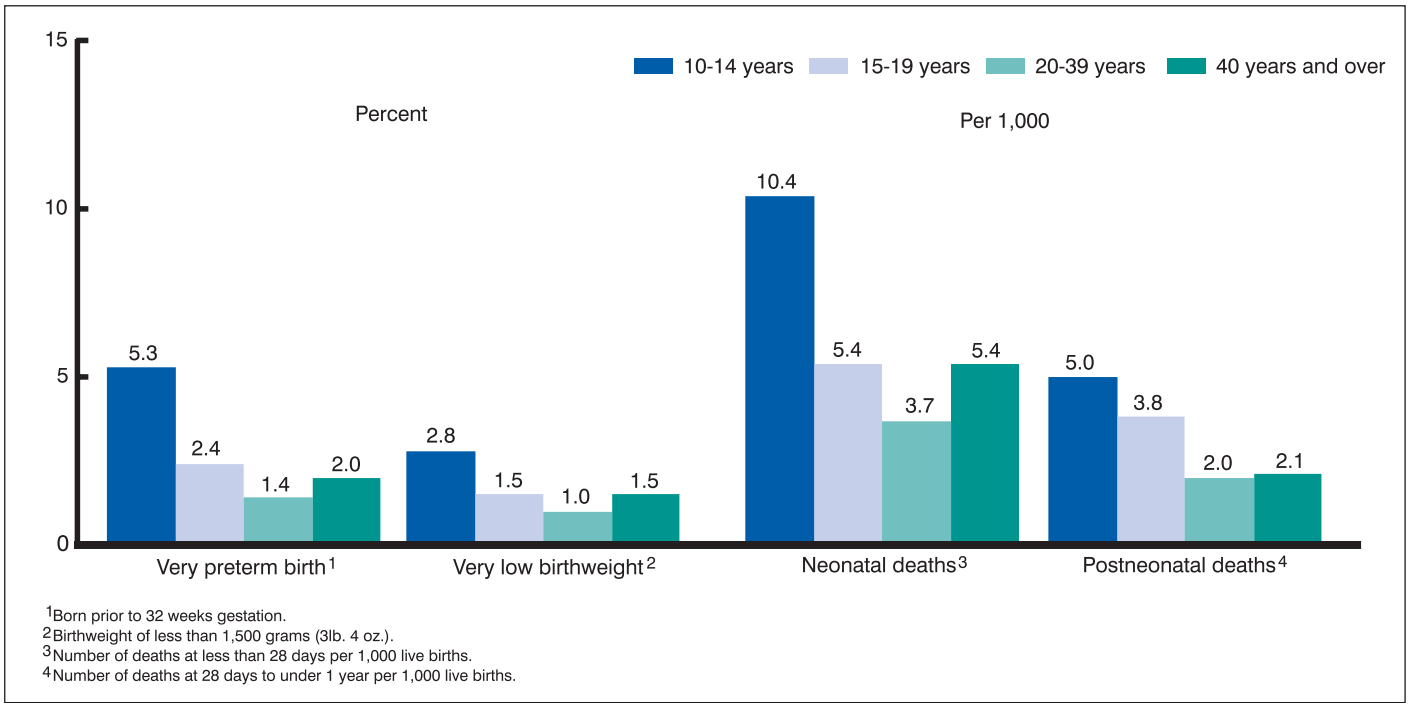


Figure 6. Selected infant outcomes by age of mother: United States, combined years, 2000–2002

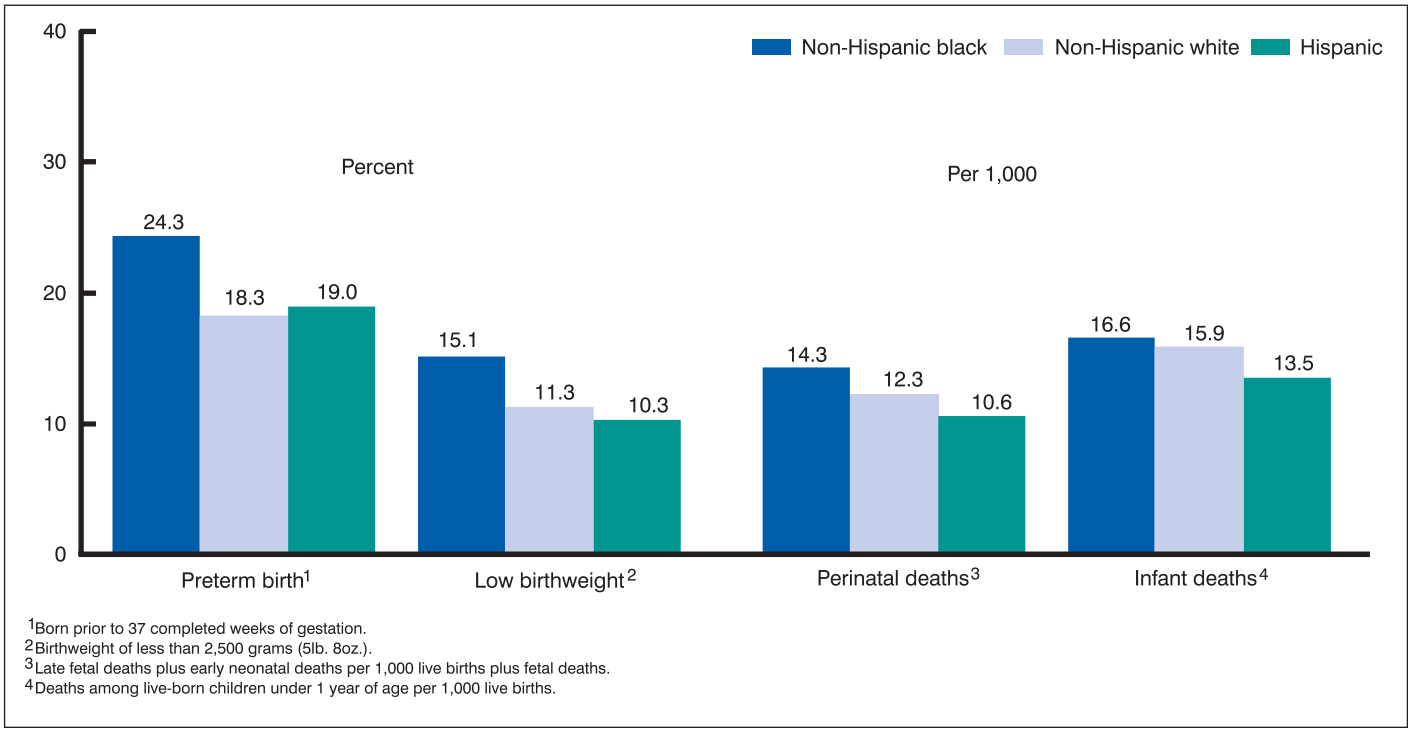


Figure 7. Selected outcomes for infants of mothers aged 10–14 years, by race and Hispanic origin: United States, combined years, 2000–2002

However, the young teenage mothers' higher risk of preterm delivery may also help to explain their higher infant mortality rate from Congenital malformations, as a preterm infant with a congenital malformation may be more likely to die from the effects of the malformation or from the effects of corrective surgery than a more robust full-term infant.

A study of the association between maternal age 15 years and under and infant death among full term, normal birthweight (i.e., healthy infants) born to young adolescent mothers found an increased risk of postneonatal death, possibly due to poor social conditions (20). Early teenage pregnancy takes a tremendous toll both personally and in terms of public health. The youngest teenage mothers and their infants face enormous social and health disadvantages.

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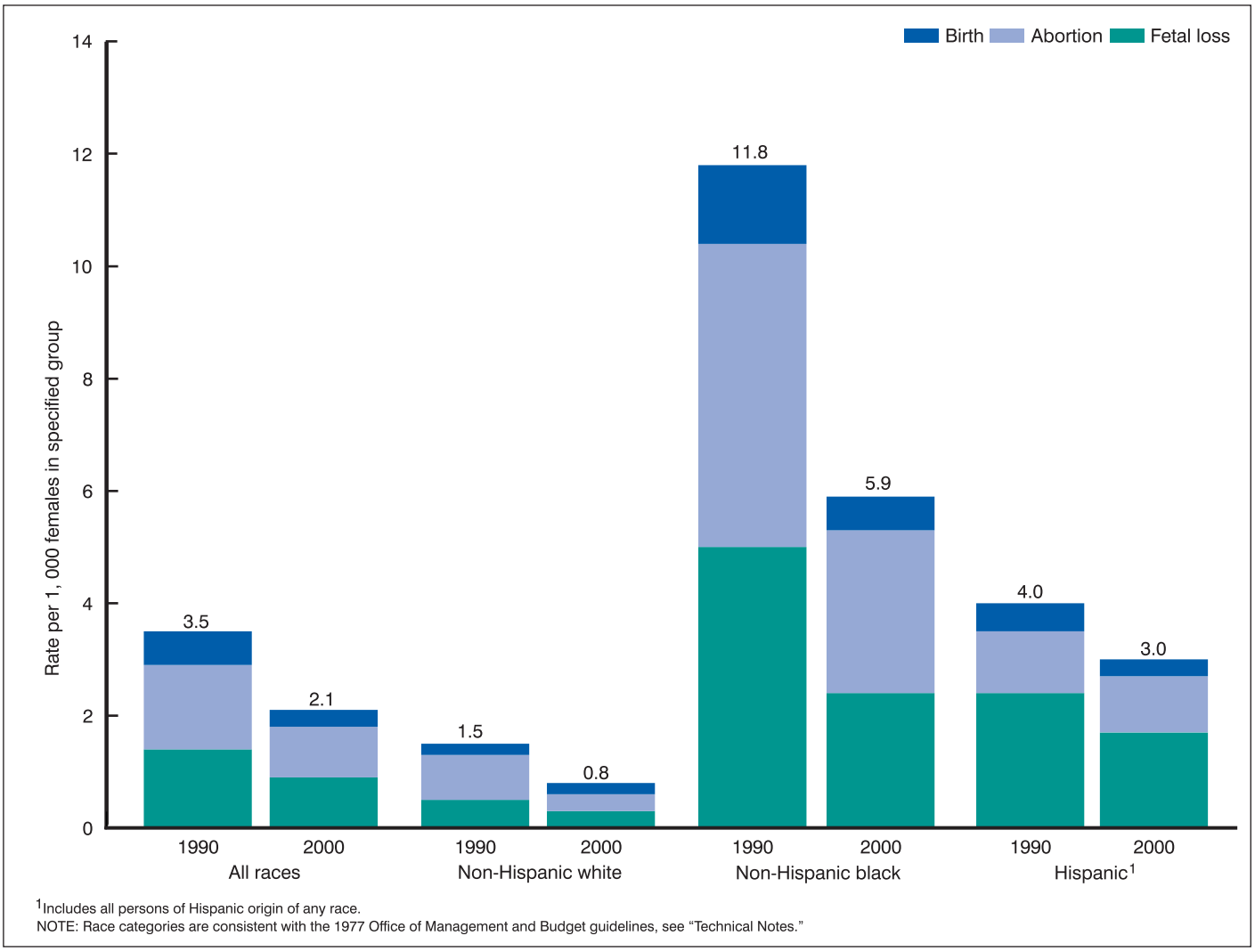

[1]Includes all persons of Hispanic origin of any race.
NOTE: Race categories are consistent with the 1977 Office of Management and Budget guidelines, see "Technical Notes."

Figure 8. Pregnancy, birth, abortion and fetal loss rates for young teenagers 10–14 years, by race and Hispanic origin, 1990 and 2000

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List of Detailed Tables

Table 1. Number and rate of live births to young teenagers 10–14 years, by race and Hispanic origin of mother: United States, 1990–2002

[Rates per 1,000 women in specified group. Rates for 1991–2001 have been revised and may differ from final birth rates previously published]

Race and Hispanic origin of mother	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990
							Number						
All races	7,315	7,781	8,519	9,054	9,462	10,121	11,148	12,242	12,901	12,554	12,220	12,014	11,657
White total	3,884	4,095	4,439	4,739	4,801	5,021	5,526	5,854	5,978	5,755	5,367	5,189	4,974
Non-Hispanic white	1,493	1,581	1,840	2,048	2,132	2,240	2,532	2,711	2,858	2,867	2,689	2,722	2,602
Black total	3,188	3,455	3,808	3,977	4,289	4,712	5,193	5,927	6,465	6,417	6,448	6,419	6,338
Non-Hispanic black	3,132	3,401	3,736	3,890	4,204	4,613	5,084	5,822	6,365	6,295	6,339	6,338	6,204
American Indian[1]	133	145	160	198	197	202	202	203	211	157	169	166	155
Asian or Pacific Islander	110	86	112	140	175	186	227	258	247	225	236	232	180
Hispanic[2]	2,421	2,555	2,638	2,725	2,716	2,833	3,056	3,187	3,147	2,950	2,715	2,484	2,346
							Rate						
All races	0.7	0.8	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.4	1.4	1.4	1.4
White total	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.7
Non-Hispanic white	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
Black total	1.8	2.0	2.3	2.5	2.8	3.1	3.5	4.1	4.5	4.5	4.6	4.7	4.9
Non-Hispanic black	1.9	2.1	2.4	2.6	2.9	3.2	3.6	4.2	4.6	4.6	4.8	4.9	5.0
American Indian[1]	0.9	1.0	1.1	1.4	1.5	1.5	1.6	1.6	1.8	1.4	1.6	1.6	1.6
Asian or Pacific Islander	0.3	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.8	0.7
Hispanic[2]	1.4	1.6	1.7	1.9	1.9	2.1	2.4	2.6	2.6	2.6	2.5	2.4	2.4

[1]Includes births to Aleuts and Eskimos.

[2]Includes all persons of Hispanic origin of any race.

NOTES: For 1991–92, excludes data on Hispanic origin for New Hampshire, which did not report Hispanic origin on the birth certificate. For 1990, excludes data for New Hampshire and Oklahoma, which did not report Hispanic origin on the birth certificate.

Table 2. Birth rates for young teenagers 10–14 years, by State: United States, 1990–92 and 2000–2002

State	2000–2002				1990–1992			
	Number	Rate per 1,000 women	95-percent confidence limits		Number	Rate per 1,000 women	95-percent confidence limits	
			Lower	Upper			Lower	Upper
United States[1]	23,615	0.8	0.8	0.8	35,891	1.4	1.4	1.4
Alabama	556	1.2	1.1	1.3	985	2.2	2.1	2.4
Alaska	45	0.5	0.4	0.7	56	0.8	0.6	1.1
Arizona	625	1.1	1.0	1.2	566	1.4	1.3	1.5
Arkansas	346	1.2	1.1	1.4	545	2.1	1.9	2.3
California	2,448	0.6	0.6	0.7	4,455	1.5	1.4	1.5
Colorado	336	0.7	0.6	0.8	324	0.9	0.8	1.0
Connecticut	178	0.5	0.4	0.6	311	1.1	0.9	1.2
Delaware	85	1.1	0.8	1.3	148	2.2	1.9	2.6
District of Columbia	89	2.0	1.6	2.4	260	6.0	5.3	6.8
Florida	1,458	0.9	0.9	1.0	2,250	1.9	1.9	2.0
Georgia	1,118	1.2	1.1	1.3	1,579	2.2	2.1	2.3
Hawaii	59	0.5	0.4	0.6	88	0.8	0.6	1.0
Idaho	53	0.3	0.3	0.5	68	0.5	0.4	0.6
Illinois	1,050	0.8	0.7	0.8	1,946	1.6	1.6	1.7
Indiana	391	0.6	0.5	0.6	623	1.0	1.0	1.1
Iowa	111	0.4	0.3	0.4	137	0.4	0.4	0.5
Kansas	157	0.5	0.5	0.6	202	0.7	0.6	0.8
Kentucky	332	0.8	0.7	0.9	564	1.4	1.3	1.5
Louisiana	743	1.5	1.4	1.6	1,245	2.4	2.3	2.6
Maine	20	0.2	0.1	0.2	41	0.3	0.2	0.4
Maryland	475	0.8	0.7	0.9	769	1.7	1.6	1.8
Massachusetts	241	0.4	0.3	0.4	367	0.7	0.6	0.8
Michigan	659	0.6	0.6	0.6	1,216	1.2	1.2	1.3
Minnesota	230	0.4	0.4	0.5	297	0.6	0.5	0.7
Mississippi	626	2.0	1.8	2.1	1,022	3.2	3.0	3.4
Missouri	379	0.6	0.6	0.7	620	1.1	1.1	1.2
Montana	26	0.3	0.2	0.4	37	0.4	0.3	0.5
Nebraska	83	0.4	0.4	0.6	116	0.7	0.5	0.8
Nevada	175	0.8	0.7	0.9	160	1.3	1.1	1.5
New Hampshire	12	*	*	*	26	0.2	0.2	0.3
New Jersey	421	0.5	0.4	0.5	761	1.1	1.0	1.1
New Mexico	246	1.1	1.0	1.3	238	1.3	1.1	1.4
New York	972	0.5	0.5	0.5	1,856	1.1	1.0	1.1
North Carolina	906	1.1	1.0	1.1	1,179	1.8	1.7	1.9
North Dakota	14	*	*	*	16	*	*	*
Ohio	848	0.7	0.6	0.7	1,304	1.1	1.1	1.2
Oklahoma	338	0.9	0.8	1.0	436	1.3	1.1	1.4
Oregon	183	0.5	0.4	0.6	250	0.8	0.7	0.9
Pennsylvania	792	0.6	0.6	0.7	1,325	1.2	1.1	1.2
Rhode Island	68	0.7	0.5	0.8	93	1.0	0.8	1.3
South Carolina	537	1.3	1.2	1.4	814	2.1	2.0	2.3
South Dakota	44	0.5	0.4	0.7	35	0.4	0.3	0.6
Tennessee	624	1.1	1.0	1.2	920	1.8	1.7	1.9
Texas	3,204	1.3	1.3	1.4	3,641	1.8	1.8	1.9
Utah	102	0.4	0.3	0.4	140	0.5	0.4	0.6
Vermont	7	*	*	*	13	*	*	*
Virginia	506	0.7	0.6	0.7	803	1.3	1.2	1.4
Washington	308	0.5	0.4	0.5	409	0.8	0.7	0.9
West Virginia	82	0.5	0.4	0.6	160	0.8	0.7	1.0
Wisconsin	287	0.5	0.4	0.5	453	0.8	0.8	0.9
Wyoming	20	0.4	0.2	0.6	22	0.4	0.2	0.6
Puerto Rico	800	1.8	1.7	1.9	---	---	---	---
Virgin Islands	12	*	*	*	---	---	---	---
Guam	29	1.3	0.9	1.9	---	---	---	---
American Samoa	7	*	*	*	---	---	---	---
Northern Marianas	9	*	*	*	---	---	---	---

* Figure does not meet standards of reliability or precision.

--- Data not available.

[1]Excludes data for the territories.

Table 3. Percent of singleton live births with selected risk factors, by age, race and Hispanic origin of mother: United States: 2000–2002

Risk factor, outcome, and race and Hispanic origin of mother	Age of mother										
			15–19 years								
	All ages	10–14 years	Total	15–17 years	18–19 years	20–24 years	25–29 years	30–34 years	35–39 years	40–44 years	45–54 years
All origins[1]											
Prenatal care beginning in the first trimeser	83.3	47.1	69.5	64.4	72.0	78.2	86.2	89.6	88.9	85.9	81.6
Late or no prenatal care	3.8	16.1	7.0	8.4	6.2	4.9	3.1	2.4	2.6	3.4	4.7
Weight gain of less than 16 lbs.[2]	12.1	13.0	10.6	10.5	10.7	12.8	12.3	11.3	12.3	14.3	16.5
Smoker[3]	12.0	6.3	17.4	14.3	18.9	16.9	10.2	7.6	8.6	9.5	6.9
Anemia	2.5	3.8	3.5	3.7	3.5	3.0	2.2	1.9	1.9	2.0	2.2
Diabetes	3.1	0.5	0.9	0.7	1.1	1.8	3.0	4.1	5.5	7.2	8.8
Eclampsia	0.3	0.7	0.4	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.5
Hypertension, chronic	0.8	0.2	0.3	0.2	0.3	0.5	0.7	1.0	1.5	2.4	3.6
Hypertension, pregnancy associated	3.7	5.3	4.2	4.4	4.1	3.7	3.6	3.4	3.6	4.3	5.8
Hydramnios/oligohydramnios	1.4	1.5	1.5	1.5	1.4	1.4	1.3	1.3	1.4	1.7	2.3
Non-Hispanic white											
Prenatal care beginning in the first trimester	88.4	53.6	75.5	71.0	77.2	83.2	90.6	93.0	92.1	89.3	86.1
Late or no prenatal care	2.3	13.8	4.8	6.1	4.3	3.3	1.8	1.4	1.6	2.4	3.5
Weight gain of less than 16 lbs.[2]	10.1	8.9	7.7	7.1	7.9	10.8	10.5	9.6	10.4	12.1	13.8
Smoker[3]	15.5	19.4	30.1	28.3	30.8	24.7	13.0	8.7	9.5	10.3	7.2
Anemia	2.0	2.9	3.0	3.1	2.9	2.5	1.9	1.7	1.7	1.8	2.0
Diabetes	2.9	0.5	1.0	0.8	1.1	1.8	2.8	3.5	4.6	6.0	7.0
Eclampsia	0.3	0.6	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.5
Hypertension, chronic	0.8	*	0.3	0.2	0.3	0.5	0.7	0.9	1.3	2.0	2.9
Hypertension, pregnancy associated	4.1	5.3	4.7	4.9	4.7	4.4	4.3	3.6	3.6	4.2	6.1
Hydramnios/oligohydramnios	1.3	1.7	1.4	1.5	1.4	1.3	1.2	1.2	1.3	1.6	2.1
Non-Hispanic black											
Prenatal care beginning in the first trimester	74.5	41.4	64.2	58.6	67.4	72.9	79.3	81.5	80.1	76.8	73.1
Late or no prenatal care	6.5	17.9	8.5	9.8	7.7	6.6	5.3	5.3	6.1	7.2	8.5
Weight gain of less than 16 lbs.[2]	17.4	15.3	14.5	14.2	14.6	16.7	18.5	19.1	20.3	21.8	23.0
Smoker[3]	9.0	2.3	7.1	5.3	8.2	9.8	8.9	8.8	11.2	13.1	9.3
Anemia	3.9	3.9	4.4	4.3	4.5	4.2	3.7	3.3	3.0	3.2	4.0
Diabetes	2.8	0.5	0.8	0.6	1.0	1.7	3.2	4.8	6.5	8.3	10.5
Eclampsia	0.5	1.0	0.6	0.7	0.5	0.4	0.4	0.4	0.4	0.6	*
Hypertension, chronic	1.5	0.3	0.4	0.3	0.4	0.7	1.4	2.5	4.0	6.2	9.3
Hypertension, pregnancy associated	4.0	6.2	4.4	4.8	4.2	3.6	3.8	4.2	4.8	5.6	6.1
Hydramnios/oligohydramnios	1.6	1.7	1.6	1.7	1.6	1.5	1.5	1.7	1.8	2.2	3.2
Hispanic[4]											
Prenatal care beginning in the first trimester	75.6	50.9	66.1	62.9	68.0	72.8	78.5	81.5	81.5	78.9	72.9
Late or no prenatal care	5.9	14.8	8.6	9.5	8.0	6.6	5.0	4.3	4.4	4.9	7.2
Weight gain of less than 16 lbs.[2]	14.7	12.8	12.5	11.9	12.8	14.5	15.2	15.2	16.5	18.5	22.5
Smoker[3]	3.2	2.1	4.0	3.5	4.3	3.8	2.6	2.5	3.1	3.5	3.8
Anemia	2.6	4.0	3.4	3.6	3.3	2.9	2.3	2.0	1.8	1.8	1.7
Diabetes	3.0	0.5	0.8	0.6	0.9	1.6	3.0	4.9	7.2	9.8	12.2
Eclampsia	0.2	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	*
Hypertension, chronic	0.4	*	0.2	0.1	0.2	0.2	0.3	0.5	0.9	1.7	2.6
Hypertension, pregnancy associated	2.6	4.1	3.1	3.5	2.9	2.5	2.3	2.5	3.0	4.0	5.5
Hydramnios/oligohydramnios	1.3	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.4	1.6	2.5

[1]Includes origin not stated.

[2]Excludes data for California, which did not report weight gain on the birth certificate.

[3]Excludes data for California, which did not report tobacco use on the birth certificate.

[4]Includes all persons of Hispanic origin of any race.

Table 4. Percent of singleton live births with selected birth outcomes, and percent multiple births, by age, race and Hispanic origin of mother: United States, 2000–2002

Risk factor, outcome, and race and Hispanic origin of mother	Age of mother										
	All ages	10–14 years	15–19 years			20–24 years	25–29 years	30–34 years	35–39 years	40–44 years	45–54 years
			Total	15–17 years	18–19 years						
All origins[1]											
Preterm[2]	10.3	21.3	13.1	14.7	12.3	10.7	9.4	9.2	10.5	12.8	16.0
Very preterm[3]	1.6	5.3	2.4	2.9	2.1	1.7	1.3	1.3	1.6	2.0	2.6
Low birthweight[4]	6.1	12.6	8.5	9.4	8.1	6.5	5.2	5.0	6.1	7.8	9.9
Very low birthweight[5]	1.1	2.8	1.5	1.8	1.4	1.1	1.0	0.9	1.2	1.5	1.8
Multiple births	3.2	1.2	1.6	1.4	1.7	2.3	3.0	4.1	4.9	5.3	20.2
Non-Hispanic white											
Preterm[2]	8.9	18.3	11.3	12.7	10.7	9.4	8.3	8.1	9.0	10.8	13.9
Very preterm[3]	1.1	4.2	1.9	2.4	1.7	1.3	1.0	0.9	1.1	1.4	1.9
Low birthweight[4]	5.0	11.3	7.4	8.3	7.1	5.6	4.4	4.1	4.9	6.2	8.4
Very low birthweight[5]	0.8	2.6	1.3	1.6	1.2	0.9	0.7	0.7	0.8	1.1	1.5
Multiple births	3.6	1.2	1.5	1.3	1.5	2.2	3.2	4.5	5.5	6.2	24.5
Non-Hispanic black											
Preterm[2]	16.0	24.3	17.2	18.8	16.2	15.1	14.7	16.0	18.4	21.0	22.7
Very preterm[3]	3.5	6.6	3.8	4.4	3.5	3.1	3.2	3.8	4.3	4.9	5.5
Low birthweight[4]	11.3	15.1	12.5	13.1	12.1	10.8	10.1	11.2	13.2	15.8	17.3
Very low birthweight[5]	2.6	3.4	2.5	2.7	2.4	2.3	2.5	3.0	3.4	3.8	3.5
Multiple births	3.5	1.2	2.2	1.8	2.4	3.3	3.9	4.3	4.7	3.6	8.6
Hispanic[6]											
Preterm[2]	10.5	19.0	12.2	13.5	11.5	10.1	9.3	10.1	12.0	14.8	19.3
Very preterm[3]	1.5	4.1	1.9	2.3	1.7	1.3	1.2	1.4	1.8	2.2	3.6
Low birthweight[4]	5.4	10.3	6.9	7.6	6.5	5.2	4.6	5.0	6.2	7.9	10.1
Very low birthweight[5]	0.9	2.1	1.1	1.3	1.0	0.8	0.8	1.0	1.3	1.6	2.4
Multiple births	2.1	1.3	1.3	1.2	1.4	1.8	2.2	2.8	3.3	2.9	9.2

[1]Includes origin not stated.
[2]Born prior to 37 completed weeks of gestation.
[3]Born prior to 32 completed weeks of gestation.
[4]Birthweight of less than 2,500 grams (5 lb. 8 oz.).
[5]Birthweight of less than 1,500 grams (3 lb. 4 oz.).
[6]Includes all persons of Hispanic origin of any race.

Table 5. Number of singleton live births, late fetal deaths and infant deaths, and late fetal, perinatal, and infant mortality rates, by age, race and Hispanic origin of mother: United States, 1999–2001

Characteristic and race of mother	Total Number	Age of mother: All ages	10–14 years	15–19 years: Total	15–17 years	18–19 years	20–24 years	25–29 years	30–34 years	35–39 years	40–44 years	45–54 years
All races[2]						Rate[1]						
Live births	11,667,718											
Late fetal deaths[3]	37,425	3.2	4.1	3.3	3.5	3.3	3.1	2.7	2.8	3.7	6.2	10.1
Infant deaths	71,258	6.1	15.4	9.2	10.0	8.8	6.9	5.2	4.7	5.6	7.4	10.9
Early neonatal (< 7 days)	35,891	3.1	8.9	4.1	4.6	3.9	3.1	2.8	2.6	3.2	4.2	6.2
Late neonatal (7–27 days)	9,811	0.8	1.5	1.2	1.4	1.1	0.9	0.7	0.7	0.8	1.1	*
Postneonatal (28 days to under 1 year)	25,556	2.2	5.0	3.8	4.0	3.7	2.9	1.8	1.4	1.6	2.1	3.2
Perinatal deaths[4]	73,316	6.3	13.0	7.5	8.1	7.2	6.2	5.5	5.4	6.9	10.4	16.2
Non-Hispanic white												
Live births	6,790,508											
Late fetal deaths[3]	17,948	2.6	*	3.1	3.3	0.3	2.7	2.3	2.2	2.9	5.1	6.9
Infant deaths	33,740	5.0	15.9	8.7	10.0	8.2	6.0	4.2	3.7	4.5	5.9	8.9
Early neonatal (< 7 days)	16,385	2.4	9.1	3.7	4.5	3.4	2.5	2.1	2.0	2.5	3.5	5.4
Late neonatal (7–27 days)	4,812	0.7	*	1.1	1.4	1.0	0.8	0.6	0.6	0.6	0.9	*
Postneonatal (28 days to under 1 year)	12,543	1.8	5.5	3.9	4.2	3.8	2.7	1.5	1.1	1.3	1.6	2.9
Perinatal deaths[4]	34,333	5.0	12.3	6.8	7.8	0.6	5.2	4.4	4.2	5.4	8.6	12.3
Non-Hispanic black												
Live births	1,722,579											
Late fetal deaths[3]	8,697	5.0	5.0	4.6	4.5	4.6	4.4	4.7	5.1	6.9	9.7	18.9
Infant deaths	21,083	12.2	16.6	13.0	13.2	12.9	11.8	11.8	12.2	12.7	14.1	23.3
Early neonatal (< 7 days)	11,074	6.4	9.4	6.2	6.2	6.2	5.7	6.6	7.2	7.7	7.1	*
Late neonatal (7–27 days)	2,722	1.6	1.8	1.6	1.7	1.5	1.5	1.5	1.7	1.8	2.6	*
Postneonatal (28 days to under 1 year)	7,287	4.2	5.4	5.2	5.2	5.2	4.6	3.7	3.4	3.3	4.5	*
Perinatal deaths[4]	19,771	11.4	14.3	10.7	10.7	10.8	10.1	11.3	12.3	14.5	16.7	29.2
Hispanic[5]												
Live births	2,380,991											
Late fetal deaths[3]	7,110	3.0	2.8	2.5	2.5	2.5	2.6	2.5	3.1	4.4	7.2	15.1
Infant deaths	12,027	5.1	13.5	6.5	7.1	6.1	4.8	4.4	4.4	5.6	8.6	12.9
Early neonatal (< 7 days)	6,112	2.6	7.8	2.9	3.3	2.7	2.3	2.3	2.5	3.1	4.9	*
Late neonatal (7–27 days)	1,774	0.7	*	1.0	1.0	1.0	0.6	0.6	0.7	0.8	1.2	*
Postneonatal (28 days to under 1 year)	4,140	1.7	4.2	2.5	2.8	2.4	1.9	1.4	1.2	1.6	2.5	*
Perinatal deaths[4]	13,222	5.5	10.6	5.4	5.8	5.2	4.9	4.7	5.6	7.5	12.0	24.2

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

[1]Per 1,000 live births.

[2]Includes races other than white or black.

[3]Number of fetal deaths of 28 weeks or more gestation per 1,000 live births plus late fetal deaths.

[4]Late fetal deaths plus early neonatal deaths per 1,000 live births plus fetal deaths.

[5]Includes all persons of Hispanic origin of any race.

Table 6. Singleton infant deaths and mortality rates for the five leading causes of infant death by maternal age: United States, 1999–2001 linked files

[Rates per 100,000 live births in specified group]

Live births, infant deaths, and cause of death[1]	Maternal Age										
	Total	10–14 years	15–19 years	15–17 years	18–19 years	20–24 years	25–29 years	30–34 years	35–39 years	40–44 years	45–54 years
	Number										
Live births	11,667,718	25,071	1,369,165	459,741	909,424	2,953,175	3,127,584	2,654,257	1,274,467	252,631	11,368
Infant deaths											
Total	71,258	387	12,575	4,599	7,975	20,368	16,342	12,494	7,093	1,877	124
Congenital malformations, deformations and chromosomal abnormalities. (Q00–Q99)	15,606	51	2,088	703	1,386	3,952	3,726	3,162	1,868	695	63
Disorders related to short gestation and low birthweight, not elsewhere classified (P07)	10,261	85	1,851	734	1,118	2,799	2,375	1,829	1,084	230	7
Sudden infant death syndrome (R95)	7,005	40	1,715	581	1,134	2,721	1,344	771	349	59	6
Newborn affected by maternal complications of pregnancy (P01)	2,920	8	360	122	237	740	788	602	343	70	7
Accidents (unintentional injuries) (V01–V59, Y85–Y86)	2,595	11	644	224	420	970	483	306	153	27	1
All other causes (Residual)	32,871	191	5,916	2,235	3,680	9,186	7,625	5,822	3,296	796	39
Cause of death[1]	Infant mortality rate										
Total	610.7	1543.6	918.4	1000.3	876.9	689.7	522.5	470.7	556.5	743.0	1090.8
Congenital malformations, deformations and chromosomal abnormalities (Q00–Q99)	133.8	203.4	152.5	152.9	152.4	133.8	119.1	119.1	146.6	275.1	554.2
Disorders related to short gestation and low birthweight, not elsewhere classified (P07)	87.9	339.0	135.2	159.7	122.9	94.8	75.9	68.9	85.1	91.0	*
Sudden infant death syndrome (R95)	60.0	159.5	125.3	126.4	124.7	92.1	43.0	29.0	27.4	23.4	*
Newborn affected by maternal complications of pregnancy (P01)	25.0	*	26.3	26.5	26.1	25.1	25.2	22.7	26.9	27.7	*
Accidents (unintentional injuries) (V01–V59, Y85–Y86)	22.2	*	47.0	48.7	46.2	32.8	15.4	11.5	12.0	10.7	*
All other causes (Residual)	281.7	761.8	432.1	486.1	404.7	311.1	243.8	219.4	258.6	315.1	343.1

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

[1]Cause of death based on the *International Classification of Diseases, Tenth Revision*, 1992.

Technical Notes

This report includes data from the national natality, linked birth/infant death, and fetal death files. Information on the percentage of records with missing information for maternal and infant characteristics is available (14,21,27,34,35).

Source of data

Natality data

Data shown in this report for 1990–2002 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 (NCHS) through the Vital Statistics Cooperative Program (VSCP). Detailed information on the source and content of natality data is presented in previous reports (14,36).

Linked birth/infant death file

In the linked file, information from the death certificate is linked to information from the birth certificate for each infant under 1 year of age who died in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, or Guam during a given year.

The 1999, 2000, and 2001 period linked files contain a numerator file that consists of all infant deaths occurring in the given year that have been linked to their corresponding birth certificates, whether the birth occurred in the year of death or in the previous year. For example, the 2001 period linked file contains a numerator file that consists of all deaths occurring in 2001 that have been linked to their corresponding birth certificates, whether the birth occurred in 2001 or 2000. Additional details, as well as information on differences between period and cohort data are presented elsewhere (21).

Fetal death file

The perinatal loss measures in this report include fetal death data. Fetal death statistical files for every year are based on records of fetal death received by NCHS. National data from these files are available for fetal deaths of presumed or stated gestation of 20 weeks or more. The content of the U.S. Standard Report of Fetal Death closely resembles the U.S. Certificate of Live Birth.

The late fetal mortality rate is defined as: fetal deaths with stated or presumed gestational ages of 28 weeks or more per 1, 000 live births plus late fetal deaths. The perinatal mortality rate is defined as late fetal deaths plus infant deaths at less than 7 days per 1,000 live births plus late fetal deaths. See "*Technical Appendix, Fetal Deaths 2001*" (35).

Age of mother

Age of mother is computed in most cases from the mother's and infant's dates of birth as reported on the birth certificate. The mother's age is directly reported by five States (Kentucky, Nevada, North Dakota, Virginia, and Wyoming) and American Samoa. For 1990–1996 mother's age was edited for ages 10–49 years. Births reported to occur to mothers younger than age 10 or older than age 49 years had age imputed according to the age of mother from the previous record with the same race and total birth order (total of live births and fetal deaths). Beginning in 1997, age of mother is edited for ages 9 years or under and 55 years and over. The numbers of births to women aged 50–54 years are too small for computing age-specific birth rates. These births have been included with births to women aged 45–49 years for computing birth rates.

Missing data are not shown for the variable age of mother. Missing data are imputed in these cases. Age of mother was imputed for just 0.02 percent of the births in 1999 and 2000 and 0.01 percent of the births in 2001 and 2002.

Race and Hispanic origin

Tabulations by race and Hispanic origin of mother are based on this information as reported on the birth certificate. Race and Hispanic origin are reported as separate items on the birth certificate. In 1990 all States and the District of Columbia reported Hispanic origin except New Hampshire and Oklahoma. In 1991 and 1992, all States and the District of Columbia reported Hispanic origin except New Hampshire. All States and the District of Columbia reported Hispanic origin during the period 1993–2002. Missing data are not shown for the variable race of mother. The race of the mother was imputed for just 0.4 percent of births in 1999 and 2000 and 0.3 percent of births in 2001 and 2002.

Race categories in this report are consistent with the 1977 Office of Management and Budget (OMB) guidelines. Detailed information on the reporting of race and ethnicity information is available in earlier reports (14,16).

More information on the reporting of maternal age, race, and the reporting of other items analyzed in this report (e.g., prenatal care, tobacco use, birthweight, and gestational age) is presented in other reports (14,36).

Computation of percents, percent distributions, and rates

Births for which a particular characteristic is unknown were subtracted from the figures for total births that were used as denominators before percents, percent distributions, and rates were computed. An asterisk (*) is shown in place of any derived statistic based on fewer than 20 births in the numerator.

Population denominators

Birth rates for 1990 are based on the 1990 census. Birth rates for 1991–99 are based on intercensal populations estimated using data from the 1990 and 2000 censuses. Birth rates for 2000–2002 are based on the 2000 census. The population estimates for 1991–2002 have been provided by the U.S. Census Bureau (37–41) and are consistent with OMB race categories as of 1977 and historical categories for birth data. The modification procedures are described in detail elsewhere (42,43). Rates by State shown in this report may differ from rates computed on the basis of other population estimates.

The populations used in this report were produced under a collaborative arrangement with the U.S. Census Bureau and incorporated 2000 census counts. Reflecting the new guidelines issued in 1997 by OMB, the 2000 census included an option for individuals to report more than one race as appropriate for themselves and household members (44). In addition, the 1997 OMB guidelines called for reporting of Asian persons separately from Native Hawaiians or other Pacific Islanders. In the earlier 1977 OMB guidelines, data for Asian or Pacific Islander persons were collected as a single group (45). Birth certificates currently report only one race for each parent in the categories specified

in the 1977 OMB guidelines (see "Race and Hispanic origin"). In addition, birth certificate data do not report Asians separately from Native Hawaiians or other Pacific Islanders. Thus, birth certificate data by race (the numerators for birth rates) currently are incompatible with the population data collected in the 2000 census (the denominators for the rates starting in 2000).

In order to produce birth rates for 1991–2002, it was necessary to "bridge" the reported population data for multiple race persons back to single race categories. In addition, the 2000 census counts were modified to be consistent with the 1977 OMB race categories, that is, to report the data for Asian persons and Native Hawaiians or other Pacific Islanders as a combined category, Asian or Pacific Islanders (42,46). The procedures used to produce the "bridged" populations are described in separate publications (43,47). Beginning with births occurring in 2003, several States began reporting multiple race data. Once all States revise their birth certificates to be compliant with the 1997 OMB standard, the use of "bridged" populations can be discontinued.

Populations used to calculate the rates for 1991–99 are based on population estimates as of July 1 and were produced by the U.S. Census Bureau, with support from the National Cancer Institute (16,43). These intercensal population estimates for 1991–99 are revised based on the April 1, 2000, census. The rates for 1990 and 2000 are based on populations from the censuses in those years as of April 1.

Birth rates for 1991–2001 shown in this report have been revised from those published in the annual reports of final data for 2001 and earlier years (27,34). Previously published birth rates for 1991 to 2001 were based on postcensal population estimates derived from the 1990 census. The revised rates shown here are based on revised population estimates consistent with the 2000 census. The revised population estimates incorporate the 2000 census counts by age, race, and sex, which have been modified to be consistent with OMB race categories as of 1977 (45) and historical categories for birth data. The modification procedures are described in detail elsewhere (43,47).

Readers should keep in mind that the population data used to compile birth rates by race and ethnicity for 1991–2002 shown in this report are based on special estimation procedures and are not actual counts. This is the case even for the 2000 populations that are based on the 2000 census. As a result, the estimation procedures used to develop these populations may contain some errors. Smaller populations, for example, American Indians, are likely to be affected much more than larger populations by potential measurement error (43). Although the nature and magnitude of error is unknown, the potential for error should be kept in mind when evaluating trends and differentials. As more accurate information becomes available, further revisions of the estimates may be necessary.

Cause-of-death classification

The mortality statistics presented in this report were compiled in accordance with the World Health Organization (WHO) regulations, which specify that member nations classify and code causes of death in accordance with the current revision of the *International Statistical Classification of Diseases and Related Health Problems* (ICD). The ICD provides the basic guidance used in virtually all countries to code and classify causes of death. The ICD not only details disease classification but also provides definitions, tabulation lists, the format of the death certificate, and the rules for coding cause of death. Cause-of-death data presented in this report were coded by procedures outlined in annual issues of the *NCHS Instruction Manual* (48,49).

In this report tabulations of cause-of-death statistics are based solely on the underlying cause of death. The underlying cause is defined by WHO as "the disease or injury which initiated the train of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury" (50).

Tabulation lists and cause-of-death ranking

The cause-of-death rankings for ICD-10 are based on the List of 130 Selected Causes of Infant Death. The tabulation lists and rules for ranking leading causes of death are available (51), and are summarized elsewhere (21).

Significance testing

Although the data in this report are not subject to sampling error, they may be affected by random variation in the number of births and deaths involved. A detailed description of the method for computing relative standard errors and for conducting significance tests is provided in earlier reports (14,21). Rates are not computed if fewer than 20 events occurred in the numerator. Any differences noted in the text are statistically significant.

Contents

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