

Births: Preliminary Data for 2003

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Abstract

Objectives—This report presents preliminary data for 2003 on births in the United States. U.S. data on births are shown by age, race, and Hispanic origin of mother. Data on marital status, tobacco use, prenatal care, cesarean delivery, preterm births, and low birthweight are also presented.

Methods—Data in this report are based on nearly 99 percent of births for 2003. The records are weighted to independent control counts of all births received in State vital statistics offices in 2003. Comparisons are made with 2002 final data.

Results—The crude birth rate rose to 14.1 births per 1,000 population in 2003, an increase of 1 percent from 2002 (13.9). The fertility rate also rose in 2003 by 2 percent to 66.1 births per 1,000 women aged 15–44 years. Since 1994, the rate has ranged from 63.6 to 66.1. The birth rate for teenagers continued to decline in 2003 to 41.7 births per 1,000 women aged 15–19 years, 3 percent lower than in 2002. Rates fell for teenagers in all race and Hispanic origin groups, in many cases marking new record lows for the Nation. Birth rates for teenagers 15–17 and 18–19 years continued to steadily decline. The rate for ages 15–17 was 22.4 per 1,000 in 2003, down 3 percent from 2002 and 42 percent from 1991, the recent peak. The rate for older teenagers 18–19 years in 2003 was 70.8 per 1,000, also 3 percent lower than in 2002 and 25 percent lower than in 1991. The birth rates for women in their twenties were 102.6 per 1,000 for women aged 20–24 years and 115.7 for women aged 25–29 years, a decrease of 1 percent and an increase of 2 percent, respectively, compared with 2002. The birth rate for women aged 30–34 years increased 4 percent to 95.2 births per 1,000 women compared with 2002. The rate rose 6 percent for women aged 35–39 years, between 2002 and 2003, and 5 percent for women aged 40–44 years. The rate for women aged 45–49 years remained unchanged. The birth rate for unmarried women increased by 3 percent in 2003, from 43.7 to 44.9 per 1,000 unmarried women aged 15–44 years. The proportion of births to unmarried women also increased in 2003 to 34.6 percent, compared with 34.0 percent in 2002. The proportion of mothers smoking during pregnancy continued to steadily decline in 2003, from 11.4 percent in 2002 to 11.0 percent. The percent of women who received prenatal care within the first 3 months of pregnancy edged upward for 2003, to 84.1 percent, compared with 83.7 percent in 2002.

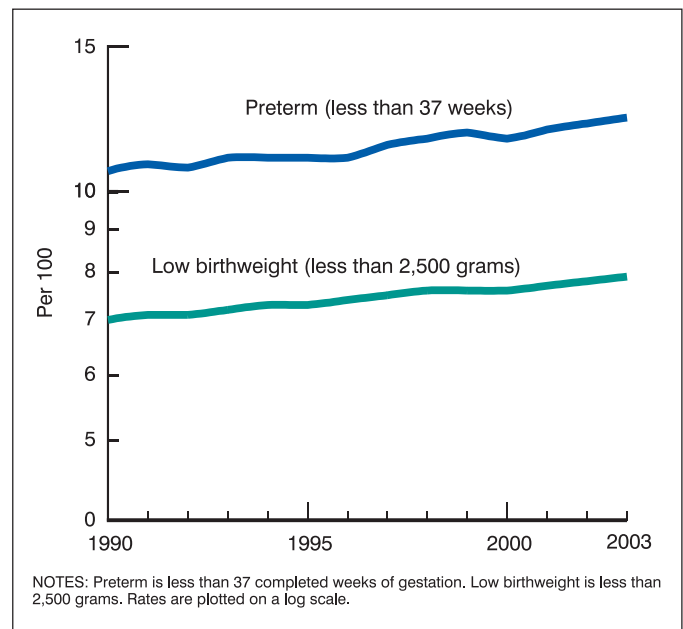


Figure 1. Preterm and low birthweight rates: United States, 1990–2003

In 2003, 27.6 percent of all births were delivered by cesarean delivery, a marked rise of 6 percent over the 2002 level, and one-third higher than that for 1996. The primary cesarean rate also rose 6 percent between 2002 and 2003 while the rate of vaginal birth after previous cesarean (VBAC) dropped by 16 percent. Preterm and low birthweight rates both rose between 2002 and 2003. The preterm rate increased from 12.1 to 12.3 and low birthweight rate rose from 7.8 to 7.9 percent.

Keywords: births • birth rates • maternal and infant health • vital statistics

Introduction

This report presents preliminary data on births based on a substantial proportion of vital records occurring in 2003. For data

years 1995–98, reports in the preliminary series included data for both births and deaths. Beginning with data year 1999, birth and death data are published separately. The preliminary report series includes detailed tabulations from the preliminary natality file. For most measures, trends shown in the preliminary reports for 1995–2001 births were confirmed by the final statistics for each year (1–5).

Sources and Methods

The preliminary data in this series are based on records of births that occurred during 2003 and were received and had undergone quality control by the Centers for Disease Control and Prevention's National Center for Health Statistics as of April 15, 2004. This represents nearly 99 percent of the births that occurred in the United States during this 12-month period.

To produce the preliminary estimates shown in this report, records in the file were weighted using independent control counts of all 2003 births by State of occurrence. Preliminary estimates are subject to sampling variation as well as random variation.

In addition to national and State estimates of total births and birth and fertility rates, this report includes preliminary statistics on births by maternal age, marital status, race, Hispanic origin, live-birth order, and selected maternal and infant health characteristics, including receipt of prenatal care, cesarean delivery, preterm birth, low birthweight, and tobacco use (tables A–C, 1–4; figures 1–3).

This report includes data for two States, Pennsylvania and Washington, which implemented the 2003 revision of the U.S. Standard Certificate of Live Birth in 2003, and also the remaining 48 States and the District of Columbia, which collected and reported birth data in 2003 based on the 1989 revision of the U.S. Standard Certificate of Live Birth. The 2003 revision is described in detail elsewhere (6,7). Because of the small number of States with data based on the revised certificate, in this report, revised data are combined with unrevised data where comparable. For the items presented in this report, data appear largely comparable despite changes to item wording format and sources. For all items except prenatal care, data from the revised and unrevised States are included in the totals for the United States. The question on prenatal care on the 2003 revision asks for the date of the first prenatal care visit based on the mother's prenatal care record whereas, prenatal

Table A. Total births and percent of births with selected demographic and health characteristics, by race and Hispanic origin of mother: United States, final 2002 and preliminary 2003

[Figures for 2003 are based on weighted data rounded to the nearest individual]

Characteristic	All races and origins		Non-Hispanic white ¹		Non-Hispanic black ¹		Hispanic ²		American Indian total ¹		Asian or Pacific Islander total ¹	
	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002
	Number											
Births	4,091,063	4,021,726	2,320,778	2,298,156	576,347	578,335	912,256	876,642	42,647	42,368	221,247	210,907
	Rate											
Birth rate	14.1	13.9	11.8	11.7	15.9	16.1	22.9	22.6	13.7	13.8	16.8	16.5
Fertility rate	66.1	64.8	58.5	57.4	67.1	67.4	96.9	94.4	57.9	58.0	66.3	64.1
Total fertility rate	2,044.0	2,013.0	1,858.0	1,828.5	2,030.0	2,047.0	2,785.0	2,718.0	1,716.5	1,735.0	1,873.5	1,819.5
	Percent											
Maternal												
Births to unmarried mothers	34.6	34.0	23.5	23.0	68.5	68.4	45.0	43.5	61.2	59.7	15.1	14.9
Prenatal care beginning in first trimester ³	84.1	83.7	89.0	88.7	76.0	75.3	77.4	76.8	70.9	69.6	85.4	84.9
Prenatal care beginning in third trimester or no care ³	3.5	3.6	2.1	2.2	6.0	6.2	5.3	5.5	7.6	8.1	3.1	3.1
Smoker ⁴	11.0	11.4	14.5	15.0	8.5	8.8	2.8	3.0	18.3	19.7	2.3	2.5
Total cesarean delivery rate ⁵	27.6	26.1	27.7	26.2	29.3	27.7	26.6	25.2	24.2	23.1	26.7	25.0
Primary cesarean rate ⁵	19.1	18.0	19.6	18.3	20.7	19.4	16.9	16.1	15.8	15.1	19.9	18.5
VBAC rate ⁵	10.6	12.6	10.7	12.8	11.3	13.2	9.4	11.5	14.1	17.0	12.2	14.1
Infant												
Preterm ⁶	12.3	12.1	11.3	11.0	17.8	17.7	11.9	11.6	13.5	13.1	10.6	10.4
Low birthweight ⁷	7.9	7.8	7.0	6.9	13.5	13.4	6.7	6.5	7.4	7.2	7.8	7.8
Very low birthweight ⁷	1.4	1.5	1.2	1.2	3.1	3.1	1.2	1.2	1.3	1.3	1.1	1.1

¹Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1977 Office of Management and Budget standards. California, Hawaii, Ohio (for December), Pennsylvania, Utah, and Washington reported multiple-race data in 2003. The multiple-race data for these States were bridged to the single race categories of the 1977 Office of Management and Budget standards for comparability with other States; see "Technical Notes." Data for persons of Hispanic origin are included in the data for each race group according to the mother's reported race; see "Technical Notes."

²Includes all persons of Hispanic origin of any race; see "Technical Notes."

³Excludes data for Pennsylvania and Washington, which implemented the 2003 Revision to the U.S. Standard Certificate of Live Birth for data year 2003. This change has resulted in a lack of comparability between prenatal care data based on the 2003 Revision and data based on the 1989 Revision to the U.S. Certificate of Live Birth; see "Technical Notes." Prenatal care levels shown for 2002 by race or Hispanic origin may differ from those published previously in "Births: Final Data for 2002."

⁴Excludes data for California, which did not report tobacco use on the birth certificate.

⁵Total cesarean delivery rate is the total number of births by cesarean as percent of all births. Primary cesarean rate is the number of primary cesareans per 100 live births to women who have not had a previous cesarean. Vaginal births after previous cesarean (VBAC) rate is the number of VBAC delivery per 100 live births to women with a previous cesarean delivery.

⁶Percent of births less than 37 completed weeks of gestation.

⁷Low birthweight is birthweight of less than 2,500 grams (5 lb 8 oz). Very low birthweight is birthweight of less than 1,500 grams (3 lb 4 oz).

Table B. Birth rates for women under 20 years of age, by age, race, and Hispanic origin: United States, final 1991, 2001 and 2002, and preliminary 2003, and percent change in rates, 1991–2003

[Rates per 1,000 women in specified group]

Age and race and Hispanic origin of mother	2003	2002	2001	1991	Percent change, 1991–2003
10–14 years					
All races ¹	0.6	0.7	0.8	1.4	–57
Non-Hispanic white ²	0.2	0.2	0.3	0.5	–60
Non-Hispanic black ²	1.6	1.9	2.1	4.9	–67
American Indian total ²	1.0	0.9	1.0	1.6	–38
Asian or Pacific Islander total ²	0.2	0.3	0.2	0.8	–75
Hispanic ³	1.3	1.4	1.6	2.4	–46
15–19 years					
All races ¹	41.7	43.0	45.3	61.8	–33
Non-Hispanic white ²	27.5	28.5	30.3	43.4	–37
Non-Hispanic black ²	64.8	68.3	73.5	118.2	–45
American Indian total ²	52.6	53.8	56.3	84.1	–37
Asian or Pacific Islander total ²	17.6	18.3	19.8	27.3	–36
Hispanic ³	82.2	83.4	86.4	104.6	–21
15–17 years					
All races ¹	22.4	23.2	24.7	38.6	–42
Non-Hispanic white ²	12.4	13.1	14.0	23.6	–47
Non-Hispanic black ²	38.8	41.0	44.9	86.1	–55
American Indian total ²	30.3	30.7	31.4	51.9	–42
Asian or Pacific Islander total ²	8.9	9.0	10.3	16.3	–45
Hispanic ³	49.7	50.7	52.8	69.2	–28
18–19 years					
All races ¹	70.8	72.8	76.1	94.0	–25
Non-Hispanic white ²	50.1	51.9	54.8	70.6	–29
Non-Hispanic black ²	105.3	110.3	116.7	162.2	–35
American Indian total ²	86.5	89.2	94.8	134.2	–36
Asian or Pacific Islander total ²	30.1	31.5	32.8	42.2	–29
Hispanic ³	131.9	133.0	135.5	155.5	–15

¹Includes data for white and black Hispanic women, not shown separately.²Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1977 Office of Management and Budget standards. California, Hawaii, Ohio (for December), Pennsylvania, Utah, and Washington reported multiple-race data in 2003. The multiple-race data for these States were bridged to the single race categories of the 1977 Office of Management and Budget standards for comparability with other States; see “Technical Notes.” Data for persons of Hispanic origin are included in the data for each race group according to the mother’s reported race; see “Technical Notes.”³Includes all persons of Hispanic origin of any race; see “Technical Notes.”**Table C. Number and percent of births to unmarried women, all ages and women under 20 years: United States, final 2002 and preliminary 2003**

[Figures for 2003 are based on weighted data rounded to the nearest individual]

Age of mother	Number		Percent	
	2003	2002	2003	2002
All ages	1,415,804	1,365,966	34.6	34.0
Under 20 years	343,908	347,279	81.6	80.2
Under 15 years	6,471	7,093	97.1	97.0
15–19 years	337,437	340,186	81.3	80.0
15–17 years	120,766	122,791	89.7	88.5
18–19 years	216,670	217,395	77.3	75.8

care information from the 1989 revision is based on the month of pregnancy (that is, first, second, third, and so on) care began. As a result, preliminary prenatal care data for the revised States are not comparable with data for the unrevised States. For the prenatal care item, data from the revised States, Pennsylvania and Washington, are excluded from the total for the United States (see “Technical Notes”).

State-specific detailed tables for 2003 births based on preliminary data by maternal age under 20 years of age, marital status, and selected maternal and infant health characteristics are available on the NCHS Web page (see “State-specific detailed tables” at <http://www.cdc.gov/nchs>).

Race and Hispanic origin are reported as separate items on the birth certificate. Therefore, births shown by race may be of Hispanic or non-Hispanic origin, and births of Hispanic origin may be of any race. All tabulations in this report show data separately for the non-Hispanic white population as well as for the white population as a whole. Although the overwhelming majority of Hispanic-origin births (approximately 97 percent in 2003) are to white women, there are notable differences in child bearing patterns between Hispanic and non-Hispanic white women. About one-quarter of white births are to Hispanic women. For this preliminary report, data are also shown separately for non-Hispanic black persons even though the great majority (more than 96 percent in 2003) of black births is to non-Hispanic persons and, thus, the difference in the statistics for the two groups is minimal. Data are not shown separately for non-Hispanic American Indian and Alaskan Native (AIAN) and Asian or Pacific Islander (API).

State-specific preliminary data are shown only for those States and areas for which at least 75 percent of the records for 2003 (with the exception of Pennsylvania) were received and had undergone quality control by April 15, 2004 (that is, were processed) (see “Technical Notes”). The proportion of records processed is shown by State in table I in the “Technical Notes.” Data for territories are shown separately but are not included in the data for the United States, which includes information for the 50 States and the District of Columbia. Detailed information on the nature, sources, and qualifications of the preliminary data is given in the “Technical Notes.”

The population estimates that were produced under a collaborative arrangement with the U.S. Census Bureau and based on the 2000 census counts by age, race, and sex have been modified to be consistent with the Office of Management and Budget (OMB) racial categories as of 1977 (see “Technical Notes”). This was necessary because birth certificates for most States currently collect only one race for each parent in the same categories as specified in the 1977 OMB guidelines (see “Technical Notes”). The population data collected in the 2000 census, according to the revised guidelines issued in 1997 by OMB, included an option for individuals to report more than one race as appropriate for themselves and household members (as well as reporting Asian persons separately from Native Hawaiians or other Pacific Islanders) and, thus, were incompatible with the birth certificate data for most States.

Population denominators used for calculating the rates in this report for 2002 and 2003 are estimates based on the 2000 census.

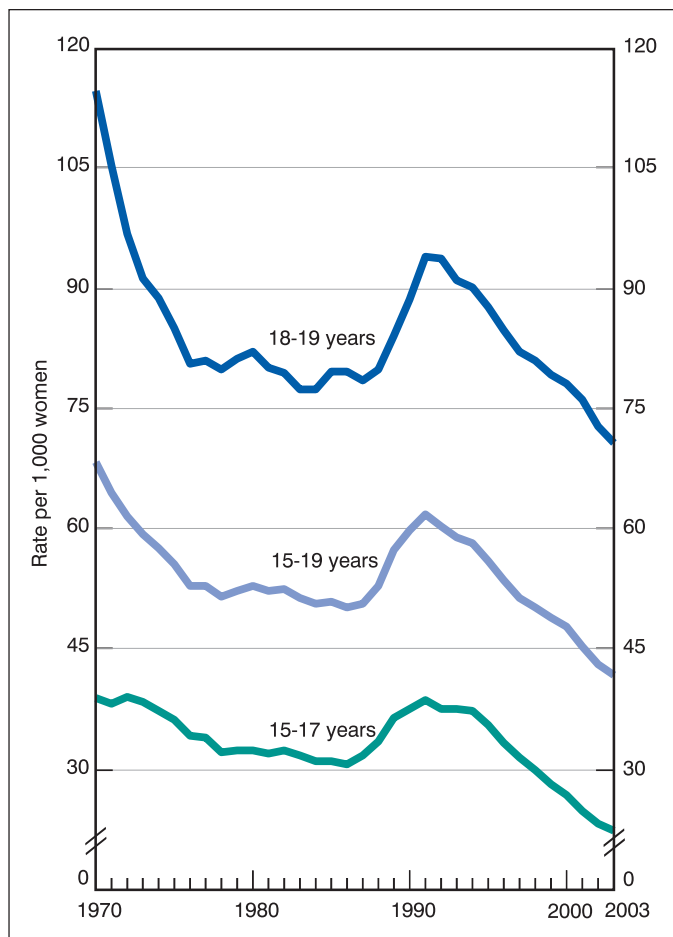


Figure 2. Birth rates for teenagers by age: United States, 1970–2003

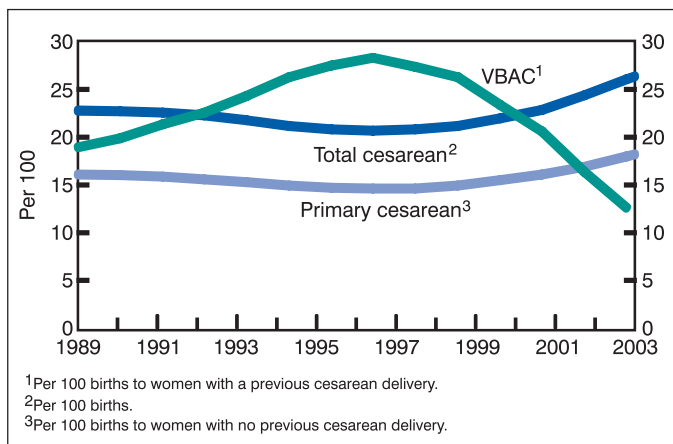


Figure 3. Total and primary cesarean rate and vaginal birth after previous cesarean (VBAC) rate: United States, 1989–2003

Results

Births and birth rates

Based on the preliminary data, the number of **births** in the United States was 4,091,063 in 2003, a rise of 2 percent from the final number of 4,021,726 in 2002 (tables A, 1, 2, and 4). The number of births by race and Hispanic origin increased for most groups in 2003. Births to non-Hispanic white mothers and American Indian mothers rose 1 percent from 2002 to 2003; births to Hispanic and Asian or Pacific Islander (API) women rose 4 and 5 percent, respectively. In contrast, the number of births to non-Hispanic black mothers, the only group that did not experience an increase, fell in 2003 by less than 1 percent.

The **crude birth rate** rose to 14.1 births per 1,000 people in 2003, an increase of 1 percent from 13.9 in 2002 (table A). This is the first increase in the rate since 2000 (1). The crude rate has generally trended downward; the rate for 2003 was 16 percent lower than the recent high point for the rate, 16.7, in 1990.

The **general fertility rate** compares births to the number of women in their childbearing ages, 15–44 years, and is thus more indicative of changes in fertility behavior than is the crude birth rate. The fertility rate rose to 66.1 in 2003, a 2-percent increase from the rate for 2002 (64.8) (1). Like the crude birth rate, the fertility rate has also generally trended downward over the past decade; the rate for 2003 was 7 percent lower than the recent high point for the rate, 70.9, in 1990.

The general fertility rate rose for most race and Hispanic origin groups between 2002 and 2003 (tables A, 1, and 3). The rates increased 2 percent for non-Hispanic white women and 3 percent for Hispanic and API women. The general fertility rate for non-Hispanic black women decreased less than 1 percent between 2002 and 2003; the rate for American Indian women was essentially unchanged.

Crude birth rates were higher in 2003 than in 2002 for most States with significant increases noted in California, Florida, Indiana, Maryland, Minnesota, Missouri, Ohio, and Wisconsin. Fertility rates vary considerably from State to State. In 2003 fertility rates ranged from a high of 92.2 births per 1,000 women aged 15–44 years in Utah to a low of 51.1 in Vermont. Fertility rates increased significantly in 30 States and were essentially unchanged for the District of Columbia and 20 States (Alaska, Colorado, Connecticut, Delaware, Kansas, Louisiana, Massachusetts, Nevada, New Hampshire, New Mexico, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, West Virginia, and Wyoming).

The **birth rate for teenagers** continued to drop in 2003, to 41.7 births per 1,000 women aged 15–19 years, 3 percent lower than in 2002 (43.0) and 33 percent below the most recent peak in 1991 (61.8) (tables B and 1; figure 2). Rates fell for teenagers in all age and race/ethnicity subgroups, in many cases marking new record lows for the Nation, according to preliminary data for 2003. The birth rate for the youngest teenage group, **10–14 years**, declined in 2003, to 0.6 births per 1,000 females, compared with 0.7 in 2002 and 0.8 in 2001. The number of births to females aged 10–14 years fell 9 percent from 2002 to 2003, to 6,665, the fewest reported in 45 years (6,648 in 1958), and about one-half of the total reported less than a decade ago (12,901 births in 1994). **Birth rates for teenagers 15–17 and 18–19 years** continued their steady decline. The rate for ages 15–17 years was 22.4 per 1,000 in 2003, down 3 percent from 2002 (23.2) and 42 percent

from the 1991 peak (38.6). The rate for older teenagers 18–19 years in 2003 was 70.8 per 1,000, also 3 percent lower than in 2002 (72.8) and 25 percent lower than in 1991 (94.0).

Teenage birth rates historically differ considerably by race and Hispanic origin (table B). Rates in 2003 were highest for Hispanic teenagers and lowest for API teenagers. Birth rates for 2003 were down considerably from 2002 for non-Hispanic black teenagers, by 5 percent overall and for teenage subgroups 15–17 years and 18–19 years. Since 1991, the rate for non-Hispanic black teenagers 15–17 years plunged 55 percent, from 86.1 to 38.8 per 1,000. Birth rates for ages 15–19 years fell considerably for non-Hispanic white teenagers (27.5 in 2003) American Indian (52.6), API (17.6), and Hispanic (82.2) teenagers. Declines from 1991 to 2003 range from 21 percent for Hispanics to 45 percent for non-Hispanic black teenagers.

In 2003, **birth rates for women in their twenties**, the age at which rates are historically the highest, were 102.6 per 1,000 for women aged 20–24 years and 115.7 for women aged 25–29 years (tables 1 and 3). The rate for women aged 20–24 years decreased by 1 percent from 103.6 in 2002, whereas the rate for women aged 25–29 years increased by 2 percent from 113.6 in 2002.

Rates for women aged 20–24 years fell from 1 to 3 percent between 2002 and 2003 for nearly all race and Hispanic origin groups, with the rate for API women essentially unchanged. Rates for women aged 25–29 years rose for non-Hispanic white, API, and Hispanic women (by 1, 3, and 4 percent, respectively). The rate for American Indian women was 92.6 in 2003 compared with 91.8 in 2002. The rate for non-Hispanic black women was essentially unchanged in 2003.

The **birth rates for women aged 30–34 years, 35–39 years, and 40–44 years** also increased in 2003. The birth rate for women aged 30–34 years increased 4 percent to 95.2 births per 1,000 women from 91.5 in 2002. The rate rose 6 percent for women aged 35–39 years, from 41.4 to 43.8 per 1,000. The birth rate for women aged 40–44 years increased 5 percent from 8.3 in 2002 to 8.7 in 2003. The **rate for women aged 45–49 years** remained unchanged at 0.5. The rates for women aged 35–39 years and 40–44 years have been increasing continuously since 1978 and 1985, respectively (1).

The first birth rate increased 3 percent between 2002 and 2003, from 25.8 to 26.7 first births per 1,000 women aged 15–44 years (see table 3 for 2003 data). The first birth rate increased for nearly all race and Hispanic origin groups, with increases ranging from 2 percent for Hispanic and non-Hispanic black women to 4 percent for non-Hispanic white and API women. The rate for American Indian women was essentially unchanged.

Whereas the first birth rate increased overall and for most race and Hispanic origin groups, there were considerable differences in the trends by age of mother. The first birth rates for women under 20 years of age continued to decline between 2002 and 2003, falling from 0.7 to 0.6 for mothers aged 10–14 years and from 34.0 to 33.4 for those aged 15–19 years. The rates for women aged 20–24 years and 25–29 years both increased in 2003, by less than 1 percent and 4 percent, respectively. First birth rates for women aged 30–34 years, 35–39 years, and 40–44 years increased substantially in 2003, by 7, 12, and 11 percent, respectively. The rate for women aged 45–49 years remained unchanged.

The **total fertility rate** (TFR) rose to 2,044.0 in 2003, an increase of 2 percent from 2,013.0 in 2002 (tabular data not shown). The TFR summarizes the potential impact of current fertility patterns on

completed family size. The TFR estimates the average number of births that a hypothetical group of 1,000 women would have if they experienced throughout their childbearing years the age-specific birth rates observed in a given year. The change in 2003 marks the first increase in the rate since 2000. Overall the rate in 2003 is down 2 percent from the recent high point for the rate, 2,081.0 in 1990.

The total fertility rate rose for many race and Hispanic origin groups between 2002 and 2003 (table A). The rates increased 1 percent for non-Hispanic white women, 2 percent for Hispanic women, and 3 percent for API women. The total fertility rate for non-Hispanic black women decreased 1 percent between 2002 and 2003; the rate for American Indian women was essentially unchanged.

In 2003 only the total fertility rate for Hispanic woman exceeded the level of “replacement” (2,100 births per 1,000 women), the rate at which a given generation can exactly replace itself. The TFRs for the remaining groups (non-Hispanic white, non-Hispanic black, AIAN, and API women) were below replacement.

Births to unmarried women

The **number of births to unmarried women** increased 4 percent in 2003, to a preliminary total of 1,415,804, compared with 1,365,966 in 2002. The steep rise from 2002 to 2003 is due mainly to an increase in the **birth rate for unmarried women**, and to a lesser extent, an increase in the unmarried population of reproductive age. The **birth rate** increased 3 percent, from 43.7 to 44.9 per 1,000 unmarried women aged 15–44 years, while the population grew about 1 percent (8).

The **proportion of births to unmarried women** increased in 2003 to 34.6 percent, compared with 34.0 percent in 2002. The proportion had changed relatively little during the mid- to late 1990s, but it has inched up steadily since 1998, when it was 32.8 percent. Between 2002 and 2003 the proportions increased for non-Hispanic white births, from 23.0 to 23.5 percent, and for Hispanic births, from 43.5 to 45.0 percent. The proportion was essentially unchanged for non-Hispanic black births, at 68.5 percent, compared with 68.4 percent in 2002 (table A).

Births to unmarried teenagers declined in 2003 for the fifth consecutive year, although the reduction was modest, about 1 percent. Births to teenagers under 15 years however dropped steeply, by 9 percent (table C). In spite of these continued reductions in the *number* of births to unmarried teenagers, the *proportions* of nonmarital births among teenagers increased in 2003. The proportions continued to increase because total births to teenagers declined even more than births to unmarried teenagers (see table 1). Birth rates for unmarried teenagers are not yet available; see “[Technical Notes](#).”

Tobacco use during pregnancy

The **proportion of mothers smoking during pregnancy** decreased in 2003 to 11.0 percent, compared with 11.4 percent in 2002. This continues a steady decline from 19.5 percent in 1989. Information on tobacco use was reported on the birth certificates of all States except California in 2003. The reporting area of 49 States and the District of Columbia accounted for 87 percent of U.S. births in 2003. The smoking question on the revised certificate, used by Pennsylvania, Washington, and Vermont (which adopted the new tobacco use item beginning in 2000), has a different format than the previous certificate revision, but summary data on smoking status

are believed to be generally comparable with data collected using the older question format; see “[Technical Notes](#).”

Prenatal care

The question on prenatal care on the 2003 revision of the U.S. Standard Certificate of Live Birth asks for the date of the first prenatal care visit based on the mother’s prenatal care record. In contrast, prenatal care information from the 1989 revision of the birth certificate is based on the month of pregnancy (that is, first, second, third, and so on) care began. As a result, preliminary prenatal care data for the revised States are not comparable with data for the unrevised States. For this report, information on prenatal care (for 2002 and 2003) excludes data for Pennsylvania and Washington that implemented the 2003 Revision to the U.S. Standard Certificate of Live Birth for data year 2003. Data for all other reporting areas are based on the 1989 Revision to the U.S. Standard Certificate of Live Birth. The exclusion of data for these two States from the U.S. totals was necessary because of changes between the 1989 and 2003 revisions to the question on the timing of prenatal care and also to likely changes in the sources of these data (6,7). Prenatal care levels shown for 2002 by race or Hispanic origin may differ from those published previously; see “[Technical Notes](#)” (1).

The percent of women who received **prenatal care** within the first 3 months of pregnancy edged upward for 2003, to 84.1 percent, from 83.7 percent in 2002 (see [table A](#)). Timely prenatal care, as measured by the proportion of women who began care in the first trimester of pregnancy, has been increasing fairly steadily since the early 1990s. Small increases in first trimester prenatal care were reported for 2003 for non-Hispanic white women (89.0 percent for 2003), non-Hispanic black women (76.0 percent), and Hispanic women (77.4 percent). The percentage of all mothers with late (care beginning in the last trimester of pregnancy) or no care declined to 3.5 percent for the current year, compared with 3.6 percent for 2002.

Method of delivery

In 2003 preliminary data indicate that 27.6 percent of all births were delivered by **cesarean delivery**, a marked 6 percent rise over the 2002 level of 26.1 percent (see [table A](#); [figure 3](#)). Following declines for 1989–96, the cesarean delivery rate has risen each year; the current level is one-third higher than that for 1996 (20.7 percent). For 2002–2003, in keeping with the recent trend, the **primary cesarean rate** (percent of cesareans among women with no previous cesarean delivery) rose 6 percent, from 18.0 to 19.1 percent, while the rate of **vaginal birth after previous cesarean** (VBAC) dropped from 12.6 to 10.6, a 16 percent decline. The primary rate has climbed 31 percent and the VBAC rate has plunged 63 percent since only 1996.

Period of gestation and birthweight

Preterm and low birthweight rates both rose for 2003. The preterm rate (percent of infants less than 37 completed weeks of gestation) increased from 12.1 to 12.3 between 2002 and 2003; the low birthweight rate (percent of infants born at less than 2,500 grams) rose from 7.8 to 7.9 percent ([table A](#); [figure 1](#)). Preterm and low birthweight levels rose slowly in recent years, up 16 and 13 percent respectively, since 1990. The upswing in preterm and low birthweight

rates is related in part to the growth in the multiple birth rate; multiple births are much more likely to be delivered preterm and/or low birthweight. Preterm and low birthweight rates also increased among singleton deliveries (1).

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Table 1. Births and birth rates, by age, race and Hispanic origin of mother: United States, final 2002 and preliminary 2003

[Data for 2003 are based on a continuous file of records received from the States. Figures for 2003 are based on weighted data rounded to the nearest individual, so categories may not add to totals. Rates per 1,000 women in specified age and racial/Hispanic origin group]

Age and race/Hispanic origin	2003		2002	
	Number	Rate	Number	Rate
All races				
Total ¹	4,091,063	66.1	4,021,726	64.8
10-14 years	6,665	0.6	7,315	0.7
15-19 years	414,961	41.7	425,493	43.0
15-17 years	134,617	22.4	138,731	23.2
18-19 years	280,344	70.8	286,762	72.8
20-24 years	1,032,337	102.6	1,022,106	103.6
25-29 years	1,086,898	115.7	1,060,391	113.6
30-34 years	975,964	95.2	951,219	91.5
35-39 years	467,520	43.8	453,927	41.4
40-44 years	100,873	8.7	95,788	8.3
45-54 years ²	5,845	0.5	5,487	0.5
White total ³				
Total ¹	3,227,755	66.2	3,174,760	64.8
10-14 years	3,682	0.5	3,884	0.5
15-19 years	298,821	38.3	305,988	39.4
15-17 years	92,807	19.8	95,864	20.5
18-19 years	206,014	66.3	210,124	68.0
20-24 years	791,106	100.6	783,000	101.6
25-29 years	872,288	119.6	851,142	117.4
30-34 years	796,520	99.4	779,535	95.5
35-39 years	379,703	44.8	369,833	42.4
40-44 years	80,929	8.7	76,928	8.2
45-54 years ²	4,706	0.5	4,450	0.5
Non-Hispanic white ³				
Total ¹	2,320,778	58.5	2,298,156	57.4
10-14 years	1,402	0.2	1,493	0.2
15-19 years	172,727	27.5	179,511	28.5
15-17 years	46,899	12.4	49,756	13.1
18-19 years	125,827	50.1	129,755	51.9
20-24 years	521,712	83.5	519,153	84.3
25-29 years	627,373	110.9	614,909	109.3
30-34 years	626,245	97.7	620,173	94.4
35-39 years	303,008	43.2	297,436	40.9
40-44 years	64,414	8.1	61,853	7.6
45-54 years ²	3,897	0.5	3,628	0.5
Black total ³				
Total ¹	599,414	66.2	593,691	65.8
10-14 years	2,722	1.6	3,188	1.8
15-19 years	100,865	63.7	103,795	66.6
15-17 years	36,855	38.2	37,889	40.0
18-19 years	64,009	103.6	65,906	107.6
20-24 years	196,112	126.0	194,704	127.1
25-29 years	139,853	100.3	136,591	99.0
30-34 years	97,526	66.5	95,006	64.4
35-39 years	49,810	33.1	48,388	31.5
40-44 years	11,880	7.7	11,443	7.4
45-54 years ²	645	0.5	576	0.4

See footnotes at end of table.

Table 1. Births and birth rates, by age, race and Hispanic origin of mother: United States, final 2002 and preliminary 2003—Con.

[Data for 2003 are based on a continuous file of records received from the States. Figures for 2003 are based on weighted data rounded to the nearest individual, so categories may not add to totals. Rates per 1,000 women in specified age and racial/Hispanic origin group]

Age and race/Hispanic origin	2003		2002	
	Number	Rate	Number	Rate
Non-Hispanic black³				
Total ¹	576,347	67.1	578,335	67.4
10–14 years	2,642	1.6	3,132	1.9
15–19 years	97,534	64.8	101,494	68.3
15–17 years	35,582	38.8	37,017	41.0
18–19 years	61,952	105.3	64,477	110.3
20–24 years	189,063	128.2	190,241	131.0
25–29 years	133,959	102.2	132,824	102.1
30–34 years	93,459	67.5	92,155	66.1
35–39 years	47,657	33.5	46,831	32.1
40–44 years	11,416	7.7	11,097	7.5
45–54 years ²	616	0.5	561	0.4
American Indian total^{3,4}				
Total ¹	42,647	57.9	42,368	58.0
10–14 years	156	1.0	133	0.9
15–19 years	7,617	52.6	7,707	53.8
15–17 years	2,648	30.3	2,663	30.7
18–19 years	4,969	86.5	5,044	89.2
20–24 years	14,480	108.8	14,343	112.6
25–29 years	10,421	92.6	10,139	91.8
30–34 years	6,372	57.0	6,338	56.4
35–39 years	2,900	25.4	2,976	25.4
40–44 years	660	5.5	701	5.8
45–54 years ²	43	0.4	31	0.3
Asian or Pacific Islander total³				
Total ¹	221,247	66.3	210,907	64.1
10–14 years	105	0.2	110	0.3
15–19 years	7,658	17.6	8,003	18.3
15–17 years	2,307	8.9	2,315	9.0
18–19 years	5,351	30.1	5,688	31.5
20–24 years	30,639	59.9	30,059	60.4
25–29 years	64,336	108.4	62,519	105.4
30–34 years	75,546	114.4	70,340	109.6
35–39 years	35,107	59.9	32,730	56.5
40–44 years	7,405	13.4	6,716	12.5
45–54 years ²	451	0.9	430	0.9
Hispanic⁵				
Total ¹	912,256	96.9	876,642	94.4
10–14 years	2,349	1.3	2,421	1.4
15–19 years	128,472	82.2	127,900	83.4
15–17 years	46,949	49.7	46,740	50.7
18–19 years	81,523	131.9	81,160	133.0
20–24 years	273,258	163.4	265,235	164.3
25–29 years	246,388	144.4	236,143	139.4
30–34 years	169,056	102.0	157,887	95.1
35–39 years	75,812	50.8	71,480	47.8
40–44 years	16,169	12.2	14,809	11.5
45–54 years ²	753	0.7	767	0.7

¹The total number includes births to women of all ages, 10–54 years. The rate shown for all ages is the fertility rate, which is defined as the total number of births, regardless of age of mother, per 1,000 women aged 15–44 years.

²The number of births shown is the total for women aged 45–54 years. The birth rate is computed by relating the number of births to women aged 45–54 years to women aged 45–49 years, because most of the births in this group are to women aged 45–49 years.

³Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1977 Office of Management and Budget standards. California, Hawaii, Ohio (for December), Pennsylvania, Utah, and Washington reported multiple-race data in 2003. The multiple-race data for these states were bridged to the single race categories of the 1977 Office of Management and Budget standards for comparability with other States; see "Technical Notes." Data for persons of Hispanic origin are included in the data for each race group according to the mother's reported race; see "Technical Notes."

⁴Includes births to Aleuts and Eskimos.

⁵Includes all persons of Hispanic origin of any race; see "Technical Notes."

NOTE: For information on the relative standard errors of the data and further discussion; see "Technical Notes."

Table 2. Live births by age of mother, live-birth order, and race and Hispanic origin of mother: United States, preliminary 2003

[Data are based on a continuous file of records received from the States. Figures are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Live-birth order and race/Hispanic origin of mother	All ages	Age of mother							
		Under 15 years	15–19 years	20–24 years	25–29 years	30–34 years	35–39 years	40–44 years	45–54 years
All races	4,091,063	6,665	414,961	1,032,337	1,086,898	975,964	467,520	100,873	5,845
1st child	1,647,451	6,533	331,983	485,430	397,815	290,985	110,663	22,530	1,512
2d child	1,331,672	120	70,204	354,366	370,265	351,494	154,561	29,170	1,493
3d child	682,289	4	10,716	140,513	202,155	198,783	108,184	20,976	957
4th child and over	422,715	2	1,306	50,243	114,943	133,213	93,203	27,947	1,857
Not stated	6,936	6	752	1,785	1,720	1,489	908	251	26
White total ¹	3,227,755	3,682	298,821	791,106	872,288	796,520	379,703	80,929	4,706
1st child	1,298,892	3,625	242,055	382,654	323,873	236,917	90,157	18,361	1,249
2d child	1,066,935	52	48,819	275,028	303,532	289,668	125,335	23,292	1,209
3d child	542,902	2	6,759	101,370	162,097	165,670	89,472	16,770	762
4th child and over	314,381	1	721	30,916	81,625	103,220	74,097	22,334	1,468
Not stated	4,645	2	468	1,139	1,160	1,044	642	171	18
Non-Hispanic white ¹	2,320,778	1,402	172,727	521,712	627,373	626,245	303,008	64,414	3,897
1st child	968,056	1,390	144,658	266,151	258,484	202,404	77,821	16,040	1,108
2d child	785,353	11	24,629	176,953	218,091	238,711	106,044	19,835	1,079
3d child	369,144	1	2,965	61,211	102,731	119,460	69,075	13,103	598
4th child and over	195,496	–	263	16,807	47,392	64,969	49,633	15,331	1,101
Not stated	2,728	–	212	589	675	701	435	105	11
Black total ¹	599,414	2,722	100,865	196,112	139,853	97,526	49,810	11,880	645
1st child	229,068	2,653	77,736	78,691	35,933	22,015	9,695	2,214	132
2d child	176,341	63	18,805	65,750	44,141	30,223	14,166	3,043	150
3d child	105,446	1	3,565	33,932	31,553	22,027	11,672	2,580	116
4th child and over	86,883	1	524	17,214	27,823	22,994	14,089	3,994	244
Not stated	1,676	4	235	525	403	267	188	49	4
Non-Hispanic black ¹	576,347	2,642	97,534	189,063	133,959	93,459	47,657	11,416	616
1st child	219,877	2,577	75,037	75,404	34,224	21,065	9,305	2,140	125
2d child	169,388	60	18,283	63,355	42,174	28,903	13,550	2,923	141
3d child	101,480	1	3,490	33,052	30,262	21,020	11,083	2,460	113
4th child and over	84,181	1	515	16,802	26,964	22,238	13,573	3,852	235
Not stated	1,420	3	210	450	335	232	146	42	2
American Indian total ^{1,2}	42,647	156	7,617	14,480	10,421	6,372	2,900	660	43
1st child	15,279	152	5,931	5,503	2,191	1,062	370	65	5
2d child	11,765	3	1,409	5,160	3,001	1,526	550	110	6
3d child	7,686	1	221	2,655	2,616	1,454	605	128	6
4th child and over	7,812	–	32	1,130	2,586	2,317	1,367	354	26
Not stated	106	–	23	32	27	13	7	3	–
Asian or Pacific Islander total ¹	221,247	105	7,658	30,639	64,336	75,546	35,107	7,405	451
1st child	104,212	104	6,260	18,582	35,818	30,990	10,441	1,891	126
2d child	76,632	1	1,171	8,429	19,590	30,077	14,510	2,725	128
3d child	26,255	–	171	2,557	5,888	9,632	6,435	1,498	73
4th child and over	13,639	–	30	983	2,909	4,682	3,650	1,264	120
Not stated	510	–	26	88	130	165	71	27	3
Hispanic ³	912,256	2,349	128,472	273,258	246,388	169,056	75,812	16,169	753
1st child	332,783	2,301	99,352	118,255	65,126	33,591	11,839	2,191	129
2d child	283,267	45	24,595	99,421	86,172	50,545	19,002	3,363	124
3d child	175,095	1	3,834	40,722	60,017	46,322	20,400	3,651	148
4th child and over	119,789	–	470	14,401	34,743	38,410	24,480	6,935	351
Not stated	1,322	2	221	460	330	188	91	30	1

– Quantity zero.

¹Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1977 Office of Management and Budget standards. California, Hawaii, Ohio (for December), Pennsylvania, Utah, and Washington reported multiple-race data in 2003. The multiple-race data for these States were bridged to the single race categories of the 1977 Office of Management and Budget standards for comparability with other States; see "Technical Notes." Data for persons of Hispanic origin are included in the data for each race group according to the mother's reported race; see "Technical Notes."

²Includes births to Aleuts and Eskimos.

³Includes all persons of Hispanic origin of any race; see "Technical Notes."

NOTE: For information on the relative standard errors of the data and further discussion, see "Technical Notes."

Table 3. Birth rates by age of mother, live-birth order, and race and Hispanic origin of mother: United States, preliminary 2003

[Data are based on a continuous file of records received from the States. Rates per 1,000 women in specified age and racial/Hispanic origin group]

Live-birth order and race/Hispanic origin of mother	Age of mother								
	15–44 years ¹	10–14 years	15–19 years	20–24 years	25–29 years	30–34 years	35–39 years	40–44 years	45–49 years ²
All races	66.1	0.6	41.7	102.6	115.7	95.2	43.8	8.7	0.5
1st child	26.7	0.6	33.4	48.3	42.4	28.4	10.4	2.0	0.1
2d child	21.5	0.0	7.1	35.3	39.5	34.3	14.5	2.5	0.1
3d child	11.0	*	1.1	14.0	21.6	19.4	10.1	1.8	0.1
4th child and over	6.8	*	0.1	5.0	12.3	13.0	8.7	2.4	0.2
White total ³	66.2	0.5	38.3	100.6	119.6	99.4	44.8	8.7	0.5
1st child	26.7	0.5	31.1	48.7	44.5	29.6	10.7	2.0	0.1
2d child	21.9	0.0	6.3	35.0	41.7	36.2	14.8	2.5	0.1
3d child	11.1	*	0.9	12.9	22.3	20.7	10.6	1.8	0.1
4th child and over	6.5	*	0.1	3.9	11.2	12.9	8.8	2.4	0.2
Non-Hispanic white ³	58.5	0.2	27.5	83.5	110.9	97.7	43.2	8.1	0.5
1st child	24.4	0.2	23.0	42.6	45.8	31.6	11.1	2.0	0.1
2d child	19.8	*	3.9	28.3	38.6	37.2	15.1	2.5	0.1
3d child	9.3	*	0.5	9.8	18.2	18.7	9.9	1.6	0.1
4th child and over	5.0	*	0.0	2.7	8.4	10.2	7.1	1.9	0.1
Black total ³	66.2	1.6	63.7	126.0	100.3	66.5	33.1	7.7	0.5
1st child	25.4	1.5	49.2	50.7	25.8	15.0	6.5	1.4	0.1
2d child	19.5	0.0	11.9	42.4	31.7	20.7	9.5	2.0	0.1
3d child	11.7	*	2.3	21.9	22.7	15.1	7.8	1.7	0.1
4th child and over	9.6	*	0.3	11.1	20.0	15.7	9.4	2.6	0.2
Non-Hispanic black ³	67.1	1.6	64.8	128.2	102.2	67.5	33.5	7.7	0.5
1st child	25.7	1.6	49.9	51.3	26.2	15.3	6.6	1.5	0.1
2d child	19.8	0.0	12.2	43.1	32.2	20.9	9.5	2.0	0.1
3d child	11.8	*	2.3	22.4	23.1	15.2	7.8	1.7	0.1
4th child and over	9.8	*	0.3	11.4	20.6	16.1	9.6	2.6	0.2
American Indian total ^{3,4}	57.9	1.0	52.6	108.8	92.6	57.0	25.4	5.5	0.4
1st child	20.8	1.0	41.0	41.4	19.5	9.5	3.2	0.5	*
2d child	16.0	*	9.7	38.8	26.7	13.7	4.8	0.9	*
3d child	10.5	*	1.5	20.0	23.3	13.0	5.3	1.1	*
4th child and over	10.6	*	0.2	8.5	23.0	20.8	12.0	3.0	0.2
Asian or Pacific Islander total ³	66.3	0.2	17.6	59.9	108.4	114.4	59.9	13.4	0.9
1st child	31.3	0.2	14.4	36.5	60.5	47.0	17.9	3.4	0.3
2d child	23.0	*	2.7	16.5	33.1	45.7	24.8	5.0	0.3
3d child	7.9	*	0.4	5.0	9.9	14.6	11.0	2.7	0.1
4th child and over	4.1	*	0.1	1.9	4.9	7.1	6.2	2.3	0.2
Hispanic ⁵	96.9	1.3	82.2	163.4	144.4	102.0	50.8	12.2	0.7
1st child	35.4	1.3	63.7	70.8	38.2	20.3	7.9	1.7	0.1
2d child	30.1	0.0	15.8	59.5	50.6	30.5	12.7	2.5	0.1
3d child	18.6	*	2.5	24.4	35.2	28.0	13.7	2.8	0.1
4th child and over	12.7	*	0.3	8.6	20.4	23.2	16.4	5.3	0.3

0.0 Quantity more than zero but less than 0.05.

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

¹The rate shown is the fertility rate, which is defined as the total number of births, regardless of age of mother, per 1,000 women aged 15–44 years.²The birth rate for ages 45–49 years is computed by relating births to women aged 45–54 years to women aged 45–49 years, because most of the births in this group are to women aged 45–49 years.³Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1977 Office of Management and Budget standards. California, Hawaii, Ohio (for December), Pennsylvania, Utah, and Washington reported multiple-race data in 2003. The multiple-race data for these States were bridged to the single race categories of the 1977 Office of Management and Budget standards for comparability with other States; see "Technical Notes." Data for persons of Hispanic origin are included in the data for each race group according to the mother's reported race; see "Technical Notes."⁴Includes births to Aleuts and Eskimos.⁵Includes all persons of Hispanic origin of any race; see "Technical Notes."

NOTE: For information on the relative standard errors of the data and further discussion, see "Technical Notes."

Table 4. Live births by race and Hispanic origin of mother: United States, each State and territory, and birth and fertility rates, preliminary 2003

[By place of residence. Data are based on a continuous file of records received from the States. Birth rates are total births per 1,000 total population; fertility rates are total births per 1,000 women aged 15–44 years. Figures are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Area	Number							Birth rate	Fertility rate
	All races	White total ¹	Non-Hispanic white ¹	Black ¹	American Indian total ^{1,2}	Asian or Pacific Islander total ¹	Hispanic ³	All races	All races
United States ⁴	4,091,063	3,227,755	2,320,778	599,414	42,647	221,247	912,256	14.1	66.1
Alabama	59,621	40,912	38,037	17,959	144	606	2,907	13.2	62.6
Alaska	10,122	6,491	4,908	406	2,508	717	776	15.6	72.7
Arizona	91,005	78,966	39,242	3,279	6,060	2,699	39,798	16.3	79.3
Arkansas	38,159	30,048	26,751	7,307	260	544	3,307	14.0	68.1
California	540,995	438,035	165,626	32,676	2,681	67,603	268,867	15.2	69.9
Colorado	69,363	63,189	42,360	2,938	564	2,672	21,398	15.2	69.5
Connecticut	42,848	35,372	28,032	5,184	261	2,031	7,547	12.3	59.6
Delaware	11,264	7,903	6,553	2,883	31	446	1,369	13.8	64.3
District of Columbia	7,606	2,125	1,847	5,223	4	253	954	13.5	53.8
Florida	212,286	158,053	104,311	47,349	1,089	5,795	54,864	12.5	63.4
Georgia	136,012	88,085	68,859	43,059	319	4,549	18,266	15.7	69.3
Hawaii	18,114	4,831	4,269	519	64	12,700	2,619	14.4	72.3
Idaho	21,802	20,972	17,921	108	369	353	2,940	16.0	76.0
Illinois	182,590	142,216	99,936	31,602	243	8,530	42,486	14.4	67.0
Indiana	86,600	75,688	68,667	9,387	136	1,389	6,764	14.0	66.5
Iowa	38,182	35,692	33,189	1,287	262	941	2,521	13.0	63.3
Kansas	39,493	35,019	29,240	2,765	483	1,226	5,443	14.5	69.5
Kentucky	55,281	49,457	47,599	4,859	99	867	1,964	13.4	63.2
Louisiana	65,298	37,459	35,863	26,328	406	1,106	1,684	14.5	66.4
Maine	13,861	13,371	13,156	184	98	208	167	10.6	52.1
Maryland	74,856	45,780	39,609	24,776	248	4,052	6,296	13.6	62.3
Massachusetts	80,250	66,061	57,917	8,606	184	5,398	9,809	12.5	57.2
Michigan	130,937	103,042	93,521	22,574	639	4,682	7,666	13.0	61.6
Minnesota	70,157	59,491	54,158	5,378	1,417	3,871	4,937	13.9	64.2
Mississippi	42,362	23,575	23,039	18,367	131	289	461	14.7	67.9
Missouri	77,079	63,814	60,484	11,163	366	1,736	3,480	13.5	64.1
Montana	11,416	9,833	9,285	51	1,399	133	381	12.4	62.6
Nebraska	25,924	23,382	19,412	1,467	470	604	3,449	14.9	71.4
Nevada	33,644	27,693	15,596	2,905	518	2,528	12,207	15.0	72.2
New Hampshire	14,393	13,646	12,589	244	35	468	527	11.2	52.7
New Jersey	116,269	85,278	61,366	20,120	186	10,685	26,504	13.5	64.5
New Mexico	27,845	23,306	8,616	533	3,603	402	14,856	14.9	71.5
New York	254,187	184,059	132,304	48,098	636	21,394	55,340	13.2	61.1
North Carolina	118,308	86,395	70,458	27,170	1,637	3,106	16,084	14.1	65.8
North Dakota	7,975	6,893	6,574	109	858	115	168	12.6	61.6
Ohio	151,983	125,476	120,074	23,059	304	3,144	5,444	13.3	63.7
Oklahoma	50,484	39,578	34,039	4,568	5,263	1,076	5,654	14.4	69.2
Oregon	45,975	41,590	33,090	1,024	868	2,493	8,440	12.9	62.5
Pennsylvania	140,660	114,043	105,066	21,333	311	4,975	10,494	11.4	56.0
Rhode Island	13,192	11,208	7,207	1,260	161	562	2,514	12.3	56.5
South Carolina	55,658	36,266	32,591	18,345	154	893	3,587	13.4	63.0
South Dakota	11,035	8,910	8,623	122	1,876	127	340	14.4	70.8
Tennessee	78,901	60,982	56,128	16,250	180	1,489	4,934	13.5	63.1
Texas	381,239	324,790	139,671	42,245	911	13,292	184,912	17.2	78.3
Utah	49,870	47,338	40,161	384	616	1,532	7,072	21.2	92.2
Vermont	6,591	6,413	6,313	54	6	119	59	10.6	51.1
Virginia	101,226	71,900	62,331	22,605	177	6,544	10,389	13.7	63.3
Washington	80,474	66,569	53,849	4,029	2,043	7,833	13,307	13.1	61.2
West Virginia	20,908	20,005	19,849	722	25	156	99	11.5	58.1
Wisconsin	70,053	60,256	54,856	6,496	1,054	2,247	5,539	12.8	60.7
Wyoming	6,708	6,299	5,635	53	290	66	666	13.4	65.7
Puerto Rico	49,427	44,972	---	4,455	---	---	---	---	---
Virgin Islands	997	227	67	752	1	17	232	---	---
Guam	3,286	277	242	39	5	2,965	54	---	---
American Samoa	1,015	---	---	---	---	1,015	---	---	---
Northern Marianas	1,344	13	---	---	---	1,331	---	---	---

--- Data not available.

--- Quantity zero.

¹Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with the 1977 Office of Management and Budget standards. California, Hawaii, Ohio (for December), Pennsylvania, Utah, and Washington reported multiple-race data in 2003. The multiple-race data for these States were bridged to the single race categories of the 1977 Office of Management and Budget standards for comparability with other States; see "Technical Notes." Data for persons of Hispanic origin are included in the data for each race group according to the mother's reported race; see "Technical Notes." ²Includes births to Aleuts and Eskimos. ³Includes all persons of Hispanic origin of any race; see "Technical Notes."

⁴Excludes data for the territories.

NOTE: For information on the relative standard errors of the data and further discussion; see "Technical Notes."

Technical Notes

Nature and sources of data

Preliminary data for 2003 are based on a substantial proportion of births for that year (98.5 percent). The data for 2003 are based on a continuous receipt and processing of statistical records through April 15, 2004, by the National Center for Health Statistics (NCHS). NCHS receives the data from the States' vital registration systems through the Vital Statistics Cooperative Program. In this report U.S. totals include only events occurring within the 50 States and the District of Columbia. Data for Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Northern Marianas are included in tables showing data by State but are not included in U.S. totals. Final data for 2002 for these areas are presented on the Internet where available.

For 2003 individual records of births are weighted to independent counts of all births occurring in each State. These State-specific counts serve as control totals and are the basis for the record weights in the preliminary file. If the number of records in the preliminary file is greater than the count received from the State, the State-specific number of records in the preliminary file is used instead, and the weight is set at 1.0.

Each birth record has one weight specific to the State where the birth occurred. Table I shows the percent completeness of the preliminary file for each event by place of occurrence. The percent completeness is obtained by dividing the number of records in the preliminary file by the control total and multiplying by 100. Although data by place of occurrence are used to compute the weights, all data in this report are tabulated by place of residence.

For selected variables in the natality file, unknown or not-stated values are imputed. Detailed information on reporting completeness and imputation procedures may be found in the Technical Appendix of *Vital Statistics of the United States, 2002 Natality* (9).

Race and Hispanic origin are reported separately on the birth certificate. Therefore, data shown by race include persons of Hispanic or non-Hispanic origin, and data for Hispanic origin include persons of any race. In this report births of Hispanic origin are included in the totals for each race group — white, black, American Indian or Alaskan Native (AIAN), and Asian or Pacific Islander (API) — according to the mother's race as reported on the birth certificate. Data shown for Hispanic persons include all persons of Hispanic origin of any race. In 2003 approximately 97 percent of Hispanic-origin births were to white women. Data are shown separately for non-Hispanic white women because there are substantial differences in childbearing patterns between Hispanic and non-Hispanic white women. Roughly one-quarter of white births were to Hispanic women in 2003.

From 1964 to 1996 mother's age was edited for ages less than 10 and greater than 49 years. Births reported to occur to mothers younger than age 10 years or older than 49 years had age imputed according to the age of the mother from the previous record with 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; that is, births reported to have occurred to mothers aged 50–54 years were not imputed. A review and verification of unedited birth data for 1996 showed that the vast majority of births reported as occurring to women aged 50 years and over were to women aged 50–54 years. Nevertheless, the numbers of births to women aged

Table I. Total count of records and percent completeness of preliminary file of live births: United States, each State and territory, preliminary 2003

[By place of occurrence]

Area	Live births	
	Counts of records	Percent completeness
United States ¹	4,095,096	98.5
Alabama	58,455	100.0
Alaska	10,013	99.5
Arizona	91,080	100.0
Arkansas	37,500	99.0
California	542,500	99.8
Colorado	69,535	100.0
Connecticut	43,515	100.0
Delaware	12,120	100.0
District of Columbia	14,617	99.9
Florida	212,334	100.0
Georgia	137,291	100.0
Hawaii	18,137	100.0
Idaho	21,287	100.0
Illinois	179,190	99.8
Indiana	87,250	99.4
Iowa	38,408	100.0
Kansas	40,331	100.0
Kentucky	53,500	96.9
Louisiana	65,575	99.6
Maine	13,668	100.0
Maryland	70,736	100.0
Massachusetts	81,350	100.0
Michigan	129,715	100.0
Minnesota	70,110	100.0
Mississippi	41,275	75.0
Missouri	77,900	99.8
Montana	11,402	99.9
Nebraska	26,080	100.0
Nevada	33,180	99.8
New Hampshire	13,872	100.0
New Jersey	113,925	99.9
New Mexico	27,329	99.9
New York	255,185	99.8
New York excluding New York City	124,350	100.0
New York City	130,835	99.6
North Carolina	119,004	100.0
North Dakota	9,191	100.0
Ohio	152,530	98.0
Oklahoma	49,330	99.8
Oregon	46,842	100.0
Pennsylvania	143,400	74.4
Rhode Island	13,825	96.1
South Carolina	53,387	100.0
South Dakota	11,503	100.0
Tennessee	84,012	100.0
Texas	387,000	98.7
Utah	51,063	100.0
Vermont	6,290	99.0
Virginia	98,995	100.0
Washington	79,988	99.9
West Virginia	21,476	100.0
Wisconsin	68,895	100.0
Wyoming	6,211	100.0
Puerto Rico	50,820	97.4
Virgin Islands	1,623	66.2
Guam	3,302	99.9
American Samoa	1,606	63.2
Northern Marianas	1,344	100.0

¹Excludes data for Puerto Rico, Virgin Islands, Guam, American Samoa, and Northern Marianas.

NOTE: Percent completeness = $\frac{\text{Number of records in preliminary file} * 100}{\text{Count of records}}$

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.

National estimates of births to unmarried women are based on two methods of determining marital status. For 2002 and 2003 birth certificates in 48 States and the District of Columbia included a direct question about the mother's marital status; in California and Nevada, the direct question is part of the electronic birth registration process but does not appear on certified or paper copies of the birth certificate. The question in most States is: "Mother married? (At birth, conception, or any time between) (Yes or no)."

Marital status is inferred in Michigan and New York. A birth is inferred as nonmarital if the father's name is missing from the birth certificate or if a paternity acknowledgment was filed.

The birth rate for unmarried women for 2003 is estimated on the basis of population distributions by marital status provided by the U.S. Census Bureau as of March 2003 applied to the national population estimates as of July 1 (8,10). Both population files are 2000-census based. The nonmarital birth rate shown here for 2003 thus differs from those published by NCHS in the annual final reports, which are based on populations estimated from 3-year averages of the marital status distributions, rather than a single year as shown here (11,12). Population estimates for a single year are not an adequate basis for computing age-specific birth rates for unmarried women—these rates are available only in reports based on final data.

2003 revision of the U.S. Standard Certificate of Live Birth

This report includes data for two States, Pennsylvania and Washington, which implemented the 2003 revision of the U.S. Standard Certificate of Live Birth in 2003, and also the remaining 48 States and the District of Columbia, which collected and reported birth data in 2003 based on the 1989 revision of the U.S. Standard Certificate of Live Birth. The 2003 revision is described in detail elsewhere (6,7). Because of the small number of States with data based on the revised certificate, in this report revised data are combined with unrevised data where comparable. For items presented in this report, data appear largely comparable despite changes to item wording format and sources. For all items except prenatal care, data from the revised and unrevised States are included in the totals for the United States. For the prenatal care item, data from the revised States, Pennsylvania and Washington, are excluded from the total for the United States.

Race of mother

The 2003 revision of the U.S. Standard Certificate of Live Birth allows the reporting of more than one race (multiple races) for each parent (6). This change was implemented to reflect the increasing diversity of the population of the United States. The race and ethnicity items on the revised certificate are compliant with the revisions to the Statistical Policy Directive No. 15, Race and Ethnic Standards for Federal Statistics and Administrative Reporting, issued by the Office of Management and Budget (OMB) in 1997, which mandates the collection of more than one race for Federal data (see "Population denominators") (13). In addition, the new certificate is compliant with the OMB mandated minimum set of five races to be reported for

Federal data. These are (1) White, (2) Black or African American, (3) American Indian or Alaskan Native (AIAN), (4) Asian, and (5) Native Hawaiian or Other Pacific Islander.

In 2003 multiple race was reported on the revised birth certificates of Pennsylvania and Washington, as well as on the unrevised certificates of California, Hawaii, Ohio (for births occurring in December only), and Utah. These States, which account for 22.8 percent of births in the United States in 2003, reported 3 to 4 percent of the mothers as multiracial. Data from the vital records of the remaining 44 States and the District of Columbia are based on the 1989 revision of the U.S. Standard Certificate of Live Birth, which follows the 1977 OMB standard, allowing only a single race to be reported (7,14). In addition, these States report a minimum set of four races as stipulated in the 1977 standard. These are (1) White, (2) Black or African American, (3) American Indian or Alaskan Native (AIAN), and (4) Asian or Pacific Islander (API). The 1997 OMB standard divided the Asian or Pacific Islander category into two categories, "Asian" and "Native Hawaiian or Other Pacific Islander."

In order to provide uniformity and comparability of the data during the transition period, before all or most of the data are available in the new multiple race format, it was necessary to "bridge" the responses of those who reported more than one race (multiple race) to one, single race (see "Population denominators"). The bridging procedure for multiracial mothers is based on the procedure used to bridge multiracial population estimates (15,16). Multiracial mothers are imputed to a single race (either white, black, AIAN, or API) according to their combination of races, Hispanic origin, sex, and age indicated on the birth certificate. The imputation procedure is described in detail elsewhere (17,18).

Tobacco use during pregnancy

The "Tobacco use during pregnancy" item was also modified on the 2003 revision of the U.S. Standard Birth Certificate (implemented by Pennsylvania and Washington) for 2003 (6,7). Vermont adopted the new tobacco use item beginning in 2000. The new certificate asks for the number of cigarettes smoked at different intervals before and during the pregnancy. The new format provides more detail on the timing of smoking, making it possible to determine if the mother stopped or reduced smoking during the pregnancy. In comparison, the 1989 standard certificate asked for "Tobacco use during pregnancy," "yes/no," and the average number of cigarettes per day. Preliminary data indicate that information on overall smoking status, as presented in [table A](#), are generally comparable between revisions and, therefore, data for Pennsylvania and Washington are included in the U.S. totals. For comparability, a woman was coded as using tobacco during pregnancy if she smoked cigarettes at any interval (trimester) during the pregnancy, as reported by the new item.

Prenatal care

For this report measures of prenatal care exclude data for Pennsylvania and Washington, the two States that implemented the 2003 Revision to the U.S. Standard Certificate of Live Birth for that year (6,7). Data for all other reporting areas are based on the 1989 Revision to the U.S. Standard Certificate of Live Birth. The exclusion of data for these two States from the U.S. totals was necessary because of changes between the 1989 and 2003 revisions in the

wording of the prenatal care item, and also to likely changes in the sources of these data. The timing of the prenatal care item was modified to "Date of first prenatal visit" from "Month prenatal care began." In addition, the 2003 revision process resulted in the recommendation that information on prenatal care be gathered from the prenatal care or other medical records whereas the 1989 revision did not include a recommended source for this item.

Preliminary data for 2003 indicate that prenatal care data from the revised certificates are not comparable to data from the unrevised certificates. Therefore, the data for the two revised States are not included in the U.S. totals for 2002 and 2003. As more States implement the revised certificates, reporting area totals will be shown for both revised and unrevised data. A table that presents the percent of mothers receiving care in the first trimester of pregnancy by race and State is available on the NCHS Web page (see "State-specific detailed tables" at <http://www.cdc.gov/nchs>).

Method of delivery/cesarean delivery

The 2003 revision of the U.S. Standard Birth Certificate, which has been implemented by Pennsylvania and Washington for 2003, includes a new format for collecting data on method of delivery (6,7). The 2003 revision process also resulted in recommendations that this information be collected from the specific medical records; the 1989 revision did not include recommended sources for this item. Despite these changes, preliminary analysis indicates that revised summary data on cesarean delivery and vaginal delivery after previous cesarean are comparable with data collected using the 1989 format.

Population denominators

Birth and fertility rates shown in this report for 2002 and 2003 are based on population estimates based on the 2000 census, as of July 1, 2002, and 2003. These population estimates are available on the NCHS Web page (10,19).

The populations used in this report were produced under a collaborative arrangement with the U.S. Census Bureau and are based on the 2000 census counts. Reflecting the new guidelines issued in 1997 by the Office of Management and Budget (OMB), the 2000 census included an option for individuals to report more than one race as appropriate for themselves and household members (13). In addition, the 1997 OMB guidelines called for reporting of Asian persons separately from Native Hawaiians or Other Pacific Islanders. In the 1977 OMB guidelines, data for Asian or Pacific Islander persons were collected as a single group (14). Birth certificates for most States currently collect only one race for each parent in the same categories as specified in the 1977 OMB guidelines (see "2003 revision of the U.S. Standard Certificate of Live Birth"). In addition, birth certificate data do not report Asians separately from Native Hawaiians or Other Pacific Islanders. The birth certificate data by race (the numerators for birth and fertility rates) are thus incompatible for most States with the population data collected in the 2000 census (the denominators for the rates).

In order to produce birth and fertility rates for 2002 and 2003, 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 racial 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 (API), and to reflect age as of the census reference date. The procedures used to produce the "bridged" populations are described in separate publications (15,16). It is anticipated that "bridged" population data will be used over the next few years for computing population-based rates. Beginning in 2003 several States (California, Hawaii, Ohio, Pennsylvania, Utah, and Washington) have collected information on multiple race reporting (see "2003 revision of the U.S. Standard Certificate of Live Birth"). As States gradually begin to collect data on race according to the 1997 OMB guidelines, it is expected that use of the "bridged" populations can be discontinued.

Readers should keep in mind that the population data used to compile the birth and fertility rates by race and ethnicity shown in this report are based on special estimation procedures. They are not true counts. This is the case even for the 2000 populations that are based on the 2000 census. The estimation procedures used to develop these populations contain some errors. Smaller populations, for example, American Indians, are affected much more than larger populations by this measurement error (16). Although the nature and magnitude of these errors is unknown, the potential for error should be kept in mind when evaluating trends and differentials. Over the next several years, additional information will be incorporated in the estimation procedures, possibly resulting in further revisions of the population estimates.

Population estimates for 2003 for the territories were not available at the time this report was prepared, and therefore rates could not be calculated. Birth and fertility rates for the territories will be reported in "Births: Final Data for 2003."

Computing rates and percents

For calculating birth rates, age and race of mother are imputed if they are not stated (0.01 percent and 0.1 percent, respectively, for 2003). In computing birth rates by live-birth order, births with live-birth order not stated are distributed in proportion to stated data. Births with marital status not reported (0.04 percent for 2003) are included with births to married mothers. Percents were computed using only events for which the characteristic is reported. The "Not stated" category is subtracted from the total before the percent is computed for tobacco use, birthweight, prenatal care, method of delivery, and preterm births. Birth rates for the Hispanic population are based only on events to persons reported as Hispanic. Rates for non-Hispanic white persons are based on the sum of all white events reported as non-Hispanic and white events with origin not stated. Likewise, rates for non-Hispanic black persons are based on the sum of all black events reported as non-Hispanic and black events with origin not stated. Hispanic origin is not imputed if it is not reported.

An asterisk (*) indicates that the figure does not meet standards of reliability or precision. In this report three sets of criteria determine whether a figure meets these standards:

- The State-specific sample is complete enough to provide reliable estimates. In this report a criterion of at least 75 percent of a State's records for the 12-month period was used as a basis for providing State-specific estimates (see [table I](#)). For this year (2003), data for Pennsylvania were 74.4 percent complete. An exception was made in the case of Pennsylvania because the data appear reliable. Pennsylvania implemented the 2003 revision of the U.S. Standard Certificate of Live Birth in 2003.

- Reporting for any particular variable is at least 80 percent complete. In this report no data were suppressed based on this criterion.
- A rate or percent is based on at least 20 births in the numerator.

Rates based on fewer than 20 births have a relative standard error (RSE) of about 23 percent or more and, therefore, are considered highly variable. However, some birth rates (based on data files that are less than 100 percent complete and based on 20–31 births) may have RSEs of 23 percent or more but are still shown instead of asterisks. As a result, caution should be exercised in analyzing rates based on 20–31 events. Additional information on random variation in numbers of events, rates, ratios, and percents may be found in “Reliability of estimates.”

Reliability of estimates

Because the preliminary estimates of births in this report are based on files that may not be complete, they are subject to sampling variability. Record weights are used to adjust record counts to independent control totals. The lack of completeness of the vital

statistics files is due to delays in receiving and processing the live-birth records.

In addition, the natality file is subject to nonsampling errors or biases. Records that were delayed and were not included in this report are assumed to have the same characteristics as the records that were included in this report. Seasonal bias may occur because file completeness is greater during the early part than during the later part of the 12-month period for which the data are processed and tabulated.

Even if the number of vital events in this report were 100 percent complete and not subject to sampling variability, it might be affected by random variation. Thus, when the number of events is small and the probability of such an event is small, considerable caution must be observed in interpreting the data. Such infrequent events may be assumed to follow a Poisson probability distribution. The first column of [table II](#) shows the estimated RSEs of a file that is nearly 100 percent complete. The estimated RSEs of the 2002 final data, the preliminary 2003 control totals, and the preliminary 2003 data (based on nearly 100 percent of a file) are shown in the first column of [table II](#).

Columns 2–6 of [table II](#) show the estimated RSEs for various levels of file completeness (that is, incorporate both sources of

Table II. Relative standard errors for preliminary number of live births by percent of file completeness

[Relative standard errors are expressed as a percent of the estimate]

Estimated number of live births	Percent of file completeness					
	100	95	90	80	70	60
	Relative standard error (percent)					
1..	100.0	102.6	105.4	111.8	119.5	129.1
5..	44.7	45.9	47.1	50.0	53.5	57.7
10..	31.6	32.4	33.3	35.4	37.8	40.8
20..	22.4	22.9	23.6	25.0	26.7	28.9
30..	18.3	18.7	19.2	20.4	21.8	23.6
40..	15.8	16.2	16.7	17.7	18.9	20.4
50..	14.1	14.5	14.9	15.8	16.9	18.3
60..	12.9	13.2	13.6	14.4	15.4	16.7
70..	12.0	12.3	12.6	13.4	14.3	15.4
80..	11.2	11.5	11.8	12.5	13.4	14.4
90..	10.5	10.8	11.1	11.8	12.6	13.6
100..	10.0	10.3	10.5	11.2	12.0	12.9
200..	7.1	7.3	7.5	7.9	8.5	9.1
300..	5.8	5.9	6.1	6.5	6.9	7.5
400..	5.0	5.1	5.3	5.6	6.0	6.5
500..	4.5	4.6	4.7	5.0	5.3	5.8
600..	4.1	4.2	4.3	4.6	4.9	5.3
700..	3.8	3.9	4.0	4.2	4.5	4.9
800..	3.5	3.6	3.7	4.0	4.2	4.6
900..	3.3	3.4	3.5	3.7	4.0	4.3
1,000..	3.2	3.2	3.3	3.5	3.8	4.1
2,000..	2.2	2.3	2.4	2.5	2.7	2.9
5,000..	1.4	1.5	1.5	1.6	1.7	1.8
10,000..	1.0	1.0	1.1	1.1	1.2	1.3
20,000..	0.7	0.7	0.7	0.8	0.8	0.9
50,000..	0.4	0.5	0.5	0.5	0.5	0.6
100,000..	0.3	0.3	0.3	0.4	0.4	0.4
200,000..	0.2	0.2	0.2	0.2	0.3	0.3
500,000..	0.1	0.1	0.1	0.2	0.2	0.2
1,000,000..	0.1	0.1	0.1	0.1	0.1	0.1
2,000,000..	0.1	0.1	0.1	0.1	0.1	0.1
4,000,000..	0.1	0.1	0.1	0.1	0.1	0.1

variability, sampling error and random error). The estimated RSEs in table II were computed using this formula:

$$\text{RSE} = 100 \sqrt{\frac{1}{\bar{X}} + \frac{(1-f)(N-X)}{fX(N-\frac{1}{f})}}$$

where

f = the sampling fraction or the percent of file completeness/100 from table I.

X = the estimated number of live births.

N = the total count of live births for the United States or any State. (NOTE: The RSEs shown in table II are based on $N = 4,000,000$. If N is smaller, the RSEs may be slightly smaller than those shown.)

RSEs may be used to compute 95 percent confidence intervals for the number of events (X), for a rate (R), or for a percent (P) and to compute statistical tests concerning the equality of two rates (R_1 and R_2) or two percents (P_1 and P_2).

For the number of live births, the 95 percent confidence interval may be computed as follows:

$$\text{Lower limit: } X_1 - 1.96 \cdot X_1 \cdot \frac{\text{RSE}(X_1)}{100}$$

$$\text{Upper limit: } X_1 + 1.96 \cdot X_1 \cdot \frac{\text{RSE}(X_1)}{100}$$

As a hypothetical example, assume the number of births, X_1 , is 70 from a file with 80 percent completeness. Then

$$\text{Lower limit: } 70 - 1.96 \cdot 70 \cdot \frac{13.4}{100} = 51.6$$

$$\text{Upper limit: } 70 + 1.96 \cdot 70 \cdot \frac{13.4}{100} = 88.4$$

This means that the chances are 95 times out of 100 that the confidence interval (51.6–88.4) will cover the “true” number of births.

For rates based on population estimates in the denominator, the 95 percent confidence interval may be computed as follows:

$$\text{Lower limit: } R_1 - 1.96 \cdot R_1 \cdot \frac{\text{RSE}(R_1)}{100}$$

$$\text{Upper limit: } R_1 + 1.96 \cdot R_1 \cdot \frac{\text{RSE}(R_1)}{100}$$

As a hypothetical example, assume the birth rate, R_1 , is 20.0, which is based on 70 births from a file with 80 percent completeness.

$$\text{Lower limit: } 20.0 - 1.96 \cdot 20.0 \cdot \frac{13.4}{100} = 14.7$$

$$\text{Upper limit: } 20.0 + 1.96 \cdot 20.0 \cdot \frac{13.4}{100} = 25.3$$

This means that the chances are 95 times out of 100 that the confidence interval (14.7–25.3) will cover the “true” rate.

For testing the equality of two rates, R_1 and R_2 , the following z-test may be used to define a significance test statistic:

$$z = \frac{R_1 - R_2}{\sqrt{R_1^2 \left(\frac{\text{RSE}(R_1)}{100}\right)^2 + R_2^2 \left(\frac{\text{RSE}(R_2)}{100}\right)^2}}$$

The two-tailed 0.95 critical value for a z statistic is 1.96. Therefore, if $|z|$ is greater than or equal to 1.96, the difference is significant at the 0.05 level. If $|z|$ is less than 1.96, then the difference would be considered not statistically significant at the 0.05 level.

As a hypothetical example, assume R_1 is the same as the above example for the current 12-month period and that R_2 , 15.0, is based on 50 births occurring in the prior 12-month period (which implies that the file is approximately 100 percent complete for R_2). The z-test may be determined as follows:

$$z = \frac{20.0 - 15.0}{\sqrt{(20.0)^2 \left(\frac{13.4}{100}\right)^2 + (15.0)^2 \left(\frac{14.1}{100}\right)^2}} = 1.46$$

Because $|z|$ is less than 1.96, there is not a statistically significant difference between the two rates at the 0.05 level of significance.

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