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SPECIAL ARTICLE

Annual Summary of Vital Statistics—2002

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ABSTRACT. The crude birth rate in 2002 was 13.9 births per 1000 population, the lowest ever reported for the United States. The number of births, the crude birth rate, and the fertility rate (64.8) all declined slightly (by 1% or less) from 2001 to 2002. Fertility rates were highest for Hispanic women (94.0), followed by black (65.4), Asian or Pacific Islander (63.9), Native American (58.0), and non-Hispanic white women (57.5). Fertility rates declined slightly for all race/ethnic groups from 2001 to 2002.

The birth rate for teen mothers continued to fall, dropping 5% from 2001 to 2002 to 42.9 births per 1000 women aged 15 to 19 years, another record low. The teen birth rate has fallen 31% since 1991; declines were more rapid for younger teens aged 15 to 17 (40%) than for older teens aged 18 to 19 (23%). The proportion of all births to unmarried women remained approximately the same at one third. Smoking during pregnancy continued to decline; smoking rates were highest among teen mothers.

In 2002, 26.1% of births were delivered by cesarean section, up 7% since 2001 and 26% since 1996. The primary cesarean rate has risen 23% since 1996, whereas the rate of vaginal birth after a previous cesarean delivery has fallen 55%. The use of timely prenatal care increased slightly to 83.8% in 2002. From 1990 to 2002, the use of timely prenatal care increased by 6% (to 88.7%) for non-Hispanic white women, by 24% (to 75.2%) for black women, and by 28% (to 76.8%) for Hispanic women, thus narrowing racial disparities.

The percentage of preterm births rose to 12.0% in 2002, from 10.6% in 1990 and 9.4% in 1981. Increases were largest for non-Hispanic white women. The percentage of low birth weight (LBW) births also increased to 7.8% in 2002, up from 6.7% in 1984. Twin and triplet/+ birth rates both increased by 3% from 2000 to 2001. Multiple births accounted for 3.2% of all births in 2001.

The infant mortality rate (IMR) was 6.9 per 1000 live births (provisional data) in 2002 compared with 6.8 in 2001 (final data). The ratio of the IMR among black infants to that for white infants was 2.5 in 2001, the same as in 2000. Racial differences in infant mortality remain a major public health concern. The role of LBW in infant mortality remains a major issue. New Hampshire, Utah, and Massachusetts had the lowest IMRs. State-by-state differences in IMR reflect racial composition, the percentage of LBW, and birth weight–specific neonatal mortality rates for each state. The United States continues to rank poorly in international comparisons of infant mortality.

Expectation of life at birth reached a record high of 77.2 years for all sex and race groups combined in 2001. Death rates in the United States continue to decline. Between 2000 and 2001, death rates declined for the 3 leading causes of death: diseases of the heart, malignant neoplasms, and cerebrovascular diseases. Death rates for children ages 1 to 19 years decreased for unintentional injuries by 3.3% in 2001; the death rate for chronic lower respiratory diseases decreased by 25% in 2001. Cancer and suicide levels did not change for children ages 1 to 19. A large proportion of childhood deaths continue to occur as a result of preventable injuries. *Pediatrics* 2003; 112:1215–1230; *birth, birth weight–specific mortality, death, infant mortality, low birth weight, mortality, multiple births, vital statistics, revised populations.*

ABBREVIATIONS. NCHS, National Center for Health Statistics; IMR, infant mortality rate; NMR, neonatal mortality rate; PNMR, postneonatal mortality rate; OMB, Office of Management and Budget; LBW, low birth weight; VBAC, vaginal birth after previous cesarean; VLBW, very low birth weight; SIDS, sudden infant death syndrome.

This annual article is a long-standing feature in *Pediatrics*. This year, we provide a summary of vital statistics data through 2002. For birth data, the most current information for 2002 was based on preliminary data, whereas more detailed

analyses were based on final data for 2001. For mortality data, the 2002 preliminary data were not available at the time of manuscript preparation, so 2002 provisional data were used. Because the 2002 provisional data contain considerably less detail, most of the analysis of mortality data uses 2001 final data. For childhood deaths, we have expanded our previous analysis of 2000 mortality data[1] to include the 10 leading causes of death for children aged 1 to 19 in 2001. We have also included sections on leading causes of death for infants and all ages, which did not appear in last year's article. Finally, we include a special feature that focuses on the effect of the 2000 census on trends in vital statistics rates.

METHODS

The data presented in this report were obtained from vital statistics records: birth certificates, fetal death reports, and death certificates for residents of the United States. Data for 2001 and earlier years are final and include all records. Birth data for 2002 are preliminary but are based on nearly 98% of births reported to the Centers for Disease Control and Prevention's National Center for Health Statistics (NCHS). Mortality data for 2002 are provisional and are based on counts of death certificates reported to NCHS by state health departments. More complete descriptions of vital statistics data systems are available elsewhere.[2–5] Preliminary birth and provisional mortality estimates for 2002 may differ from the final data for 2002 that will include all records, but differences are usually small.

Current vital statistics patterns and recent trends through 2002 are presented in this report by age, race, and Hispanic origin, as well as other birth and death characteristics. More detailed data are available in the final birth and death files for 2001 than in the preliminary and provisional files for 2002, so some of the detailed analyses of birth and death patterns focus on the 2001 data. Data on infant deaths from the linked birth/infant death data set are for 2001.

Hispanic origin and race are collected as separate items in vital records. People of Hispanic origin may be of any race, although most births and infant deaths of Hispanic origin (97%) are to white women. Because there are often important differences in childbearing patterns between non-Hispanic white and Hispanic women, all tables that present data by race include data separately for non-Hispanic white and Hispanic women. Data for black, Native American, and Asian or Pacific Islander women are not shown separately by Hispanic origin because the vast majority of these women are not Hispanic.

The mother's marital status for birth data, underlying cause of death for deaths, and birth weight for infant deaths have the following special considerations. Mother's marital status was reported directly on the birth certificates or through the electronic birth registration process in all but 2 states (Michigan and New York) in 2001 and 2002. Details about the reporting of marital status in those 2 states and methods of edits and imputations applied to other items on the birth certificate are presented in NCHS publications.[2,4,6]

Cause-of-death statistics in this report are based solely on the underlying cause of death. The underlying cause of death is defined as "(a) the disease or injury which initiated the train of morbid events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury." From 1999 to the present, cause-of-death data in the United States are classified according to the *10th Revision, International Classification of Diseases (ICD-10)*.[7] Ranking for leading causes of death is based on number of deaths.[8]

Infant mortality refers to the death of an infant under 1 year of age. Infant mortality rates (IMRs) were computed by dividing the total number of infant deaths in each calendar year by the total number of live births in the same year.[3,5,9] Neonatal mortality rates (NMRs) are shown for infants who died between 0 and 27 days of age, and postneonatal mortality rates (PNMRs) are shown for infants who died between 28 days and 1 year of age. Perinatal mortality rates include fetal deaths at 28+ weeks of gestation and infant deaths at <7 days of age. Fetal mortality rates are shown for

fetal deaths at 20+ weeks of gestation. Fetal and perinatal mortality rates were computed by dividing the number of fetal or perinatal deaths by the number of live births plus fetal deaths. IMR, NMR, and PNMR all are shown per 1000 live births.

The latest infant mortality statistics by birth weight were obtained from the 2001 period linked birth/infant death data set.[9] In this data set, the death certificate was linked with the corresponding birth certificate for each infant who died in the United States in 2001. The purpose of this linkage is to use additional variables available from the birth certificate, such as birth weight, to better interpret infant mortality patterns. Numbers of infant deaths were weighted to compensate for the 1% of infant deaths for whom the matching birth certificate could not be identified.[9] The weighting procedure results in the same overall IMR as that based on unlinked mortality data; however, small differences may exist because of geographic coverage differences, additional quality control, and weighting.[9]

Population denominators for the calculation of birth, death, and fertility rates are estimates based on the population enumerated by the US Census Bureau as of April 1, 2000. Estimates for 2000 to 2002 and the intercensal period 1991 to 1999 were produced under a collaborative arrangement between the US Census Bureau and the NCHS. 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 >1 race as appropriate for themselves and household members.[10] The 1997 OMB guidelines also provided for the reporting of Asian people separately from Native Hawaiians or other Pacific Islanders. Under the previous OMB standards, issued in 1977, data for people who are Asian or Pacific Islander were collected as a single group.[11] Birth and death certificates currently collect only 1 race for mother and decedent in the same categories as specified in the 1977 OMB guidelines and do not report Asians separately from Native Hawaiians or other Pacific Islanders. Birth and death certificate data by race (the numerators for birth and death rates) thus are currently incompatible with the population data collected in the 2000 census (the denominators for the rates).

To produce birth and death rates for 2000 to 2002 and revised intercensal rates for the 1991 to 1999 period, it was necessary to "bridge" the reported population data for people of multiple race 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 or Pacific Islanders and to reflect age as of the census reference data.[12] The procedures used to produce the "bridged" populations are described in separate publications.[13,14] Rates based on "bridged" population data may differ from previously published rates.

Data for international comparisons of IMRs, births, and birth rates were obtained from United Nations sources, including the 2000 Demographic Yearbook,[15] and the Population and Vital Statistics Reports, Statistical Papers, with data reported as of January 1, 2003,[16] January 1, 2002,[17] and January 1, 2001.[18] Organization for Economic Co-operation and Development Health Data 2002[19] were used to obtain IMRs for 2000 when they were not available from the United Nations sources and were consistent with trends for 1998 and 1999. The most recent report of data were used when a discrepancy was noted in the figures from an earlier source. Data on IMRs in 2000 were not available from United Nations sources for 11 countries reported in Table 9; for 7 of these countries, the Organization for Economic Co-operation and Development data are reported for 2000 and, for 1 country, 2001 data.

NATURAL INCREASE

As a result of natural increase (the excess of births over deaths), ~1.6 million people were added to the population in 2002 (Table 1).[4,5] The rate of natural increase was 5.5 people per 1000 population in 2002, compared with 5.7 in 2001.

BIRTHS

The number of births in the United States in 2002 was 4 019 280 (preliminary data), down <1% compared with the final total for 2000 (Table 1).[4] The birth rate in 2002 was 13.9 births per 1000 population, down 1% from the rate for 2001 (14.1) and the lowest

TABLE 1. Vital Statistics of the United States, 1915–2002 (Selected Years)

	Number			Rate*						
	2002	2001	2000	2002	2001	2000	1990	1980	1950	1915†
Live births	4 019 280	4 025 933	4 058 814	13.9	14.1	14.4	16.7	15.9	24.1	29.5
Fertility rate				64.8	65.3	65.9	70.9	68.4	106.2	125.0
Deaths	2 436 000	2 416 425	2 403 351	8.4	8.5	8.5	8.6	8.8	9.6	13.2
Age-adjusted rate				NA	8.5	8.7	9.4	10.4	14.5	21.7
Natural increase	1 583 280	1 609 508	1 655 463	5.5	5.7	5.9	8.1	7.1	14.5	16.3
Infant mortality	27 600	27 568	28 035	6.9	6.8	6.9	9.2	12.6	29.2	99.9
Population base (in thousands)				288 369	284 797	281 422	248 710	226 546	150 697	100 546

NA indicates data not available.

Birth data for 2002 are preliminary; mortality and infant mortality data for 2002 are provisional. All data for 2001 and earlier years are final. Populations are as of July 1 for 2001 and 2002 and as of April 1 in 1950, 1980, 1990, and 2000. Population for 1915 is the midyear estimate based on the April 15, 1910, census. Rates for 2000–2001 have been revised using populations based on the 2000 census and may differ from rates previously published.[4,17]

Source: Centers for Disease Control and Prevention/NCHS, National Vital Statistics System, and the US Census Bureau.

* Rates per 1000 population except for fertility, which is per 1000 women 15 to 44 years old and infant mortality, which is per 1000 live births.

† Birth rate adjusted to include states not in registration area (10 states and the District of Columbia when started in 1915). Death rate is for death registration area. IMR is for birth registration area.

TABLE 2. Live Births, Age-Specific Birth Rates*, and Total Fertility Rates† by Race and Hispanic Origin of Mother (United States, 2001)

	Live Births	Age-Specific Birth Rate by Age of Mother*								Total Fertility Rate†
		15–44‡	15–17	18–19	20–24	25–29	30–34	35–39	40–44	
Total	4 025 933	65.3	24.7	76.1	106.2	113.4	91.9	40.6	8.1	2034.0
White	3 177 626	65.0	21.4	70.8	103.7	117.0	95.8	41.3	8.0	2040.0
Black	606 156	67.6	43.9	114.0	133.2	99.2	64.8	31.6	7.2	2051.0
Native American§	41 872	58.1	31.4	94.8	115.0	90.4	55.9	24.7	5.7	1746.5
Asian/Pacific Islander	200 279	64.2	10.3	32.8	59.1	106.4	112.6	56.7	12.3	1840.0
All Hispanic	851 851	96.0	52.8	135.5	163.5	140.4	97.6	47.9	11.6	2748.5
Mexican	611 000	105.7	59.3	147.0	177.0	146.4	101.9	50.0	12.6	2928.5
Puerto Rican	57 568	72.2	‖	‖	147.2	93.6	70.5	30.7	6.7	2165.0
Cuban	14 017	56.7	‖	‖	‖	‖	‖	‖	‖	1792.5
Central and South American and other	169 266	82.7	35.6	115.2	136.0	143.3	95.4	50.3	11.6	2519.5
Non-Hispanic white	2 326 578	57.7	14.0	54.8	87.1	108.9	94.3	39.8	7.5	1843.0

Race and Hispanic origin are reported separately on birth certificates. People of Hispanic origin may be of any race. In this table, Hispanic women are classified only by place of origin; non-Hispanic women are classified by race. Populations are from the US Census Bureau. Rates by race and for Hispanic and non-Hispanic white women have been revised using populations based on the 2000 census and may differ from rates previously published.[17]

Source: Centers for Disease Control and Prevention/NCHS, National Vital Statistics System, natality.

* Rates per 1000 women in age-specific group.

† Sum of age-specific birth rates times 5 divided by 1000 (includes rates for ages 10–14 and 45–49 years, not shown separately).

‡ Relates the number of births to women of all ages to women 15 to 44 years.

§ Includes births to Aleuts and Eskimos.

‖ Figure does not meet standards of reliability or precision; based on either <20 births in the numerator or, for the Hispanic subgroups, <75 000 women in the denominator.

birth rate reported for the United States since national data have been available. The fertility rate, defined as the number of births per 1000 women aged 15 to 44 years, also decreased slightly to 64.8 in 2002, compared with 65.3 in 2001. The total fertility rate for 2002 was 2012.5, 1% lower than in 2001 (2034.0). The total fertility rate estimates the number of births that a hypothetical group of 1000 women would have if they experienced, throughout their childbearing years, the age-specific birth rates observed in a given year. Because it is computed from age-specific birth rates, the total fertility rate is age-adjusted; it is not affected by changes over time in age composition. The birth, fertility, and total fertility rates all have generally declined since 1990, by 17%, 9%, and 3%, respectively.[4]

Racial and Ethnic Composition

Fertility rates vary among race and ethnic groups (Table 2). Hispanic women had the highest fertility rate (94.0 births per 1000 women aged 15–44 years in preliminary 2002 data).[4] Rates in 2002 were considerably lower for black (65.4), Asian or Pacific Islander (63.9), Native American (58.0), and non-Hispanic white women (57.5). Between 2001 and 2002, fertility rates declined slightly for all race and ethnic groups. In 2002, 22% of all births in the United States were to Hispanic women, compared with 14% in 1989.

When comparing race and ethnic groups, Mexican-American women continue to have the highest fertility, with a rate of 105.7 per 1000 in 2001 (Table 2), and the highest age-specific birth rates among women <30 and aged 40 to 44. In contrast, Asian or

SPECIAL ARTICLE **1217**

TABLE 3. Birth Rates* for Teens, by Age, Race, and Hispanic Origin: United States, Final, Selected Years, 1990–2001 and Preliminary 2002

Age and Race and Hispanic Origin of Mother	2002	2001	2000	1991	1990	% Change 1991–2002
15–19 y						
All races	42.9	45.3	47.7	61.8	59.9	−30.6
White, total	39.4	41.2	43.2	52.6	50.8	−25.1
White, non-Hispanic†	28.6	30.3	32.6	43.4	42.5	−34.1
Black, total	66.2	71.8	77.4	114.8	112.8	−42.3
Asian or Pacific Islander	18.3	19.8	20.5	27.3	26.4	−33.0
Native American	53.8	56.3	58.3	84.1	81.1	−36.0
Hispanic†	82.9	86.4	87.3	104.6	100.3	−20.7
15–17 y						
All races	23.2	24.7	26.9	38.6	37.5	−39.9
White, total	20.5	21.4	23.3	30.6	29.5	−33.0
White, non-Hispanic†	13.2	14.0	15.8	23.7	23.2	−44.3
Black, total	39.7	43.9	49.0	83.6	82.3	−52.5
Asian or Pacific Islander	9.0	10.3	11.6	16.1	16.0	−44.1
American Indian	30.7	31.4	34.1	52.2	48.5	−41.2
Hispanic†	50.3	52.8	55.5	69.3	65.9	−27.4
18–19 y						
All races	72.7	76.1	78.1	94.0	88.6	−22.7
White, total	68.0	70.8	72.3	83.2	78.0	−18.3
White, non-Hispanic†	52.0	54.8	57.5	70.6	66.6	−26.3
Black, total	107.1	114.0	118.8	157.6	152.9	−32.0
Asian or Pacific Islander	31.5	32.8	32.6	43.0	40.2	−26.7
Native American	89.2	94.8	97.1	132.9	129.3	−32.9
Hispanic†	132.2	135.5	132.6	155.1	147.7	−14.8

Race and Hispanic origin are reported separately on birth certificates. People of Hispanic origin may be of any race. In this table, Hispanic women are classified only by place of origin; non-Hispanic women are classified by race. Populations are from the US Census Bureau. Rates for 1991–2001 have been revised using populations based on the 2000 census and may differ from those previously published.[17]

Source: Centers for Disease Control and Prevention/NCHS, National Vital Statistics System, natality.

* Rates per 1000 women in specified group.

† In 1991 excludes data for New Hampshire and in 1990 excludes data for New Hampshire and Oklahoma, which did not report Hispanic origin on the birth certificate.

Pacific Islander women have the highest rates among women in their 30s.[20]

Trends in Age-Specific Birth Rates

Teen Childbearing

In 2002, the preliminary teen birth rate was 42.9 births per 1000 women aged 15 to 19, 31% lower than the rate of 61.8 in 1991 when it reached a 20-year high (Table 3). The 2002 rate was 5% lower than in 2001 (45.3) and is the lowest rate in the >6 decades for which comparable data have been available.[4,20,21] Birth rates declined more rapidly for the younger teens aged 15 to 17 (by 40% since 1991) than for the older teens aged 18 to 19 (23%). The birth rate for the youngest mothers aged 10 to 14 fell the most rapidly. The 2002 rate of 0.7 is just half the rate of 1.4 in 1991 and is the lowest rate recorded since 1946. The number of births to teenagers also declined in 2002, entirely as a result of the declining birth rate, as the number of female teenagers in the US population has increased steadily since 1993.[20]

Teen birth rates declined for all age, race, and Hispanic-origin groups from 2001 to 2002 (Table 3). 2002 teen birth rates ranged from 18.3 for Asian or Pacific Islander teens to 82.9 for Hispanic teens. Teen birth rates declined during the 1990s for all race and Hispanic-origin groups (Fig 1, Table 3).[20] Declines from 1991 to 2002 were largest for black teens (42%);
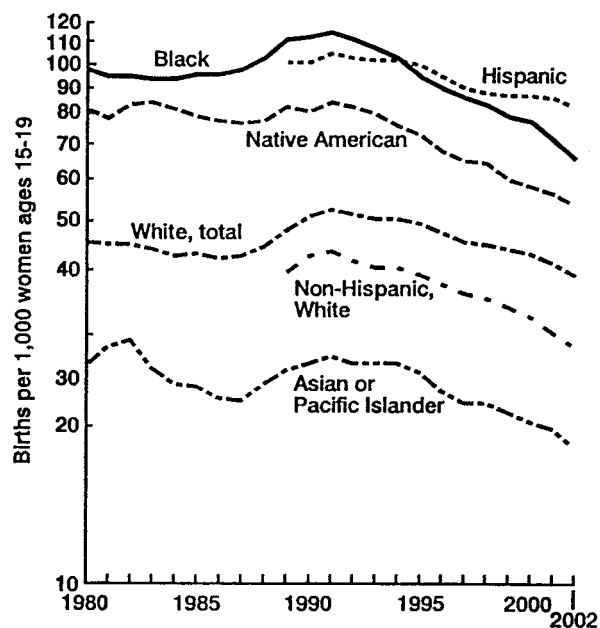
Fig 1. Birth rate for teens 15 to 19 by race and Hispanic origin: United States, 1980 to 2002.

intermediate for Native American (36%), non-Hispanic white (34%), and Asian or Pacific Islander (33%) teens; and smallest for Hispanic teens (21%).[20]

Among teenagers, an estimated 56% of pregnancies ended in live birth, 29% in induced abortion, and 15% in fetal loss in 1999, the most recent year for which pregnancy data are available.[22] Teen birth rates fell by 19% from 1990 to 1999, whereas abortion rates declined even more rapidly (39%).[20,23] Recently published abortion data for 1999 and 2000 show a continued decline in abortions among teenagers.[24] Along with the drop in the teen birth rate, the decline in abortions suggests that the teen pregnancy rate has fallen as well.

Nearly 4 in 5 teen births are first births. Repeat births account for only 21% of all teen births but are of particular concern, as a teenager with 2 or more children is at greater risk for a host of difficulties.[4,25] Declines have been fairly similar for first and repeat teen birth rates over the decade.

Childbearing for Women ≥20 Years Old

From 2001 to 2002, the birth rate for women 20 to 24 years of age decreased 3% to 103.5, whereas the rate for 25- to 29-year-olds was essentially unchanged (113.6, preliminary data). Rates for women in these age groups have been relatively stable over the past 2 decades.[2,20]

Birth rates for women aged 30+ have generally increased over the past 2 decades. From 2001 to 2002,

the birth rate for women aged 30 to 34 (91.6 in 2002) changed little; however, rates for women aged 35 to 39 (41.4) and 40 to 44 (8.3) each increased by 2%, to their highest levels in at least 30 years. After rapid increases during the 1990s, the birth rate for women aged 45 to 54 was 0.5 in 2002, the same as in 2001. The upward trend in birth rates for women in their 30s and 40s reflects in large part the ongoing tendency for many women to make up for previously postponed childbearing.[2,26]

Unmarried Mothers

The number of births to unmarried women increased very slightly from 1 349 249 in 2001 to 1 358 768 in 2002 (preliminary data).[2,4] This increase was entirely attributable to the growth in the population of unmarried women of reproductive age.[4] The birth rate for unmarried women was 43.6 per 1000 unmarried women aged 15 to 44 years in 2002, down slightly from 43.8 in 2001. It has remained below the peak reached in 1994 (46.9). In 2002, 33.8% of all births were to unmarried women, slightly higher than in 2001 (33.5%). This proportion has changed little since 1994.[2,27] From 2001 to 2002, it increased for non-Hispanic white (22.9%) and Hispanic (43.4%) women and declined for black (68.0%) women.

TABLE 4. Percentage of Births With Selected Characteristics, by Race and Hispanic Origin of Mother: United States, Final 1990, 2001, Preliminary 2002

	All Races*			White, Total			Non-Hispanic White			Black, Total			Hispanic		
	2002	2001	1990	2002	2001	1990	2002	2001	1990†	2002	2001	1990	2002	2001	1990†
Mother															
<20 Years of age	10.7	11.3	12.8	9.7	10.2	10.9	7.9	8.2	9.6	18.0	18.9	23.1	14.8	15.6	16.8
Unmarried	33.8	33.5	28.0	28.4	27.7	20.4	22.9	22.5	16.9	68.0	68.4	66.5	43.4	42.5	36.7
<12 Completed years of school‡	NA	16.7	17.6	NA	17.2	17.1	NA	8.1	15.2	NA	16.8	19.6	NA	44.6	53.9
≥16 Completed years of school‡	NA	28.3	20.1	NA	29.7	21.7	NA	36.3	22.5	NA	15.0	9.4	NA	9.3	5.1
Smoker§	NA	12.0	18.4	NA	13.0	19.4	NA	15.5	20.9	NA	9.0	15.9	NA	3.2	6.7
Diabetes during pregnancy	NA	3.1	2.1	NA	3.0	2.2	NA	3.0	2.3	NA	2.9	1.8	NA	3.0	2.4
Pregnancy-associated hypertension	NA	3.8	2.7	NA	3.8	2.8	NA	4.2	3.1	NA	4.1	2.7	NA	2.6	2.3
Health care utilization															
First trimester prenatal care	83.8	83.4	75.8	85.5	85.2	79.2	88.7	88.5	83.3	75.2	74.5	60.6	76.8	75.7	60.2
Midwife-attended births	NA	8.0	3.9	NA	8.1	3.9	NA	7.5	3.2	NA	7.5	4.5	NA	9.6	6.2
Cesarean delivery rate	26.1	24.4	22.7	25.9	24.3	23.0	26.2	24.5	23.4	27.6	25.9	22.1	25.2	23.6	21.2
Infant															
Birth weight															
VLBW‖	1.4	1.4	1.3	1.2	1.2	1.0	1.2	1.2	0.9	3.1	3.0	2.9	1.2	1.1	1.0
LBW‖	7.8	7.7	7.0	6.8	6.7	5.7	6.9	6.8	5.6	13.3	13.0	13.3	6.5	6.5	6.1
Preterm birth¶	12.0	11.9	10.6	11.1	11.0	8.9	11.0	10.8	8.5	17.5	17.5	18.8	11.6	11.4	11.0
Multiple births per 1000 total births															
Live births in twin deliveries (not percent)	NA	30.1	22.6	NA	30.0	22.1	NA	33.5	22.9	NA	33.7	26.5	NA	20.3	18.0
Live births in higher-order multiple deliveries (not percent)	NA	1.9	0.7	NA	2.1	0.8	NA	2.5	0.9	NA	0.9	0.5	NA	0.8	0.4

NA indicates data not available.

Race and Hispanic origin are reported separately on birth certificates. People of Hispanic origin may be of any race. In this table, Hispanic women are classified only by place of origin; non-Hispanic women are classified by race.

Source: Centers for Disease Control and Prevention/NCHS, National Vital Statistics System, natality.

* Includes races other than white and black.

† Excludes data for New Hampshire and Oklahoma, which did not report Hispanic origin.

‡ Includes mothers ≥20 years old. For 1990, excludes data for New York (exclusive of New York City) and Washington, which did not report educational attainment of mother.

§ For 2001, excludes data for California, and for 1990, excludes data for California, Indiana, New York, Oklahoma, and South Dakota, which did not report tobacco use during pregnancy.

‖ VLBW is birth weight of <1500 g (3 lb, 4 oz), and LBW is birth weight of <2500 g (5 lb, 8 oz).

¶ Born before 37 completed weeks of gestation.

The number of nonmarital births to teenagers declined from 2001 to 2002, by 5% for 10- to 14-year-olds, and by 4% for 15- to 17- and 18- to 19-year-olds.[4] Despite these reductions, the proportions of nonmarital births among teenagers rose slightly in 2002 because total births to teenagers declined even more than births to unmarried teenagers. Birth rates for unmarried teenagers declined by 19% overall between 1994 and 2001.[20]

Smoking During Pregnancy

Smoking during pregnancy has declined steadily since 1989, the first year this information was reported on the birth certificate. In 2001 (latest year for which data are available), 12.0% (Table 4) of women reported smoking during pregnancy, 38% lower than in 1989 (19.5%).[2,28] Tobacco use during pregnancy is a risk factor for a variety of adverse outcomes, including low birth weight (LBW), intrauterine growth retardation, and infant mortality, as well as negative consequences for child health.[2,9,29–31]

The percentage of mothers who smoked during pregnancy was highest for American Indian (19.9%) and Non-Hispanic white women (15.5%); moderate for Puerto Rican (9.7%) and black women (9.0%); and lowest for Asian and Pacific Islander, Mexican, Cuban, and Central and South American women (1%–3%). The teen smoking rate decreased slightly from 17.8% to 17.5% from 2000 to 2001, a reversal of their generally upward trend since 1994. Still, pregnant teens have higher smoking rates than any other age group, and teen smoking remains a major public health problem. Variations by race and Hispanic origin were particularly marked for teen smokers. For example, 30.5% of non-Hispanic white teens aged 15 to 19 smoked during pregnancy, compared with only 2% to 3% of Mexican and Central and South American teens. Smoking during pregnancy by black teenagers, historically relatively rare, has risen from 5.0% to 7.2% since 1994.[2,28]

Prenatal Care

The percentage of women who began prenatal care in their first trimester of pregnancy increased slightly from 83.4% in 2001 to 83.8% in 2002 (Table 4). This percentage has increased by 11% since 1990 (75.8%). Timely receipt of prenatal care is one area in which efforts to reduce racial disparities in health have met with some success, although disparities still exist. From 1990 to 2002, first-trimester care increased by 6% (from 83.3% to 88.7%) for non-Hispanic white women but by 24% for black women (from 60.6% to 75.2%) and by 28% for Hispanic women (from 60.2% to 76.8%).

The benefits of prenatal care are difficult to measure, but timely and appropriate prenatal care may promote better birth outcomes by providing early risk assessment to manage preexisting medical conditions and by offering health behavior advice such as smoking cessation and nutrition counseling.[32–34] The proportion of women who began care during the third trimester of pregnancy or had no care declined to 3.6% in 2002, compared with 6.1% in 1990.[2,4]

Cesarean Delivery

In 2002, the cesarean delivery rate was 26.1, an increase of 7% over 2001 (Table 4), and is at the highest level reported since data have been available from birth certificates (1989).[2,4,35] The cesarean delivery rate declined steadily between 1989 and 1996 but has climbed 26% since 1996 (Fig 2). The rise is attributable to both an increase in the primary cesarean rate (first cesareans per 100 live births to women who had no previous cesarean; 18.0% in 2002) and a sharp decline in the rate of vaginal births after previous cesarean (VBAC) delivery. From 2001 to 2002, the VBAC rate fell 23% to 12.7% per 100 women with a previous cesarean delivery. It had risen 50% from 1989 to 1996 but has fallen 55% since the 1996 high of 28.3%.

Cesarean rates rose for all racial, ethnic, and age groups between 1996 and 1999.[35] From 2001 to 2002, they each increased 7% among non-Hispanic white (26.2%), black (27.6%), and Hispanic (25.2%) women. In 2001 as in previous years, cesarean rates increased steadily with advancing maternal age and were more than twice as high for mothers aged 40 to 54 years (38.0%) than for mothers under age 20 (16.8%).[2] The recent decline in the VBAC rate may reflect renewed controversy over the safety of VBAC compared with elective repeat cesareans.[36,37]

Multiple Births

The twin birth rate continued its upward climb in 2001, increasing by 3% to 30.1 twin births per 1000 total births (Table 4). The twin birth rate has risen by 59% since 1980 (18.9). After 2 years of decline, the birth rate for triplets and other higher order multiples (triplet+) rose 3%, to 185.6 triplet+ births per 100 000 in 2001, although this level is lower than the
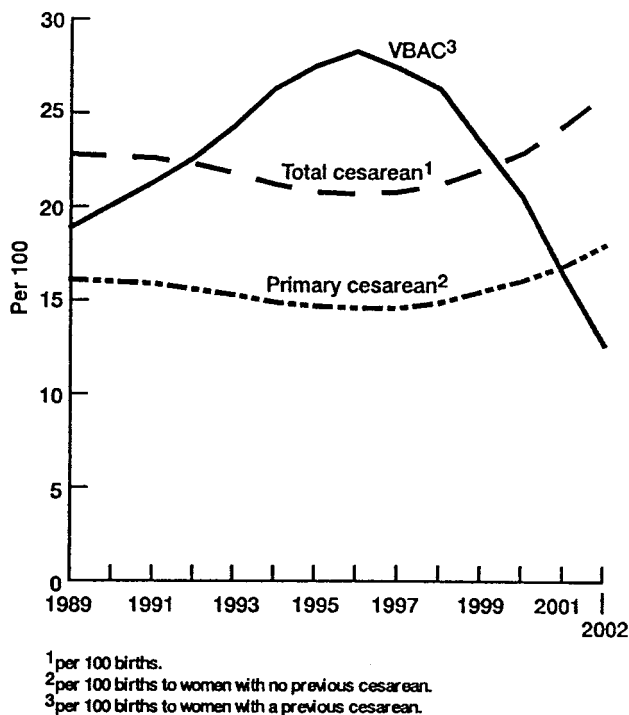

Fig 2. Total and primary cesarean rate and VBAC rate, United States, 1989 to 2002.

[1] per 100 births.
[2] per 100 births to women with no previous cesarean.
[3] per 100 births to women with a previous cesarean.

1998 peak of 193.5. Before 1998, the higher order multiple birth rate had more than doubled since 1991 (81.4) and quadrupled since 1980 (37.0).[2,38] Twins, triplets, and other higher order multiples accounted for 3.2% of all births in 2001. The rise in multiple births has been especially steep among births to women in the oldest childbearing ages; for example, 1 (20.1%) in 5 births to women aged 45 to 54 years in 2001 was a multiple-birth delivery compared with 1 in 50 in 1990 (tabular data not shown).[2]

The increase in multiple births, especially higher order multiples, has been associated with 2 related trends: older age at childbearing and increased use of ovulation-inducing drugs and assisted reproductive technologies, such as in vitro fertilization.[2,38,39] Multiple births, regardless of how conceived, tend to be high-risk births. More than half of all twins and >90% of triplets are born preterm or LBW; multiple births also have a greatly elevated risk of infant death.[2,9] Because of their increased risk of poor outcome, the American College of Obstetricians and Gynecologists and the American Society of Reproductive Medicine issued recommendations in 1999 intended to prevent triplet+ pregnancies.[40,41]

Preterm Birth

The percentage of births that were preterm (<37 completed weeks of gestation) increased slightly from 11.9% in 2001 to 12.0% in 2002 (Table 4). The percentage of births that were preterm has risen fairly steadily over the past 2 decades, from 9.4% in 1981 and 10.6% in 1990. Preterm births have higher morbidity and mortality rates, when compared with term births.[42,43] The percentage of preterm births was higher for black mothers (17.5%) than for non-Hispanic white (11.0%) or Hispanic mothers (11.6%) in 2002 (Table 4). The causes of preterm delivery are not fully understood, and until progress is made in this regard, substantial reduction in the preterm birth rate seems unlikely.[2,42–44]

For non-Hispanic white women, the percentage of preterm births has risen sharply (by 29%) from 8.5% in 1990 to 11.0% in 2002. Although still substantially higher than for non-Hispanic white women, the preterm birth rate for black mothers has followed a slow downward trend since peaking at 18.9% in 1991. The percentage of preterm births for Hispanic women has been relatively stable since 1990, when it was 11.0%.

LBW

The percentage of LBW (<2500 g) births increased from 7.7% in 2001 to 7.8% in 2002, the highest level in >3 decades (7.9% in 1970; Table 4). From 1984 to 1998, the percentage of LBW births increased fairly steadily from the low of 6.7% reported in 1984. The percentage of very low birth weight (VLBW; <1500 g) births was 1.45% in 2002 and has remained relatively stable since 1998. Previously, VLBW had risen moderately from 1.15% in 1980 to 1.45% in 1998.[2] When compared with the IMR of 2.4 infant deaths per 1000 live births weighing 2500+ g, the risk of infant death in 2001 was 6 times higher for infants who weighed 1500 to 2499 g (15.2) and >100 times

TABLE 5. IMR, NMR, PNMR, Perinatal Mortality Rate, and Fetal Mortality Rate by Race of Mother: Final 1980, 1990, 2000, and 2001

	2001	2000	1990	1980	% Change 1980–2001
IMR*	6.8	6.9	9.2	12.6	−46.0
White, total	5.7	5.7	7.6	10.9	−47.7
White non-Hispanic	5.7	5.7	7.4	NA	NA
Black, total	14.0	14.1	18.0	22.2	−36.9
Hispanic	5.5	5.6	7.8	NA	NA
Black/white ratio	2.5	2.5	2.4	2.0	
NMR*	4.5	4.6	5.8	8.5	−47.1
White, total	3.8	3.8	4.8	7.4	−48.6
White non-Hispanic	3.8	3.8	4.7	NA	NA
Black, total	9.2	9.4	11.6	14.6	−37.0
Hispanic	3.7	3.7	5.0	NA	NA
Black/white ratio	2.4	2.5	2.4	2.0	
PNMR*	2.3	2.3	3.4	4.1	−43.9
White, total	1.9	1.9	2.8	3.5	−45.7
White non-Hispanic	1.9	1.9	2.8	NA	NA
Black, total	4.8	4.7	6.4	7.6	−36.8
Hispanic	1.8	1.9	2.8	NA	NA
Black/white ratio	2.5	2.5	2.3	2.2	
Perinatal mortality rate		7.0	9.1	13.2	
White, total		5.9	7.7	11.8	
White non-Hispanic		6.7	7.5†	NA	
Black, total		12.7	16.4	21.3	
Hispanic		6.0	8.5†	NA	
Black/white ratio		2.2	2.1	1.8	
Fetal mortality rate		6.6	7.5	9.1	
White, total		5.6	6.4	8.1	
White non-Hispanic	5.0	6.1†	NA		
Black, total		12.4	13.3	14.7	
Hispanic	5.7	6.7†	NA		
Black/white ratio		2.2	2.1	1.8	

NA indicates data not available.
Infant, fetal, and perinatal deaths are tabulated separately by race and Hispanic origin; people of Hispanic origin may be of any race. IMRs, NMRs, and PNMRs by race from unlinked data may differ slightly from those based on the linked file (Table 6).
Source: Centers for Disease Control and Prevention/National Center for Health Statistics, National Vital Statistics System, natality, mortality (unlinked file), and fetal death files.
* Includes races other than white and black; rate per 1000 live births.
† Data from 36 States and the District of Columbia with >90% completeness of reporting of Hispanic origin data. Includes >80% of the Hispanic population.

higher for infants with birth weights of <1500 g (244.4).[9]

Between 2001 and 2002, the percentage of LBW births increased slightly for non-Hispanic white women and is up 23% since 1990 (Table 4). LBW incidence also rose to 13.3% for black mothers in 2002, after remaining relatively stable at 13.0% to 13.1% from 1995 to 2001. For Hispanic women, the percentage of LBW births was unchanged at 6.5%. LBW rates tend to be highest for the youngest (<15 years) and the oldest mothers (ages 45+), but much of the LBW risk for the latter age group is attributable to their higher multiple-birth rates.

INFANT MORTALITY

In 2002, ~27 600 infant deaths (provisional data) were reported in the United States. The IMR was 6.9 per 1000 live births (provisional data) in 2002, compared with the 2001 rate of 6.8 (Table 1).[3,5,9] The NMR was 4.5 per 1000 live births in 2001 (latest year this rate is available), 2.2% less than the rate of 4.6 in
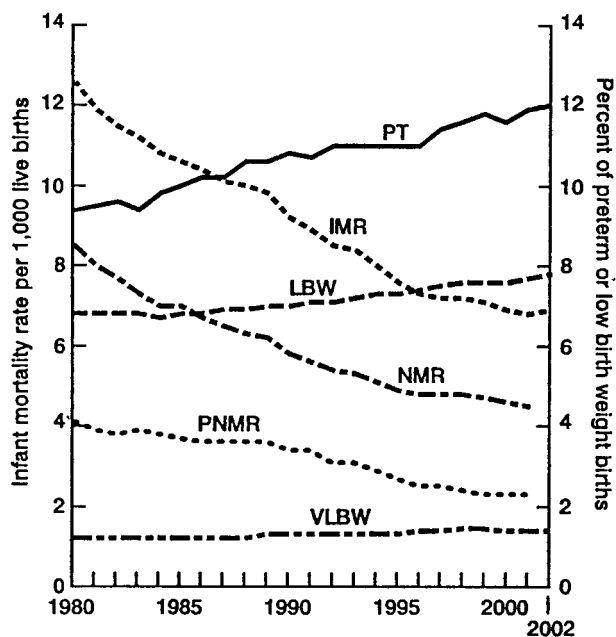
Fig 3. Infant, neonatal, and postneonatal mortality; LBW and VLBW; and preterm delivery, United States, 1980 to 2002.

data set for 2001 shows important differences in IMRs according to key maternal, demographic, and health characteristics.[9] Rates were higher for infants whose mothers were teenagers or 40 years of age or older, did not complete high school, were unmarried, began prenatal care after the first trimester of pregnancy, or smoked during pregnancy. IMRs were also higher for male infants, multiple births, and infants born preterm or LBW.

Infant mortality in the United States has declined by 46% since 1980 (Table 5, Fig 3).[3] The NMR declined more rapidly during the 1980s, whereas the PNMR declined more rapidly during the 1990s. The decline in the perinatal mortality rate has closely paralleled the decline in the NMR, whereas the fetal mortality rate has declined more slowly.

Racial differences in the IMR remain a major national concern. The relative difference in rates between black and white newborns expressed as a ratio of black to white IMRs was 2.5 in 2001 (Table 5). The Hispanic IMR was 3.5% lower than the non-Hispanic white IMR in 2001. Racial disparities in IMR present continued challenges for researchers and health care providers alike.[45–47]

2000, whereas the PNMR was 2.3 per 1000 live births in both 2001 and 2000 (Table 5). Between 2000 and 2001, the IMR declined by 1% and 2% for infants of black and Hispanic mothers, respectively. The NMR declined by 2% for infants of black mothers. The PNMR declined by 5% for infants of Hispanic mothers and increased by 2% for infants of black mothers. There was no statistically significant change in IMR, NMR, or PNMR for infants of white mothers.

Information from the linked birth/infant death

Birth Weight–Specific Infant Mortality

Birth weight is one of the most important predictors of infant mortality. The IMR for a given population can be partitioned into 2 key components: the birth weight distribution and birth weight–specific mortality rates (the mortality rate for infants at a given weight). The IMR can decrease when either the percentage of LBW births decreases or birth weight–specific mortality rates decrease. The percentage of LBW births has increased from a low of 6.7% in 1984

TABLE 6. IMR and NMR by Birth Weight and Race of Mother, 2001 Linked File, and Percentage Change in Birth Weight–Specific IMR, 1995–2001 Linked Files: United States

Birth Weight (g)	IMR†				NMR‡				% Change in IMR 1995–2001
	All Races*	Non-Hispanic White	Black	Hispanic	All Races*	Non-Hispanic White	Black	Hispanic	
Total	6.8	5.7	13.3	5.4	4.5	3.8	8.9	3.6	−10.5
<2500	58.6	52.2	75.7	54.9	47.6	43.3	59.8	44.7	−9.3
<1500	244.4	229.4	270.1	231.8	213.8	205.7	228.7	203.0	−8.9
<500	855.0	872.3	847.5	812.5	838.1	859.2	827.8	792.3	−5.4
500–749	476.8	494.5	453.5	478.6	411.1	438.5	374.0	420.7	−9.7
750–999	154.1	156.6	150.3	148.6	115.9	127.7	95.9	113.6	−15.4
1000–1249	73.8	77.0	68.3	72.1	50.0	57.6	38.1	48.8	−13.7
1250–1499	45.6	43.5	42.4	53.4	34.0	34.3	27.2	40.3	−16.5
1500–1999	27.2	26.8	25.8	30.5	17.4	17.8	14.1	20.9	−18.1
2000–2499	11.3	10.8	11.3	12.3	6.0	6.2	4.7	7.2	−16.3
≥2500	2.4	2.3	3.8	1.9	0.9	0.8	1.1	0.7	−20.0
2500–2999	4.5	4.6	5.4	3.6	1.7	2.0	1.6	1.4	−16.7
3000–3499	2.3	2.2	3.3	1.8	0.8	0.8	0.9	0.7	−20.7
3500–3999	1.7	1.5	3.1	1.3	0.5	0.5	0.9	0.5	−15.0
4000–4499	1.5	1.4	2.7	1.3	0.5	0.5	§	0.4	−16.7
≥4500	2.4	1.9	6.2	2.3	1.4	0.9	§	§	−14.3

IMRs and NMRs by race from the linked file differ slightly from those based on unlinked data because the linked file uses the self-reported race of mother from the birth certificate, whereas the unlinked data use the race of child as reported by the funeral director on the death certificate. Race and Hispanic origin are reported separately on birth certificates. People of Hispanic origin may be of any race. In this table, Hispanic women are classified only by place of origin; non-Hispanic women are classified by race.
Source: Centers for Disease Control and Prevention/NCHS, 1995 and 2001 Period Linked Birth/Infant Death Data Sets.
* Includes races other than white and black.
† IMR are infant deaths during a year per 1000 live births in specified group.
‡ NMR are deaths of infants 0–27 days of age per 1000 live births in specified group.
§ Figure does not meet standards of reliability or precision.

TABLE 7. Percentage LBW and IMR by Race of Mother, United States and Each State, 2001

State of Residence	% LBW*					IMR†				
	All‡ Races	White, total	Non-Hispanic White	Black	Hispanic	All Races	White, total	Non-Hispanic White	Black	Hispanic
United States§	7.7	6.7	6.8	13.0	6.5	6.8	5.7	5.7	14.0	5.5
Alabama	9.6	7.6	7.6	14.0	6.9	9.4	6.8	6.9	15.1	‖
Alaska	5.7	5.2	5.0	10.9	6.3	8.1	5.8	6.1	‖	‖
Arizona	7.0	6.7	6.7	13.7	6.6	6.9	6.1	5.7	22.8	7.2
Arkansas	8.8	7.5	7.6	14.1	5.9	8.3	6.8	7.2	14.5	‖
California	6.3	5.8	5.9	11.6	5.7	5.4	5.0	5.0	12.9	5.1
Colorado	8.5	8.2	8.1	14.0	8.4	5.8	5.5	5.0	12.8	6.6
Connecticut	7.4	6.7	6.3	12.1	8.2	6.1	4.7	4.3	16.9	6.9
Delaware	9.3	7.7	7.9	13.7	6.5	10.7	8.0	8.3	19.9	‖
District of Columbia	12.1	6.3	6.3	15.3	6.5	10.6	‖	‖	15.0	‖
Florida	8.2	6.8	7.0	12.5	6.5	7.3	5.5	5.9	13.5	4.4
Georgia	8.8	6.7	7.0	12.9	5.7	8.6	6.2	6.7	13.3	4.5
Hawaii	8.1	6.5	6.7	11.4	7.6	6.2	6.0	‖	‖	‖
Idaho	6.4	6.4	6.3	‖	6.8	6.2	6.3	6.1	‖	7.6
Illinois	8.0	6.6	6.7	13.7	6.6	7.7	6.0	6.0	15.5	5.7
Indiana	7.6	7.0	7.0	12.9	6.6	7.5	6.8	6.8	13.7	8.0
Iowa	6.4	6.1	6.1	13.7	6.2	5.6	5.5	5.3	‖	‖
Kansas	7.0	6.5	6.6	12.4	6.0	7.4	6.5	6.2	20.5	7.9
Kentucky	8.3	7.8	7.8	13.4	7.7	5.9	5.6	5.6	9.7	‖
Louisiana	10.4	7.7	7.7	14.4	6.6	9.8	6.5	6.6	14.4	‖
Maine	6.0	6.0	6.1	‖	‖	6.1	5.7	5.8	‖	
Maryland	9.0	7.0	7.0	12.9	6.9	8.1	5.5	5.7	13.7	4.7
Massachusetts	7.2	6.8	6.5	10.2	8.3	5.0	4.6	4.1	9.6	7.4
Michigan	8.0	6.6	6.7	14.1	6.2	8.0	6.1	6.0	17.0	7.2
Minnesota	6.3	5.9	5.9	9.8	6.2	5.3	4.8	4.6	9.6	7.3
Mississippi	10.7	7.8	7.8	14.3	7.0	10.5	7.0	7.0	14.9	‖
Missouri	7.6	6.7	6.8	12.6	5.7	7.4	5.9	6.0	16.5	‖
Montana	6.9	6.9	7.0	‖	8.0	6.7	6.7	6.5	‖	‖
Nebraska	6.6	6.3	6.3	12.4	6.2	6.8	6.4	6.5	‖	7.1
Nevada	7.6	7.0	7.5	13.0	6.4	5.7	5.1	4.9	17.1	5.4
New Hampshire	6.5	6.4	6.1	13.9	5.9	3.8	3.8	3.9	‖	
New Jersey	7.9	6.8	6.7	12.6	7.0	6.5	5.1	4.5	14.2	6.5
New Mexico	7.9	7.9	7.8	13.1	8.0	6.4	6.3	5.7	‖	6.9
New York	7.7	6.7	6.4	11.3	7.4	5.8	5.1	5.3	9.7	4.0
North Carolina	8.9	7.3	7.6	13.8	6.1	8.5	6.1	6.4	15.8	4.9
North Dakota	6.2	6.1	6.0	‖	‖	8.8	8.0	7.8	‖	‖
Ohio	8.0	7.0	7.0	13.4	7.0	7.7	6.2	6.2	16.4	5.9
Oklahoma	7.8	7.3	7.4	13.6	5.9	7.3	6.5	6.4	15.0	7.3
Oregon	5.5	5.4	5.3	10.1	5.6	5.4	5.5	5.6	‖	5.6
Pennsylvania	7.9	6.9	6.8	13.7	8.8	7.2	6.1	5.9	14.4	9.8
Rhode Island	7.3	6.7	6.5	11.8	7.6	6.8	6.1	5.6	‖	7.7
South Carolina	9.6	7.3	7.4	14.0	6.6	8.9	5.9	5.9	15.0	5.4
South Dakota	6.4	6.3	6.2	‖	8.2	7.4	6.1	6.3	‖	
Tennessee	9.2	8.0	8.1	13.6	6.5	8.7	6.7	6.5	16.2	9.2
Texas	7.6	6.9	6.9	12.9	6.9	5.9	5.2	5.2	12.0	5.4
Utah	6.4	6.4	6.2	10.8	7.4	4.8	4.9	4.6	‖	6.9
Vermont	5.9	5.9	5.9	‖	‖	5.5	5.6	5.8	‖	
Virginia	7.9	6.5	6.6	12.5	5.8	7.6	5.4	5.3	15.8	5.1
Washington	5.8	5.5	5.6	9.8	5.2	5.8	5.7	5.6	12.9	5.9
West Virginia	8.5	8.4	8.4	11.5	‖	7.2	7.2	7.1	‖	‖
Wisconsin	6.6	5.9	5.8	13.1	6.2	7.1	5.9	6.0	17.8	5.0
Wyoming	8.3	8.0	7.9	‖	9.1	5.9	5.9	5.4	‖	‖
Puerto Rico	11.2	11.1	NA	12.1	NA	9.3	9.9	NA	‖	NA
Virgin Islands	9.7	9.0	‖	9.5	9.4	‖	‖	‖	‖	‖
Guam	8.1	‖	‖	‖	‖	9.8	‖	‖	‖	‖
American Samoa	3.9	‖	NA	‖	NA	‖	‖	NA	‖	NA
Northern Marianas	8.3	‖	NA	‖	NA	‖	‖	NA	‖	NA

NA indicates data not available.

Race and Hispanic origin are reported separately on birth certificates. People of Hispanic origin may be of any race. In this table, Hispanic women are classified only by place of origin; non-Hispanic women are classified by race.

Source: Centers for Disease Control and Prevention/NCHS, 2001 National Vital Statistics System, mortality (unlinked file) and natality.

* Percentage of births <2500 g (5 lbs, 8 oz).
† Infant deaths under 1 year of age per 1000 live births.
‡ Includes races other than white and black.
§ Total excludes data for the territories.
‖ Figure does not meet standards of reliability or precision (defined as <20 deaths in the numerator).

to 7.8% in 2002 (Fig 3). Thus, all of the decline in the IMR since the mid-1980s has been attributable to declines in birth weight–specific IMRs, which have been attributed primarily to improvements in obstetric and neonatal care.[46] The United States has been unsuccessful in reducing the number of preterm and

LBW deliveries, although prevention efforts have the potential to save many more infant lives and reduce subsequent morbidity than do additional improvements in neonatal care.

In 2001, 67% of all infant deaths occurred to the 7.7% of infants who were born LBW and 53% to the 1.5% of infants who were born VLBW.[9] Approximately 86% of all infants who are born weighing <500 g die within the first year of life (Table 6), with 95% of them dying within the first few days of life. An infant's chances of survival increase rapidly thereafter with increasing birth weight. At birth weights of 1250 to 1499 g, ~95 of 100 infants now survive the first year of life. In 2001, IMRs were lowest for infants who weighed 3500 to 4499 g, with small increases among the heaviest infants.

Overall IMRs were higher in 2001 for infants of black mothers than for infants of non-Hispanic white or Hispanic mothers. However, black birth weight–specific mortality rates for detailed birth weight categories <2500 g were generally similar to those for non-Hispanic white infants (Table 6). At birth weights >2500 g, IMRs were consistently and significantly higher for infants of black than for infants of non-Hispanic white or Hispanic mothers. In fact, for birth weight categories >3500 g, black IMRs were generally 2 to 3 times those for non-Hispanic white or Hispanic infants. Thus, much of the excess mortality for black infants can be explained by 2 factors: 1) a higher incidence of LBW, VLBW, and preterm births and 2) higher IMRs for black infants who weigh 2500+ g.

IMRs declined significantly from 1995 to 2001 for all birth weight categories except for 4500+ g. IMRs declined most rapidly (by 15%–21%) for infants with birth weights of 750 to 999 g and 1250 to 4499 g. In contrast, mortality rates for infants who were born at <500 g declined by only 5% from 1995 to 2001, reflecting the limited success of intensive efforts made to save these very tiny infants. The few infants who do survive at these VLBWs are at great risk of experiencing lifetime disabilities such as blindness, developmental delays, and neurologic disorders, necessitating increased levels of medical and parental care.[48,49]

Geographic Variation

Table 7 presents information on state variations in LBW and IMRs for 2001 (latest year for which reliable data are available). Oregon, Washington state, Alaska, and Vermont had the lowest percentage of LBW births (5.5%–5.9%), whereas Louisiana (10.4%), Mississippi (10.7%), and the District of Columbia (12.1%) had the highest. When examining IMRs by state, New Hampshire, Utah, and Massachusetts had the lowest rates in 2001 (3.8–5.0 per 1000), and Mississippi, the District of Columbia, and Delaware had the highest (10.5–10.7 per 1000). Although LBW and IMRs for the District of Columbia were among the highest, it is more appropriate to compare these rates with those for other large US cities because of the concentration of high-risk women in these areas. Variations by state in LBW and IMR reflect compositional differences by race, ethnicity, and socioeconomic status in the population in addition to other factors (prenatal, quality of care, and postnatal influences on infants) that are associated with LBW or IMR.

Leading Causes of Infant Death

The 10 leading causes of infant death for 2001 are shown in Table 8.[3] Approximately half of all infant deaths were attributable to the 4 leading causes: congenital malformations, disorders relating to short gestation and unspecified LBW, sudden infant death syndrome (SIDS), and newborn affected by maternal complications of pregnancy. Between 2000 and 2001, changes in IMRs by cause of death among the 10 leading causes were statistically significant for 3 conditions. Mortality for SIDS declined by 10.8%. SIDS

TABLE 8. Infant Deaths and IMRs for the 10 Leading Causes of Infant Death in 2001: United States, 2000 and 2001 and Percentage Change, 2000–2001

Cause of Death and *International Classification of Diseases*, Tenth Revision, Codes	Rank*	2001			2000			% Change 2000–2001
		n	%	Rate†	*n*	%	Rate†	
All causes	NA	27 568	100.0	684.8	28 035	100.0	690.7	−0.9
Congenital malformations, deformations, and chromosomal abnormalities [Q00–Q99]	1	5513	20.0	136.9	5743	20.5	141.5	−3.3
Disorders related to short gestation and LBW, not elsewhere classified [P07]	2	4410	16.0	109.5	4397	15.7 0.0	108.3	1.1
SIDs [R95]	3	2234	8.1	55.5	2523	9.0	62.2	−10.8
Newborn affected by maternal complications of pregnancy [P01]	4	1499	5.4	37.2	1404	5.0 0.0	34.6	7.5
Newborn affected by complications of placenta, cord, and membranes [P02]	5	1018	3.7	25.3	1062	3.8	26.2	−3.4
Respiratory distress of newborn [P22]	6	1011	3.7	25.1	999	3.6	24.6	2.0
Accidents (unintentional injuries) [V01-X59]	7	976	3.5	24.2	881	3.1	21.7	11.5
Bacterial sepsis of newborn [P36]	8	696	2.5	17.3	768	2.7	18.9	−8.5
Diseases of the circulatory system [I00–I99]	9	622	2.3	15.4	663	2.4	16.3	−5.5
Intrauterine hypoxia and birth asphyxia [P20-P21]	10	534	1.9	13.3	630	2.2	15.5	−14.2
All other causes [residual]	NA	9055	32.8	224.9	8965	32.0	220.9	NA

NA indicates not applicable.
Source: Centers for Disease Control and Prevention/NCHS, 2000–2001 National Vital Statistics System, mortality (unlinked file).
* Rank based on 2001 data. Ranking is shown for 10 leading causes of infant death. For an explanation of ranking procedures, see Technical Appendix in Vital Statistics of the United States, Vol. II, Mortality Part A (published annually).
† Rate per 100 000 live births.

TABLE 9. Number of Live Births and Birth Rates for 2000 and IMR for 1998, 1999, and 2000 for countries of >250 000 population and With IMR Equal to or Less Than the United States Rate for 1998, 1999, or 2000

	No. of Births in 2000	Birth Rate† 2000	IMR* 2000	IMR* 1999	IMR* 1998
Singapore	46 631‡	11.3‡	2.9‡	3.5	4.2
Hong Kong	54 134‡	8.0‡	3.0	3.1	3.2
Japan	1 190 560‡	9.4‡	3.2‡	3.4	3.6
Sweden	90 441‡	10.2‡	3.2‡	3.4	3.5
Norway	59 229‡	13.2‡	3.8¶	3.9	4.0
Finland	56 742‡	11.8‡	3.8¶	3.9¶	4.2
Czech Republic	90 715‖	8.9‖	4.1¶	4.6	5.2
Denmark	66 232§	12.4§	—	4.2	4.7
France	778 900‡	13.2‡	4.4‡	4.3	4.6
Spain	386 450‡	10.2‡	4.4‡	4.5¶	4.9
Germany	743 500‖	9.0‖	4.4‡	4.5	4.6
Italy	538 999‡	9.3‡	4.6	5.2	5.6
Austria	77 558	9.6‡	4.8‡	4.4	4.9
Switzerland	73 176‖	10.1‖	4.9¶	4.6	4.8
Australia	248 861‡	13.0‡	4.9‡	5.7	5.0
Canada	331 050‡	10.8‡	—	5.3	5.3
Netherlands	201 461¶	12.6¶	5.1¶	5.2‡	5.2
Greece	117 140‡	11.7‡	5.4¶	5.5‡	6.7
Belgium	114 883‡	11.2‡	5.2¶	4.9¶	5.5‡
Portugal	118 551‡	11.8‡	5.6‡	5.6	8.4‡
United Kingdom	679 284‡	11.4‡	5.6‡	5.8	5.7
Israel	136 390	21.7	—	5.8‡	5.9
Ireland	54 239‡	14.3‡	5.9‡	5.5	6.2
New Zealand	56 605	14.8	6.1	5.6	5.5
Cuba	138 718¶	12.4¶	6.2¶	6.4	7.1
United States	4 058 814	14.7	6.9	7.1	7.2

Sources: United Nations, 2000 Demographic Yearbook. Population and Vital Statistics Report, Statistical Papers, Series A, Vol. L111, No. 1, January, 2001. Population and Vital Statistics Report, Statistical Papers, Series A, Vol. LIV, No. 1, January, 2002. Population and Vital Statistics Report, Statistical Papers, Series A, Vol. LV, No. 1, January, 2003. OECD Health Data 2002 on the Internet, http://www.oecd.org/health/.
* IMR: per 1000 live births.
† Birth rate: per 1000 total population.
‡ Provisional data.
§ 1999 data, no 2000 data.
‖ 2001 data, no 2000 data.
¶ Organization for Economic Co-operation and Development data source.

rates declined slowly during the 1980s before the American Academy of Pediatrics issued a recommendation in 1992 to reduce the risk of SIDS by placing infants on their back or side to sleep.[50–52] Rates dropped by almost 40% between 1992 and 1998 and have continued to decline since then. Medical reporting practices have also contributed to decreases in death rates for SIDS as physicians have begun to use other terms that result in classification of these deaths to a different ill-defined category as the cause of death. The rate for intrauterine hypoxia and birth asphyxia dropped by 14% in 2001, whereas the rate for unintentional injuries increased by 11%.

INTERNATIONAL COMPARISONS

Table 9 shows IMRs for the United States and 25 other developed countries for 1998, 1999, and 2000 as well as the number of births and birth rates for 2000. Countries were included in the table when their population was at least 2.5 million, their IMR was less than the US rate in at least 1 of the 3 years, and they had data available on IMRs for at least 2 of the 3 years.

As in earlier years, the 2000 IMR for the United States was greater than the rate in the other 25 countries in Table 9 for both 2000 and 1999 and for the majority of the countries in 1998 as well. Moreover, the US rate was >2 times greater than the IMR for 5 countries in 2000. This unenviable position is attributable in part to the unfavorable distribution of birth weight among live births in the United States relative to other developed countries, especially for births weighing 1500 g or less. These births account for a significant proportion of neonatal deaths in the country. Reporting variations related to distinguishing live births from fetal deaths, especially among the smallest newborns, are also likely to play a role in the differences, but the magnitude of their effect is unknown.[53–55] Given the lack of progress in reducing LBW, even among single births, it is unlikely that the US position relative to other developed countries will change much in the near future.

DEATHS

There were 2 436 000 deaths (provisional data) in the United States in 2002 (Table 1), 19 575 more than the 2 416 425 deaths reported in 2001. The death rate for 2001 was 848.5 deaths per 100 000 population, a 1% decrease from the 2000 rate of 854.0. Age-adjusted death rates are better indicators of the risk of mortality over time than crude death rates because they control for variations in the age composition of the population. The age-adjusted death rate for 2001 was 854.5 deaths per 100 000 US standard population.[3] This rate was 2% lower than the 2000 age-adjusted death rate of 869.0 and was a record low for the United States.[3]

Expectation of Life

The estimated expectation of life at birth for a given year represents the average number of years that a cohort of infants would be expected to live if, throughout their lifetime, they were to experience the age-specific death rates prevailing during the year of their birth. In 2001, the expectation of life at birth reached a new record high of 77.2 years, an increase of 0.2 years from the previous year.[3] Between 2000 and 2001, life expectancy increased by 0.3 years for both black men (68.6) and black women (75.5) and by 0.1 year for both white men (75.0) and white women (80.2). All 4 groups attained record high levels.

Causes of Death

The 15 leading causes of death in 2001 accounted for >80% of all US deaths (Table 10). Between 2000 and 2001, age-adjusted death rates declined significantly for 5 of the 15 leading causes: diseases of the heart by 4%, malignant neoplasms (cancer) by 2%, cerebrovascular diseases (stroke) by 5%, chronic lower respiratory diseases by 1%, and influenza and pneumonia by 7%.[3] Age-adjusted death rates increased significantly for 7 of the 15 leading causes of death: accidents (unintentional injuries) by 2%; diabetes mellitus by 1%; Alzheimer's disease by 6%; nephritis, nephrotic syndrome, and nephrosis (kidney disease) by 4%; intentional self-harm (suicide) by

TABLE 10. Mortality From 15 Leading Causes of Death: United States, 2000 and 2001

Cause of Death (Based on the 10th Revision *International Classification of Diseases*, 1992)	Rank*	2001			2000			% Change in Age-Adjusted Rate, 2000–2001
		Number	Percent	Rate†	Number	Percent	Rate†	
All causes	NA	2 416 425	100.0	854.5	2 403 351	100.0	869.0	−1.7
Diseases of heart	I00–I09, I11, I13, I20–I51	1	700 142	29.0	247.8	710 760	29.6	257.6	−3.8
Malignant neoplasms	C00–C97	2	553 768	22.9	196.0	553 091	23.0	199.6	−1.8
Cerebrovascular diseases	I60–I69	3	163 538	6.8	57.9	167 661	7.0	60.9	−4.9
Chronic lower respiratory diseases	J40–J47	4	123 013	5.1	43.7	122 009	5.1	44.2	−1.1
Accidents (unintentional injuries)	V01–X59, Y85–Y86	5	101 537	4.2	35.7	97 900	4.1	34.9	2.3
Diabetes mellitus	E10–E14	6	71 372	3.0	25.3	69 301	2.9	25.0	1.2
Influenza and pneumonia	J10–J18	7	62 034	2.6	22.0	65 313	2.7	23.7	−7.2
Alzheimer's disease	G30	8	53 852	2.2	19.1	49 558	2.1	18.1	5.5
Nephritis, nephrotic syndrome, and nephrosis	N00–N07,N17–N19, N25–N27	9	39 480	1.6	14.0	37 251	1.5	13.5	3.7
Septicemia	A40–A41	10	32 238	1.3	11.4	31 224	1.3	11.3	0.9
Intentional self-harm (suicide)	*U03, X60–X84, Y87.0	11	30 622	1.3	10.7	29 350	1.2	10.4	2.9
Chronic liver disease and cirrhosis	K70, K73–K74	12	27 035	1.1	9.5	26 552	1.1	9.5	0.0
Assault (homicide)	*U01–U02, X85–Y09, Y87.1	13	20 308	0.8	7.1	16 765	0.7	5.9	20.3
Essential (primary) hypertension and hypertensive disease	I10,I12	14	19 250	0.8	6.8	18 073	0.8	6.5	4.6
Pneumoniitis due to solids and liquids	J69	15	17 301	0.7	6.1	16 636	0.7	6.1	0.0
All other causes	Residual	NA	400 935	16.6	NA	391 904	16.3	NA	NA

NA indicates not applicable.
Source: Centers for Disease Control and Prevention/NCHS, National Vital Statistics System, mortality, 2000–2001.
* Rank based on 2001 data. Ranking is shown for 15 leading causes of death. For an explanation of ranking procedures, see Technical Appendix in Vital Statistics of the United States, Vol. II, Mortality Part A (published annually).
† Age-adjusted death rate per 100 000 US standard population.

3%; essential (primary) hypertension and hypertensive disease (hypertension) by 5%; and assault (homicide) by 20%. The dramatic rise in the homicide rate was primarily a result of the September 11, 2001, terrorist attacks, which added 2926 certified resident deaths to this category. Without the additional deaths resulting from the terrorist attacks, the homicide rate would have increased by 3%.

Deaths Among Children

In 2001, 25 757 children and adolescents between the ages of 1 and 19 died in the United States (Table 11).[3] The death rate for this age group was 33.6 per 100 000 population, 1% lower than the rate in 2000. From 2000 to 2001, the respective death rates for children and teens aged 5 to 9, 10 to 14, and 15 to 19 declined by 5%, 4%, and < 1%, respectively. The rate increased by 4% for children aged 1 to 4.

For all children aged 1 to 19 the first and second leading causes of death in 2001 were accidents (unintentional injuries) and assault (homicide). Unintentional injuries accounted for 43.5% of all deaths and homicide for 10.2%. The rate for unintentional injuries declined by 3% from the rate in 2000, but the rate for homicide did not change between the 2 years. The rate for influenza and pneumonia (the seventh leading cause of death) increased by 33%, and the rate for chronic lower respiratory diseases (the ninth leading cause of death) decreased by 25%.

For children 1 to 4 years of age, unintentional injury was the leading cause of death and congenital malformations, the second leading cause. Unintentional injuries accounted for 33.6% of all deaths in this age group, and congenital malformations ac-counted for 10.9%. Death rates for unintentional injuries declined by 7%, whereas the rate for congenital malformations increased by 20% between 2000 and 2001. An estimated 420 children 1 to 4 years of age died from cancer, making it the third leading cause of death in this age group. Homicide and diseases of heart are the fourth and fifth leading causes among this age group.

For children 5 to 9 years of age, unintentional injury, cancer, congenital malformations, homicide, and heart disease were the leading causes of death in descending order. Unintentional injury accounted for 41.5% of all deaths in 2001, whereas cancer accounted for 15.9% of all deaths in this age group. Between 2000 and 2001, the rate for deaths from unintentional injuries declined by 6%, and the rate for congenital malformations declined by 10%.

For children 10 to 14 years of age, unintentional injury was the leading cause of death and accounted for 38.8% of all deaths in this age group. The second leading cause was cancer, followed by suicide, congenital malformations, and homicide. Since 2000, unintentional injuries, suicide, congenital malformation, and homicide rates decreased by 4%, 3%, 10%, and 18%, respectively.

For teens aged 15 to 19 years, the leading cause of death, unintentional injuries, accounted for 49% of all deaths in 2001. An estimated 1899 teens were victims of homicide, the second leading cause, in 2001, accounting for 14% of all deaths. Suicide was the third leading cause for this age group, accounting for 12% of all deaths. Cancer and diseases of heart were the fourth and fifth leading causes. The death rate for accidents, suicide, cancer, and diseases of the

TABLE 11. Deaths and Death Rates for the Five Leading Causes of Childhood Death in Specified Age Groups in 2001: United States, Final 2000 and 2001

	Rank*	2001			2000			% Change 2000–2001
		n	%	Rate†	n	%	Rate†	
Total 1–19 y								
All causes	NA	25 757	100.0	33.6	25 955	100.0	33.9	−0.9
Accidents (unintentional injuries) (V01–X59, Y85–Y86)	1	11 196	43.5	14.6	11 560	45.0	15.1	−3.3
Assault (homicide) (*U01–*U02, X85–Y09,Y87.1)	2	2640	10.2	3.4	2641	10.0	3.4	0.0
Malignant neoplasms (C00–C97)	3	2160	8.4	2.8	2179	8.0	2.8	0.0
Intentional self-harm (suicide) (*U03, X60–X84, Y87.0)	4	1890	7.3	2.5	1928	7.0	2.5	0.0
Congenital malformations, deformations, and chromosomal abnormalities (Q00–Q99)	5	1188	4.6	1.5	1119	4.0	1.5	0.0
Diseases of heart (I00–I09, I11, I13, I20–I51)	6	844	3.3	1.1	855	3.0	1.1	0.0
Influenza and pneumonia (J10–J18)	7	270	1.0	0.4	255	3.0	0.3	33.3
Septicemia (A40–A41)	8	234	0.9	0.3	202	1.0	0.3	0.0
Chronic lower respiratory diseases (J40–J47)	9	221	0.9	0.3	276	1.0	0.4	−25.0
In situ neoplasms, benign neoplasms, and neoplasms of uncertain or unknown behavior (D00–D48)	10	210	0.8	0.3	192	1.0	0.3	0.0
1–4 y								
All causes	NA	5108	100.0	33.3	4979	100.0	32.0	4.1
Accidents (unintentional injuries) (V01–X59, Y85–Y86)	1	1714	33.6	11.2	1826	36.7	12.0	−6.7
Congenital malformations, deformations, and chromosomal abnormalities (Q00–Q99)	2	558	10.9	3.6	495	9.9	3.0	20.0
Malignant neoplasms (C00–C97)	3	420	8.2	2.7	420	8.4	3.0	−10.0
Assault (homicide) (*U01–*U02, X85–Y09, Y87.1)	4	415	8.1	2.7	356	7.2	2.0	35.0
Diseases of heart (I00–I09, I11, I13, I20–I51)	5	225	4.4	1.5	181	3.6	1.0	50.0
5–9 y								
All causes	NA	3092	100.0	15.3	3253	100.0	15.8	−3.2
Accidents (unintentional injuries) (V01–X59, Y85–Y86)	1	1283	41.5	6.4	1391	42.8	6.8	−5.9
Malignant neoplasms (C00–C97)	2	493	15.9	2.4	489	15.0	2.4	0.0
Congenital malformations, deformations, and chromosomal abnormalities (Q00–Q99)	3	181	5.9	0.9	198	6.1	1.0	−10.0
Assault (homicide) (*U01–*U02, X85–Y09, Y87.1)	4	137	4.4	0.7	140	4.3	0.7	0.0
Diseases of heart (I00–I09, I11, I13, I20–I51)	5	98	3.2	0.5	106	3.3	0.5	0.0
10–14 y								
All causes	NA	4002	100.0	19.2	4160	100.0	20.3	−5.4
Accidents (unintentional injuries) (V01–X59, Y85–Y86)	1	1553	38.8	7.4	1588	38.2	7.7	−3.9
Malignant neoplasms (C00–C97)	2	515	12.9	2.5	525	12.6	2.6	−3.8
Intentional self-harm (suicide) (*U03, X60–X84, Y87.0)	3	272	6.8	1.3	300	7.2	1.5	−13.3
Congenital malformations, deformations, and chromosomal abnormalities (Q00–Q99)	4	194	4.8	0.9	201	4.8	1.0	−10.0
Assault (homicide) (*U01–*U02, X85–Y09, Y87.1)	5	189	4.7	0.9	231	5.6	1.1	−18.2
15–19 y								
All causes	NA	13 555	100.0	66.9	13 563	100.0	67.0	−0.1
Accidents (unintentional injuries) (V01–X59, Y85–Y86)	1	6646	49.0	32.8	6755	49.8	33.0	−0.6
Assault (homicide) (*U01–*U02, X85–Y09, Y87.1)	2	1899	14.0	9.4	1914	14.1	9.0	4.4
Intentional self-harm (suicide) (*U03, X60–X84, Y87.0)	3	1611	11.9	7.9	1621	12.0	8.0	−1.3
Malignant neoplasms (C00–C97)	4	732	5.4	3.6	745	5.5	4.0	−10.0
Diseases of heart (I00–I09, I11, I13, I20–I51)	5	347	2.6	1.7	403	3.0	2.0	−15.0

NA indicates not applicable.

Source: Centers for Disease Control and Prevention/NCHS, National Vital Statistics System, mortality, 2000–2001.

* Rank based on 2001 data. Ranking is shown for 10 leading causes of death for 1- to 19-year-olds and for 5 leading causes of death for specified age groups. For an explanation of ranking procedures, see Technical Appendix in Vital Statistics of the United States, Vol. II, Mortality Part A (published annually).

† Rate per 100 000 population in specified group.

heart decreased by 1%, 1%, 10%, and 15%, respectively, between 2000 and 2001. The death rate for homicide increased by 4%.

EFFECT OF THE 2000 CENSUS ON TRENDS IN VITAL STATISTICS RATES

As noted in the Methods section, the vital statistics rates presented in this report have been revised using population estimates based on the 2000 census. The denominators that NCHS uses to compute birth and death rates are estimates of the US population produced by the US Bureau of the Census. Populations are enumerated in census years (1990 and 2000) and estimated in other years. In years distant from a census, the estimates can be less accurate. When a subsequent census becomes available (eg, the 2000 census), rates for the intercensal years are revised to correct for any inaccuracies in earlier population estimates. Thus, when the 2000 census data became available, the Census Bureau revised the estimated populations for the 1990s, based on the bridged 2000 populations discussed in the Methods section, and NCHS revised all vital statistics rates for 2001 to 2000 and the 1991 to 1999 intercensal period.[3,20,56] Our article last year included rates based on populations projected from the 1990 census.[1]

With few exceptions, the revised rates, based on the 2000 census, are lower than the rates previously published; in other words, the earlier rates were overstated in most cases. Differences for Hispanic, American Indian, and Asian or Pacific Islander populations were considerable.[20,57] It is important to note, however, that the trends reported earlier on the basis of 1990 census-projected populations are essentially replicated with the rates computed using 2000 census-based populations. It is important to use the best population data available when computing rates so that the disparities that are identified reflect real
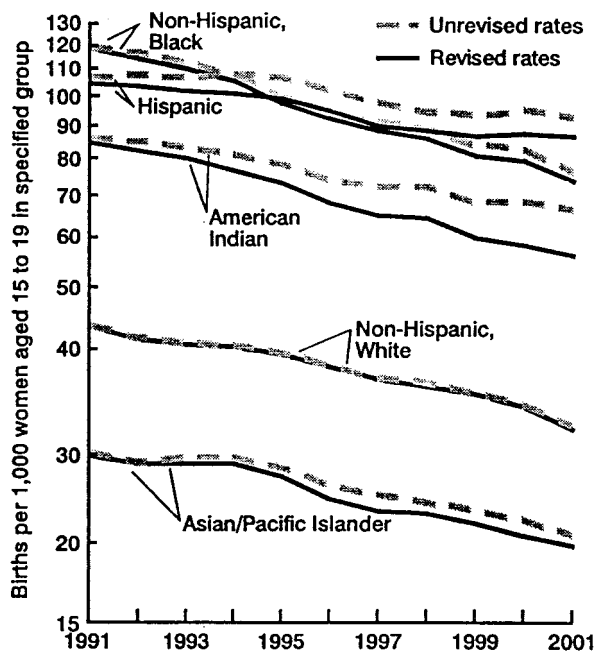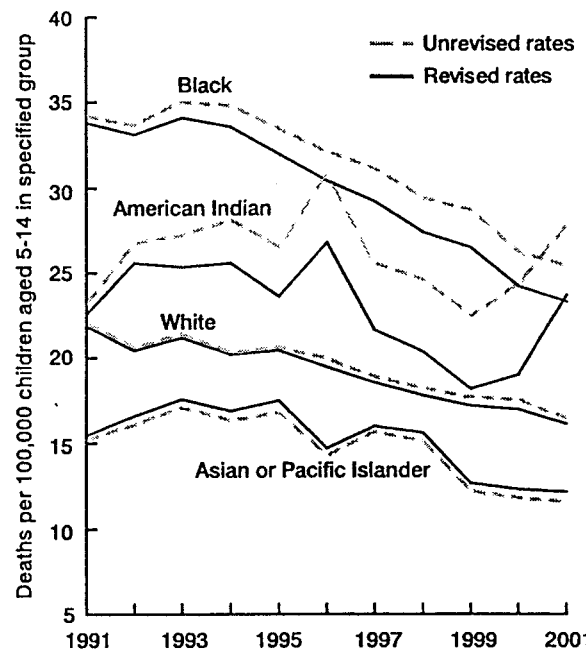

Fig 5. Death rates for children 5 to 14 years, by race, 1991 to 2001.

differences in fertility and mortality, not inaccuracies in the populations.[20]

In this section, we illustrate the differences between the originally published and revised rates for 2 important topic areas: teenage birth rates and child death rates. Revised birth rates for teenagers confirm the steady and steep declines during the decade of the 1990s. Rates fell to historic low levels, with sizable declines recorded for teenagers in all age groups and for population subgroups by race and Hispanic origin. The overall revised rate for teenagers 15 to 19 years fell 27% between 1991 and 2001. The rate for black teenagers plummeted 37%.[20]

The downward trends for American Indian and Hispanic teenagers are much more striking when the rates are computed from the revised 2000 census-based populations (Fig 4). On the basis of the revised populations, the birth rate for American Indian teenagers fell 33% during 1991 to 2001, compared with a 22% decline based on previously published rates. Among Hispanic teenagers, the birth rate fell 17% on the basis of revised rates, compared with 13% on the basis of the originally published rates. The onset of the disparity between the 2 sets of rates for each racial/ethnic group was early in the 1990s, and the gap widened steadily during the decade.[20] The impact of the revised populations was smaller for non-Hispanic white, non-Hispanic black, and Asian or Pacific Islander teenagers. Because of the differential impact of the revised populations, the disparities among population groups narrowed somewhat during the decade. The range in the rates per 1000 women aged 15 to 19 for 2001 was 20.4 (Asian or Pacific Islander) to 92.5 (Hispanic) with the originally published rates; the range was 19.8 (Asian or Pacific Islander) to 86.4 (Hispanic) for the revised rates.[20]

As with teenage births, revised death rates for children aged 5 to 14 confirm the pattern of declining mortality throughout the 1991 to 2001 period for all

Fig 4. Birth rates for teenagers 15 to 19 years of age, by race and Hispanic origin, 1991 to 2001.

race groups except the American Indian population (Fig 5). On the basis of the revised populations, death rates declined by 26% for white, 31% for black, and 21% for Asian or Pacific Islander children and increased by 5% for American Indian children between 1991 and 2001.

Consistent also with patterns observed for teenage births, death rates for children based on revised populations were generally lower than those based on the 1990 population. Differences between revised and unrevised death rates for children throughout the 1991 to 2001 period were relatively small for white and Asian or Pacific Islander children but considerably large for black and especially American Indian children. For white children, rates based on revised populations were lower with a differential range of <1% in 1991 to <2% in 2001. For Asian and Pacific Islander children, the only group for which rates based on the revised populations were higher, the differential range was from 2% in 1991 to 6% in 2001. Revised rates for black children were lower by 1% in 1991 to 8% in 2001, and revised rates for American Indian children were lower by 2% in 1991 to 15% in 2001. Overall, revised rates parallel birth and mortality trends estimated based on the 1990 census population.

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"MR. GATES IN AFRICA"

"The buzz among African aid workers is that Mr. Gates will be remembered more for his work fighting disease than for Windows. Certainly the wealth of the Bill and Melinda Gates Foundation is improving the prospect that vaccines will be found for malaria and AIDS. The foundation's most banal work is with vaccines, but those programs have already given out vaccines that will save 300 000 lives. Hey, that's better than most rapacious monopolists do. AIDS, malaria and tuberculosis are all worsening in the third world and now kill a combined six million people per year. This slaughter is one of the central moral challenges we face today, yet Western governments have abdicated responsibility, and Western medical science is uninterested in diseases that kill only poor people. Many times more money addresses erectile dysfunction than malaria. So at least somebody is stepping up to the plate. . . . 'It's unfortunate in a way that because of geography malaria has been wiped out in the rich world,' Mr. Gates mused with typical political incorrectness. When Mr. Gates made his first tentative donation to malaria research, he found he'd raised the global budget by 50%."

Kristof ND. Fighting the fevers. *New York Times.* September 24, 2003

Noted by JFL, MD

Annual Summary of Vital Statistics—2002

Elizabeth Arias, Marian F. MacDorman, Donna M. Strobino and Bernard Guyer

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