Annual Summary of Vital Statistics—1997

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Note: Readers will notice that this annual article is changing over time by incorporating new datasets and providing new analyses while, at the same time, maintaining continuity with the historic presentation of the data. We want to point out several features of this year's paper and to emphasize to practicing pediatricians and obstetricians the importance of the accurate completion of the birth and death certificates from which the data reported here are drawn.

This year we present expanded information from the birth certificates on the characteristics of mothers and their pregnancies. Improvement in the accuracy of this information reported on birth certificates will have an enormous pay-off in monitoring the health of women. For the first time, this year's article presents data on fetal deaths. Again, by directing the reader to these important data, we hope to increase the motivation of physicians to complete fetal death certificates accurately so that long-term trends can be monitored better. Again, this years's article uses data from the linked birth/infant death dataset to present information on birth weight-specific survival of infants. These results are important because they measure the performance of the health care system in managing neonates. For the second year, we present data on the major causes of child death and, in addition, provide a new framework for analyzing childhood injury mortality data that classifies deaths according to intent and mechanism of injury. Again, our goal is to examine the important causes of death, to encourage accurate reporting by physicians, and to make these data more accessible to clinicians and policymakers.

ABSTRACT. Many positive trends in the health of Americans continued into 1997. In 1997, the preliminary birth rate declined slightly to 14.6 births per 1000 population, and the fertility rate, births per 1000 women 15 to 44 years of age, was unchanged from the previous year (65.3). These indicators suggest that the downward trend in births observed since the early 1990s may have abated.

Fertility rates for white, black, and Native American women were essentially unchanged between 1996 and 1997. Fertility among Hispanic women declined 2% in 1997 to 103.1, the lowest level reported since national data for this group have been available. For the sixth consecutive year, birth rates dropped for teens. Birth rates for women 30 years or older continued to increase. The proportion of births to unmarried women (32.4%) was unchanged in 1997.

The trend toward earlier utilization of prenatal care continued for 1997; 82.5% of women began prenatal care in the first trimester. There was no change in the percentage with late (third trimester) or no care in 1997. The cesarean delivery rate rose slightly to 20.8% in 1997, a reversal of the downward trend observed since 1989. The percentage of low birth weight (LBW) infants rose again in 1997 to 7.5%. The percentage of very low birth weight was up only slightly to 1.41%. Among births to white mothers, LBW increased for the fifth consecutive year, to 6.5%, whereas the rate for black mothers remained unchanged at 13%. Much, but not all, of the rise in LBW for white mothers during the 1990s can be attributed to an increase in multiple births. In 1996, the multiple birth rate rose again by 5%, and the higher-order multiple birth rate climbed by 20%.

Infant mortality reached an all time low level of 7.1 deaths per 1000 births, based on preliminary 1997 data. Both neonatal and postneonatal mortality rates declined. In 1996, 64% of all infant deaths occurred to the 7.4% of infants born at LBW. Infant mortality rates continue to be more than two times greater for black than for white infants. Among all the states in 1996, Maine, Massachusetts, and New Hampshire had the lowest infant mortality rates. Despite declines in infant mortality, the United States continues to rank poorly in international comparisons of infant mortality.

Expectation of life at birth reached a new high in 1997 of 76.5 years for all gender and race groups combined. Age-adjusted death rates declined in 1997 for diseases of the heart, accidents and adverse affects (unintentional injuries), homicide, suicide, malignant neoplasms, cerebrovascular disease, chronic liver disease and cirrhosis, and diabetes. In 1997, mortality due to HIV infection declined by 47%. Death rates for children from all major causes declined again in 1997. Motor vehicle traffic injuries and firearm injuries were the two major causes of traumatic death. A large proportion of childhood deaths continue to occur as a result of preventable injuries. *Pediatrics* 1998;102:1333–1349; *birth, death, infant mortality, low birth weight, mortality, multiple births, injury, vital statistics.*

ABBREVIATIONS. IMR, infant mortality rate; HIV, human immunodeficiency virus; LBW, low birth weight; NCHS, National Center for Health Statistics; ICD–9, *International Classification of Diseases*, 9th Revision; SIDS, sudden infant death syndrome; RDS, respiratory distress syndrome.

Many positive trends in the health of Americans continued into 1997, although there were still some problems. The infant mortality rate (IMR) for the United States declined in

1997 to a new record low, life expectancy at birth reached a new record high, the rate of births to teen mothers decreased for the sixth consecutive year, use of timely prenatal care continued to improve, the death rate from human immunodeficiency virus (HIV) decreased sharply again, and deaths among children and adolescents from injuries, including intentional injuries, decreased. Fertility rates and the number of births were essentially unchanged in 1997, whereas the rates of multiple births and low birth weight (LBW) births continued to rise.

METHODS

The data presented in this report were obtained primarily from two sources, the natality data from certificates of live birth and the mortality data from certificates of death for all residents of the United States. Data for 1996 and earlier years are final. Data for 1997 are preliminary and are based on a 99% sample of births and a >85% sample of deaths reported to the National Center for Health Statistics (NCHS) and weighted to represent US totals.[1] Because more detailed data are available in the final files for 1996 than in the preliminary files for 1997, some of the detailed analyses of birth and death patterns that we present here focus on the 1996 data. Wherever possible, comparisons are made between final 1996 and preliminary 1997 data. Final data for 1997, based on complete birth and death files, are likely to differ somewhat from the preliminary estimates presented here, but we expect the differences to be small.

Natality data are presented for mother's state of residence, age, race, Hispanic origin, education, smoking status, selected medical risk factors of pregnancy, month of pregnancy that prenatal care began, midwife-attended births, method of delivery, infant's birth weight, and plurality. By comparing the parents' and child's names and other paternal information, mother's marital status was inferred for births in the five states in 1996 and the four states in 1997 that did not have a direct question about marital status on their birth certificates. The change in reporting of marital status in California and New York City in 1997 had little impact on summary national measures of unmarried births.[1,2] The details of other edits and imputations applied to these data are presented in other publications.[1,2]

Births are tabulated separately by race and Hispanic origin; persons of Hispanic origin may be of any race. For 1997, 23% of white births were to mothers of Hispanic origin. Most (97%) births of Hispanic origin are to white women. Although often it is informative to present data for these groups separately, national data for births of Hispanic origin are available only for more recent years, and it was not feasible to present these data in longer-term trend tables (see Table 5). More detailed data on births of Hispanic origin are presented in other publications.[1,2]

Mortality data are presented by age, race, and underlying cause of death. The underlying cause of death is defined as "(a) the disease or injury which initiated the train of events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury." From 1979 to the present, cause of death data in the United States have been classified according to the International Classification of Diseases, 9th Rev (ICD–9).[3]

Population denominators for the calculation of birth, death, and fertility rates are estimates of the US population as of July 1 of each year, produced by the United States Bureau of the Census.[4–6] However, 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.[7] 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.

The data for birth weight-specific IMRs were obtained from the 1996 period linked birth/infant death dataset.[8] In this dataset, the death certificate is linked with the corresponding birth certificate for each infant who died in 1996 in the United States. The purpose of this linkage is to use the many additional variables available from the birth certificate to interpret infant mortality patterns more effectively. Period IMRs were calculated by dividing the number of linked infant deaths in 1996 by the number of live births in 1996, according to birth weight and maternal race. Numbers of infant deaths were weighted to compensate for the 2.2% of infant deaths in 1996 for which the matching birth certificate could not be identified.[8]

NATURAL INCREASE

Based on preliminary data, 1 580 232 persons were added to the US population in 1997 as a result of natural increase, the excess of births over deaths (Table 1).[1,2,4–7] The rate of natural increase was 5.9 per 1000 population, unchanged from 1996, but down slightly from the 1995 rate of 6.0 per 1000.

BIRTHS

The preliminary number of births in the United States in 1997 was 3 894 970, slightly more than the number reported for 1996 (3 891 494) (Table 1). The preliminary birth rate fell in 1997 to 14.6 per 1000 total population, from 14.7 in 1996, the lowest rate since the mid-1970s and 13% lower than the 1990 birth rate (16.7 per 1000). The fertility rate, defined as the number of births per 1000 women 15 to 44 years of age, was unchanged from the previous year (65.3 per 1000). These three measures of childbearing have changed little since 1995, suggesting that the downward trend in births observed in the early 1990s may have abated.

Geographic Variation

Preliminary figures indicate that fertility rates rose in the majority of states between 1996 and 1997. Rates increased for 32 states, declined in 18 states and the District of Columbia, and remained the same in 1.

TABLE 1. Vital Statistics of the United States, Final 1915–1996 (Selected Years) and Preliminary 1997

Item	Number			Rate*						
	1997	1996	1995	1997	1996	1995	1990	1980	1950	1915†
Live births	3 894 970	3 891 494	3 899 589	14.6	14.7	14.8	16.7	15.9	24.1	29.5
Fertility rate				65.3	65.3	65.6	70.9	68.4	106.2	125.0
Deaths	2 314 738	2 314 690	2 312 132	8.6	8.7	8.8	8.6	8.8	9.6	13.2
Age-adjusted rate				4.8	4.9	5.0	5.2	5.9	8.4	14.4
Natural increase	1 580 232	1 576 804	1 587 457	5.9	5.9	6.0	8.1	7.1	14.5	16.3
Infant mortality	27 691	28 487	29 583	7.1	7.3	7.6	9.2	12.6	29.2	99.9
Population base (in thousands)				267 636	265 284	262 755	248 710	226 546	150 697	100 546

* Rates per 1000 population except for fertility, which is per 1000 women 15 to 44 years of age 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. Infant death rate is for birth registration area. Note: Populations are as of July 1 for 1995, 1996, and 1997, and as of April 1 in 1950, 1980, and 1990. Population for 1915 is the midyear estimate based on the April 15, 1910, census.
Source: National Center for Health Statistics, National Vital Statistics System and the US Bureau of the Census.

Table 2 presents the number of births for each state for 1997 by mother's race and Hispanic origin, and birth and fertility rates by state for 1996 and 1997.

As in earlier years, births to mothers of Native American, Asian or Pacific Islander, and Hispanic origin were highly concentrated geographically. In 1997, the majority of Hispanic births were to residents of California and Texas; more than half of

TABLE 2. Live Births by Race and Hispanic Origin of Mother: United States, Each State, Puerto Rico, Virgin Islands, and Guam, Preliminary 1997, and Birth and Fertility Rates, Final 1996 and Preliminary 1997

Area	All Races†	Number					Birth Rate*		Fertility Rate*	
		White	Black	Native American‡	Asian or Pacific Islander	Hispanic§	1997	1996	1997	1996
United States‖	3 894 970	3 085 477	600 898	38 486	170 110	711 753	14.6	14.7	65.3	65.3
Alabama	61 038	40 529	19 859	140	509	1041	14.1	14.2	62.2	62.1
Alaska	9705	6473	453	2293	486	598	15.9	16.5	70.6	71.7
Arizona	75 753	66 319	2503	5318	1612	28 492	16.6	17.0	78.1	77.1
Arkansas	36 720	28 227	7905	213	375	1541	14.6	14.5	67.8	67.1
California	526 033	427 102	37 477	3362	58 092	249 572	16.3	16.9	72.5	74.8
Colorado	56 539	51 717	2585	590	1647	13 217	14.5	14.6	64.2	63.6
Connecticut	42 977	36 213	5238	108	1418	5640	13.1	13.6	60.1	61.7
Delaware	10 243	7496	2512	12	222	624	14.0	14.0	60.2	59.8
District of Columbia	7905	1973	5795	2	134	701	14.9	15.4	61.5	62.3
Florida	192 556	144 174	43 579	717	4087	37 402	13.1	13.2	65.0	64.5
Georgia	118 347	75 663	39 774	206	2704	7174	15.8	15.5	66.2	64.5
Hawaii	17 381	4479	578	184	12 140	2150	14.6	15.5	69.0	72.5
Idaho	18 594	18 012	68	277	237	2366	15.4	15.7	70.3	71.3
Illinois	180 898	138 912	35 453	244	6289	33 142	15.2	15.5	68.4	69.0
Indiana	83 447	74 764	7633	121	928	3407	14.2	14.3	62.9	62.8
Iowa	36 933	34 830	1109	232	762	1615	12.9	13.0	60.8	60.5
Kansas	37 446	33 403	2817	331	895	3568	14.4	14.2	66.0	65.1
Kentucky	53 228	47 950	4652	91	535	728	13.6	13.6	60.0	59.4
Louisiana	66 012	37 643	27 126	288	955	1263	15.2	15.0	65.7	65.1
Maine	13 670	13 324	81	103	162	121	11.0	11.1	49.5	49.5
Maryland	70 267	44 488	22 966	205	2608	3277	13.8	14.1	58.9	60.1
Massachusetts	82 448	70 389	7922	177	3960	8408	13.5	13.2	59.3	57.1
Michigan	133 621	105 723	24 277	768	2853	5431	13.7	13.9	60.0	61.1
Minnesota	64 525	57 349	3252	1094	2830	2573	13.8	13.7	61.4	60.6
Mississippi	42 747	22 646	19 541	200	360	338	15.7	15.1	68.2	65.6
Missouri	74 747	62 149	11 144	269	1186	1775	13.8	13.8	62.8	62.2
Montana	10 851	9431	31	1294	95	302	12.3	12.3	59.1	58.5
Nebraska	23 327	21 315	1253	363	396	1980	14.1	14.1	64.6	64.2
Nevada	27 039	22 962	2143	449	1486	7749	16.1	16.3	75.8	75.5
New Hampshire	14 433	14 117	105	30	181	229	12.3	12.5	52.8	53.3
New Jersey	113 141	84 620	20 846	178	7497	19 531	14.0	14.3	64.0	64.9
New Mexico	26 874	22 733	506	3245	390	13 326	15.5	15.9	70.5	71.6
New York	263 339	189 054	56 460	609	17 215	51 876	14.5	14.5	65.4	64.7
North Carolina	107 013	75 882	27 476	1585	2071	6906	14.4	14.3	64.3	62.9
North Dakota	8356	7399	84	775	98	170	13.0	13.0	61.0	60.6
Ohio	152 265	127 230	22 659	284	2092	3437	13.6	13.6	60.8	60.3
Oklahoma	48 110	37 891	4725	4628	866	3249	14.5	14.0	67.6	65.0
Oregon	43 895	40 314	939	747	1895	5866	13.5	13.6	62.8	62.7
Pennsylvania	144 235	120 222	20 408	275	3329	6623	12.0	12.3	55.9	57.0
Rhode Island	12 388	10 862	931	142	452	1765	12.5	12.8	56.3	58.9
South Carolina	51 904	32 910	16 271	122	601	1111	13.8	13.8	60.0	59.5
South Dakota	10 208	8455	91	1547	114	141	13.8	14.3	63.8	66.6
Tennessee	74 577	57 080	16 345	127	1025	1725	13.9	13.9	61.3	60.9
Texas	333 889	284 245	39 476	794	9374	146 536	17.2	17.3	75.3	75.0
Utah	43 885	41 666	269	673	1277	4394	21.3	21.0	90.2	89.0
Vermont	6667	6581	24	5	57	22	11.3	11.5	50.0	50.2
Virginia	91 990	66 806	21 111	202	3872	5380	13.7	13.8	58.1	58.4
Washington	79 024	68 340	3214	1752	5718	9434	14.1	14.1	62.5	62.0
West Virginia	20 752	19 875	746	17	114	62	11.4	11.4	53.2	52.5
Wisconsin	66 602	57 439	6421	879	1863	3210	12.9	13.0	58.2	58.3
Wyoming	6424	6099	63	217	45	542	13.4	13.1	62.1	59.8
Puerto Rico	63 668	58 982	4686	—	—	—	16.6	16.7	70.6	70.8
Virgin Islands	2005	359	1586	56	3	373	17.5	16.8	79.9	76.1
Guam	4307	415	65	2	3624	40	29.5	29.4	138.8	134.9

* Birth rates per 1000 total population; fertility rates per 1000 women 15 to 44 years of age.
† Race and Hispanic origin are reported separately on the birth certificate. Data for persons of Hispanic origin are included in the data for each race group according to the mother's reported race.
‡ Includes births to Aleuts and Eskimos.
§ Includes all persons of Hispanic origin of any race.
‖ Excludes data for Puerto Rico, Virgin Islands, and Guam.
—, Indicates data not available.

Asian or Pacific Islander births were to residents of California, New York, and Hawaii; and half of all births to Native American women were to residents of Arizona, Oklahoma, California, New Mexico, and Alaska.

Racial and Ethnic Composition

Fertility rates for white (64.2), black (70.8), and Native American women (68.9) essentially were unchanged between 1996 and 1997. Fertility among women of Asian or Pacific Island origin (66.5) increased 1%, and fertility among Hispanic women (103.1) declined 2% to the lowest level reported since national data for this latter group have been available (1989). Fertility rates for all racial or ethnic groups generally have declined during the 1990s, with the most marked decline occurring among black mothers (down 18% since 1990, when the rate was 86.8).

In 1996, Mexican women were more than twice as likely as were non-Hispanic white and Cuban women to give birth (119.3 compared with 57.3 and 58.9) (Table 3). Fertility rates among Mexican women younger than 30 years of age were higher than those for the other racial or ethnic groups examined; however, childbearing among women 30 years of age and older was most common among women of Asian or Pacific Islander origin.

Trends in Age-specific Birth Rates

Teen Childbearing

Childbearing among teenagers fell in 1997 for the sixth consecutive year to 52.9 births per 1000 females 15 to 19 years of age, 3% lower than the 1996 rate of 54.4 and 15% lower than the 1991 rate of 62.1 (Table 4). The rate for younger teens 15 to 17 years of age fell 4% between 1996 and 1997, whereas the rate for teens 18 to 19 years declined by 2%. Since 1991, birth rates for these age groups have fallen by 16% and 11%, respectively, but still are higher than those reported during the 1980s. Despite a rise in the US teen female population in 1997, the number of births to teenagers younger than 20 years of age declined from 502 725 to 500 063. The proportion of all births to teen mothers fell slightly from 12.9% to 12.8%.

Childbearing declined by 2% to 3% for non-Hispanic white (from 37.6 to 36.4), black (from 91.4 to 89.5), and Hispanic (from 101.8 to 99.1) teenagers between 1996 and 1997. Since 1991, fertility among younger black teens 15 to 17 years of age has fallen 26% (from 84.1 to 62.3), and for teens 18 to 19 years of age by 17% (from 158.6 to 131.2). The fertility rate for Hispanic teens 15 to 19 years dipped to <100 per 1000 in 1997 to 99.1 for the first time since national data became available in 1989; the rate declined for the second straight year from 101.8 in 1996 and 106.7 in 1995.

Childbearing for Women 20 Years of Age and Older

Birth rates for women 20 years of age and older increased moderately in 1997. The rate for women 20 to 24 years increased by <1% to 110.9, whereas the rate for women 25 to 29 years rose by 1% to 114.3. Rates for women in their twenties declined during the first half of the 1990s, but began to rise in 1996. Women in their twenties still account for more than half of all births.

Birth rates also rose for women 30 to 34 and 35 to 39 years of age by 2% in 1997 to 85.4 and 36.0 per 1000, respectively. Birth rates for women 30 to 34, and especially for those 35 to 39 years, have climbed steadily over the last 2 decades (by 52% and 88%, respectively, since 1977), although the rate of increase has slowed during the 1990s. The birth rate for women 40 to 44 also increased slightly from 6.8 to 6.9, the highest level reported since 1971.

The total fertility rate, an estimate of lifetime childbearing based on age-specific rates for a single year rose slightly in 1997 (2039.5 births per 1000 women in the childbearing ages). Rates increased for non-Hispanic white (1810.0) and black women (2158.0) by 1%, but declined for Hispanic women (3007.5) by a similar proportion.

TABLE 3. Live Births, Age-specific Birth Rates, and Total Fertility Rates by Race and Hispanic Origin of Mother: United States, Final, 1996

	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	3 891 494	65.3	33.8	86.0	110.4	113.1	83.9	35.3	6.8	2027.0
White	3 093 057	64.3	28.4	78.4	107.2	116.1	86.3	35.6	6.7	2005.5
Black	594 781	70.7	64.7	132.5	136.8	98.2	63.3	29.1	6.1	2144.0
Native American‡	37 880	68.7	46.4	122.3	133.9	98.5	63.2	28.5	6.3	2030.0
Asian/Pacific Islander	165 776	65.9	14.9	40.4	70.7	111.2	109.2	52.2	12.2	1907.5
All Hispanic	701 339	104.9	69.0	151.1	189.5	161.0	98.1	45.1	10.8	3047.5
Mexican	489 666	119.3	83.4	174.3	206.3	176.9	103.7	47.6	12.0	3353.5
Puerto Rican	54 863	71.3	52.2	143.2	148.8	109.4	58.3	25.9	5.6	2163.0
Cuban	12 613	58.9	19.8	54.5	82.5	110.7	85.9	34.3	6.4	1774.5
Central and South American and Other	144 197	90.2	46.6	103.1	166.5	146.3	105.3	50.4	11.0	2762.0
Non-Hispanic White	2 358 989	57.3	20.6	63.7	90.1	107.0	83.5	34.0	6.2	1795.5
Non-Hispanic Black	578 099	72.5	66.6	136.6	140.9	100.8	64.9	29.7	6.2	2204.0

* Rates per 1000 women in specific age group.
† Sum of age-specific births times 5 divided by 1000.
‡ Includes births to Aleuts and Eskimos.
Note: Births are tabulated separately by race and Hispanic origin; persons of Hispanic origin may be of any race.

TABLE 4. Birth Rates for Teens by Age, Race, and Hispanic Origin: United States, Final 1990–1996 and Preliminary 1997

Age and Race and Hispanic Origin of Mother	1997	1996	1995	1994	1993	1992	1991	1990	Percent Change 1991–97
15–19 Years									
All races	52.9	54.4	56.8	58.9	59.6	60.7	62.1	59.9	−14.8
White, total	46.8	48.1	50.1	51.1	51.1	51.8	52.8	50.8	−11.4
White, non-Hispanic	36.4	37.6	39.3	40.4	40.7	41.7	43.4	42.5	−16.1
Black, total	89.5	91.4	96.1	104.5	108.6	112.4	115.5	112.8	−22.5
Hispanic*	99.1	101.8	106.7	107.7	106.8	107.1	106.7	100.3	−7.1
15–17 Years									
All races	32.6	33.8	36.0	37.6	37.8	37.8	38.7	37.5	−15.8
White, total	27.4	28.4	30.0	30.7	30.3	30.1	30.7	29.5	−10.7
White, non-Hispanic	19.5	20.6	22.0	22.8	22.7	22.7	23.6	23.2	−17.4
Black, total	62.3	64.7	69.7	76.3	79.8	81.3	84.1	82.3	−25.9
Hispanic*	68.2	69.0	72.9	74.0	71.7	71.4	70.6	65.9	−3.4
18–19 Years									
All races	84.4	86.0	89.1	91.5	92.1	94.5	94.4	88.6	−10.6
White, total	76.6	78.4	81.2	82.1	82.1	83.8	83.5	78.0	−8.3
White, non-Hispanic	62.5	63.7	66.1	67.4	67.7	69.8	70.5	66.6	−11.3
Black, total	131.2	132.5	137.1	148.3	151.9	157.9	158.6	152.9	−17.3
Hispanic*	145.8	151.1	157.9	158.0	159.1	159.7	158.5	147.7	−8.0

* Persons of Hispanic origin may be of any race.
Note: Rates per 1000 women in specified group.

Unmarried Mothers

The number (1 260 593) and the proportion (32.4%) of births to unmarried women were essentially unchanged for 1997 (Table 5). Between 1996 and 1997, the percentage of births to unmarried women rose among mothers younger than 20 years of age and among white (from 25.7% to 25.8%) and Hispanic women (from 40.7% to 40.9%), but declined among black women (from 69.8% to 69.1%). The birth rate for unmarried women declined by 2%, from 44.8 to 44.0 per 1000, reflecting a larger increase in the number of unmarried women in the general population relative to the number of births to unmarried women. After rising for nearly 2 decades, the birth rate for unmarried women peaked at 46.9 in 1994 and has declined moderately since.

Smoking During Pregnancy

Women were slightly less likely to report smoking during pregnancy in 1996 (13.6%) compared with 1995 (13.9%) (Table 5). Since 1989, when information on tobacco use during pregnancy first became available from birth certificate data, reported tobacco use has fallen 30%. The number of cigarettes smoked also

TABLE 5. Percent of Births with Selected Characteristics, by Race of Mother: United States, Final 1980, 1990, 1996, Preliminary 1997

Characteristic	All Races*				White				Black			
	1997	1996	1990	1980†	1997	1996	1990	1980†	1997	1996	1990	1980†
Mother												
<20 Years of age	12.8	12.9	12.8	15.6	11.3	11.3	10.9	13.5	22.5	22.8	23.1	26.5
Unmarried	32.4	32.4	28.0	18.4	25.8	25.7	20.4	11.0	69.1	69.8	66.5	55.3
<12 Completed years of school‡	—	16.2	17.6	—	—	16.2	17.1	—	—	17.2	19.6	—
16 Or more completed years of school‡	—	25.4	20.1	—	—	26.9	21.7	—	—	13.0	9.4	—
Smoker§	—	13.6	18.4	—	—	14.7	19.4	—	—	10.2	15.9	—
Medical risk factors during pregnancy												
Diabetes	—	2.6	2.1	—	—	2.6	2.2	—	—	2.5	1.8	—
Pregnancy-associated hypertension	—	3.6	2.7	—	—	3.6	2.8	—	—	3.8	2.7	—
Health care utilization												
First trimester prenatal care	82.5	81.9	75.8	76.3	84.7	84.0	79.2	79.2	72.3	71.4	60.6	62.4
Midwife-attended births	—	6.5	3.9	1.7	—	6.3	3.7	1.5	—	7.0	4.5	2.6
Cesarean delivery rate	20.8	20.7	22.7	—	20.7	20.6	23.0	—	21.8	21.7	22.1	—
Infant												
Birth weight												
VLBW‖	1.4	1.4	1.3	1.2	1.1	1.1	1.0	0.9	3.0	3.0	2.9	2.5
LBW‖	7.5	7.4	7.0	6.8	6.5	6.3	5.7	5.7	13.0	13.0	13.3	12.7
Multiple births per 1000												
Live births in twin deliveries (not percent)	—	25.9	22.6	18.9	—	25.8	22.1	18.1	—	29.1	26.5	24.0
Live births in higher-order multiple deliveries (not percent)	—	1.5	0.7	0.4	—	1.7	0.8	0.4	—	0.7	0.5	0.2

—, Indicates comparable data not available for this period.
* Includes races other than white and black.
† Data for 1980 based on 100% of births in selected states and on a 50% sample of births in all other states.
‡ Includes mothers 20 years of age and older.
§ Excludes data for California, Indiana, New York (but includes New York City), and South Dakota, which did not require reporting of tobacco use.
‖ VLBW is birth weight <1500 g (3 lb, 4 oz), and LBW is birth weight <2500 g (5 lb, 8 oz).

continued to decline; among women who smoked cigarettes, 33% smoked more than half a pack a day in 1996 compared with 42% in 1989. Among teenagers, however, maternal smoking rose from 1995 to 1996. An increase of 5% was reported for younger teens 15 to 17 years of age (to 15.4% in 1996) and 1% for teens 18 to 19 years (to 18.3% in 1996). For the first year since these data have been available from this source, teens were more likely to smoke than were women of any other age group.[9] Smoking during pregnancy is one of the most important preventable determinants of LBW.[10]

Patterns of smoking by age varied distinctly by race and Hispanic origin in 1996. White teen mothers were more than three times as likely to smoke as were black or Hispanic teenagers (22% compared with 6% and 4%), but black mothers 30 years of age and older were more likely to be smokers during pregnancy than their white or Hispanic counterparts (15% compared with 11% and 4%). These patterns are consistent with tobacco use data from the 1992 National Pregnancy and Health Survey,[11] although the percentage of women reporting to be smokers in this survey was 20.4%, ~20% higher than the percentage (16.9) reported on birth certificates in 1992.[12]

Medical Risk Factors During Pregnancy

The two most frequent maternal medical risk factors reported on the birth certificate in 1996 were pregnancy-associated hypertension (3.6%) and diabetes (2.6%). Although the completeness of reporting of these risk factors has improved since the introduction in 1989 of check-boxes on the birth certificate for 16 specific risk factors, their prevalence still is underreported.[13] The prevalence of pregnancy-associated hypertension is lower than that generally reported in clinical studies,[14] and it is not possible to distinguish gestational diabetes from preexisting diabetes as reported on the birth certificate.

Prenatal Care

The trend toward earlier utilization of prenatal care continued for 1997: 82.5% of mothers began care in the first trimester of pregnancy compared with 81.9% for 1996. (Table 5). The proportion of women with first trimester prenatal care has risen steadily throughout the 1990s (from 75.5% in 1989). No concurrent decline in the percent of women with late care (beginning in the third trimester) or no care (4.0%) was observed for the current year, but this percentage has fallen 38% since 1989. The benefits of routine prenatal care are difficult to measure, but timely, comprehensive prenatal care can promote healthier pregnancies by detecting and managing preexisting maternal medical conditions and providing education about health behaviors.[15]

Increases in first trimester care for the current year were observed among white (from 84.0% to 84.7%), black (from 71.4% to 72.3%), and Hispanic mothers (from 72.2% to 73.7%). Late or no care was unchanged from the previous year among white (3.3%) and black (7.3%) mothers, but declined among Hispanic mothers from 6.7% to 6.2%. Since 1989, the percentage of black mothers with first trimester care

has risen 21% (from 60.0%), and late or no care has declined 39% (from 11.9%). Progress in prenatal care utilization has been most pronounced among Hispanic women; first trimester care climbed 24% since 1989 (from 59.5%), and the percentage of mothers with late or no care has dropped by half, from 13.0% to 6.2%.

Cesarean Delivery

The cesarean delivery rate rose slightly to 20.8% for 1997 (Table 5). This small rise in the overall cesarean rate relative to the figure reported for 1995 appears to indicate a leveling off of the downward trend observed in recent years (from 22.8% for 1989). The lack of decline makes it unlikely that the Healthy People Year 2000 Objective to reduce the overall cesarean rate to no more than 15% will be met.[16]

The current year rise in the total cesarean rate is the result of a slight increase in the rate of repeat cesarean; that is, in cesarean deliveries among women who have had a previous cesarean. Accordingly, the rate of vaginal birth after previous cesarean declined from 28.3% for 1996 to 27.4% in 1997, the first reported decline in this rate since the mid-1970s.[17,2] The percentage of women with a first cesarean (14.6%), or the primary cesarean rate (first cesarean per 100 live births to women who have not had a previous cesarean), was unchanged from the previous year.

Multiple Births

The multiple birth rate (defined as the number of births in twin, triplet, and greater deliveries per 1000 live births) rose 5%, from 26.1 in 1995 to 27.4 per 1000 births in 1996. The vast majority (94%) of multiple births are twins. The twinning rate (the number of births in twin deliveries per 1000 live births) rose 4% (from 24.8 to 25.9 per 1000), and the number of twin births exceeded 100 000 (100 750) for the first time since these data have been collected. Since 1980, the number of twin births has risen 47% (from 68 339).

The higher-order multiple birth rate (the number of births in triplet, quadruplet, and greater deliveries per 100 000 live births) climbed 20% for 1996, rising from 127.5 to 152.6, the largest single year increase in at least 25 years. The 5939 higher-order multiple births born in 1996 included 5298 triplets, 560 quadruplets, and 81 quintuplet or greater multiples. The number and rate of higher-order multiple births has quadrupled since 1980 (Fig 1).[18] The dramatic rise in multiple births, and especially in higher-order multiple births, over the last several decades has been attributed to increases in the use of fertility-enhancing therapies and delayed childbearing (the risk of multiple birth increases with maternal age, even without the use of fertility-enhancing therapies).[18–20]

Black mothers historically have been, and continue to be, more likely than white mothers to have a twin birth (29.1 compared with 25.8 per 1000), although the racial differential in twin birth rates is narrowing. White mothers, however, are more than twice as likely to have a higher-order multiple birth (174.0 compared with 73.8 per 100 000). The greater likelihood of white mothers to seek infertility services

Fig 1. The higher-order multiple birth ratios, by race of mother. Note: Higher-order multiples include births in greater than twin deliveries. Ratios are plotted on a log scale.
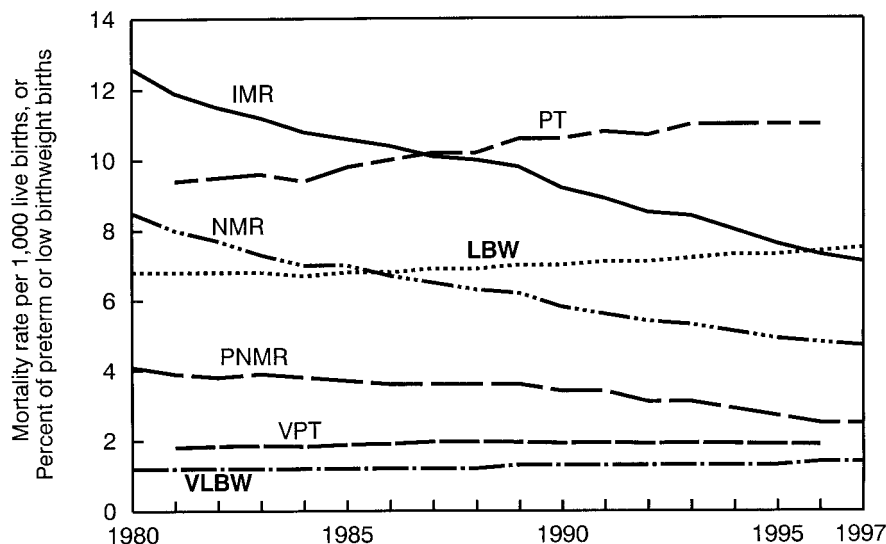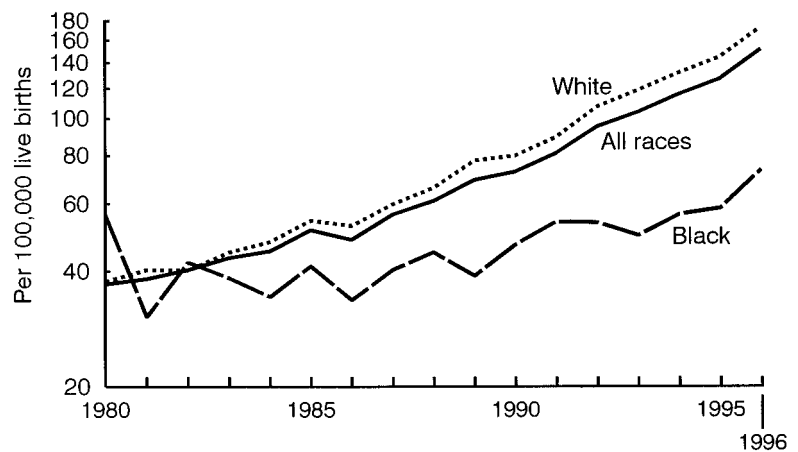

Fig 2. Infant, neonatal, and postneonatal mortality, LBW and VLBW, and preterm and very preterm delivery, United States, 1980–1997. IMR indicates IMR per 1000 live births; LBW, percent LBW (<2500 g); VLBW, percent VLBW (<1500 g); PT, percent preterm (<37 weeks of gestation); VPT, percent very preterm (<32 weeks of gestation).

likely accounts for much of this difference.[21] White women 30 to 34 years of age are three times as likely and those 35 or older over are twice as likely to have a higher-order multiple birth than are black women of similar ages. Conversely, black teen mothers are more likely than are white teen mothers to have a higher-order multiple birth.

Although multiple births are much more likely than are singletons to be LBW or preterm (<37 completed weeks of gestation), there is evidence that the optimum birth weight and gestational period for multiples are lower than those for singletons, and that they continue to decline with increasing plurality.[22] Despite their likely survival advantage over singletons at lower birth weights and shorter gestations, however, multiples are at greater risk of early death. For 1996, multiple births made up 16% of all neonatal deaths and were seven times more likely than were singletons to die within the first month of life.

Birth Weight

The percent of LBW infants (<2500 g) rose from 7.4% to 7.5% for 1996–1997, the highest level reported since 1973. LBW has risen by 12% since a low of 6.7% reported for 1984. When only LBW births among singleton births are analyzed, however, the rate of increase is substantially less; between 1984 and 1996, singleton LBW rose a moderate 3% (from 5.8% to 6.0%) compared with an increase of 10% in overall LBW for the same years. The unprecedented rise in multiple births since the early 1980s has influenced overall LBW rates. The percent of very low birth weight (VLBW) infants (<1500 g) was up very slightly for the current year to 1.41%, from 1.37% in 1996, and has risen from 1.15% in 1980 (Table 5). The percent of VLBW births among singletons increased from 0.96% in 1980 to 1.08% in 1995 and 1.09% in 1996. LBW is a major indicator of infant health, and despite improvements in survival rates among these smaller infants in recent years, 2 of 100 moderately LBW infants (1500 to 2499 g), and 1 of 4 VLBW infants do not survive the first year of life.[8]

Among births to white mothers, LBW increased for the fifth consecutive year, rising from 6.3% for 1996 to 6.5% for 1997, and included increases among all maternal age groups. The percent of LBW white infants has risen 14% since 1990. The VLBW rate among white births also rose in 1996, to 1.12%, and has increased by >20% since the early 1980s. Much of the increase in LBW for white births can be attributed to the rise in multiple birth rates.[23] However, LBW among singleton white births also has risen during the 1990s.

The percent of LBW among births to black mothers was unchanged, at 13.0%, in 1996. LBW among black births has declined from a high of 13.6% reported for 1991, but remains higher than levels in the early to mid-1980s. In contrast to LBW, however, the percent of black infants with VLBW rose slightly from 2.99% in 1996 to 3.03% in 1997, and is 25% above the VLBW percentages in the 1970s.

The elevated risk of LBW for black infants can be primarily attributed to the much higher incidence of preterm birth; 17.4% of black infants compared with 9.8% of white infants were born at these shortened gestations in 1996. Infants born preterm are much more likely than those born at longer gestations to weigh <2500 g. Black infants are more likely than white infants, however, to be LBW, whether born preterm (49.4% vs 41.6%) or at term (5.4% vs 2.6%).

There are distinct differences in LBW rates by state (Table 6). In 1996, the percent of LBW for white mothers ranged from a low of 4.7% in New Hampshire to a high of 8.5% for Colorado. Among the reporting areas with ≥1000 black infants, LBW among black infants ranged from 10.4% for Massa-

TABLE 6. Percent LBW and IMR by Race for the United States and Each State, 1996

State	LBW*			Infant Mortality		
	All Races†	White	Black	All Races†	White	Black
United States	7.4	6.3	13.0	7.3	6.1	14.7
Alabama	9.3	7.2	13.6	10.5	8.2	15.5
Alaska	5.5	5.0	12.1	7.2	5.8	‡
Arizona	6.7	6.5	12.4	7.6	7.1	20.5
Arkansas	8.5	7.0	13.6	9.3	8.1	14.0
California	6.1	5.5	11.8	5.9	5.5	13.9
Colorado	8.8	8.5	15.0	6.6	6.4	14.7
Connecticut	7.2	6.4	12.9	6.4	5.3	14.9
Delaware	8.5	6.7	14.1	7.6	6.0	12.7
District of Columbia	14.3	7.2	16.7	14.9	‡	17.6
Florida	7.9	6.6	12.2	7.5	5.8	13.3
Georgia	8.5	6.4	12.7	9.2	6.3	14.9
Hawaii	7.3	4.9	8.6	5.8	4.4	‡
Idaho	5.8	5.7	‡	7.4	7.4	‡
Illinois	8.0	6.3	14.5	8.6	6.4	18.2
Indiana	7.6	6.9	13.9	8.7	7.5	18.4
Iowa	6.4	6.0	14.7	7.0	6.5	22.9
Kansas	6.9	6.4	13.4	8.3	7.2	23.1
Kentucky	7.9	7.4	12.7	7.5	6.9	13.6
Louisiana	9.9	6.9	14.3	9.0	6.5	12.8
Maine	5.9	5.8	‡	4.4	4.4	‡
Maryland	8.6	6.3	13.4	8.5	5.7	14.5
Massachusetts	6.4	6.0	10.4	5.0	4.8	8.8
Michigan	7.7	6.4	13.6	8.1	5.9	17.6
Minnesota	5.8	5.4	12.0	5.9	5.1	14.5
Mississippi	9.9	7.3	12.9	11.0	8.0	14.6
Missouri	7.5	6.5	12.8	7.6	6.2	15.7
Montana	6.4	6.2	‡	7.0	6.8	‡
Nebraska	6.3	6.0	10.7	8.7	8.4	‡
Nevada	7.5	6.8	14.0	6.2	5.4	13.7
New Hampshire	4.8	4.7	‡	5.0	5.0	‡
New Jersey	7.7	6.4	13.1	6.9	5.3	14.9
New Mexico	7.5	7.5	13.5	6.2	6.1	‡
New York	7.7	6.5	11.9	7.0	5.7	12.4
North Carolina	8.7	6.8	13.9	9.2	7.1	15.3
North Dakota	5.7	5.7	‡	5.3	5.0	‡
Ohio	7.5	6.5	13.2	7.7	6.3	16.2
Oklahoma	7.4	6.8	13.1	8.5	7.7	17.6
Oregon	5.3	5.2	11.2	5.6	5.3	‡
Pennsylvania	7.5	6.5	14.1	7.8	6.4	16.9
Rhode Island	6.9	6.5	12.0	5.2	5.1	‡
South Carolina	9.2	7.0	13.2	8.4	5.6	13.7
South Dakota	5.8	5.8	‡	5.7	4.5	‡
Tennessee	8.8	7.3	14.2	8.5	6.7	15.4
Texas	7.2	6.5	12.4	6.3	5.7	11.7
Utah	6.6	6.6	12.0	6.0	5.9	‡
Vermont	6.2	6.2	‡	7.1	6.9	‡
Virginia	7.7	6.3	12.2	7.7	6.1	13.8
Washington	5.6	5.3	10.8	6.0	5.6	15.7
West Virginia	8.0	7.8	12.4	7.4	6.9	‡
Wisconsin	6.3	5.6	12.7	7.3	6.1	18.8
Wyoming	8.4	8.3	‡	6.4	6.2	‡

* Percent of births <2500 g (5 lbs, 8 oz).
† Includes races other than white and black.
‡ Figure does not meet standards of reliability or precision.
Note: Rates per 1000 live births in specified group. Live births based on race of mother.

chusetts to 16.7% for the District of Columbia and 15.0% for Colorado.

INFANT MORTALITY

The preliminary number of infant deaths in the United States in 1997 was 27 691 (Table 1). The preliminary IMR was 7.1 per 1000 live births, 3% lower than the final 1996 rate of 7.3 and the lowest ever recorded in the United States.[1] The neonatal mortality rate (NMR; infant death before 28 days of age) declined from 4.8 in 1996 to 4.7 in 1997, whereas the postneonatal mortality rate (PNMR; death between 28 days through 11 months of age) declined from 2.5 to 2.4. Between 1996 and 1997, IMR, NMR, and PNMR declined significantly for infants of black mothers, but the decline for infants of white mothers was statistically significant only for postneonatal mortality. IMRs were higher for infants whose mothers were teenagers or ≥40 years of age, did not complete high school, were unmarried, began prenatal care after the first trimester of pregnancy, or smoked during pregnancy. IMRs also were higher for male infants, multiple births, and infants born preterm or LBW.[8]

Infant mortality in the United States has declined by >40% since 1980 (Table 7, Fig 2). The NMR declined more rapidly during the 1980s, whereas the PNMR has declined more rapidly during the 1990s. The decline in the perinatal mortality rate (number of fetal deaths at ≥28 weeks of gestation plus number of infant deaths at <7 days of age per 1000 live births plus fetal deaths) has paralleled closely the decline in the NMR,[24] whereas the fetal mortality rate (number of fetal deaths at ≥20 weeks of gestation per 1000 live births plus fetal deaths) has declined more slowly.

Racial differences in the IMR remain a major national concern. Although all race groups have experienced declines in IMR, the relative difference in rates between black and white newborns, expressed as the ratio of black to white IMRs, increased from 2.0 in 1980 to 2.4 in 1990 (Table 7). The ratio remained unchanged at 2.4, from 1990 to 1996. According to preliminary data, the race ratio declined to 2.3 in 1997, the first decline in this ratio since 1973. The absolute difference in IMRs actually has decreased since 1990, from 10.4 to 8.6 deaths per 1000 live births in 1996. Although this recent decline is very encouraging, these racial disparities in IMR present continued challenges for researchers and health care providers alike.[25,26]

Birth Weight-specific Infant Mortality

Birth weight is one of the most important predictors of infant mortality.[27] The IMR for a given population can be partitioned into two key components: the birth weight distribution and birth weight-specific mortality rates (the death rate for infants at a given weight). The IMR decreases when either the percentage of LBW births decreases or the birth weight-specific mortality rates decrease. All of the decline in the IMR since 1980 (Fig 2) has been attributable to declines in birth weight-specific IMRs, and not to the prevention of LBW. These declines have been attributed primarily to improvements in obstetric and neonatal care. However, the United States has been unsuccessful in reducing the number of preterm and LBW deliveries, even though prevention efforts have the potential to save many more infant lives and reduce subsequent morbidity.[28]

In 1996, 64% of all infant deaths occurred to the 7.4% of infants born LBW.[8] About 9 of 10 infants with birth weights <500 g die within the first year of life, and most within the first few days of life (Table 8). An infant's chances of survival increase rapidly thereafter with increasing birth weight. At birth weights of 1250 to 1499 g, ~95% of babies now survive the first year of life. IMRs are lowest for infants at birth weights of 4000 to 4499 g, with small increases thereafter among the heaviest infants. IMRs are lower for infants of black mothers than for infants of white mothers for individual 250-g birth weight categories <2000 g, but are higher at birth weights of ≥2000 g. In contrast, IMRs are higher for infants of black than for infants of white mothers for the broad birth weight categories of <1500 g and <2500 g. The reason for this disparity is that the birth weight distribution for infants of black mothers includes greater proportions of births at extremely low birth weights, resulting in higher rates for the broad birth weight groupings.

IMRs have declined most rapidly (by 52% to 60%) from 1985 to 1996 for infants weighing 750 to 1499 g at birth. They declined by 33% for 500- to 749-g infants, by 44% for 1500- to 1999-g infants, and by 36% for 2000- to 2499-g and ≥2500-g infants. In con-

TABLE 7. IMR, NMR, PNMR, Perinatal Mortality Rate, and Fetal Mortality Rate by Race of Mother: Final 1980 and 1996, and Preliminary 1997

	1997	1996	1980	Percent Change 1980–1997
IMR*†	7.1	7.3	12.6	−43.7
White	6.0	6.1	10.9	−45.0
Black	13.7	14.7	21.4	−36.0
Black:white ratio	2.3	2.4	2.0	
NMR*†	4.7	4.8	8.5	−44.7
White	3.9	4.0	7.4	−47.3
Black	9.0	9.6	14.1	−36.2
Black:white ratio	2.3	2.4	1.9	
PNMR*†	2.4	2.5	4.1	−41.5
White	2.0	2.1	3.5	−42.9
Black	4.7	5.1	7.3	−35.6
Black:white ratio	2.4	2.4	2.1	
Perinatal mortality rate*‡	—	7.4	13.2	−43.9‖
White	—	6.4	11.8	−45.8‖
Black	—	13.3	21.3	−37.6‖
Black:white ratio		2.1	1.8	
Fetal mortality rate*§	—	6.9	9.1	−24.2‖
White	—	5.9	8.1	−27.2‖
Black	—	12.5	14.7	−15.0‖
Black:white ratio		2.1	1.8	

* Includes races other than white and black.
† Rate per 1000 live births.
‡ Number of fetal deaths at ≥28 weeks of gestation plus number of infant deaths at <7 days of age per 1000 live births plus fetal deaths.
§ Number of fetal deaths at ≥20 weeks of gestation per 1000 live births plus fetal deaths.
‖ Percent change is from 1980–1996 because preliminary 1997 data is not available.
Source: National Center for Health Statistics, National Vital Statistics System, 1980–1997.

TABLE 8.   IMR by Birth Weight and Race of Mother, United States, 1996, and Percent Change 1985–1996

Birth Weight (g)	IMR			Percent Change, 1985–1996*		
	All Races†	White	Black	All Races†	White	Black
Total	7.3	6.1	14.1‡	−31.7	−33.7	−24.0
<2500	62.9	57.5	78.7	−34.8	−38.7	−24.0
<1500	259.3	249.0	280.4	−35.1	−39.0	−27.3
<500	889.0	892.1	886.0	−3.2	−3.8	−2.0
500–749	512.4	528.0	485.8	−32.9	−32.7	−33.4
750–999	167.2	176.9	145.7	−58.6	−59.4	−58.0
1000–1249	77.2	79.3	71.6	−60.0	−62.8	−51.8
1250–1499	52.7	55.6	46.5	−51.6	−54.7	−42.8
1500–1999	30.3	30.4	29.4	−44.3	−47.9	−35.3
2000–2499	13.4	13.3	13.8	−35.5	−37.8	−28.0
≥2500	2.8	2.5	4.2	−35.7	−35.9	−33.9
2500–2999	5.1	4.9	6.0	−34.2	−36.0	−30.6
3000–3499	2.7	2.5	3.7	−38.1	−38.5	−35.7
3500–3999	1.9	1.7	3.4	−34.5	−34.6	−24.4
4000–4499	1.7	1.5	3.2	−39.3	−40.0	−38.5
≥4500	2.5	2.2	§	−51.0	−50.0	§

* Percent change from 1985–1996 was computed based on unweighted and unimputed birth weight data for 1996, because comparable weighted and imputed birth weight data were not available for 1985.
† Includes races other than white and black.
‡ IMRs from the linked file differ slightly from those based on unlinked data (Tables 6, 7), because the linked file uses the self-reported race of mother from the birth certificate, whereas the unlinked data uses the race of the decedent as reported by the funeral director on the death certificate.
§ Figure does not meet standard of reliability or precision.
Source: National Center for Health Statistics, Linked Birth/Infant Death Dataset—1996 Period Data.

trast, mortality rates for infants born at <500 g declined very little from 1985 to 1996, reflecting the limited success of intensive efforts made to save these very small infants. For the few infants who do survive at these VLBWs, many suffer lifetime disabilities such as blindness, mental retardation, and neurologic disorders, necessitating increased levels of medical and parental care.[29–31]

Declines in IMR from 1985 to 1996 have been more rapid for infants of white than for infants of black mothers in all birth weight categories, except for infants weighing 500 to 749 g, for whom the decline was the same for both groups. The largest difference in birth weight-specific IMRs between infants of white and black mothers is for infants weighing ≥2500 g (2.5 and 4.2, respectively). Thus, most of the excess mortality for black infants can be explained by two factors: a birth weight distribution with a higher percentage of LBW, VLBW, and preterm births among infants of black mothers; and higher IMRs for black infants weighing ≥2500 g.

Leading Causes of Infant Death

The 10 leading causes of infant death for 1997 are shown in Table 9. Half of all infant deaths were attributable to four leading causes of infant death: congenital anomalies, disorders relating to short gestation and unspecified LBW, sudden infant death syndrome (SIDS), and respiratory distress syndrome (RDS). IMRs from congenital anomalies declined by 39% from 1979 to 1996, although this decline was less than that for overall infant mortality. After slow declines during the 1980s, SIDS rates fell by 42% since 1992 when the American Academy of Pediatrics issued a recommendation to reduce the risk of SIDS by placing infants on their backs or sides to sleep.[32–34] IMRs for RDS declined by 64% since 1989

when new medical treatments for this condition became widely available.[35–37]

Geographic Variation

Maine, Massachusetts, and New Hampshire had the lowest IMRs in 1996 (Table 6). Although the highest rate was noted for the District of Columbia (14.9), it is compared more appropriately with rates for other large US cities because of the high concentrations of high-risk women in these areas. The states with the next highest IMRs were Mississippi and Alabama. Twenty-two states already have met the Year 2000 infant mortality health objective of an overall IMR ≤7.0.

Differences in IMRs by state in part reflect differences in the racial and socioeconomic composition of their populations. Differences in IMRs by state also may reflect differences in birth weight-specific mortality rates, but these data are not presented here. Also, caution must be exercised in comparing yearly IMRs among states because differences, although seemingly great, may not be statistically significant.

INTERNATIONAL COMPARISONS

Table 10 shows the IMR for countries with a population of at least 2.5 million and for which the IMR was lower than the rate for the United States in 1994, 1995, or 1996. These data were obtained primarily from the *1996 United Nations Demographic Yearbook*.[38]

This year, two countries have been added to the Table: the Czech Republic and Portugal. There are a number of small countries with rates lower than that for the United States, but they were omitted because their population base was <2.5 million. Other developed countries, such as Israel, were excluded because their IMRs were higher than that for the United States for 1994–1996.

TABLE 9. Infant Deaths and IMR for the 10 Leading Causes of Infant Death in 1997: United States, Final 1979 and 1996, and Preliminary 1997

Cause of Death and ICD–9 Codes	Rank*	1997			1996			1979			Percent Change 1979–1997
		Number	Percent	Rate†	Number	Percent	Rate†	Number	Percent	Rate†	
All causes	—	27 692	100.0	711.0	28 487	100.0	732.0	45 665	100.0	1306.8	−45.6
Congenital anomalies (740–759)	1	6063	21.9	155.7	6381	22.4	164.0	8923	19.5	255.4	−39.0
Disorders relating to short gestation and unspecified low birth weight (765)	2	3727	13.5	95.7	3902	13.7	100.3	3495	7.7	100.0	−4.3
SIDS (798.0)	3	2705	9.8	69.4	3050	10.7	78.4	5279	11.6	151.1	−54.1
RDS (769)	4	1262	4.6	32.4	1362	4.8	35.0	5458	12.0	156.2	−79.3
Newborn affected by maternal complications of pregnancy (761)	5	1242	4.5	31.9	1249	4.4	32.1	1621	3.5	46.4	−31.3
Newborn affected by complications of placenta, cord, and membranes (762)	6	927	3.3	23.8	949	3.3	24.4	970	2.1	27.8	−14.4
Infections specific to the perinatal period (771)	7	756	2.7	19.4	756	2.7	19.4	981	2.1	28.1	−31.0
Accidents and adverse effects (E800–E949)	8	753	2.7	19.3	804	2.8	20.7	1080	2.4	30.9	−37.5
Intrauterine hypoxia and birth asphyxia (768)	9	456	1.6	11.7	428	1.5	11.0	1393	3.1	39.9	−70.7
Pneumonia and influenza (480–487)	10	397	1.4	10.2	496	1.7	12.7	1129	2.5	32.3	−68.4

* Rank based on number of deaths.
† Rate per 100 000 live births.

TABLE 10. Live Births and Birth Rates for 1996 and IMR for 1994, 1995, and 1996 for Countries of >2 500 000 Population and With IMR Equal to or Less Than the United States Rate for 1994, 1995, or 1996

	Number of Births in 1996	Birth Rate 1996	IMR		
			1996	1995	1994
Singapore	48 577	13.4	3.8	4.0	4.3
Japan	1 206 555	9.6	3.8	4.2	4.3
Finland	60 723	11.8	4.0	3.9	4.7
Sweden	95 297	10.8	4.0	3.7	4.4
Norway	60 927	14.0	4.0	4.0	5.3
Hong Kong	64 599	10.2	4.0	4.6	4.5
Switzerland	83 007	11.7	4.7	5.0	5.1
Spain	352 249	9.0	4.7‡	5.5	6.0
France	735 300	12.6	4.9	4.9	5.9
Germany	796 013	9.7	5.0	5.3	5.6
Austria	88 809	11.0	5.1	5.1	6.3
Ireland	50 390	13.9	5.5	6.4	5.7
Belgium	116 208	11.4	5.6	6.1	7.6
Canada	364 732	12.2	5.6	6.1	6.3
Denmark	67 675	12.9	5.7	5.1	5.5
Netherlands	189 521	12.2	5.7	5.5	5.6
Australia	253 834	13.9	5.8	5.7	5.9
Italy	531 364	9.3	6.0	6.1	6.5
Czech Republic	90 446	8.8	6.0	7.7	7.9
United Kingdom	733 375	12.5	6.1	6.2	6.2
New Zealand	57 795*	16.3*	†	6.7	7.2
Portugal	110 363	11.1	6.9	7.5	8.1
United States	3 891 494	14.7	7.3	7.6	8.0
Greece	101 500‡	9.7‡	8.1‡	7.9	7.9

* 1995 Data.
† Data not available.
‡ Preliminary data.
Sources: United Nations Demographic Yearbook, 1996, United Nations Population and Vital Statistics Reports, and individual country reports.

As in previous years, the United States' ranking in infant mortality in relation to other developed countries (23rd) is not enviable, but the reader is cautioned against making quick judgments about the reasons for its poor ranking. Reporting of data on live births, especially for the very smallest infants with the highest mortality rates, appears to differ across countries as does the reporting of stillbirths and the timing of when a live birth is required to be registered.[39–42] Moreover, there are variations in the quality of data and coverage of the birth registration systems in some countries, which may affect international comparisons. One reason for the poor ranking of the United States, however, continues to be its persistently high rate of LBW relative to that for other developed countries.

DEATHS

The preliminary number of deaths in the United States in 1997 was 2 314 738 (Table 1), slightly more than the high of 2 314 690 deaths reported in 1996. The preliminary death rate for 1997 was 864.9 deaths per 100 000 population, lower than the final 1996 rate of 872.5. The preliminary age-adjusted death rate for 1997 was 478.1 deaths per 100 000 US standard population.[1] This rate was almost 3% lower than the final 1996 age-adjusted death rate of 491.6 and was a record low for the United States.[1,7] Age-adjusted death rates are more accurate indicators of the risk of mortality over time than are crude death rates because they control for variations in the age composi-

TABLE 11. Mortality From Selected Causes of Death: United States, Final 1979 and 1996, and Preliminary 1997

Causes of Death and ICD–9 Codes	Rank*	1997			1996			1979			Percent Change in Age-adjusted Rate, 1979–1997
		Number	Percent	Rate†	Number	Percent	Rate†	Number	Percent	Rate†	
All causes		2 314 729‡	100.0	478.2	2 314 690	100.0	491.6	1 913 841	100.0	577.0	−17.1
Major cardiovascular diseases (390–448)		942 680	40.7	165.4	950 164	41.1	170.7	958 282	50.1	254.2	−34.9
Diseases of heart (390–398, 402, 404–429)	1	725 790	31.4	129.9	733 361	31.7	134.5	733 235	38.3	199.5	−34.9
Cerebrovascular diseases (430–438)	3	159 877	6.9	25.9	159 942	6.9	26.4	169 488	8.9	41.6	−37.7
Malignant neoplasms (140–208)	2	537 390	23.2	125.0	539 533	23.3	127.9	403 395	21.1	130.8	−4.4
Digestive system (150–159)		126 109	5.5	27.9	126 495	5.5	28.5	109 125	5.7	33.1	−15.7
Respiratory system (160–165)		158 234	6.8	38.6	157 271	6.8	39.3	103 178	5.4	35.2	9.7
Breast (174–175)		42 181	1.8	10.5	43 448	1.9	11.0	34 622	1.8	12.2	−13.9
Genital organs (179–187)		58 539	2.5	11.9	60 080	2.6	12.5	45 402	2.4	13.6	−12.5
Urinary organs (188–189)		23 271	1.0	5.0	23 004	1.0	5.1	17 443	0.9	5.2	−3.8
Chronic obstructive pulmonary diseases (490–496)	4	110 637	4.8	21.4	106 027	4.6	21.0	49 933	2.6	14.6	46.6
Pneumonia and influenza (480–487)	6	88 383	3.8	13.2	83 727	3.6	12.8	45 030	2.4	11.2	17.9
Diabetes mellitus (250)	7	62 332	2.7	13.4	61 767	2.7	13.6	33 192	1.7	9.8	36.7
Chronic liver disease and cirrhosis (571)	10	24 765	1.1	7.2	25 047	1.1	7.5	29 720	1.6	12.0	−40.0
Nephritis, nephrotic syndrome, and nephrosis (580–589)	9	25 570	1.1	4.5	24 304	1.0	4.3	15 729	0.8	4.3	4.7
Infectious and parasitic diseases (001–139)		52 538	2.3	13.7	65 791	2.8	18.8	15 360	—	5.0§	—
Tuberculosis (010–018)		1165	0.1	0.3	1202	0.1	0.3	2007	0.1	0.7	−57.1
Septicemia (038)		22 604	1.0	4.2	21 423	0.9	4.1	8024	—	2.3	82.6
HIV infection (*042–*044)		16 685	0.7	5.9	31 130	1.3	11.1	—	—	—	—
Viral hepatitis (070)		3908	0.2	1.1	3780	0.2	1.1	753	0.0	0.3	266.7
Accidents and adverse effects (E800–E949)	5	92 191	4.0	28.9	94 948	4.1	30.4	105 312	5.5	42.9	−32.6
Motor vehicle accidents (E810–E825)		42 420	1.8	15.5	43 649	1.9	16.2	53 524	2.8	23.2	−33.2
All other accidents (E800–E807, E826–E949)		49 772	2.2	13.4	51 299	2.2	14.2	51 788	2.7	19.6	−31.6
Suicide (E950–E959)	8	29 725	1.3	10.3	30 903	1.3	10.8	27 206	1.4	11.7	−12.0
Homicide and legal intervention (E960–E978)		18 774	0.8	7.5	20 971	0.9	8.5	22 550	1.2	10.2	−26.5
Certain perinatal conditions (760–779)		12 565	0.5	322.6‖	12 955	0.6	332.9‖	23 322	1.2	667.4‖	−51.7

* Rank based on 1997 data. Ranking is shown for 10 leading causes only. For an explanation of ranking procedures, see Technical Appendix, Vital Statistics of the United States. Vol II. Mortality. Pt. A (published annually).

† Age-adjusted death rate per 100 000 US standard population.

‡ Two separate sets of weights were applied to mortality records: one for demographic and one for cause-of-death data, resulting in slight inconsistencies in the number of deaths between Tables 1 and 11.

§ Excludes HIV infection.

‖ Because deaths from this cause occur primarily among infants, infant deaths, and mortality rates per 100 000 live births due to this cause are shown.

—, Indicates comparable data not available for this time period.

Source: National Center for Health Statistics, National Vital Statistics System, 1979–1997.

TABLE 12. Deaths and Death Rates for the Five Leading Causes of Childhood Death in Specified Age Groups in 1997: United States, Final 1979 and 1996 and Preliminary 1997

Cause of Death and Age	Rank*	1997			1996			1979			Percent Change 1979–1997
		Number	Percent	Rate†	Number	Percent	Rate†	Number	Percent	Rate†	
Total: 1–19 years											
All causes	—	27 489	100.0	37.6	28 941	100.0	39.9	40 339	100.0	58.1	−35.3
Accidents and adverse effects (E800–E949)	1	11 694	42.5	16.0	12 336	42.6	17.0	21 727	53.9	31.3	−48.9
Homicide and legal intervention (E960–E978)	2	3228	11.7	4.4	3858	13.3	5.3	2899	7.2	4.2	4.8
Suicide (E950–E959)	3	2127	7.7	2.9	2119	7.3	2.9	1940	4.8	2.8	3.6
Malignant neoplasms (140–208)	4	2124	7.7	2.9	2137	7.4	2.9	3271	8.1	4.7	−38.3
Congenital anomalies (740–759)	5	1216	4.4	1.7	1286	4.4	1.8	1899	4.7	2.7	−37.0
1–4 Years											
All causes	—	5471	100.0	35.6	5948	100.0	38.3	8108	100.0	64.2	−44.5
Accidents and adverse effects (E800–E949)	1	1958	35.8	12.8	2147	36.1	13.8	3349	41.3	26.5	−51.7
Congenital anomalies (740–759)	2	596	10.9	3.9	638	10.7	4.1	1021	12.6	8.1	−51.9
Malignant neoplasms (140–208)	3	458	8.4	3.0	424	7.1	2.7	578	7.1	4.6	−34.8
Homicide and legal intervention (E960–E978)	4	345	6.3	2.3	420	7.1	2.7	314	3.9	2.5	−8.0
Diseases of heart (390–398, 402, 404–429)	5	195	3.6	1.3	217	3.6	1.4	265	3.3	2.1	−38.1
5–9 Years											
All causes	—	3646	100.0	18.5	3780	100.0	19.4	5278	100.0	31.1	−40.5
Accidents and adverse effects (E800–E949)	1	1524	41.8	7.7	1588	42.0	8.2	2707	51.3	16.0	−51.9
Malignant neoplasms (140–208)	2	518	14.2	2.6	523	13.8	2.7	791	15.0	4.7	−44.7
Congenital anomalies (740–759)	3	214	5.9	1.1	241	6.4	1.2	289	5.5	1.7	−35.3
Homicide and legal intervention (E960–E978)	4	159	4.4	0.8	179	4.7	0.9	165	3.1	1.0	−20.0
Diseases of heart (390–398, 402, 404–429)	5	138	3.8	0.7	129	3.4	0.7	119	2.3	0.7	—
10–14 Years											
All causes	—	4398	100.0	23.1	4550	100.0	24.0	5868	100.0	31.8	−27.4
Accidents and adverse effects (E800–E949)	1	1805	41.0	9.5	1845	40.6	9.7	2982	50.8	16.2	−41.4
Malignant neoplasms (140–208)	2	477	10.9	2.5	505	11.1	2.7	761	13.0	4.1	−39.0
Suicide (E950–E959)	3	308	7.0	1.6	298‡	6.6	1.6	151§	2.6	0.8	100.0
Homicide and legal intervention (E960–E978)	4	278	6.3	1.5	335‡	7.4	1.8	229§	3.9	1.2	25.0
Congenital anomalies (740–759)	5	211	4.8	1.1	216	4.8	1.1	289§	4.9	1.6	−31.3
15–19 Years											
All causes	—	13 974	100.0	73.3	14 663	100.0	78.6	21 085	100.0	98.8	−25.8
Accidents and adverse effects (E800–E949)	1	6407	45.9	33.6	6756	46.1	36.2	12 689	60.2	59.4	−43.4
Homicide and legal intervention (E960–E978)	2	2446	17.5	12.8	2924	19.9	15.7	2191	10.4	10.3	24.3
Suicide (E950–E959)	3	1814	13.0	9.5	1817	12.4	9.7	1788	8.5	8.4	13.1
Malignant neoplasms (140–208)	4	671	4.8	3.5	685	4.7	3.7	1141	5.4	5.3	−34.0
Diseases of heart (390–398, 402, 404–429)	5	382	2.7	2.0	407	2.8	2.2	395	1.9	1.9	5.3

* Rank based on number of deaths.
† Rate per 100 000 population in specified group.
‡ In 1996, homicide was the third leading cause of death for children 10–14 years old, and suicide ranked fourth.
§ In 1979, congenital anomalies was the third leading cause of death for children 10–14 years old, with a total of 289 deaths and a death rate of 1.6; homicide was ranked the fourth, suicide sixth, and diseases of heart fifth.
Source: National Center for Health Statistics, National Vital Statistics System, 1979–1997.

tion of the population; the aging of the US population results in higher crude death rates, despite lower age-specific rates.

Expectation of Life

The estimated expectation of life at birth for a given year represents the average number of years that a group 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. Based on preliminary data for 1997, the expectation of life at birth reached a new record high of 76.5 years, an increase of 0.4 year from the previous year. Life expectancy increased from the previous year by 1.2 years for black males, 0.5 years for black females, 0.4 years for white males, and 0.1 years for white females, setting record highs for black males and females and white males, and matching the record high set in 1992 for white females. In 1997, life expectancy at birth was 79.8 years for white females, 74.7 years for black females, 74.3 years for white males, and 67.3 years for black males.

Causes of Death

Based on preliminary data, the 10 leading causes of death in 1997 accounted for ~80% of all US deaths (Table 11). Between 1996 and 1997, age-adjusted death rates declined for a number of causes of death, including HIV infection, by 47%; accidents and adverse effects (unintentional injuries), by 5%; suicide, by 5%; chronic liver disease and cirrhosis, by 4%; diseases of heart, by 3%; malignant neoplasms, by 2%; cerebrovascular diseases, by 2%; and diabetes mellitus by 1%. Among the 10 leading causes of death in 1997, age-adjusted death rates increased for nephritis, nephrotic syndrome, and nephrosis (kidney disease), by 5%; chronic obstructive pulmonary disease, by 2%; and pneumonia and influenza, by 3%.

HIV Infection and Other Infectious Diseases

In 1987, a special cause-of-death category was created in the United States to classify uniquely deaths due to HIV infection.[43] Between 1987 and 1994, the age-adjusted death rate for HIV infection rose an average of 16% annually, before leveling off in 1995. Since 1995, mortality due to HIV infection has fallen by 62%, and HIV infection has dropped from the 8th leading cause of death in 1995 to the 14th in 1997. This downturn has been attributed to improvements in the treatment and prevention of the disease.[44]

The number of deaths due to infectious diseases has increased substantially since 1979, although they account for a relatively small percentage of all deaths (2.3% in 1997). Although a large proportion of this increase since 1987 is attributable to increases in HIV infection, increases in other infectious diseases also have occurred. In particular, the age-adjusted death rate for septicemia increased by 83% from 1979 to 1997, and the rate for viral hepatitis more than tripled during the same period. In 1997, septicemia accounted for 43% of deaths attributable to infectious and parasitic diseases, whereas HIV infection accounted for 32%, and viral hepatitis for 7%. Between 1996 and 1997, the age-adjusted death rate from infectious diseases declined, however, by 27%.

Homicide and Suicide

The age-adjusted death rate for homicide and legal intervention (homicide) declined by 12%, from 8.5 per 100 000 in 1996 to 7.5 in 1997, marking a 31% decline since the peak of 10.9 in 1991. Since 1979, the age-adjusted homicide rate has decreased by 27%. The age-adjusted death rate for suicide declined by 5% in 1997, contributing to the 12% decline since 1979.

Deaths Among Children

Based on preliminary data, 27 489 children and adolescents between 1 and 19 years of age died in the United States in 1997 (Table 12). The death rate for children 1 to 4 years old in 1997 was 35.6 per 100 000 population, 7% lower than the rate of 38.3 in 1996. The respective death rates for children and teens 5 to 9, 10 to 14, and 15 to 19 years of age declined by 5%, 4%, and 7%. Since 1979, death rates have declined by 45% for children 1 to 4 years old, by 41% for children 5 to 9 years old, by 27% for children 10 to 14 years old, and by 26% for teens 15 to 19 years.

For children age 1 to 4 years, unintentional injury was the leading cause of death, with congenital anomalies the second and cancer the third leading causes of death. Unintentional injuries accounted for 36% of all deaths in this age group, although the rate has declined by 52% since 1979. Death rates for congenital anomalies and cancer have decreased 52% and 35%, respectively, since 1979. An estimated 345 children 1 to 4 years old died from homicide, making homicide the fourth leading cause of death in this age group. Since 1979, death rates for homicide for this age group have declined by 8%.

For children 5 to 9 years old, unintentional injury, cancer, congenital anomalies, and homicide were the leading causes of death. The leading cause, unintentional injury, accounted for nearly 42% of all deaths in 1997, whereas the second leading cause, cancer, accounted for 14% of all deaths in this age group. Since 1979, death rates attributable to each of these leading causes of death have declined by at least 20%.

Unintentional injury was the leading cause of death and accounted for 41% of all deaths of children 10 to 14 years of age. The second leading cause was cancer. In 1997, suicide moved from the fourth to the third leading cause, and homicide from the third to the fourth. The death rate due to unintentional injuries and cancer for this age group declined by 41% and 39%, respectively, since 1979. In contrast, the death rate for suicide doubled during this period. The homicide death rate increased 25% from 1979 to 1996, but declined 17% between 1996 and 1997.

For teens 15 to 19 years of age, unintentional injuries accounted for 46% of all deaths in 1997 and was the leading cause of death, although the rate has dropped by 43% since 1979. An estimated 2446 teens were victims of homicide, the second leading cause of death, in 1997. Homicide accounted for 18% of all deaths. The teen homicide rate increased by 24%

TABLE 13. Injury Deaths and Death Rates Among Children and Teenagers: United States, Preliminary 1997

Mechanism and Intent of Death (ICD–9 E Codes)	Total: 1–19 Years		1–4 Years		5–9 Years		10–14 Years		15–19 Years	
	Number	Rate*	Number	Rate*	Number	Rate*	Number	Rate*	Number	Rate*
All Injury‖	17 165	23.4	2303	15.0	1682	8.5	2407	12.6	10 773	56.5
Unintentional (E800–E869, E880–E929)	11 610	15.9	1925	12.5	1504	7.6	1793	9.4	6387	33.5
Suicide (E950–E959)	2127	2.9	NA	—	5	†	308	1.6	1814	9.5
Homicide (E960–E969)	3215	4.4	345	2.3	159	0.8	277	1.5	2434	12.8
Undetermined (E980–E989)	200	0.3	33	0.2	14	†	28	0.1	125	0.7
Other (E970–E978, E990–E999)	13	†	0	†	0	†	1	†	12	†
Motor vehicle traffic, All (E810–E819, E958.5)	7480	10.2	655	4.3	797	4.0	1033	5.4	4995	26.2
Unintentional §(E810–E819)	7462	10.2	655	4.3	796	4.0	1031	5.4	4979	26.1
Occupant (E810–E819 [.0, .1])	4477	8.2	337	2.8	362	2.3	510	3.5	3269	23.4
Motor cyclist (E810–E819 [.2, .3])	131	0.2	0	†	3	†	13	†	116	0.8
Pedal cyclist (E810–E819 [.6])	288	0.4	6	†	77	0.4	129	0.7	77	0.4
Pedestrian (E810–E819 [.7])	943	1.3	215	1.4	259	1.3	202	1.1	267	1.4
Unspecified (E810–E819 [.9])	1604	‡	97	‡	94	‡	170	‡	1243	‡
Firearm (E922, E955.0–.4, E965.0–.4, E970, E985.0–.4)	4078	5.6	77	0.5	107	0.5	424	2.2	3470	18.2
Unintentional (E922)	325	0.4	23	0.1	33	0.2	97	0.5	172	0.9
Suicide (E955.0–.4)	1282	1.8	NA	—	1	†	120	0.6	1161	6.1
Homicide (E965.0–.4)	2390	3.3	52	0.3	72	0.4	197	1.0	2069	10.9
Undetermined (E985.0–.4)	68	0.1	2	†	1	†	9	†	56	0.3
Other (970)	13	†	0	†	0	†	1	†	12	†
Poisoning (E850–E869, E950–E952, E962, E980–E982)	460	0.6	44	0.3	26	0.1	46	0.2	343	1.8
Unintentional (E850–E869)	287	0.4	37	0.2	18	†	23	0.1	209	1.1
Suicide (E950–E952)	101	0.1	NA	—	0	†	11	†	90	0.5
Undetermined (E980–E982)	53	0.1	3	†	3	†	4	†	42	0.2
Fall (E880–E886, E888, E957, E968.1, E987)	232	0.3	46	0.3	23	0.1	32	0.2	131	0.7
Unintentional (E880–E886, E888)	187	0.3	43	0.3	23	0.1	28	0.1	94	0.5
Suicide (E957)	34	0.0	NA	—	0	†	4	†	31	0.2
Suffocation (E911–E913, E953, E963, E983)	1103	1.5	166	1.1	72	0.4	278	1.5	586	3.1
Unintentional (E911–E913)	348	0.5	141	0.9	56	0.3	86	0.5	65	0.3
Suicide (E953)	642	0.9	0	†	3	†	171	0.9	469	2.5
Homicide (E963)	93	0.1	20	0.1	11	†	12	†	51	0.3
Drowning (E830, E832, E910, E954, E964, E984)	1273	1.7	451	2.9	243	1.2	209	1.1	370	1.9
Unintentional (E830, E832, E910)	1237	1.7	439	2.9	240	1.2	207	1.1	351	1.8
Fire/hot object/substance (E890–E899; E924; E958 [.1, .2, .7]; E961; E968 [.0, .3]; E988 [.1, .2, .7])	761	1.0	354	2.3	197	1.0	113	0.6	96	0.5
Unintentional (E890–E899, E924)	684	0.9	330	2.1	176	0.9	99	0.5	80	0.4
Homicide (E961, E968 [.0, .3])	57	0.1	18	†	17	†	13	†	7	†
Cut/pierce (E920, E956, E966, E986)	223	0.3	10	†	14	†	30	0.2	168	0.9
Homicide (E966)	206	0.3	7	†	12	†	26	0.1	161	0.8
Struck by/against (E916–E917, E960.0, E968.2, E973, E975)	163	0.2	45	0.3	30	0.2	25	0.1	63	0.3
Unintentional (E916–E917)	128	0.2	37	0.2	24	0.1	21	0.1	46	0.2
Machinery (E919)	67	0.1	19	†	17	†	14	†	17	†
Pedal cycle, other (E800–E807 [.3]; E820–E825 [.6]; E826 [.1, .9]; E827–E829 [.1])	29	0.0	4	†	8	†	14	†	3	†
Pedestrian, other (E800–E807 [.2], E820–E825 [.7], E826–E829 [.0])	193	0.3	92	0.6	20	0.1	29	0.2	52	0.3
Transportation, other (E800–E807 [.0, .1, .8, .9]; E820–E825 [.0–.5, .8, .9]; E826 [.2–.8]; E827–E829 [.2–.9]; E831; E833–E845; E958.6; E988.6)	242	0.3	12	†	35	0.2	72	0.4	124	0.6
Natural/environmental (E900–E909; E928 [.0–.2]; E958.3; E988.3)	101	0.1	29	0.2	14	†	22	0.1	36	0.2
Unintentional (E900–E909; E928 [.0–.2])	101	0.1	29	0.2	14	†	22	0.1	36	0.2

* Rate per 100 000 population in specified group.
† Rates based on fewer than 20 deaths are unreliable.
‡ In the rate calculations, the fourth-digit .9 codes for unspecified person were distributed proportionately according to the known distribution of occupant and motorcyclist deaths in each age group.
§ Includes fourth-digit ICD codes .4, .5, .8 not shown separately.
‖ ICD–E codes for all injuries include (E800–E869, E880–E929, E950–E959, E960–E969, E980–E989, E970–E978, E990–E999).
Note: Totals for selected causes of death differ from those shown in previous tables that use standard mortality tabulation lists.
Source: National Center for Health Statistics. Data computed by the Office of Analysis, Epidemiology, and Health Promotion from data compiled by the Division of Vital Statistics.

from 1979 to 1997, but decreased 18% between 1996 and 1997. Suicide was the third leading cause of death for this age group, accounting for 13% of all deaths. Since 1979, suicide rates increased by 13% for this age group, but declined by 2% between 1996 and 1997.

Childhood Injury Deaths by Mechanism and Intent

The injury mortality data shown in Table 13 are presented as an alternative to the more traditional presentation of injury mortality. The data in Table 13 are tabulated by the two axes of the external cause of injury and poisoning codes (ICD–9 E-codes): 1) mechanism or cause of death, and 2) intent of injury or manner of death. This framework,[45] used in the Injury Chartbook,[46] draws more attention to how the injury occurred and thus to prevention. Because slightly different groupings of ICD–9 codes are used, numbers of deaths for various categories may not agree exactly with those in Table 12. The injury framework was developed by the CDC's National Center for Injury Prevention and Control and NCHS in collaboration with the American Public Health Association's Injury Control and Emergency Health Services Section.[45]

In 1997, 17 165 children and teenagers 1 to 19 years of age died as a result of an injury at a rate of 23.4 per 100 000 population. Across these ages, motor vehicle traffic injuries and firearm injuries were the two major causes of injury. For children 1 to 4 years of age, death rates associated with motor vehicle traffic injuries (occupant and pedestrian fatalities), fires/flames, and drowning were among the highest. At ages 5 to 9 and 10 to 14 years, death rates due to motor vehicle traffic injuries were greater than those for other causes. In these age groups, the children were occupants, pedestrians, and bicyclists. For teenagers 15 to 19 years of age, the death rate for motor vehicle traffic injuries (primarily occupant fatalities) was 1.4 times the rate for firearm-related injuries; these two causes accounted for 79% of all injury deaths in that age group.

Summary of Childhood Deaths

In summary, death rates for children and teenagers dropped by 35% between 1979 and 1997. Despite declines, the leading cause of death in 1997 among children and teens continued to be unintentional injury. Congenital anomalies was the second leading cause of death at 1 to 4 years of age but dropped in importance for successively older age groups as cancer, homicide, and suicide became more prominent. Cancer accounts for 5% to 14% of deaths for each of the age groups younger than 19 years of age. Declines for unintentional injuries have been attributed in part to injury prevention measures such as mandatory car seat requirements, smoke alarms, and sprinkler systems in homes and schools.[47] Decreases in recent years for homicide and suicide, hopefully, signal the beginning of a long-term reversal in mortality from these causes among children. Yet, a large proportion of childhood deaths continue to occur as a result of preventable injuries.[48] American pediatricians must strengthen their efforts to prevent many of these deaths.

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BERTRAND RUSSELL'S STORY ABOUT THE "PROBLEM OF INDUCTION"

The chicken noticed that the farmer came every day to feed it. It predicted that the farmer would continue to bring food every day. Inductivists think that the chicken had 'extrapolated' its observations into a theory. Then, one day the farmer came and wrung the chicken's neck. The disappointment experienced by this chicken has also been experienced by trillions of other chickens. This inductively justifies the conclusion that induction cannot justify any conclusions.

Quoted in Deutsch D. *The Fabric of Reality.* New York, NY: Penguin Press; 1997

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