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Health and Demographic Characteristics of Twin Births: United States, 1988

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Introduction

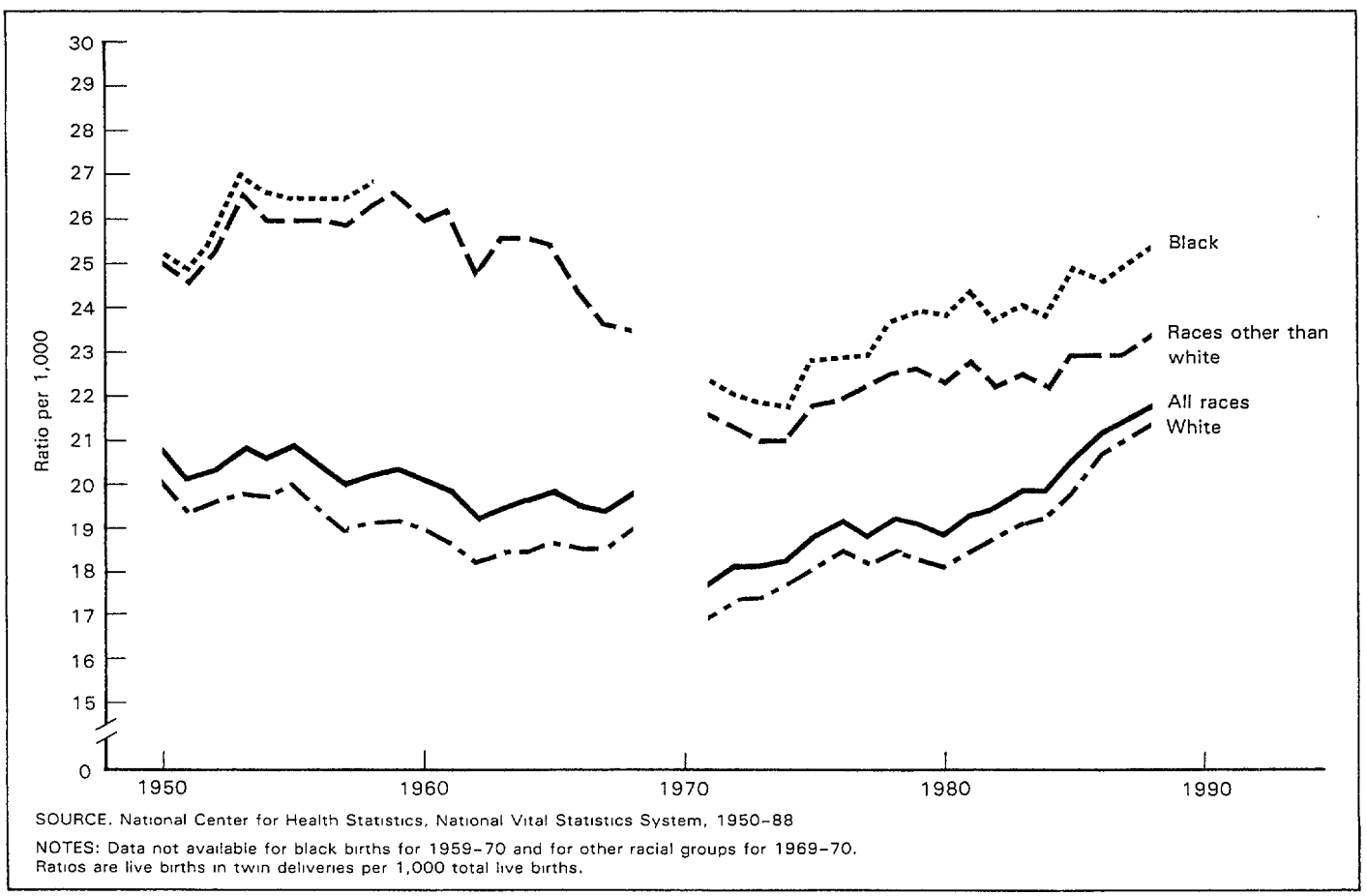
Information on the plurality of births derived from live birth certificates has been published annually in the United States since 1917. Before 1959, the live birth and fetal death records for sets of multiple births were matched. Beginning with the 1959 data year, however, this matching process was discontinued, and it was no longer possible to determine the number and composition of plural sets. Because of the lack of such information for recent years, information presented in this report refers only to the number of twin live births.

Trends in twin birth incidence

Both the number of twin live births and the ratio of twin births per 1,000 total live births have risen fairly steadily since the early 1970's (table 1 and figure 1). This rise follows a slight decline in twin birth ratios from 1950 to the late 1960's. By 1988, there were 21.8 twin live births per 1,000 total live births in the United States, an increase of 22 percent over the twinning ratio of 17.8 in 1971. The 1988 ratio is the highest ratio observed in the last four decades. A rising proportion of twin births since the 1970's has also been noted in England and Wales (1).

The recent rise in twinning incidence reflects a change in the age distribution of women at childbirth, with more women giving birth at older ages (see "Age of mother and live-birth order"), and an increased use of fertility drugs, which greatly increases the risk of multiple ovulation and subsequent delivery of multiple births (2). In 1988, approximately 1.9 million women, ages 15–44, reported that they had ever used ovulation-inducing drugs. This figure is up from 1.1 million in 1982 (unpublished tabulations from the 1982 and 1988 National Surveys of Family Growth, National Center for Health Statistics).

During all years for which data are available, the twinning ratio for black births exceeds the ratio for white births. In 1988, the ratio of 25.4 for black births was 19 percent higher than the ratio of 21.4 for white births. The racial differential has narrowed considerably since 1971, when the black ratio exceeded the white ratio by 32 percent (table 1). The narrowing of the racial differential is due to the more rapid increase in twinning incidence for white births than for black births (26 percent and 13 percent, respectively).



SOURCE. National Center for Health Statistics, National Vital Statistics System, 1950–88

NOTES: Data not available for black births for 1959–70 and for other racial groups for 1969–70. Ratios are live births in twin deliveries per 1,000 total live births.

Figure 1. Twin birth ratios by race of child: United States, 1950–88

Age of mother and live-birth order

The incidence of twinning increases with the mother's age, up to ages 35–39 years, and then declines. This pattern is evident for both white and black births (table 2). It has been attributed to the rise in the level of gonadotropin with age, with maximum stimulation of follicles occurring at ages 35–39, and a subsequent decline in ovarian function at older ages (2).

Since the mid-1970's, the proportion of births to women in their thirties has risen steadily. In 1988, 20.6 percent of all births were to women 30–34 years of age, 81 percent more than the comparable proportion in 1971 (11.4 percent). Similarly, in 1988, 6.9 percent of births were to women 35–39 years of age, 50 percent more than the 4.6 percent in 1971.

These increases are a major reason for the recent rise in the twinning ratio. From 1971 to 1988, 39 percent of the increase in twinning incidence for white births and 50 percent of the increase for black births can be attributed to the change in the age distribution of women giving birth during this period. If the age distribution of mothers in 1988 were exactly the same as in 1971, the 1988 overall and black twinning ratios would have been 6 percent lower, and the 1988 white twinning ratio would have been 8 percent lower (table 3).

An independent effect of parity of equal or greater importance than that of maternal age has been observed in a number of previous studies (3-5). However, it is not possible to determine the exact influence of parity from data derived from birth certificates, because each live-born twin in a twin delivery is assigned a different, adjacent, live-birth order. Thus, if a mother had one previous live-born child, the first born of a set of twins would be assigned live-birth order two while the second would be assigned live-birth order three. However, despite this shortcoming, it is evident that there is a greatly increased incidence of twinning for high-order compared with low-order births.

As indicated in table 4, the twinning ratios for fourth, fifth, and higher birth orders are about four times as high as the ratio for first-order births. These differences are not due to the older ages of women having high-order births. For all maternal ages and for both white and black births, twinning ratios increase with birth order and are substantially higher for high- than for low-birth orders. Previous studies indicate that maternal age and birth order effects on twinning incidence are most pronounced for dizygotic (fraternal) twins, with little or no difference for monozygotic (identical) twin deliveries (3,4,6).

Twin birth ratios for American Indian, Chinese, Japanese, Filipino, and other Asian and Pacific Islander births are 13 to 31 percent lower than for white births and 26 to 42 percent lower than for black births, despite a generally higher proportion of births to older mothers and lower incidence of teenage births for these racial groups. These lower twin ratios reflect a much reduced twinning ratio for almost all age groups (table 5). The age groups analyzed are 10-year intervals because of the small number of twins for some racial groups.

Variation in twinning incidence among racial and ethnic groups is due primarily to differences in dizygotic twinning rates. It has been observed that the rate of monozygotic twinning is fairly constant throughout the world. Several factors have been identified to explain racial differences in dizygotic twinning incidence. Among these are genetic disposition, which is inherited primarily through the mother, and undernourishment, which decreases gonadotropin secretion and hence incidence of multiple delivery (2).

Sex ratio at birth

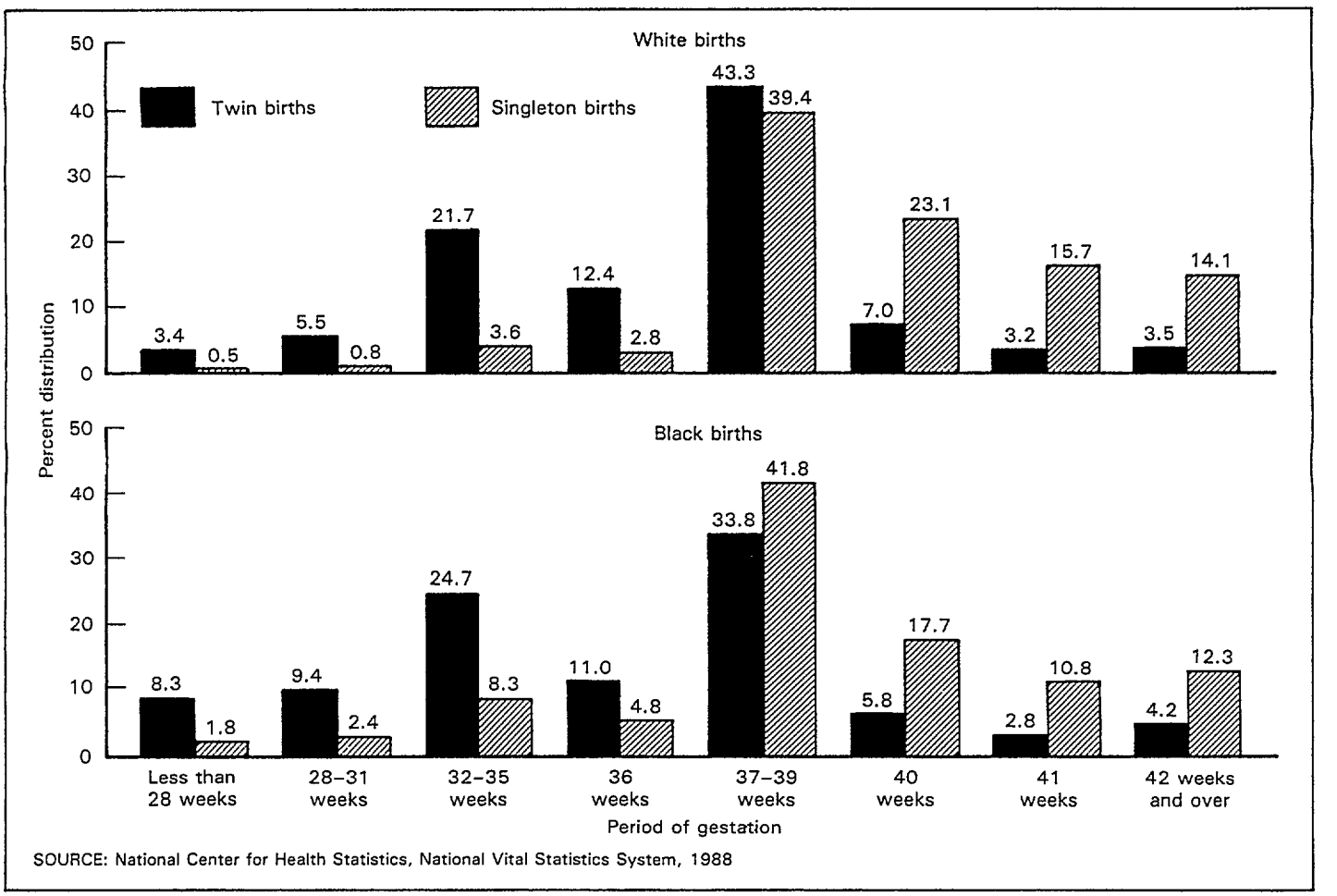
There is a distinct difference in the sex ratio at birth (the number of male births per 1,000 female births) for twin and singleton live births. The sex ratio for twin births by age of mother tends to vary from year to year because of small numbers. Therefore, data analyzed in this report are for the combined 3-year period 1986–88. During this time, the sex ratio for singleton live births was 1,051, 4.5 percent higher than the ratio of 1,006 for twin births. As indicated in table 6, the ratio is higher for singleton births for all maternal ages, except 40–44 years of age, where it is the same. This general pattern is evident for both white and black births, but the sex differential by plurality is less for black births.

Period of gestation and birth weight

The gestational age of a newborn is determined from the first day of the mother's last normal menstrual period and the date of birth. Short gestational periods are far more common for twins than for singletons (table 7 and figure 2). In 1988, almost five times the proportion of twins as of singletons were born preterm (before 37 weeks gestation) (45.0 percent compared with 9.4 percent).

It has been suggested that the greater risk of preterm delivery for twins is due to uterine overdistention, mechanical stretching of the cervix, and decreased uterine blood flow (2). Preterm birth is the leading cause of neonatal death for multiple births (7) and is one of the major causes of infant mortality for twins (8).

Black twin births are more likely to be born preterm than white twin births (53.4 percent compared with 43.0 percent). However, the risk of preterm delivery for white twins compared with white singletons is far greater than for black twins compared with black singletons. Five and one-half times the proportion of white twins as white singletons are born before 37 weeks compared with three times the proportion of black twins as black singletons.



SOURCE: National Center for Health Statistics, National Vital Statistics System, 1988

Figure 2. Percent distribution of twin and singleton live births by period of gestation, according to race of child: United States, 1988

Slightly more than one-half of twin babies are born at term (37–41 weeks gestation) compared with about three-quarters of singleton births. There are relatively few twins born post-term (3.7 percent compared with 13.7 percent of singletons), and racial differences are minor for post-term deliveries.

The average length of gestation for singletons is 39.3 weeks, about 3 weeks longer than the twin average of 36.2 weeks. Approximately the same differential is evident for white and black births (table 7).

It is well known that twins weigh less at birth than singletons. While their lower birth weight is due in part to shorter gestational periods, there are major differences in birth weight for equal periods of gestation (table 8). More than twice the proportion of twins than singletons born before 37 weeks gestation weigh less than 2,500 grams (75.5 percent compared with 34.6 percent). Similarly, more than twice the proportion of premature twins than premature singletons weigh less than 1,500 grams (19.5 percent compared with 9.3 percent). Less than 1 percent of twins born preterm weigh 3,500 grams or more compared with 14.0 percent of singletons.

At 37–39 weeks of gestation, the disparity in birth weight between twins and singletons is even more pronounced, with 28.8 percent of twins weighing less than 2,500 grams compared with only 4.1 percent of singletons. While 34.4 percent of singletons with these gestations weigh at least 3,500 grams, only 4.3 percent of twins attain this birth weight.

For gestations of 40 weeks and over, the proportion of low-birth-weight infants (less than 2,500 grams) declines to 26.5 percent for twins. The disparity with singleton birth weight becomes even more evident, with only 1.6 percent of singletons weighing this little.

For all periods of gestation, the risk of low birth weight for both black twin and singleton births far exceeds that for white births, and this racial differential increases as period of gestation lengthens. Thus, while only 11 percent more black twin preterm than white twin preterm births were low birth weight (81.4 percent compared with 73.6 percent), this racial difference increases to 58 percent for gestations of 40 weeks and over (37.5 percent compared with 23.7 percent).

The fact that twins have on the average far lower birth weights than singletons of matched gestational ages suggests that other factors are responsible for their reduced birth weight. Several explanations have been offered:

- The overcrowding in the uterus limits the area available for placental growth, leading to placental insufficiency.
- The inability of the mother to provide adequate nourishment to support optimal growth of two fetuses.
- The blood supply to the uterus is not sufficient to support the same rate of growth for a multiple as for a single pregnancy (9).

Apgar score

The Apgar score, developed by Virginia Apgar in 1952, is used to evaluate the physical condition of an infant at 1 and 5 minutes after birth. The score may be predictive of an infant's chance for survival and often is used as an indication of whether immediate medical attention is required. The score is the sum of five signs of the physical condition of the infant, each having a value of 0, 1, or 2. These are heart rate, respiratory effort, muscle tone, reflex irritability, and color. A score of 0–3 indicates that the infant is severely depressed; 4–6, moderately depressed; and 7–10, that the infant is in good to excellent condition. The 1-minute score reflects the infant's condition at birth, while the 5-minute score is a better predictor of long-term health and survival.

As indicated in table 9, more than one-fifth of twins (21.4 percent) had a 1-minute score of less than 7; a score this low was more common for black twins than for white twins (28.0 percent compared with 19.6 percent). A low 1-minute score was 2½ times as frequent for twins as for singletons, regardless of race. White singletons were 46 percent more likely than white twins to have optimal 1-minute scores of 9 or 10 (42.1 percent compared with 28.8 percent), but this differential increased to 74 percent for black births (43.9 percent compared with 25.3 percent).

While 5-minute scores are considerably higher than 1-minute scores for both twins and singletons, the differential by plurality is still quite marked. A twin is more than four times as likely as a singleton to have a 5-minute score of less than 7 (6.5 percent compared with 1.5 percent). About 7 out of 10 twins, compared with about 9 out of 10 singletons, had high 5-minute scores of 9 or 10. Again, large differentials in 5-minute Apgar scores by plurality are evident for both races.

Weight at birth is highly correlated with Apgar scores. At 1 minute after birth, low-birth-weight babies are about nine times as likely as those of higher weights to be classified as severely depressed (scores of 0 to 3) and about three times as likely to be classified as moderately depressed (scores of 4 to 6).

Differentials for 5-minute Apgar scores for low-birth-weight infants are even larger. As noted earlier, the birth weight of twins is less favorable than that of singletons. About 50 percent of twins weigh less than 2,500 grams at birth compared with 6 percent of singletons. Thus, the higher prevalence of low birth weight among twin births is one of the major reasons for the relatively large proportion of low 1- and 5-minute scores.

An additional reason is that a very high proportion of twins are delivered by cesarean section. In 1988, almost two-thirds of twin deliveries compared with about one-quarter of singleton deliveries were by cesarean section (unpublished data from the National Hospital Discharge Survey of the National Center for Health Statistics). Both 1- and 5-minute Apgar scores are lower for cesarean than for vaginal deliveries (unpublished data from the 1980 National Natality Survey of the National Center for Health Statistics).

Discussion

It is evident that the health status at birth is far more precarious for twins than for singletons. A study of congenital anomalies and birth injuries among live births found that the overall incidence of congenital defects was 18 percent higher among births in plural than in single deliveries, and that for almost all anomalies examined there was a higher incidence for plural births. Additionally, there was a far greater likelihood of brain, bone, or nerve injury at birth for a multiple than for a single birth (10). The lower birth weight and higher incidence of prematurity for twin births have been identified as critical factors in their higher rates of infant mortality (8).

With the continuing increase in the number of twin births in the United States, research into the prevention of preterm delivery and low birth weight for multiple births is of increasing importance. This will be aided by the wealth of new information that will become available from the revised U.S. Standard Certificate of Live Birth, implemented by all but three States in 1989.

Included on the new certificate are a number of questions particularly relevant to the study of twin health. These include medical risk factors of pregnancy, such as anemia, pregnancy-associated hypertension, and eclampsia; and complications of labor and delivery, such as fetal distress and dysfunctional labor.

In addition, information will be collected on lifestyle factors—tobacco and alcohol use and weight gain during pregnancy—as well as method of delivery and abnormal conditions and congenital anomalies of the newborn. For some of these risk factors and conditions, there will be only a relatively small number of events annually. Thus, it may be necessary to combine several years of data for meaningful analyses.

This new information, combined with other socioeconomic and health data available from birth certificates, will provide a more complete and clearer picture of the risks of multiple delivery than is presently obtainable from periodic sample surveys.

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List of detailed tables

Table 1. Twin birth ratios by race of child: United States, 1950–88

(Ratios are live births in twin deliveries per 1,000 total live births)

Year	All races			White			All other					
							Total			Black		
	Number of twin births	Total births	Ratio	Number of twin births	Total births	Ratio	Number of twin births	Total births	Ratio	Number of twin births	Total births	Ratio
1988	85,315	3,909,510	21.8	65,136	3,046,162	21.4	20,179	863,348	23.4	17,052	671,976	25.4
1987	81,778	3,809,394	21.5	62,952	2,992,488	21.0	18,826	816,906	23.0	16,042	641,567	25.0
1986	79,485	3,756,547	21.2	61,385	2,970,439	20.7	18,100	786,108	23.0	15,252	621,221	24.6
1985	77,102	3,760,561	20.5	59,420	2,991,373	19.9	17,682	769,188	23.0	15,137	608,193	24.9
1984[1]	72,949	3,669,141	19.9	56,439	2,923,502	19.3	16,510	745,639	22.1	14,111	592,745	23.8
1983[1]	72,287	3,638,933	19.9	55,766	2,904,250	19.2	16,521	734,683	22.5	14,142	586,027	24.1
1982[1]	71,631	3,680,537	19.5	55,229	2,942,054	18.8	16,402	738,483	22.2	14,042	592,641	23.7
1981[1]	70,049	3,629,238	19.3	53,653	2,908,669	18.4	16,396	720,569	22.8	14,340	587,797	24.4
1980[1]	68,339	3,612,258	18.9	52,397	2,898,732	18.1	15,942	713,526	22.3	14,026	589,616	23.8
1979[1]	66,858	3,494,398	19.1	51,372	2,808,420	18.3	15,486	685,978	22.6	13,782	577,855	23.9
1978[1]	64,163	3,333,279	19.2	49,461	2,681,116	18.4	14,702	652,163	22.5	13,116	551,540	23.8
1977[1]	62,880	3,326,632	18.9	48,824	2,691,070	18.1	14,056	635,562	22.1	12,512	544,221	23.0
1976[1]	60,664	3,167,788	19.2	47,521	2,567,614	18.5	13,143	600,174	21.9	11,786	514,479	22.9
1975[1]	59,192	3,144,198	18.8	46,266	2,551,996	18.1	12,926	592,202	21.8	11,674	511,581	22.8
1974[1]	57,836	3,159,958	18.3	45,573	2,575,792	17.7	12,263	584,166	21.0	11,041	507,162	21.8
1973[1]	56,777	3,136,965	18.1	44,452	2,551,030	17.4	12,325	585,935	21.0	11,201	512,597	21.9
1972[1]	59,122	3,258,411	18.1	46,302	2,655,558	17.4	12,820	602,853	21.3	11,670	531,329	22.0
1971[2]	63,298	3,555,970	17.8	49,576	2,919,746	17.0	13,722	636,224	21.6	12,656	564,960	22.4
1970[2]	---	3,731,386	---	---	3,091,264	---	---	640,122	---	---	572,362	---
1969[2]	---	3,600,206	---	---	2,993,614	---	---	606,592	---	---	543,132	---
1968[2]	69,300	3,501,564	19.8	55,464	2,912,224	19.0	13,836	589,340	23.5	---	531,152	---
1967[3]	68,336	3,520,959	19.4	54,123	2,922,502	18.5	14,213	598,457	23.7	---	543,976	---
1966[2]	70,340	3,606,274	19.5	55,430	2,993,230	18.5	14,910	613,044	24.3	---	558,244	---
1965[2]	74,594	3,760,358	19.8	58,436	3,123,860	18.7	16,158	636,498	25.4	---	581,126	---
1964[2]	78,954	4,027,490	19.6	62,076	3,369,160	18.4	16,878	658,330	25.6	---	607,556	---
1963[2,4]	80,044	4,098,020	19.5	61,062	3,326,344	18.4	16,356	638,928	25.6	---	580,658	---
1962[2,4]	80,180	4,167,362	19.2	61,792	3,394,068	18.2	15,788	641,580	24.6	---	584,610	---
1961[2]	84,926	4,268,326	19.9	67,442	3,600,864	18.7	17,484	667,462	26.2	---	611,072	---
1960[2]	85,440	4,257,850	20.1	68,414	3,600,744	19.0	17,026	657,106	25.9	---	602,264	---
1959[2]	86,426	4,244,796	20.4	69,230	3,597,430	19.2	17,196	647,366	26.6	---	605,962	---
1958[2]	84,934	4,203,812	20.2	68,314	3,572,306	19.1	16,620	631,506	26.3	15,992	594,500	26.9
1957[2]	85,196	4,254,784	20.0	68,788	3,621,456	19.0	16,408	633,328	25.9	15,773	596,050	26.5
1956[2]	84,765	4,163,090	20.4	68,724	3,545,350	19.4	16,041	617,740	26.0	15,486	584,572	26.5
1955	84,394	4,047,295	20.9	69,079	3,458,448	20.0	15,315	588,847	26.0	14,806	558,251	26.5
1954[2]	82,626	4,017,362	20.6	67,705	3,443,630	19.7	14,921	573,732	26.0	14,477	544,288	26.6
1953[2]	81,000	3,902,120	20.8	66,518	3,356,772	19.8	14,482	545,348	26.6	13,998	517,576	27.0
1952[2]	78,457	3,846,986	20.4	65,232	3,322,658	19.6	13,225	524,328	25.2	12,817	497,880	25.7
1951[2]	75,335	3,750,850	20.1	62,772	3,237,072	19.4	12,563	513,778	24.5	12,155	489,282	24.8
1950	73,499	3,554,149	20.7	61,233	3,063,627	20.0	12,266	490,522	25.0	11,794	466,718	25.3

[1]Based on 100 percent of births in selected States and on a 50-percent sample of births in all other States; see Technical notes.

[2]Based on a 50-percent sample of births.

[3]Based on a 20- to 50-percent sample of births.

[4]Figures by race exclude data for New Jersey.

Table 2. Twin birth ratios by age of mother and race of child: United States, 1988

(Ratios are live births in twin deliveries per 1,000 total live births in specified group)

Age of mother	Race of child		
	All races[1]	White	Black
All ages	21.8	21.4	25.4
Under 15 years	13.4	14.0	13.1
15–19 years	13.8	12.6	16.6
20–24 years	19.0	17.6	24.6
25–29 years	22.7	22.1	29.5
30–34 years	26.6	26.4	32.2
35–39 years	29.2	29.8	32.0
40–44 years	22.4	23.0	23.5
45–49 years	*	*	*

[1]Includes races other than white and black.

Table 3. Observed and adjusted twin birth ratios by race of child: United States, selected years, 1971–88

(Ratios are live births in twin deliveries per 1,000 total live births in specified group. Adjusted ratios reflect the age distribution of mothers in 1971 in specified racial group)

Year	All races[1]			White			Black		
	Observed	Adjusted	Percent difference[2]	Observed	Adjusted	Percent difference[2]	Observed	Adjusted	Percent difference[2]
1988	21.8	20.4	–6.4	21.4	19.7	–7.9	25.4	23.9	–5.9
1987	21.5	20.2	–6.0	21.0	19.6	–6.7	25.0	23.7	–5.2
1986	21.2	20.0	–5.7	20.7	19.3	–6.8	24.6	23.3	–5.3
1985	20.5	19.5	–4.9	19.9	18.7	–6.0	24.9	23.5	–5.6
1984	19.9	19.0	–4.5	19.3	18.3	–5.2	23.8	22.7	–4.6
1983	19.9	19.1	–4.0	19.2	18.4	–4.2	24.1	23.1	–4.1
1982	19.5	18.8	–3.6	18.8	18.1	–3.7	23.7	22.7	–4.2
1981	19.3	18.8	–2.6	18.4	17.9	–2.7	24.4	23.6	–3.3
1980	18.9	18.5	–2.1	18.1	17.7	–2.2	23.8	23.2	–2.5
1975	18.8	18.8	–	18.1	18.1	–	22.8	23.1	1.3
1973	18.1	18.1	–	17.4	17.4	–	21.9	22.2	1.4
1971	17.8	17.8	–	17.0	17.0	–	22.4	22.4	–

[1]Includes races other than white and black.

[2]Adjusted twin ratio compared with observed twin ratio.

Table 4. Twin birth ratios by live-birth order, age of mother, and race of child: United States, 1988

(Ratios are live births in twin deliveries per 1,000 total live births in specified group)

Age of mother and race of child	Live-birth order					
	Total	1	2	3	4	5 and over
All races[1]						
All ages	21.8	10.8	23.3	33.2	42.5	46.1
Under 20 years	13.8	7.0	32.2	50.7	76.6	107.7
20–24 years	19.0	9.5	21.6	34.8	45.5	58.2
25–29 years	22.7	11.9	22.4	32.9	43.2	50.4
30–34 years	26.6	15.8	23.2	31.6	42.8	47.5
35–49 years	28.3	18.6	26.0	30.4	35.2	36.7
White						
All ages	21.4	10.9	23.1	32.9	42.4	44.4
Under 20 years	12.6	6.5	33.1	51.5	76.2	*
20–24 years	17.6	9.2	20.9	34.5	46.3	55.4
25–29 years	22.1	12.0	22.2	32.9	43.1	49.4
30–34 years	26.4	16.2	23.4	31.7	43.2	46.4
35–49 years	28.9	19.7	27.1	31.3	35.7	36.5
Black						
All ages	25.4	10.8	26.3	36.3	45.5	56.4
Under 20 years	16.5	8.0	31.2	50.7	79.7	118.8
20–24 years	24.6	11.6	25.0	36.9	45.3	63.7
25–29 years	29.5	13.6	25.6	35.7	47.1	59.3
30–34 years	32.2	15.3	25.4	33.4	43.2	57.3
35–49 years	30.8	16.0	24.6	30.0	36.7	43.4

[1]Includes races other than white and black.

Table 5. Twin birth ratios by specified race of child and age of mother: United States, 1988

(Ratios are live births in twin deliveries per 1,000 total live births in specified group)

Age of mother	Race of child									
	All races[1]	White	Black	American Indian	Asian or Pacific Islander					
					Total	Chinese	Japanese	Hawaiian	Filipino	Other
All ages	21.8	21.4	25.4	18.7	15.6	14.9	17.7	15.5	14.7	15.8
Under 20 years	13.8	12.6	16.5	12.4	13.2	*	*	18.6	*	11.4
20–29 years	21.0	20.1	26.7	18.5	14.0	12.2	14.8	13.8	13.3	14.6
30–39 years	27.3	27.2	32.1	24.9	18.0	16.9	20.0	17.5	17.4	18.3
40–49 years	22.1	22.6	23.3	*	14.1	*	*	*	*	16.2

[1]Includes other races not shown separately.

Table 6. Sex ratio of twin and singleton live births by age of mother and race of child: United States, 1986–88 average

(Ratios are the number of male births per 1,000 female births in specified group)

Age of mother	All races[1]		White		Black	
	Twin births	Singleton births	Twin births	Singleton births	Twin births	Singleton births
All ages	1,006	1,051	1,009	1,055	996	1,033
Under 15 years	865	1,047	947	1,079	808	1,026
15–19 years	981	1,055	979	1,060	988	1,042
20–24 years	1,008	1,050	1,006	1,054	1,006	1,033
25–29 years	1,020	1,051	1,029	1,053	995	1,030
30–34 years	995	1,053	995	1,056	986	1,030
35–39 years	1,004	1,050	998	1,053	1,017	1,015
40–44 years	1,044	1,044	1,102	1,045	975	1,023
45–49 years	750	1,060	*	1,024	*	1,044

[1]Includes races other than white and black.

Table 7. Percent distribution of twin and singleton live births by period of gestation and race of child: United States, 1988

Period of gestation	All races[1]		White		Black	
	Twin births	Singleton births	Twin births	Singleton births	Twin births	Singleton births
			Number			
Live births[2]	85,315	3,821,810	65,136	2,979,007	17,052	654,623
			Percent distribution			
Total	100.0	100.0	100.0	100.0	100.0	100.0
Under 28 weeks	4.3	0.7	3.4	0.5	8.3	1.8
28–31 weeks	6.3	1.0	5.5	0.8	9.4	2.4
32–35 weeks	22.2	4.5	21.7	3.6	24.7	8.3
36 weeks	12.2	3.2	12.4	2.8	11.0	4.8
37–39 weeks	41.4	40.1	43.3	39.4	33.8	41.8
40 weeks	6.8	22.1	7.0	23.1	5.8	17.7
41 weeks	3.1	14.7	3.2	15.7	2.8	10.8
42 weeks and over	3.7	13.7	3.5	14.1	4.2	12.3
Under 37 weeks	45.0	9.4	43.0	7.7	53.4	17.4
			Weeks			
Mean	36.2	39.3	36.4	39.5	35.3	38.6

[1]Includes races other than white and black.

[2]Includes births with period of gestation not stated, which are excluded from the computation of the percent distribution.

Table 8. Percent distribution of twin and singleton live births by birth weight, according to period of gestation and race of child: United States, 1988

Period of gestation and birth weight	All races[1]		White		Black	
	Twin births	Singleton births	Twin births	Singleton births	Twin births	Singleton births
All gestations			Number			
Live births[2,3]	85,315	3,821,810	65,136	2,979,007	17,052	654,623
			Percent distribution			
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than 1,000 grams	4.6	0.5	3.6	0.4	8.6	1.3
1,000–1,499 grams	5.3	0.5	4.6	0.4	8.0	1.1
1,500–1,999 grams	12.3	1.1	11.2	0.8	16.3	2.2
2,000–2,499 grams	28.0	3.8	27.6	3.1	29.2	7.1
2,500–2,999 grams	31.5	15.7	32.8	13.8	26.4	23.3
3,000–3,499 grams	15.2	37.1	16.7	36.5	9.8	38.6
3,500–3,999 grams	2.7	30.1	3.1	32.3	1.4	20.8
4,000 grams or more	0.3	11.3	0.4	12.7	0.2	5.6
Less than 2,500 grams	50.2	5.9	47.1	4.7	62.2	11.7
Under 37 weeks			Number			
Live births[3]	36,531	344,244	26,777	219,515	8,559	107,564
			Percent distribution			
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than 1,000 grams	9.0	4.6	7.5	4.0	14.1	6.1
1,000–1,499 grams	10.5	4.7	9.7	4.3	13.3	5.6
1,500–1,999 grams	21.6	8.1	20.8	7.6	23.9	9.2
2,000–2,499 grams	34.4	17.3	35.7	17.0	30.0	18.1
2,500–2,999 grams	19.8	26.8	21.4	26.8	15.1	26.7
3,000–3,499 grams	4.2	24.5	4.5	24.8	3.1	23.5
3,500–3,999 grams	0.4	11.0	0.4	12.0	0.3	8.8
4,000 grams or more	0.1	3.0	0.1	3.5	*	1.9
Less than 2,500 grams	75.5	34.6	73.6	32.9	81.4	39.1
37–39 weeks			Number			
Live births[3]	33,658	1,465,993	26,948	1,127,803	5,424	258,893
			Percent distribution			
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than 1,000 grams	0.1	0.0	0.1	0.0	0.4	0.1
1,000–1,499 grams	0.6	0.1	0.4	0.1	1.4	0.1
1,500–1,999 grams	4.3	0.4	3.7	0.4	7.2	0.8
2,000–2,499 grams	23.8	3.6	22.4	3.0	30.3	6.2
2,500–2,999 grams	43.2	19.5	43.4	17.5	41.6	27.1
3,000–3,499 grams	23.7	42.0	25.3	41.8	16.7	42.2
3,500–3,999 grams	3.9	26.9	4.3	28.9	2.3	19.2
4,000 grams or more	0.4	7.6	0.4	8.5	*	4.3
Less than 2,500 grams	28.8	4.1	26.6	3.4	39.2	7.2
40 weeks and over			Number			
Live births[3]	11,059	1,849,405	8,542	1,514,227	2,057	253,430
			Percent distribution			
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than 1,000 grams	0.4	0.0	0.3	0.0	*	0.1
1,000–1,499 grams	1.0	0.0	0.6	0.0	2.2	0.1
1,500–1,999 grams	4.6	0.2	3.6	0.1	8.5	0.4
2,000–2,499 grams	20.6	1.4	19.2	1.1	26.1	2.9
2,500–2,999 grams	37.8	10.3	37.7	9.0	37.6	17.8
3,000–3,499 grams	27.7	35.7	29.6	34.4	20.9	41.9
3,500–3,999 grams	7.1	36.5	7.9	38.1	3.8	28.1
4,000 grams or more	0.9	15.9	1.1	17.3	*	8.7
Less than 2,500 grams	26.5	1.6	23.7	1.3	37.5	3.5

[1]Includes races other than white and black.

[2]Includes births with period of gestation not stated.

[3]Includes births with birth weight not stated, which are excluded from the computation of the percent distribution.

Table 9. Percent distribution of twin and singleton live births by 1- and 5-minute Apgar scores, according to race of child: Total of 46 reporting States and the District of Columbia, 1988

Apgar score	*All races*[1]		*White*		*Black*	
	Twin births	*Singleton births*	*Twin births*	*Singleton births*	*Twin births*	*Singleton births*
1-minute score			Number			
Live births[2]	66,979	2,946,186	50,613	2,282,720	14,494	552,096
			Percent distribution			
Total	100.0	100.0	100.0	100.0	100.0	100.0
0–3	7.6	2.1	6.3	1.8	12.0	3.5
4–6	13.8	6.4	13.3	6.2	16.0	7.6
7–8	50.5	49.0	51.5	49.9	46.6	45.0
9–10	28.1	42.5	28.8	42.1	25.3	43.9
Less than 7	21.4	8.6	19.6	8.0	28.0	11.1
5-minute score			Number			
Live births[2]	66,979	2,946,186	50,613	2,282,720	14,494	552,096
			Percent distribution			
Total	100.0	100.0	100.0	100.0	100.0	100.0
0–3	2.5	0.5	1.9	0.4	4.6	1.0
4–6	4.0	1.0	3.4	0.9	6.3	1.7
7–8	21.1	9.2	20.9	9.0	22.3	10.2
9–10	72.3	89.3	73.8	89.8	66.8	87.1
Less than 7	6.5	1.5	5.4	1.2	10.9	2.7

[1]Includes races other than white and black.

[2]Includes births with Apgar score not stated, which are excluded from the computation of the percent distribution.

NOTE: Excludes data for California, Delaware, Oklahoma, and Texas, which did not report Apgar scores on the birth certificate.

Appendix
Technical notes

Source of data

Data shown in this report for 1988 are based on 100 percent of the birth certificates in all States and the District of Columbia. The data are provided to the National Center for Health Statistics through the Vital Statistics Cooperative Program (VSCP). In 1984 and earlier years, the VSCP included varying numbers of States, which provided data on 100 percent of their birth certificates. Data for States not in the VSCP were based on a 50-percent sample of birth certificates filed in those States. Information on sampling procedures and sampling errors for 1984 and earlier years is provided in the annual report, *Vital Statistics of the United States*, Volume I, Natality.

Racial classification

Racial designation shown in this report is that of the child. The child's race is determined from the race or national origin of the parents. When only one parent is white, the child is assigned the other parent's race or national origin. When neither parent is white, the child is assigned the father's race or national origin, with one exception; if the mother is Hawaiian or part-Hawaiian, the child is considered Hawaiian. If information on race is missing for either parent, the child is assigned the known race. When the information is missing for both parents, the race of the child is assigned according to the race of the child on the previous record.

Computation of percents, medians, and ratios

Percent distributions, means, and ratios are computed using only events for which the characteristic is reported. The number of births with information not stated is subtracted from the total before computation of these measures. An asterisk is shown in place of any derived statistic based on fewer than 20 births in the numerator or denominator.

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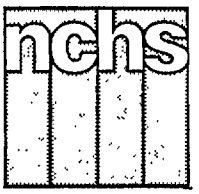

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1988 National Maternal and Infant Health Survey

The first public use tape for the National Maternal and Infant Health Survey (NMIHS) that links vital records to questionnaire responses given by mothers was released by the National Center for Health Statistics (NCHS).

The NMIHS is designed to collect data on factors prior to birth that could be related to adverse outcomes such as low birth weight, stillbirth, infant illness, and infant death. This survey is the first national survey to combine information from three sources, hospitals, prenatal health care providers, and mothers, as a means of studying factors related to pregnancy outcome. A second tape containing data obtained from the hospitals' and prenatal care providers' questionnaires will be released in late 1992.

The first NMIHS file contains data from a sample of:

- 9,953 women who had live births
- 3,309 women who had late fetal deaths
- 5,335 women who had infant deaths

These samples, once weighted, are designed to produce national estimates.

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