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Vital and

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Triplet Births: Trends and Outcomes, 1971–94

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Triplet Births: Trends and Outcomes, 1971–94

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Abstract

Objectives—This report describes changes in the number and ratio of live births in triplet and other higher order multiple deliveries from 1971 to 1994 by maternal race, age, education, and marital status. The report also examines the birth outcomes of triplets compared with singletons, including overall gestation specific, and birthweight specific infant mortality rates.

Methods—Birth data are obtained from the U.S. certificates of live birth. Mortality data were obtained from the Linked Birth and Infant Death Data Sets for the 1983–91 birth cohorts. Most analyses are based on triplet and other higher-order multiple births (quadruplet and quintuplet and greater births) in the aggregate. (Triplet births comprise about 92 percent of all higher order multiple births.) Triplet and other higher order birth ratios for most variables are computed by combining data for years 1982–84 and 1992–94, and for infant mortality by combining birth cohorts for years 1987–91.

Findings—Between 1971 and 1994 the number and ratio of triplet births quadrupled, rising from 1,034 to 4,594, and from 29.1 to 116.2 per 100,000 live births. Most of the increase was among births to white mothers, particularly among married and more educated mothers. Only about one-third of the increase in triplet birthing among white mothers between 1989 and 1994 could be attributed to changes in the maternal age distribution. Massachusetts reported the highest triplet birth ratio (215.9), more than twice the U.S. ratio (105.5). Other States with comparatively high ratios were New Hampshire, New Jersey, and Iowa. Nine of 10 triplets were born preterm compared with 1 of 10 singletons. The average triplet weighed 1,698 grams at birth, one-half that of the average singleton (3,358 grams). Triplets were about 12 times more likely to die during the first year of life as singletons, but had a survival advantage over singletons at lower gestations and birthweights.

Keywords: triplet births • higher order multiple births • birth certificate • triplet infant health • triplet infant mortality

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Triplet Births: Trends and Outcomes, 1971–94

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Highlights

The number of live births in triplet and other higher order multiple deliveries tripled between 1980 (1,337) and 1994 (4,594) and quadrupled between 1971 (1,034) and 1994. Over the last decade (1985–94), increases in the number of triplets averaged 11 percent a year.

The triplet and other higher order birth ratio (the number of triplet and other higher order multiple births per 100,000 live births) rose 214 percent between 1980 and 1994, from 37.0 to 116.2. Steady, sizable increases averaging 12 percent a year were reported for 1987–94.

The overall rise in the triplet and other higher order multiple birth ratio (or triplet birth ratio) can be attributed almost exclusively to the rise in triplet births to white mothers, among whom the ratio rose 252 percent (from 37.6 to 132.2) between 1980 and 1994.

About one-third of the increase in the triplet birth ratio among white mothers can be explained by changes in the maternal age distribution. The likely explanation for the remaining two-thirds of the increase is the rise in the use of fertility-enhancing drugs and techniques.

Among black mothers, the triplet birth ratio rose by a more modest 52 percent (from 37.1 to 56.3). Most of the increase among black mothers is fairly recent, occurring since the mid- to late-1980's.

Massachusetts reported the highest triplet birth ratio for 1992–94, 215.9, more than twice as high as that of the Nation as a whole. Ratios were also comparatively high for New Hampshire, New Jersey, and Iowa.

Triplet births are at much greater risk than singletons of poor birth outcome. More than 9 of 10 triplet births were born preterm (less than 37 competed weeks of gestation) compared with fewer than 1 of 10 singleton infants. The average weight of a triplet newborn (3 pounds 12 ounces or 1,698 grams) was one-half that of a singleton newborn (7 pounds 6 ounces or 3,358 grams). The infant death rate for triplet and other higher order multiple births was 12 times higher than that for singletons (93.7 compared with 7.8 infant deaths per 1,000 live births), but triplets generally held a survival advantage over singletons at lower birthweights and shorter gestations.

Introduction

This report describes changes in the number and ratio of live births in triplet and other higher order multiple deliveries between 1971 and 1994 by maternal race, age, education, and marital status. The report also examines the birth outcomes and infant mortality of newborn triplets compared with newborn singletons.

National information on the plurality of births based on data derived from birth certificates has been published annually by the National Center for Health Statistics (NCHS) since 1917. (Excepted are data years 1969 and 1970 for which plurality data are not available.) NCHS also has published additional, more detailed reports on the subject (1,2). These

reports focused on births in twin deliveries as opposed to births in triplet and other higher multiple deliveries (from now on referred to as ''triplet births'' or ''triplets'') because twin births comprise the vast majority of multiples, and because of the small number of triplet births at the time these reports were written. However, the recent, rapid rise in the number and ratio of triplet births, has heightened the interest in, and the feasibility of studying triplets independently.

Although data are available for selected years, NCHS has not published recent annual infant mortality rates by plurality from the linked birth and death data sets. Two early NCHS studies did, however, present rates for singleton and plural births based on the 1950 and 1960 birth cohorts (3,4).

The general literature includes a number of recent reports (published since 1990) on multiple births based on national vital records (5–14); only one of these reports focuses exclusively on triplets (9). This is the first NCHS report to focus on triplet births.

Methods

Birth data for this analysis were obtained from birth certificates from all States and the District of Columbia for 1985–94. The data are provided to NCHS through the Vital Statistics Cooperative Program (VSCP). From 1972 to 1984 the VSCP included varying numbers of States that provided data based 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. For 1971 data were based on a 20- to 50-percent sample of births. The data sets include births of U.S. residents occurring in the United States, but excludes births and deaths of U.S. residents occurring outside the United States.

Mortality data were obtained from the Linked Birth and Infant Death Data Sets for the 1983–91 birth cohorts. In these data sets, the death certificate is linked with the corresponding birth certificate for each infant who dies in the United States. For example, the 1991 birth cohort file includes infants born in 1991 who died in 1991 or 1992. The linked file is constructed as a cohort file, with a one-to-one match of birth and death records from the NCHS annual Natality and Mortality Vital Statistics Files (15). For more detailed information see *Public Use Tape Documentation: Linked Birth/Infant Death Data Set* (16).

The practice of matching live birth and fetal death records, which made it possible to determine the number of sets of multiple births, was discontinued on the national level beginning with data year 1959. This report, therefore, refers only to individual live births or deaths in triplet and other higher order multiple birth deliveries, *NOT* to sets of triplets. For example, a delivery resulting in two live births and one stillbirth would be reported as two live births in a triplet delivery, or two triplet births. Thus, the number of triplet sets cannot be derived from these data.

For much of the period covered by this report (1978–88) triplet births were not differentiated from quadruplet and quintuplet and higher order multiple births in the coding process for the birth or linked birth-infant death data sets. Thus, most analyses in this report are based on triplet and other higher order multiple births in the aggregate. Triplet births, however, comprise the bulk of higher order multiple births (92 percent for 1989–94). Therefore, the category "triplet and other higher order multiple births" primarily represents triplet births (table A).

The triplet birth ratio is defined as the number of triplet births per 100,000 live births. Three years of data are combined to compute triplet birth ratios for a number of variables

Table A. Numbers of triplet, quadruplet, and quintuplet and other higher order multiple births: United States, 1989–94

Year	Triplets	Quadruplets	Quintuplets and other higher order multiples	Triplets as percent of all triplet and other higher order multiple births
1994	4,233	315	46	92
1993	3,834	277	57	92
1992	3,547	310	26	91
1991	3,121	203	22	93
1990	2,830	185	13	93
1989	2,529	229	40	90

in order to generate statistically reliable rates. Data for years 1982–84 are combined and, when appropriate, compared with data for years 1992–94. Similarly, more detailed infant mortality rates (defined as the number of infant deaths under 1 year of age per 1,000 live births) combine data for birth cohorts 1987–91.

National data for births to unmarried women are derived from two sources. For 1994 marital status is reported directly on the birth certificate of 45 States and the District of Columbia. For 1992–93 marital status is reported directly on the birth certificate of 44 States and the District of Columbia, and for 1982–84 marital status was reported directly on the birth certificates of 41 States and the District of Columbia. For the remaining States, marital status was inferred from comparison of the child's and parent's surnames.

For 1982–84 educational attainment of the mother was not reported for three States: California, Texas, and Washington. For 1992–94 this item was available for all 50 States and the District of Columbia. Triplet birth ratios for 1992–94 by age, education, and marital status are presented for both the entire reporting area (50 States and the District of Columbia), and for a 47-State and the District of Columbia reporting area. To maintain consistent reporting areas between time periods (1982–84 and 1992–94), all analyses are based on the 47-State area.

Trend data by race in this report are tabulated by race of mother for all years. References to white births and white mothers or black births and black mothers are used interchangeably. Trends and characteristics of triplet births among racial or ethnic groups other than white and black are not presented because of small numbers or, as in the case for Hispanic births,

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because of substantial changes in the size and composition of the reporting area over the study period. (Hispanics can be of any race.) Where the race of mother is missing from the birth record, it is imputed according to the race of the mother of the previous record with known race (17).

The effects of changes in the maternal age distribution on triplet birth ratios for 1980–94 are eliminated using direct standardization. The 1980 distribution of births by age of mother is used as the standard population. Standardization was performed separately by race of mother.

The period of gestation is computed from the first day of the last normal menstrual period (LMP), as reported by the mother, to the date of birth. When the LMP is not stated or is inconsistent with birthweight, the ''clinical estimate of gestation'' or the birth attendants' estimate of gestational age is used.

Results

Trends in triplet births

There were 4,594 live births in triplet deliveries in 1994, triple the number born during the early 1980's and more than quadruple the number of 1971 (table 1). The incidence of triplet birthing accelerated between 1971 and 1994; increases averaged about 2 percent a year for the 1970's, 7 percent for the early 1980's, and 11 percent from 1985 to 1989. During the first half of the 1990's, the number of triplet births continued to rise rapidly despite a decline in singleton births. As a result, there were more triplets born over this 5-year period than for the entire decade of the 1980's.

As would be expected, the triplet birth ratio also rose over this period, and at only a slightly slower pace than the number of triplet births. The 1994 ratio of 116.2 per 100,000 was twice the 1987 ratio of 56.2, and 4 times the 1971 ratio of 29.1. Steady, sizable increases averaging 12 percent a year were reported for 1987–94.

Maternal race and ethnicity

The steep increase in the overall triplet birth ratio can be attributed almost exclusively to the rise in triplet births among white mothers. Throughout the study period about 80 percent of all births were to white mothers. However, from 1971 to 1994, the percent of triplet births to white mothers increased from 81 to 90 percent. Among white mothers, the rise in the triplet birth ratio was even more pronounced than the rise overall. The triplet ratio among white births was 132.2 for 1994, nearly 5 times the ratio in 1971 (28.4), and double that reported only 6 years earlier (66.0 in 1988). Between 1990 and 1994 alone, the ratio rose 65 percent.

Triplet birth ratios for black and white mothers were quite similar during the 1970's and early 1980's, but ratios for subsequent years diverged sharply. Ratios for black triplet births fluctuated during the 1970's and 1980's, but rose by 52 percent between 1980 and 1994, from 37.1 to 56.3 (compared with a 252 percent increase in white triplet births, from 37.6 to 132.2). Growth in the ratio among black mothers appears to be increasing for the most recent years; between 1990 and 1994 ratios increased 20 percent, rising from 46.9 to 56.3 per 100,000.

More recent triplet birth ratios among white mothers undoubtably would be even higher if not for the increasing influence of births of Hispanic origin. Although reliable ratios are not available for much of the study period, triplet births appear to be much rarer among white Hispanic mothers than among non-Hispanic white mothers. For 1994 the non-Hispanic white triplet birth ratio was 152.6, 3 times as high as the ratio among white Hispanic mothers of 52.3, and 15 percent higher than the ratio including Hispanic mothers (132.2).

The effect of the changing maternal age distribution

The proportion of mothers aged 30 years and over who gave birth in 1994 was much higher than in 1980 (34 compared with 20 percent); the result of delayed childbearing and an aging female population. This upward shift in the maternal age distribution would be expected to have a positive influence on triplet birth ratios because the risk of multiple birth increases with maternal age until about the age of 40 (18). (This is believed to occur as a result of the heightened levels of gonadotropin hormones of older mothers (18).) A second factor widely recognized to have a positive effect on the triplet birth ratio is fertility-enhancing therapies such as ovulation-enhancing drugs and assisted reproductive techniques (for example, in vitro fertilizations) (19). These therapies, which are more likely to result in triplet births and are more commonly used by older white women, became more widespread during the 1980's (20).

Direct standardization was used to separate the effect of the older maternal age distribution from that of other potential influences on triplet birth ratios between 1980 and 1994. Figure 1 represents the observed and age-adjusted triplet birth
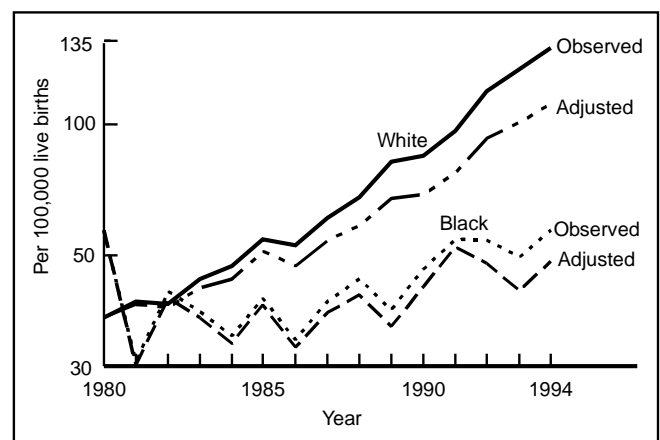
Figure 1. Observed and age-adjusted birth ratios for triplet and other higher order multiple births by race of mother, 1980–94

ratios by maternal race from 1980 to 1994. After standardization for maternal age, the triplet birth ratio for white births in 1994 was 102.1 (compared with the observed or unadjusted ratio of 132.2). That is, given a maternal age distribution for 1994 similar to that of 1980, the triplet birth ratio would be about one-fourth lower than the actual ratio or, put another way, the changing maternal age distribution explains about one-third of the increase in triplet birth ratios among white mothers from 1980 to 1994.

The adjustment reveals that the changing age distribution had a slightly greater impact on triplet birth ratios among black mothers. Standardization resulted in an age-adjusted level of 49.1, compared with the observed ratio of 56.3, indicating that about two-fifths of the increase in the black births can be attributed to this cause.

Age-specific birth ratios

Sharp rises in age-specific triplet birth ratios among older mothers over the study period also suggest the influence of factors other than a shifting maternal age distribution on overall triplet birth ratios (table 2 and figure 2). Between 1982–84 and 1992–94 triplet birth ratios increased for each age group, but increases were the most pronounced among mothers 30 years of age and over. Triplet birth ratios more than tripled for mothers 35–39 years of age, rising from 67.8 to 216.1 and nearly tripled for mothers 30–34 years of age, rising from 68.6 to 193.6. Comparatively, the triplet birth ratio for mothers 25–29 years of age doubled, and that for mothers aged 20–24 years rose by only 17 percent.

The number of triplet births born to women in their forties between 1982 and 1984 was too small (only 15) to allow for the computation of stable ratios and for comparison of these ratios with those for 1992–94. However, it should be noted that there has been a large increase in the number of triplet births to women in this age group, and this increase is far in excess of the rise in singleton births. For 1992–94 the number of triplet births to mothers 40–49 years of age (379 births) was 25 times as high as the number born to their counterparts in

1982–84 (15 births). In contrast, the number of singleton births to mothers in this age group was 2.3 times as high.

Among white mothers, a similar, albeit stronger rise in age-specific ratios among mothers 30 years of age and over was observed. Increases for all age groups were substantially less pronounced among black mothers. The largest increases among black mothers were, however, also among older mothers 35–39 years of age.

Maternal educational attainment and marital status

Increases in triplet birth ratios between 1982–84 and 1992–94 were most pronounced among married, college-educated mothers 30 years of age and over. (Table 3 includes triplet birth ratios by race, age, education, and marital status for 1992–94 for two reporting areas, one for the entire United States, and the other for the 47-State reporting area for which comparable data are available for 1982–84 and 1992–94. All analyses in the report are based on ratios derived from the 47-State reporting area, see Sources and methods.) Among all married women, there was a more than threefold rise in the birth ratio (from 47.9 to 151.4) in contrast with only a 14 percent rise in the ratio among unmarried mothers (from 32.5 to 37.1). Ratios for married mothers in their twenties doubled, while levels among mothers in their thirties more than tripled.

Increases were observed in triplet birth ratios between 1982–84 and 1992–94 across all educational levels, but the largest were found among women with more education. Again, increases were largely restricted to married mothers. Over this time period, triplet birth ratios increased 67 percent among married mothers with less than a high school education, 173 percent for mothers with at least 12 years of school, and 224 percent for college-educated mothers (at least 16 years of education). Increases for each educational level were most elevated for mothers aged 30–39 years (figure 3). Ratios more than tripled among married mothers in their thirties in each educational category except for those with less than a high school education that rose by a comparatively modest 72 percent.
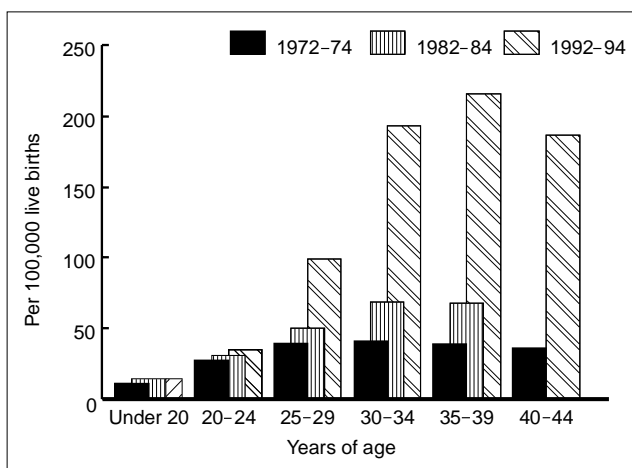
Figure 2. Triplet and other higher order multiple birth ratios by age of mother, 1972–74, 1982–84, and 1992–94
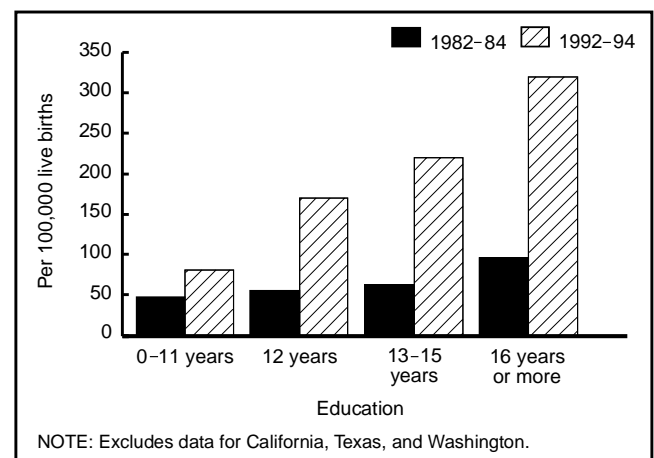
Figure 3. Triplet and other higher order multiple birth ratios for married mothers 30–39 years of age by education, 1982–84 and 1992–94

Trends in triplet birth ratios by marital status and educational attainment among white mothers between 1982–84 and 1992–94 were similar to those noted earlier, but generally were of greater magnitude. Among black mothers, trends were generally analogous, but considerably more modest. Although rises in the triplet birth ratio overall among black unmarried mothers were greater than for white unmarried mothers, these data suggest that the largest increases among black mothers were also among those who were older, married, and more educated.

Mothers' State of residence

Massachusetts reported the highest triplet birth ratio for combined years 1992–94 (215.9) more than twice as high as that of the Nation as a whole (105.5) (table 4). The Massachusetts ratio was substantially higher than that of any other State for both 1993 and 1994, and was the third highest for 1992. Other States reporting ratios at least 50 percent higher than the United States for 1992–94 were New Hampshire, New Jersey, and Iowa. These States also tended to have higher proportions of births to older mothers who are more likely to have a triplet birth, and to older, white non-Hispanic mothers who may be more likely to obtain fertility-enhancing drugs and procedures, further increasing their chances of bearing triplets (20).

Birth outcomes

Period of gestation and birthweight

The mean or average gestational age for triplet infants was 32 completed weeks, almost 7 weeks shorter than the average for singleton births (table 5). The most common gestational age for triplets was 34–36 weeks, while that for singletons was 37–41 weeks. Accordingly, most triplets (91.6 percent) were born preterm, that is, at fewer than 37 completed weeks of gestation, compared with 9.8 percent of singleton infants. Moreover, 13.4 percent of triplets were born at the extremely preterm gestational age of less than 28 weeks, whereas only 0.6 percent of singletons were born at this short gestational age.

The average triplet weighed 3 pounds, 12 ounces (1,698 grams) at birth, one-half that of the average singleton infant (7 pounds, 6 ounces or 3,358 grams) (table 6). Because preterm infants weigh less than term infants, the smaller size of triplet births can be partly explained by their shorter gestations, but large differences in birthweight between triplets and singletons persist at similar or equal gestations. At each completed week of gestation except the shortest (17 weeks), the average birthweight for triplets was lower than that of singletons (data not shown). The greatest absolute and relative disparities in triplet and singleton birthweight, however, were for term and postterm births (those born at 37–41 weeks and at 42 and more weeks of gestation). In illustration, the average birthweight for triplet term births was 1,202 grams less or 35 percent lower than that for singleton births (2,224 grams compared with 3,426 grams, table B).

Table B. Mean birthweight for triplet and other higher order multiple births and singleton births by length of gestation: United States, 1992–94 total

Period of gestation[1]	Triplet[2]	Singleton	Difference in grams	Percent difference
		Mean		
All gestations.	1,698	3,358	−1,660	−49
Under 28 weeks.	731	961	−230	−24
28–31 weeks.	1,347	2,054	−707	−34
32–33 weeks.	1,755	2,497	−742	−30
34–36 weeks.	2,109	2,898	−789	−27
37–41 weeks.	2,224	3,426	−1,202	−35
42 weeks or more.	2,203	3,525	−1,322	−38

[1]Completed weeks of gestation.
[2]Includes births in quadruplet, and quintuplet and other higher order multiple deliveries.

Overall, 92.1 percent of triplets born between 1992 and 1994 were low birthweight (less than 2,500 grams); and 35.0 percent were very low birthweight (less than 1,500 grams) (figure 4). The respective proportions for singleton infants were 6.0 and 1.1 percent. At no gestational age was the average triplet birthweight greater than 2,499 grams. Most triplets, 86.0 percent, are born both low birthweight and preterm; only 6.2 percent were term low-birthweight infants (data not shown).

Triplets born to black mothers (unlike singleton births to black mothers) were slightly less likely than triplets born to white mothers to be preterm (88.2 compared with 91.1 percent), but were nearly twice as likely to be born at less than 28 weeks (22.4 compared with 12.7 percent). Triplets born to black mothers were slightly smaller on average than those born to white mothers (1,537 compared with 1,712 grams) and were more likely to be very low birthweight; nearly one-half of all black triplets (45.4 percent) weighed less than 1,500 grams compared with 34.1 percent of white triplets (tables 5 and 6).
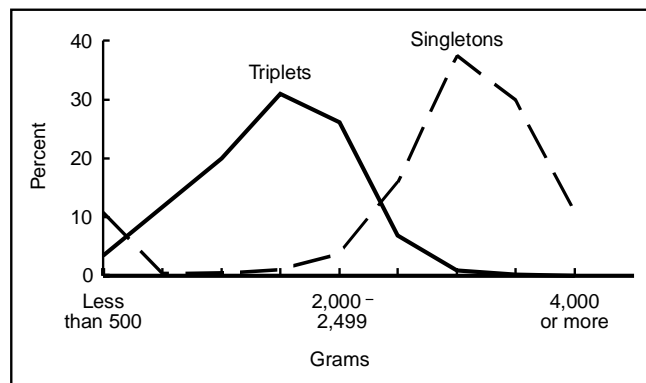
Figure 4. Birthweight distributions for triplet and other higher order multiple births and singleton births, 1992–94

Trends in infant mortality

From 1983 to 1991 infant mortality rates for triplet births declined by 40 percent, from 156.1 infant deaths per 1,000 live births to 93.7 for 1991 (table 7). This decrease was greater than the 28 percent decrease among singletons (from 10.9 in 1983 to 7.8 in 1991). Infant mortality rates for triplet births to white mothers declined more rapidly and were generally substantially lower than those for triplet births to black mothers, although small numbers of black infant deaths have led to large fluctuations in infant mortality rates for this group.

Infant mortality by gestation and birthweight

In recent years triplet infants have been about 12 times more likely to die during the first year of life as singleton infants. Much of the difference in mortality can be explained by triplets' considerably shorter gestations and lower birthweights (see section on Period of gestation and birthweight). For combined years 1987–91, birthweight-specific mortality rates through 2,500 grams for triplets were comparable to, or were more favorable than those for singletons (table 8). Below birthweights of 1,000 grams, mortality rates were similar for triplets and singletons, but at 1,000–2,499 grams, triplets held a distinct survival advantage. For example, at birthweights of 1,500–1,999 grams, the triplet infant mortality rate was 15.2 per 1,000 compared with a singleton rate of 50.4.

Among all triplet births, mortality was lowest at birthweights of 2,000–2,499 grams, whereas among singletons, the most favorable mortality rate was for heavier babies with birthweights of at least 2,500 grams. (Although considered unreliable because it is based on only 15 deaths, the rate for triplets with birthweights of 2,500 grams or more (11.4) is higher than that for triplets born at 2,000–2,499 grams (7.3), and for singletons born at 2,500 grams or more (3.7)).

Triplet mortality rates by gestation follow a pattern not unlike that of birthweight (table 9). For gestations of less than 28 weeks, the infant mortality rate was higher among triplets than for singletons (628.8 compared with 402.1 per 1,000), but for longer gestations of up to 36 weeks, triplet mortality rates were similar to, or more favorable than those for singletons. For instance, at 32–33 weeks, the triplet mortality rate of 17.9 was 33 percent lower than the singleton rate (26.8). Conversely, triplet births born at term were at greater risk of mortality than singleton term births (21.5 compared with 4.0).

Whereas, among singleton births infant mortality rates decline steadily with increasing gestation, mortality rates among triplets decline to 34–36 weeks, but rise for births born at term. As a result, for triplet births overall, the lowest mortality was among moderately preterm births of 34–36 weeks of gestation, whereas singleton mortality was most favorable among term births.

Five leading causes of infant death

The five leading causes of infant death were the same for triplets as for singletons, but the order of the causes was very different (table 10). The leading cause of death for triplets was Newborn affected by maternal complications of pregnancy (maternal complications), followed by Respiratory distress syndrome (RDS), Disorders relating to short gestation and unspecified low birthweight (short gestation and low birthweight), Congenital anomalies, and Sudden infant death syndrome (SIDS). For singletons, the leading cause of death was Congenital anomalies, followed by SIDS, short gestation and low birthweight, RDS, and maternal complications. Of the triplet records coded to maternal complications as a cause of death, the majority of these deaths (89 percent in 1991) were coded to subcategory 761.5—Multiple pregnancy. Cause-of-death coding rules require that maternal complications such as Multiple pregnancy be selected in preference to short gestation and low birthweight as the underlying cause of death, even if the physician had listed short gestation and low birthweight as the underlying cause (21). All triplet records coded to multiple pregnancy in 1991 also contained multiple cause-of-death codes for short gestation and low birthweight. If these records were recoded to short gestation and low birthweight, as has been done in other studies of multiple deliveries (6), short gestation and low birthweight would have been the leading cause of death for triplets.

In general, infant mortality rates for causes of death that are strongly associated with low birthweight are much higher among triplets than among singletons. In 1991 at least 97 percent of the deaths from maternal complications, RDS, and short gestation and low birthweight (the three leading causes of infant death for triplet and higher order births) were to low-birthweight infants (data not shown).

Discussion

The triplet birth ratio rose 214 percent over the 15-year period 1980 to 1994. Among white mothers, the ratio rose 252 percent and among black mothers, 52 percent. In comparison, the twin birth ratio rose only 30 percent over this period. Most of the remarkable rise in the overall triplet birth ratio can be attributed to increases in triplet births to white mothers who accounted for 87 percent of all triplet births.

About one-third of the increase in the white triplet birth ratio can be explained by the change in maternal age at childbearing. The likely explanation for the remaining two-thirds of the increase is the rise in the use of fertility-enhancing drugs and techniques (ovulation-enhancing drugs and assisted reproductive techniques such as in vitro fertilization), which are more likely to result in triplet births (20 and 22–24) and are more commonly used by older white women of higher socioeconomic status, the group for which triplet birth ratios rose the most (20). A recent study estimates that about 30 percent of the increase in triplet births from the early 1970's to the early 1990's can be attributed to the older maternal age distribution (a proportion similar to that reported here), 38 percent to artificial reproductive techniques, and the remaining one-third may be associated with the use of fertility-enhancing drugs (19). Others have estimated that 59–80 percent of the increase in triplet births are the result of these therapies (25,26).

Although at a much slower pace, triplet birthing among black mothers is also on the rise. This study suggests that much of this increase also is the result of factors other than a changing maternal age distribution such as fertility-enhancing therapies. This contrasts with the results of an earlier study that attributed the growth in the triplet birth ratio among black mothers from 1972 to 1989 to an older maternal age distribution (9). This discrepancy is most likely the result of the different time periods studied. Indeed, we found that most of the increase among black mothers is fairly recent, occurring since the mid- to late-1980's. When 3-year average triplet birth ratios are used, the triplet birth ratio increased 8 percent between 1980–82 and 1986–88, and 34 percent between 1986–88 and 1992–94.

The steep rise in triplet births (whether the result of fertility-enhancing techniques) is of concern because of their high likelihood of permanent disability or early death. (Extensive pregnancy-related morbidity among mothers of triplets has been reported elsewhere (27).) This study confirms that triplet births are at greater risk than singletons of poor birth outcomes, and that much of this excess risk results from triplets' shorter gestations and lower birthweights. The vast majority (92.1 percent) weigh less than 2,500 grams at birth, and more than one-third less than 1,500 grams; most are born preterm (91.1 percent), and 13 percent were born at the very abbreviated gestational length of less than 28 weeks. Associated with the high preterm rate of triplets is their increased risk of inadequate lung development and greater likelihood of morbidity (22) or infant death resulting from respiratory distress syndrome.

The survival advantage which triplets appear to have with respect to singletons at most shorter gestations and lower birthweights disappears for gestations of 34 weeks and greater, and may disappear at birthweights of 2,500 grams and more. These findings suggest that intrauterine growth may stop earlier for triplets than for singletons, and, that the optimum gestational age and birthweight may be shorter and lower for triplets than for singletons. Indeed, the mean birthweight for triplets dropped precipitously at 39 weeks, whereas that of singletons did not begin to decline until the 42d week of gestation (data not shown). Ellster AD, et al. (26) found that the 35th week of gestation was the point at which triplet birthweight began to lag even further behind that of singletons. Similar results have been reported for twin births (24,28).

Whereas data on birthweight and plurality from the birth certificate are considered reliable (29,30), the accuracy of birth certificate data on gestational age has been widely questioned (31). However, comparison of our data on the gestational age of triplets with that of a study that based its computation of gestational age on known date of conception by artificial methods, or by first trimester ultrasonography for patients who conceived spontaneously, revealed fairly similar average gestational ages (33 compared with 32.2 weeks) and rates of preterm birth (86.0 compared with 91.1 percent) (27). For 1992–94, gestational age was missing from only 1.0 percent of the birth records of triplets and 0.9 percent of records of singleton births. Differences by plurality in the rate of preterm birth are too great to be substantively affected by potential differential reporting of gestational age.

In general, the birthweight and gestation measures presented in this report are comparable to, but somewhat lower than those reported elsewhere (26,27,32). One reason for the slightly lower levels is that for this study data are derived from all U.S. births, whereas data for other studies (such as the one mentioned in earlier text) are often drawn from one medical center, or are otherwise based on preselected populations (26,27,32). In addition, because disaggregated data were not

available for much of the study period, all findings for triplets in this study include quadruplet, and quintuplet and other higher order multiple births (these births accounted for 8 percent of all triplet and other higher order multiple births for 1994 (table A), whereas other studies generally restrict the analysis to triplet births only.) This is important because measures of birthweight and gestation that include all higher-order multiple births are slightly different than those for triplets alone (that is, the percents low birthweight, very low birthweight, and preterm are higher, and mean birthweight and gestational age are lower). For example, for 1992–94 the percent low birthweight for triplets excluding other higher order multiples was 91.7 and the percent preterm was 90.8, compared with levels for all higher order multiple births of 92.4 and 91.1 percent.

The majority of the 37,514 triplets born between 1980 and 1994 were most likely the result of fertility-enhancing therapies. Despite declines in infant mortality and a survival advantage over singletons at shorter gestations and lower birthweights, about 1 of every 10 of triplet newborns died within the first year of life. Those who survived were at greater risk of perinatal complications resulting in lifelong disability. The precarious health status of triplets and their rising numbers make further research into these births of growing importance.

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List of detailed tables

Table 1. Numbers and ratios of triplet and other higher order multiple births: United States 1971–94

[Ratios are live births in triplet and other higher order multiple birth deliveries per 100,000 total live births]

Year	Triplets[2]	All races[1] Total[3]	Triplet birth ratio	Triplets[2]	White Total[3]	Triplet birth ratio	Triplets[2]	Black Total[3]	Triplet birth ratio
1994	4,594	3,952,767	116.2	4,127	3,121,004	132.2	358	636,391	56.3
1993	4,168	4,000,240	104.2	3,748	3,149,833	119.0	327	658,875	49.6
1992	3,883	4,065,014	95.5	3,444	3,201,678	107.6	361	673,633	53.6
1991	3,346	4,110,907	81.4	2,905	3,241,273	89.6	368	682,602	53.9
1990	3,028	4,158,212	72.8	2,639	3,290,273	80.2	321	684,336	46.9
1989	2,798	4,040,958	69.2	2,483	3,192,355	77.8	262	673,124	38.9
1988	2,385	3,909,510	61.0	2,048	3,102,083	66.0	286	638,562	44.8
1987	2,139	3,809,394	56.2	1,821	3,043,828	59.8	246	611,173	40.3
1986	1,814	3,756,547	48.3	1,585	3,019,175	52.5	199	592,910	33.6
1985	1,925	3,760,561	51.2	1,648	3,037,913	54.2	240	581,824	41.2
1984[4]	1,653	3,669,141	45.1	1,416	2,967,100	47.7	195	568,138	34.3
1983[4]	1,575	3,638,933	43.3	1,319	2,946,468	44.8	216	562,624	38.4
1982[4]	1,484	3,680,537	40.3	1,199	2,984,817	40.2	240	568,506	42.2
1981[4]	1,385	3,629,238	38.2	1,188	2,947,679	40.3	172	564,955	30.4
1980[4]	1,337	3,612,258	37.0	1,104	2,936,351	37.6	211	568,080	37.1
1979[4]	1,202	3,494,398	34.4	999	2,842,867	35.1	185	557,684	33.2
1978[4]	1,185	3,333,279	35.6	942	2,713,108	34.7	206	532,825	38.7
1977[4]	1,076	3,326,632	32.3	899	2,720,183	33.0	164	526,667	31.1
1976[4]	1,086	3,167,788	34.3	852	2,593,957	32.8	205	498,506	41.1
1975[4]	1,066	3,144,198	33.9	909	2,576,818	35.3	151	496,829	30.4
1974[4]	1,005	3,159,958	31.8	812	2,598,222	31.3	171	494,005	34.6
1973[4]	944	3,136,965	30.1	751	2,571,660	29.2	169	500,505	33.8
1972[4]	907	3,258,411	27.8	733	2,675,535	27.4	156	519,824	30.0
1971[5]	1,034	3,555,970	29.1	834	2,939,568	28.4	196	553,750	35.4

[1]Includes races other than white and black.

[2]Includes births in quadruplet and quintuplet and other higher order multiple deliveries.

[3]Includes births in twin deliveries.

[4]Based on 100 percent of births in selected States and on a 50-percent sample of births in all other States.

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

Table 2. Triplet and other higher order multiple birth ratios by age and race of mother: United States, 1972–74, 1982–84, and 1992–94 total

[Ratios are the number of triplet and other higher order multiple births per 100,000 live births in the specific group]

Age and race of mother	Years			Percent change 1982–84 to 1992–94	Percent change 1972–74 to 1992–94
	1992–94	1982–84	1972–74		
All races[1]					
All ages	105.2	42.9	29.9	145.2	251.8
Under 20 years	14.9	15.0	10.2	−0.7	46.1
20–24 years	35.7	30.5	27.4	17.0	30.3
25–29 years	99.3	50.1	40.0	98.2	148.3
30–34 years	193.6	68.6	41.5	182.2	366.5
35–39 years	216.1	67.8	39.6	218.7	445.7
40–44 years	186.8	*	37.3	*	400.8
45–49 years	672.1	*	*	*	*
White					
All ages	119.5	44.2	29.3	170.4	307.8
Under 20 years	12.8	13.0	7.7	−1.5	66.2
20–24 years	35.8	29.8	25.6	20.1	39.8
25–29 years	109.0	51.3	39.6	112.5	175.3
30–34 years	217.3	70.6	40.6	207.8	435.2
35–39 years	236.1	70.8	38.7	233.5	510.1
40–44 years	214.7	*	29.8	*	620.5
45–49 years	735.0	*	*	*	*
Black					
All ages	53.1	38.3	32.8	38.6	61.9
Under 20 years	17.6	15.7	16.6	12.1	6.0
20–24 years	40.2	34.5	35.3	16.5	13.9
25–29 years	61.3	49.1	47.5	24.8	29.1
30–34 years	87.5	68.0	48.0	28.7	82.3
35–39 years	127.9	65.6	49.3	95.0	159.4
40–44 years	*	*	*	*	*
45–49 years	*	*	*	*	*

*Figure does not meet standards of reliability or precision.

[1]Includes races other than white and black.

Table 3. Triplet and other higher order multiple birth ratios by age, education, marital status, and race of mother: Total of 47 reporting States, 1982–84, total of 47 reporting States, 1992–94, and United States, 1992–94 total

[Ratios are the number of triplet and other higher order multiple births in the specific group]

Education level, race and age of mother	Total			Married			Unmarried		
	1992–94[1]	1992–94[2]	1982–84[2]	1992–94[1]	1992–94[2]	1982–84[2]	1992–94[1]	1992–94[2]	1982–84[2]
All educational levels									
All races,[3] all ages	105.2	115.1	44.7	136.1	151.4	47.9	37.2	37.1	32.5
Under 20 years	14.9	15.9	15.9	12.8	14.6	16.1	15.7	16.3	15.7
20–29 years	68.9	76.9	41.9	83.7	94.7	42.7	36.1	38.7	38.1
30–39 years	200.0	217.1	71.8	221.3	240.8	72.0	79.1	73.9	70.0
40–49 years	204.7	189.3	*	225.2	212.3	*	112.9	*	*
White, all ages	119.5	133.4	46.3	145.8	161.8	48.2	35.3	34.7	32.5
Under 20 years	12.8	13.7	14.6	12.1	14.4	16.0	13.1	13.4	12.5
20–29 years	75.3	85.5	42.4	88.4	100.1	42.9	33.1	35.2	38.1
30–39 years	222.6	242.4	73.6	240.1	259.2	73.1	80.2	76.0	83.7
40–49 years	233.3	217.7	*	250.8	234.0	*	134.3	*	*
Black, all ages	53.1	53.0	38.7	79.5	82.2	47.9	41.3	41.0	32.7
Under 20 years	17.5	19.0	16.2	*	*	*	17.5	18.8	17.1
20–29 years	49.1	50.0	41.5	62.8	63.9	43.6	42.7	44.0	39.7
30–39 years	99.2	95.3	66.2	109.9	111.0	70.5	87.0	78.1	57.9
40–49 years	93.0	*	*	*	*	*	*	*	*
0–11 years									
All races,[3] all ages	33.2	36.7	28.8	40.1	46.4	27.8	27.9	31.1	30.2
Under 20 years	14.5	17.1	13.9	10.3	*	10.4	15.8	18.0	16.1
20–29 years	35.9	41.8	36.0	40.6	47.4	32.0	31.1	37.0	43.4
30–39 years	69.4	82.2	53.9	66.4	80.2	46.7	74.1	85.0	73.5
40–49 years	*	*	*	*	*	*	*	*	*
White, all ages	33.4	38.3	24.4	40.6	47.7	24.2	26.0	29.7	24.8
Under 20 years	13.4	16.6	11.7	10.8	*	10.5	14.7	17.5	13.1
20–29 years	34.8	42.3	29.7	40.5	48.2	28.4	27.0	34.6	34.1
30–39 years	71.0	86.7	45.3	70.3	87.8	39.5	72.3	84.5	*
40–49 years	*	*	*	89.4	*	*	*	*	*
Black, all ages	33.2	34.1	38.2	50.6	52.2	51.6	30.9	32.0	34.6
Under 20 years	14.3	15.8	15.0	*	*	*	14.6	16.3	16.1
20–29 years	42.5	41.3	54.8	*	*	54.9	41.3	40.1	54.8
30–39 years	90.0	93.8	82.5	*	*	82.7	89.4	95.4	82.2
40–49 years	*	*	*	*	*	*	*	*	*
12 years									
All races,[3] all ages	76.6	81.4	37.8	96.3	105.6	38.7	38.6	36.4	34.1
Under 20 years	14.5	13.5	18.2	15.3	*	21.4	14.1	13.7	14.5
20–29 years	60.1	66.5	37.0	70.4	80.6	36.6	40.1	40.2	39.4
30–39 years	143.1	146.5	55.0	163.3	170.2	54.9	65.5	55.2	55.8
40–49 years	105.7	88.0	*	118.0	112.5	*	*	*	*
White, all ages	84.4	91.1	37.4	101.1	110.8	37.7	35.5	32.0	35.1
Under 20 years	9.7	*	18.3	*	*	20.6	*	*	*
20–29 years	63.8	71.3	36.3	72.7	83.2	36.1	37.1	34.7	38.3
30–39 years	160.2	166.4	53.8	176.2	183.0	52.2	66.5	61.7	76.9
40–49 years	106.4	89.7	*	112.6	109.5	*	*	*	*

See footnotes at end of table.

Table 3. Triplet and other higher order multiple birth ratios by age, education, marital status, and race of mother: Total of 47 reporting States, 1982–84, total of 47 reporting States, 1992–94, and United States, 1992–94 total—Con.

[Ratios are the number of triplet and other higher order multiple births in the specific group]

Education level, race and age of mother	Total 1992–94[1]	Total 1992–94[2]	Total 1982–84[2]	Married 1992–94[1]	Married 1992–94[2]	Married 1982–84[2]	Unmarried 1992–94[1]	Unmarried 1992–94[2]	Unmarried 1982–84[2]
12 years—Continued									
Black, all ages	51.6	52.3	40.4	69.0	76.8	47.6	44.4	43.0	35.2
Under 20 years	23.3	27.0	*	*	*	*	22.2	25.2	*
20–29 years	50.4	52.7	43.1	62.5	67.3	43.8	45.5	47.2	42.6
30–39 years	75.8	69.5	59.4	83.8	93.3	70.6	69.3	50.5	*
40–49 years	*	*	*	*	*	*	*	*	*
13–15 years									
All races,[3] all ages	119.2	127.3	50.2	138.9	150.7	51.1	44.5	41.3	42.6
Under 20 years	*	*	*	*	*	*	*	*	*
20–29 years	82.7	88.5	45.3	97.2	105.1	47.4	36.2	37.9	29.7
30–39 years	185.3	200.5	66.6	200.9	219.7	62.6	78.8	67.5	122.9
40–49 years	198.9	175.9	*	218.8	209.9	*	*	*	*
White, all ages	134.7	144.1	53.8	150.4	161.7	52.8	41.1	35.1	70.5
Under 20 years	*	*	*	*	*	*	*	*	*
20–29 years	92.1	98.8	49.3	103.8	111.8	48.8	33.1	31.9	58.0
30–39 years	207.4	223.3	68.5	219.7	236.9	64.7	74.8	62.3	171.4
40–49 years	217.6	202.8	*	237.6	229.6	*	*	*	*
Black, all ages	65.0	63.8	35.0	80.5	79.5	45.5	51.9	51.7	21.4
Under 20 years	*	*	*	*	*	*	*	*	*
20–29 years	53.8	53.4	28.4	67.9	62.2	42.1	43.7	47.5	*
30–39 years	98.6	95.4	61.7	102.5	107.0	60.1	92.9	79.1	*
40–49 years	*	*	*	*	*	*	*	*	*
16 or more years									
All races,[3] all ages	228.7	239.8	75.3	237.4	249.0	76.9	89.1	79.1	*
Under 20 years	*	*	*	*	*	*	*	*	*
20–29 years	121.8	128.5	58.4	128.6	135.6	60.1	36.3	39.6	*
30–39 years	294.2	312.5	94.3	302.5	320.9	95.7	124.3	110.6	*
40–49 years	316.4	287.9	*	320.7	290.9	*	*	*	*
White, all ages	250.2	259.3	80.1	256.0	265.1	81.0	118.0	103.4	*
Under 20 years	*	*	*	*	*	*	*	*	*
20–29 years	135.9	141.7	63.6	140.5	146.0	64.3	*	*	*
30–39 years	318.3	334.1	98.4	324.5	339.9	99.5	150.5	129.6	*
40–49 years	352.3	314.8	*	351.9	312.6	*	*	*	*
Black, all ages	99.8	99.8	36.2	118.1	118.7	40.8	49.6	*	*
Under 20 years	*	*	*	*	*	*	*	*	*
20–29 years	46.4	54.5	*	58.5	70.6	*	*	*	*
30–39 years	144.3	136.8	63.4	157.1	147.7	64.3	*	*	*
40–49 years	*	*	*	*	*	*	*	*	*

*Figure does not meet standards of reliability or precision.
[1]Includes 50 States and the District of Columbia.
[2]Excludes Calfornia, Texas, and Washington that did not report education for 1982–84.
[3]Includes races other than white and black.

Table 4. Triplet and other higher order multiple birth ratios: United States and each State, 1992–94 total

[Ratios are live births in triplet and other higher order multiple birth deliveries per 100,000 total live births]

State	Ratio	State	Ratio
United States	105.5	Missouri	79.1
Alabama	78.4	Montana	*
Alaska	*	Nebraska	149.0
Arizona	94.9	Nevada	87.4
Arkansas	67.4	New Hampshire	178.4
California	76.6	New Jersey	165.6
Colorado	127.3	New Mexico	70.8
Connecticut	136.5	New York	131.5
Delaware	123.3	North Carolina	97.8
District of Columbia	*	North Dakota	138.0
Florida	94.1	Ohio	140.9
Georgia	72.1	Oklahoma	55.9
Hawaii	139.0	Oregon	90.1
Idaho	*	Pennsylvania	111.7
Illinois	155.0	South Carolina	108.6
Indiana	157.6	Rhode Island	107.3
Iowa	158.8	South Dakota	89.9
Kansas	118.8	Tennessee	88.3
Kentucky	64.4	Texas	73.3
Louisiana	84.6	Utah	81.7
Maine	72.4	Vermont	84.2
Maryland	123.5	Virginia	86.4
Massachusetts	215.9	Washington	68.0
Michigan	128.0	West Virginia	93.4
Minnesota	149.1	Wisconsin	106.9
Mississippi	61.5	Wyoming	*

*Figure does not meet standards of reliability or precision.

Table 5. Number and percent distribution of triplet and other higher order multiple births and singleton births by period of gestation and race of mother: United States, 1992–94 total

Period of gestation[2]	All races[1]		White		Black	
	Triplets[3]	Singletons	Triplets[3]	Singletons	Triplets[3]	Singletons
	Number					
Live births.	12,645	11,716,495	11,319	9,237,688	1,046	1,912,339
	Percent distribution					
Total	100.0	100.0	100.0	100.0	100.0	100.0
Under 28 weeks	13.4	0.6	12.7	0.4	22.4	1.6
28–31 weeks	21.4	1.0	21.7	0.8	19.7	2.3
32–33 weeks	21.8	1.2	22.0	1.0	18.9	2.5
34–36 weeks	34.6	6.9	35.3	6.1	27.1	10.7
37–41 weeks	8.4	80.3	8.0	81.6	10.6	73.7
42 or more weeks	0.5	9.9	0.4	10.1	1.3	9.2
Under 37 weeks	91.1	9.8	91.6	8.3	88.2	17.1
Mean weeks	32.2	39.1	32.2	39.2	31.4	38.4

[1]Includes races other than white and black.
[2]Period of gestation is in completed weeks of gestation.
[3]Includes births in quadruplet, and quintuplet and other higher order multiple deliveries.

Table 6. Number of triplet and other higher order multiple births and singleton births by period of gestation and percent distribution by birthweight according to period of gestation and race of mother: United States, 1992–94 total

Period of gestation and birthweight	All races[1] Triplets[2]	All races[1] Singletons	White Triplets[2]	White Singletons	Black Triplets[2]	Black Singletons
All gestations				Number		
Live births[3,4]	12,645	1,171,695	11,319	9,237,688	1,046	1,912,339
				Percent distribution		
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than 500 grams	3.4	0.1	3.2	0.1	6.1	0.3
500–999 grams.	11.6	0.4	11.0	0.3	19.2	1.1
1,000–1,499 grams	20.0	0.5	20.0	0.4	20.0	1.1
1,500–1,999 grams	31.1	1.1	31.1	0.8	28.9	2.1
2,000–2,499 grams	26.1	3.9	26.7	3.2	19.3	7.1
2,500–2,999 grams	6.7	15.9	6.9	14.1	4.8	23.4
3,000–3,499 grams	0.9	37.4	0.9	36.9	1.1	38.6
3,500–3,999 grams	0.2	29.9	0.2	32.0	*	20.8
4,000 grams or more	*	10.8	*	12.1	*	5.4
Less than 1,500 grams	35.0	1.1	34.1	0.8	45.4	2.5
Less than 2,500 grams	92.1	6.0	92.0	4.8	93.6	11.7
Mean birthweight.	1,698	3,358	1,712	3,409	1,537	3,132
Less than 28 weeks				Number		
Live births[3,4]	1,673	70,448	1,421	37,195	231	30,999
				Percent distribution		
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than 500 grams	24.6	17.4	24.5	16.5	25.7	18.5
500–999 grams.	60.1	53.6	60.0	55.2	61.9	51.8
1,000–1,499 grams	12.8	14.9	13.4	15.6	*	14.1
1,500–1,999 grams	1.7	4.7	1.6	4.1	*	5.3
2,000–2,499 grams	*	3.7	*	3.1	*	4.2
2,500–2,999 grams	*	5.8	*	5.4	*	6.1
3,000–3,499 grams	*	*	*	*	*	*
3,500–3,999 grams	*	*	*	*	*	*
4,000 grams or more	*	*	*	*	*	*
Less than 1,500 grams	97.5	85.9	97.9	87.3	96.0	84.4
Less than 2,500 grams	99.8	94.2	99.9	94.6	99.6	93.9
Mean birthweight.	731	961	730	947	720	973
28–36 weeks				Number		
Live births[3,4]	9,733	1,069,436	8,847	724,182	677	293,243
				Percent distribution		
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than 500 grams	*	0.0	*	0.0	*	0.1
500–999 grams.	4.5	1.1	4.2	1.0	8.3	1.4
1,000–1,499 grams	22.5	4.3	22.2	3.9	25.6	5.5
1,500–1,999 grams	37.3	8.9	37.1	8.3	38.6	10.7
2,000–2,499 grams	29.0	19.1	29.6	18.3	22.7	21.2
2,500–2,999 grams	6.0	28.7	6.2	28.7	3.8	28.6
3,000–3,499 grams	0.5	24.7	0.5	25.3	*	22.8
3,500–3,999 grams	*	10.6	0.1	11.5	*	8.1
4,000 grams or more	*	2.6	*	3.0	*	1.6
Less than 1,500 grams	27.1	5.4	26.5	4.9	34.1	7.0
Less than 2,500 grams	93.4	33.4	93.2	31.5	95.4	38.9
Mean birthweight.	1,801	2,749	1,810	2,786	1,698	2,646

See footnotes at end of table.

Table 6. Number of triplet and other higher order multiple births and singleton births by period of gestation and percent distribution by birthweight according to period of gestation and race of mother: United States, 1992–94 total—Con.

Period of gestation and birthweight	All races[1] Triplets[2]	All races[1] Singletons	White Triplets[2]	White Singletons	Black Triplets[2]	Black Singletons
37–47 weeks				Number		
Live births[3,4]	1,108	10,467,811	946	8,394,930	122	1,570,294
				Percent distribution		
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than 500 grams	*	*	*	*	*	*
500–999 grams.	2.3	0.0	2.4	0.0	*	0.0
1,000–1,499 grams	9.3	0.0	9.1	0.0	*	0.1
1,500–1,999 grams	19.4	0.2	18.7	0.2	25.4	0.5
2,000–2,499 grams	38.1	2.3	38.6	1.9	32.8	4.5
2,500–2,999 grams	22.2	14.7	22.8	12.9	18.0	22.8
3,000–3,499 grams	6.0	39.0	6.1	38.1	*	42.3
3,500–3,999 grams	*	32.0	*	33.9	*	23.5
4,000 grams or more	*	11.7	*	13.0	*	6.3
Less than 1,500 grams	12.0	0.0	11.8	0.0	*	0.1
Less than 2,500 grams	69.5	2.6	69.1	2.1	72.1	5.1
Mean birthweight.	2,223	3,437	2,231	3,475	2,158	3,266

* Figure does not meet standards of reliability or precision.
0.0 Quantity more than 0 but less than 0.5.
[1]Includes races other than white and black.
[2]Includes births in quadruplet and quintuplet and other higher order multiple deliveries.
[3]Includes births with period of gestation not stated.
[4]Includes births with birthweight not stated.

Table 7. Infant mortality rates for triplet and other higher order multiple births and singleton births by race of mother: United States, 1983–91 birth cohorts

[Rates are per 1,000 live births in specified group]

Year	All races[1] Triplets[2]	All races[1] Singletons	White Triplets[2]	White Singletons	Black Triplets[2]	Black Singletons
1991	93.7	7.8	79.1	6.4	209.2	15.1
1990	102.4	8.0	100.8	6.6	134.0	15.4
1989	101.5	8.7	97.1	7.1	160.3	16.2
1988	112.8	8.7	108.9	7.3	139.9	16.2
1987	136.0	8.9	130.9	7.4	157.7	16.3
1986	113.6	9.2	123.2	7.7	45.7	16.7
1985	159.7	9.5	138.9	8.0	302.5	17.0
1984	125.9	10.4	119.1	8.8	156.4	17.9
1983	156.1	10.9	148.5	9.3	215.7	19.0

[1]Includes races other than white and black.
[2]Includes births in quadruplet and quintuplet and other higher order deliveries.

Table 8. Infant mortality rates for triplet and other higher order multiple births and for singleton births by birthweight: United States, birth cohorts 1987–91 total

[Rates are per 1,000 live births in specified group]

Birthweight	Triplets[1]	Singletons	Percent difference
499 grams or less	934.1	882.0	5.9
500–999 grams	449.2	451.5	–0.5
1,000–1,499 grams.	47.4	112.7	–57.9
1,500–1,999 grams.	15.2	50.4	–69.8
2,000–2,499 grams.	7.3	19.0	–61.6
2,500 or more grams	*	3.7	*

*Figure does not meet standards of reliability or precision.
[1]Includes births in quadruplet and quintuplet and other higher order multiple deliveries.

Table 9. Infant mortality rates for triplet and other higher order multiple births and for singleton births by period of gestation: United States, birth cohorts 1987–91 total

[Rates are per 1,000 live births in specified group]

Period of gestation[1]	Triplets[2]	Singletons	Percent difference
Under 28 weeks	628.8	402.1	56.4
28–31 weeks	64.8	66.9	–3.1
32–33 weeks	17.9	26.8	–33.2
34–36 weeks	12.7	11.9	6.7
37 weeks or more	21.5	4.0	437.5

[1]Completed weeks of gestation.
[2]Includes births in quadruplet and quintuplet and other higher order multiple deliveries.

Table 10. Infant mortality rates for the 5 leading causes of death for triplet and other higher order multiple births and singleton births: United States, birth cohorts 1987–91 total

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

Cause of death	Triplets[1] Rank	Triplets[1] Rate	Singletons Rank	Singletons Rate
Newborn affected by maternal complications of pregnancy . . . . (761)	1	2,810.2	5	17.2
Respiratory distress syndrome . . . . (769)	2	1,824.8	4	60.2
Disorders relating to short gestation and unspecified low birthweight . . . . . . (765)	3	729.9	3	84.2
Congenital anomalies . . . . (740–759)	4	700.7	1	189.0
Sudden infant death syndrome . . . . (798.0)	5	255.5	2	129.4

[1]Includes births in quadruplet and quintuplet and other higher order multiple deliveries.

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