# SPECIAL REPORT

# INFANT MORTALITY IN THE STATE OF NEW MEXICO

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Office of New Mexico
Vital Records and Health Statistics
Public Health Division
New Mexico Department of Health

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NEW MEXICO DEPARTMENT OF HEALTH

# EXECUTIVE SUMMARY

This report focuses on risk factors and infant mortality trends by maternal and infant characteristics in the State of New Mexico using the 1997-1999 linked birth and death data set.

- The New Mexico infant mortality rate (IMR) significantly dropped since the late seventies. In 1974, the IMR was 18.3 infant deaths per 1,000 live births, compared to 6.6 in 2000.

- The infant mortality rate (IMR) for New Mexico during 1997-1999 was 6.7 infant deaths per 1,000 live births for all race/ethnic groups conbined. The IMR was highest for Black infants (9.2/1,000 live births) followed by American Indian infants (7.9/1,000 live births).

- The IMR for male infants in 1997-1999, at 7.4 per 1,000 live births, was higher than for female infants, at 6.0.

- The neonatal mortality rate (3.8 per 1,000 live births) was higher than the postneonatal mortality rate (2.9) for all race/ethnic groups combined. However, among American Indians the postneonatal mortality rate, at 4.4 per 1,000 live births, was higher than the neonatal mortality rate (3.5).

- Infants born to unmarried mothers had a significantly higher mortality rate than infants born to married mothers.

- The IMR for infants whose birth weight was below 1,500 grams (Very Low Birth Weight) was significantly higher than for infants whose birth weight was between 2,500-4,000 grams. The rate for infants born at Very Low Birth weight (VLBW) was 239.7 per 1,000 live births, compared to 3.0 for infants weighing 2,500-4,000 grams at birth.

- High birth weight is also a risk factor for infant mortality. The IMR for infants weighing more than 4,000 grams at birth was 8.0 per 1,000 live births, over 2.5 times higher than for infants weighing 2,500-4,000 grams. The IMR for Black and American Indian infants weighing more than 4,000 grams at birth were 38.2 and 10.4 per 1,000 live births, respectively.

- The IMR for multiple births was approximately five times higher than the rate for single births.

- The IMR for infants whose mothers received high levels of prenatal care was approximately four times lower than for infants whose mothers received no or low levels of prenatal care.

- Infants born to mothers who had completed high school had a 24.7% lower IMR (6.4 per 1,000 live births) than infants whose mothers had less than nine years of education (8.5 per 1,000 live births). Infants of mothers with 16 or more years of education had a significantly lower IMR (5.0 per 1,000 live births).

- An analysis of mother's age showed that the highest IMR was for infants of teenage mothers (under age 20) and the lowest was for infants whose mothers were age 30-34. Infant mortality was also high for infants whose mothers were age 40 and older.

- Infants born by cesarean section had a higher mortality rate than those born using other delivery methods because cesarean sections are usually performed with delivery complications and high-risk infants.

- The IMR of infants whose mothers resided within city limits was 31.7% lower than for those who resided outside city limits.

- The leading causes of infant deaths were Congenital malformations, Short gestation and low birth weight; Sudden infant death syndrome (SIDS), Accidents (unintentional injuries); and Newborn affected by complications of placenta, cord, and membranes.

**TABLE 1**
**INFANT MORTALITY RATES**
**NEW MEXICO RESIDENTS & UNITED STATES**
**1974 - 2000**

| YEAR | NEW MEXICO | UNITED STATES [1] |
|---|---|---|
| 1974 | 18.3 | 16.7 |
| 1975 | 16.9 | 16.1 |
| 1976 | 15.6 | 15.2 |
| 1977 | 14.4 | 14.1 |
| 1978 | 13.8 | 13.8 |
| 1979 | 14.2 | 13.1 |
| 1980 | 11.0 | 12.6 |
| 1981 | 9.6 | 11.9 |
| 1982 | 11.4 | 11.5 |
| 1983 | 10.0 | 11.2 |
| 1984 | 9.6 | 10.8 |
| 1985 | 10.6 | 10.6 |
| 1986 | 9.3 | 10.4 |
| 1987 | 8.0 | 10.1 |
| 1988 | 9.9 | 10.0 |
| 1989 | 8.5 | 9.8 |
| 1990 | 8.9 | 9.2 |
| 1991 | 8.1 | 8.9 |
| 1992 | 7.5 | 8.5 |
| 1993 | 8.4 | 8.4 |
| 1994 | 8.3 | 8.0 |
| 1995 | 6.0 | 7.6 |
| 1996 | 6.2 | 7.3 |
| 1997 | 6.1 | 7.2 |
| 1998 | 7.1 | 7.2 |
| 1999 | 6.8 | 7.1 |
| 2000 | 6.6 | 6.9 |

Rates per 1,000 live births

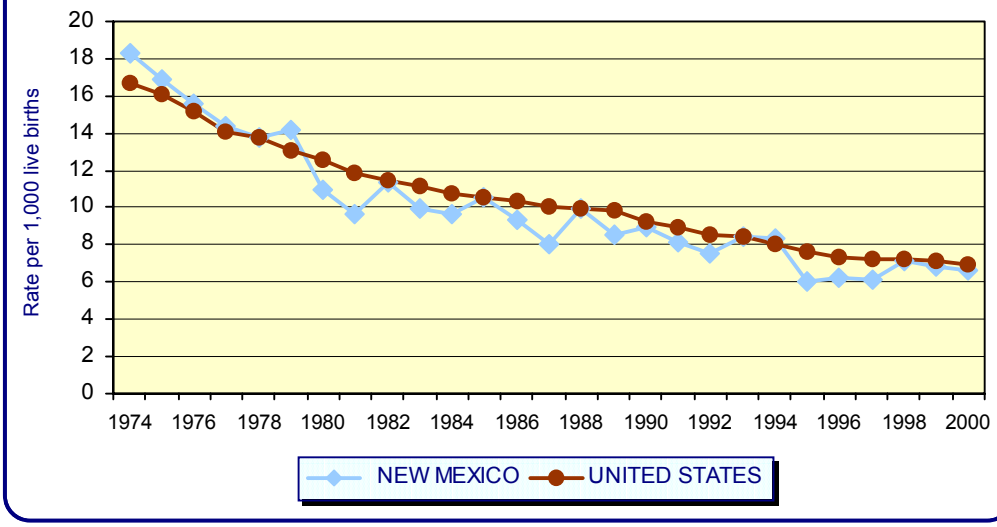
Infant mortality is an important health indicator for the State. This report examines infant mortality in New Mexico from 1997-1999 using linked birth and death files.

The IMR in New Mexico dropped significantly since the late seventies. In 1980, for the first time, New Mexico's IMR dropped below the national rate to 11.0 infant deaths per 1,000 live births, compared to 12.6 nationally. With the exception of 1994, the rate has remained at, or below, the national rate since 1980 (Table 1). Despite being a poor state, New Mexico's IMR was lower than the rate for the United States. Figure 1 shows the declining trend in IMRs, compared to national rates. The neonatal (under 28 days) mortality rate for the state has remained below the national rate since 1978 (Table 2). Figure 2 shows the neonatal mortality rate lower than the national rate, while the postneonatal (28 days to 1 year) mortality rate was appreciably higher than the national rate.[1]

In the United States, the 1997-99 average IMR was highest for the District of Columbia (14.1 per 1,000 live births), followed by Mississippi (10.3). New Mexico's IMR for the same period was 6.7.[2]

Infant mortality depends on various interrelated factors. These include poverty; socioeconomic status (SES); quality of, and access to, prenatal care; birth weight; length of pregnancy; mother's age; mother's marital status; maternal tobacco and alcohol use during pregnancy; and mother's education.

**FIGURE 1**
**INFANT MORTALITY RATES**
**NEW MEXICO RESIDENTS AND UNITED STATES**
**1974 - 2000**



Using the 1997-1999 death file with the corresponding birth records for this study, a linked file was created. There were 544 resident infant death records during this time period, of which 508 (93.4%) were matched with the corresponding birth records. A record weight was added to the linked file to compensate for the 6.6% of infant death records that were not linked to corresponding birth records.

Infant mortality rates for race and ethnic groups vary widely. Mortality rates for infants born to Hispanic White, non-Hispanic White, American Indian, Black, and Asian or Pacific Islander and Other mothers were calculated and tabulated for this report. In Table 3, rates for infant, neonatal and postneonatal mortality are presented by mother's race and ethnicity.

In New Mexico, as in the United States, mortality rates for infants born to Black mothers were highest. During 1997-1999 this rate was 9.2 infant deaths per 1,000 live births, followed by 7.9 for infants born to American Indian mothers. The rate for Asian or Pacific Islander and Other should be cautiously interpreted because of the very small number of infant deaths.

Nationally, two-thirds of all infant deaths occur during the neonatal (the first 27 days of life) period.[2] In New Mexico, the neonatal

**TABLE 2**
**NEONATAL AND POSTNEONATAL MORTALITY RATES**
**NEW MEXICO RESIDENTS AND UNITED STATES**
**1978 - 2000**

| Year | New Mexico | | United States [1] | |
|---|---|---|---|---|
| | Neonatal | Postneonatal | Neonatal | Postneonatal |
| 1978 | 8.7 | 5.1 | 9.5 | 4.3 |
| 1979 | 8.8 | 5.4 | 8.9 | 4.2 |
| 1980 | 7.0 | 4.0 | 8.5 | 4.1 |
| 1981 | 5.7 | 3.9 | 8.0 | 3.9 |
| 1982 | 6.7 | 4.7 | 7.7 | 3.8 |
| 1983 | 5.5 | 4.5 | 7.3 | 3.9 |
| 1984 | 6.0 | 3.6 | 7.0 | 3.8 |
| 1985 | 6.2 | 4.4 | 7.0 | 3.7 |
| 1986 | 5.4 | 4.0 | 6.7 | 3.6 |
| 1987 | 5.0 | 3.0 | 6.5 | 3.6 |
| 1988 | 6.1 | 3.9 | 6.3 | 3.6 |
| 1989 | 5.4 | 3.1 | 6.2 | 3.6 |
| 1990 | 5.2 | 3.7 | 5.8 | 3.4 |
| 1991 | 4.9 | 3.1 | 5.6 | 3.4 |
| 1992 | 3.9 | 3.6 | 5.4 | 3.1 |
| 1993 | 4.6 | 3.8 | 5.3 | 3.1 |
| 1994 | 4.9 | 3.4 | 5.1 | 2.9 |
| 1995 | 4.0 | 2.0 | 4.9 | 2.7 |
| 1996 | 3.9 | 2.4 | 4.8 | 2.5 |
| 1997 | 3.3 | 2.9 | 4.8 | 2.5 |
| 1998 | 4.3 | 2.8 | 4.8 | 2.4 |
| 1999 | 3.9 | 2.9 | 4.7 | 2.3 |
| 2000 | 3.7 | 2.9 | 4.6 | 2.3 |

**FIGURE 2**
**NEONATAL AND POSTNEONATAL MORTALITY RATES**
**NEW MEXICO AND UNITED STATES**
**1978 - 2000**

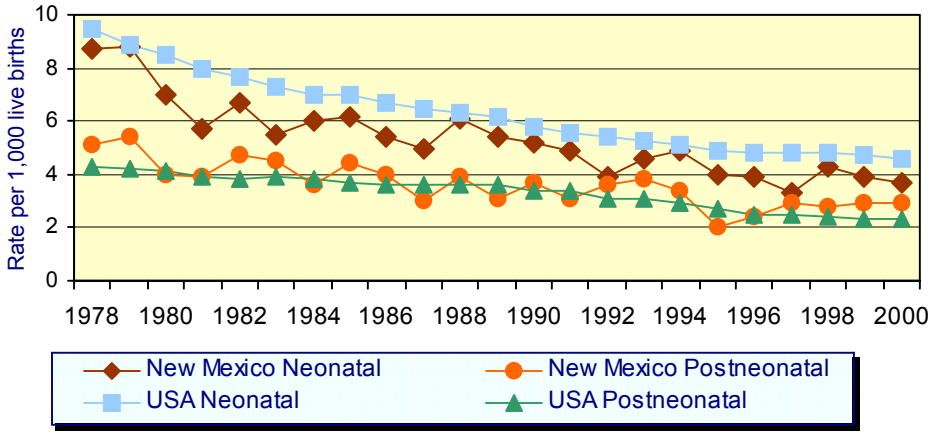


**TABLE 3**
**INFANT, NEONATAL, POSTNEONATAL MORTALITY RATES AND BY RACE/ETHNICITY OF MOTHER**
**1997 - 1999**

| Race/Ethnicity | Infant | Neonate | Post-neonate |
|---|---|---|---|
| Hispanic White | 6.4 | 3.5 | 2.9 |
| Non-Hispanic White | 6.7 | 4.2 | 2.5 |
| American Indian | 7.9 | 3.5 | 4.4 |
| Black | 9.2 | 5.7 | 3.5 |
| Asian or Pacific Islander & Other | 2.8 | 1.9 | 0.9 |
| All Races | 6.7 | 3.8 | 2.9 |

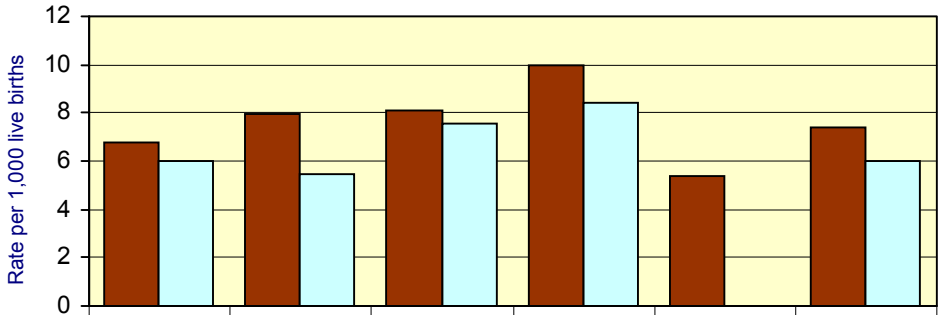
mortality rate was highest for infants of Black mothers (5.7 per 1,000 live births), followed by infants of non-Hispanic White mothers. The postneonatal (28 days-1 year) mortality rate in New Mexico was highest (4.4 live births) for infants who were born to American Indian mothers, followed by infants of Black mothers.

Infant mortality data in this report are presented by race and ethnicity of mother/infant, sex of infant, birth weight, marital status of mother, number of births per pregnancy, level of prenatal care, educational attainment of mother, maternal age, trimester of pregnancy when prenatal care began, birth attendant during delivery, methods of delivery, maternal smoking during pregnancy, residence of mother within/outside of city limit, and underlying cause of death. Causes of death were coded according to the World Health Organization's *International Classification of Diseases* (ICD), 10th revision for 1999 (ICD-10) and 9th revision for 1997-1998 (ICD-9). (Comparability ratios were applied to causes of death for 1997 and 1998 to account for changes in the two coding schemes.) Infant mortality data by different characteristics of mother/infant are described below.

## Sex of Infant

During 1997-1999, 50.8% of newborns were male (41,282). During the same period, 56.1% of infant deaths were male (305). Figure 3 shows a 23.3% higher mortality rate to male infants, compared to female infants. The rate of male infant mortality was 7.4 infant deaths per 1,000 live births, while the female IMR was 6.0 (Appendices A and B). Other studies have shown similar patterns.

**FIGURE 3**
**INFANT MORTALITY RATES BY INFANT SEX BY MOTHER'S RACE/ETHNICITY**
**1997 - 1999**




| | Hispanic White | Non-Hispanic | American Indian | Black | Asian or PI* & Other | All Races |
|---|---|---|---|---|---|---|
| Male | 6.8 | 8.0 | 8.1 | 10.0 | 5.3 | 7.4 |
| Female | 6.0 | 5.4 | 7.6 | 8.4 | 0.0 | 6.0 |

Race/Ethnicity of Mother

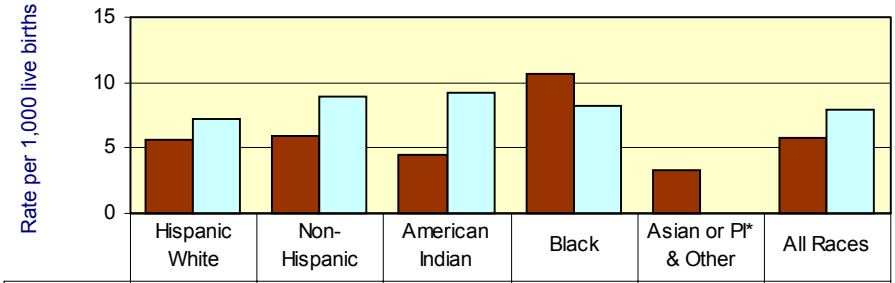
* PI = Pacific Islander

Infant mortality rates were higher for males than for females in each racial/ethnic group, but highest among Black infants. (The Asian or Pacific Islander and Other category was excluded due to small numbers.) The male non-Hispanic White infant mortality rate, at 8.0 deaths per 1,000 live births, was 48.1% higher than the female rate at 5.4. Differences in mortality rates were statistically significant.

## Marital Status of Mother

Single mothers made up 44.1% of the resident New Mexico births during 1997-1999. Infants born to unmarried mothers had a 40.4% higher IMR (8.0 per 1,000 live births), compared to infants born to married mothers (5.7) (Figure 4 and Appendices A and B). Similar trends were seen for each racial and ethnic group except infants born to Black mothers or Asian or Pacific Islander or Other mothers. (Because of small numbers, results for Black or Asian or Pacific Islander or Other should be interpreted with caution.)

**FIGURE 4**
**INFANT MORTALITY RATES**
**BY MOTHER'S MARITAL STATUS**
**1997-1999**




| | Hispanic White | Non-Hispanic | American Indian | Black | Asian or PI* & Other | All Races |
|---|---|---|---|---|---|---|
| Married | 5.6 | 5.9 | 4.5 | 10.7 | 3.3 | 5.7 |
| Unmarried | 7.2 | 8.9 | 9.2 | 8.2 | 0.0 | 8.0 |

Race/Ethnicity of Mother

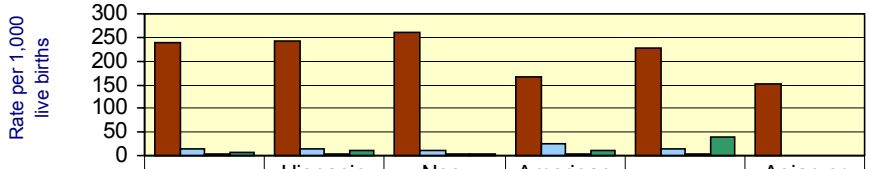
* PI = Pacific Islander

## Birth Weight

Birth weight and gestational period had significant effects on infant survival. This research shows a strong correlation between infant's birth weight and his/her chance of survival. During 1997-1999, 1.1% of babies were born below 1,500 grams and 6.6% were born with a birth weight between 1,500 and 2,499 grams. Due to recent technological advancements and improvements in neonatal care in the United States, more Very Low Birth Weight (VLBW) babies are surviving. The data show that 52.8% of infant deaths during 1997-1999 were of VLBW or Low Birth Weight (LBW). Figure 5 shows high IMRs for infants whose birth weight was below 1,500 grams. The IMR for VLBW was 239.7 infant deaths per 1,000 live births, nearly 71 times higher than for infants whose birth weight was 2,500 grams or greater (3.4) (Appendix B).

In addition to low birth weight, very high birth weight is also a risk factor for infant mortality. During 1997-1999, 7.2% of babies were born weighing more than 4,000 grams. The IMR for infants whose birth weight was greater than 4,000 grams was 8.0 infant deaths per 1,000 live births—2.5 times higher than for infants whose birth weight was between 2,500 and 4,000 grams.

**FIGURE 5**
**INFANT MORTALITY RATES BY BIRTHWEIGHT**
**AND RACE/ETHNICITY OF MOTHER**
**1997 - 1999**




| | All Races | Hispanic White | Non-Hispanic | American Indian | Black | Asian or PI* & Other |
|---|---|---|---|---|---|---|
| VLBW (<1500 grams) | 239.7 | 243.9 | 259.1 | 164.7 | 229.5 | 153.0 |
| LBW (1500 -2499 grams) | 14.3 | 13.7 | 12.2 | 26.3 | 12.7 | 0.0 |
| 2500 - 4000 grams | 3.0 | 2.8 | 2.8 | 4.7 | 2.6 | 1.0 |
| 4000 grams or More | 8.0 | 9.9 | 4.6 | 10.4 | 38.2 | 0.0 |

Race/Ethnicity of Mother

Note: Due to rounding, numbers may not add to total.

* PI = Pacific Islander

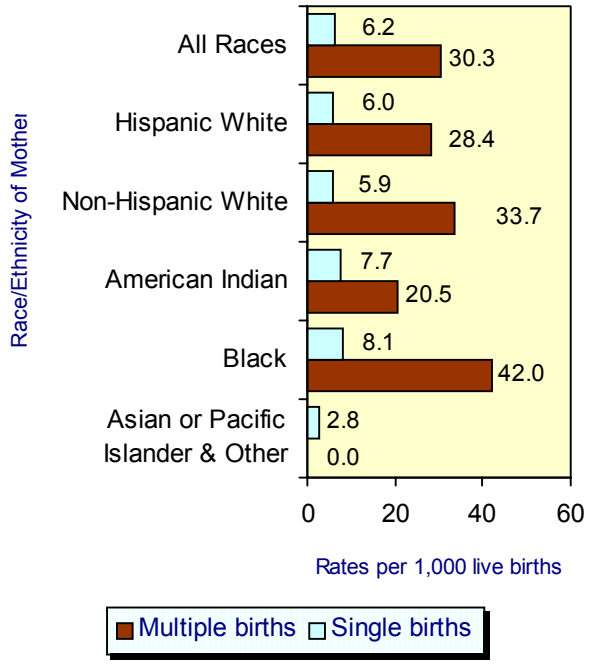
Differences in rates between VLBW and birth weight of 2,500 grams or higher by all race/ethnic groups were statistically highly significant (Appendix A). The IMR for VLBW was highest among non-Hispanic Whites, followed by Hispanic Whites. Except for infants of Asian or Pacific Islander or Other mothers, American Indian mothers had the lowest IMR for VLBW infants at 164.7 per 1,000 live births. (Data for Asian or Pacific Islander or Other should be cautiously interpreted because of the small number of infant deaths.)

The IMR of infants weighing 2,500 grams or greater was lowest for infants born to Asian or Pacific Islander or Other mothers and non-Hispanic White mothers.

## Multiple Births

The data show that 97.8% of New Mexico births during 1997-1999 were single births and 2.2% were multiple births, predominantly twins. The IMR for multiple births was approximately five times greater than the singleton rate. The IMR for multiple births was 30.3 deaths per 1,000 live births, and for singletons 6.2 (Figure 6 and Appendices A and B). The higher IMR for multiple births was found in all race/ethnic groups except Asian or Pacific Islanders or Others. The IMR for multiple births was highest for infants of Black mothers, followed by infants of non-Hispanic White mothers. Other research shows that multiple births are increasing rapidly due to the use of fertility drugs (ovulation inducing drugs) and women's delayed childbearing.

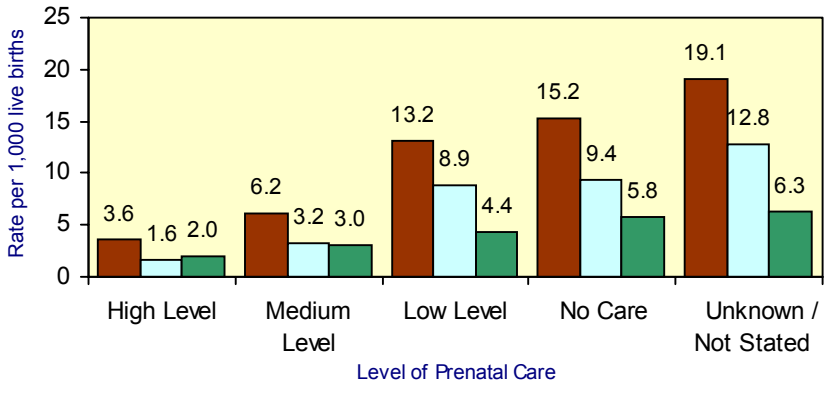
**FIGURE 6**
**INFANT MORTALITY RATES**
**BY PLURALITY AND**
**MOTHER'S RACE/ETHNICITY**
**1997 - 1999**




## Prenatal Care

Prenatal care has a significant effect on infant mortality as well as on maternal mortality and morbidity. Early prenatal care can detect risk factors related to pregnancy and delivery, and adverse outcomes may be prevented. Mothers who receive adequate or high levels of prenatal care are much more likely to have their infants survive the first year of life. During 1997-1999, 12.4% of women received no or low levels of prenatal care, compared to women who received high levels of prenatal care (50.0%). National data show that 83% of mothers reported receiving early prenatal care in 2000.[2] Figure 7 shows that the IMR was significantly higher with no or low levels of prenatal care, compared to the rate for high levels of prenatal care. The IMR for mothers who received high levels of prenatal care was approximately four times lower than for mothers who received no or low prenatal care (Appendices A and B). There was no significant difference in IMRs between mothers who received no prenatal care and mothers who received low levels of prenatal care. The IMR for mothers who received high levels of prenatal care was 3.6 infant deaths per 1,000 live births, which was significantly lower than for mothers who received no prenatal care (15.2). Figure 7 shows that prenatal care had a significantly greater effect on neonatal mortality rates than on postneonatal mortality rates.

**FIGURE 7**
**INFANT, NEONATAL AND POSTNEONATAL**
**MORTALITY RATES**
**BY LEVEL OF PRENATAL CARE**
**1997 - 1999**




Note: Due to rounding neonatal & postneonatal mortality rates may not add to infant mortality rate.

The level of prenatal care is calculated using the Modified Kessner Index, which combines the month prenatal care began and the number of prenatal visits (Figure 8). The Kessner index gives more weight to when prenatal care began than the number of visits. Low level prenatal care is defined as care that begins in the third trimester of pregnancy or care that included less than five prenatal visits. A high level of care is defined as care beginning in the first three months of pregnancy and includes nine or more visits. The exact combination varies from state to state so there is no standard modified Kessner.

**FIGURE 8**
**MODIFIED KESSNER INDEX**
**CLASSIFICATIONS OF LEVELS OF PRENATAL CARE**

| NUMBER OF PRENATAL VISITS | MONTH CARE BEGAN | | | | |
|---|---|---|---|---|---|
| | 1-3 | 4-6 | 7-9 | NONE (0) | UNKNOWN |
| 9+ | H | M | L | L | ? |
| 5-8 | M | M | L | L | ? |
| 1-4 | L | L | L | L | L |
| NONE | L | L | L | (NONE) L | L |
| UNKNOWN | ? | ? | L | L | ? |

HIGH (OPTIMUM) LEVEL H — LOW or NO LEVEL L
MID-LEVEL M — UNKNOWN LEVEL ?

## Educational Attainment of Mother

Maternal education has a strong effect on infant mortality, possibly because poverty and socioeconomic status (SES) are highly associated with educational attainment. During 1997-1999, 5.6% of New Mexico mothers had completed less than nine years of education and 34.8% of mothers had completed high school. Infants of mothers with a high school education had a lower IMR, compared to mothers with less than nine years of education (Appendices A and C). Table 4 shows that mothers with at least 16 years of education had a significantly lower IMR (5.0 infant deaths per 1,000 live births).

For all racial/ethnic groups in New Mexico, infant mortality increases with decreased maternal education, showing an association between maternal education and infant mortality. For non-Hispanic Whites, the IMR was significantly higher among mothers who had fewer than nine years of education (25.5 infant deaths per 1,000 live births), compared to mothers who had completed high school (8.0) or had at least 16 years of education (4.6).

**TABLE 4**
**INFANT MORTALITY RATES BY EDUCATIONAL ATTAINMENT AND RACE/ETHNICITY OF MOTHER**
**1997 - 1999**

| Race/Ethnicity | 0 - 8 Years | 9 - 11 Years | 12 Years | 13 - 15 Years | 16 Years or More | Unknown or Not Stated |
|---|---|---|---|---|---|---|
| Hispanic White | 7.9 | 6.7 | 5.0 | 5.3 | 5.8 | 15.7 |
| Non-Hispanic White | 25.5 | 6.6 | 8.0 | 3.4 | 4.6 | 27.4 |
| American Indian | 3.9 | 7.0 | 8.6 | 7.1 | 5.2 | 17.2 |
| Black | 0.0 | 12.6 | 6.1 | 8.7 | 11.6 | 17.6 |
| Asian or Pacific Islander and Other | 0.0 | 0.0 | 0.0 | 4.5 | 5.0 | 0.0 |
| **All Races** | **8.5** | **6.8** | **6.4** | **4.8** | **5.0** | **19.3** |

**TABLE 5**
**INFANT DEATHS, BIRTHS & MORTALITY RATES BY AGE OF MOTHER**
**1997 - 1999**

| Age of Mother | Infant Deaths | Births | Rate |
|---|---|---|---|
| Under 20 Years | 117 | 14,594 | 8.0 |
| 20 - 24 Years | 161 | 24,049 | 6.7 |
| 25 - 29 Years | 126 | 20,217 | 6.3 |
| 30 - 34 Years | 80 | 13,821 | 5.8 |
| 35 - 39 Years | 46 | 6,994 | 6.6 |
| 40 - 54 Years | 12 | 1,532 | 7.7 |
| Unknown | 2 | 64 | 33.5 |

Note: Due to rounding, numbers may not add to total.

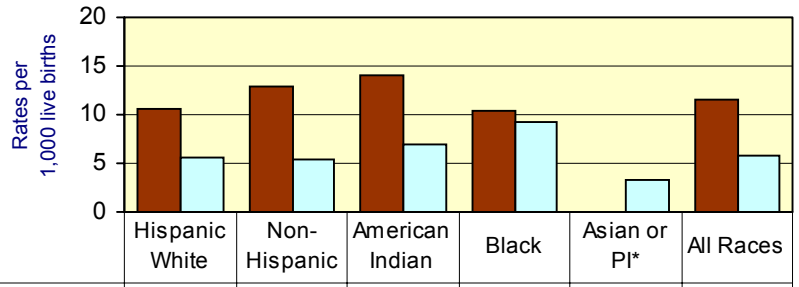
## Age of Mother

Age is an infant mortality risk factor for infants born to teenagers as well as to mothers over age 40 (Table 5 and Appendix C). Teen mothers face adverse situations during pregnancy and delivery. Other studies have shown that teenagers are more likely to have premature or low birth weight infants, who are more vulnerable. During 1997-1999, 18.0% babies were born to mothers under 20 years of age, while 1.9% babies were born to mothers between the ages of 40-54. The IMR for mothers who were under 20 (8.0 deaths per 1,000 live births) was higher than for other age groups. The IMR was lowest among mothers who were 30-34 years old (5.8). For mothers who were 40-54 years old, the IMR was nearly as high as for teenagers (7.7).

## Methods of Delivery

Delivery by cesarean section has increased in the last two decades. During 1997-1999, 13,620 (16.8%) deliveries were done by cesarean section. Data show that Black mothers had the highest percent (20.6%), followed by non-Hispanic mothers (17.9%). American Indian women had the lowest percent of cesarean sections (12.8%), compared to other ethnic/ racial groups (Appendix C). Figure 9 also shows that the mortality rate for infants born by cesarean section was higher (11.6 infant deaths per 1,000 live births) than for infants born by other delivery methods (5.7). While statistically significant (Appendix A), this association may not be clinically significant—mothers with delivery complications and whose infants are at risk are more likely to be given a cesarean section.

**FIGURE 9**
**INFANT MORTALITY RATES**
**BY METHOD OF DELIVERY AND**
**RACE/ETHNICITY OF MOTHER**
**1997 - 1999**




| | Hispanic White | Non-Hispanic | American Indian | Black | Asian or PI* | All Races |
|---|---|---|---|---|---|---|
| Cesarean Section Delivery | 10.6 | 12.8 | 14.1 | 10.3 | 0.0 | 11.6 |
| Other Methods of Delivery | 5.6 | 5.4 | 6.9 | 9.2 | 3.2 | 5.7 |

Race/Ethnicity of Mother

* PI = Pacific Islander

**TABLE 6**
**INFANT DEATHS, BIRTHS & MORTALITY RATES**
**BY TYPE OF ATTENDANT**
**1997 - 1999**

| Birth Attendant | Deaths | Births | Rate |
|---|---|---|---|
| MD / DO | 477 | 62,015 | 7.7 |
| Certified Nurse Midwife or Midwife | 59 | 18,720 | 3.1 |
| Registered Nurse | 2 | 239 | 9.0 |
| Other | 6 | 296 | 21.7 |
| Unknown | 0 | 1 | -- |

**Note: Due to rounding, numbers may not add to total.**

## Birth Attendant

Physicians attended to 76.3% of deliveries in New Mexico during 1997-1999, while certified nurse/midwives attended to 23% (Table 6). The IMR for births attended by physicians was higher than for births attended by certified nurse/midwives (Appendices A and C) because physicians are much more likely to attend to deliveries with complications or that require surgical procedures.

## Smoking During Pregnancy

Other research has shown that smoking during pregnancy has deleterious effects on infants. During 1997-1999, 10.5% of New Mexico mothers who gave birth smoked during pregnancy. The IMR for infants of mothers who smoked was 9.4 infant deaths per 1,000 live births—significantly higher than for infants whose mothers said they had not smoked while pregnant (6.1) (Table 7). Infants of non-smoker mothers had a 54.1% lower IMR. The IMRs for mothers who smoked during pregnancy was higher among infants of Black and American Indian mothers than among infants of other racial/ethnic groups (Appendix B). Tobacco use is often underreported on the birth certificate, from which this data is obtained.

**TABLE 7**
**INFANT DEATHS, BIRTHS & MORTALITY RATES**
**BY MATERNAL SMOKING DURING PREGNANCY**
**1997 - 1999**

| Smoking Status | Infant Deaths | Births | Rate |
|---|---|---|---|
| Smoker | 80 | 8,509 | 9.4 |
| Non-Smoker | 430 | 71,041 | 6.1 |
| Unknown | 33 | 1,721 | 19.3 |

**Note: Due to rounding, numbers may not add to total.**

## Place of Residence

During 1997-1999, 79.3% of mothers lived within city limits. The IMR for infants of city dwellers was 31.7% lower than for infants of mothers who lived outside city limits (Appendices A and C).

## Causes of Death

Leading causes of infant deaths were tabulated in Table 8 by mother's race/ethnicity. Causes of deaths were coded according to the World Health Organization's *International Classification of Disease* (ICD), version 10, for 1999 and version 9 for 1997-1998. Comparability ratios were applied to causes of death for 1997 and 1998 to account for changes in the two coding schemes. The IMR for all causes of death during 1997-1999 was 669.4 per 100,000 live births. Figure 10 shows infant, neonatal and postneonatal mortality rates for the five leading causes of infant death.

The leading cause of infant death was Congenital malformations, deformations, and chromosomal abnormalities, accounting for 24.4% of all infant deaths during 1997-1999. The IMR for congenital malformations was 163.2 per 100,000 live births. Disorders related to short gestation and unspecified low birth weight was the second leading cause of infant deaths, accounting for 18.9% of infant deaths. The rate for this cause was 126.1 per 100,000 live births. Sudden infant death syndrome (SIDS) was the third leading cause of infant death, with an IMR of 73.1 per 100,000 live births. Accidents (unintentional injuries) and Newborn affected by complications of placenta, cord, and membranes were the fourth and fifth leading causes of deaths.

Infant mortality rates differ significantly by cause among race and ethnic groups. Low birth weight was the leading cause of infant death among Black infants, with a rate that was significantly higher than for other race/ethnic groups. The rate for SIDS was highest for Blacks, followed by American Indians. Respiratory distress syndrome (RDS) was the third leading cause of infant death in Blacks. Prematurity and low birthweight are risk factors for RDS.

Leading causes of infant, neonatal, and postneonatal deaths are tabulated in Tables 8-10.

**TABLE 8**
**LEADING CAUSE OF INFANT MORTALITY**
**NUMBER AND RATE**
**BY RACE/ETHNICITY OF MOTHER**
**1997 - 1999**

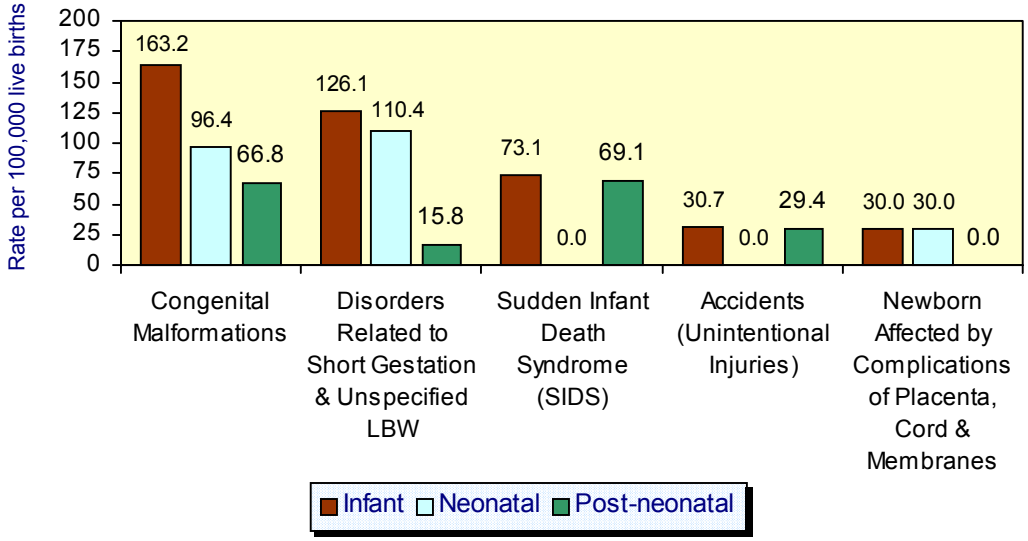
| All Races | Number | Rate |
|---|---|---|
| All Causes | 544 | 669.4 |
| Congenital Malformations | 133 | 163.2 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 103 | 126.1 |
| Sudden Infant Death Syndrome (SIDS) | 59 | 73.1 |
| Accidents (Unintentional Injuries) | 25 | 30.7 |
| Newborn Affected by Complications of Placenta, Cord and Membranes | 24 | 30.0 |
| **Hispanic White** | | |
| All Causes | 259 | 640.4 |
| Congenital Malformations | 67 | 165.4 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 47 | 115.8 |
| Sudden Infant Death Syndrome (SIDS) | 28 | 68.2 |
| Newborn Affected by Complications of Placenta, Cord and Membranes | 19 | 46.5 |
| Accidents (Unintentional Injuries) | 14 | 35.0 |
| **Non-Hispanic White** | | |
| All Causes | 188 | 671.9 |
| Congenital Malformations | 42 | 151.4 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 41 | 145.9 |
| Sudden Infant Death Syndrome (SIDS) | 15 | 54.5 |
| Newborn Affected by Maternal Complications of Pregnancy | 11 | 38.7 |
| Accidents (Unintentional Injuries) | 8 | 27.1 |
| **American Indian** | | |
| All Causes | 79 | 785.1 |
| Congenital Malformations | 21 | 209.9 |
| Sudden Infant Death Syndrome (SIDS) | 11 | 109.2 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 10 | 100.0 |
| Assault (Homicide) | 4 | 40.8 |
| Influenza and Pneumonia | 3 | 26.8 |
| **Black** | | |
| All Causes | 14 | 921.9 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 5 | 306.2 |
| Sudden Infant Death Syndrome (SIDS) | 4 | 291.4 |
| Respiratory Distress of Newborn | 1 | 72.7 |
| Accidents (Unintentional Injuries) | 1 | 70.9 |
| Diseases of the Circulatory System | 1 | 70.9 |
| **Asian or Pacific Islander** | | |
| All Causes | 3 | 279.6 |
| Sudden Infant Death Syndrome (SIDS) | 1 | 96.6 |
| Congenital Malformations | 1 | 93.2 |
| Newborn Affected by Complications of Placenta, Cord and Membranes | 1 | 93.2 |

**Note: Due to rounding, numbers may not add to total.**

**--Due to the implementation of ICD-10 in 1999, comparability ratios have been applied to statistics for years prior to 1999. Rates and numbers may not be equal to those previously reported due to application of comparability ratios.**

**Rate per 100,000 live births**

**FIGURE 10**
**INFANT, NEONATAL AND POSTNEONATAL MORTALITY RATES BY SELECTED CAUSES**
**1997 - 1999**




### *Congenital malformations, deformations, and chromosomal abnormalities*

During 1997-1999, congenital malformations was the leading cause of infant death for all racial/ethnic groups except infants born to Black or Asian or Pacific Islander or Other mothers. The New Mexico IMR for congenital malformations was 163.2 infant deaths per 100,000 live births, higher than the 1999 national rate of 138.2. This was also the leading cause of infant death in the US in 1999. The rate for American Indian infants was 209.9 per 100,000 live births.

Congenital malformations was the second leading cause of neonatal death in the state, with a rate of of 96.4 infant deaths per 100,000 live births. This was the second leading cause of neonatal death for infants born to Hispanic and non-Hispanic White mothers, and the leading cause of neonatal death of infants born to American Indian mothers (Table 9). This was the second leading cause of postneonatal deaths in 1997-1999, while SIDS was the leading cause of postneonatal deaths (Table 10).

### *Disorders related to short gestation and unspecified low birth weight*

Disorders related to short gestation and unspecified low birth weight was the second leading cause of infant death during 1997-1999, with an IMR of 126.1 infant deaths per 100,000 live births. It was also the second leading cause of infant death nationally in 1999. The national rate for this cause was 110.9 infant deaths per 100,000 live births.[3] This cause was the leading cause of death for infants with Black mothers and the second leading cause of infant death for infants with Hispanic and non-Hispanic White mothers.

The neonatal infant mortality rate due to all causes in 1997-1999 was 375.5 infant deaths per 100,000 live births. During 1997-1999, 29.5% of all neonatal deaths were due to disorders related to short gestation and low birth weight. This was the leading cause of neonatal deaths during 1997-1999, with a rate of 110.4 infant deaths per 100,000 live births. The national neonatal mortality rate for this cause was 109.1, which was not significantly different from the New Mexico rate (1997-1999). Low birth weight and prematurity was the leading cause of neonatal deaths in all racial/ethnic groups except American Indian and Asian/Pacific Islander.

### *Sudden infant death syndrome (SIDS)*

SIDS was the third leading cause of infant death in the state in 1997-1999. The rate for SIDS was 73.1 per 100,000 live births (Figure 10). Nationally, SIDS was also the third leading cause of infant death. The national rate for SIDS in 1999 was 66.9 infant deaths per 100,000 live births, 9.3% lower than the New Mexico rate for 1997-1999 of 73.1. There has

been a declining trend in the SIDS IMR that may be due in part to the "Back to Sleep" campaign. The IMR for SIDS was highest for infants of Black mothers with a rate of 291.4—a rate higher than for other racial/ethnic groups.

Most infant deaths due to SIDS occur between two to four months, during the postneonatal period. SIDS was the leading cause of postneonatal death in New Mexico during 1997-1999 (69.1 postneonatal deaths per 100,000 live births) and in the United States in 1999 (61.6). The postneonatal SIDS death rate was highest for infants of Black mothers, followed by infants of American Indian mothers. The postneonatal mortality rate due to SIDS for infants of Black mothers (291.4) was much higher than the New Mexico rate.

### *Accidents (unintentional injuries)*

Accidents was the fourth leading cause of infant death in New Mexico during 1997-1999, with an IMR of 30.7 infant deaths per 100,000 live births. As the seventh leading cause of infant death nationally in 1999, the rate was 21.3 infant deaths per 100,000 live births.[3] The IMRs for Accidents among infants whose mothers were Hispanic or non-Hispanic White were 35.0 and 27.1, respectively. Accidents was the fifth leading cause of infant death among these groups.

Among Post-neonates, Accidents was the third leading cause of postneonatal death during 1997-1999, with a rate of 29.4 postneonatal deaths per 100,000 live births. Most common mechanisms of accident-related injury deaths for infants in the New Mexico during 1997-1999 were motor vehicle accidents, drowning, and accidental mechanical suffocation.

### *Newborn affected by complications of placenta, cord, and membranes*

This was the fifth leading cause of death among New Mexico infants during 1997-1999, with a rate of 30.0 deaths per 100,000 live births. Nationally, it was the sixth leading cause of infant death in 1999 with an IMR of 25.9. Newborn affected by complications of placenta, cord, and membranes was the third leading cause of neonatal death in New Mexico in 1997-1999. The neonatal mortality rate for this cause was highest for Asian or Pacific Islander followed by Hispanic Whites.

**TABLE 9**
**LEADING CAUSE OF NEONATAL MORTALITY**
**NUMBER AND RATE**
**BY RACE/ETHNICITY OF MOTHER**
**1997 - 1999**

| All Races | Number | Rate |
|---|---|---|
| All Causes | 305 | 375.5 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 90 | 110.4 |
| Congenital Malformations | 78 | 96.4 |
| Newborn Affected by Complications of Placenta, Cord and Membranes | 24 | 30.0 |
| Respiratory Distress of Newborn | 15 | 18.7 |
| Newborn Affected by Maternal Complications of Pregnancy | 13 | 16.1 |
| **Hispanic White** | | |
| All Causes | 141 | 349.3 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 39 | 95.6 |
| Congenital Malformations | 38 | 93.4 |
| Newborn Affected by Complications of Placenta, Cord and Membranes | 19 | 46.5 |
| Respiratory Distress of Newborn | 9 | 21.4 |
| Bacterial Sepsis of Newborn | 4 | 9.9 |
| **Non-Hispanic White** | | |
| All Causes | 118 | 419.9 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 39 | 137.5 |
| Congenital Malformations | 26 | 94.2 |
| Newborn Affected by Maternal Complications of Pregnancy | 10 | 34.9 |
| Respiratory Distress of Newborn | 5 | 19.4 |
| Diseases of the Circulatory System | 4 | 13.6 |
| **American Indian** | | |
| All Causes | 35 | 350.1 |
| Congenital Malformations | 12 | 119.4 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 8 | 77.6 |
| Diseases of the Circulatory System | 2 | 22.7 |
| Newborn Affected by Maternal Complications of Pregnancy | 2 | 21.9 |
| Newborn Affected by Complications of Placenta, Cord and Membranes | 1 | 11.1 |
| **Black** | | |
| All Causes | 9 | 567.3 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 5 | 306.2 |
| Respiratory Distress of newborn | 1 | 72.7 |
| Diseases of the Circulatory System | 1 | 70.9 |
| Congenital Malformations | 1 | 64.3 |
| **Asian or Pacific Islander** | | |
| All Causes | 2 | 186.4 |
| Congenital Malformations | 1 | 93.2 |
| Newborn Affected by Complications of Placenta, Cord and Membranes | 1 | 93.2 |

**Note: Due to rounding, numbers may not add to total.**

**--Due to the implementation of ICD-10 in 1999, comparability ratios have been applied to statistics for years prior to 1999. Rates and numbers may not be equal to those previously reported due to application of comparability ratios.**

**Rate per 100,000 live births**

**TABLE 10**
**LEADING CAUSE OF POSTNEONATAL MORTALITY**
**NUMBER AND RATE**
**BY RACE/ETHNICITY OF MOTHER**
**1997 - 1999**

| Total New Mexico/All Races | Number | Rate |
|---|---|---|
| All Causes | 239 | 293.8 |
| Sudden Infant Death Syndrome (SIDS) | 56 | 69.1 |
| Congenital Malformations | 54 | 66.8 |
| Accidents (Unintentional Injuries) | 24 | 29.4 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 13 | 15.8 |
| Assault (Homicide) | 9 | 11.7 |
| **Hispanic White** | | |
| All Causes | 118 | 291.1 |
| Congenital Malformations | 29 | 72.0 |
| Sudden Infant Death Syndrome (SIDS) | 26 | 65.4 |
| Accidents (Unintentional Injuries) | 13 | 32.3 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 8 | 20.2 |
| Meningitis | 3 | 7.9 |
| **Non-Hispanic White** | | |
| All Causes | 71 | 251.9 |
| Congenital Malformations | 16 | 57.1 |
| Sudden Infant Death Syndrome (SIDS) | 13 | 46.8 |
| Accidents (Unintentional Injuries) | 8 | 27.1 |
| Assault (Homicide) | 3 | 11.5 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 2 | 8.4 |
| **American Indian** | | |
| All Causes | 44 | 435.0 |
| Sudden Infant Death Syndrome (SIDS) | 11 | 109.2 |
| Congenital Malformations | 9 | 90.5 |
| Assault (Homicide) | 4 | 40.8 |
| Disorders Related to Short Gestation and Unspecified Low Birth Weight | 2 | 22.3 |
| Accidents (Unintentional Injuries) | 2 | 21.2 |
| **Black** | | |
| All Causes | 5 | 354.6 |
| Sudden Infant Death Syndrome (SIDS) | 4 | 291.4 |
| Accidents (Unintentional Injuries) | 1 | 70.9 |
| **Asian or Pacific Islander** | | |
| All Causes | 1 | 93.2 |
| Sudden Infant Death Syndrome (SIDS) | 1 | 93.2 |

**Note: Due to rounding, numbers may not add to total.**

**--Due to the implementation of ICD-10 in 1999, comparability ratios have been applied to statistics for years prior to 1999. Rates and numbers may not be equal to those previously reported due to application of comparability ratios.**

**Rate per 100,000 live births**

## Limitations of data

During 1997-1999, 93.4% of infant death records were matched to birth records. Because of this limitation, the data have been weighted to compensate for underestimation. Several items are also unknown or underreported on the birth certificate such as level of prenatal care, maternal tobacco and alcohol use during pregnancy, educational attainment of mothers, and trimester prenatal care began.

For rate calculation, the numerator is the number of deaths under one year of age in 1997-1999 (whether the baby was born in the corresponding year of death or in the previous year) and the denominator is the number of births occurring in 1997-1999.

Single race data was used in this report. Infant mortality rates by race/ethnicity are calculated using infant's race in the numerator (deaths) and mother's race in the denominator (births).

## Statistical Analyses

Significance tests were used to indicate the generalizability of the research findings in this report. SAS Software was used for data analyses. Rate ratios, 95% confidence intervals (CI), and Z-scores were calculated to measure statistical significance. Statistical analyses for different variables are tabulated in Appendix A.

## Discussion

Risk factors and causes of infant death in the State of New Mexico are discussed in this report. Data were tabulated for Hispanic Whites, non-Hispanic Whites, American Indian, Black, and Asian or Pacific Islanders or Others. Data for Asian or Pacific Islanders or Others and Black populations should be cautiously interpreted because of the small numbers for these groups.

The underlying cause of death is coded according to the World Health Organization's *International Classification of Diseases*— ICD-10 for 1999 and ICD-9 for 1997-1998. Comparability ratios were applied to death statistics for 1997-1998 to adjust for differences between ICD-9 and ICD-10.

While the infant mortality rate decreased, there were still large disparities between different racial/ethnic groups. The male infant mortality rate was higher than the female rate. The postneonatal mortality rate was highest for American Indians, and was much higher than the New Mexico rate. Among American Indians, the neonatal mortality rate was lower than the postneonatal mortality rate.

The infant mortality rate was significantly higher for infants born to unmarried mothers, compared to married mothers.

Multiple births are a risk factor for infant death because these infants are prone to prematurity and low birth weight. Multiple births were highest (3.4%) for Blacks, followed by non-Hispanic Whites (3.1%) during 1997-1999. The infant mortality rate of infants born in multiple births was highest for Blacks (42.0 infant deaths per 1,000 live births), followed by non-Hispanic Whites (33.7 infant deaths per 1,000 live births) (Appendix B).

Prenatal care reduces infant and maternal death and morbidity. Non-Hispanic White mothers were the most likely to receive high prenatal care (57.2%), followed by Asian/Pacific Islander mothers (56.7%) during 1997-1999. American Indian mothers reported the highest percent (17.6%) of low or no prenatal care, followed by Black mothers (14.8%). During 1997-1999, 64.1% of mothers began their prenatal care during the first trimester of pregnancy, while 8.2% of mothers began their prenatal care during the third trimester or not at all. Infants born to mothers who began prenatal care in the first trimester had a significantly lower mortality rate (5.7 infant deaths per 1,000 live births) than those who had no prenatal care (15.2).

Infant mortality depends on many factors. Technological advancement, control of infectious diseases, immunizations, and high level of prenatal care are some of the key factors for decreasing patterns of infant mortality.

## SOURCES:

[1] New Mexico Department of Health, Office of Vital Records and Health Statistics.
*New Mexico Selected Health Statistics Annual Report for 2000.*

[2] U.S. Department of Health and Human Services.
*Health, United States, 2002.*
DHHS, August 2002, DHHS Publication No 1232.

[3] Centers for Disease Control, National Center for Health Statistics.
*National Vital Statistics Report,* Vol. 49, No 11, October 12, 2001.

[4] Centers for Disease Control, National Center for Health Statistics.
*National Vital Statistics Report,* Vol. 50, No 4, January 30, 2002.

## APPENDIX A
## STATISTICAL CALCULATIONS FOR INFANT MORTALITY RATES BY SELECTED CHARACTERISTICS OF MOTHER AND INFANT 1997 - 1999

| Characteristics | Rate | Rate Ratio | 95% CI | Z-Score |
|---|---|---|---|---|
| **Gender** | | | | |
| Male | 7.4 | | 6.6 -8.2 | |
| Female | 6.0 | 1.2 | 5.2-6.8 | 2.4 |
| **Marital Status** | | | | |
| Unmarried | 8.0 | | 7.1--8.9 | |
| Married | 5.7 | 1.4 | 5.0--6.4 | 3.9 |
| **Birthweight** | | | | |
| Very Low Birth Weight (<1500 grams) | 239.7 | | 203.7 -- 275.7 | |
| Low Birth Weight (1500-2499 grams) | 14.3 | 16.8 | 11.2 -- 17.9 | |
| Normal Weight (2500grams or more) | 3.4 | 70.5 | 3.0 -- 3.8 | 12.9 |
| **Plurality** | | | | |
| Multiple Births | 30.3 | | 22.7 -- 39.6 | |
| Single Births | 6.2 | 4.9 | 5.6 -- 6.8 | |
| **Level of Prenatal Care** | | | | |
| No / Low Care | 13.5 | | 11.2 -- 15.8 | |
| Medium Care | 6.2 | 2.2 | 5.2 -- 7.2 | 5.8 |
| High Care | 3.6 | 3.8 | 3.0 -- 4.2 | 8.2 |
| **Trimester of Pregnancy Prenatal Care Began** | | | | |
| No Prenatal Care | 15.2 | | 9.5 -- 23.0 | |
| First Trimester | 5.7 | 2.7 | 5.1 --- 6.3 | |
| Second Trimester | 5.4 | 2.8 | 4.4 -- 6.6 | |
| Third Trimester | 5.8 | 2.6 | 3.9 -- 8.3 | |
| **Educational Attainment of Mother** | | | | |
| 0 - 8 Years | 8.5 | | 6.0 -- 11.6 | |
| 12 Years | 6.4 | 1.3 | 5.5 -- 7.3 | |
| 16 Years and Above | 5.0 | 1.7 | 3.8 -- 6.4 | |
| **Maternal Smoking During Pregnancy** | | | | |
| Smoker | 9.4 | | 7.4 -- 11.7 | |
| Non-smoker | 6.1 | 1.5 | 5.5 -- 6.7 | |
| **Methods of Delivery** | | | | |
| Cesarean Section | 11.6 | | 9.8 -- 13.4 | |
| Other Methods of Delivery | 5.7 | 2.0 | 5.1 -- 6.3 | 6.0 |
| **Type of Attendant** | | | | |
| MD / DO | 7.7 | | 7.0 -- 8.4 | |
| CNM (Certified Nurse Midwife) / Midwife | 3.1 | 2.5 | 2.4 -- 4.0 | |
| **City Limit** | | | | |
| Outside City Limit | 8.3 | | 6.9 -- 9.7 | |
| Within City Limit | 6.3 | 1.3 | 5.7 -- 6.9 | 2.6 |

**Note: Due to rounding, numbers and rates may not add to totals.**

**When the number of events in the numerator is less than 100 infant deaths, the CI for the rate is estimated based on the Poisson distribution otherwise it is based on Binomial distribution. If one rate occurs within the 95-percent CI of another rate, then the differences between the two rates are not statistically significant [4].**

**If each of the two rates compared is based on 100 or more infant deaths, a Z-test may be used to test statistical significance.**

**If Z>= 1.96, then the difference is statistically significant at 0.05 level and if Z< 1.96, the difference is not significant.**

**Rates per 1,000 live births**

**APPENDIX B**
**INFANT DEATHS, BIRTHS AND INFANT MORTALITY RATES**
**BY SELECTED CHARACTERISTICS AND MATERNAL RACE/ETHNICITY**
**1997 - 1999**

| Characteristics | Race/Ethnicity of Mother | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All races | | | Hispanic White | | | Non-Hispanic White | | | Amercian Indian | | | Black | | | Asian or Pacific Islander | | |
| | Deaths | Births | Rate | Deaths | Births | Rate | Deaths | Births | Rate | Deaths | Births | Rate | Deaths | Births | Rate | Deaths | Births | Rate |
| **Gender** | | | | | | | | | | | | | | | | | | |
| Male | 305 | 41,282 | 7.4 | 140 | 20,693 | 6.8 | 114 | 14,223 | 8.0 | 41 | 5,016 | 8.1 | 7 | 749 | 10.0 | 3 | 601 | 5.3 |
| Female | 239 | 39,989 | 6.0 | 119 | 19,774 | 6.0 | 75 | 13,829 | 5.4 | 39 | 5,077 | 7.6 | 6 | 761 | 8.4 | 0 | 548 | 0.0 |
| **Age at Death** | | | | | | | | | | | | | | | | | | |
| Total Neonatal | 305 | 81,271 | 3.8 | 141 | 40,467 | 3.5 | 118 | 28,052 | 4.2 | 35 | 10,093 | 3.5 | 9 | 1,510 | 5.7 | 2 | 1,149 | 1.9 |
| Early Neonatal ( < 7 days) | 231 | 81,271 | 2.8 | 110 | 40,467 | 2.7 | 91 | 28,052 | 3.2 | 22 | 10,093 | 2.2 | 5 | 1,510 | 3.5 | 2 | 1,149 | 1.9 |
| Late Neonatal (7- 27 days) | 74 | 81,271 | 0.9 | 31 | 40,467 | 0.8 | 27 | 28,052 | 1.0 | 13 | 10,093 | 1.3 | 3 | 1,510 | 2.1 | 0 | 1,149 | 0.0 |
| Postneonatal | 239 | 81,271 | 2.9 | 118 | 40,467 | 2.9 | 71 | 28,052 | 2.5 | 44 | 10,093 | 4.4 | 5 | 1,510 | 3.5 | 1 | 1,149 | 0.9 |
| **Marital Status** | | | | | | | | | | | | | | | | | | |
| Married | 259 | 45,424 | 5.7 | 113 | 20,266 | 5.6 | 123 | 20,740 | 5.9 | 13 | 2,845 | 4.5 | 6 | 599 | 10.7 | 3 | 974 | 3.3 |
| Unmarried | 285 | 35,847 | 8.0 | 146 | 20,201 | 7.2 | 65 | 7,312 | 8.9 | 66 | 7,248 | 9.2 | 7 | 911 | 8.2 | 0 | 175 | 0.0 |
| **Birthweight** | | | | | | | | | | | | | | | | | | |
| Very Low Birthweight (<1500 grams) | 211 | 880 | 239.7 | 99 | 404 | 243.9 | 89 | 343 | 259.1 | 15 | 91 | 164.7 | 6 | 28 | 229.5 | 2 | 14 | 153.0 |
| Low Birthweight (1500-2499 grams) | 76 | 5,326 | 14.3 | 36 | 2,658 | 13.7 | 22 | 1,846 | 12.2 | 15 | 569 | 26.3 | 2 | 169 | 12.7 | 0 | 84 | 0.0 |
| 2500 grams or More | 257 | 75,065 | 3.4 | 124 | 37,405 | 3.3 | 77 | 25,863 | 3.0 | 49 | 9,433 | 5.2 | 5 | 1,313 | 4.1 | 1 | 1,051 | 1.0 |
| **Plurality** | | | | | | | | | | | | | | | | | | |
| Single Births | 489 | 79,471 | 6.2 | 239 | 39,750 | 6.0 | 160 | 27,193 | 5.9 | 76 | 9,936 | 7.7 | 12 | 1,459 | 8.1 | 3 | 1,133 | 2.8 |
| Multiple Births | 55 | 1,800 | 30.3 | 20 | 717 | 28.4 | 29 | 859 | 33.7 | 3 | 157 | 20.5 | 2 | 51 | 42.0 | 0 | 16 | 0.0 |
| **Level of Pre-natal Care** | | | | | | | | | | | | | | | | | | |
| No Care | 22 | 1,481 | 15.2 | 11 | 951 | 11.3 | 6 | 246 | 26.1 | 5 | 248 | 21.6 | 0 | 26 | 0.0 | 0 | 10 | 0.0 |
| Low Care | 114 | 8,570 | 13.2 | 47 | 4,528 | 10.4 | 40 | 2,233 | 17.7 | 21 | 1,526 | 14.0 | 5 | 198 | 27.0 | 0 | 85 | 0.0 |
| Medium Care | 155 | 24,975 | 6.2 | 75 | 12,941 | 5.8 | 48 | 7,630 | 6.3 | 26 | 3,623 | 7.1 | 5 | 454 | 11.8 | 1 | 327 | 3.3 |
| High Care | 146 | 40,640 | 3.6 | 75 | 19,205 | 3.9 | 55 | 16,042 | 3.4 | 15 | 4,037 | 3.7 | 1 | 704 | 1.5 | 0 | 652 | 0.0 |
| Unknown Care | 107 | 5,605 | 19.1 | 51 | 2,842 | 18.1 | 40 | 1,901 | 20.8 | 12 | 659 | 17.9 | 2 | 128 | 16.7 | 2 | 75 | 28.6 |
| **Maternal Smoking During Pregnancy** | | | | | | | | | | | | | | | | | | |
| Smoker | 80 | 8,509 | 9.4 | 24 | 3,374 | 7.0 | 47 | 4,490 | 10.5 | 5 | 345 | 15.5 | 4 | 245 | 17.5 | 0 | 55 | 0.0 |
| Non-smoker | 430 | 71,041 | 6.1 | 226 | 36,181 | 6.2 | 125 | 22,987 | 5.5 | 66 | 9,573 | 6.9 | 10 | 1,226 | 7.9 | 3 | 1,074 | 3.0 |
| Unknown | 33 | 1,721 | 19.3 | 10 | 912 | 10.6 | 16 | 575 | 27.9 | 7 | 175 | 42.8 | 0 | 39 | 0.0 | 0 | 20 | 0.0 |
| **Births to Single Mother** | 285 | 35,847 | 8.0 | 146 | 20,201 | 7.2 | 65 | 7,312 | 8.9 | 66 | 7,248 | 9.2 | 7 | 911 | 8.2 | 0 | 175 | 0.0 |
| **Home Births** | 4 | 731 | 5.9 | 2 | 161 | 13.3 | 1 | 513 | 2.1 | 1 | 29 | 36.9 | 0 | 23 | 0.0 | 0 | 5 | 0.0 |

* Due to rounding, numbers may not add to totals.

**APPENDIX C**
**INFANT DEATHS, BIRTHS AND INFANT MORTALITY RATES**
**BY SELECTED CHARACTERISTICS AND MATERNAL RACE/ETHNICITY**
**1997 - 1999**

| Characteristics | Race of Mother | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All races | | | Hispanic White | | | Non-Hispanic White | | | American Indian | | | Black | | | Asian or Pacific Islander | | |
| | Deaths | Births | Rate | Deaths | Births | Rate | Deaths | Births | Rate | Deaths | Births | Rate | Deaths | Births | Rate | Deaths | Births | Rate |
| **Educational Attainment of Mother** | | | | | | | | | | | | | | | | | | |
| 0 - 8 Years | 39 | 4,542 | 8.5 | 31 | 3,941 | 7.9 | 6 | 252 | 25.5 | 1 | 276 | 3.9 | 0 | 25 | 0.0 | 0 | 48 | 0.0 |
| 9 - 11 Years | 116 | 17,070 | 6.8 | 73 | 10,941 | 6.7 | 20 | 3,088 | 6.6 | 18 | 2,612 | 7.0 | 4 | 340 | 12.6 | 0 | 89 | 0.0 |
| 12 Years | 182 | 28,321 | 6.4 | 72 | 14,403 | 5.0 | 70 | 8,710 | 8.0 | 37 | 4,369 | 8.6 | 3 | 531 | 6.1 | 0 | 308 | 0.0 |
| 13 - 15 Years | 75 | 15,671 | 4.8 | 32 | 6,056 | 5.3 | 24 | 6,899 | 3.4 | 15 | 2,111 | 7.1 | 3 | 368 | 8.7 | 1 | 237 | 4.5 |
| 16 Years and Above | 60 | 11,897 | 5.0 | 17 | 2,943 | 5.8 | 36 | 7,930 | 4.6 | 2 | 414 | 5.2 | 2 | 185 | 11.6 | 2 | 425 | 5.0 |
| Unknown | 73 | 3,770 | 19.3 | 34 | 2,183 | 15.7 | 32 | 1,173 | 27.4 | 5 | 311 | 17.2 | 1 | 61 | 17.6 | 0 | 42 | 0.0 |
| **Age of Mother** | | | | | | | | | | | | | | | | | | |
| Under 20 Years | 117 | 14,594 | 8.0 | 66 | 9,124 | 7.3 | 34 | 3,233 | 10.6 | 13 | 1,843 | 7.0 | 3 | 341 | 9.4 | 0 | 53 | 0.0 |
| 20 - 24 Years | 161 | 24,049 | 6.7 | 76 | 13,082 | 5.8 | 49 | 7,108 | 6.9 | 31 | 3,135 | 9.9 | 4 | 533 | 8.0 | 0 | 191 | 0.0 |
| 25 - 29 Years | 126 | 20,217 | 6.3 | 59 | 9,517 | 6.2 | 48 | 7,692 | 6.3 | 17 | 2,346 | 7.3 | 2 | 318 | 6.7 | 0 | 344 | 0.0 |
| 30 - 34 Years | 80 | 13,821 | 5.8 | 35 | 5,814 | 6.1 | 25 | 5,812 | 4.2 | 15 | 1,652 | 9.1 | 2 | 209 | 10.2 | 3 | 334 | 9.6 |
| 35 - 39 Years | 46 | 6,994 | 6.6 | 15 | 2,431 | 6.2 | 26 | 3,382 | 7.6 | 3 | 892 | 3.6 | 2 | 96 | 22.3 | 0 | 193 | 0.0 |
| 40 - 54 Years | 12 | 1,532 | 7.7 | 5 | 470 | 11.4 | 6 | 794 | 8.1 | 0 | 222 | 0.0 | 0 | 12 | 0.0 | 0 | 34 | 0.0 |
| Unknown | 2 | 64 | 33.5 | 2 | 29 | 73.9 | 0 | 31 | 0.0 | 0 | 3 | 0.0 | 0 | 1 | 0.0 | 0 | 0 | - |
| **Trimester of Pregnancy Prenatal Care Began** | | | | | | | | | | | | | | | | | | |
| First Trimester | 297 | 52,133 | 5.7 | 142 | 24,920 | 5.7 | 112 | 20,134 | 5.6 | 35 | 5,384 | 6.6 | 4 | 869 | 4.9 | 2 | 826 | 2.6 |
| Second Trimester | 95 | 17,671 | 5.4 | 41 | 9,401 | 4.3 | 26 | 4,774 | 5.4 | 22 | 2,903 | 7.7 | 6 | 385 | 16.7 | 0 | 208 | 0.0 |
| Third Trimester | 30 | 5,150 | 5.8 | 15 | 2,710 | 5.5 | 9 | 1,304 | 6.6 | 5 | 962 | 5.6 | 1 | 124 | 8.6 | 0 | 50 | 0.0 |
| No Prenatal Care | 22 | 1,481 | 15.2 | 11 | 951 | 11.3 | 6 | 246 | 26.1 | 5 | 248 | 21.6 | 0 | 26 | 0.0 | 0 | 10 | 0.0 |
| Unknown | 100 | 4,836 | 20.6 | 50 | 2,485 | 20.3 | 35 | 1,594 | 22.2 | 11 | 596 | 18.0 | 2 | 106 | 20.2 | 1 | 55 | 19.5 |
| **Methods of Delivery** | | | | | | | | | | | | | | | | | | |
| Cesarean Section Delivery | 157 | 13,620 | 11.6 | 72 | 6,799 | 10.6 | 64 | 5,019 | 12.8 | 18 | 1,291 | 14.1 | 3 | 311 | 10.3 | 0 | 200 | 0.0 |
| Other Methods of Delivery | 387 | 67,651 | 5.7 | 187 | 33,668 | 5.6 | 124 | 23,033 | 5.4 | 61 | 8,802 | 6.9 | 11 | 1,199 | 9.2 | 3 | 949 | 3.2 |
| **Birth Attendant** | | | | | | | | | | | | | | | | | | |
| MD / DO | 477 | 62,015 | 7.7 | 236 | 31,323 | 7.5 | 170 | 22,424 | 7.6 | 54 | 6,243 | 8.6 | 14 | 1,161 | 12.0 | 3 | 864 | 3.7 |
| CNM (Certified Nurse Midwife) / | 59 | 18,720 | 3.1 | 20 | 8,886 | 2.3 | 15 | 5,439 | 2.8 | 24 | 3,782 | 6.2 | 0 | 331 | 0.0 | 0 | 282 | 0.0 |
| R.N. / Medical Student | 2 | 239 | 9.0 | 1 | 138 | 7.8 | 0 | 69 | 0.0 | 1 | 26 | 41.2 | 0 | 4 | 0.0 | 0 | 2 | 0.0 |
| Other | 6 | 296 | 21.7 | 2 | 120 | 18.1 | 3 | 119 | 27.0 | 1 | 42 | 25.5 | 0 | 14 | 0.0 | 0 | 1 | 0.0 |
| Unknown | 0 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - |
| **City Limit** | | | | | | | | | | | | | | | | | | |
| Within City Limit | 408 | 64,464 | 6.3 | 213 | 33,809 | 6.3 | 146 | 23,253 | 6.3 | 35 | 4,982 | 7.1 | 12 | 1,383 | 8.5 | 2 | 1,037 | 2.1 |
| Outside City Limit | 136 | 16,484 | 8.3 | 46 | 6,628 | 6.9 | 43 | 4,755 | 9.0 | 44 | 4,866 | 9.0 | 2 | 124 | 17.3 | 1 | 111 | 9.6 |
| **Total** | 544 | 81,271 | 6.7 | 259 | 40,467 | 6.4 | 188 | 28,052 | 6.7 | 79 | 10,093 | 7.9 | 14 | 1,510 | 9.2 | 3 | 1,149 | 2.8 |

*** Due to rounding, the numbers may not add to totals.**