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**A Study of Infant Mortality Among
American Indians & Alaska Natives from
the 1983 Linked Birth/Infant Death Data Set**

February, 1992

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Public Health Service
Indian Health Service
Office of Planning, Evaluation, and Legislation
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INTRODUCTION

The Linked Birth/Infant Death Data Set offers two unique opportunities unavailable prior to its preparation. First, it affords a means to estimate the level of misreporting of race on State death certificates of American Indian and Alaska Native infant deaths. (The term "Indian" will be used to denote the American Indian and Alaska Native population throughout this report.) Secondly, it provides the opportunity to analyze for infant deaths regardless of race, demographic, socioeconomic, and health data contained on the birth certificate but not the death certificate.

The first public use version of a national linked file was made available by the National Center for Health Statistics (NCHS) for the 1983 live birth cohort. NCHS plans to issue these public use tapes routinely on an annual basis. Currently, public use tapes containing linked file data are available for the 1984, 1985, and 1986 birth cohorts.

The Indian Health Service (IHS) had only the 1983 Linked File for use when preparing this report. The data presented here should be interpreted with caution because of the small number of infant deaths under review for this one-year period.

SOURCES AND LIMITATIONS OF DATA

IHS normally prepares its Indian infant mortality statistics from the routine annual vital event data tapes it receives from NCHS. The tapes contain automated copies of records compiled from official birth and death certificates for all U.S. residents which are supplied to NCHS by the State health departments. Infant death records are included on the annual mortality record file provided to IHS as are records of decedents of all other ages.

Infant mortality rates computed from these data tapes consist of "period data" as opposed to "cohort data." A period rate is defined as the number of infant deaths per 1,000 live births occurring during a one year period. The numerator and denominator are not exactly comparable since some of these deaths may be to infants born during the previous year while some of the infants born in that year may not die until the following year but prior to reaching the first birthday. Normally there is no routine linkage between the mortality and natality data tapes to identify which of the infants died.

The Linked Birth/Infant Death Data Set used for this report was compiled using the 1983 live birth cohort. This cohort, by definition, consists of all infants born alive within the U.S.

during calendar year 1983. NCHS created the linked file with assistance from the State health departments. The linked data set consists of two separate files. The first file, or numerator file, consists of records of deaths of infants born in 1983, linked with their live birth records. These deaths may have occurred in 1983 or 1984, prior to the infant's first birthday. The second file, or denominator file, consists of records of all live births occurring during 1983, and it offers the opportunity to compute infant mortality rates for the cohort. Therefore, infant mortality rates computed from the linked file are defined as the number of deaths of infants born during 1983 per 1,000 live births occurring in that year. More detailed information on preparation of the data set is included in the documentation issued by NCHS for the public use data tape¹.

The linkage of the birth record to the death record offers a wealth of new information not previously available when analyzing infant mortality record data. Without the linkage the only available information about the individual comes from the death certificate. Some of this information, while relevant and important to an adult decedent, cannot be answered for, or is irrelevant to, an infant. For example, usual occupation and kind of business or industry, while an indicator of socioeconomic status for an adult, obviously does not pertain to an infant. However, age and education of the mother and father identified on the birth certificate are good indications of the newborn's socioeconomic status.

For infants dying during the first year of life, it is possible to identify health status at birth indicated by birth weight and Apgar score as a result of the linkage. Certain pregnancy and delivery items related to survival chances are available for analysis from the birth certificate, as well.

RACE REPORTING FOR INFANT DEATHS

Numerous studies have found an underreporting of infant deaths for Indians and for racial categories other than White or Black^{2,3}.

¹Public Use Data Tape Documentation - Linked Birth/Infant Death Data Set: 1983 Birth Cohort. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, January 1989.

²F. Frost and Kirkwood K. Shy. Racial differences between linked birth and infant deaths records in Washington State. American Journal of Public Health, 70:974-976, Sept. 1980.

Differences have been identified in linked studies by comparing race reported on the death certificate with race reported on the birth certificate for the same infant. The linked file used here contains the race shown on the birth certificate only, eliminating the possibility of a direct comparison of race reporting for the same infant on the birth and death certificates. An estimate of the extent of underreporting of Indian infant deaths can, however, be developed by comparing the number of infant deaths from the death registration system with the number from the linked file. Estimates of underreporting of Indian infant deaths are included in a later section of this report.

Race Reporting Procedures and Classification Methods

Different procedures are followed for reporting race on the birth certificate and on the death certificate. For the birth certificate, race of mother and father are usually provided by the mother at the time of delivery. For the death certificate, usually the funeral director provides the race of the infant based on personal observation or information provided by an informant, such as a parent or other relative.

IHS classifies the race of the child from the birth certificate differently from NCHS. IHS classifies as Indian any birth for which the mother or the father is reported as Indian. This method is used by IHS because any infant born to an eligible Indian mother or father is eligible to receive IHS-funded health care services. In contrast, NCHS has coding rules which take into account the race of both parents (See Appendix A). The only difference in identification of an Indian birth resulting from these two methods would occur if the mother is an Indian and the father is a race other than Indian or White. IHS would classify the birth as Indian while NCHS would classify the birth as the race of the father. This report conforms to the IHS method of classification and uses the race of mother and father rather than the NCHS method of classification.

IHS reports generally show data for Indians residing in either the IHS Service Area or the Reservation States. The Service Area consists of those geographic areas in which IHS has responsibilities. In general, the IHS Service Area is comprised of counties on which an Indian reservation of a Federally recognized Indian Tribe or traditional Indian land is located, as well as counties which border these counties. Reservation States are those States in which at least one Federally recognized Indian reservation or traditional Indian land is located. There were 31 Reservation States in 1983; currently there are 33 such States. Records are allocated to the Service Area based on county of residence. For those counties split between the Service and nonservice Area, a community code is used to allocate the record to the appropriate Area. Although the linked file contains the county of residence code it does not contain the community codes necessary

to properly allocate records from split counties, so data included in this report are shown for infant deaths regardless of whether they were in the Service Area. Although it would be possible to limit the analysis of data to Reservation States, eliminating the infant deaths occurring in Nonreservation States would make the number of infant deaths too small for some analysis purposes. Therefore, tables showing health or demographic characteristics contain the data for all States of the United States unless identified otherwise.

Underreporting of American Indian/Alaska Native Infant Deaths

Table 1 provides a comparison of the number of Indian infant deaths included in the linked data set with the number reported through regular registration procedures. For the United States as a whole, the linked file identified 615 infant deaths as Indian, compared to only 443 identified through regular registration data, an additional 172 infant deaths identified through linking procedures. If we assume the linked file provides a more accurate count, the number of Indian infant deaths was approximately 39 percent greater than the number actually reported on death certificates.

Table 1 also shows the data by State, categorizing the States as Reservation and Nonreservation. For the 31 States that were classified as Reservation States in 1983, the linked file identified 37 percent more Indian infant deaths than were reported from death certificates, 586 compared to 427. Since 1983, Alabama and Massachusetts have been added as Reservation States.

Examination of the data by State shows wide variation in accuracy of reporting of the number of Indian infant deaths. Reservation States with a large percentage difference between linked data and registration data (among States with at least 10 deaths from the registration data file) included California (356 percent), Oklahoma (63 percent), North Dakota (42 percent), and Washington (32 percent). Underreporting in these States is consistent with prior findings of an artificially low infant mortality rate for three IHS Areas- California, Oklahoma City, and Portland, compared with other Areas. California, Oklahoma, and Washington comprise portions of these three Areas. (Appendix B shows IHS Areas and the States included in each.)

Unfortunately, some Areas are not combinations of whole States such that the number of infant deaths could be computed for an Area based on State data from the linked file. For instance, although the California Area includes only the State of California, the California Area consisted of only one-third of the Indian population and 28 percent of the births in the State of California in 1983. Therefore, we cannot extrapolate, in all cases, the number of deaths or an infant mortality rate from a State or a combination of States to an IHS Area.

It is unclear why underreporting is more extensive in the three previously identified "problem" Areas. Perhaps the large Hispanic population in California and the heavy concentration of Hispanic sounding names among American Indians leads to misclassification as Hispanic in that State. Residence in non-Indian/Anglo areas may also result in greater likelihood of misclassification as non-Indian.

Table 2 shows the number and percent distribution of Indian births by race of parents by IHS Area from 1983 birth registration data. The California, Oklahoma, and Portland Areas each have the lowest percentage of Indian births for which both parents were identified as Indian, 23 percent for each Area; this may be a factor in differences in racial classification, as well. For the other Areas the percentage of births for whom both parents were Indian ranged from 30 percent for Bemidji to 69 percent for Navajo.

There is an interesting point that should be noted from Table 1. On a State by State basis the number of births identified as Indian in the linked study was extremely close, if not identical, to the number identified from the regular registration file except for the States of Arizona and California. For these two States, the number of Indian births in the linked file was notably higher. Although one might assume that the additional Indian births included in the linked file might be the addition of late filed certificates, the summary table below disproves this theory. As shown below, the total number of births of all races in the linked file was no greater than the number in the registration file for these two States, eliminating the possibility of the addition of late filed certificates.

One possible factor contributing to this difference might be the status of these two States as nonparticipants in the Vital Statistics Cooperative Program. For the five nonparticipating States, only 50 percent of the birth certificates (the even numbered certificates) were coded for the natality file. When an infant death was associated with an odd-numbered birth record, that record was added to the denominator file. To maintain the same total number of birth records in the file, record weights were changed from 2 to 1 for the same number of even-numbered records. Although the procedure used to make this adjustment was devised to minimize the introduction of bias to the file, some bias may have resulted. While this accounts for some of the additional Indian births found for these two States, further analysis indicates that it does not explain all of the additional Indian births.

Table A.

	<u>Indian Births</u>		<u>Total Births,</u> <u>All Races</u>	
	<u>Registration</u>	<u>Linked</u>	<u>Registration</u>	<u>Linked</u>
Arizona	5,694	5,818	53,785	53,745
California	5,459	5,737	436,143	436,144

Infant Mortality Rates from the Linked File Compared to Registration Data

Indian infant mortality rates were substantially higher when computed from the linked file as shown in Table 1. The rate for Reservation States computed from registration data was 10.8 infant deaths per 1,000 live births; from the linked file the rate for these States was 14.7, 36 percent higher. Considerable variation in rates was found by State, with the greatest difference occurring for California (over 4 times as great, 2.9 compared to 12.7). Although several other States showed increases of this magnitude, the actual number of deaths on which these increases were based was small (less than 5 deaths).

IHS plans to use the linked file routinely in the future to compute what are expected to be much more accurate infant mortality rates. However, several more years are needed before preparation of the linked file catches up to the availability of the regular registration file so that this can be accomplished.

Table 3 compares linked file and registration data by age at death. It is apparent from the table that race misclassification is a problem for each age category. The number of Indian infant deaths ranged from 21 percent to 58 percent greater in the linked file compared to registration data. The greatest difference was found for those dying within 1 to 23 hours after birth, the smallest difference for those dying within 7 to 27 days.

Race reporting on the death certificate was no better for those infants dying shortly after birth than for those dying months later. Most healthy newborns typically remain in the hospital with the mother 2 to 3 days following delivery⁴. The average length of stay for an infant with health problems is probably even longer than for a healthy one. It would seem logical to assume that an infant dying within several days of birth would most likely die in the hospital in which it was born and that the birth and death certificates would be filed at the same time and signed by the same

⁴IHS Direct Hospital Data for FY 1983 shows the average length of stay as 2.6 days.

physician so that information completed on the two documents would be the same. However, an examination of data in Table 3 shows substantial misclassification for infants dying within 24 hours of birth. For infants dying within 1 hour of birth the linked file identified 26 percent more as Indian than did the registration file. For those newborns dying at least 1 hour but less than 24 hours after birth the number identified as Indian was 58 percent higher in the linked file. Some of these differences may be due to transfer of critically ill infants to a more technologically sophisticated hospital shortly after birth.

Table 3 shows age-specific infant mortality rates computed from the linked file. Figure 1 compares the difference in rates between the linked and registration files. The pattern of change for the rates corresponded to the pattern of change in the number of deaths by age.

Table B shows the percentage distribution of deaths by age for the linked file compared to the registration file. The proportion of deaths occurring in the neonatal (less than 28 days) and postneonatal (28 days or more) periods was similar for both files.

Table B.

	<u>Registration Data</u>		<u>Linked Data</u>	
	Percent Distribution	Number	Percent Distribution	Number
<u>Age at Death</u>				
Less than 1 hour	9.7	43	8.8	54
1 to 23 hr.	13.3	59	15.1	93
1 to 6 days	13.5	60	13.8	85
7 to 27 days	13.1	58	11.4	70
28 days or more	50.3	223	50.9	313
TOTAL	100.0	443	100.0	615

CHARACTERISTICS OF INFANT DEATHS

This section of the report provides an analysis of characteristics of Indian infant deaths based on data from the linked file. The analysis includes comparison of characteristics of Indian infant deaths with U.S. All Races and White infant deaths; it also compares linked data with regular registration file data for those characteristics that are included in both files.

Characteristics relating to survival chances of infants can be categorized in two ways - health characteristics of the infant itself and demographic characteristics of the infant's parents which can affect the health of the infant before or shortly after birth or at any time during the first year of life.

Health Characteristics of Infant Deaths

Age at Death

Table 4 and Figure 2 show the number of infant deaths and infant mortality rates by race from the linked file. The higher overall infant mortality rate among Indian infants when compared to U.S. All Races and White infants was the result of a higher postneonatal mortality rate. There was little difference in the neonatal rate - 7.2 infant deaths per 1,000 live births for Indian infants compared to 7.1 for U.S. All Races and 6.1 for White infants. However, for the postneonatal period, Indian infants had a mortality rate more than twice the rate for these two other racial categories - 7.2 (Indian) compared to 3.8 (All Races) and 3.2 (White), respectively. The table shows that Indian infants were the only racial group about as likely to die during the postneonatal as during the neonatal period. Although Black infants had an overall infant mortality rate of 18.9, 1.3 times the rate for Indian infants they, too, had a lower mortality rate during the postneonatal period than did Indian infants- 6.6 compared to 7.4.

Birth Weight

Birth weight is one of the items that is available for infant deaths only from the linked file. Since it is not included on the death certificate no comparison can be made with the registration file.

Table 5 and Figure 3 compare Indian infant mortality rates by birth weight with rates for U.S. All Races, White, and Black. The mortality rates for infants of low birth weight (less than 2,500 grams or 5 lbs. 9 oz.) were high for each racial category - approximately 1 out of 10 of these infants died, regardless of from which racial group they came.

What is most strikingly shown in Figure 3 is that Indian babies of normal weight were less likely to benefit from the additional weight than infants in other racial categories. Non-low birth weight Indian babies were approximately twice as likely to die as were White infants and U.S. infants of All Races in this weight category. Infant mortality rates for these infants were 8.5, 4.1, and 4.5 infant deaths per 1,000 live births, respectively.

Table 6 shows a finer breakout by birth weight. American

Indian survival disadvantage in relation to the race categories shown in the table first becomes apparent at 1,500 grams (3 lbs., 5 oz.) and was most pronounced for infants with birth weight in the 3,000 to 4,499 grams (6 lbs., 10 oz. to 9 lbs., 14 oz.) range. Another noteworthy finding from the table is the relationship of mortality among Indian infants compared to Black infants. The birth weight-specific mortality rates were higher for Indians than for Blacks for low and medium weight infants; however, for infants weighing 4,000 grams or more, the mortality rates were higher for Black than for Indian babies.

Table 7 shows neonatal and postneonatal mortality rates by birth weight. Neonatal and postneonatal rates were consistent among the racial groups shown in the table for the smallest babies (less than 1,500 grams or 3 lbs., 4 oz.): one third of these tiniest of infants did not survive the neonatal period regardless of race. Of infants in this weight category surviving past the 28th day, there appeared to be no survival advantage for any particular racial category. Postneonatal infant mortality rates were 41.8 for Indians, 41.4 for Whites, 53.1 for Blacks, and 45.8 for U.S. infants of All Races.

For infants larger than 1,500 grams but still in the low birth weight category, the neonatal mortality rates for Indian, White, and U.S. All Races infants were approximately the same: 20.2, 20.1, and 18.0, respectively. For White infants and U.S. infants of All Races, survival chances improved in the postneonatal period, with mortality rates decreasing to 11.3 and 12.0, respectively. However, no similar improvement was found for American Indian infants, the postneonatal mortality rate remaining as high as during the neonatal period.

Infants weighing 2,500 grams or more in all racial categories shown in Table 7 experienced relatively low mortality during both the neonatal and postneonatal periods. In this weight category higher mortality rates occurred in the postneonatal compared to the neonatal period. The largest difference in rates between these time periods was found for Indian infants, with the postneonatal rate over 2.6 times the neonatal rate (6.2 compared to 2.3). In fact, the highest mortality rate for normal weight infants in either the neonatal or postneonatal period was the postneonatal rate of 6.2 for Indian babies.

Cause of Death

Table 8 shows the number of Indian infant deaths by cause of death from the linked file compared to registration data. It also shows cause-specific infant mortality rates computed from each of the two files. The cause-specific mortality rates are shown per 100,000 live births since the numbers of deaths are small when broken down by individual causes. Rates based on small numbers should be interpreted with caution since differences may be based

on random fluctuations.

The additional infant deaths identified in the linked file were distributed among all the major causes of death. Differences in number of deaths between the linked file and registration data ranged from 27 percent to 67 percent for those causes with more than 10 deaths in the registration file. Two causes of death for Indian infants, sudden infant death syndrome (SIDS) and congenital anomalies, far surpassed the other leading causes in terms of the number of deaths. The linked file showed 153 Indian babies dying from SIDS compared to 99 identified from registration data, an increase of 55 percent. The number of deaths from congenital anomalies increased by 44 percent, from 77 identified from registration data to 111 identified in the linked file.

Figure 4 shows the relationship between cause-specific mortality rates computed from registration data compared to those rates computed from the linked file. The figure shows that rates increased for each of the causes shown and that there was no major re-ranking of causes as a result of the additional deaths identified in the linked file.

A comparison by cause of death by race from the linked study is shown in Table 9. Most striking is the substantially higher death rate from SIDS among Indian infants when compared to each of the racial groupings shown on the table. It was the leading cause of death of Indian infants in contrast to White and U.S. infants of All Races for whom the leading cause was congenital anomalies. The SIDS mortality rate for Indians was 3 times the rate for White infants (361.8 compared to 121.5).

Figure 5 graphically shows a comparison of cause-specific rates by race. The mortality rate for Indians was notably higher than the rate for White infants and for U.S. infants of All Races for most causes.

Preventable Infant Mortality

Preventable infant mortality has been defined by Kleinman as postneonatal mortality among infants weighing 2,500 grams or more at birth excluding deaths from congenital anomalies.⁵ Although the small size of the one year linked data file precludes development of a table crossing these three variables it is obvious from the data presented for each of these variables that preventable infant mortality is probably a serious problem among Indians. Further

⁵Kleinman, Joel C., Ph.D., Infant Mortality Among Racial/Ethnic Minority Groups, 1983-1984. Morbidity and Mortality Weekly Report, Vol. 39/No. SS-3, July 1990, Center for Disease Control.

analysis of "preventable" deaths by characteristics previously unavailable but extracted from the birth certificate and now included in the linked file might provide some clues on why this is a particular problem among Indians. However, analysis of this issue must wait until additional years of linked files are available in order to have a large enough population of infant deaths for more in-depth analysis.

Factors During Pregnancy and Delivery Relating to Health of the Infant

Certain factors affect the health of an infant, including receipt of prenatal care, attendant and place of delivery, and plurality. Apgar scores reflect the condition of the infant at time of delivery. Each of these characteristics is available for analysis of infant deaths only from the linked file.

Prenatal Care

The timing and quality of prenatal care is an important means of influencing the outcome of a pregnancy and an infant's chance of survival. Optimally, care should begin during the first trimester. Table 10 shows infant mortality rates by month prenatal care began by race. Indian infants whose mothers initiated prenatal care during the first three months had lower mortality rates than those born to mothers who waited until later in pregnancy to begin care. Those born to mothers who received no prenatal care had an infant mortality rate 3 times that of infants born to mothers who began care early.

Although it is obvious from Table 10 that receiving prenatal care early in pregnancy was related to a lower mortality rate for an Indian infant, the mortality rate remained high in relation to rates for White infants (Figure 6). White infants whose mothers began care as late as the last trimester still experienced lower infant mortality rates than Indian infants whose mothers began care in the first trimester. The only prenatal care category for which White infants fared as poorly as Indian infants was the one in which no prenatal care was received by the mother (34.8 and 35.7, respectively).

Attendant at Birth and Place of Delivery

Table 11 shows the number of infant deaths and infant mortality rates by attendant and place of delivery by race. The vast majority of Indian infants who died had been delivered in a hospital by a physician (572 of 615).

Apgar Score

The Apgar score was developed by Virginia Apgar, M.D. in 1952

to evaluate an infant's physical condition at 1 and 5 minutes after birth. It serves as an indication of the need for immediate medical attention and a predictor of an infant's chances of surviving the first year of life. It is based on an evaluation of heart rate, respiratory effort, muscle tone, reflex irritability, and color. A score of 0-3 indicates that the infant is severely depressed; 4-6, moderately depressed; and 7-10 indicates good to excellent condition. The 1-minute score is an indication of condition at birth; the 5-minute score reflects condition at birth and the results of care given during the first 5 minutes after birth. The 5-minute score is a better predictor of long-term health conditions and survival chances than the 1-minute score.

Number of deaths and mortality rates by race for 1-minute score are shown in Table 12. As one would expect, the higher the Apgar score the lower the mortality rate; mortality rates dropped sharply with increasing scores. Interestingly, Indian infants with scores in the lower range (6 or below) showed no substantially greater mortality than infants in the other race categories. However, among those with an Apgar score of 7 or above, indicating good to excellent health at birth, the mortality rate for Indians was twice as high as for White and U.S. infants of All Races (See Figure 7).

Table 13 shows number of deaths and mortality rates by race for 5-minute Apgar score. Again, mortality rates dropped sharply as Apgar scores increased, although they did not drop as quickly as did the rates for the 1-minute scores. Mortality rates by 5-minute score were high (over 100 per 1,000) for infants with scores from 0 to 6; for 1-minute scores mortality rates were above 100 only for those infants with scores from 0 to 3. This difference in the pattern of mortality rate decline between 1 and 5-minute scores reflect successful resuscitative efforts for infants with low 1-minute scores. As shown in Figure 8, Indian infants showed no greater mortality risk for the lower scores than infants in the other race categories; however, mortality rates for Indian infants with scores in the excellent range (9 to 10) were approximately twice as high as for White infants and U.S. infants of All Races.

Plurality

Table 14 shows number of infant deaths and mortality rates by plurality and race. Twin and other multiple births experienced much higher rates than did single infants regardless of race. Shorter gestation periods and lower birth weights among plural births contribute to higher mortality rates.

Age of Mother

Number of infant deaths and infant mortality rates by age of mother by race are shown in Table 15. Mortality rates were generally higher for infants born to teenage mothers and to those

born to mothers over age 40. Optimal survival for Indian infants occurred among somewhat older mothers compared to optimal survival for White infants. The lowest mortality rate for Indian infants, 10.3, was found among those born to mothers 35 to 39 years old; White infants most likely to survive were those born to mothers age 25 to 29. The only age category in which Indian infants experienced lower mortality rates than White infants was the youngest ; however, the rates (18.0 compared to 25.0) were based on a relatively small number of births.

Education of Parents

Tables 16 and 17 show number of deaths and mortality rates by education of mother and father as a measure of socioeconomic status. Parents under age 18 were excluded since most would not be old enough to finish high school.

Education of the mother is shown in Table 16. Mortality rates decreased with increasing education for both Indian and White infants; for both groups mortality rates were more than twice as high when comparing the lowest to the highest education categories. Rates for Indian infants ranged from 19.7 for those with 0 to 8 years of education to 8.2 for those with at least 16 years of schooling. Mortality rates for Indian infants were higher than for White infants and for U.S. infants of All Races for every education category as shown in Figure 9.

Mortality rates by education of father are shown in Table 17. The same patterns of rates by education of father emerge as those found by education of mother. However, almost half of the Indian infant deaths show education of father as not stated, probably as a result of the parents not being married at the time of birth of the child.

Marital Status of Mother

Mortality rates were higher for infants born to unmarried mothers for each racial group shown in Table 18. Indian babies born to unmarried mothers experienced mortality rates 50 percent higher than those born to mothers who were married(18.3 and 12.2, respectively). Indian babies experienced higher mortality than White infants and U.S. infants of All Races for both marital status categories (Figure 10).

Live Birth Order

Table 19 shows the number of deaths and mortality rates by live birth order by race. Mortality rates increased with increasing birth order for Indian babies, ranging from 13.0 for first births to 17.6 for births of 4th or higher order, a difference of 35 percent between lowest and highest mortality rates. In contrast, the lowest rate for White infants was found

for those who were second rather than first born; the difference was slight, however (8.9 compared to 9.1). Rates were higher for Indians than for White or U.S. infants of All Races for each birth order (Figure 11). Rates for Indians were approximately 60 percent higher than for Whites, except for first births for which the difference was 40 percent, due to the slightly elevated rate for White first births.

APPENDIX A

National Center for Health Statistics (NCHS) Procedures for Coding Race of the Child When the Parents Are of Different Races-

When only one parent is White the child is assigned the race of the other parent. When neither parent is White, the child is assigned the race of the father unless the mother is Hawaiian or part-Hawaiian in which case the child is assigned Hawaiian. If race is missing for one parent, the child is assigned the race of the other parent. If race is missing for both parents, the child is assigned the race of the preceding child on the electronic data file.

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APPENDIX B

Indian Health Service Area Offices

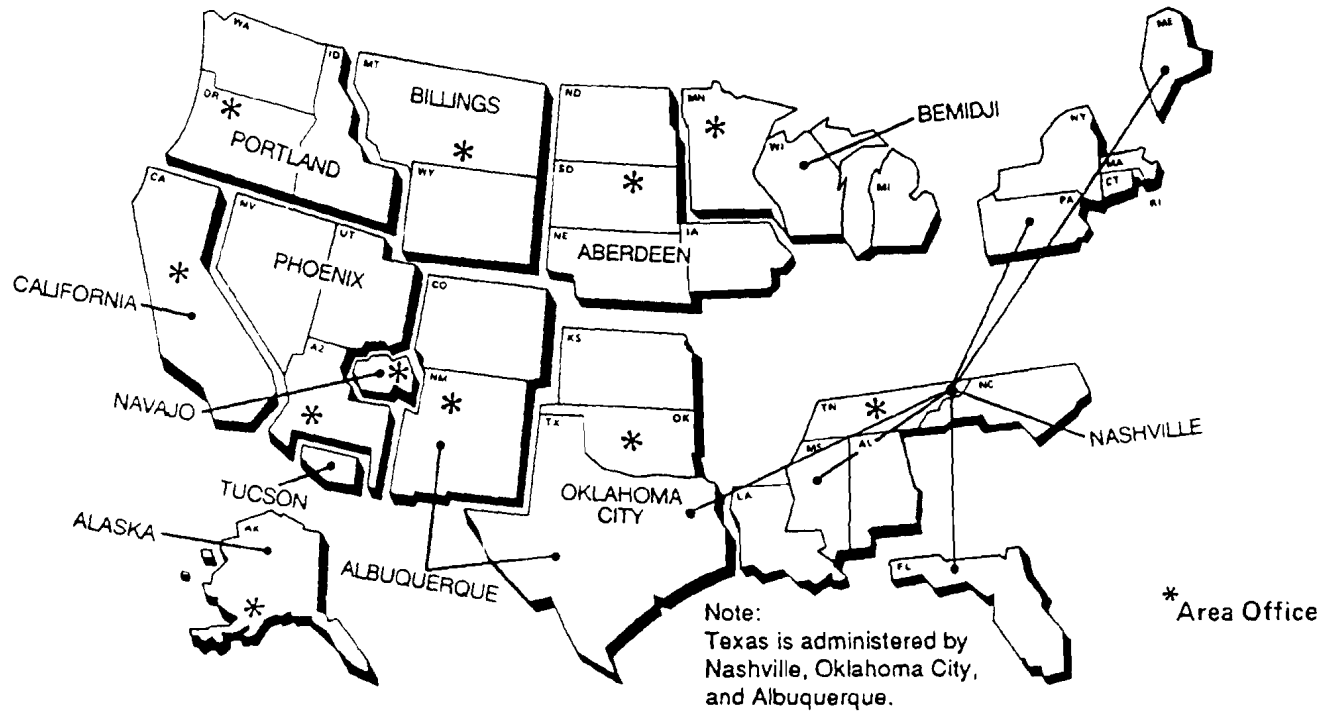


TABLE 1

NUMBER OF AMERICAN INDIAN & ALASKA NATIVE BIRTHS AND
INFANT DEATHS BY STATE OF RESIDENCE OF MOTHER FOR
EACH RESERVATION AND NONRESERVATION STATE, FROM
THE 1983 LINKED STUDY AND REGULAR REGISTRATION DATA

RESERVATION STATES*	INFANT DEATHS		BIRTHS		RATE**	
	REG	LINKED	REG	LINKED	REG	LINKED
ALASKA(4%)	46	48	2682	2681	17.2	17.9
ARIZONA(19%)	57	68	5694	5818	10.0	11.7
CALIFORNIA(356%)	16	73	5459	5737	2.9	12.7
COLORADO(300%)	2	8	570	571	3.5	14.0
CONNECTICUT(0%)	0	0	44	44	0.0	0.0
FLORIDA(-)	0	3	226	228	0.0	13.2
IDAHO(0%)	5	5	287	287	17.4	17.4
IOWA(-33%)	3	2	139	139	21.6	14.4
KANSAS(233%)	3	10	336	336	8.9	29.8
LOUISIANA(-50%)	2	1	296	297	6.8	3.4
MAINE(100%)	1	2	126	126	7.9	15.9
MICHIGAN(17%)	6	7	735	735	8.2	9.5
MINNESOTA(27%)	15	19	1268	1268	11.8	15.0
MISSISSIPPI(33%)	3	4	192	192	15.6	20.8
MONTANA(6%)	17	18	1438	1438	11.8	12.5
NEBRASKA(125%)	4	9	354	354	11.3	25.4
NEVADA(25%)	4	5	498	499	8.0	10.0
NEW MEXICO(12%)	42	47	3636	3612	11.6	13.0
NEW YORK(14%)	7	8	728	728	9.6	11.0
NORTH DAKOTA(42%)	12	17	844	844	14.2	20.1
N. CAROLINA(10%)	29	32	1585	1586	18.3	20.2
OKLAHOMA(63%)	46	75	5497	5496	8.4	13.6
OREGON(0%)	4	4	698	699	5.7	5.7
PENNSYLVANIA(-)	0	2	144	144	0.0	13.9
RHODE ISLAND(300%)	1	4	94	94	10.6	42.6
SOUTH DAKOTA(-4%)	46	44	1815	1816	25.3	24.2
TEXAS(0%)	4	4	542	542	7.4	7.4
UTAH(50%)	4	6	650	653	6.2	9.2
WASHINGTON(32%)	25	33	1744	1744	14.3	18.9
WISCONSIN(30%)	20	26	880	880	22.7	29.5
WYOMING(-33%)	3	2	320	320	9.4	6.3
SUBTOTAL(37%)	427	586	39521	39908	10.8	14.7

* Figure shown in () is the percent difference in number of deaths between the registration and linked files- (-) indicates computation of percent based on 0 infant deaths

** Rate= Infant Deaths/1,000 Live Births

TABLE 1 (Continued)

**NUMBER OF AMERICAN INDIAN & ALASKA NATIVE BIRTHS AND
INFANT DEATHS BY STATE OF RESIDENCE OF MOTHER FOR
EACH RESERVATION AND NONRESERVATION STATE, FROM
THE 1983 LINKED STUDY AND REGULAR REGISTRATION DATA**

NONRESERVATION STATES	INFANT DEATHS		BIRTHS		RATE**	
	REG	LINKED	REG	LINKED	REG	LINKED
ALABAMA(-)	0	0	38	38	0.0	0.0
ARKANSAS(100%)	1	2	136	136	7.4	14.7
DELAWARE(-)	0	0	9	8	0.0	0.0
DISTRICT OF COL(-)	0	0	7	14	0.0	0.0
GEORGIA(50%)	2	3	75	83	26.7	36.1
HAWAII(400%)	1	5	264	264	3.8	18.9
ILLINOIS(0%)	2	2	327	327	6.1	6.1
INDIANA(-100%)	1	0	114	114	8.8	0.0
KENTUCKY(-)	0	1	53	53	0.0	18.9
MARYLAND(-)	0	2	149	156	0.0	12.8
MASSACHUSETTS(0%)	2	2	167	169	12.0	11.8
MISSOURI(0%)	2	2	170	170	11.8	11.8
NEW JERSEY(400%)	1	5	261	259	3.8	19.3
N. HAMPSHIRE(-)	0	0	17	17	0.0	0.0
OHIO(-33%)	3	2	288	288	10.4	6.9
SOUTH CAROLINA(0%)	1	1	84	85	11.9	11.8
TENNESSEE(-)	0	1	59	59	0.0	16.9
VERMONT(-)	0	0	7	7	0.0	0.0
VIRGINIA(-)	0	1	123	126	0.0	7.9
WEST VIRGINIA(-)	0	0	8	8	0.0	0.0
SUBTOTAL(81%)	16	29	2356	2381	6.8	12.2
TOTAL	443	615	41877	42289	10.6	14.5

*Figure shown in () is the percent difference in number of deaths between the registration and linked files- (-) indicates computation of percent based on 0 infant deaths

**RATE= Infant Deaths/1,000 Live Births

TABLE 2

**NUMBER AND PERCENT OF AMERICAN INDIAN & ALASKA NATIVE
BIRTHS BY RACE OF PARENTS, 1983 REGISTRATION DATA**

	BOTH PARENTS		FATHER ONLY		MOTHER ONLY	
	<i>NO.</i>	<i>%</i>	<i>NO.</i>	<i>%</i>	<i>NO.</i>	<i>%</i>
ALL AREAS	12165	42.8	4405	15.5	11836	41.7
ABERDEEN	1182	45.4	183	7.0	1236	47.5
ALASKA	1018	38.0	289	10.8	1375	51.3
ALBUQUERQUE	727	49.4	112	7.6	633	43.0
BEMIDJI	444	30.5	277	19.0	737	50.6
BILLINGS	812	55.4	208	14.2	447	30.5
CALIFORNIA	362	23.4	580	37.5	606	39.2
NASHVILLE	286	38.5	138	18.6	318	42.9
NAVAJO	3653	68.9	93	1.8	1560	29.4
OKLAHOMA CITY	1289	23.1	1603	28.8	2683	48.1
PHOENIX	1573	54.6	350	12.1	959	33.3
PORTLAND	514	23.4	511	23.3	1173	53.4
TUCSON	305	64.2	61	12.8	109	23.0

TABLE 3

**NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY AGE AT DEATH, AMERICAN INDIAN & ALASKA
NATIVE, 1983 LINKED STUDY, COMPARED TO 1983
REGISTRATION DATA**

<u>AGE AT DEATH</u>	<u>Infant Deaths</u>		<u>Percent Difference</u>
	<u>Registered</u>	<u>Linked</u>	
Less than 1 hr.	43	54	25.6%
1 to 23 hrs.	59	93	57.6%
1 to 6 days	60	85	41.7%
7 to 27 days	58	70	20.7%
28 days or more	223	313	40.4%
TOTAL	443	615	38.8%
<u>Infant Mortality Rate*</u>			
Less than 1 hr.	1.0	1.3	24.4%
1 to 23 hrs.	1.4	2.2	56.1%
1 to 6 days	1.4	2.0	40.3%
7 to 27 days	1.4	1.7	19.5%
28 days or more	5.3	7.4	39.0%
TOTAL	10.6	14.5	37.5%

*Number of infant deaths per 1,000 live births

TABLE 4

NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY AGE AT DEATH, AMERICAN INDIAN &
ALASKA NATIVE, COMPARED TO SELECTED RACES,
1983 LINKED STUDY

	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
<u>AGE AT DEATH</u>	<i>INFANT DEATHS</i>			
Less than 1 hr.	54	4216	2962	1108
1 to 23 hrs.	93	11018	7292	3419
1 to 6 days	85	6472	4620	1619
7 to 27 days	70	4049	2929	1050
<i>Subtotal</i>	302	25755	17803	7196
28 days or more	313	13856	9310	3882
<i>Total</i>	615	39611	27113	11078
	<i>INFANT MORTALITY RATE*</i>			
Less than 1 hr.	1.3	1.2	1.0	1.9
1 to 23 hrs.	2.2	3.0	2.5	5.8
1 to 6 days	2.0	1.8	1.6	2.8
7 to 27 days	1.7	1.1	1.0	1.8
<i>Subtotal</i>	7.1	7.1	6.1	12.3
28 days or more	7.4	3.8	3.2	6.6
<i>Total</i>	14.5	10.9	9.3	18.9

*Number of Infant Deaths per 1,000 Live Births

TABLE 5

NUMBER OF INFANT DEATHS AND INFANT MORTALITY RATES
BY SELECTED BIRTH WEIGHT CATEGORIES, AMERICAN INDIAN
& ALASKA NATIVE, COMPARED TO SELECTED RACES, 1983
LINKED STUDY

<u>Birth Weight, in grams</u>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
<i>Infant Deaths</i>				
Less than 2,500	262	23178	15220	7212
2,500 or more	335	15362	11160	3479
Not stated	18	1164	733	387
Total	615	39704	27113	11078
<i>Infant Mortality Rate*</i>				
Less than 2,500	95.9	93.5	92.4	98.0
2,500 or more	8.5	4.5	4.1	6.8
Not stated	195.7	216.1	176.7	380.9
Total	14.5	10.9	9.3	18.9

*Number of infant deaths per 1,000 live births

TABLE 6

**NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY BIRTH WEIGHT, AMERICAN INDIAN & ALASKA
NATIVE, COMPARED TO SELECTED RACES, 1983 LINKED
STUDY**

<u>Birth Weight, in grams</u>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
<i>Infant Deaths</i>				
499 or less	31	3938	2296	1534
500-999	98	9584	6030	3279
1000-1499	42	3525	2573	834
1500-1999	37	2690	1912	673
2000-2499	54	3441	2409	892
2500-2999	87	4998	3424	1350
3000-3499	143	5798	4155	1348
3500-3999	81	3293	2570	563
4000-4499	20	930	751	143
4500-4999	4	229	184	38
5000+	0	114	76	37
Not Stated	18	1164	733	387
Total	615	39704	27113	11078
<i>Infant Mortality Rate*</i>				
499 or less	885.7	885.7	890.3	877.1
500-999	550.6	577.0	597.3	545.0
1000-1499	173.6	158.4	179.4	116.8
1500-1999	70.9	56.8	61.0	46.9
2000-2499	30.8	21.9	22.7	20.1
2500-2999	13.5	8.5	8.2	9.6
3000-3499	9.2	4.3	3.9	6.0
3500-3999	6.5	3.1	2.8	4.9
4000-4499	5.0	2.8	2.6	5.7
4500-4999	5.0	3.8	3.4	9.6
5000+	0.0	14.0	10.6	51.0
Not Stated	195.7	216.1	176.7	380.9
Total	14.5	10.9	9.3	18.9

*Number of infant deaths per 1,000 live births

TABLE 7

NUMBER OF NEONATAL AND POSTNEONATAL DEATHS AND INFANT MORTALITY RATES
BY BIRTH WEIGHT, AMERICAN INDIAN AND ALASKA NATIVE, COMPARED TO SELECTED
RACES, 1983 LINKED STUDY

<u>Birth Weight,</u> <u>in grams</u>	<i>Indian &</i> <i>Alas Nat.</i>		<i>All Races</i>		<i>White</i>		<i>Black</i>	
	<u>Neonatal</u>	<u>Postneo.</u>	<u>Neonatal</u>	<u>Postneo.</u>	<u>Neonatal</u>	<u>Postneo.</u>	<u>Neonatal</u>	<u>Postneo.</u>
<i>Infant Deaths</i>								
Less than 1,500	152	19	15062	1985	9780	1119	4855	792
1,500 to 2,499	46	45	3677	2454	2767	1554	762	803
2,500 or more	89	246	6012	9350	4571	6589	1208	2271
Not stated	15	3	1097	67	685	48	371	16
Total	302	313	25848	13856	17803	9310	7196	3882
<i>Infant Mortality Rate*</i>								
Less than 1,500	334.1	41.8	347.8	45.8	362.0	41.4	325.7	53.1
1,500 to 2,499	20.2	19.8	18.0	12.0	20.1	11.3	13.0	13.7
2,500 or more	2.3	6.2	1.8	2.8	1.7	2.4	2.4	4.4
Not stated	163.0	32.6	203.7	12.4	165.1	11.6	365.2	15.7
Total	7.1	7.4	7.1	3.8	6.1	3.2	12.3	6.6

*Number of infant deaths per 1,000 live births

TABLE 8

**NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY CAUSE OF DEATH, AMERICAN INDIAN AND
ALASKA NATIVE, 1983 LINKED STUDY, COMPARED TO
1983 REGISTRATION DATA**

<u>CAUSE OF DEATH</u>	INFANT DEATHS		INFANT MORTALITY RATE*	
	<i>Registered</i>	<i>Linked</i>	<i>Registered</i>	<i>Linked</i>
Sudden infant death syndrome	99	153	236.4	361.8
Congenital anomalies	77	111	183.8	262.4
Respiratory distress syndrome	33	44	78.8	104.0
Disorders related to short gestation & low brthwght	22	30	52.5	70.9
Accidents	12	20	28.7	47.3
Pneumonia & influenza	12	19	28.7	44.9
Infections specific to perinatal period	10	16	23.9	37.8
Intrauterine hypoxia & birth asphyxia	11	14	26.3	33.1
Newborn affected by maternal complications of pregnancy	6	10	14.3	23.6
Newborn affected by complications of placenta cord & membranes	8	10	19.1	23.6
Meningitis	7	8	16.7	18.9
Septicemia	2	6	4.8	14.2
All other causes	144	174	343.8	411.4
Total	443	615	1057.7	1454.1

*Number of infant deaths per 100,000 live births

TABLE 9

NUMBER OF INFANT DEATHS AND INFANT MORTALITY RATES
BY CAUSE OF DEATH, AMERICAN INDIAN & ALASKA NATIVE,
COMPARED TO SELECTED RACES, 1983 LINKED STUDY

<u>CAUSE OF DEATH</u>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
	<i>INFANT DEATHS</i>				<i>INFANT MORTALITY RATE*</i>			
Sudden infant death syndrome	153	5271	3533	1478	361.8	144.7	121.5	252.4
Congenital anomalies	111	8576	6759	1452	262.4	235.4	232.4	248.0
Respiratory distress syndrome	44	3600	2565	928	104.0	98.8	88.2	158.5
Disorders related to short gestation & low brthwght	30	3235	1833	1326	70.9	88.8	63.0	226.5
Accidents	20	870	573	262	47.3	23.9	19.7	44.7
Pneumonia & influenza	19	732	438	252	44.9	20.1	15.1	43.0
Infections specific to perinatal period	16	845	589	218	37.8	23.2	20.3	37.2
Intrauterine hypoxia & birth asphyxia	14	1182	805	332	33.1	32.4	27.7	56.7
Newborn affected by maternal complications of pregnancy	10	1435	977	423	23.6	39.4	33.6	72.2
Newborn affected by complications of placenta cord & membranes	10	842	599	212	23.6	23.1	20.6	36.2
Meningitis	8	310	186	111	18.9	8.5	6.4	19.0
Septicemia	6	281	174	91	14.2	7.7	6.0	15.5
All other causes	174	12525	8082	3993	411.4	343.8	277.9	682.0
Total	615	39704	27113	11078	1454.1	1089.9	932.3	1892.0

*Number of infant deaths per 100,000 live births

TABLE 10

NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY MONTH PRENATAL CARE BEGAN, AMERICAN
INDIAN & ALASKA NATIVE, COMPARED TO SELECTED
RACES, 1983 LINKED STUDY

<u>MONTH PRENATAL CARE BEGAN</u>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
INFANT DEATHS				
1st & 2nd months	192	17771	13239	3924
3rd month	109	8014	5556	2177
4th-6th month	162	7747	4687	2719
7th-9th month	67	1567	944	521
No prenatal care	47	2474	1291	1109
Not stated	38	2131	1396	628
Total	615	39704	27113	11078
INFANT MORTALITY RATE*				
1st & 2nd months	12.8	9.4	8.3	17.9
3rd month	11.5	9.6	8.3	16.6
4th-6th month	14.4	11.9	10.3	16.6
7th-9th month	17.3	11.1	9.9	14.2
No prenatal care	35.7	42.5	34.8	59.5
Not stated	27.0	28.3	25.4	39.9
Total	14.5	10.9	9.3	18.9

*Number of infant deaths per 1,000 live births

TABLE 11

**NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY ATTENDENT AT BIRTH & PLACE OF DELIVERY,
AMERICAN INDIAN & ALASKA NATIVE, COMPARED TO
SELECTED RACES, 1983 LINKED STUDY**

<u>Attendant & Place of Delivery</u>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
INFANT DEATHS				
In hospital				
Physician	572	38345	26270	10645
Midwife	18	433	262	143
Other attendant	14	177	150	92
Not in hospital				
Physician	2	226	152	107
Midwife	0	84	78	4
Other attendant	8	268	177	80
Unknown	1	131	24	7
Total	615	39664	27113	11078
INFANT MORTALITY RATE*				
In hospital				
Physician	15.0	10.9	9.4	19.0
Midwife	7.0	6.0	5.3	8.2
Other attendant	13.6	9.5	11.1	30.4
Not in hospital				
Physician	17.1	20.0	17.4	52.6
Midwife	0.0	5.0	5.0	5.3
Other attendant	39.6	21.6	17.4	48.4
Unknown	26.3	62.8	15.5	21.5
Total	14.5	10.9	9.3	18.9

*Number of infant deaths per 1,000 live births.

TABLE 12

NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY 1 MINUTE APGAR SCORE, AMERICAN INDIAN
& ALASKA NATIVE, COMPARED TO SELECTED RACES,
1983 LINKED STUDY

<u>Apgar Score</u>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
INFANT DEATHS				
0	13	821	559	237
1 to 3	131	13585	8873	4362
4 to 6	60	4919	3456	1329
7 to 8	156	6678	4660	1759
9 to 10	73	3896	2473	1261
Not Stated	182	9805	7092	2130
Total	615	39704	27113	11078
INFANT MORTALITY RATE*				
0	406.3	402.5	407.7	399.0
1 to 3	161.7	206.5	195.6	237.0
4 to 6	24.0	23.4	21.2	32.6
7 to 8	9.8	5.1	4.4	8.4
9 to 10	6.8	3.2	2.6	5.8
Not Stated	14.7	11.5	10.3	21.1
Total	14.5	10.9	9.3	18.9

*Number of infant deaths per 1,000 live births.

TABLE 13

NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY 5 MINUTE APGAR SCORE, AMERICAN INDIAN
& ALASKA NATIVE COMPARED TO SELECTED RACES,
1983 LINKED STUDY

<u>Apgar Score</u>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
<i>Infant deaths</i>				
0	13	1195	803	363
1 to 3	82	9085	5846	3011
4 to 6	61	4982	3439	1410
7 to 8	63	4923	3462	1322
9 to 10	213	9364	6255	2714
Not Stated	183	10155	7308	2258
Total	615	39704	27113	11078
<i>Infant Mortality Rate*</i>				
0	500.0	612.2	634.8	585.5
1 to 3	471.3	595.7	599.9	591.0
4 to 6	129.0	126.3	123.3	134.7
7 to 8	17.7	16.4	14.8	23.4
9 to 10	8.3	3.8	3.2	6.6
Not Stated	14.8	11.9	10.6	22.3
Total	14.5	10.9	9.3	18.9

*Number of infant deaths per 1,000 live births

TABLE 14

NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY PLURALITY, AMERICAN INDIAN & ALASKA
NATIVE COMPARED TO SELECTED RACES, 1983 LINKED
STUDY

	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
<u>PLURALITY</u>				
<i>INFANT DEATHS</i>				
Single Birth	562	35561	24252	9911
Twin Births	52	3912	2677	1122
Other Multiple Births	1	231	184	45
Total	615	39704	27113	11078
<i>INFANT MORTALITY RATE*</i>				
Single Birth	13.5	10.0	8.5	17.4
Twin Births	68.3	54.0	47.9	79.3
Other Multiple Births	62.5	146.3	141.8	200.9
Total	14.5	10.9	9.3	18.9

*Number of infant deaths per 1000 live births

TABLE 15

NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY AGE OF MOTHER, AMERICAN INDIAN &
ALASKA NATIVE, COMPARED TO SELECTED RACES,
1983 LINKED STUDY

	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
INFANT DEATHS				
<u>AGE OF MOTHER</u>				
Under 15 years	3	274	101	166
15 to 17 years	56	3042	1707	1251
18 to 19 years	100	4630	2932	1546
20 to 24 years	221	13343	9066	3863
25 to 29 years	138	10482	7516	2550
30 to 34 years	67	5717	4171	1231
35 to 39 years	18	1847	1350	404
40 to 44 years	12	340	253	63
45 to 49 years	0	29	17	4
Total	615	39704	27113	11078
INFANT MORTALITY RATE*				
Under 15 years	18.0	28.1	25.0	30.6
15 to 17 years	17.7	17.6	15.6	21.5
18 to 19 years	18.3	14.6	12.8	19.7
20 to 24 years	14.0	11.5	9.9	19.0
25 to 29 years	13.1	9.1	7.9	17.8
30 to 34 years	13.1	9.1	8.0	17.4
35 to 39 years	10.3	10.2	9.2	18.1
40 to 44 years	36.8	13.1	12.5	15.7
45 to 49 years	0.0	25.0	21.0	20.2
Total	14.5	10.9	9.3	18.9

*Number of infant deaths per 1,000 live births

TABLE 16

NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY MOTHER'S EDUCATION FOR WOMEN 18 YEARS
OR OLDER, AMERICAN INDIAN & ALASKA NATIVE,
COMPARED TO SELECTED RACES, 1983 LINKED STUDY

<u>Years of School</u> <u>Completed by</u> <u>Mother</u>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
INFANT DEATHS				
0 to 8 years	30	1210	847	277
9 to 11 years	143	6236	3626	2416
12 years	200	12508	8591	3555
13 to 15 years	64	4928	3486	1303
16 or more years	12	3121	2567	442
Not stated	107	8385	6188	1668
Total	556	36388	25305	9661
INFANT MORTALITY RATE*				
0 to 8 years	19.7	14.2	13.3	19.7
9 to 11 years	15.9	15.8	13.1	23.3
12 years	14.4	10.5	8.9	17.5
13 to 15 years	12.7	9.1	7.8	16.0
16 or more years	8.2	7.0	6.5	13.3
Not stated	13.3	10.5	9.5	19.3
Total	14.3	10.5	9.1	18.5

*Number of infant deaths per 1,000 live births.

TABLE 17

NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY FATHER'S EDUCATION FOR MEN 18 YEARS
OR OLDER, AMERICAN INDIAN & ALASKA NATIVE,
COMPARED TO SELECTED RACES, 1983 LINKED STUDY

<u>Years of School</u> <u>Completed by</u> <u>Father</u>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
INFANT DEATHS				
0 to 8 years	25	1045	808	178
9 to 11 years	88	4039	2961	954
12 years	150	9883	7374	2215
13 to 15 years	45	3864	3025	722
16 or more years	17	3943	3406	383
Not stated	285	16639	9349	6533
Total	610	39413	26923	10985
INFANT MORTALITY RATE*				
0 to 8 years	17.1	12.7	12.0	19.0
9 to 11 years	15.9	13.9	12.6	20.0
12 years	13.2	9.9	8.9	15.8
13 to 15 years	10.7	8.6	7.8	14.5
16 or more years	9.4	6.9	6.6	12.5
Not stated	16.3	13.5	10.9	21.6
Total	14.6	10.9	9.3	18.9

*Number of infant deaths per 1,000 live births.

TABLE 18

NUMBER OF INFANT DEATHS AND INFANT MORTALITY RATES BY
MARITAL STATUS OF MOTHER, AMERICAN INDIAN & ALASKA
NATIVE, COMPARED TO SELECTED RACES, 1983 LINKED STUDY

<u>Marital Status of Mother</u>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
INFANT DEATHS				
Married	315	26832	21886	3850
Unmarried	300	12872	5227	7228
Total	615	39704	27113	11078
INFANT MORTALITY RATE*				
Married	12.2	9.2	8.6	15.7
Unmarried	18.3	17.4	14.1	21.2
Total	14.5	10.9	9.3	18.9

* Number of infant deaths per 1,000 live births

TABLE 19

NUMBER OF INFANT DEATHS AND INFANT MORTALITY
RATES BY LIVE BIRTH ORDER, AMERICAN INDIAN &
ALASKA NATIVE, COMPARED TO SELECTED RACES,
1983 LINKED STUDY

<u>Live Birth</u> <u>Order</u>	<i>Indian & Alas Nat</i>	<i>All Races</i>	<i>White</i>	<i>Black</i>
INFANT DEATHS				
1st birth	198	15938	11262	4142
2nd birth	176	12249	8659	3106
3rd birth	110	6238	4114	1872
4th or more	128	4871	2800	1843
Not Stated	3	408	278	115
Total	615	39704	27113	11078
INFANT MORTALITY RATE*				
1st birth	13.0	10.4	9.1	18.0
2nd birth	14.4	10.3	8.9	18.1
3rd birth	14.9	11.2	9.5	19.1
4th or more	17.6	13.9	11.3	22.3
Not Stated	23.4	30.9	18.5	33.0
Total	14.5	10.9	9.3	18.9

* Number of infant deaths per 1,000 live births.

FIGURE 1.
Infant Mortality Rates by Age at Death
for American Indians/Alaska Natives,
1983 Registration Data and 1983 Linked Study

Rate per 1,000 live births

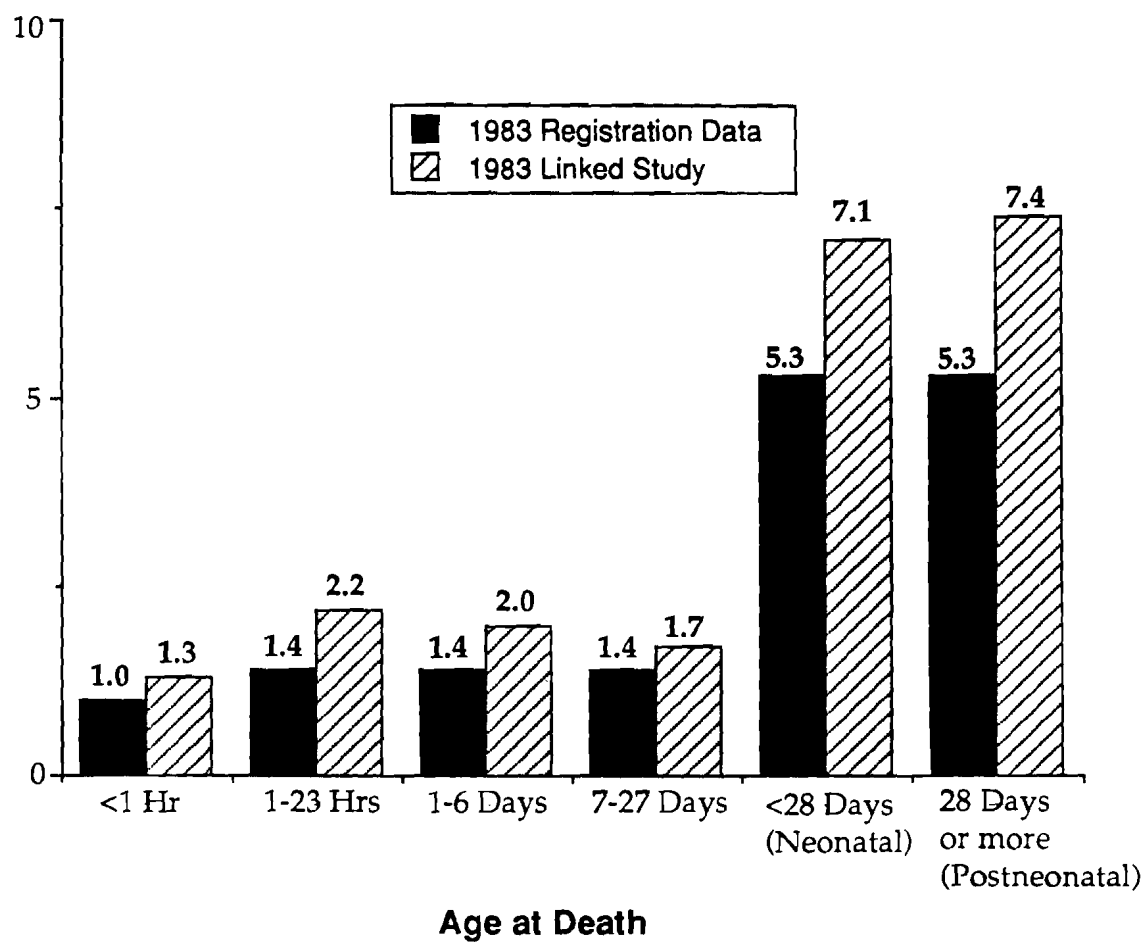


FIGURE 2.
Infant Mortality Rates by Age at Death
for American Indians/Alaska Natives
Compared to Selected Races, 1983 Linked Study

Rate per 1,000 live births

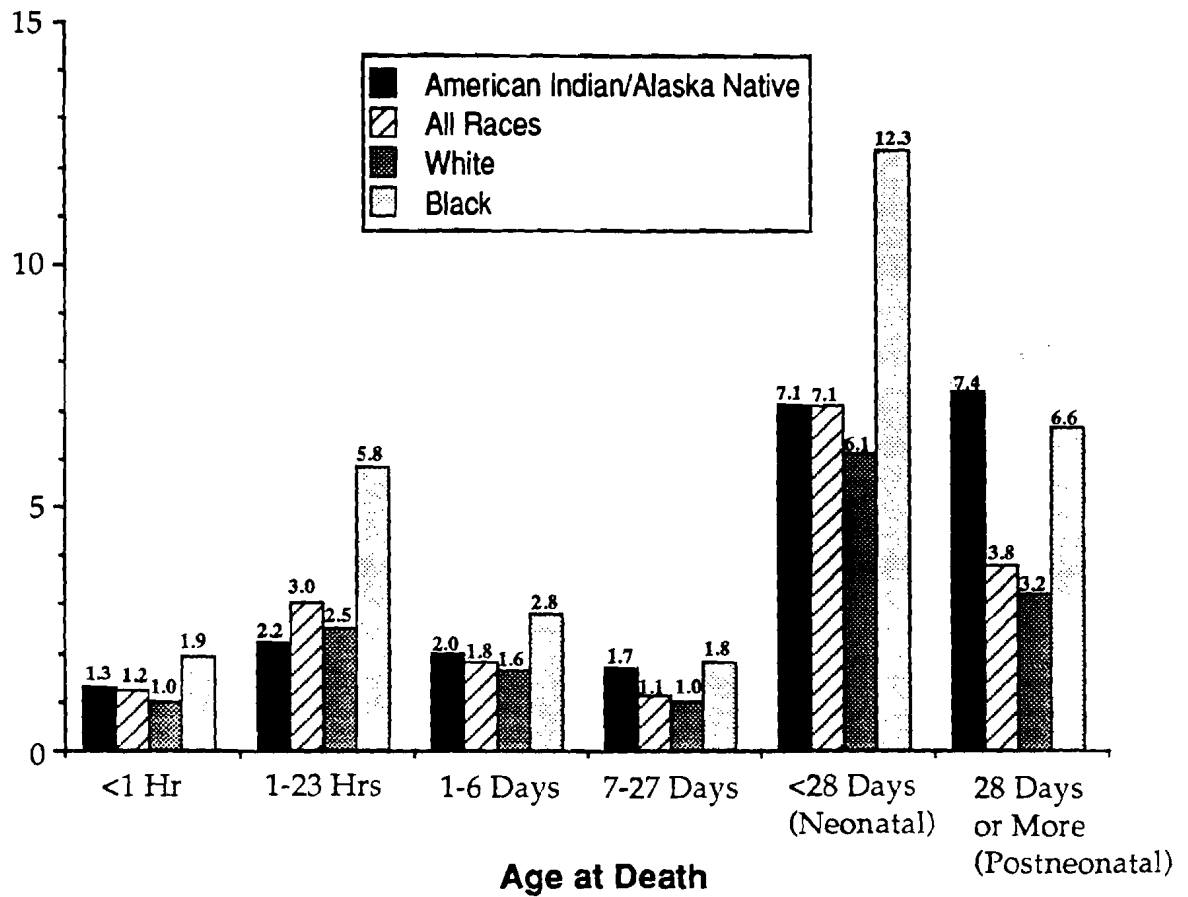


FIGURE 3.
Infant Mortality Rates for Infants
Weighing 2500 Grams or More,
American Indians/Alaska Natives
Compared to Selected Races,
1983 Linked Study

Rate per 1,000 live births

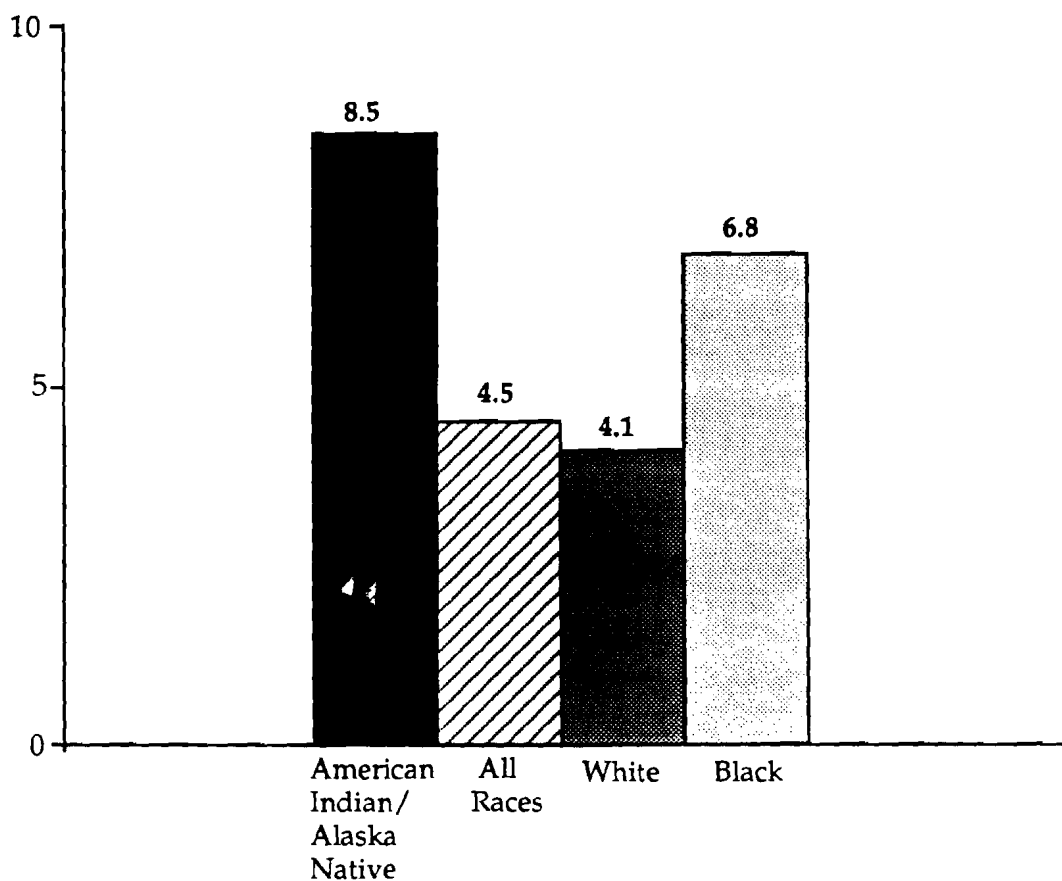


FIGURE 4.
Infant Mortality Rates for American
Indians/Alaska Natives by Cause of Death,
1983 Registration Data and 1983 Linked Study

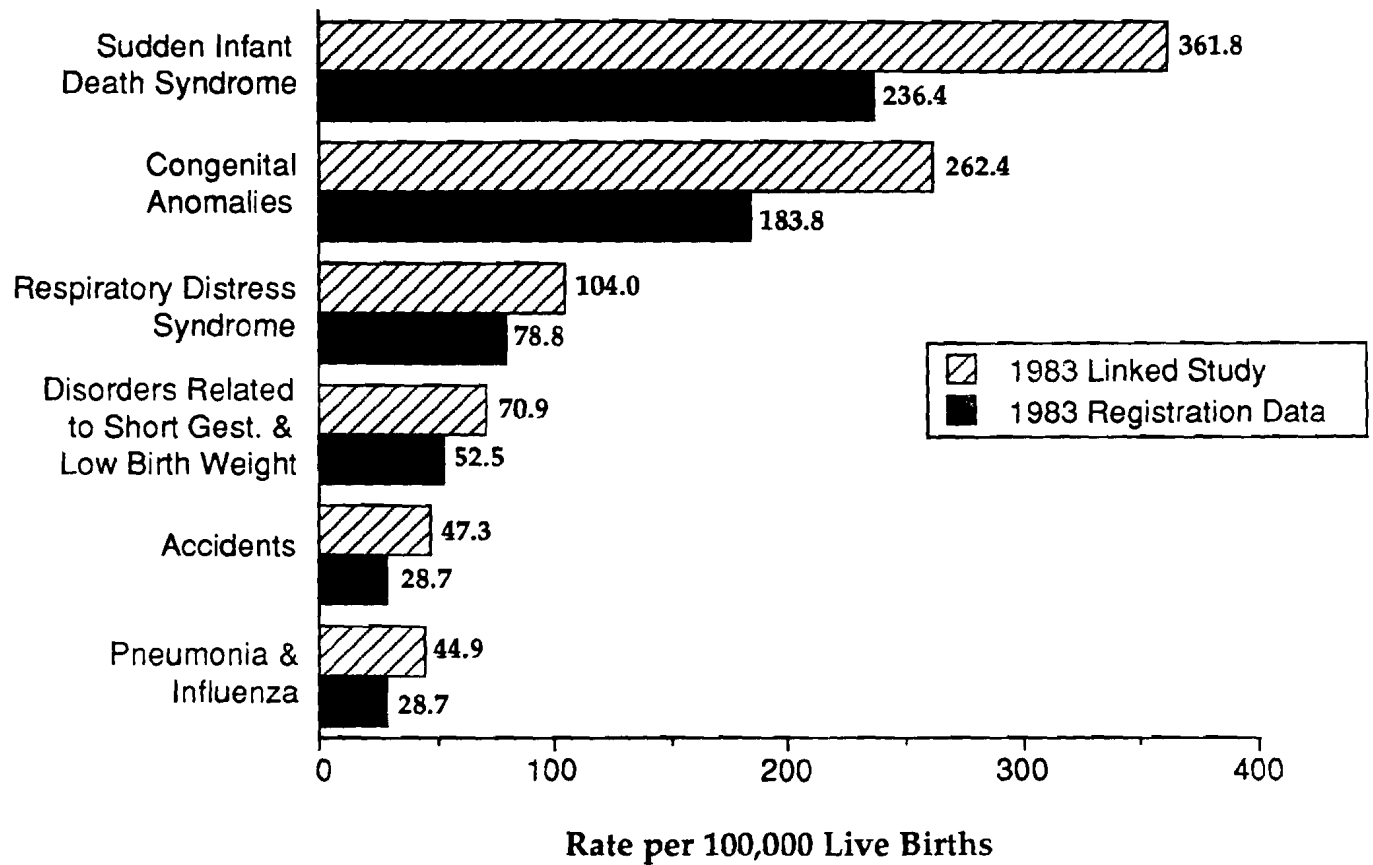


FIGURE 5.
Infant Mortality Rates by Cause
for American Indians/Alaska Natives
Compared to Selected Races, 1983 Linked Study

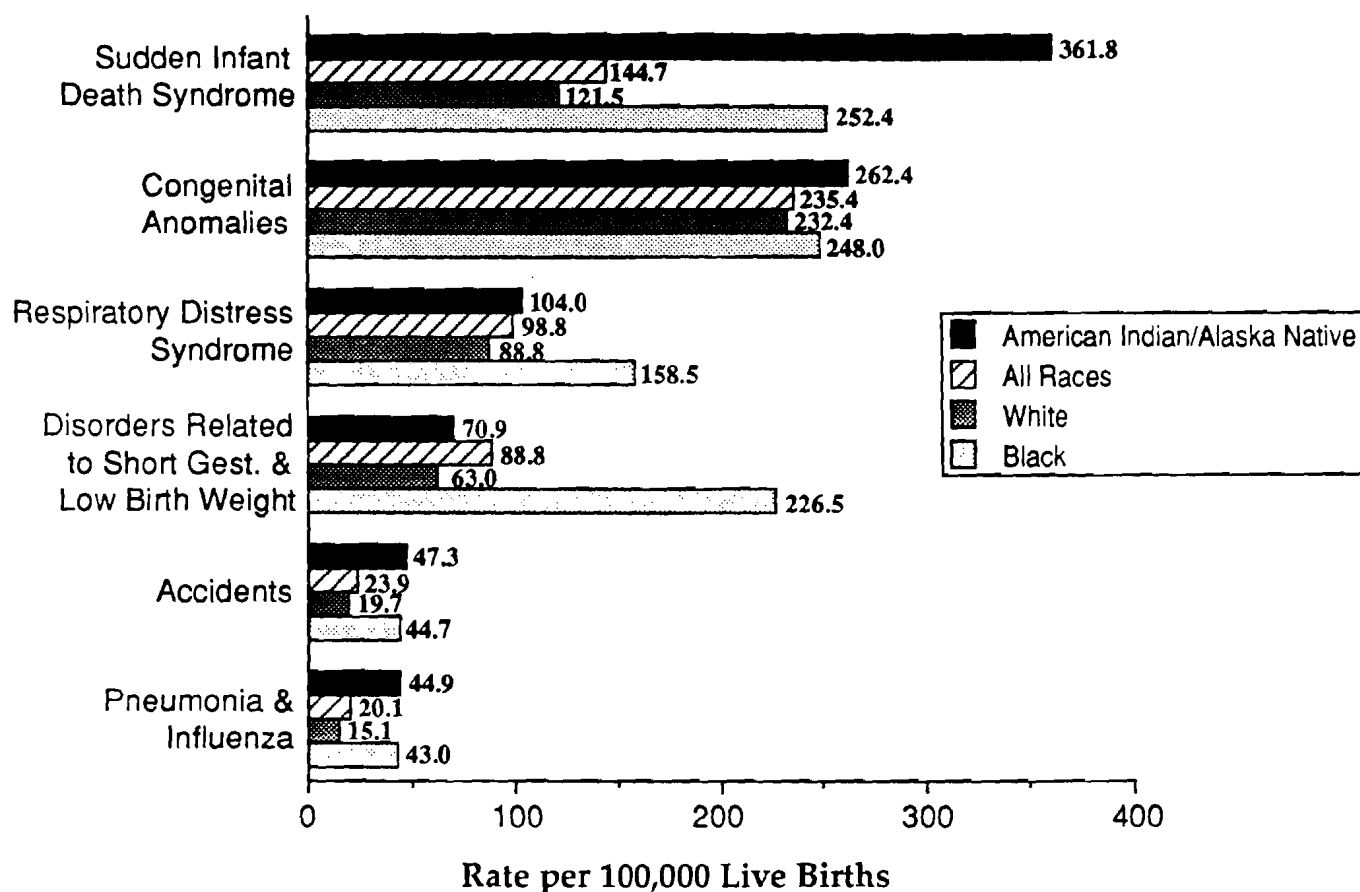


FIGURE 6.
Infant Mortality Rates by Month Prenatal Care
Began for American Indians/Alaska Natives
Compared to Selected Races, 1983 Linked Study

Rate per 1,000 Live Births

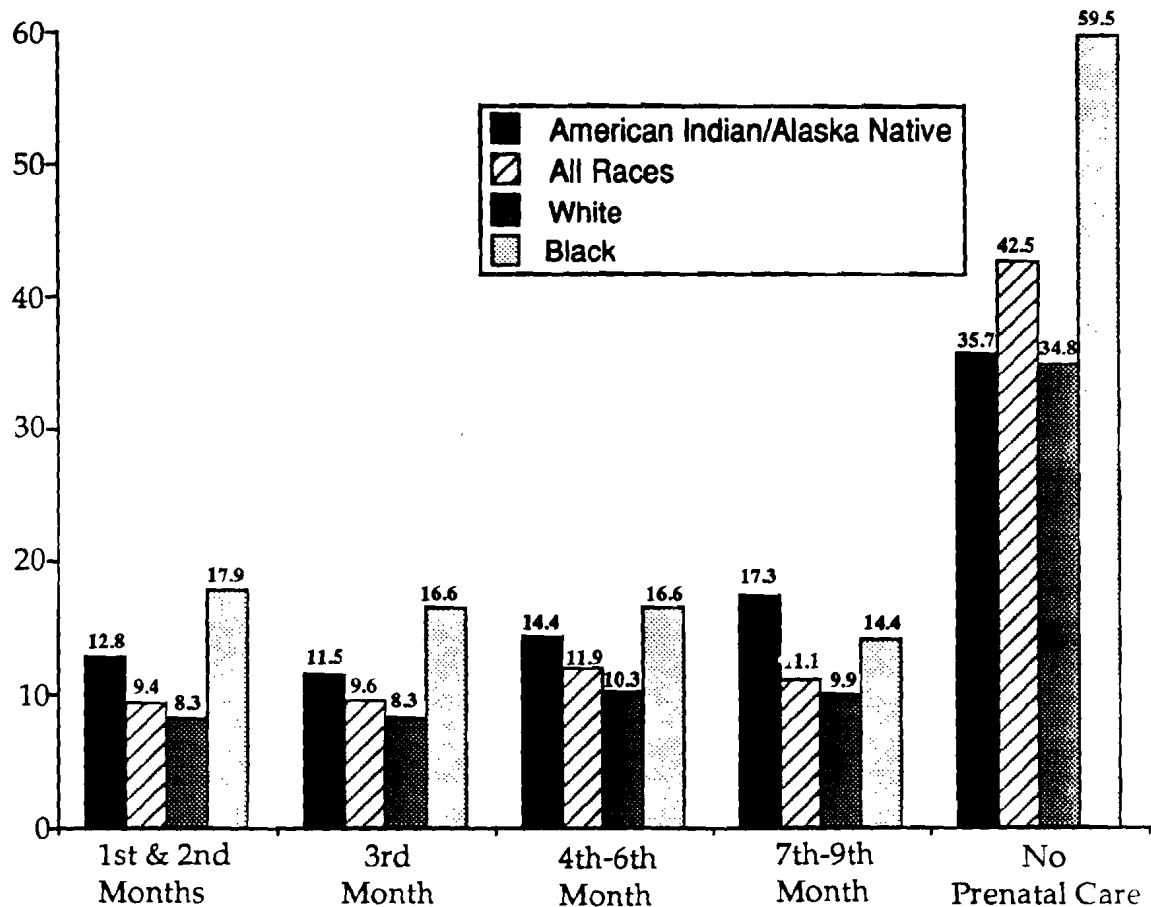


FIGURE 7.
Infant Mortality Rates by 1 Minute Apgar Score
for American Indians/Alaska Natives
Compared to Selected Races, 1983 Linked Study

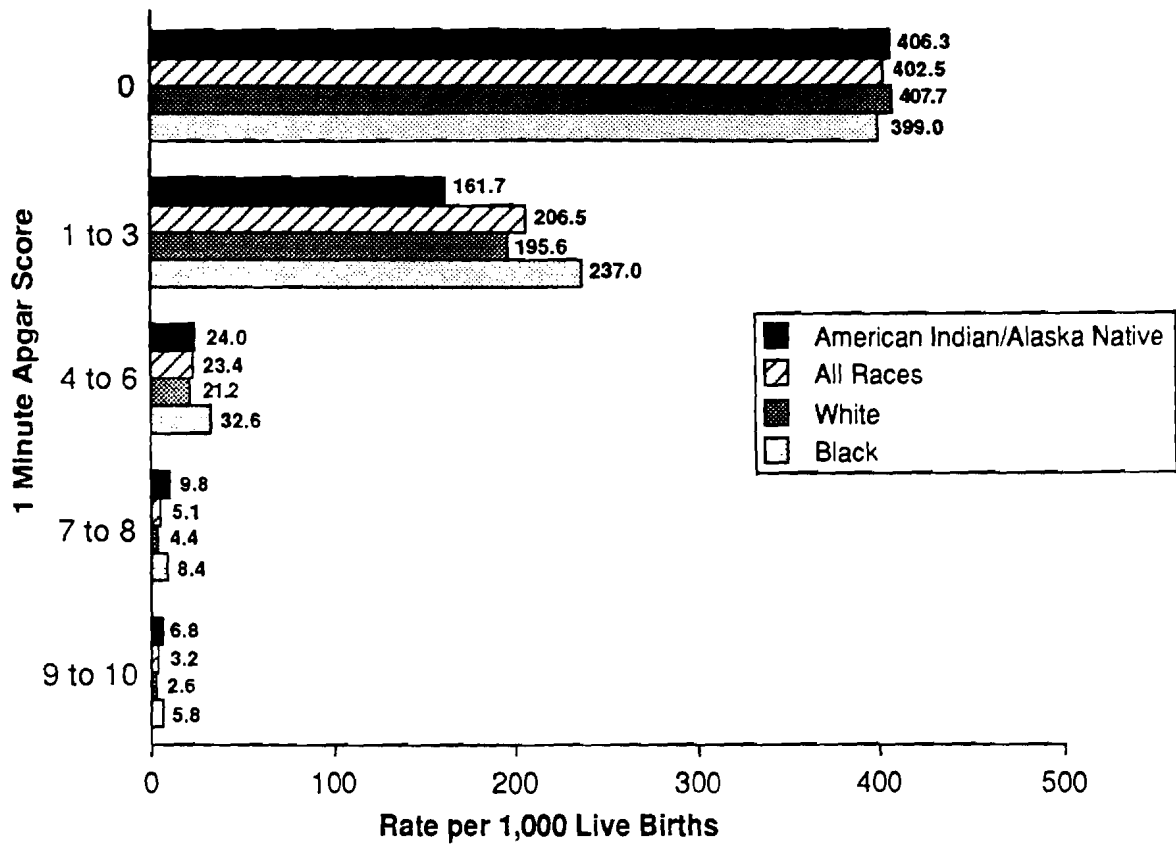


FIGURE 8.
Infant Mortality Rates by 5 Minute Apgar Score
for American Indians/Alaska Natives
Compared to Selected Races, 1983 Linked Study

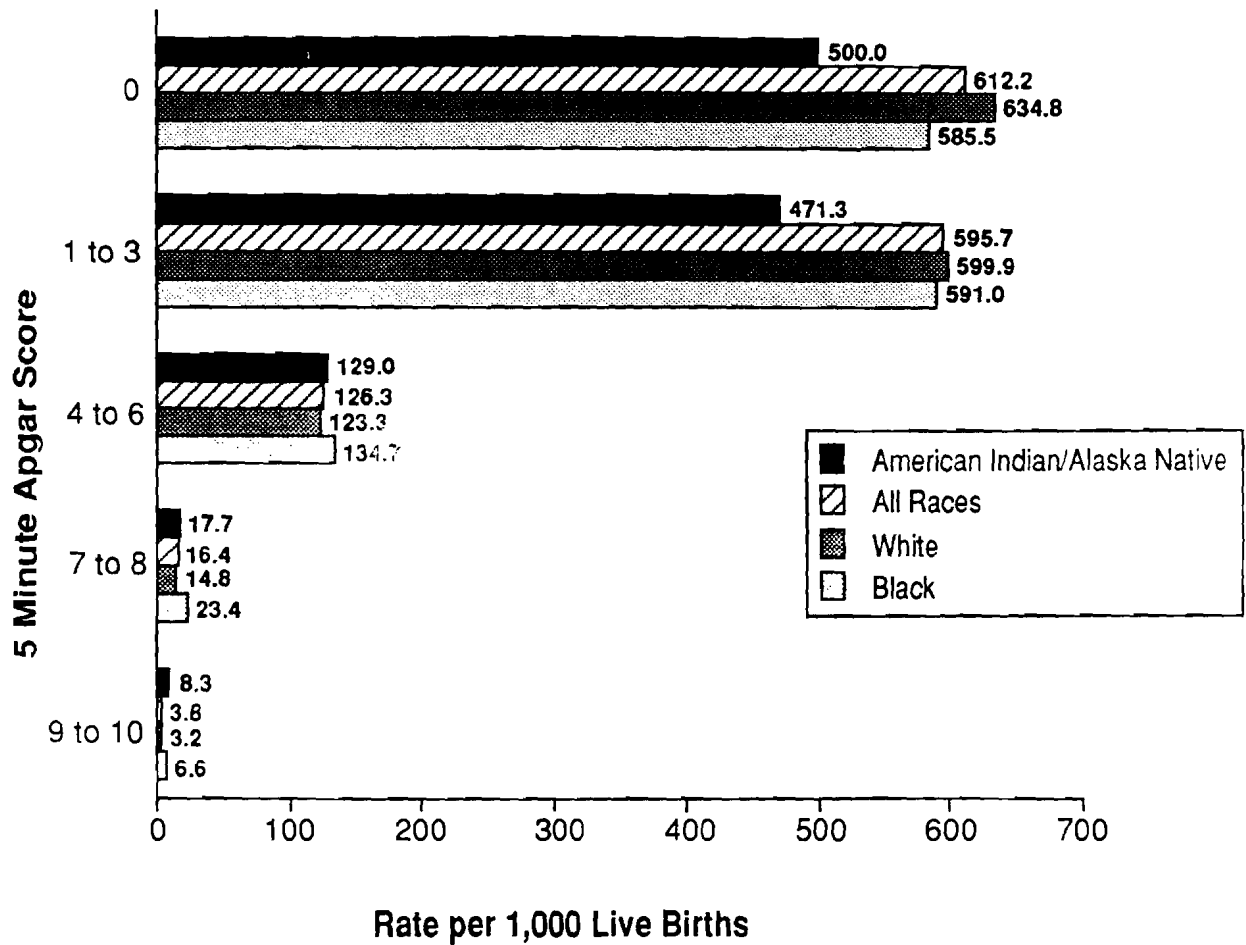


FIGURE 9.
Infant Mortality Rates by Mother's Education
for Mothers Age 18 Years or Older,
American Indians/Alaska Natives
Compared to Selected Races, 1983 Linked Study

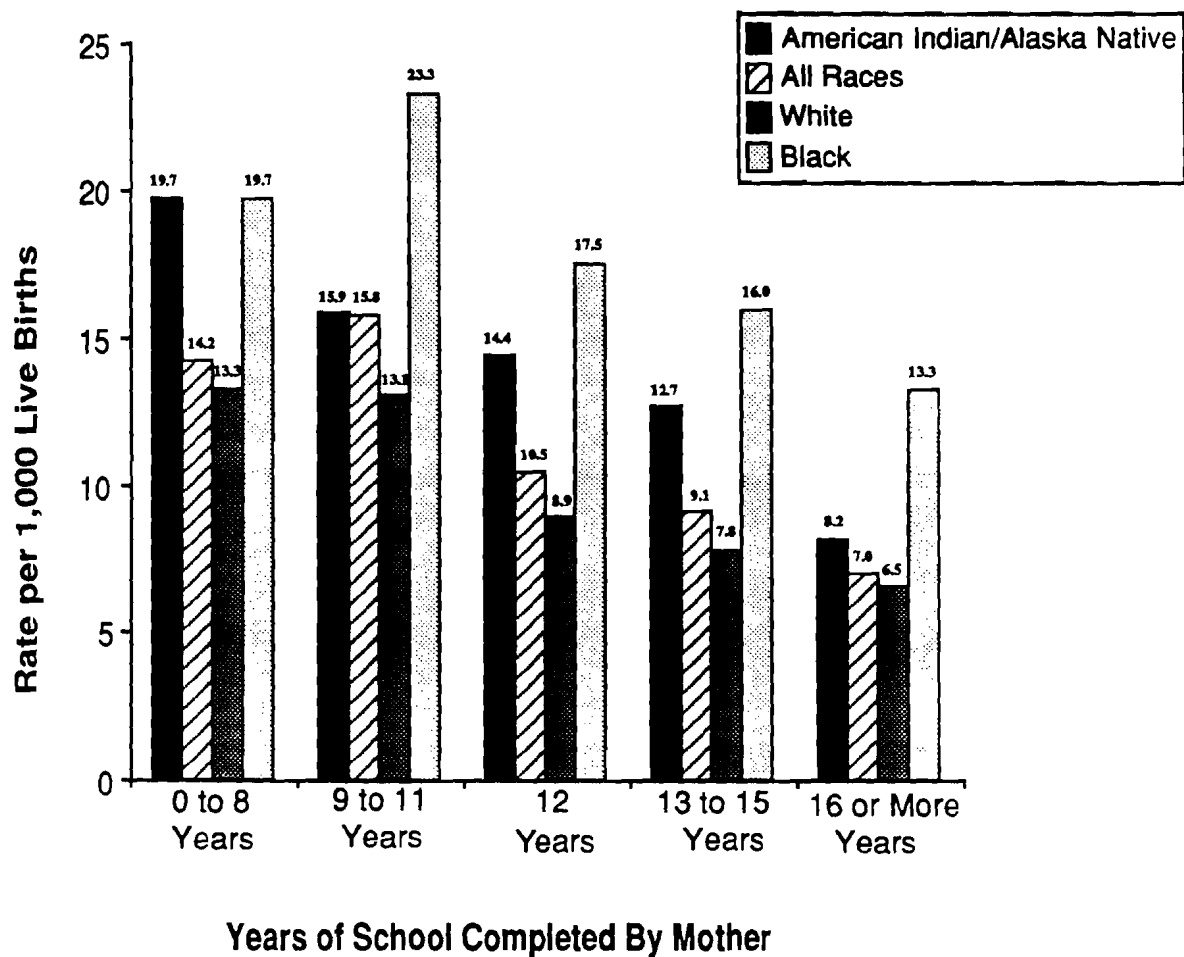


FIGURE 10.
Infant Mortality Rates by Marital Status of Mother
for American Indians/Alaska Natives
Compared to Selected Races, 1983 Linked Study

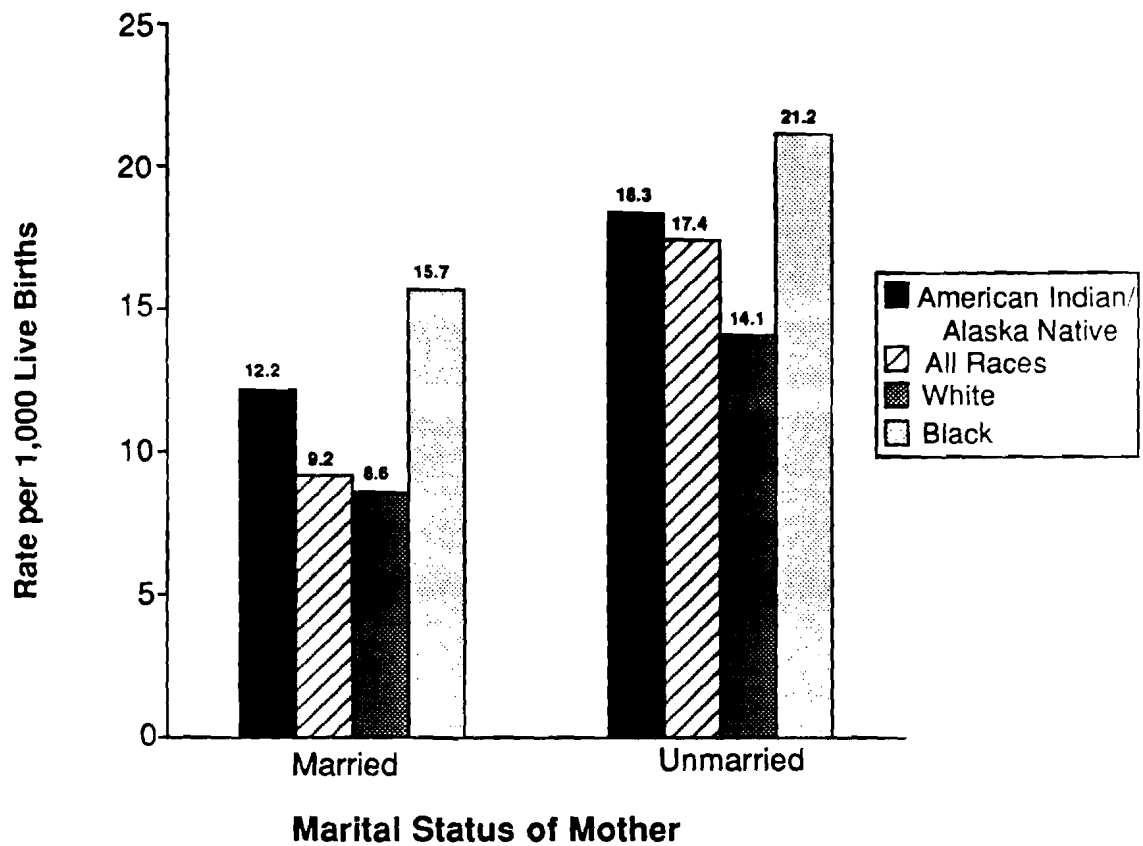


FIGURE 11.
Infant Mortality Rates by Live Birth Order
For American Indians/Alaska Natives
Compared to Selected Races, 1983 Linked Study

