

# Family Health Dataline

## IN THIS ISSUE:

- Alaska has one of the lowest neonatal mortality rates in the country
- Alaska has one of the highest postneonatal mortality rates in the country
- Males and Alaska Natives have higher neonatal and postneonatal mortality rates than females or whites.
- During 1979-92, the highest infant mortality rates in Alaska were found in the Lake and Peninsula, North Slope, and Northwest Arctic Boroughs and the Nome, Wade Hampton, and Bethel Census Areas.

**Correction:** Due to a computer programming error, in the August, 1995 edition ("Mortality rates and causes of death among Alaskans 15 to 19 years of age"), all the mortality rates reported in column 3 of Table 1 were accidentally doubled. For example, the mortality rate for motor vehicle crashes was reported as 88 per 100,000 persons per year when the actual value was 44. The suicide mortality rate should read 35 rather than 69, the water transport mortality rate should read 12 rather than 24, etc. The cause-specific mortality rates reported in the text are correct.

## Infant Mortality In Alaska: A Historical Perspective

Infant mortality rates have been recognized as one of the leading indicators of a state's or nation's health status and social well-being<sup>1-3</sup>. Unfortunately, the United States consistently has had an infant mortality rate greater than that of most other industrialized countries<sup>4</sup>. Alaska in particular has had a high infant mortality rate, primarily due to an increase in the total postneonatal mortality rate and to an increased infant mortality rate among Alaska Natives<sup>5-7</sup>.

To address the issue of a high infant mortality rate in Alaska, the Alaska Maternal-Infant Mortality Review (MIMR) was initiated in 1992. The next several issues of the Dataline will present results of analysis of data collected by the MIMR review team during 1992-94. As background for those upcoming issues, in this issue we present infant, neonatal, and postneonatal mortality rates and causes of death for 1979-92 to indicate the data driving the formation of MIMR.

### Methods

We reviewed linked birth and death certificate data provided by the Section of Vital Statistics to determine infant, neonatal, and postneonatal mortality rates and causes of death. We determined most mortality rates using data from 1978-92. Because International Classification of Diseases, 9th revision (ICD-9) coding began during 1979, cause specific mortality rates were determined for 1979-92. All rates presented are in deaths per 1000 live births per year.

When an infant with short gestation or low birth weight dies, the death certificate frequently reports a resultant condition, such as respiratory distress syndrome, or the immediate cause of death, such as cardiac arrest, as the cause of death rather than the ICD-9 code for short gestation or low birth weight. Alternatively, an infant born prematurely or with low birth weight may have an underlying condition such as a congenital anomaly. To account for these issues we developed the following criteria to identify infants whose underlying cause of death was likely to be low birth weight or premature delivery: an infant was said to have died of premature birth if he was born with a short gestation or low birthweight; died in the neonatal period; and did not die of a neoplasm or congenital anomaly (except lung hypoplasia), sudden infant death syndrome, or as the result of an injury or poisoning.

### Results

#### Mortality rates

The total infant mortality rate (IMR) during 1978 - 92 was 11.1. The IMR decreased from 13.0 during 1978-80 to 9.3 during 1990-92, a decrease of 32%. While IMR decreased for all races except Asian during this time period, the largest change was among Alaska Natives who experienced a 53% decline (Figure 1). Despite the overall improvement in IMR, a large gap continues to exist between the higher

mortality rates among blacks and Alaska Natives and the lower mortality rates among whites and Asians.

Improvement in the neonatal mortality rate accounted for the entire change in IMR (Figure 2). The overall neonatal mortality rate during 1978-92 was 5.8 and it changed from 7.7 during 1978-80 to 4.2 during 1990-92, a decrease of 46%. The overall postneonatal mortality rate during 1978-92 was 5.3 and did not change over the study period.

Neonatal mortality rates declined for all racial and gender groups examined (Figure 3). Despite these declines, however, males and Alaska Natives experienced higher neonatal mortality rates than females and whites for all years examined. Postneonatal mortality rates did not change among most racial and gender groups (Figure 4). Interestingly, however, Alaska Native females had a 63% drop in postneonatal mortality. The relatively high mortality rates among males and Alaska Natives and the relatively low mortality rates among females and whites seen with neonatal mortality persisted with postneonatal mortality.

IMR varied by borough or census area from 4.0 for Haines Borough to 21.5 for Lake and Peninsula Borough (Figure 5). Overall, six boroughs or census areas had infant mortality rates significantly different from those seen in Anchorage Borough: Lake and Peninsula, North Slope, and Northwest Arctic Boroughs and Nome, Wade Hampton, and Bethel Census Areas.

### Causes of death

The leading causes of neonatal death were prematurity or low birth weight, congenital anomalies, and conditions originating during the perinatal period (Table 1). Together, these causes accounted for over 90% of neonatal deaths during 1979-92. The leading causes of postneonatal death were sudden infant death syndrome (SIDS), infections, and congenital anomalies, accounting for 70% of all postneonatal deaths (Table 2).

### Discussion

Alaska has achieved significant progress towards decreasing its IMR, an accomplishment shared by every other state<sup>8</sup>. Unfortunately, Alaska still has an IMR higher than most other states and the United States as a whole still has an IMR higher than most industrialized countries. In Alaska, great disparities exist between various racial, gender, and geographically located groups. Particularly distressing are the geographic variations in IMR, which, though of unknown etiology, suggest that differences in socio-economic status, access to medical services, high-risk behavior, and education may contribute to infant mortality. All of these factors are potentially preventable.

All of the decrease in IMR occurred by decreasing the neonatal mortality rate. During 1988-90, Alaska had a neonatal mortality rate lower than all but 10 states<sup>8</sup>. Despite this achievement, some groups bear a disproportionate share of the mortality, particularly males and Alaska Natives, a finding noted nationally<sup>8</sup>. Prematurity and low birth weight accounted for the majority of neonatal deaths in Alaska. While methods to prevent prematurity or low birth weight remain elusive, hope exists that adequate prenatal care will alter the outcome of some pregnancies.

Figure 1. Infant mortality rates, by race and year; Alaska, 1978-92

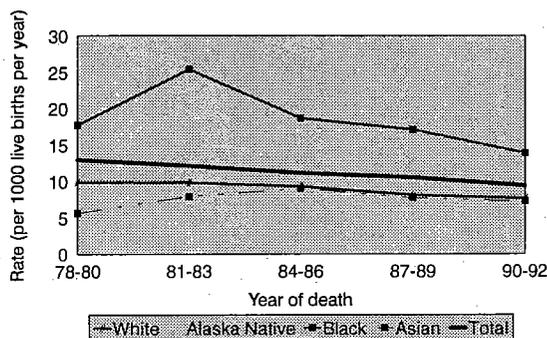


Figure 2. Neonatal and postneonatal infant mortality rates; Alaska 1978-92

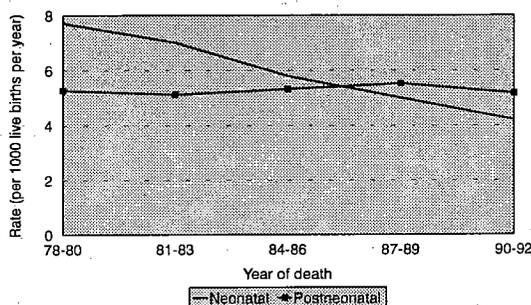


Figure 3. Neonatal mortality rates, by race and gender; Alaska, 1978-92

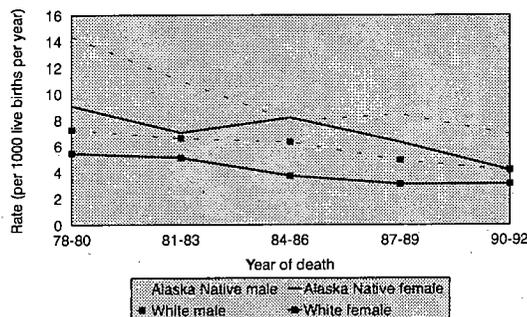


Figure 4. Postneonatal mortality rates, by race and gender; Alaska, 1978-92

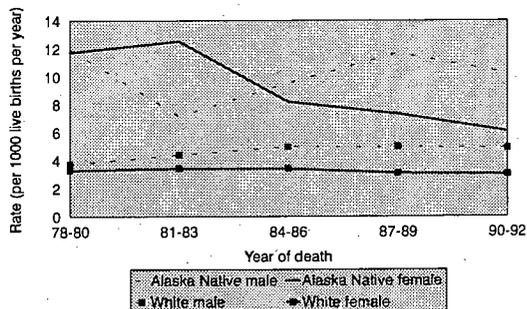


Figure 5. Infant mortality rates (IMR) by borough or census area. The horizontal line indicates the actual IMR. The upper and lower ends of the vertical bar indicate the 95% confidence limits. Alaska, 1978-92.

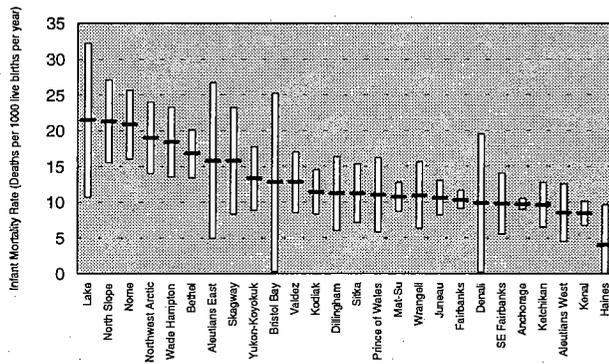


Table 1. Mortality from 5 leading causes of neonatal death - Alaska, 1979-92

Rank order	Cause of death (ICD-9 codes)	Number	Rate (per 1000 live births)	Percentage of total deaths
1	Extreme prematurity or low birth weight*	342	2.14	37.6
2	Congenital anomalies (740-759)	237	1.48	26.1
3	Prematurity or low birth weight not extreme†	150	0.94	16.5
4	Conditions originating in the perinatal period (760-779) without prematurity or low birth weight	113	0.71	12.4
5	Infection without prematurity or low birth weight (0-139, 320-324, 460-469, 480-487)	20	0.13	2.2
	All other causes (residual)	47	0.29	5.2
	All causes	909	5.69	100.0

\* Infants were included in this category if they met the following criteria: (birthweight of <1000 g or gestation < 28 weeks or ICD-9 code of 765.0) AND (age at death < 28 days) AND (ICD-9 code not equal to 140-239, 740-759 [except 748.5], 798.0, or over 799).

† Infants were included in this category if they met the following criteria: (birthweight of 1000-2499 g or gestation of 28-37 weeks or ICD-9 code of 765.1) AND (age at death < 28 days) AND (ICD-9 code not equal to 140-239, 740-759 [except 748.5], 798.0, or over 799).

Table 2. Mortality from 5 leading causes of postneonatal death - Alaska, 1979-92

Rank order	Cause of death (ICD-9 codes)	Number	Rate (per 1000 live births)	Percentage of total deaths
1	Sudden infant death syndrome (798.0)	405	2.53	47.7
2	Infection (0-139, 320-324, 460-469, 480-487)	93	0.58	11.0
3	Congenital anomalies (740-759)	91	0.57	10.7
4	Conditions originating in the perinatal period (760-779)	33	0.21	3.9
5	Accidental mechanical suffocation (E913)	27	0.17	3.2
	All other causes (residual)	200	1.25	23.6
	All causes	849	5.31	100.0

Alaska has the highest postneonatal mortality rate of any state in the country: during 1988-90, six states had a postneonatal mortality rate less than 3.0 per 1000 live births per year, 33 had a postneonatal mortality rate less than 4.0, and only Alaska had a rate higher than 5 per 1000 live births per year<sup>8</sup>. To put this in perspective, if Alaska had achieved a postneonatal mortality rate of 3.8 per 1000 live births during 1978-92 (the approximate overall U.S. rate during 1978-90<sup>8</sup>), 252 fewer deaths would have occurred, an average of 17 per year.

Postneonatal mortality in industrialized countries occurs primarily due to SIDS and Alaska had a SIDS rate during 1979-92 approximately twice as high as that found in the U.S. as a whole during 1989<sup>8</sup>. SIDS is a perplexing disorder of unknown etiology. Recent research has suggested several potential methods of preventing SIDS including modifying sleep position and bedding<sup>9</sup> and initiating anti-smoking campaigns among mothers of newborns<sup>10-11</sup>. Some deaths labeled SIDS may be due to other causes. Deaths occurring due to a parent rolling over the child after using alcohol or other substances may be preventable through education. Deaths due to homicide may be preventable through programs of intensive home visits to families at high risk of child abuse.

The MIMR was formed to identify the underlying preventable factors leading to SIDS, prematurity or low birth weight related deaths, and other causes of infant death. As stated at its formation, the purpose of MIMR is "to reduce infant mortality and morbidity through a case review process that examines medical, environmental, socio-economic and other factors that may have contributed to infant deaths". It is important to understand the circumstances of these deaths to guide educational,

medical, and health care system changes so that additional deaths may be prevented. During the next several issues of *Dataline* we will present results of this review and suggest potential avenues for intervention.

Submitted by:

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**Family Health Dataline** is a monthly publication of the Alaska Department of Health and Social Services; Division of Public Health; Section of Maternal, Child, and Family Health, 1231 Gambell Street, Anchorage, AK 99501, (907) 274-7626 (fax) 277-6814.

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 Printing ..... Continuous Printing of Alaska



Vol. 1, No. 7

Family Health *Dataline*  
 State of Alaska, MCFH  
 1231 Gambell Street  
 Anchorage, Alaska 99501

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