

Alaska Maternal-Infant Mortality Review and Child Death Review
Annual Report 2011
Reviews of infant deaths 1992-2007

Prepared by
Margaret Young

Acknowledgements
Bradford Gessner, editorial review
Jared Parrish, editorial review
Michael Valiquette, MIMR-CDR Coordinator

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Maternal and Child Health Epidemiology Unit
Section of Women's, Children's and Family Health
Alaska Division of Public Health
<http://www.epi.hss.state.ak.us/mchepi/default.stm>
(907) 269-8073

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1. Executive Summary

This report summarizes findings of the Alaska Maternal Infant Mortality Review and Child Death Review (MIMR-CDR) committee following reviews of 90% of neonatal deaths during 2005 and 97% of postneonatal deaths during 2005-2007. Summary findings from reviews of deaths during 1992-2004 are also presented.

During 2005-2007, the infant mortality rate in Alaska was 6.4 per 1,000 live births, similar to the US rate. The Alaska postneonatal mortality rate (deaths of infants 28-364 days of age) was higher than the US postneonatal rate, while the Alaska neonatal mortality rate (0-27 days of age) was lower than the US rate. Total infant mortality rates were highest in the Southwest and Northern regions of Alaska and lowest in the Interior, and higher among Alaska Native infants compared to non-Native infants.

Among the 133 deaths reviewed (36 neonatal deaths and 97 postneonatal deaths) which occurred during 2005-2007, the most common causes (allowing for multiple causes of death) were Sudden Unexpected Infant Death (SUID) or asphyxiation, suffocation, or strangulation in a sleep environment (40% of reviewed deaths); congenital anomalies (22%); infections (21%); and preterm birth (20%). One-third (33%) of reviewed deaths were associated or probably associated with maltreatment, which included abuse, neglect, or negligence by a caregiver. The most common type of maltreatment was gross negligence; however abuse was found in 11% of all deaths reviewed. In addition, 41% of all deaths were associated with substance use by a caretaker or other person.

The review committee believed that 33% of all deaths reviewed were preventable, 15% were probably preventable, and 27% were possibly preventable, while only 11% were not preventable. Preventability varied by cause of death. While all of the deaths related to injury and 75% of SUID/asphyxia deaths were preventable or probably preventable, only 25% of deaths related to infections and 21% of those associated with congenital anomalies were preventable or probably preventable.

Examples of actions recommended by the team to prevent future infant deaths included:

- Provide safe sleep environments for infants (such as no pillows or wedges in cribs and no bed sharing with infants if the adult is impaired or intoxicated)
- Put infants on their back to sleep
- Provide or improve programs to prevent child abuse and educate caregivers about appropriate care and supervision for infants
- Prevent infant exposure to tobacco and cigarette smoke, both prenatally and postpartum
- Provide and increase access to treatment for alcoholism and postpartum depression
- Encourage hand washing
- Earlier treatment for infections and transfer to hospitals when needed

2. History and objectives of MIMR-CDR

The Alaska MIMR was established by the Commissioner of the Department of Health and Social Services in 1989 and initially reviewed selected fetal and infant (<1 year of age) deaths. After an initial pilot period, the program started comprehensive reviews of all infant deaths during 1992. Review of maternal deaths (deaths from any cause within one year of pregnancy) began in 1999. Case reviews of deaths of children ages 1 to 18 years (the Child Death Review) began with deaths during 2004.

MIMR-CDR conducts ongoing and systematic collection, review, analysis, and interpretation of information surrounding maternal, infant and child deaths in Alaska. The process was modeled on national evidence-based programs. The ultimate goal of MIMR-CDR is to develop recommendations for public health interventions, changes in legislation, policy and practices to prevent deaths and reduce mortality in infants, children and mothers. MIMR-CDR has the following objectives:

- Collect accurate and complete data on medical, social, behavioral and environmental causes of and contributors to death.
- Identify disparities, risk factors, and trends in causes and contributors to death.
- Identify preventable causes of and contributors to death, including barriers and system issues.
- Educate members of the review committee and improve quality of care, delivery of services and communication among agencies and providers.
- Increase public awareness by presenting recommendations and findings to various state, local, and community partners.

MIMR-CDR operates under Alaska Statute AS § 18.15.360b regarding acquisition of data for conditions of public health importance. Identifiable information provided to MIMR-CDR is protected under AS §18.15.355-18.15.395.

At the time of this Annual Report, the MIMR-CDR Review Committee had completed reviews of 98% of all infant deaths for the years 1992-2005, and 94% of postneonatal deaths during 2006 and 2007. Starting with deaths in 2006, the committee decided to halt reviews of cases where the infant did not leave the hospital prior to death, so that they could achieve more timely reviews of deaths that may potentially have been prevented by public health education, action or interventions. This change primarily affected reviews of neonatal deaths. The MIMR-CDR committee generally completes retrospective reviews of deaths 3-4 years after they occurred. See *Appendix A* for a table comparing numbers of cases reviewed as of February 2011 and number reported by the Alaska Bureau of Vital Statistics, by year.

3. Review process, criteria for review, and sources of information

The MIMR-CDR Committee is a multidisciplinary group of professionals and child advocates who possess knowledge and experience relating to infant and child health and welfare. Members have expertise in a variety of areas relevant to infant and child health including neonatology and perinatology, family practice, obstetrics/gynecology, pediatrics, pathology and social work. While State of Alaska employees may assist with case reviews and provide relevant information on services provided by the State, formal recommendations are developed only by non-State employees. See *Appendix B* for a list of current committee members.

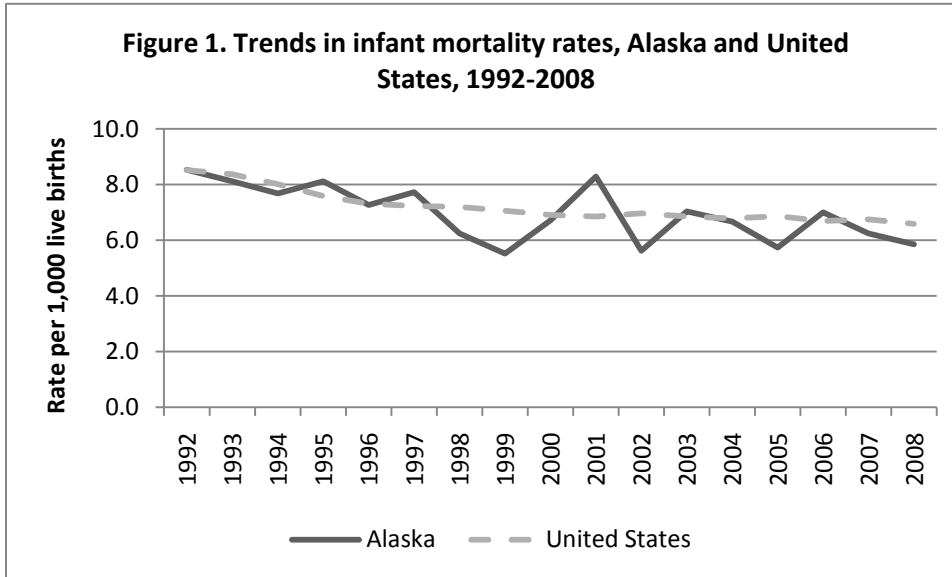
MIMR-CDR maintains case files for all infant and child deaths occurring in Alaska. Case files are stored in locked cabinets following strict guidelines to maintain confidentiality. Although the committee no longer regularly reviews all deaths, files are still maintained to ensure complete information is available for special studies.

Sources of information

MIMR-CDR attempts to obtain copies of the following types of original records and information. It generally takes about two years after the death occurred for the MIMR-CDR program manager to gather all of the associated reports and documents and create a complete case file.

- **Death Certificate.** Death certificates are sent from the Alaska Bureau of Vital Statistics to the MIMR-CDR program manager on a quarterly basis. Receipt of a death certificate is required to open a new MIMR-CDR case file. Death certificates provide information concerning the death, including date and place of death, and the cause and manner of death as determined at the time of death or autopsy.
- **Birth Certificate.** The full birth certificate record provides clinical and demographic information about the mother and child. Birth certificates also direct the MIMR-CDR program manager to other sources of information about the child, such as place of birth and physicians and providers involved at the time of birth. Birth certificates are always requested for infant deaths and are requested for child deaths on a case-by-case basis.
- **Medical Records.** These include all relevant hospital, private physician, village clinic and health aide records. Records requested for infant deaths are: maternal prenatal, admission, and labor and delivery; and delivery (including intensive care unit), additional hospitalizations, emergency room, and outpatient visits (including well child check-ups) for the infant. Medical records for child deaths are requested based on the circumstances surrounding the death.
- **Autopsy.** Results of specialized tests conducted in conjunction with an autopsy, such as pathology reports on tissues and cultures, are also requested separately from the autopsy.
- **Investigative Reports.** First responder reports and Police/State Trooper/Village Public Safety Officer investigative reports are requested for all out-of-hospital deaths.
- **Medicaid.** The state Medicaid database is searched for relevant ICD-9 billing codes for health care visits or medications for the deceased child.
- **Office of Children's Services (OCS).** Information on reports to OCS is collected for the deceased child and siblings.
- **Other data sources when appropriate and/or available:** Child Fatality Review Team reports, MIMR-CDR files of related children, court records, Alaska Pregnancy Risk Assessment Monitoring System and Childhood Understanding Behaviors Survey, newborn hearing and metabolic screening reports, genetic clinic reports, social network searches, news articles, obituaries, and any other records/reports which would add value to the review process are included.

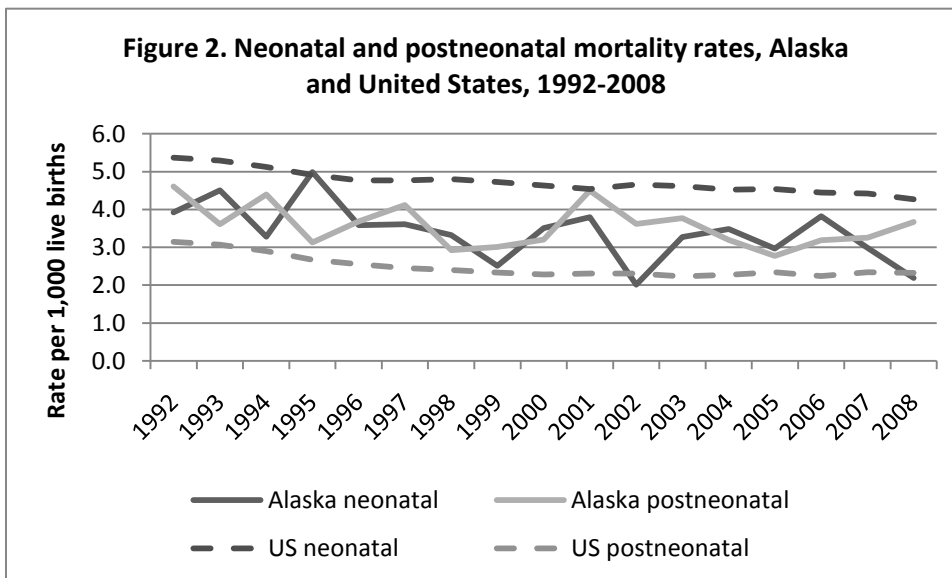
4. Background: Trends and demographics



The Alaska infant mortality rate is similar to the rate for the United States, although with more annual variation associated with a relatively small numbers of deaths (**Figure 1**). During 2006-2008, the infant mortality rate in Alaska was 6.4 per 1,000 live births. The US rate in 2008 was 6.6 per 1,000 births.

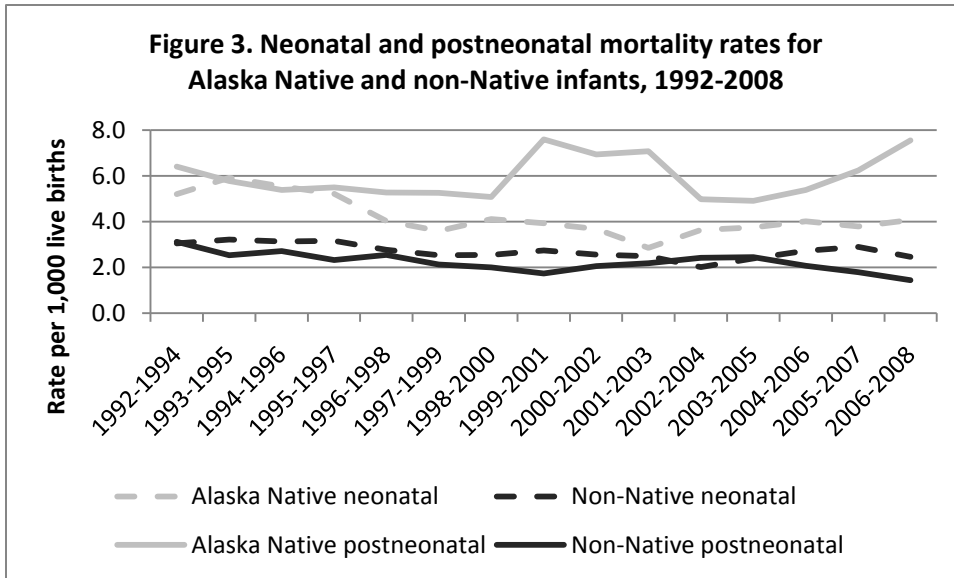
Data source: Alaska Bureau of Vital Statistics and National Center for Health Statistics at the Centers for Disease Control and Prevention (<http://www.cdc.gov/nchs/deaths.htm>).

Infant deaths are often categorized by those occurring during the first 27 days of life (neonatal), and during 28 days to one year of age (postneonatal). Risk factors, causes, and preventability of neonatal and postneonatal deaths often differ. Many neonatal deaths are influenced by events that occurred before the baby was born or during delivery (such as prenatal health of the mother or perinatal conditions), while postneonatal deaths are often associated with injuries from external events (such as unintentional suffocation in a sleep environment).



The Alaska neonatal mortality rate was lower than the US neonatal rate during all years examined, except for 1995 (**Figure 2**). The Alaska postneonatal mortality rate was consistently higher than the US postneonatal rate.

Data source: Alaska Bureau of Vital Statistics and National Center for Health Statistics at the Centers for Disease Control and Prevention (<http://www.cdc.gov/nchs/deaths.htm>).



Since 1992, Alaska Native infant mortality rates (based on mother’s race on the birth certificate) have consistently been higher than non-Native rates (Figure 3). During the ten year period 1999-2008, the Alaska Native postneonatal mortality rate was 3.4 times the non-Native rate.

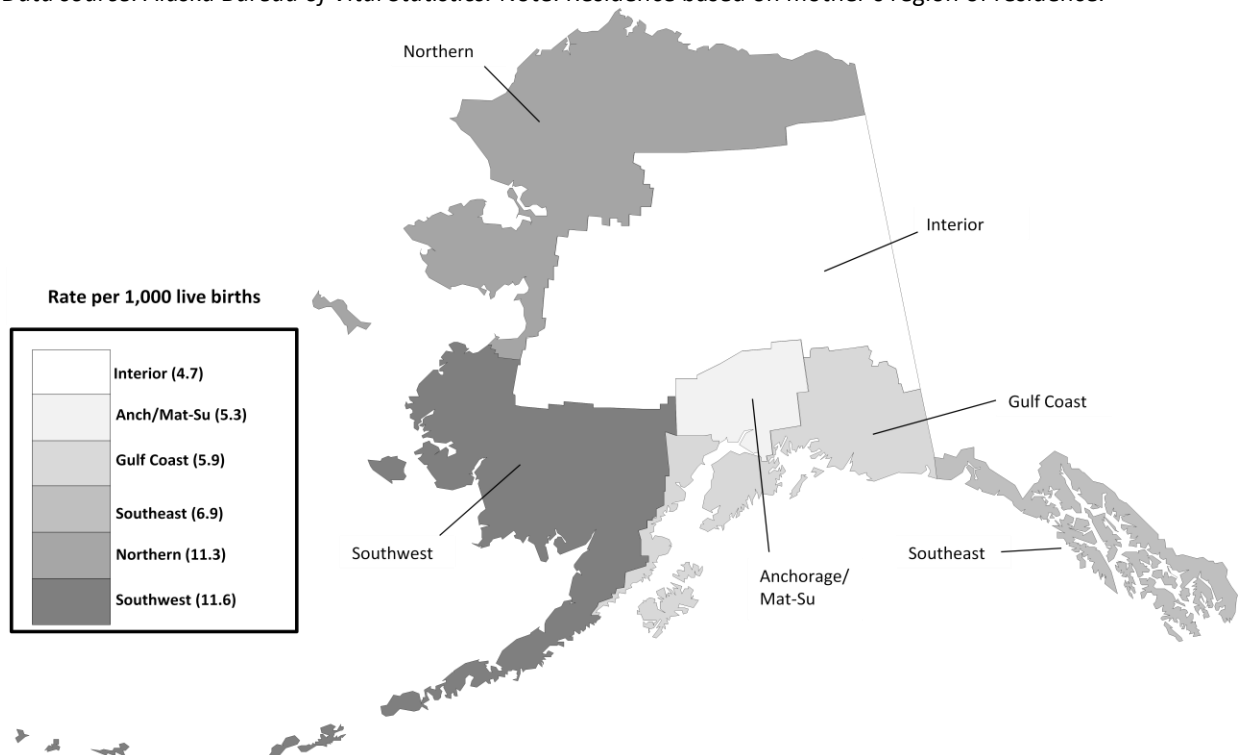
Data source: Alaska Bureau of Vital Statistics.

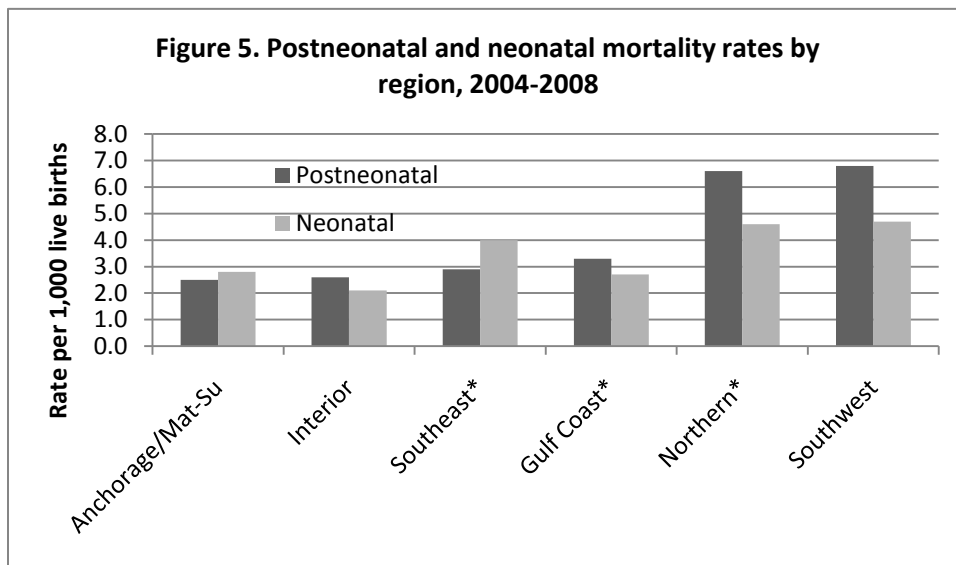
The disparity in postneonatal mortality has been growing since 2004, and the Alaska Native rate was 5.2 times higher during 2006-2008. A smaller but persistent disparity also exists between Alaska Native and non-Native neonatal mortality rates since 1992.

Geographically, the lowest overall infant mortality rates for 2004-2008 were in the Interior region (4.7 per 1,000 live births), while the highest were in the Southwest region (11.6) (Figure 4).

Figure 4. Infant mortality rates by region; Alaska 2004-2008.

Data source: Alaska Bureau of Vital Statistics. Note: Residence based on mother’s region of residence.





During 2004-2008, neonatal mortality was highest in the Southwest and Northern regions and lowest in Interior, Gulf Coast, and Anchorage/Mat-Su (Figure 4). Postneonatal mortality was highest in the Southwest and Northern regions and lowest in Interior and Anchorage/ Mat-Su.

Data source: Alaska Bureau of Vital Statistics.

*Rates based on fewer than 20 occurrences are statistically unreliable and should be used with caution.

Postneonatal mortality rates were higher than neonatal rates in all regions except for Anchorage/Mat-Su and Southeast.

5. Review Findings: cause-specific mortality rates, 1992-2007

During case reviews, the committee assigns contributing causes to each death, identifying multiple causes per death as appropriate. The Case Review Form that has been used starting with deaths that occurred during 2005 can be found in *Appendix C*. Summary causes of death are selected by the committee from a check list found in question 6 on the form. Prior to 2005 deaths, the committee wrote in responses to open-ended questions regarding the primary and underlying causes, and their responses were re-coded into summary categories by the MIMR-CDR staff epidemiologist.

Since 1992, when MIMR-CDR reviews began, the overall Alaska infant mortality rate declined from 8.5 per 1,000 live births to 5.7 in 2005. **Figure 6** shows the trends in cause-specific mortality rates, as determined by the MIMR-CDR committee and allowing for multiple causes for each death. Overall, the top three causes of death in 1992 (SUID/asphyxia, preterm birth, and congenital anomalies) had at least one period of decline during the 1990s but have remained relatively stable since 1998-2000. By contrast, infection-associated mortality remained stable until 2000-2002, when it rose to be on a par with the previous top three causes by 2003-2005. Cause-specific mortality rates for 2003-2005 are shown in **Table 1**.

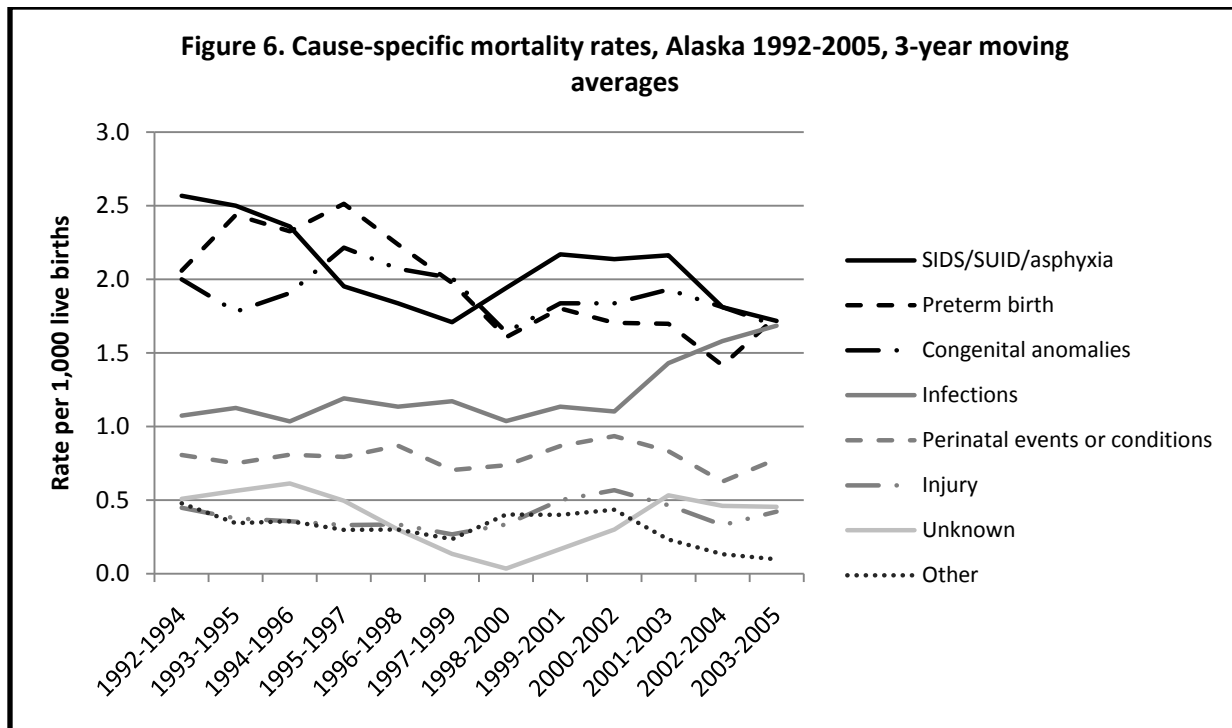
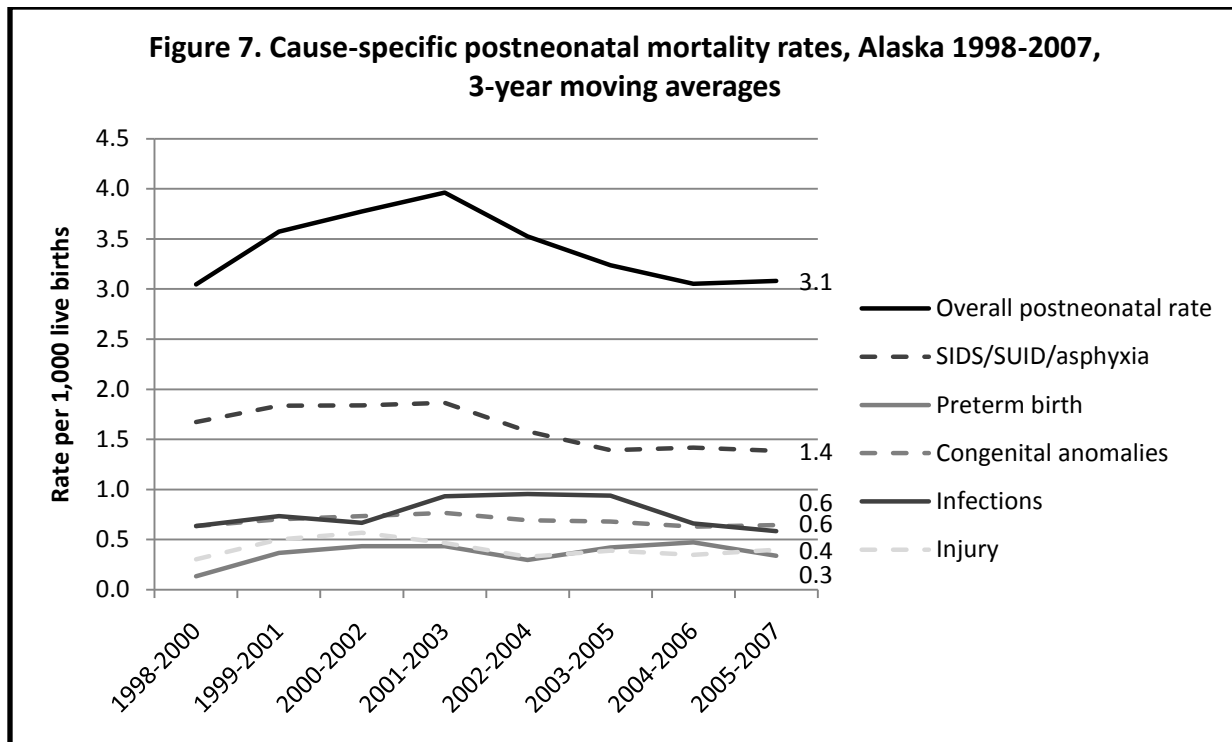


Table 1. Cause-specific mortality rates, Alaska 2003-2005, allowing for multiple causes per death

<i>MIMR-CDR cause</i>	<i>Rate per 1,000 live births</i>
SUID/asphyxia	1.7
Preterm birth	1.7
Congenital anomalies	1.7
Infections	1.7
Perinatal events or conditions	0.8
Injury	0.4
Unknown	0.5

At the time of this report, reviews of only a few neonatal deaths occurring in 2006 and 2007 had been completed by the committee, however close to 100% of known postneonatal deaths were reviewed for these years. Therefore, total infant cause-specific mortality rates for the most recent time period can't be calculated. Cause-specific and overall postneonatal mortality rates for 1998-2000 through 2005-2007 are shown in **Figure 7** and demonstrate essentially no change in any categories.



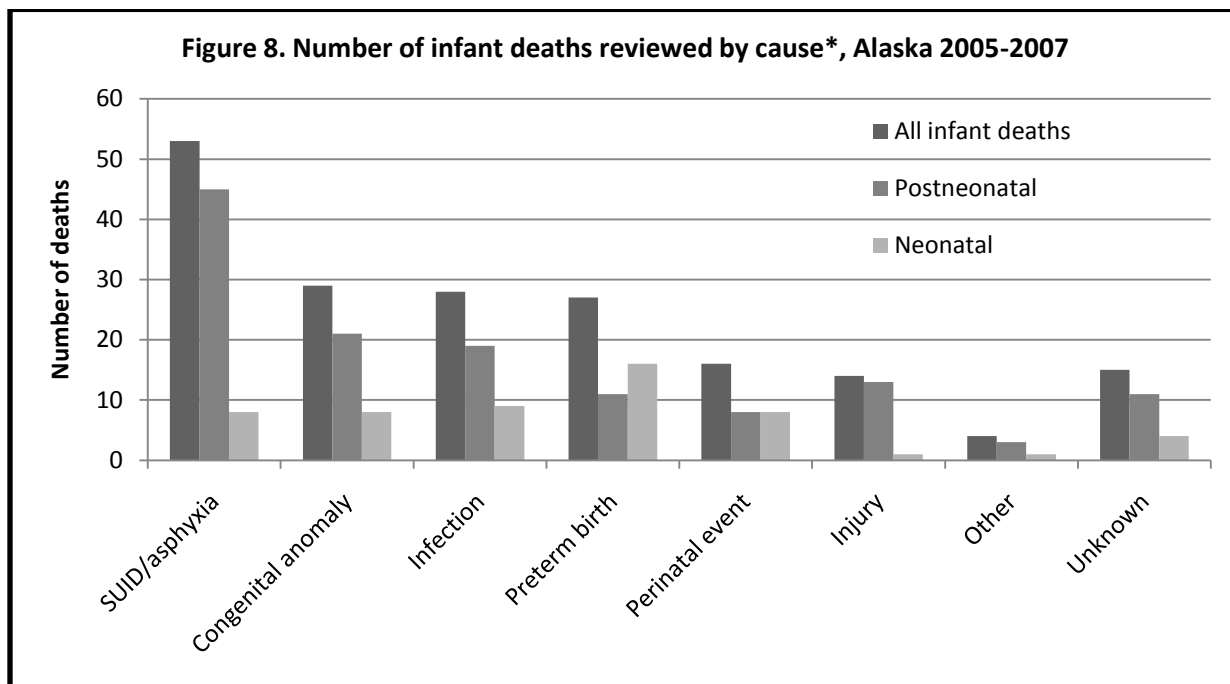
6. Review findings: causes and contributors to deaths, 2005-2007

a. Overview

At the time of this report, the MIMR-CDR committee had reviewed 133 infant deaths which occurred during 2005-2007; 36 were neonatal and 97 were postneonatal. These represent 90% of all neonatal deaths in 2005, as well as eight out-of-hospital neonatal deaths occurring in 2006 or 2007, and 97% of all postneonatal deaths during the three year period. Among the 36 neonatal deaths, the top causes identified by the committee were preterm birth (44%), infections (25%), and SUID/asphyxia, congenital anomalies, and perinatal events (22% each). Among the 97 postneonatal deaths, the most common causes were SUID/asphyxia (46%), congenital anomalies (22%), infections (20%), and injuries (13%) (**Figure 8**). The SUID/asphyxia category included all deaths which occurred in a sleep environment, whether or not there was a known mechanism for asphyxia. The category of injuries included both unintentional and intentional deaths that were associated with exposure, poisoning, drowning, fire, and weapons, including body parts. Risk factors and characteristics of the major causes of postneonatal death are discussed further in Sections 6c-6f.

The review committee found that for 75 deaths (56%), the death certificate did not accurately reflect their findings regarding either the underlying or contributing causes of infant death. For 32 (24%), the death certificate accurately reflected the underlying cause of death, but not the contributing causes. For 18 (14%), the death certificate accurately reflected the contributing causes of death, but not the underlying cause, and for 23 (17%), the death certificate did not accurately reflect either the contributing or underlying causes. Underlying causes that were not indicated on death certificates included hypothermia, positional asphyxia, and forms of child maltreatment. Examples of contributing causes not included on the death certificates were chorioamnionitis, preterm birth, domestic violence

and substance use by caretakers, poor bedding or unsafe sleep environments, congenital anomalies and metabolic conditions, infections, and prenatal exposure to tobacco and other illicit substances.



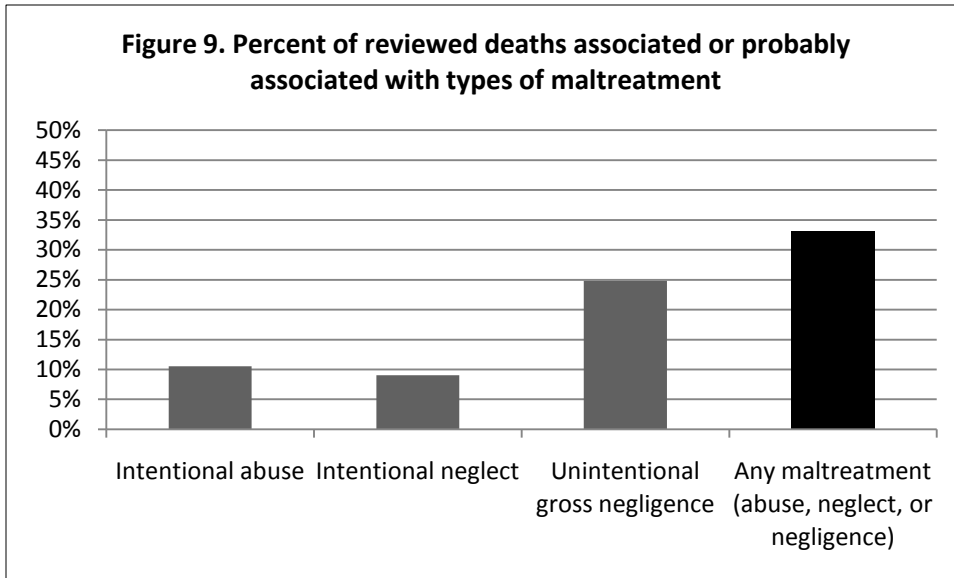
*Allowing for multiple causes for each death.

Lack of access to care or inadequate access to care contributed or possibly contributed to 27 deaths (20%). These included cases in which the committee believed that poor weather and misdiagnoses may have contributed to delays in proper care, cases where prenatal ultrasounds were misinterpreted, and situations where current procedures for emergency care were not properly followed.

The committee found that substance use by someone other than the infant contributed, probably contributed, or possibly contributed to 55 deaths (41%). They identified tobacco as contributing to 34 deaths, alcohol as contributing to 24, and marijuana to 16.

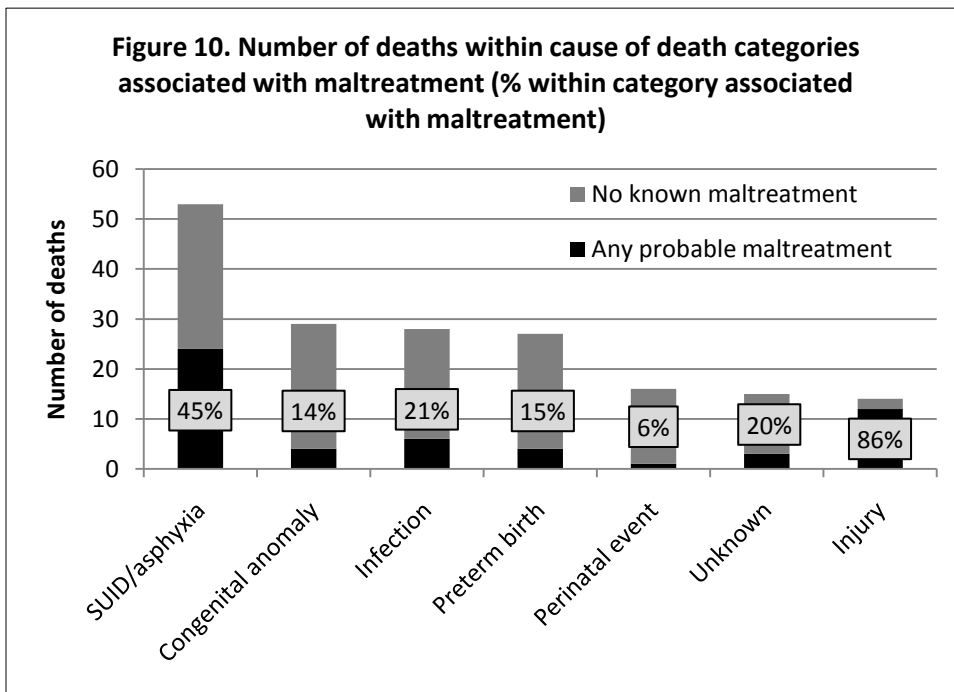
b. Contribution of child maltreatment

One of MIMR-CDR's primary functions is to assist with identifying infant and child deaths that are due to or related to child maltreatment, which includes abuse, neglect, and negligence. The committee will determine that "abuse" contributed or probably contributed if there is evidence that deliberate words or overt actions on the part of a caregiver resulted in harm to the child and led to the death. "Neglect" includes the failure to provide for a child's basic physical, emotional, or educational needs or to protect a child from harm or potential harm. "Gross negligence" includes the failure to exercise reasonable care that would be expected of most people in a similar situation. The determinations made by committee members are not required to be based on sufficient evidence to withstand legal scrutiny, therefore MIMR-CDR is able to have a more sensitive definition of child maltreatment than the death certificate. This sensitive definition ensures that all maltreatment-related deaths and associated risk factors are identified and this information can be used to improve prevention programs. Additionally, this method elucidates the preventability of causes of death previously thought to be unpreventable, such as SIDS, by identifying the contribution of probable child abuse or negligent care to these deaths.



Among the 133 deaths reviewed, the committee found that 44 (33%) were associated or probably associated with at least one type of maltreatment (**Figure 9**); of these, 12 had more than one type of maltreatment. Abuse contributed or probably contributed to 14 deaths, neglect to 12, and negligence to 33.

The deaths related to abuse included causes such as abusive head trauma, shaken baby syndrome, and induced labor by the mother. The deaths related to neglect included causes such as an intoxicated mother overlaying the infant and pneumonia in a premature infant who did not receive appropriate follow-up medical care for a previous illness. The deaths related to negligence included contributing causes such as unsafe sleep environments, environmental tobacco smoke exposure and carbon monoxide poisoning, in utero illicit drug exposure, and intoxicated care givers. The committee believed that only one of the maltreatment-related deaths was unpreventable. This infant had a fatal congenital anomaly, yet the committee believed that negligent care was an additional contributing cause of death.



The proportion of deaths associated with maltreatment varied within cause of death categories, ranging from 6% of deaths due to perinatal events to 86% of deaths due to injury (**Figure 10**). Among the most common cause of death category, SUID/asphyxia, 45% of deaths were associated or probably associated with maltreatment.

c. Sudden Unexpected Infant Deaths (SUID) and asphyxia

Sudden Unexpected Infant Death or asphyxia in a sleep environment was the most common determination made by the committee. In earlier reviews of deaths occurring during 1992-2004, 52% of postneonatal deaths and 7% of neonatal deaths were assigned this category. Among the postneonatal deaths during 2005-2007, 46% were due to SUID or asphyxia. The committee believed that 25 (47%) of the 53 SUID deaths reviewed were preventable, 15 (28%) were probably preventable, and eight (15%) were possibly preventable. Preventability was unknown for five deaths. While the exact causes of most SUID deaths are unknown, many are believed to be due to suffocation related to an unsafe sleep environment. Some known risk factors for SUID include infants being placed to sleep prone (on the stomach), sleeping on a non-standard sleep surface, sharing a bed with an impaired person, and being exposed to prenatal tobacco or environmental tobacco smoke.

Among the 53 SUID deaths during 2005-2007:

- 12 infants (23%) were either found or placed to sleep prone.
- 33 (62%) were sleeping on an adult bed while 11 (21%) were sleeping in a crib or bassinette. The remainder were in a car seat or bouncy chair, on the floor, carried by an adult while riding a snow machine, on a sofa, and on an air mattress.
- 33 (62%) were sharing a bed. The committee found that the evidence indicated that overlying contributed or probably contributed to 16 deaths.
- Negligence by a caregiver contributed or probably contributed to 21 deaths (40%), while neglect and abuse each contributed to less than five deaths. More than one type of maltreatment was associated with the deaths of six infants (11%).
- Inappropriate bedding contributed, probably contributed, or possibly contributed to 25 deaths (47%).
- Substance use by someone else contributed, probably contributed, or possibly contributed to 38 deaths (68%). This other person was both parents for seven infants, the mother for 24 infants, the father for four infants, and another household member for one infant.
- Substances identified by the committee that contributed to these deaths included tobacco (42%), alcohol (32%), and marijuana (21%), as well as cocaine, methadone, semi-synthetic drugs, over-the-counter and prescription drugs.

Among the 33 infants that were sharing a bed, 9 were sleeping with an impaired person and 8 were probably sleeping with an impaired person. Among the remaining 16, 8 were possibly sleeping with an impaired person and 11 had a history of maternal tobacco use. Other factors identified among these 16 included evidence of paternal smoking, parental non-compliance related to use of medical equipment for the infant, a history of substance-using parents who did not respond to ongoing cries of the baby, bed sharing on a single bunk trailer mattress, being covered by blankets, and bed sharing with a parent who worked the night shift and may have been experiencing extreme exhaustion. One death occurred in a remote region of the state and there was no evidence of a death investigation or autopsy, so little information was available for the committee review. With the exception of this last death (where information was unknown), all of the deaths that occurred while bed-sharing occurred in association with known risk factors for infant death, supporting previous data that bed sharing by itself is not a risk factor for infant death in Alaska.

Among the 11 infants in a crib or bassinette, many had risk factors for asphyxia present, including adult pillows and wedge-shaped pillows in the crib, prone sleep position, being found with a blanket over

them, and histories of apnea and preterm birth. One death in a crib had no known common risk factors based on the available information, but the committee noted that a better death scene investigation was needed to determine whether the death was due to Sudden Infant Death Syndrome (SIDS).

Demographics

Thirty-two (60%) of the infants who died in the SUID category had at least one parent who was identified as Alaska Native on the birth certificate. The postneonatal mortality rate due to SUID/asphyxia for infants with Alaska Native mothers was 3.1 per 1,000 live births, which was more than three times the rate among non-Natives (0.9 per 1,000 live births).

The majority (53%) of infants who died due to SUID/asphyxia were residents of the Anchorage/Mat-Su region. Thirteen percent were residents of the Southwest, 11% of Southeast, and 9% of the Interior. Less than five were residents of the Gulf Coast and Northern regions.

d. Congenital anomalies

Congenital anomalies were the second most common cause of infant deaths during 2005-2007, among those reviewed. Among the postneonatal deaths, 22% were related to congenital anomalies. Similarly, the committee found that 20% of postneonatal deaths during 1992-2004 were associated with congenital anomalies. The committee determined that 12 of the 29 deaths (41%) related to congenital anomalies during 2005-2007 were not preventable, while five had unknown preventability. Two deaths were preventable, four probably preventable, and six possibly preventable. The preventable deaths included cases that occurred in association with probable child abuse or medical neglect, infections, and unintentional asphyxia.

Types of congenital anomalies identified as contributing to the deaths during 2005-2007 included:

- Multiple anomalies (n=7).
- Nervous system anomalies, such as spinal muscular atrophy, hydrocephalus, and encephalopathy of unknown etiology (n=6).
- Circulatory system anomalies, such as hypoplastic left heart syndrome and long QT syndrome (n=5).
- Chromosomal anomalies, such as trisomy 18 (n<5).
- Digestive system anomalies, such as mid-gut volvulus and intestinal volvulus (n<5).
- Metabolic disorders (n<5).
- Respiratory system anomalies (n<5).

Of the 29 deaths related to congenital anomalies:

- Nine had additional acute medical conditions that contributed to the death.
- Death was expected as a result of the medical condition of the infant among 15, and possibly expected among eight. Death was not expected among five, and this information was unknown for one death.
- The committee determined that negligence or abuse by a caregiver contributed or probably contributed to less than five deaths. No deaths were associated with neglect or more than one type of maltreatment.
- The primary caregivers for six infants were not compliant with prescribed care plans.
- The committee found that seven infants were not receiving adequate health care.

- The primary care facility did not provide adequate care based on available knowledge and technology for six infants. Four of these infants had acute medical conditions in addition to the congenital anomaly, however the committee did not indicate whether the inadequate care was for the congenital anomaly or the acute condition.

Demographics

Fourteen (48%) of the infants whose deaths were related to congenital anomalies had at least one parent identified as Alaska Native on the birth certificate. The postneonatal mortality rate due to congenital anomalies for infants with Alaska Native mothers was 1.5 per 1,000 live births, which was more than three times the rate among non-Natives (0.4 per 1,000 live births).

Fourteen (48%) infants were residents of the Anchorage/Mat-Su region and seven (24%) were residents of the Southwest. Less than five were residents of each of the remaining regions.

e. Infections

About one-fifth (21%) of all deaths reviewed that occurred during 2005-2007 were associated with infections. Sixty-eight percent of the infection-related deaths occurred during the postneonatal period. Among the postneonatal deaths, 20% were related to infections, which was similar to the percentage of infection-related postneonatal deaths during 1992-2004. Among the 28 infection-related deaths that occurred during 2005-2007, the committee found that four were preventable, three were probably preventable, and 14 were possibly preventable. Interventions that may have prevented some of the deaths, if they had occurred, included better infection screening, earlier transfer to hospitals, treatment for respiratory and viral diseases, hand washing, caregiver compliance with treatment plans, no smoking in the home, and prenatal care.

Types of infections identified as contributing to the deaths during 2005-2007 included (in non-mutually exclusive categories):

- Invasive bacterial disease (n=8)
- Non-bacteremic pneumonia (n=7)
- Chorioamnionitis (n=7)
- Peritonitis and necrotizing enterocolitis (n=5)
- Viral infections, including herpes simplex, Epstein-Barr virus, Influenza, rotavirus, and cytomegalovirus (n=5)

Specific bacterial etiologies identified were (in non-mutually exclusive categories):

- Gram negative bacteria including *Klebsiella pneumoniae*, *Enterobacter sp.*, and *Haemophilus influenzae* type b (n=5).
- Gram positive bacteria including Coagulase negative *Staphylococcus pneumoniae*, *Streptococcus pneumoniae*, and *Enterococcus sp.* (n<5).

Of the 28 deaths related to infections:

- Death was expected as the result of the infant's medical condition among 13, and possibly expected among four. Four of the infants with an expected death and all of those whose death was possibly expected had underlying congenital or chronic conditions in addition to the infection. Death was not expected as a result of the medical condition among eight.
- Thirteen (46%) infants were born at less than 34 weeks gestation, and two were born at 34-36 weeks gestation.

- Negligence, neglect, and abuse each contributed or probably contributed to less than five deaths, and less than five deaths were associated with more than one type of maltreatment.
- Substance use, including tobacco, by someone else contributed or possibly contributed to six deaths.
- For five infants, the committee found that the primary caregiver was not compliant with prescribed health care plans, including four with a history of missed appointments. One of the five was a preterm infant whose mother received no prenatal care and had multiple social risk factors. Three others had underlying congenital conditions, however the committee did not indicate whether the non-compliance was associated with care for the infection or the underlying condition.
- The committee found that six infants were not receiving adequate health care. Three of these infants had underlying congenital or chronic conditions in addition to the infection; the committee did not indicate whether the inadequate care was for the infection or the underlying condition.
- The primary care facility did not provide adequate care based on available knowledge and technology for six infants. Five of these had additional underlying congenital or chronic conditions; the committee did not indicate whether the inadequate care was for the infection or the underlying condition.

Demographics

Fourteen (50%) of the infants whose deaths were related to infections had at least one parent identified as Alaska Native on the birth certificate. The postneonatal mortality rate due to infections for infants with Alaska Native mothers was 1.1 per 1,000 live births, which was more than two times the rate among non-Natives (0.4 per 1,000 live births).

Thirteen (47%) were residents of the Anchorage/Mat-Su region. Eight (29%) were residents of the Southwest. Less than five were residents of each of the remaining regions.

f. Injury

Injuries from an external event caused or contributed to 11% of all of the deaths reviewed, and 13% of the postneonatal deaths reviewed. By comparison, 10% of all postneonatal deaths during 1992-2004 were caused by injuries. All of these deaths were preventable.

Of the 14 injury deaths:

- Abuse by a caregiver contributed or probably contributed to nine deaths (64%), negligence contributed to six (43%), and neglect contributed to less than five. More than one type of maltreatment was associated with the deaths of five infants (36%).
- Causes of unintentional injury death included carbon monoxide poisoning, drowning, hypothermia, and fire.

Demographics

Less than five of the infants whose deaths were related to injuries had at least one parent identified as Alaska Native on the birth certificate.

Six (46%) infants were residents of the Anchorage/Mat-Su region. Less than five infants were residents of each of the remaining regions.

APPENDIX A

Number of infant deaths per year

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Reported by Bureau of Vital Statistics	100	90	82	83	73	77	62	55	67
Reviewed by MIMR-CDR Committee as of February 2011	100	90	83	83	74	78	61	57	66

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Reported by Bureau of Vital Statistics	83	56	71	69	60	77	69	67	76
Reviewed by MIMR-CDR Committee as of February 2011	81	53	62	60	58	35	40	4	0

APPENDIX B

Current Review Committee members, February 2011

Name	Specialty/Organization
Tina Anliker, MPH, RNC, CDR, USPHS	Clinical Coordinator, Nutaqsiivik program, Southcentral Foundation
Cathy Baldwin-Johnson, MD	Family Physician and Medical Director, Alaska CARES
BJ Coopes, MD	Medical Director, PICU and Inpatient Pediatric Services, Children's Hospital at Providence
Martin Grasmeder, MD	Pediatrics and Medical Director, SouthEast Alaska Regional Health Consortium
Jessica Hagan, MPH	Epidemiologist, Alaska Native Tribal Health Consortium, Alaska Native Epidemiology Center
Bernita Hamilton, MSW	Program Officer, Office of Children's Services (Ex officio member)
Georgia Heiberger, EdD, PNP	Assistant Professor of Nursing, University of Alaska Anchorage
Matt Hirschfeld, MD, PhD	Medical Director, Pediatrics, Alaska Native Medical Center
Melissa Kemberling, PhD, MPH	Senior Epidemiologist, Alaska Native Tribal Health Consortium, Alaska Native Epidemiology Center
Carol Klamser, FNP, DNP	Kachemak Bay Medical Clinic and Seldovia Village Tribal Health Center
Susan Lemagie, MD	Obstetrics-Gynecology, Valley Women's Health Care
Jenny Miller, DrPH, MS, MPH	Assistant Professor of Public Health, University of Alaska Anchorage
Jaime Muhr, MSW	Social work, Office of Children's Services (Ex officio member)
Kelly Murphy, RN, FNP, CDR, USPHS	Outpatient Pediatrics, Southcentral Foundation
Neil Murphy, MD	Obstetrics-Gynecology, Alaska Native Medical Center
Diane Payne	Children's Justice Specialist and Alaska Native community liaison
Marilyn Pierce-Bulger, FNP, CNM	Nurse Midwife, Southcentral Foundation; Owner, Pioneer Consulting
Ellen Provost, DO, MPH	Director, Alaska Native Tribal Health Consortium, Alaska Native Epidemiology Center
Sherrie Richey, MD	Maternal-Fetal Medicine, Alaska Perinatology Associates
Nigel Wappett, MD	Obstetrics-Gynecology, Tanana Chiefs Conference

MIMR-CDR Committee Consensus Form

Case Presenter: _____

Other Case Reviewers: 1. _____

Scribe: _____

2. _____

What type of death is this? [] Natural [] Accidental [] Suicide [] Assault/Neglect [] Unknown

1) Autopsy Performed: [] Yes [] No

If No, Committee recommended autopsy: [] Yes [] No

Why: _____

2) What do you believe was the most probable cause of death for this child? _____

3) What do you believe were other contributing cause(s) that led to this death, or the incident resulting in death?

- A) _____
B) _____
C) _____
D) _____
E) _____

4) Does the death certificate completely capture the above causes and contributors of death? [] Yes

[] Does not accurately reflect most probable cause of death

*Explain why not: _____

[] Does not accurately reflect contributing cause(s) of death

5) Was the information available for review adequate for the committee to determine the cause(s) of death?

- [] Yes [] No [] Presumptive death

What missing information would have helped to better understand this case? (check all that apply)

- [] Post-mortem cultures [] Post-mortem drug screen [] Post-mortem x-rays [] School records
[] Social Service records [] Home interview [] Police report
[] Other medical records: (psychiatry/psychology)
[] Standardized death scene investigation form
[] Toxicology Testing: _____
[] Other: _____

* If No, what improvements of the available records would have helped? _____

Did lack of access or inadequate access to care contribute to this death? (due to geographical or other reasons)

- [] Yes [] Yes probably [] Yes, possibly [] No [] Unknown

If any "Yes", explain: _____

Specific Causes or Contributing Factors to Death

Please also refer to and correct the data extraction sheet on the left side of the file

Motor Vehicle N/A (Circle N/A and skip to next section if not applicable)

12) Was the child properly restrained or was the child wearing proper protective gear (i.e. seatbelt, child safety seat, ATV rider protection)?

Yes No Unknown N/A

*If No, please list what was *not* or *incorrectly* used. _____

The above listed was: Not Used Incorrectly used Unknown

13) Please describe any factors not previously mentioned that you believe may have contributed to motor vehicle incident resulting in the death of the child: _____

Drowning N/A (Circle N/A and skip to next section if not applicable)

14) What was the primary reason child was in the water? Unknown Rescuing another Swimming Bathing

Accidental fall (i.e. fell in toilet, fell off boat)

Other: _____

15) Contributing factor(s) to death (check all that apply):

Weather Current Drop-off Inappropriate supervision House not child safe

No personal flotation device Water temp Child's inability to swim Other: _____

16) Please describe any factors not previously mentioned that you believe may have contributed to the drowning of the child: _____

Assault N/A (Circle N/A and skip to next section if not applicable)

17) Child-related factors that may have contributed to the assault (*check all that had supporting evidence*)

Current sexual abuse Past sexual abuse Dangerous online activities

Prostitution Drug use/abuse History of delinquency

Other: _____

18) Perpetrator-related factors that may have contributed to the assault (*check all that had supporting evidence*)

Inexperienced caregiver Stress/frustration Drug use/abuse

Mental health issues Previous victim of DV/abuse Previously committed DV/abuse

Religious beliefs Discrimination Other: _____

19) Event-related factors that may have contributed to the assault (*check all that had supporting evidence*)

Domestic dispute Gangs Other: _____

Medical Condition continued:

31) Was the child receiving adequate health care for the medical condition(s)? Yes No Unknown

* **If no**, was the inadequate care while the child was in utero, or after birth? in utero after birth

32) Was the child or primary caregiver compliant with prescribed care plans?

Yes No Presumed Unknown N/A

***If No**, check non-compliance issues: Appointments Medications Medical equipment use
 Therapies Other: _____

33) Did the primary care facility provide adequate care based on available knowledge and technology?

Yes No Unknown N/A

***If no**, please explain: _____

Sudden Unexpected Infant Deaths N/A (Circle N/A and skip to next section if not applicable)

(Include all child asphyxiation/suffocation sleep related deaths)

34) Was child sleeping with an impaired person?

Yes Yes, Probably Yes, Possibly No Unknown Not bed sharing

***If YES**, how was the person impaired ETOH Tobacco Extreme exhaustion
 Sleep apnea Other _____

35) Did overlying contribute to the death?

Yes Yes, Probably Yes, Possibly No Insufficient information Not bed sharing

36) Did inappropriate bedding contribute to the death?

Yes Yes, Probably Yes, Possibly No Unknown

37) Did any object that is not sleep related contribute to the death (i.e. plastic bag in crib)?

Yes Yes, Probably Yes, Possibly No Unknown

38) Please circle how close this case fits the definition of a true SIDS death (see definitions handout).

Definitely SIDS Probably SIDS Possibly SIDS Unlikely SIDS NOT SIDS

Preventability

- 39)** Was this death preventable? (*see definitions handout*) Unknown No. Why not? _____
- Yes, possibly (causal chain/mechanism between prevention and outcome is unclear)
- Yes, probably (causal chain/mechanism between prevention and outcome is clear)
- Yes

40) If yes, during the sequence of events prior to the death, what reasonable things, if they **had not** occurred or **had** occurred, might have prevented the death? (Please rank in order, with 1 being most likely to have prevented death.)

Rank

- _____
- _____
- _____
- _____
- _____
- _____

41) What specific change(s) do you believe should occur to **prevent other similar deaths** and to keep children safe, healthy and protected? (*Check all that apply and describe.*)

- Improved patient education _____
- Improved parent education _____
- Improved other caretaker education _____
- Improved education of medical care providers; Who? _____
- More widely offered school education programs _____
- Increased availability and use of alcohol/drug/tobacco abuse treatment programs _____
- New or expanded social support programs or services _____
- New or revised procedures _____
- New law or ordinance _____
- Improved enforcement of existing law/ordinance; What? _____
- Modify or recall consumer product; What product? _____
- Improved access to medical care Primary Intensive Specialty Mental Health _____
- _____
- Changes in public health nursing: _____
- Other: _____

42) Other comments (Anything else important about this death that has not already been captured):
