

INJURY UPDATE

*A Report to Oklahoma Injury Surveillance Participants**

September 24, 2010

Undetermined Manner Deaths among Infants Less than One Year of Age, Oklahoma, 2004-2007

Annually in the United States more than 4,500 infants aged 0-11 months die suddenly from no obvious cause. The majority of these sudden unexplained infant deaths (SUID) are due to Sudden Infant Death Syndrome (SIDS). The percentage of SUID attributed to SIDS has been decreasing nationally for the past seven years because of a diagnostic shift away from SIDS towards other designations such as “undetermined manner.” The main reason for this shift is due to improved death scene investigations and greater consideration of medical histories which clearly distinguish SIDS from other causes.

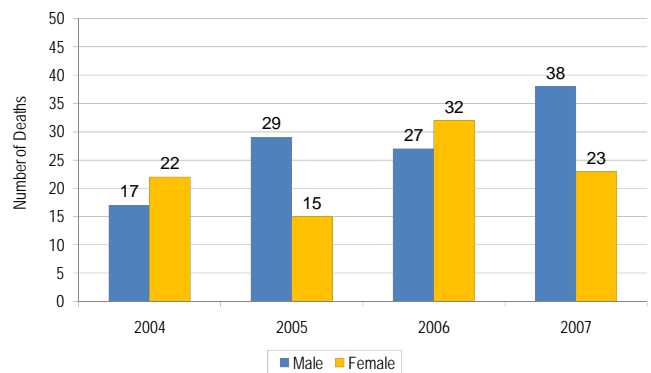
The Oklahoma Office of the Chief Medical Examiner certifies deaths as “undetermined” when “...serious doubt exists as to the manner of death. Information concerning the circumstances may be lacking because of the absence of background information, lack of witnesses or because of a lengthy delay between death and discovery...”

On average, 145 undetermined manner deaths occur each year in Oklahoma (4.1 deaths per 100,000 population). Almost one-third of these deaths are among infants less than one year of age. Data from the Oklahoma Violent Death Reporting System were used to assess the characteristics of undetermined manner death among infants less than one year of age. Cases of SIDS were not included in this analysis.

From 2004-2007, there were 203 deaths of infants in Oklahoma ruled as undetermined manner (1.0 per 1,000 live births). Forty-five percent (92) of the infants were female and 55% (111) were male. The number of undetermined manner deaths among infants increased from 39 in 2004 to 61 in 2007 (Figure 1).

The vast majority of the infants dying unexpectedly in an undetermined manner (61%) were 1-3 months of age (Figure 2). The majority of the infants who died were white (55%), 22% were Native American, 16% were black, and 6% were other races. Six percent of the infants were Hispanic and 94% were non-Hispanic. The undetermined manner death rate among Native American infants (1.9 per 1,000 live births) was 2.7 times higher than the rate among whites (0.7 per 1,000 live births), and 12% higher than the rate among blacks (1.7 per 1,000 live births) (Figure 3).

Figure 1. Undetermined Manner Deaths among Infants <1 Year of Age by Gender and Year, Oklahoma, 2004-2007



The majority of undetermined manner deaths among infants occurred in a residence (98%, n=197), three deaths occurred in a hotel, one in foster care, and the location of injury was unknown for two deaths. Fifty-one percent of the infants who died of undetermined manner were found in a bed, 14% on a couch, 13% in a crib, 10% on a mattress on the floor, and the information regarding the surface the infant was on at the time of death was unknown in 12% of cases.

In 89% of the deaths, the infant was in an unsafe sleeping environment or an unsafe sleeping position. In 70% of the deaths, the infant was sleeping with adults or other children (Table 1). In 8% of deaths, “suspected overlay” was documented. Other sleeping conditions documented included prone sleeping (15%), pillows in the infant’s sleeping area (10%), and blankets in the infant’s sleeping area (6%). Entrapment of the infant between the bed and wall was cited in 7% of the deaths. In almost all of the entrapment cases co-sleeping was also involved.

When the death was associated with co-sleeping, the persons sleeping with the infant at the time of death included adults only (79%), adults and children (20%), and children only (1%). Among adults who were co-sleeping with infants, 91% were parents and 8% were caregivers. Drug or alcohol use by adults co-sleeping with an infant was documented in 12% of deaths. Smoking by the adults co-sleeping with an infant was documented in 4% of the deaths. In 48% (67) of the cases, infants were co-sleeping with two other persons, 43% (61) with one other person, 6% (9) with three other persons, and 2% (3) with four other persons.

For 12% of the infants, a medical history was documented including prematurity (9%), prenatal complications (2%), or apnea (1%). Twenty-five percent of the infants had recently had an illness such as a cold, viral infection, or fever.

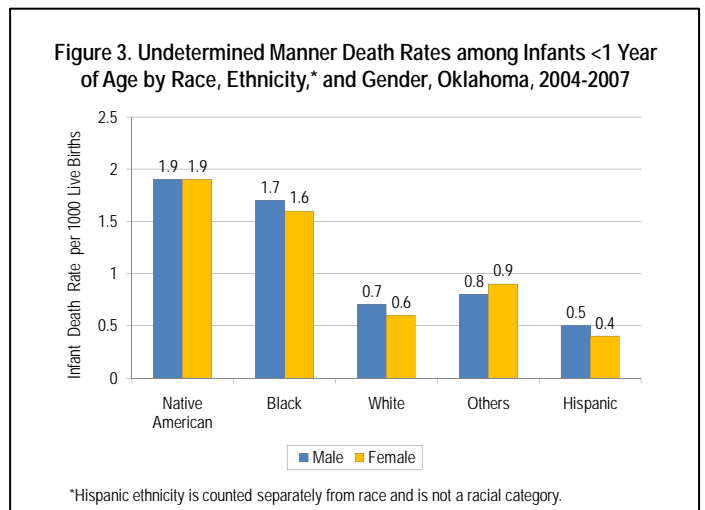
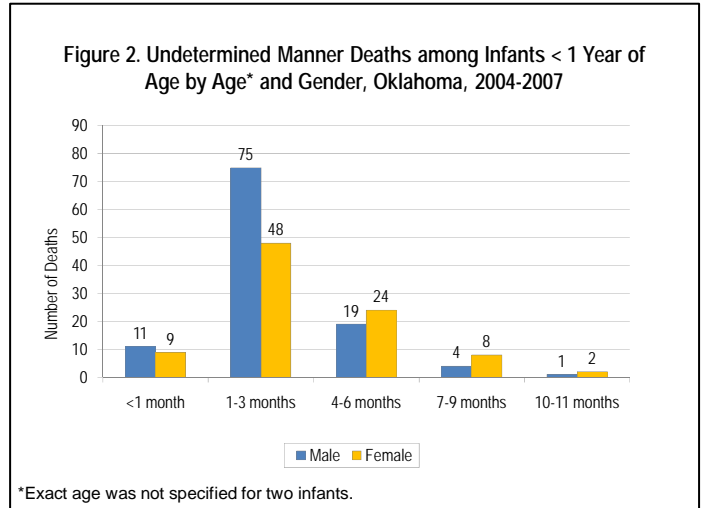
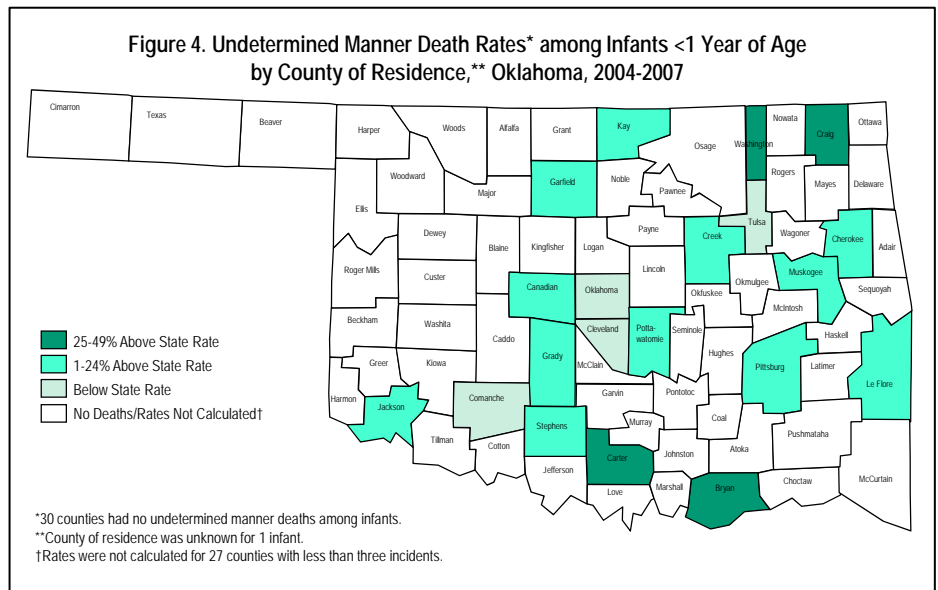


Table 1. Selected Unsafe Sleeping Conditions,* Undetermined Manner Infant Deaths, Oklahoma, 2004-2007

Age Group**	Co-sleeping		Prone sleeping		Pillows		Blankets		Suspected overlay		Entrapment		Total number of undetermined manner deaths N
	N	%	N	%	N	%	N	%	N	%	N	%	
<1 month	18	90	2	10	2	10	0	0	3	15	1	5	20
1-3 months	87	71	22	18	12	10	4	3	9	7	6	5	123
4-6 months	26	61	4	9	5	12	5	12	2	5	5	12	43
7-9 months	7	58	1	8	0	0	2	17	2	17	1	8	12
10-11 months	2	67	1	33	0	0	0	0	0	0	0	0	3
All Ages combined	140	70	30	15	19	10	12	6	16	8	13	7	201

*More than one condition may have been documented.
** Age was unknown for 2 infants.

Nearly one in five (18%) of the infants were found in a home environment with evidence of drug or alcohol abuse. A history of child abuse was present in 15% of the families. Five percent of the infants who died lived in an environment with exposure to smoking. A family history of either another SIDS death or an undetermined manner infant death was found in 2% of the cases. Extremely unsanitary conditions in the home environment were found in 7% of the deaths. The rate of undetermined manner deaths among infants was generally higher in rural areas compared to urban areas. Craig, Carter, Bryan, and Washington Counties had the highest rates of undetermined manner deaths among infants (Figure 4).



CASE BRIEFS

- A 2-month-old male was sleeping with his mother on a couch in the living room. The mother awoke to find him unresponsive. Emergency medical workers were called and the baby was pronounced dead at the hospital. The baby had no medical history and he was born full term vaginally. There were no signs of trauma found on the baby.
- A 7-month-old female was in a hotel bed sleeping along with her grandparents and an 18-month-old child. The baby was found lifeless in the morning.
- A 27-day-old male was found unresponsive in a bed he was sharing with his mother and her boyfriend. The mother and her boyfriend had been drinking all day. The baby was transported to a hospital where he was pronounced dead. The death was suspected to be secondary to overlay.
- A 2-month-old female was found unresponsive by her parents. She was sleeping on a queen-sized bed between her parents. She was pronounced dead when emergency medical personnel arrived. She had recently been diagnosed with a respiratory illness and was taking medication for it.
- A 2-month-old male, previously healthy, was found unresponsive in the bed he was sharing with his parents. The mother had placed him between her and his father on a full size bed. The family did not have a history of child abuse. The mother smoked and was obese and the father smoked marijuana.
- A 5-month-old male was at home with his parents. The parents left him on their bed with several pillows. They returned to the room a short time later and found the baby with a pillow covering his face and "gurgling." The baby was pronounced dead at the hospital. There was no previous medical history and no trauma to the body.
- A 7-month-old male was found unresponsive with his head wedged between a mattress and a desk. His mother had put him to bed on a mattress on the floor and awoke to find him in this position.
- A 9-month-old female was found unresponsive on a full size mattress; she was sleeping with her parents who were overweight. The mother saw the father sleeping with his leg on top of the child's head and noted that the baby was alive at this time. When the mother awoke later, she found the baby unresponsive. The baby was transported to a hospital where efforts to resuscitate her were unsuccessful. No trauma was apparent.

PREVENTION

While many risk factors for SIDS such as prone sleeping, low birth weight, and maternal smoking have been identified, the possible risk factors for infant deaths of undetermined cause have not been described in detail. The increase in undetermined manner deaths among infants has been associated with factors such as co-sleeping and unsafe sleeping environments and sleeping positions. A National Center for Health Statistics survey conducted from 1991-1999 found that 25% of American families always slept with their baby in bed, 42% slept with their baby sometimes, and 32% never co-slept with their baby. Overlay or entrapment can occur if an infant is co-sleeping. The chances of the infant suffocating are increased if the co-sleeping person is obese. Smoking and drug and alcohol use by the person sleeping with the infant are also associated with an increased risk of undetermined manner infant death.

According to the American Academy of Pediatrics, infant deaths related to co-sleeping and unsafe sleeping environments or positions can be prevented by taking the following simple precautions:

- Always place your baby on his or her back to sleep, for naps and at night.
- Always place your baby on a firm sleep surface such as in a safety-approved crib with a firm mattress, covered by a fitted sheet.
- Remember that adult beds, sofas and chairs are not safe for sleeping babies. Never let a baby sleep on an adult bed, a waterbed, sheepskin rug, couch, chair, or other soft surface.
- You can bring your baby into bed to breastfeed and bond, but when it is time for sleep, place your baby in a safe sleep area close to, but separate from, where you and others sleep.
- Never bring your baby into bed with you to sleep, especially if you, or anyone in the bed, have been drinking alcohol, taking drugs/medicines that may make you sleepy, are very tired or very overweight.
- Keep soft objects, toys and loose bedding out of your baby's sleep area. These items can lessen the baby's ability to breathe if they cover his or her face.
- "Tummy time" is for babies who are awake and it should be supervised.
- Dress the baby lightly for sleep. Do not let your baby overheat during sleep.
- Do not allow smoking around your baby.
- Do not use or rely on home monitors or products that claim to reduce the risk of SIDS.
- Educate your baby's child care providers, grandparents, other family members, babysitters and all caregivers about safe sleep measures.

For further reading:

<http://aappolicy.aappublications.org/cgi/content/full/pediatrics;105/3/650>

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The Oklahoma Violent Death Reporting System (OKVDRS) is a statewide surveillance system for suicide, homicide, undetermined manner death, unintentional firearm injury death and legal intervention death. Data are collected from medical examiner reports, death certificates, law enforcement reports, and child fatality review board data. The data are included in the National Violent Death Reporting System and can be accessed at <http://www.cdc.gov/injury/wisqars/>.