

Regional Infant and Child Mortality Review Committee: 2009 Final Report

By Brad Randall, MD; Ann Wilson, PhD

Abstract

The 2009 annual report of the Regional Infant and Child Mortality Review Committee (RICMRC) is presented. Since 1997, RICMRC has sought to achieve its mission to “review infant and child deaths so that information can be transformed into action to protect young lives.” For the year 2009, the Committee reviewed 23 deaths from Minnehaha, Turner, Lincoln, Moody, Lake, McCook, Union, Hanson, Miner and Brookings counties that met the following criteria:

- Children under age 18 dying subsequent to hospital discharge following delivery.
- Children who either died in these counties from causes sustained in them, or residents who died elsewhere from causes sustained in the 10-county region.

The acronym SUID, (Sudden Unexpected Infant Death), is being increasingly used by investigators of infant deaths. SUID is an intentionally broad category used for any infant death where the cause of death is unapparent or multifactorial. Sudden Infant Death Syndrome (SIDS) is a subset of SUID. No deaths categorized as SIDS occurred in 2009. The committee has observed a stable decline in the number of deaths due to SIDS for the last several years with the exception of two SIDS deaths that occurred in 2008. The national SIDS rate of 0.55 per 1000 live births¹ would suggest that our region should have one SIDS death per year. It would appear, on the average, that our region's SIDS incidence is close to that number.

Many investigators believe that a “diagnostic drift” is occurring in the SIDS diagnosis.² These investigators believe that some deaths certified as SIDS in earlier years may now be classified as “undetermined,” or in the new terminology, SUID.³ Although the committee strives to be consistent year to year in its death investigation protocols, we have noticed that the number of deaths classified as “undetermined” has been increasing over the last few years (Figure 1). The majority of our “undetermined” manners of infant deaths appear to be related to concerns about possible asphyxial risks (e.g., overlaying, re-breathing and true suffocation). Our data may be mirroring a national trend among death investigators to increasingly recognize asphyxial risks in infant death scenes.⁴

DISCUSSION

The Minnehaha County Infant and Child Mortality Review Committee (RICMRC) was established in 1997 with the aim of examining deaths of children to identify preventive strategies that may decrease the risk of loss of young life in Minnehaha county. The committee's mission statement is “To review infant and child deaths so that information can be transformed into action to protect young life.” Although the committee was initially formed to serve Minnehaha County, it has expanded its review region to include Lincoln, Turner, McCook, Lake, Moody, Union,

Hanson, Miner and Brookings counties.

The Committee is chaired by the Minnehaha County Coroner and is composed of professionals representing expertise in pediatrics, nursing, law enforcement, child protective services, emergency medical services and mental health. Sheriff and police departments from the participating counties are invited to be present for the review of deaths of children in their counties. To operationalize its goal of preventing deaths of infants and children in the region, the population of reviewed deaths is defined by the following criteria:

Children under the age of 18 dying subsequent to hospital discharge following delivery.

Children who either died in Minnehaha, Lincoln, Turner, McCook, Lake, Moody, Union, Hanson, Miner or Brookings counties from causes sustained in those respective counties, or who died elsewhere from causes sustained in the 10-county region.

Seventy-four infant and childhood deaths occurred in the 10 county review area in 2008 (66 in Minnehaha, two each in Brookings, Hanson and Union, and one each in Lincoln and Turner counties). For illustrative purposes, the age distribution of childhood deaths of Minnehaha County residents is presented in Table 1. Of importance to the interpretation of the data presented in Table 1 is that in 2009, 60 percent of the Minnehaha County resident deaths occurred in the first 28 days of life (neonatal), and some of these occurred within hours of birth.

In 2009, 23 deaths met the committee's criteria and were reviewed (versus 21 in 2008). Of these, 15 were residents of Minnehaha county, two each were from Lincoln and Brookings counties, and one each were from Hanson, McCook and Turner counties.

The reviewed deaths listed below are separated by their manner of death (natural, accident, suicide, homicide and undetermined). The number of deaths for 2009 in each manner category is listed adjacent to the manner heading. Numbers listed in parentheses represent the comparable number of deaths from 1997 through 2008. Care must be taken in comparing yearly data due to the addition of Lincoln (1998), Turner (1999), McCook (2000), Lake and Moody counties (2001), Union County (2002), Hanson and Miner counties (2003) and Brookings County (2004) in subsequent years since the initiation of the review process in Minnehaha County in 1997. However, since more than 70 percent of the total reviewed cases are from by Minnehaha County, some meaningful comparison of data between years is justified.

Natural Deaths 14 (6 – 2008, 11 – 2007, 11 – 2006, 3 – 2005, 9 – 2004, 7 – 2003, 13 – 2002, 10 – 2001, 9 – 2000, 17 – 1999, 14 – 1998, 5 – 1997).

There were no deaths that met the criteria for the Sudden Infant Death Syndrome (SIDS). Given the national SIDS incidence of 0.54 per thousand live births for 2006,¹ our region should expect zero to one SIDS death per year. However, both at the national and regional level, there is concern that the SIDS rate may not be reflecting the true incidence of unexpected infant deaths. Many feel that this is because cases, which in the past were designated as SIDS are now being labeled as “undetermined.” Although we believe that the RICMRC criteria for SIDS have remained relatively constant since RICMRC's inception in 1997, the increase in cases categorized as “undetermined” among those reviewed by the RICMRC over the last several years raises the possibility that one death in this year's “undetermined” group, and possibly one in the accidental group, may have been classified as SIDS in the earlier years of RICMRC review. At issue is the growing awareness that the cause of death in infants sleeping prone on soft bedding, or bed-sharing with adults, often cannot be differentiated between SIDS and asphyxia. It is possible that the combined incidence of SIDS and SIDS-like deaths (Sudden Unexpected Deaths in Infancy – SUID) may be remaining relatively constant in our region. To address that issue, we began in the 2008 report to track the number of combined SIDS, SUID and accidental positional asphyxial deaths (Figure 1). As a national SUID rate has not been officially determined, it is unclear if our regional SUID rate is above, at, or below the national average. It would appear, however, that the SUID rate in our

Table 1

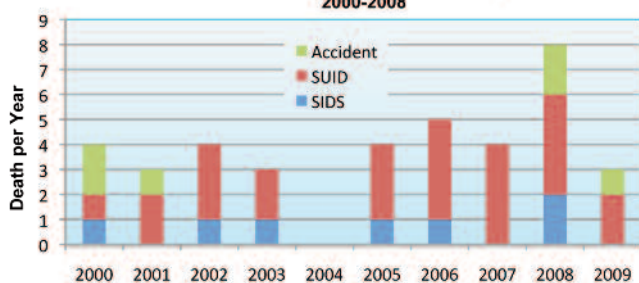
Minnehaha County Resident Deaths	Infant	1-14 years	15-17 years	Total Resident Deaths
2009	17	6	2	25
2008	23	3	1	27
2007	22	6	4	32
2006	21	4	3	28
2005	16	6	1	23
2004	12	6	3	21
2003	13	6	2	21
2002	14	9	6	29
2001	14	9	2	25
2000	11	10	2	23
1999	23	5	3	31
1998	22	9	8	39
1997	15	4	2	21
1996	11	7	4	22
1995	18	5	4	27
1994	15	6	5	26
1993	17	4	3	24
1992	16	5	0	21
1991	19	6	6	31

Data for 1997-2009 from the Regional Infant and Child Mortality Review Committee.
Data for 1991-1996 from the SD Department of Health.

region since 2000 is relatively stable (with the exception of the spike noted in 2008 – which hopefully was a statistical anomaly related to the low number of infant deaths in each year). The data in Figure 1 also suggests that, at least since 2000, we have not been over utilizing the SIDS diagnosis versus the SUID classification. Nevertheless, we must strive for a zero SUID/SIDS rate each year, which will require a continued need for adherence to the Back-to-Sleep campaign message of placing infants to sleep both on their backs and in safe sleeping environments.²

Figure 1

**Infant Death During Sleep
RICMRC Area (SE South Dakota)
2000-2008**



All 14 of the natural deaths represented infectious and congenital disease processes. None of these 14 deaths demonstrated any strategies that might have prevented these natural deaths. There was one death due to the H1N1 influenza virus. This case illustrates the need for timely vaccination to prevent influenza deaths. However, this particular death occurred before the vaccination was readily available.

Accidental Deaths 5 (9 – 2008, 7 – 2007, 13 – 2006, 10 – 2005, 10 – 2004, 15 – 2003, 4 – 2002, 8 – 2001, 8 – 2000, 4 – 1999, 6 – 1998, 4 – 1997)

Three of the “accidental” deaths in 2009 and four each in both 2008 and 2007 were related to motor vehicle crashes, versus nine each in 2005 and 2006. In 2004, there were three motor vehicle crashes resulting in three deaths. In 2005, there were five crashes resulting in seven deaths. In 2006, there were eight crashes resulting in nine deaths. In 2007, four motor vehicle crash-related deaths involved three crashes. In 2008 and 2009, one child died in each crash. We are hopeful that the continuing lower number of motor vehicle crash-related deaths since 2007 represents a decreasing trend of childhood motor vehicle deaths that will continue in future years. However, a single future crash with multiple fatalities could erase this encouraging trend.

Only one of the motor vehicle related-deaths involved a recurring theme of inexperienced youthful driving and poor decision-making. Unfortunately, alcohol use also

contributed to this death (compared to no alcohol related crashes in 2007 and 2008 versus five in 2006 and 2 in 2005).

The other two 2009 motor vehicle crash-related deaths occurred in an infant and a small child. In one of these deaths a small infant was properly restrained in a car seat but did not survive a high velocity crash. The other death, however, involved a toddler who unbuckled himself from his car seat immediately prior to the crash that took his life. A similar death occurred in 2008. These deaths serve as an important reminder that caregivers need to assure that their children remain in their restraints and that the manufacturers of child car seats fabricate them as to not allow small children to be able to release themselves from the seats.

One infant died of positional asphyxia in a dangerous sleeping environment (versus two in 2008). The infant was placed prone on soft bedding. Placing an infant to sleep (even if not initially face down) on a soft surface that an adult might prefer to sleep on can be a life-threatening event.

One child died as a passenger in an airplane crash.

Fortunately, unlike previous years, there were no fire-related deaths in 2009.

Suicidal Deaths 2 (1 – 2008, 1 – 2007, 1 – 2006, 1 – 2005, 2 – 2004, 1 – 2003, 3 – 2002, 1 – 2001, 1 – 2000, 1 – 1999, 3 – 1998, 1 – 1997)

There were two teen suicides reflecting the difficulties of appropriately managing emotional and personal crisis during adolescence. Both of these deaths were due to firearms. While removing all firearms from South Dakota homes is impractical, we do hope that caregivers with children demonstrating depressive symptoms consider at least temporarily removing firearms and other dangerous objects from their homes.

Homicidal Deaths 0 (1 – 2008, 1-2008, 1 – 2006, 4 – 2005, 0 – 2004, 0 – 2003, 2 – 2002, 0 – 2001, 1 – 2000, 1 – 1999, 0 – 1998, 0 – 1997)

Although no children died of inflicted trauma in 2009, we remain concerned about issues of anger management for frustrated caregivers dealing with challenging infants and children.

Undetermined Deaths 2 (4 – 2008, 5 – 2007, 4 – 2006, 5 – 2005, 0 – 2004, 2 – 2003, 1 – 2002, 2 – 2001, 0 – 2000, 1 – 1999, 2 – 1998, 1 – 1997)

Although the SIDS rate appears to be relatively low and stable in our region, there continue to be instances of babies being placed to sleep on their stomachs on soft, unsafe sleeping surfaces and bed-sharing with adults. In 2009 there

was one case (versus four in 2008) of an infant sleeping in such an unsafe sleeping environment that represented a potential for lethal asphyxia. Since asphyxia cannot be differentiated from SIDS at autopsy, this case was labeled as “undetermined.” Adult beds and couches can be dangerous sleeping environments for infants, particularly when shared with adults. An additional sudden unexpected infant death was labeled as “undetermined” because neither a death scene investigation nor an autopsy was performed in this case. Hopefully, in the future, area law enforcement personnel and death investigators will be able to prevent this lack of death investigation.

Advocacy Issues

Although the committee believes that its review and subsequent annual reports are in themselves a form of child advocacy, we did undertake additional advocacy activities in 2009:

1. Members of the committee continued to be active in bringing the Back-to-Sleep and Safe Sleep message to the medical and nursing staffs of our regional hospitals and through education of child care providers. Efforts to continue to spread this information to all who provide care to babies must continue.
2. Some members of the Regional Infant and Child Mortality Review Committee are also participants in the Safe Passage Study (PASS). The PASS study works closely with a large cohort of pregnant women in the region, through their subsequent child's first birthday, to ensure good prenatal care and adherence to safe sleeping practices for their infants. The PASS study also helps to assure that in the event of a study infant death there will be an appropriate death scene investigation and autopsy examination. We believe that the good practices promulgated by the PASS study will benefit all of the mothers and infants in our region.
3. The committee's 2008 Annual Report was published in South Dakota Medicine in 2009. We hope that this will be a continuing publication that will alert all of the state's physicians to health risks confronting our infants and children. It is our desire that this publication may also encourage others throughout the state to formulate similar infant and child death review committees. Members of the Regional Infant and Child Mortality Review Committee have either published or submitted for publication articles dealing with child rearing practices that help enable safe sleeping environments for infants and a review of infant death scene investigations that help to clarify the potential role of asphyxia in SUID. Members of the Committee have also assisted area law enforcement personnel in the techniques for

proper infant death scene investigation.

4. The committee's review of Brookings County cases continues to contribute to the efforts required for South Dakota State University's Vanguard Site of the National Children's Study, a 20-year longitudinal research project that will examine the effects of environmental variables upon children's health and development.
5. The Regional Infant and Child Mortality Review Committee hopes to assist the state of South Dakota in initiating a more comprehensive SUID review as proposed in funding provided in the recent federal stimulus package.

SUMMARY

The Regional Infant and Child Mortality Review Committee concludes its report with the following recommendations (listed in the order we believe may prevent the most deaths and which will be the easiest to implement; starred items are repeats from earlier reports.):

- 1.* ALL INFANTS SHOULD BE PLACED ON THEIR BACKS TO SLEEP. Side sleeping is not recommended. Hospitals, physicians and other health care providers must emphasize the need to place infants on their backs to sleep and to model this in their infant care practices. We should be careful not to prematurely ascribe a continuing low number of true SIDS deaths to a marked improvement in the percentage of back sleeping infants in our region since the number of infant SUID deaths may be relatively constant over the years. The actual percentage of back sleeping in our region is unknown. Furthering the understanding of the essential need for babies to be placed on their backs for sleep demands the effort of all those in communities who care for infants.
- 2.* INFANTS SHOULD NOT BE PLACED ON OR NEAR SOFT BEDDING, BLANKETS, QUILTS OR PILLOWS, particularly while sleeping (even if on their backs) or unsupervised. Even for infants sleeping on their backs, adults must exercise extreme caution when sleeping with infants if intoxicated or otherwise mentally impaired. Although there is considerable controversy regarding the dangers of adult-infant bed sharing, the adult bed with its soft covers and pillows is inherently dangerous for sleeping infants. Couches and soft chairs are particularly dangerous environments for infants, especially if shared with a sleepily adult. An additional risk associated with soft bedding is the potential overheating of sleeping infants (likewise caregivers should be careful that the environmental temperatures where infants are sleeping are comfortably in the lower “room temperature” range).

- 3.* Maternal alcohol use is a known risk factor for SIDS/SUID. Maternal smoking, both during and after pregnancy, also represents a risk factor for SIDS/SUID. Secondhand smoke also is a SIDS risk factor. Parents should make every effort to restrict the use of alcohol, tobacco and illicit drugs for the well-being of their infants, both before and after the baby's birth. We encourage the creation of programs that assist parents in abstaining from tobacco and alcohol use. After adherence to the Back-to-Sleep program of safe sleeping, cessation of maternal smoking during and after pregnancy is the next best way to prevent SIDS.
4. Absent or inadequate restraint of infants and children in motor vehicles proved fatal in one case this year. This toddler died after releasing himself from restraints, which illustrates the danger of an infant or child even temporarily leaving a car seat. We believe that it is of paramount importance that adults not only restrain their infants/children, but that they do so in a safe and appropriate manner. In addition, we believe that car seats for older children should be designed in such a way that prevents children from easily unbuckling themselves from the seats.
- 5.* The sleeping environments for all children and adults need to be protected by working smoke detectors. Although no fire-related deaths occurred in 2009, in 2008, three young children's lives might have been saved by a functioning smoke detector.
- 6.* Although none of this year's review deaths addressed this concern, we continue to believe that older children often do not have regular physical check-ups. As a committee, we recommend that all children have periodic

physical examinations to detect potentially preventable illnesses. This is particularly true to assure that not only younger children, but also adolescents receive potentially life-saving vaccinations.

Report submitted by the Regional Infant and Child Mortality Review Committee:

- Brad Randall, MD, Chair
- Ann Wilson, PhD, Vice-Chair
- Lt. Bruce Bailey – Sioux Falls Police
- Mike Elliot, MD
- Connie Byrne-Olson, MS, LPC
- Jeff Luther, MD
- Mary Haight, MSN
- Vicki Burger, BSW
- Jim Sideras, BSN, MS – Sioux Falls Fire Department
- Carol Cressman, BSN
- Jerry Blake, MD
- Evie Orcutt, RNC

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