Abstract:
The 2010 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 2010, the Committee reviewed 15 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 sudden infant death when the cause of death is unapparent or multifactorial. Sudden Infant Death Syndrome (SIDS) is a subset of SUID, which in addition to SIDS includes sudden unexpected infant deaths of any cause. One death categorized as SIDS occurred in 2010. 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 0.57 per 1000 live births would suggest that our region should have one SIDS death per year. It would appear that on average, our region’s SIDS incidence is close to that number.

Many investigators believe that a “diagnostic drift” is occurring in the SIDS determination. These investigators believe that some deaths certified as SIDS in earlier years may now be classified as “undetermined,” or in the new terminology, SUID. Overall the number of SUID deaths has remained relatively stable over the last decade. In those years when there were spikes of infant deaths, the increases were largely due to an increase in the number of “undetermined” deaths. The majority of our “undetermined” manners of infant death appear to be related to concerns about possible asphyxial risks (e.g., overlaying, re-breathing and true suffocation) emphasizing the need to promote safe sleeping environments.

Only one motor vehicle-related child death occurred in 2010, which represents a steady decline in deaths from a peak of nine deaths in 2005.

Discussion
The Regional 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. 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 comprised 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 age 18 dying subsequent to hospital discharge following delivery (or who were not delivered in a hospital).
- 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.

Fifty-nine infant and childhood deaths occurred in the 10-county review area in 2010 (54 in Minnehaha County, two in Moody County and one each in Brookings, 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 2010, 72 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 2010, 15 deaths met the committee’s criteria and were reviewed (versus 23 in 2009). Of these, 10 were residents of Minnehaha County, two were from Moody County and one each were from Lincoln, Brookings 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 2010 in each manner category is listed adjacent to the manner heading. Numbers listed in parentheses represent the comparable number of deaths from 1997 through 2009. 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 study in Minnehaha County in 1997. However, since more than 70 percent of the total reviewed cases are from Minnehaha County, some meaningful comparison of data between years is justified.

**Natural Deaths 7**

There was one death meeting the criteria for Sudden Infant Death Syndrome (SIDS). Given the national SIDS incidence of 0.57 per thousand live births for 2007, our region should expect zero to one SIDS death per year. With the exception of two SIDS deaths in 2008, we have not exceeded one SIDS per year for a decade. However, at both the national and regional level, there is concern that the SIDS rate may not reflect the true incidence of unexpected infant deaths. Many feel this is because cases, which in the past were designated as SIDS, are now being labeled as “undetermined” or accidental. Although we believe that the RICMRC criteria for SIDS have been relatively constant since RICMRC’s inception in 1997, both the absolute and relative preponderance of cases categorized as “undetermined” among those reviewed by the RICMRC over the last decade 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

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earlier years of RICMRC review. At issue is the growing awareness that one cannot differentiate between SIDS and asphyxia as the cause of death in infants sleeping prone on soft bedding or bed-sharing with adults. It is possible that the combined incidence of SIDS and SIDS-like deaths may be remaining relatively constant in our region. To address this issue, in 2008, we began to track and report the number of combined SIDS, SUID and accidental positional asphyxial deaths (Figure 1). Since 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 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 suggest 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/accident 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.\textsuperscript{5}

Six of the seven natural deaths represented infectious and congenital disease processes. None of these six deaths demonstrated any strategies that might have prevented these deaths.

Accidental Deaths 3

Only one of the “accidental” deaths in 2010, versus three deaths in 2009 and four deaths each in 2008 and 2007 were related to motor vehicle crashes (as further compared to nine deaths each in 2005 and 2006). In 2004 there were three motor vehicle crashes, five crashes in 2005, eight crashes in 2006, three crashes in 2007 and one crash each in 2008, 2009 and 2010. We are hopeful that the continuing lower number of motor vehicle crashes and crash-related deaths since 2007 represent a decreasing trend of childhood motor vehicle deaths that will continue in future years. However, a single future crash with multiple fatalities could quickly erase this encouraging trend.

The one motor vehicle related-death in 2010 involved a recurring theme of inexperienced youthful driving and poor decision-making. Risk factors included multiple distractions (multiple teenaged occupants of the vehicle plus cell phone use) along with not using a seat belt. Fortunately, alcohol use did not contribute to this death. This compares with one alcohol-related death in 2009, no alcohol-related crashes in 2007 and 2008, five in 2006 and two in 2005.

One infant died of positional asphyxia in a dangerous sleeping environment (comparable to one in 2009 and two in 2008). The infant was placed on soft bedding in an adult bed between two sleeping adults. 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 situation.

One child died in a bicycle accident that occurred while the child was riding a bike in a dangerous side-walk environment. The rider was not wearing a helmet.

Fortunately, unlike previous years, there were no fire-related deaths in 2010.

Suicidal Deaths 1

There was one teen suicide reflecting the difficulties of appropriately managing emotional and personal crises during adolescence. As in previous years, this death was due to a firearm. 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 (or at least separating firearms and ammunition) and other dangerous objects from their homes.

Homicidal Deaths 2

Two infants died of inflicted head trauma in 2010. Both of these deaths occurred while under the care of non-parental care providers. Caring for a crying and fussy infant can be a challenging undertaking. Care providers thrust into such a situation and who don’t possess the necessary coping skills or emotional attachment to the infant can result in their
frustration and anger being vented toward the infant. We believe that it is essential that parents have properly trained and experienced childcare available to cover for times when the parents are unable to care for their children due to work, other obligations or illness.

Undetermined Deaths 2

One sudden unexpected infant death was labeled as “undetermined” because neither a death scene investigation nor an autopsy was performed. A similar case occurred in 2009. We hope that in the future, area law enforcement personnel and death investigator training programs will be able to prevent this lack of death investigation. These investigations are essential not only for determining why an infant died but also for developing appropriate public education programs to prevent infant deaths.

One child died from an oxycodone overdose, reportedly sustained when the child picked up and ate spilled oxycodone tablets found loose on the floor. Since it was unclear exactly how the child came into contact with the oxycodone, the manner of death was left as undetermined. Since infants and young children love to pick things up and put them in their mouths, we hope that this case illustrates how vigilant parents and caregivers must be in ensuring infant and children’s environments are free of potentially lethal drugs and toxins. This case was further complicated by a non-parental caregiver.

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 2010:

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 RIRM C 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. Towards that end special training sessions on infant death scene investigation were given to area coroners and law enforcement officials. 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 2009 Annual Report was published in South Dakota Medicine in 2010. 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 promote safe sleeping environments for infants and review of infant death scene investigations to help 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 statewide review of infant and child deaths.

Summary
The Regional Infant and Child Mortality Review Committee concludes its report with the following recommendations (listed in the order we believe may
1. All infants must 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 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 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.*
   This is particularly important 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 sleeping or intoxicated adult. An additional risk associated with soft bedding is the potential for 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 ethanol 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 is an additional 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. Although the number of motor vehicle crash-related deaths remained low in this reporting period, we must continue to make our young drivers aware of the huge risks associated with multiple distractions associated with operating a motor vehicle.
   Of particular concern are multiple occupants in a vehicle plus using cell phones (or texting) while driving.

5. The sleeping environments for all children and adults need to be protected by working smoke detectors.*
   Although no fire-related deaths occurred in 2010, 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 examinations.*
   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:

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REFERENCES


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