



**Iowa's**  
**CHILD DEATH**  
**Review Team**

**Report to the Governor and General Assembly**

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*Governor*

*Kim Reynolds*  
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***2011 Annual Report***



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## Contents

Introduction from the Chairperson .....	4
Iowa Child Death Review Team Members.....	4
Executive Summary.....	6
Recommendations to the Governor and the Iowa General Assembly.....	11
History of Iowa Child Death Review Team .....	12
Annual Summary.....	14
Deaths by Cause and Manner.....	16
Infant Mortality.....	18
Natural Deaths .....	20
Accidental Deaths .....	22
Drowning.....	25
Poisonings .....	26
Suicide.....	27
Homicide .....	29
Undetermined.....	30
Sleep-Related Mortality and SIDS.....	30
Appendix A- Additional Tables	
Appendix B- Sleep Associated Death Data	

### Tables

Table 1. Total number, five year average, and percent change of deaths by age group.....	14
Table 2. Total number of deaths by race category ages 0-17 from 2006-2011 .....	14
Table 3. Total number of deaths by ethnicity ages 0-17 from 2004-2011 .....	14
Table 4. Total number of infant deaths by infantile period, sex, and year from 2006-2011 .....	18
Table 5. The total number of infant deaths by infantile period, cause of death category, and year from 2006-2011 .....	19
Table 6. The total number, five year average, and percent change of natural deaths by medical condition cause and year from 2006-2011.....	20
Table 7. The total number of natural deaths by age group and year from 2006-2011 .....	21
Table 8. The total number, three year average, and percent change of accidental deaths by cause and year from 2006-2011 .....	22
Table 9. All motor vehicle accidents by vehicle type 2006-2011 .....	23
Table 10. Motor vehicle or other transport accident deaths by gender for years 2006-2011 .....	23
Table 11. Level of license gradation for drivers involved in fatal motor vehicle crashes .....	24
Table 12. The total number of poisoning deaths by type, age group, and year from 2006-2011 26	26

Table 13. The total number, five year average and percent change of suicide deaths by method and age group from 2006-2011 ..... 27

Table 14. The number of suicide deaths by method and sex from 2006-2011..... 27

Table 15. The total number, five year average, and percent change of suicide deaths by sex ... 28

Table 16. Number of homicides by age group and year from 2007-2011 ..... 29

Table 17. All homicides by age, race, gender, method, and perpetrator for 2011 ..... 29

Table 18. Number and percent of undetermined deaths by age group, 2011 ..... 30

Table 19. The total number, five year average, and percent change of deaths by county from 2006-2011 ..... 32

Table 20. The total number of deaths by manner of death category and age, 2006-2011 ..... 35

Table 21. The total number of accidental manner of death causes by age group and year from 2006-2011 ..... 36

Table 22. The total number of infant deaths by infantile period, race, and year from 2006-2011 138

Table 23. Mortality by infantile period, race and year ..... 39

Table 24. Position of child at time of motor vehicle accident by year ..... 40

Table 25. Accidental drownings by water type, age group and year ..... 41

**Figures**

Figure 1. Total number of deaths by age group for 2006-2011 ..... 15

Figure 2. Percent of deaths by sex, 2006-2011 ..... 15

Figure 3. Number and percent by manner of death category..... 16

Figure 4. Number of deaths by manner and year, excluding Natural manner of death ..... 17

Figure 5. Number of deaths by cause of death category for all age groups from years 2006-2011 17

Figure 6. The total number of infant deaths, either neonatal or postneonatal, and year from 2006-2011. .... 18

Figure 7. The total number of natural deaths for the top four medical condition category causes by year from 2006-2011 ..... 21

Figure 8. The total number of accidental deaths for the top four causes by year from 2006-2011 22

Figure 9. Position of decedent in motorized vehicle ..... 23

Figure 10. Percent of drivers by license graduation, 2006-2011..... 24

Figure 11. The number of drowning-related deaths by location of drowning in 2011..... 25

Figure 12. The number of drowning-related deaths by month and type of open water from 2006-2011 ..... 25

Figure 13. The total number and percentage of suicide deaths by sex for 2006-2011 ..... 28

Figure 14. The total number of suicide deaths by age and year from 2006-2011 ..... 28

Figure 15. Undetermined manner of death by cause category, count and percent, 2011..... 30

Figure 16. Number of sleep-related infant deaths, 2006-2011..... 30

Figure 17. Risk factors identified in sleep-related deaths, percentage of deaths where factor was present ..... 31

Figure 19. Usual infant sleep position, White and Black race groups ..... 31

Figure 18. Infant sleeping on same surface as another person or animal ..... 31

## Introduction from the Chairperson

Four to five times each year, a group of individuals travel to Des Moines in order to come together and review circumstances and events associated with the death of Iowa children. This group is known as the Iowa Child Death Review Team (CDRT). Iowa's CDRT has representatives from many disciplines, from health care to public safety to social services. While the members of the team come from different backgrounds and locations in Iowa, we all have a common goal, to reduce child death through collection of data. It is our greatest hope that we can eliminate or minimize risk to Iowa children. I have stated in the past that this task is often overwhelming, reminding us how fragile life is and how important children are to us as individuals and as a state. This fact remains unchanged, yet our team continues to work diligently.

The Child Death Review Team believes all children deserve the opportunity to grow up in an environment where harm is minimized and risk is mitigated. We believe our careful review and discussion of each child's death will help us to effect change and create such an environment. We continue to focus on child *life* through examination of circumstances leading to child death.

I applaud the efforts of the members of this team to disseminate our data and recommendations. We each represent larger groups and know it is our duty to ensure our constituents receive this information. It is only through the sharing of information that change and growth can occur. The Office of the State Medical Examiner has the monumental task of collating and assembling our data into this Annual Report, in addition to coordination of team activities. Without their continued support and enthusiasm our team would not be as effective.

As in previous years, I am honored to be a member of this team and am humbled to be allowed to serve as chairperson. I believe we make a difference, and know every time I look into the eyes of a child, that our efforts will never be in vain.

Respectfully submitted,

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## EXECUTIVE SUMMARY

### 2011 Iowa Child Death Review Team Report

The goal of the Iowa Child Death Review Team is to identify those risks or factors in childhood (ages 17 and under) that result in fatal outcomes through a retrospective review of child death cases. A multidisciplinary team approach to reviewing child death cases is conducted. Recommendations made by the team are based on data, which then are used to identify trends that require systemic solutions.

A review of 2011 data shows child deaths continue to decline in Iowa over the five years prior to 2011; the year of this report is the first increase since 2008. The decrease started in 2008 with 386 deaths, to 311 deaths in 2009, and to 302 deaths in 2010. The incidence of child deaths continues to be higher in the counties with the highest populations: Black Hawk, Dubuque, Johnson, Linn, Polk, Scott, and Woodbury. Polk and Johnson counties have large and very active children's trauma centers. This accounts for higher incidences in these counties because many severe child trauma cases from across the state, and even outside of Iowa, are referred to these centers for treatment.

#### Key findings in the 2011 report:

- The number of child deaths in 2011 is higher than 2010, but deaths over the past five years have slowly declined. The increase in 2011 is the result of a higher number of deaths in all manner of death categories except homicides and poisonings.
- Infant mortality is decreasing, despite a slight increase in neonatal mortality that was offset by a decrease in postneonatal deaths.
- Deaths due to prematurity have declined by more than 30 percent over the past five years.
- There is a 21 percent increase in motor vehicle-related deaths in 2011 compared to the previous three years. The increase is due to ATV accidents where children are drivers.
- The rise in suicides that began in 2010 was even higher in 2011. An alarming 78 percent of suicides among Iowa teens are committed by males.

In general, natural deaths including premature birth, birth defects and cancer, are much more difficult to prevent. Reducing the pregnant mother's exposure to second-hand smoke and eliminating prenatal smoking, alcohol and illicit drug use are likely to significantly reduce the number of natural deaths. Also, promoting regular prenatal care will help with early detection and prevention of many medical conditions leading to prematurity and birth defects. SIDS and other undetermined infant deaths can be significantly reduced through education of parents and caregivers on the American Academy of Pediatrics' risk reduction recommendations for creating infant safe sleep environments. Medical care providers should consistently offer reminders of these recommendations to parents at well baby and other pediatric appointments.

Accidental deaths can be prevented through adequate education, parental intervention and supervision, and by following established laws. Suicides can be prevented through timely

interventions, especially when mental health and bullying concerns are immediately identified and addressed. Cases of abuse or neglect resulting in deaths can be prevented by educating and informing parents and caregivers of available services and support.

### **NATURAL DEATHS**

The majority of Iowa children die by natural means, which include prematurity, various medical conditions, SIDS, congenital anomalies, cancers, infections and other illnesses. The 199 natural deaths in 2011 comprise 58 percent of all Iowa child deaths. Regular prenatal care, well baby visits, and continued medical follow-up by parents and other caregivers is essential in detecting and reducing many prenatal, perinatal and postnatal causes of natural deaths, such as congenital anomalies and maternal complications.

### **ACCIDENTS**

The belief that most accidents are preventable is true. To reduce accidental deaths, increased parental and caretaker supervision should be embraced and imposed. In motor vehicle collision deaths, continued education and encouragement of seat belt use and proper installation of infant and toddler car seats will reduce deaths of child passengers.

Parents should become involved with educating teen drivers and be models for instilling safe driving practices. Limiting the number of passengers (especially other teenagers) riding with a teen driver will also help reduce the number of accidental deaths. Underage alcohol consumption, illicit drug use and teen drivers distracted by cell phones and other devices were also identified as contributing factors in some of the motor vehicle collisions. Penalties for such actions should be strictly enforced.

Preventing drowning deaths involves enclosing and limiting access to swimming pools, and increasing supervision of children near bodies of water. In addition, children should be properly fitted with personal flotation devices. Swim lessons are also strongly encouraged. Installation of working smoke detectors in residences and having a fire safety plan can help reduce child fire fatalities. Wearing helmets, obeying traffic laws and riding/operating bicycles, ATVs, scooters and motorcycles in a safe manner will prevent deaths from these high use/high risk activities.

In 2011, 70 children died from accidents, comprising 20 percent of all child death; the majority of deaths continue to be the result of motor vehicle collisions. An alarming increase in the number of deaths involving ATVs was seen in 2011. Iowa averages one fatality per year due to ATV driving or riding, and in 2011 there were eight; all were driving the ATV at time of death. Across all categories of accidents in 2010, 67 children died.

### **SUICIDES**

In 2011, there were 18 child suicides, comprising 5 percent of all child deaths. This was a 50 percent increase over 2009, when eight child suicides occurred. Children that committed suicide were between 13 and 17 years of age. The most common method used to inflict self-harm was hanging, followed by the use of a firearm. Recognizing mental health concerns and other stressors in children, such as bullying, school performance, family and personal

relationship discord, as well as drug and alcohol abuse, can lead to intervention and counseling to help control and abate self-harm. Controlling and restricting child access to firearms is essential.

## **HOMICIDES**

There were seven child homicides in 2011. One homicide was caused by a mother trying to hide her pregnancy. Three homicides in children under the age of six were the result of child abuse- two caused by head trauma and one by asphyxiation. One of the traumatic head injury homicides and the asphyxia were committed by fathers unable to control their frustration at a child. The second traumatic head injury was inflicted by the child's father's paramour, and was determined to be part of long-term abuse inflicted on the child. The paramour also admitted to abusing other children in the same home. One homicide was the result of a highly negligent, impaired driver, who struck the child as she crossed the street getting off the school bus. Two homicides were caused by perpetrators upset by trivial arguments. One assailant started a fire under the home of a relative. Another perpetrator, with access to a loaded, unlocked gun, shot his brother over an argument involving a video game.

Strategies to prevent homicides in children include increased awareness and utilization of local family support and counseling services, including awareness of Safe Haven laws. Parenting and anger management classes should include education on how best to react to stressful and chaotic situations, such as caring for crying or difficult infants and children. These classes should include education on the warning signs of stress, when to ask for help, and where to seek out support. If they are unable to do so for any reason, parents and caregivers should carefully choose whom they entrust to watch and care for their children. Lastly, access to firearms is a significant issue in preventing both homicides and suicides. Firearms should be kept inaccessible to children, locked, and unloaded.

## **UNDETERMINED**

In 2011, there were 45 deaths classified as undetermined or 13 percent of all child deaths. Unspecified medical conditions and Sudden Infant Death Syndrome (SIDS)/Sudden Unexplained Infant Deaths (SUID) comprised the majority of these cases. When deaths are certified as "undetermined" it usually means that no evidence exists to support other competing manners of death (i.e., accident, suicide), or there was no explanation of the circumstances surrounding a death that would definitely determine the manner. In many SIDS/SUID deaths, it is difficult to determine a degree of risk attached to a particular unsafe sleep environment component; however, enough evidence exists to suggest that any one component or risk factor, or combination of risk factors, do create an environment that increases the risk of injury or death to a child during sleep.

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## **Appendix B Summary- Sleep-Related Deaths**

Since the introduction of the Back to Sleep campaign in 1994, the nation has seen a significant decrease in Sudden Infant Death Syndrome (SIDS) and other sleep related infant deaths. However, sleep related infant deaths are still the number two killer of infants and a problem in Iowa that has affected an average of 43 infants over the past five years, or about three per month. The number of yearly victims has varied between the range of 36 (2009) to 55 (2008) deaths depending on various factors, such as a spike in respiratory infections in the winter of 2008. Even with a multitude of causes for infant death, many of the victims during this time period were classified as an “undetermined” manner of death due to the lack of a definitive explanation to the cause and circumstances of their death. Despite the lack of a conclusive cause, research and literature suggests that infants exposed to a certain risk factor or combination of factors have an increased risk of a sleep related death or injury. Some of these risks include sleep position, sleep surface, co-sleeping with adults, and having items in the sleep environment (i.e. blankets, bumper pads).

From the data collected in the past five years, the most common risk factor found in sleep related infant deaths was a blanket in the sleeping space with the infant, which comprised 42% of the deaths. The second biggest factor was the infant co-sleeping with an adult which accounted for 29% of the deaths. Co-sleeping in an adult bed was also more common amongst Blacks, being indicated almost 40% of the time, thus showing a racial disparity. In terms of sleep position, almost half of the children were reported to be put to sleep on their backs, as recommended, but 45% of White and 44% of Black children were found on their stomachs.

Profiles of the primary and secondary caregivers of all of the infants were also collected and analyzed for any reoccurring factors. Data pertained to employment status, income status, education, social services, Medicaid, drug abuse, maltreatment of a child, mental health services, and prior child deaths. When compared to the general population of Iowa, caregivers of infants who suffered from sleep related deaths were twice as likely to be unemployed, of low-income and only completed high school. Despite negative factors, 94% of mothers reported regular prenatal care. However, a staggering 44% also reported smoking during pregnancy.

Overall trends for the state in the last five years showed that the average age of sleep related infant death occurred around 2.8 months, with a range of 1 to 4.5 months. There also appeared to be a more significant risk for male infants at a ratio of 1.5:1 male to female deaths. Although this disproportion is not fully understood, it is consistent with scientific literature. Comparing deaths by race groups also showed a disparity amongst race. The percent of deaths that occurred among Black children was higher than any other racial group in Iowa. This data is also consistent with national evidence indicating that Blacks and American Indians have a two to three times higher risk of SIDS than the average <sup>1</sup>.

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<sup>1</sup> <http://www.childdeathreview.org/causesSI.htm>

The data in this report was collected by the Childhood Death Review Team to determine risk factors and disparities in Iowa. The best way to reduce sleep related infant deaths is to place the child to sleep on their back in a proper crib on a firm mattress without any soft bedding or extra items. Co-sleeping with adults, other children, or pets should also be eliminated.

## **Iowa Child Death Review Team Annual Report Recommendations**

1. The Iowa Child Death Review Team (ICDRT) recommends that appropriate safe sleep educational resources, based on the American Academy of Pediatrics Safe Sleep Expanded Recommendations (January 2013), be distributed by healthcare professionals and discussed with all new parents before discharge from an Iowa hospital in an effort to proactively campaign to reduce infant deaths. In regard to childcare providers of infants less than one year of age, the ICDRT recommends that mandatory safe sleep training is completed within the first three months of employment.
2. The ICDRT recommends evaluation for drug and/or alcohol use by caretakers present when a child dies in violent or suspicious circumstances. In addition, all drivers involved in a fatal motor vehicle crash (MVC) should be tested for drugs and alcohol at the time of the crash.
3. The ICDRT recommends an autopsy be performed upon the death of any child, unless deferred by the Iowa Office of the State Medical Examiner. These autopsies should be strongly encouraged or mandatory, and will include toxicological evaluation. This recommendation will apply to every child who dies, with the exception of children who are known to have died of a natural disease process while under the care of a physician or under extenuating circumstances as determined in consultation with the Iowa State Medical Examiner.
4. The ICDRT recommends establishing a statewide system of community child death review teams comprised of representation similar to the state team. These community teams will review all deaths of children 17 years or younger that occur in their area. These teams will be permitted the same statutory authority as the ICDRT to gather and review information related to child deaths, as long as they operate under strict confidentiality guidelines. As with the ICDRT, all members will be volunteers. Community CDRTs will submit information regarding their reviews to the ICDRT.
5. The ICDRT recognizes the importance of prevention of child death and therefore supports efforts to educate professionals involved in the lives of children. This will include formal and informal education. In addition, the ICDRT recommends increased resources for schools to improve screening for mental health conditions in adolescents.
6. The ICDRT, with recognition of the importance of early recognition of child abuse, supports and recommends enhanced and mandatory child abuse trainings designed for professionals interacting with children. Families can be strengthened and tragedies prevented through such trainings.
7. Relationship and financial stressors lead to increased chances for abusive behavior towards children by adults. Services that offer support, guidance and counseling to struggling families should be made available free of charge, or at a minimal cost.
8. Children should always be properly supervised. No matter how safe a commercial product is made or endorsed (i.e., toys, pools, swing sets), there is no substitute for proper supervision of children.

## History of the Iowa Child Death Review Team

The State Child Death Review Team was first established in 1995 via Iowa Code 135.43 and is governed through Iowa Administrative Rule 641-90. The Team is composed of 14 members and seven state government liaisons. Each of the 14 members represents a different professional organization or medical specialty. Team members represent such disciplines as Perinatology, Neonatology, Pediatrics, Law Enforcement, Social Work, Substance Abuse, Mental Health, Domestic Violence, Family Practice, Forensic Pathology, Law, SIDS, Nursing, EMS, Trauma Services and Insurance. Each of the aforementioned disciplines recommends an individual to represent their profession on the team who has demonstrated a commitment to improving the health and safety of children in Iowa. Team liaisons representing the Departments of Human Services, Public Health, Transportation, Attorney General, Education, and Public Safety are also involved with case review and the development of recommendations.

In 1995, legislation was enacted mandating review of child deaths through age 6 years. In 2000, the law was amended to mandate that child deaths ages 17 and under be reviewed. In 2005, legislation was passed to allow the State Child Death Review Team to recommend to the Department of Human Services, appropriate law enforcement agencies and other persons involved with child protection, interventions that may prevent harm to a child who is living in the same household as a child whose case is reviewed by the team.

Prior to 2009, the Iowa Child Death Review Team was coordinated by two individuals within the Bureau of Family Health within the Iowa Department of Public Health (IDPH). The team had an annual budget of \$28,000. Funding for this program came from the IDPH Maternal Child Health Block Grant (\$8,000) and the state's general fund (\$20,000). Funding was year-to-year. This funding was allocated to support the two IDPH employees assigned to help coordinate the team, pay for supplies, and to allow team members' reimbursement for their travel to Des Moines, Iowa and other associated expenses related to regularly scheduled meetings. In 2009, staffing and funding for this program was eliminated due to federal and state budget cuts. In the spring of 2009, the Iowa Office of the State Medical Examiner (IOSME) was assigned the coordination of the team with no funding or staff, due to budget cut-backs. One full-time and two part-time IOSME staff members were given the additional responsibility of assisting the Chief State Medical Examiner with case review and team management. In 2012, the IDPH Bureau of Family Health also assigned an employee to assist the team with record acquisition. The team members and liaisons continue to attend a minimum of four scheduled meetings annually on a strictly voluntary basis, with knowledge that reimbursement for their expenses is not possible. This exemplifies the true passion, commitment and dedication team members have for preventing childhood injuries and deaths.

Due to the work involved in transitioning and integrating the team into the IOSME and the necessary updating of the Iowa Code and Administrative Rules to reflect the change in team coordination and focus, the team was inactive for several months. In April, 2010 the team held its first meeting under the auspices of the IOSME. Every child death is reviewed by the CDRT

Coordinator and then is subsequently entered into the National Child Death Reporting System Database. The CDRT Coordinator then selects child death cases where there was a noted deficiency in reporting, investigating, and lack of appropriate resource allocation for in-depth team review.

Using the current model of operation in today's challenging economic environment, the Child Death Review Team has re-focused its mission and objectives. The purpose of the Team is to aid in the reduction of preventable deaths of children under the age of 18 years through the identification of unsafe consumer products; identification of unsafe environments; identification of factors that play a role in accidents, homicides and suicides which may be eliminated or counteracted; and promotion of communication, discussion, cooperation, and exchange of ideas and information among agencies investigating child deaths.

This and future annual reports will be direct, concise and highlight only those areas in child death where improvements can be made and future lives can be saved.



## Annual Summary

In 2011 there were 342 deaths involving Iowa children ages 17 years and younger (Table 1). There were 41 more deaths in 2011 compared to 2010; however, the number of deaths that occurred in 2011 is five percent lower compared to the previous five years.

	2006	2007	2008	2009	2010	2011	5-Yr Avg	% Chg
<b>&lt;1 Year</b>	217	244	225	176	179	178	208	-15%
<b>1-5 Years</b>	49	46	64	52	34	51	49	4%
<b>6-12 Years</b>	27	38	36	29	20	35	30	17%
<b>13-17 Years</b>	89	85	61	54	68	78	71	9%
<b>Total</b>	382	413	386	311	301	342	359	-5%

**Table 1. Total number, five year average, and percent change of deaths by age group**

As the table below shows, a majority of deaths occurred within the Caucasian population (Table 2). This is to be expected, as a majority of Iowa's population is Caucasian. Seven percent of deaths were among Black children, which is nearly twice the proportion of Blacks in the general population. A similar disparity was evident among ethnicity as Hispanics comprise only 5.5 percent of Iowa's population, but nine percent of the children who died in 2011 were Hispanic (Table 3).

**Table 2. Total number of deaths by race category ages 0-17 from 2006-2011**

	2006	2007	2008	2009	2010	2011	2011%*	Iowa Population %**	Total
<b>White</b>	340	372	321	269	244	206	85%	93%	1752
<b>Black</b>	31	36	37	36	34	18	7%	3%	192
<b>Pacific Islander</b>	1	0	1	0	1	0	0%	<1%	3
<b>Asian</b>	4	3	8	1	5	7	3%	2.00%	28
<b>American Indian</b>	2	1	3	1	1	0	0%	<1%	8
<b>Multi-racial</b>	3	1	15	3	16	12	5%	1.50%	50
<b>Unknown</b>	1	0	1	1	0	99			102
<b>Total</b>	382	413	386	311	301	342			2135

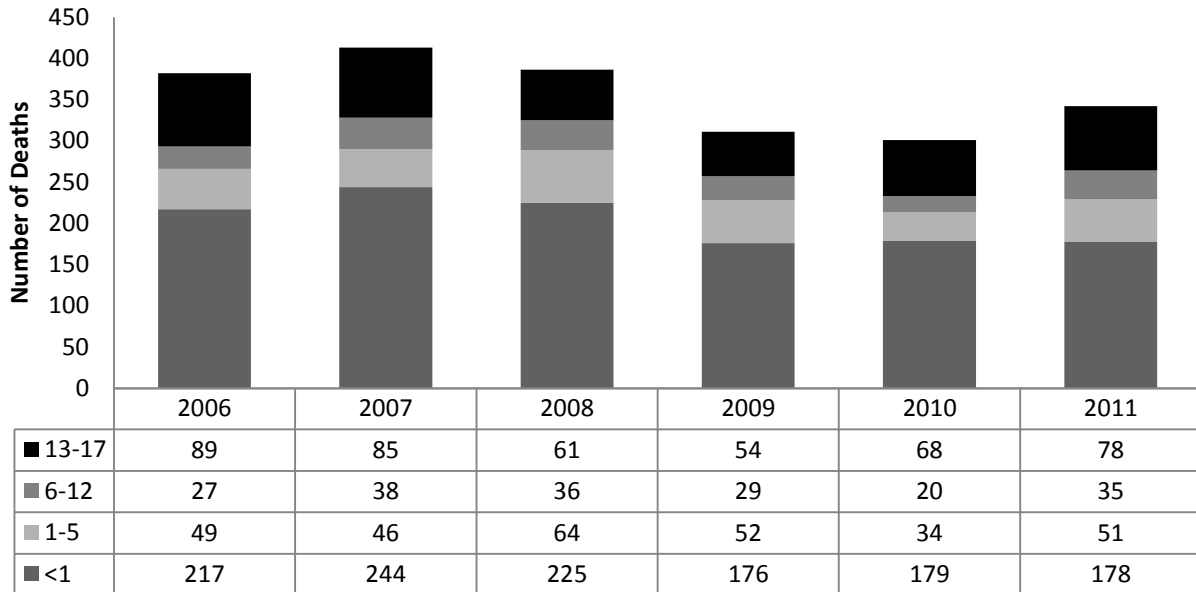
\*Deaths with "Unknown" race were excluded

\*\*US Census 2010 distribution for children <18 years of age

**Table 3. Total number of deaths by ethnicity ages 0-17 from 2004-2011**

	2006	2007	2008	2009	2010	2011	2011%
<b>Hispanic or Latino</b>	36	43	38	42	26	21	9%
<b>Non-Hispanic or Latino</b>	345	370	342	267	266	203	91%
<b>Unknown</b>	1	0	6	2	9	118	
<b>Total</b>	382	413	386	311	301	342	

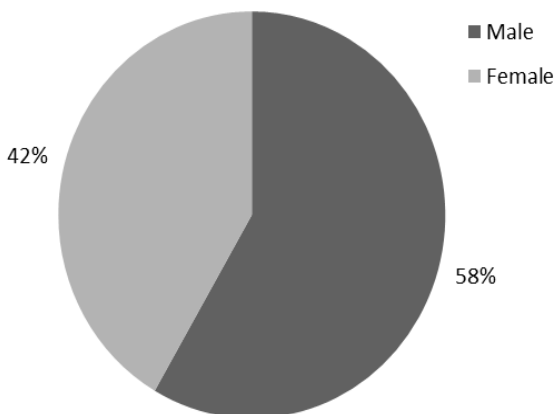
The majority of child deaths occurred in infants less than 12 months of age (Figure 1). However, infant mortality has been steadily declining since 2006 with a 15 percent reduction reported in 2011 compared to the past five years (see Infant Mortality, page 13).



**Figure 1. Total number of deaths by age group for 2006-2011**

Of interest is the increase in deaths among children ages 6-12 and 13-17 years. The number of deaths in these age groups is small, but the percent increase is significant, especially among adolescents ages 13-17. A marked increase in deaths attributed to suicide occurred in 2010 and

**Figure 2. Percent of deaths by sex, 2006-2011**



continued at the same rate in 2011 (Table 13). For children 6-12 years old, an increase in natural deaths, including those due to asthma and cancer, may be an event isolated to 2011, or other unknown factors affecting child mortality.

On average, deaths occur more often in males than females (Figure 2). This distribution has changed little in previous years.

## Deaths by Cause and Manner

In 2011, the majority of child deaths were attributed to a natural manner of death, followed by accidental, undetermined, suicide, and then homicide (Figure 3). There were slight increases from 2010 to 2011 in all manner of death categories except homicides, which remained the same (Figure 4).

In Iowa, the attending physician or medical examiner certifies the cause and manner of death. The cause of death is defined as an event or action which ultimately caused the decedent's death. The manner of death is how the death occurred based on the circumstances surrounding the death. Iowa's death certificate allows the certifier to choose from five different manners of death: natural, accident, suicide, homicide or undetermined.

**The five manners of death are defined as follows:**

**Natural:** Death resulted from a natural process such as disease, prematurity or a congenital defect. Most deaths of this manner are considered by the CDRT to be non-preventable.

**Accident:** Death resulted from an unintentional act or an uncontrolled external environmental influence.

**Suicide:** Death resulted from one's own intentional actions. Evidence to support this manner can be both explicit and implicit.

**Homicide:** Death resulted from the actions of another individual with or without the intent to kill.

**Undetermined:** Investigation of circumstances and autopsy did not clearly identify the manner of death or evidence gathered supported equally two or more other manners of death.

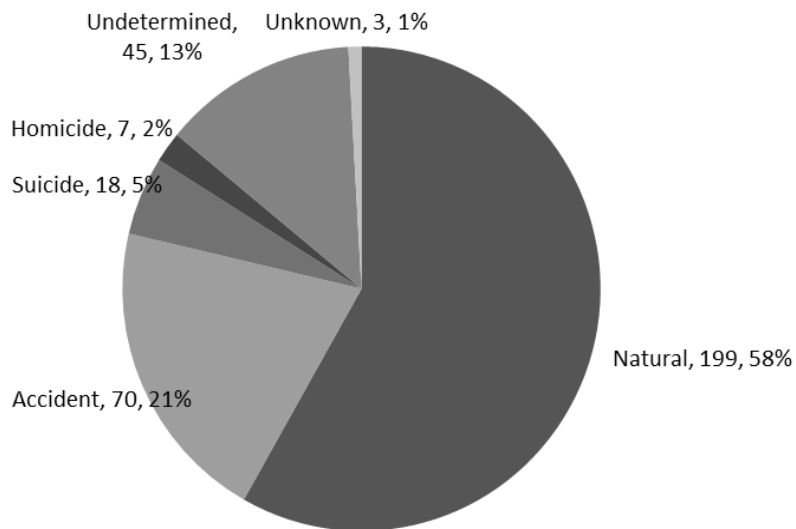


Figure 3. Number and percent by manner of death category



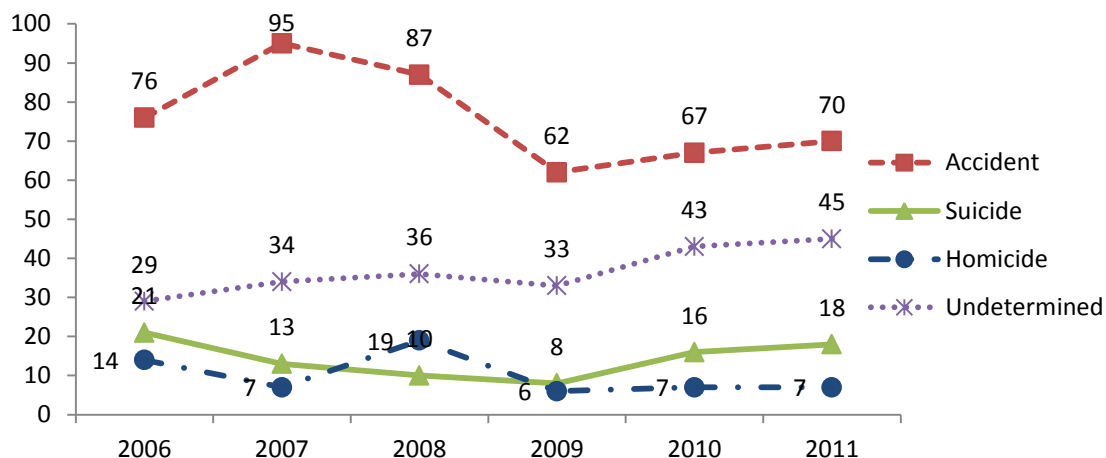


Figure 4. Number of deaths by manner and year, excluding Natural manner of death

Of deaths that were attributed to natural manner, medical conditions were the leading cause of death category, with most deaths due to birth defects or prematurity and occurring in infants less than one year of age (Table 6, Table 7). Almost 70 percent of deaths caused by a medical condition happened in infants, followed by children ages one to five.

Injury or trauma fatalities were slightly higher in 2011 compared to the previous two years (Figure 5). More detailed information on deaths involving trauma or injury is in the ‘Accidental Deaths’ section of this report.

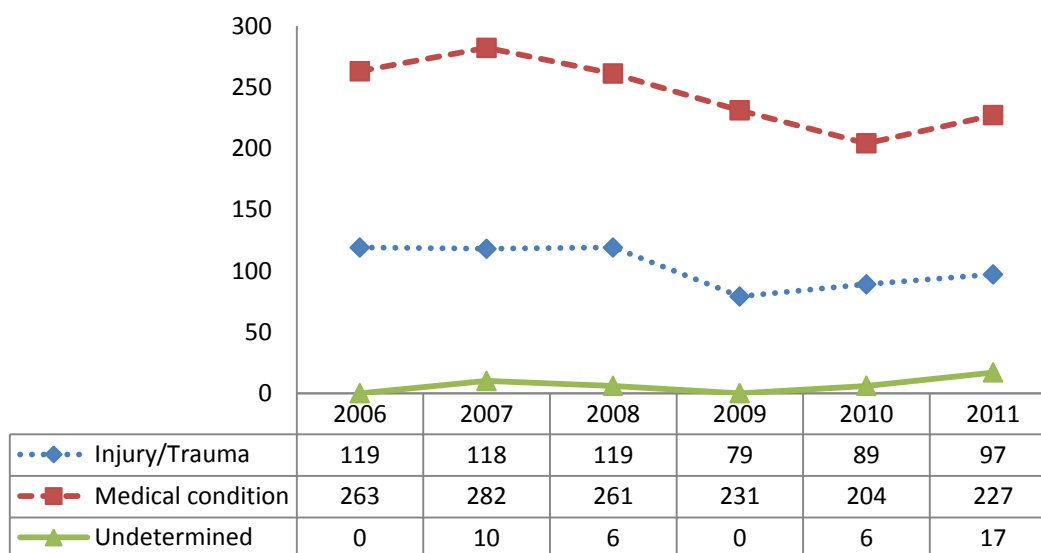


Figure 5. Number of deaths by cause of death category for all age groups from years 2006-2011

## Infant Mortality

Infant mortality is the leading cause of death among all children ages 0-17 years. In an effort to better understand when and how infant mortality happens, the statistics in this section of the report were divided into age categories of “neonatal” and “postneonatal”. The neonatal period is defined as the period from birth through 27 days of life. The postneonatal period is defined as the period from 28 days of life to 364. A third age category of “child” is included for comparison to the infant age categories and includes children ages 1-17 years.

It is encouraging that infant deaths have declined 15 percent since 2007, but appear to be reaching a point of stability (Table 1). A slight increase in the number of deaths in the neonatal period was offset by a decrease in deaths in the postneonatal period (Figure 6). More infants that do not survive the first year of life are male than female (Table 4).

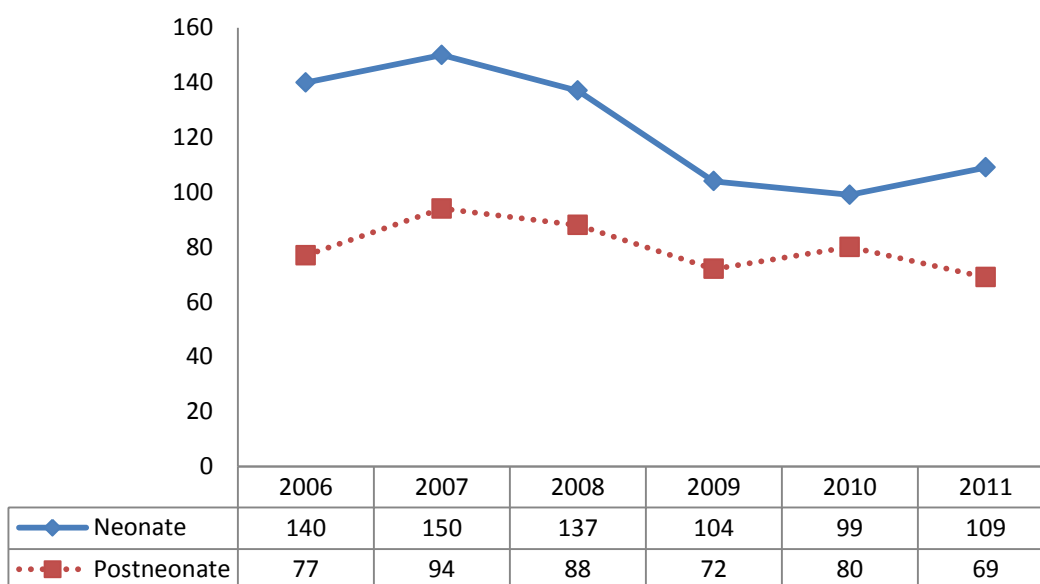


Figure 6. The total number of infant deaths, either neonatal or postneonatal, and year from 2006-2011.

	Sex	Percent
<b>Neonate</b>	Male	55%
	Female	45%
<b>Postneonate</b>	Male	59%
	Female	41%
<b>Child</b>	Male	61%
	Female	39%
<b>Total</b>	Male	58%
	Female	42%

Table 4. Total number of infant deaths by infantile period, sex, and year from 2006-2011

In the neonatal period, the manner of death is typically natural; attributed to birth defects, prematurity, SIDS, infection and other causes. The proportion of accidental deaths is higher in post-neonates compared to neonates, and is highest among children. A detailed breakdown of natural cause categories is available in the 'Natural Causes' section of this report.

During the neonatal and postneonatal periods, medical conditions were the leading cause of death. After the infantile period, this cause falls second to injury/trauma. The next leading cause of death for infants in 2011 was injury/trauma, but at a significantly lower rate only causing one death in a neonate and six in post-neonates (Table 5).

		2006	2007	2008	2009	2010	2011	Total
<b>Neonate</b>	<b>Injury/ Trauma</b>	3	1	4	0	2	1	11
	<b>Medical condition</b>	137	147	133	104	96	108	725
	<b>Undetermined</b>	0	2	0	0	0	0	2
	<b>Unknown</b>	0	0	0	0	1	0	1
	<b>Total</b>	<b>140</b>	<b>150</b>	<b>137</b>	<b>104</b>	<b>99</b>	<b>109</b>	<b>739</b>
<b>Postneonate</b>	<b>Injury/ Trauma</b>	16	9	20	14	10	6	75
	<b>Medical condition</b>	61	76	63	58	66	47	371
	<b>Undetermined</b>	0	7	5	0	3	15	30
	<b>Unknown</b>	0	2	0	0	1	1	4
	<b>Total</b>	<b>77</b>	<b>94</b>	<b>88</b>	<b>72</b>	<b>80</b>	<b>69</b>	<b>480</b>
<b>Child</b>	<b>Injury/ Trauma</b>	100	108	95	65	77	90	535
	<b>Medical condition</b>	65	59	65	69	42	72	372
	<b>Undetermined</b>	0	1	1	0	3	2	7
	<b>Unknown</b>	0	1	0	1	0	0	2
	<b>Total</b>	<b>165</b>	<b>169</b>	<b>161</b>	<b>135</b>	<b>122</b>	<b>164</b>	<b>916</b>
<b>Total</b>	<b>Injury/ Trauma</b>	119	118	119	79	89	97	621
	<b>Medical condition</b>	263	282	261	231	204	227	1468
	<b>Undetermined</b>	0	10	6	0	6	17	39
	<b>Unknown</b>	0	3	0	1	2	1	7
	<b>Total</b>	<b>382</b>	<b>413</b>	<b>386</b>	<b>311</b>	<b>301</b>	<b>342</b>	<b>2135</b>

Table 5. The total number of infant deaths by infantile period, cause of death category, and year from 2006-2011

## Natural Deaths

A majority of child deaths in 2011 were the result of various medical conditions, prematurity, congenital anomalies, SIDS, and cardiovascular diseases. These deaths were the result of natural factors affecting the mother, the developing fetus and child during pregnancy, childbirth, and development. Such factors can include pneumonia, influenza, nuchal cord and other complications affecting pregnancy, delivery and development (Table 6).

By definition, cases where the cause of death was certified as Sudden Infant Death Syndrome (SIDS), the investigation, autopsy, death scene, and interview findings revealed no suspicions that any action or event was non-natural.

	2006	2007	2008	2009	2010	5-Yr Avg	2011	% Chg
N/A	119	131	125	80	97	110	115	4%
Prematurity	87	96	80	64	61	78	47	-39%
Congenital anomaly	68	57	39	55	51	54	62	15%
SIDS	13	26	33	29	33	27	24	-10%
Other medical condition	5	8	15	12	15	11	53	382%
Cancer	24	17	11	15	9	15	6	-61%
Cardiovascular	18	31	30	11	9	20	13	-34%
Other infection	11	12	19	16	7	13	2	-85%
Pneumonia	16	10	10	10	6	10	4	-62%
Other perinatal condition	3	4	19	7	2	7	2	-71%
Neurological/Seizure disorder	5	8	1	7	2	5	6	NS
Undetermined medical cause	10	7	0	0	2	4	1	NS
Asthma	1	3	1	1	1	1	2	NS
Malnutrition	1	2	1	0	0	1	3	NS
Influenza	1	0	1	2	1	1	0	-100%
<b>Total</b>	<b>382</b>	<b>413</b>	<b>386</b>	<b>311</b>	<b>301</b>	<b>359</b>	<b>342</b>	<b>-5%</b>

**Table 6. The total number, five year average, and percent change of natural deaths by medical condition cause and year from 2006-2011**

The strongest contributor to the gradual decline in Iowa infant mortality is due to the reduction in deaths due to prematurity. When comparing the number of infant deaths attributed to prematurity in 2011 to the average of the previous five years, there is a 39 percent decrease (Table 6, Figure 7 **Error! Reference source not found.**).

The increase in the number of deaths attributed to 'Other medical condition' is the result of recoding at the point of data entry (Table 6).

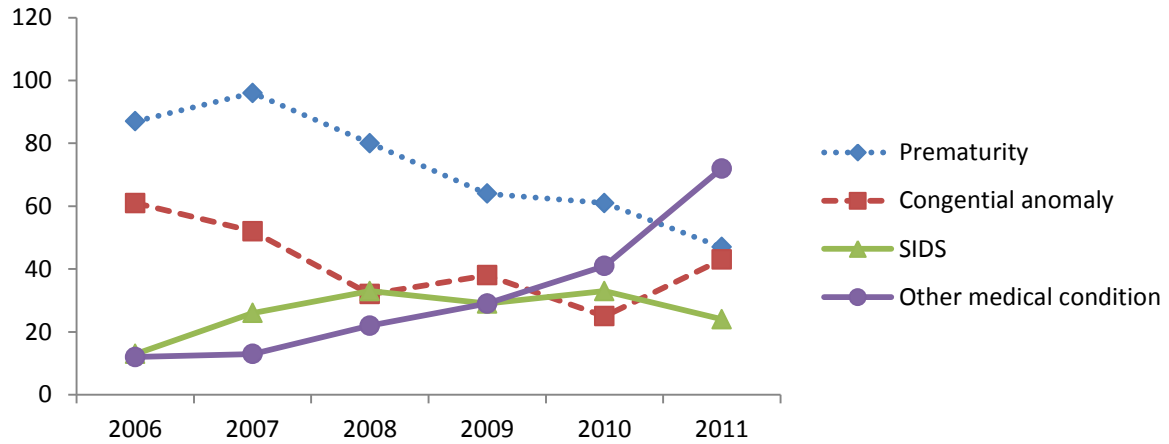


Figure 7. The total number of natural deaths for the top four medical condition category causes by year from 2006-2011

	2006	2007	2008	2009	2010	2011	Total
<1 Year	180	206	169	133	128	129	1321
1-5 Years	23	20	31	32	15	27	191
6-12 Years	18	20	14	15	7	22	145
13-17 Years	20	18	20	22	17	21	160
<b>Total</b>	<b>241</b>	<b>264</b>	<b>234</b>	<b>202</b>	<b>167</b>	<b>199</b>	<b>1817</b>

Table 7. The total number of natural deaths by age group and year from 2006-2011

## Accidental Deaths

There were 43 reported accidental deaths in 2011 (Table 8). A vast majority of these deaths were the result of motor vehicle collisions followed by asphyxia, followed by drowning, use of weapons (firearms), poisoning, and fire related. In 2011, there was an increase in motor vehicle deaths compared to the previous three years. The number of deaths caused by drowning also increased, but the difference between 2011 and past years is small.

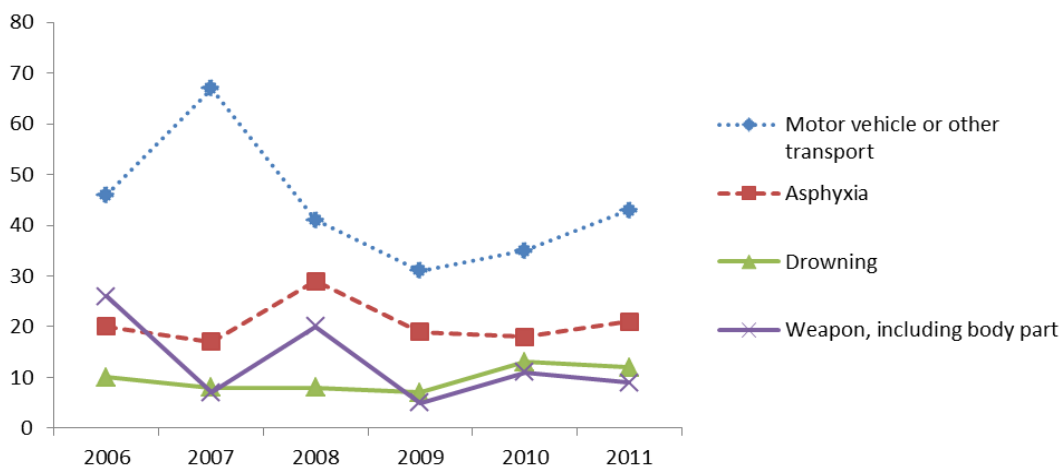
Five fatalities were the result of fire, burns or electrocutions. One statistic of note was that in these deaths, the family's home lacked either a working smoke detector or did not have one at all.

Asphyxia is the leading known cause of accidental death

for infants. Asphyxia deaths result from inadequate oxygenation due to airway obstruction or the individual's inability to breathe. Asphyxiation may result from positional, mechanical, chemical, and oxygen-deficient atmospheres. These deaths include autoerotic activities, farm accidents (tractor roll-overs, grain/corn engulfment), drowning, infants co-sleeping with adults, and entrapment of children between bedding and walls/objects (wedging).

	2008	2009	2010	3-Yr Avg	2011	% Chg
<b>Motor vehicle or other transport</b>	41	31	35	36	43	20.6%
<b>Asphyxia</b>	29	19	18	22	21	-4.5%
<b>Drowning</b>	8	7	13	9	12	28.6%
<b>Weapon, including body part</b>	20	5	11	12	9	-25.0%
<b>Fire, burn or electrocution</b>	9	10	4	8	5	-34.8%
<b>Poisoning, overdose or acute intoxication</b>	2	3	7	4	3	-25.0%
<b>Fall or crush</b>	6	1	0	2	2	-14.3%
<b>Animal bite or attack</b>	0	0	0	0	1	NS
<b>Other</b>	4	1	1	2	1	-50.0%
<b>Exposure</b>	0	0	0	0	0	NS
<b>Undetermined</b>	0	2	0	1	0	NS
<b>Unknown</b>	0	0	0	0	0	NS
<b>Total</b>	119	79	89	96	97	1.4%

**Table 8. The total number, three year average, and percent change of accidental deaths by cause and year from 2006-2011**



**Figure 8. The total number of accidental deaths for the top four causes by year from 2006-2011**

## Motor Vehicle Accidents

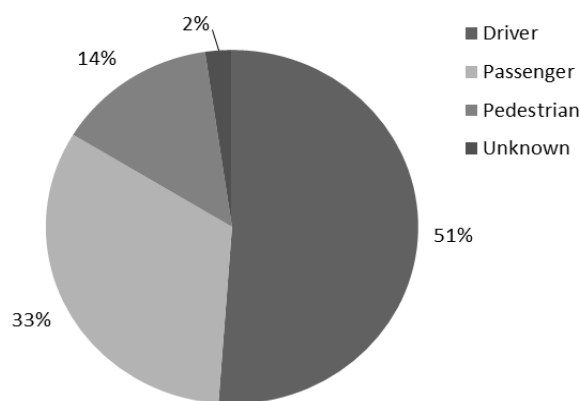
When children reach the age of one the leading known cause of death changes to motor vehicle accidents and continues through age 17 (Table 21). Motor vehicle-related deaths in children 6-17 were more often male victims than females (Table 10). The deaths resulting from motor vehicle collisions can be attributed to not wearing seat belts, careless driving (contributing factors included inexperience, speeding and distracted driving) and impairment. Motor vehicles include any motorized vehicle used for land transportation.

The primary types of motor vehicles involved in fatal accidents were automobiles and ATVs. This year more ATV-related deaths occurred compared to any previous year and all children were driving the ATV at the time of death.

**Table 9. All motor vehicle accidents by vehicle type 2006-2011**

Year	2006	2007	2008	2009	2010	2011	Total
All automobile	39	53	25	22	25	26	286
ATV	1	3	1	1	2	8	18
Other/Unknown	0	2	2	4	3	3	24
Bicycle	0	1	1	1	1	0	12
Tractor	0	0	4	0	0	0	6
Motorcycle	0	2	0	0	0	0	5
School bus	0	0	0	0	0	2	2
Snowmobile	0	0	0	0	1	0	1
None	4	4	2	2	1	0	24
<b>Total</b>	<b>46</b>	<b>67</b>	<b>41</b>	<b>31</b>	<b>35</b>	<b>43</b>	<b>396</b>

**Figure 9. Position of decedent in motorized vehicle**



In 2011 for all automobile accidents, slightly more than half were drivers. This is the first year more deaths were reported among drivers than passengers or pedestrians.

	2006	2007	2008	2009	2010	5-Yr Avg	2011	% Chg	Total
Male	24	36	19	17	21	23	27	15%	117
Female	21	31	22	14	14	20	16	-22%	102

**Table 10. Motor vehicle or other transport accident deaths by gender for years 2006-2011**

Driver’s license data were obtained from the Iowa Department of Transportation to examine the level of driving gradation for adolescents involved in motor vehicle crashes when the adolescent was the driver.

Drivers in Iowa under the age of 18 are on a graduated license system that is divided into the following levels:

**Instruction Permit**

Available at age 14 with consent of a parent/guardian. All driving must be supervised by a licensed driver that is an immediate family member age 21 or older, or a driver older than 25 with parental permission.

**Intermediate License**

Available at age 16 with consent of parent/guardian. Teens may drive without supervision between the hours of 5:00 a.m. to 12:30 a.m. Drivers must also be crash and violation free for 12 consecutive months before applying for their full license.

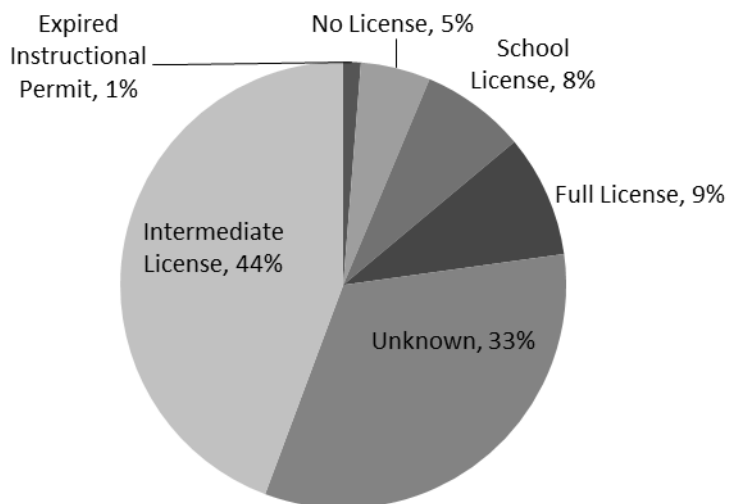
**Full License**

Available at age 17 after meeting all of the intermediate license conditions with parental consent. This license removes any previous driving restrictions giving drivers full privileges.

A cumulative review of license data for all adolescent drivers involved in fatal automobile crashes reveals that most had intermediate licenses at the time of the accident. Approximately 10 percent had either full licenses or school licenses (Figure 10).

The number of motor vehicle crashes where the driver was killed and an adolescent more than doubled from 2010 to 2011.

**Figure 10. Percent of drivers by license graduation, 2006-2011**



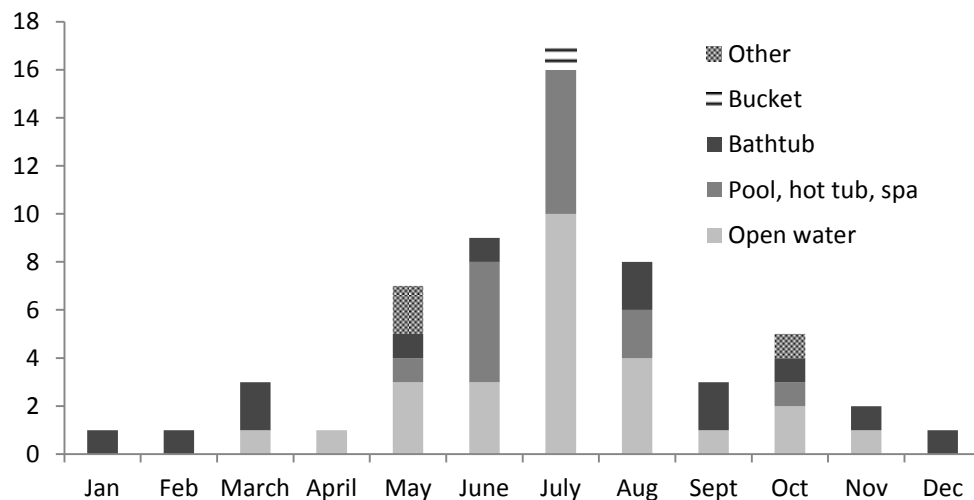
**Table 11. Level of license gradation for drivers involved in fatal motor vehicle crashes**

	2006	2007	2008	2009	2010	2011	Total
<b>License</b> Expired Instructional Permit	0	0	1	0	0	0	1
Unknown	3	4	1	2	2	0	26
School License	1	2	0	1	1	1	6
Full License	2	1	1	0	1	2	7
No License	0	1	1	0	0	2	4
Intermediate License	15	7	2	3	1	7	35
<b>Total</b>	21	15	6	6	5	12	79



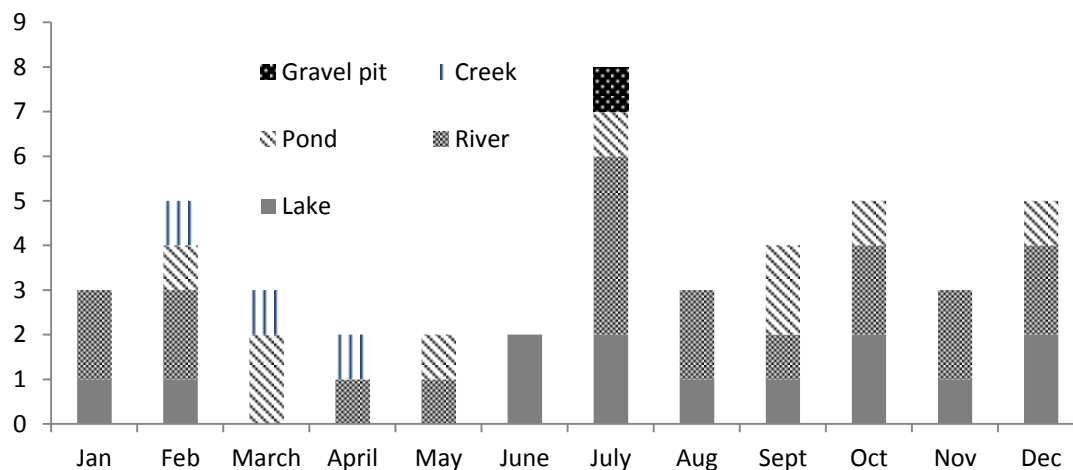
## Drowning

Many of these drowning incidents can be attributed to inadequate supervision, failure of inexperienced swimmers to know their true swimming abilities, or not using a personal flotation device (PFD). There were 11 drowning-related deaths in 2011. Drowning deaths have increased in recent years. When reviewing these deaths by location, they most often happen in open water, in the month of July, and in a river (Figure 11, Figure 12). Swimming pools are the second most common location comprising 23 percent of accidental drowning, followed by bathtub drowning at 17 percent.



**Figure 11. The number of drowning-related deaths by location of drowning in 2011**

Over the last six years, the highest number of accidental drowning deaths was among children ages 1-5 years, and happened in a pool, hot tub or spa (Table 25). A small number of bathtub drowning accidents have involved infants. Across all age groups, drowning in open water is most common, but is not the leading location of drowning until children reach the age of six.



**Figure 12. The number of drowning-related deaths by month and type of open water from 2006-2011**

## Poisonings

Three poisoning deaths occurred in 2011. Two children were siblings who died of carbon monoxide poisoning from an unintentional car fire started by their biological father. The third poisoning was the result of acute methadone poisoning from an unintentional overdose.

		2006	2007	2008	2009	2010	2011	Total
<b>&lt;1 Year</b>	Accidental overdose	0	0	0	0	0	1	1
	Other	0	0	0	1	0	0	1
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>
<b>1-5 Years</b>	Accidental overdose	0	0	2	0	0	1	3
	Other	0	0	0	1	1	0	2
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>5</b>
<b>6-12 Years</b>	Other	0	0	0	0	1	0	1
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>13-17 Years</b>	Accidental overdose	2	0	0	1	2	0	5
	Adverse effect but not overdose	1	1	0	0	1	0	3
	Deliberate poisoning	2	0	0	0	2	0	4
	Acute intoxication	0	0	0	0	0	1	1
	Unknown	0	1	0	0	0	0	1
	<b>Total</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>14</b>
<b>Total</b>	Accidental overdose	2	0	2	1	2	2	9
	Adverse effect but not overdose	1	1	0	0	1	0	3
	Deliberate poisoning	2	0	0	0	2	0	4
	Acute intoxication	0	0	0	0	0	1	1
	Other	0	0	0	2	2	0	4
	Unknown	0	1	0	0	0	0	1
<b>Total</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>7</b>	<b>3</b>	<b>22</b>	

Table 12. The total number of poisoning deaths by type, age group, and year from 2006-2011

## Suicide

In 2011, there were 18 suicides of children ages 17 and under (Table 13). Males comprised the majority of suicide victims with 15 deaths (there were only three female deaths) (Table 14). Of these 18 deaths, 13 were between the ages of 15-17 years and five were between the ages of 13-14 years. Eleven children hanged themselves, six used a firearm, and one used a motor vehicle (Table 13). The number of suicides due to hanging is an 83 percent increase compared to the previous five years. All female children hanged themselves, whereas an almost even number of male children used either a firearm or hanging (Table 14).

		2006	2007	2008	2009	2010	5-Yr Avg (2006-2010)	2011	% Chg
6-12 Years	Asphyxia	1	0	0	1	0	0	0	NS
	<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>
13-17 Years	Asphyxia	6	8	3	6	7	6	11	83%
	Weapon, including body part	11	4	6	1	6	6	6	7%
	Poisoning, overdose or acute intoxication	3	1	0	0	2	1	0	NS
	Motor vehicle or other transport	0	0	1	0	1	0	1	NS
	<b>Total</b>	<b>20</b>	<b>13</b>	<b>10</b>	<b>7</b>	<b>16</b>	<b>13</b>	<b>18</b>	<b>36%</b>
<b>Total</b>	Asphyxia	7	8	3	7	7	6	11	72%
	Weapon, including body part	11	4	6	1	6	6	6	7%
	Poisoning, overdose or acute intoxication	3	1	0	0	2	1	0	NS
	Motor vehicle or other transport	0	0	1	0	1	0	1	NS
	<b>Total</b>	<b>21</b>	<b>13</b>	<b>10</b>	<b>8</b>	<b>16</b>	<b>14</b>	<b>18</b>	<b>32%</b>

Table 13. The total number, five year average and percent change of suicide deaths by method and age group from 2006-2011

		2006	2007	2008	2009	2010	2011	Total
Male	Motor vehicle or other transport	0	0	0	0	1	1	2
	Asphyxia	4	6	2	6	5	8	31
	Weapon, including body part	10	4	5	1	5	6	31
	Poisoning, overdose or acute intoxication	2	1	0	0	0	0	3
	<b>Total</b>	<b>16</b>	<b>11</b>	<b>7</b>	<b>7</b>	<b>11</b>	<b>15</b>	<b>67</b>
Female	Motor vehicle or other transport	0	0	1	0	0	0	1
	Asphyxia	3	2	1	1	2	3	12
	Weapon, including body part	1	0	1	0	1	0	3
	Poisoning, overdose or acute intoxication	1	0	0	0	2	0	3
	<b>Total</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>19</b>
<b>Total</b>	Motor vehicle or other transport	0	0	1	0	1	1	3
	Asphyxia	7	8	3	7	7	11	43
	Weapon, including body part	11	4	6	1	6	6	34
	Poisoning, overdose or acute intoxication	3	1	0	0	2	0	6
	<b>Total</b>	<b>21</b>	<b>13</b>	<b>10</b>	<b>8</b>	<b>16</b>	<b>18</b>	<b>86</b>

Table 14. The number of suicide deaths by method and sex from 2006-2011

The disparity between the number of male and female suicide victims cannot be understated. Over the past six years, the proportion of males committing suicide has increased 44 percent (Table 15). From 2009 to 2010, the total number of suicides doubled and rose again from 2010 to 2011 (

Figure 14). The CDRT strongly recommends full investigation, including autopsy, in the case of a death by suicide to aid in characterizing these tragic events.

Sex	5-Yr Avg	2011	Total
Male	10	15	85
Female	3	3	24
Total	14	18	109

Table 15. The total number, five year average, and percent change of suicide deaths by sex

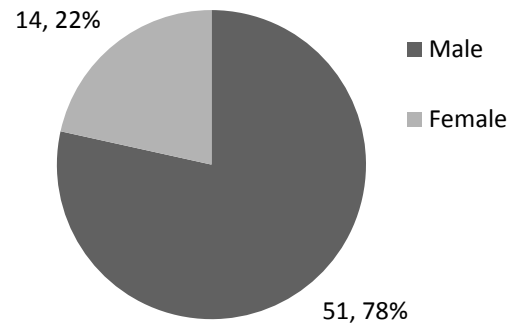


Figure 13. The total number and percentage of suicide deaths by sex for 2006-2011

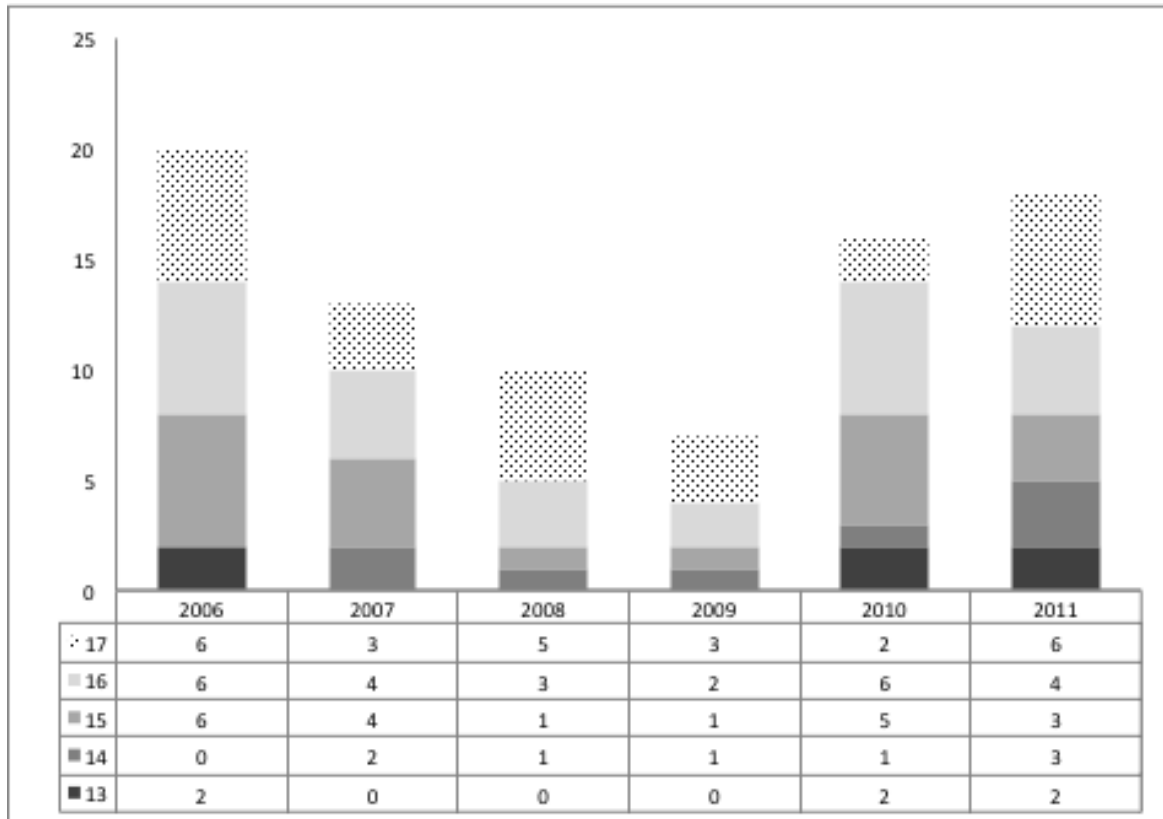


Figure 14. The total number of suicide deaths by age and year from 2006-2011

## Homicide

In 2011, Iowa experienced seven homicides affecting children ages 17 and under. This was the same number of homicides as the previous year (Table 16).

	2007	2008	2009	2010	2011	Total
<1 Year	2	5	2	2	2	18
1-5 Years	3	6	3	4	2	31
6-12 Years	0	5	0	0	1	9
13-17 Years	2	3	1	1	2	22
<b>Total</b>	<b>7</b>	<b>19</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>80</b>

**Table 16. Number of homicides by age group and year from 2007-2011**

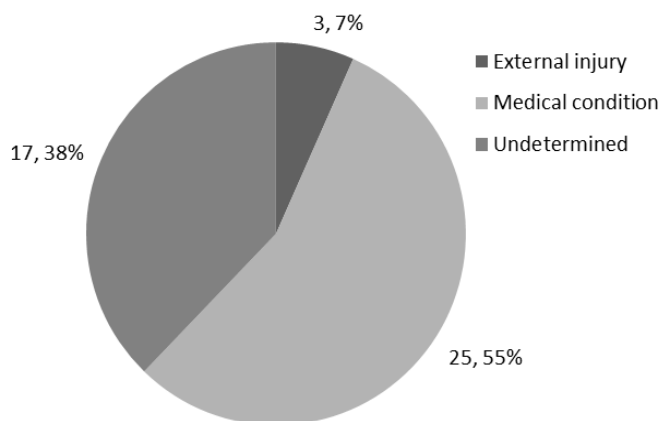
Two homicides were the result of abusive head trauma inflicted by a parent or caregiver. One homicide could have been prevented if the mother had used Iowa's Safe Haven law to give up custody of her infant without consequence. One homicide occurred as the victim was getting off the school bus. Another death was the result of a fire intentionally set by a relative. One homicide resulted from an argument over a video game, where the assailant had access to an unlocked handgun that he believed to be unloaded. And, one homicide was committed by a parent drowning their child inside a bathtub.

Age	Race/Gender	Method	Perpetrator/Criminal Charges
<b>1 day</b>	White/Male	Bathtub drowning	<b>31 year old female, biological mother</b> Charged with 2 <sup>nd</sup> Degree Murder
<b>5 months</b>	White/Male	Abusive head trauma	<b>35 year old male, biological father</b> Charged with Murder
<b>17 months</b>	White/Male	Asphyxia	Trial pending
<b>5 years</b>	White/Female	Abusive head trauma	<b>20 year old female, father's paramour</b> Charged with Child Endangerment
<b>7 years</b>	White/Female	Struck by vehicle while getting on school bus	<b>32 year old male, stranger</b> Charged with Vehicular Homicide
<b>14 years</b>	Black/Male	Thermal injuries and carbon monoxide poisoning from an intentionally set fire	<b>49 year old female, relative</b> Charged with 1 <sup>st</sup> Degree Burglary and 2 <sup>nd</sup> Degree Arson
<b>17 years</b>	White/Male	Shot with an unlocked handgun in an argument	<b>14 year old, stepbrother</b> Charged with Involuntary Manslaughter

**Table 17. All homicides by age, race, gender, method, and perpetrator for 2011**

## Undetermined

In 2011, the exact cause of death for 45 (13 percent of all deaths) children could not be determined and happened in children less than one year of age (Table 18). Of the 45 deaths, 23 (7 percent of all deaths) were classified as Sudden Infant Death Syndrome (SIDS) or Sudden Unexplained Infant Deaths (SUIDs), and two were believed to have unknown medical conditions (Appendix B). Two of the three accidental or external injury deaths were attributed to asphyxia (Figure 15).



	Frequency	Percent
<1 Year	39	86.7
1-5 Years	4	8.9
6-12 Years	1	2.2
13-17 Years	1	2.2
<b>Total</b>	<b>45</b>	<b>100.0</b>

Table 18. Number and percent of undetermined deaths by age group, 2011

Figure 15. Undetermined manner of death by cause category, count and percent, 2011

## Sleep-Related Infant Mortality (including Sudden Infant Death Syndrome/Sudden Unexplained Infant Death)

Sleep-related mortality continues to be a significant cause of death for Iowa's infants. Sleep-related deaths include those involving unsafe sleep positions, conditions, or environment, and cases of sudden unexplained infant death (SUIDs or SIDS), and any undetermined/unknown cause of death. The incidence of these deaths has remained stagnant for at least the past five years, despite the fact that many of these deaths are preventable.

A cumulative review of deaths occurring between 2006-2011 revealed the presence of known risk factors, some higher in certain race groups compared to others. The presence of a blanket was reported in almost half of cases; a pillow in a quarter

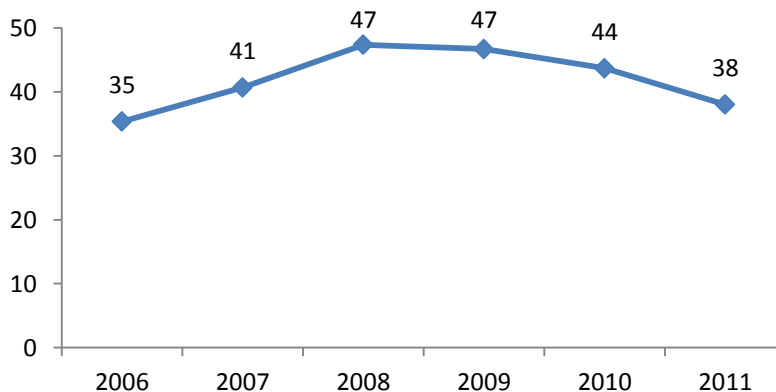
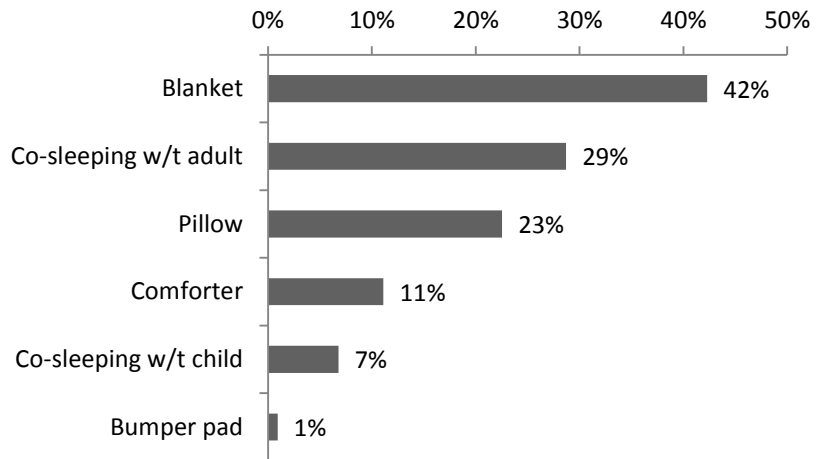
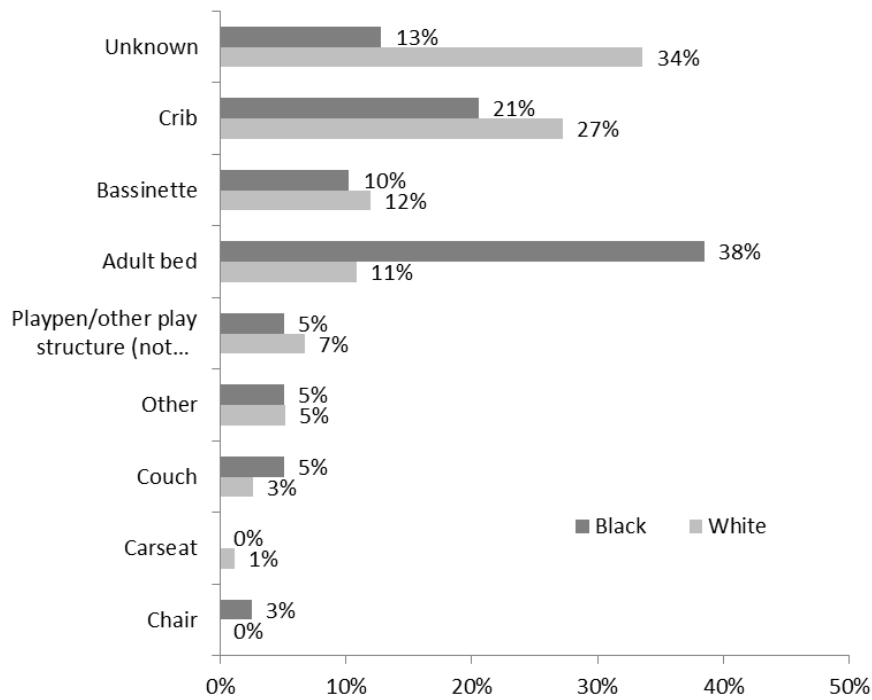


Figure 16. Number of sleep-related infant deaths, 2006-2011

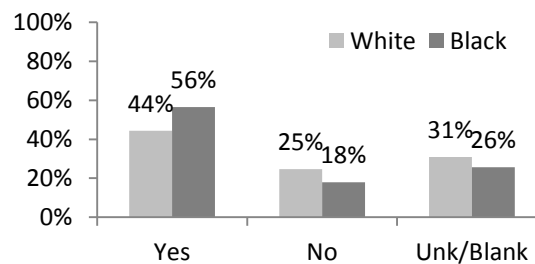
of cases. Co-sleeping is still taking place at an alarming 29 percent of cases. Among Blacks, an even higher percentage are sleeping in an adult bed and more than half are sleeping on the same surface as a person or animal. Only about a third of infants were reportedly sleeping in a crib or bassinette.



**Figure 17. Risk factors identified in sleep-related deaths, percentage of deaths where factor was present**



**Figure 18. Infant sleeping on same surface as another person or animal**



**Figure 19. Usual infant sleep position, White and Black race groups**

## Appendix A- Additional Tables

**Table 19. The total number, five year average, and percent change of deaths by county where the death occurred from 2006-2011**

County	2006	2007	2008	2009	2010	5-Yr Avg	5-Yr Rate per 10,000*	2011	2011 Rate per 10,000*
<b>State of Iowa</b>	<b>382</b>	<b>413</b>	<b>386</b>	<b>311</b>	<b>311</b>	<b>361</b>	<b>5.0</b>	<b>342</b>	<b>4.7</b>
Adair	0	6	7	2	2	3	19.7	0	0.0
Adams	0	0	0	1	2	1	7.1	0	0.0
Allamakee	4	3	0	2	0	2	5.4	0	0.0
Appanoose	1	2	1	0	1	1	3.5	2	6.9
Audubon	0	1	0	1	0	0.4	3.0	1	7.5
Benton	1	2	1	1	3	2	2.4	1	1.5
Black Hawk	16	16	20	11	14	15	5.4	12	4.2
Boone	1	4	2	1	6	3	4.5	4	6.4
Bremer	4	2	1	2	1	2	3.6	5	9.1
Buchanan	2	2	4	0	1	2	3.2	1	1.8
Buena Vista	2	2	4	2	1	2	4.4	4	7.9
Butler	2	1	0	1	2	1	3.4	1	2.9
Calhoun	2	1	1	1	2	1	6.8	0	0.0
Carroll	4	6	3	3	1	3	6.6	2	3.9
Cass	0	0	1	0	3	1	2.5	1	3.1
Cedar	2	3	4	3	2	3	6.2	2	4.4
Cerro Gordo	6	6	5	6	3	5	5.5	2	2.1
Cherokee	1	2	1	0	2	1	4.7	3	11.7
Chickasaw	3	1	2	1	1	2	5.3	2	6.6
Clarke	2	3	0	1	1	1	6.0	4	17.1
Clay	2	4	1	1	1	2	4.7	0	0.0
Clayton	4	6	4	3	3	4	9.5	3	7.1
Clinton	12	12	12	9	7	10	9.0	4	3.5
Crawford	1	6	2	1	0	2	4.4	0	0.0
Dallas	7	2	5	1	6	4	2.2	6	3.1
Davis	1	1	1	2	1	1	4.7	2	7.8
Decatur	2	3	0	0	2	1	7.3	0	0.0
Delaware	2	2	3	7	1	3	6.7	4	8.9
Des Moines	9	0	4	3	6	4	4.7	9	9.6
Dickinson	0	1	1	1	0	1	1.9	2	6.2
Dubuque	14	11	12	7	12	11	5.0	8	3.6
Emmet	3	2	1	0	0	1	5.1	0	0.0
Fayette	3	2	3	2	2	2	5.1	4	8.5
Floyd	3	3	3	3	1	3	6.7	2	5.1
Franklin	2	2	1	1	0	1	4.7	0	0.0
Fremont	0	0	3	1	0	1	4.7	0	0.0



IOWA CHILD DEATH REVIEW TEAM ANNUAL REPORT, 2011

Greene	5	0	1	0	0	1	5.6	1	4.6
Grundy	0	1	3	1	1	1	4.0	1	3.4
Guthrie	2	0	2	1	0	1	3.8	2	7.6
Hamilton	1	3	3	1	2	2	5.3	4	10.6
Hancock	1	1	1	0	2	1	3.8	0	0.0
Hardin	2	0	2	1	0	1	2.5	4	9.9
Harrison	2	3	2	1	2	2	5.6	3	8.3
Henry	3	3	3	1	0	2	4.3	0	0.0
Howard	6	3	4	0	1	3	11.6	2	8.3
Humboldt	0	1	3	1	1	1	5.3	0	0.0
Ida	0	0	2	1	0	1	3.5	2	11.8
Iowa	4	1	2	1	2	2	5.0	4	10.0
Jackson	4	3	2	0	3	2	5.2	4	8.7
Jasper	1	7	3	2	3	3	3.8	3	3.6
Jefferson	2	1	0	2	2	1	4.6	3	9.8
Johnson	12	12	14	34	15	17	6.7	7	2.7
Jones	2	1	3	1	3	2	4.3	0	0.0
Keokuk	2	2	2	0	1	1	5.7	3	12.3
Kossuth	2	2	1	0	2	1	3.9	1	2.8
Lee	2	4	5	4	2	3	4.3	5	6.3
Linn	24	18	30	18	14	21	4.0	23	4.4
Louisa	0	2	3	1	4	2	6.8	0	0.0
Lucas	1	2	2	1	5	2	10.1	3	13.8
Lyon	2	0	0	0	0	0	1.2	0	0.0
Madison	0	1	1	1	2	1	2.3	2	4.7
Mahaska	10	1	3	0	2	3	5.9	1	1.8
Marion	1	3	6	2	4	3	3.8	3	3.6
Marshall	1	4	5	3	3	3	3.1	2	1.9
Mills	0	2	5	1	0	2	4.2	1	2.6
Mitchell	1	2	3	0	0	1	4.5	1	3.8
Monona	2	0	0	0	0	0	2.0	1	4.9
Monroe	1	0	2	0	2	1	5.2	1	5.2
Montgomery	1	4	0	2	0	1	5.6	1	4.0
Muscatine	5	0	2	6	2	3	2.7	5	4.5
O'Brien	0	4	1	2	0	1	4.1	1	2.9
Osceola	0	2	0	0	0	0	2.7	1	6.7
Page	4	1	1	1	3	2	5.7	1	2.9
Palo Alto	1	2	0	0	0	1	2.9	2	9.7
Plymouth	3	5	2	0	2	2	3.7	2	3.1
Pocahontas	1	0	0	1	3	1	6.4	3	19.1
Polk	59	67	58	68	53	61	5.5	66	6.0
Pottawattamie	8	17	8	8	5	9	4.1	8	3.6
Poweshiek	2	2	1	0	1	1	3.0	3	7.6

IOWA CHILD DEATH REVIEW TEAM ANNUAL REPORT, 2011

<b>Ringgold</b>	1	4	1	0	2	2	12.9	3	24.1
<b>Sac</b>	6	11	2	1	1	4	18.1	3	12.9
<b>Scott</b>	17	24	20	13	20	19	4.6	19	4.7
<b>Shelby</b>	0	2	0	0	0	0	1.4	2	7.0
<b>Sioux</b>	3	8	4	3	2	4	4.4	7	7.7
<b>Story</b>	4	6	11	7	2	6	3.8	9	5.6
<b>Tama</b>	2	2	0	0	1	1	2.2	1	2.2
<b>Taylor</b>	0	1	1	1	1	1	5.4	1	6.8
<b>Union</b>	0	2	1	2	6	2	7.5	1	3.4
<b>Van Buren</b>	3	2	0	0	1	1	6.6	0	0.0
<b>Wapello</b>	4	5	5	3	5	4	5.4	1	1.2
<b>Warren</b>	10	2	5	3	7	5	4.5	6	5.0
<b>Washington</b>	2	2	2	3	2	2	4.0	3	5.5
<b>Wayne</b>	0	1	1	1	0	1	4.0	0	0.0
<b>Webster</b>	2	6	5	5	2	4	4.8	5	5.9
<b>Winnebago</b>	2	3	1	0	1	1	5.9	0	0.0
<b>Winneshiek</b>	3	4	0	1	0	2	3.7	0	0.0
<b>Woodbury</b>	15	15	18	13	5	13	4.9	5	1.8
<b>Worth</b>	3	0	1	1	1	1	6.8	1	5.7
<b>Wright</b>	2	3	1	2	2	2	6.5	2	6.5
<b>Unknown</b>	5	3	3	4	3	4	0	2	0

\*2010 census estimate

**Table 20. The total number of deaths by manner of death category and age, 2006-2011**

		2006	2007	2008	2009	2010	2011	Total
<b>&lt;1 Year</b>	<b>Natural</b>	180	206	169	133	128	129	945
	<b>Accident</b>	10	5	18	10	10	6	59
	<b>Homicide</b>	1	2	5	2	2	2	14
	<b>Undetermined</b>	26	31	33	31	38	39	198
	<b>Unknown</b>	0	0	0	0	1	2	3
	<b>Total</b>	<b>217</b>	<b>244</b>	<b>225</b>	<b>176</b>	<b>179</b>	<b>178</b>	<b>1219</b>
<b>1-5 Years</b>	<b>Natural</b>	23	20	31	32	15	27	148
	<b>Accident</b>	20	20	27	15	12	17	111
	<b>Homicide</b>	4	3	6	3	4	2	22
	<b>Undetermined</b>	2	3	0	2	3	4	14
	<b>Unknown</b>	0	0	0	0	0	1	1
	<b>Total</b>	<b>49</b>	<b>46</b>	<b>64</b>	<b>52</b>	<b>34</b>	<b>51</b>	<b>296</b>
<b>6-12 Years</b>	<b>Natural</b>	18	20	14	15	7	22	96
	<b>Accident</b>	6	18	16	13	13	11	77
	<b>Suicide</b>	1	0	0	1	0	0	2
	<b>Homicide</b>	1	0	5	0	0	1	7
	<b>Undetermined</b>	0	0	1	0	0	1	2
	<b>Unknown</b>	1	0	0	0	0	0	1
<b>Total</b>	<b>27</b>	<b>38</b>	<b>36</b>	<b>29</b>	<b>20</b>	<b>35</b>	<b>185</b>	
<b>13-17 Years</b>	<b>Natural</b>	20	18	20	22	17	21	118
	<b>Accident</b>	40	52	26	24	32	36	210
	<b>Suicide</b>	20	13	10	7	16	18	84
	<b>Homicide</b>	8	2	3	1	1	2	17
	<b>Undetermined</b>	1	0	2	0	2	1	6
	<b>Total</b>	<b>89</b>	<b>85</b>	<b>61</b>	<b>54</b>	<b>68</b>	<b>78</b>	<b>435</b>
<b>Total</b>	<b>Natural</b>	241	264	234	202	167	199	1307
	<b>Accident</b>	76	95	87	62	67	70	457
	<b>Suicide</b>	21	13	10	8	16	18	86
	<b>Homicide</b>	14	7	19	6	7	7	60
	<b>Undetermined</b>	29	34	36	33	43	45	220
	<b>Unknown</b>	1	0	0	0	1	3	5
<b>Total</b>	<b>382</b>	<b>413</b>	<b>386</b>	<b>311</b>	<b>301</b>	<b>342</b>	<b>2135</b>	

**Table 21. The total number of accidental manner of death causes by age group and year from 2006-2011**

		2006	2007	2008	2009	2010	2011	Total
<b>&lt;1 Year</b>	<b>Unknown</b>	198	234	201	162	167	171	1133
	<b>Asphyxia</b>	8	4	17	9	6	3	47
	<b>Weapon, including body part</b>	1	1	3	2	2	1	10
	<b>Undetermined</b>	7	1	0	1	0	0	9
	<b>Motor vehicle or other transport</b>	1	2	1	0	2	1	7
	<b>Drowning</b>	0	0	1	0	2	1	4
	<b>Fire, burn or electrocution</b>	1	0	1	1	0	0	3
	<b>Other</b>	1	1	1	0	0	0	3
	<b>Poisoning, overdose or acute intoxication</b>	0	0	0	1	0	1	2
	<b>Fall or crush</b>	0	1	0	0	0	0	1
	<b>Total</b>	<b>217</b>	<b>244</b>	<b>225</b>	<b>176</b>	<b>179</b>	<b>178</b>	<b>1219</b>
	<b>1-5 Years</b>	<b>Unknown</b>	26	23	31	33	18	31
<b>Motor vehicle or other transport</b>		9	6	10	5	7	4	41
<b>Drowning</b>		5	4	3	4	3	5	24
<b>Fire, burn or electrocution</b>		2	2	6	4	0	3	17
<b>Asphyxia</b>		3	3	4	2	2	2	16
<b>Weapon, including body part</b>		3	0	5	0	2	1	11
<b>Fall or crush</b>		1	4	0	1	0	2	8
<b>Other</b>		0	1	3	1	1	1	7
<b>Poisoning, overdose or acute intoxication</b>		0	0	2	1	1	1	5
<b>Exposure</b>		0	2	0	0	0	0	2
<b>Undetermined</b>		0	1	0	1	0	0	2
<b>Animal bite or attack</b>		0	0	0	0	0	1	1
<b>Total</b>		<b>49</b>	<b>46</b>	<b>64</b>	<b>52</b>	<b>34</b>	<b>51</b>	<b>296</b>
<b>6-12 Years</b>	<b>Unknown</b>	19	20	15	15	7	22	98
	<b>Motor vehicle or other transport</b>	3	13	12	8	7	7	50
	<b>Fire, burn or electrocution</b>	0	1	2	3	3	1	10
	<b>Asphyxia</b>	2	0	2	2	1	3	10
	<b>Drowning</b>	2	2	1	1	1	2	9
	<b>Weapon, including body part</b>	1	1	3	0	0	0	5
	<b>Fall or crush</b>	0	1	1	0	0	0	2
	<b>Poisoning, overdose or acute intoxication</b>	0	0	0	0	1	0	1
<b>Total</b>	<b>27</b>	<b>38</b>	<b>36</b>	<b>29</b>	<b>20</b>	<b>35</b>	<b>185</b>	

IOWA CHILD DEATH REVIEW TEAM ANNUAL REPORT, 2011

<b>13-17 Years</b>	<b>Motor vehicle or other transport</b>	33	46	18	18	19	31	165
	<b>Unknown</b>	20	18	20	22	20	21	121
	<b>Weapon, including body part</b>	21	5	9	3	7	7	52
	<b>Asphyxia</b>	7	10	6	6	9	13	51
	<b>Drowning</b>	3	2	3	2	7	4	21
	<b>Poisoning, overdose or acute intoxication</b>	5	2	0	1	5	1	14
	<b>Fall or crush</b>	0	2	5	0	0	0	7
	<b>Fire, burn or electrocution</b>	0	0	0	2	1	1	4
	<b>Total</b>	<b>89</b>	<b>85</b>	<b>61</b>	<b>54</b>	<b>68</b>	<b>78</b>	<b>435</b>
<b>Total</b>	<b>Unknown</b>	263	295	267	232	212	245	1514
	<b>Motor vehicle or other transport</b>	46	67	41	31	35	43	263
	<b>Asphyxia</b>	20	17	29	19	18	21	124
	<b>Weapon, including body part</b>	26	7	20	5	11	9	78
	<b>Drowning</b>	10	8	8	7	13	12	58
	<b>Fire, burn or electrocution</b>	3	3	9	10	4	5	34
	<b>Poisoning, overdose or acute intoxication</b>	5	2	2	3	7	3	22
	<b>Fall or crush</b>	1	8	6	1	0	2	18
	<b>Undetermined</b>	7	2	0	2	0	0	11
	<b>Other</b>	1	2	4	1	1	1	10
	<b>Exposure</b>	0	2	0	0	0	0	2
	<b>Animal bite or attack</b>	0	0	0	0	0	1	1
	<b>Total</b>	<b>382</b>	<b>413</b>	<b>386</b>	<b>311</b>	<b>301</b>	<b>342</b>	<b>2135</b>

**Table 22. The total number of infant deaths by infantile period, race, and year from 2006-2011**

		2006	2007	2008	2009	2010	2011	Total
<b>Neonate</b>	<b>Natural</b>	135	146	129	103	94	107	714
	<b>Accident</b>	2	0	3	0	2	0	7
	<b>Homicide</b>	0	1	1	0	0	1	3
	<b>Undetermined</b>	3	3	4	1	2	0	13
	<b>Unknown</b>	0	0	0	0	1	1	2
	<b>Total</b>	<b>140</b>	<b>150</b>	<b>137</b>	<b>104</b>	<b>99</b>	<b>109</b>	<b>739</b>
<b>Postneonate</b>	<b>Natural</b>	45	60	40	30	34	22	231
	<b>Accident</b>	8	5	15	10	8	6	52
	<b>Homicide</b>	1	1	4	2	2	1	11
	<b>Undetermined</b>	23	28	29	30	36	39	185
	<b>Unknown</b>	0	0	0	0	0	1	1
	<b>Total</b>	<b>77</b>	<b>94</b>	<b>88</b>	<b>72</b>	<b>80</b>	<b>69</b>	<b>480</b>
<b>Child</b>	<b>Natural</b>	61	58	65	69	39	70	362
	<b>Accident</b>	66	90	69	52	57	64	398
	<b>Suicide</b>	21	13	10	8	16	18	86
	<b>Homicide</b>	13	5	14	4	5	5	46
	<b>Undetermined</b>	3	3	3	2	5	6	22
	<b>Unknown</b>	1	0	0	0	0	1	2
<b>Total</b>	<b>165</b>	<b>169</b>	<b>161</b>	<b>135</b>	<b>122</b>	<b>164</b>	<b>916</b>	
<b>Total</b>	<b>Natural</b>	241	264	234	202	167	199	1307
	<b>Accident</b>	76	95	87	62	67	70	457
	<b>Suicide</b>	21	13	10	8	16	18	86
	<b>Homicide</b>	14	7	19	6	7	7	60
	<b>Undetermined</b>	29	34	36	33	43	45	220
	<b>Unknown</b>	1	0	0	0	1	3	5
<b>Total</b>	<b>382</b>	<b>413</b>	<b>386</b>	<b>311</b>	<b>301</b>	<b>342</b>	<b>2135</b>	

**Table 23. Mortality by infantile period, race and year**

		2006	2007	2008	2009	2010	2011	Total
<b>Neonate</b>	<b>White</b>	127	133	114	81	74	48	577
	<b>Black</b>	7	14	12	20	13	5	71
	<b>Pacific Islander</b>	1	0	1	0	1	0	3
	<b>Asian</b>	3	2	1	0	0	2	8
	<b>American Indian</b>	2	1	2	1	1	0	7
	<b>Multi-race</b>	0	0	2	1	5	1	9
	<b>Unknown</b>	0	0	5	1	5	53	64
	<b>Total</b>	<b>140</b>	<b>150</b>	<b>137</b>	<b>104</b>	<b>99</b>	<b>109</b>	<b>739</b>
<b>Postneonate</b>	<b>White</b>	67	79	68	66	66	43	389
	<b>Black</b>	8	13	15	4	9	7	56
	<b>Asian</b>	0	1	0	1	2	0	4
	<b>Multi-race</b>	1	0	4	1	3	5	14
	<b>Unknown</b>	1	1	1	0	0	14	17
	<b>Total</b>	<b>77</b>	<b>94</b>	<b>88</b>	<b>72</b>	<b>80</b>	<b>69</b>	<b>480</b>
<b>Child</b>	<b>White</b>	146	160	139	122	104	115	786
	<b>Black</b>	16	9	10	12	12	6	65
	<b>Asian</b>	1	0	7	0	3	5	16
	<b>American Indian</b>	0	0	1	0	0	0	1
	<b>Multi-race</b>	0	0	2	0	1	2	5
	<b>Unknown</b>	2	0	2	1	2	36	43
	<b>Total</b>	<b>165</b>	<b>169</b>	<b>161</b>	<b>135</b>	<b>122</b>	<b>164</b>	<b>916</b>
<b>Total</b>	<b>White</b>	340	372	321	269	244	206	1752
	<b>Black</b>	31	36	37	36	34	18	192
	<b>Pacific Islander</b>	1	0	1	0	1	0	3
	<b>Asian</b>	4	3	8	1	5	7	28
	<b>American Indian</b>	2	1	3	1	1	0	8
	<b>Multi-race</b>	1	0	8	2	9	8	28
	<b>Unknown</b>	3	1	8	2	7	103	124
	<b>Total</b>	<b>382</b>	<b>413</b>	<b>386</b>	<b>311</b>	<b>301</b>	<b>342</b>	<b>2135</b>

**Table 24. Position of child at time of motor vehicle accident by year**

	2004	2005	2006	2007	2008	2009	2010	2011
<b>Driver</b>	18	19	22	18	7	10	8	22
<b>Passenger</b>	39	35	18	40	23	16	21	14
<b>Pedestrian</b>	6	8	5	6	10	4	5	6
<b>On bicycle</b>	3	3	0	1	1	1	1	0
<b>Unknown</b>	1	1	1	2	0	0	0	1



**Table 25. Accidental drowning by water type, age group and year**

		2006	2007	2008	2009	2010	2011	Total
<b>&lt;1 Year</b>	<b>Bathtub</b>	0	0	1	0	2	1	4
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>4</b>
<b>1-5 Years</b>	<b>Pool, hot tub, spa</b>	3	2	2	0	0	3	10
	<b>Open water</b>	1	2	0	0	2	1	6
	<b>Bathtub</b>	0	0	0	2	1	1	4
	<b>Bucket</b>	0	0	1	0	0	0	1
	<b>Other</b>	1	0	0	1	0	0	2
	<b>Unknown</b>	0	0	0	1	0	0	1
	<b>Total</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>5</b>	<b>24</b>
<b>6-12 Years</b>	<b>Open water</b>	1	1	1	0	0	1	4
	<b>Pool, hot tub, spa</b>	0	0	0	1	1	1	3
	<b>Bathtub</b>	1	1	0	0	0	0	2
	<b>Total</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>9</b>
<b>13-17 Years</b>	<b>Open water</b>	3	2	3	1	4	3	16
	<b>Bathtub</b>	0	0	0	1	1	1	3
	<b>Pool, hot tub, spa</b>	0	0	0	0	2	0	2
	<b>Total</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>7</b>	<b>4</b>	<b>21</b>
<b>Total</b>	<b>Open water</b>	5	5	4	1	6	5	26
	<b>Pool, hot tub, spa</b>	3	2	2	1	3	4	15
	<b>Bathtub</b>	1	1	1	3	4	3	13
	<b>Bucket</b>	0	0	1	0	0	0	1
	<b>Unknown</b>	0	0	0	1	0	0	1
	<b>Other</b>	1	0	0	1	0	0	2
	<b>Total</b>	<b>10</b>	<b>8</b>	<b>8</b>	<b>7</b>	<b>13</b>	<b>12</b>	<b>58</b>

## **Appendix B**

### **Sleep-Related Infant Mortality Profile**

**2004-2011**

**Iowa Child Death Review Team**

**Prepared by the Iowa Department of Public Health**



**Patty Keeley, Meghan Harris, Caitlin Lueck, and Brittany Perkins**

### Summary

Over the past five years, sleep-related infant deaths have averaged 43 per year, with a range of 36 (2009) to 55 (2008). The average number of deaths per month is three. The five year moving average slows little fluctuation from year to year with the exception of 2008, where a spike in winter deaths resulted in a high count for that year (Figure 1). The spike was attributed in part to respiratory infections, some undetected, including RSV, influenza, and bacterial infections of the upper and lower respiratory tracts.

The average age at death for seven years was 2.8 months, with a range of 1 to 4.5 months.



Figure 1. The five year average of sleep-related deaths from 2006-2011.

Month	5-Yr mean	SD	Mean+2SD
Jan	4	3.1	10
Feb	3	2.0	7
March	2	1.2	5
April	4	1.8	7.5
May	4	1.4	6.5
June	4	1.9	7.3
July	4	1.8	7
Aug	3	2.0	7.2
Sept	4	2.5	9
Oct	4	1.3	6.3
Nov	2	0.8	3.8
Dec	3	1.8	7

Table 1. Mean monthly mortality and threshold data for 2007-2011.

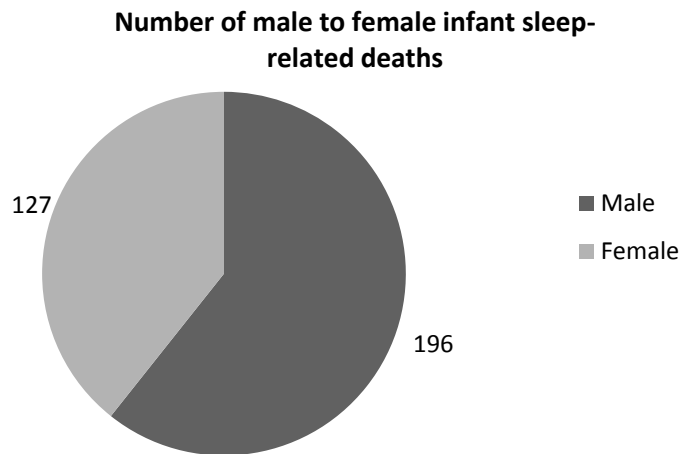


Figure 3. Number of infant sleep-related deaths from 2004-2011 by sex.

It is important to examine gender and racial breakdowns to determine which groups might be disproportionately impacted by sleep-related deaths. There is nearly a 1.5:1 ratio of male to female deaths (Figure 3). This is consistent with findings in scientific literature, though is not fully understood. Consistent with research studies on Sudden Infant Death (SID), male infants are at higher risk for experiencing sleep-related death than females. The percent distribution of deaths by race group changes only slightly over time (Table 2). The percent of deaths occurring among Blacks is higher than the percent that race group comprises for the population of Iowa.

## Iowa Sleep-Related Infant Mortality Profile, 2004-2011

	2004	%	2005	%	2006	%	2007	%	2008	%	2009	%	2010	%	2011	%
<b>White</b>	25	76	32	94	32	86	41	84	42	76	34	94	31	78	31	82
<b>Black</b>	4	12	2	6	4	11	8	16	11	20	2	6	6	15	2	5
<b>Asian</b>	1	3	0	0	0	0	0	0	0	0	0	0	1	3	0	0
<b>American Indian</b>	3	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Multi-Racial</b>	0	0	0	0	1	3	0	0	2	4	0	0	2	5	5	13

Table 2. The number of infant sleep-related deaths by race group from 2004-2011.

### Classification of Deaths

Sleep-related deaths are classified for manner of death as “natural”, “accident”, or “undetermined”. Deaths that are undetermined are typically SIDS cases. From 2004 to 2011, there is a change in the use of manner of death classification “natural” (Figure 4). In 2009, it appears the use of “natural” became less frequently used as there was not a significant change in the average number of deaths per year.

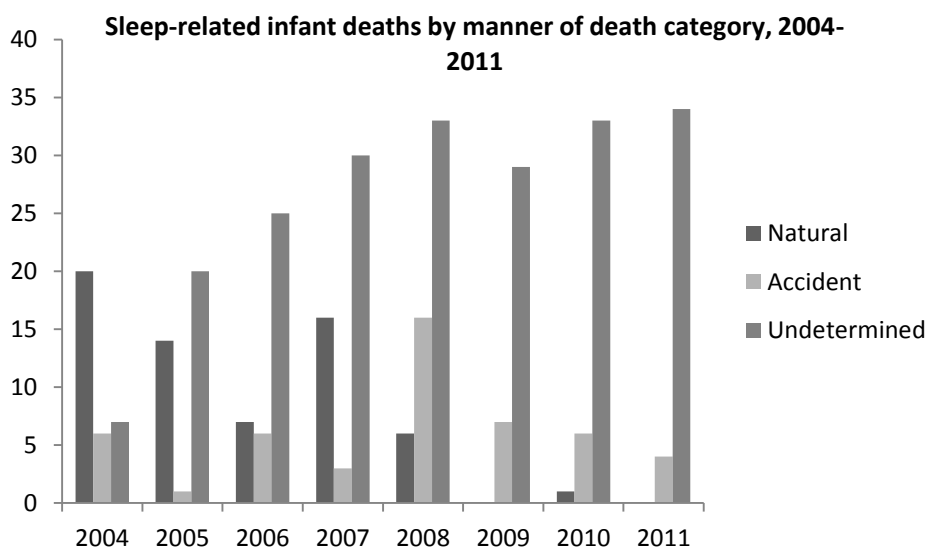


Figure 4. The number of sleep-related deaths by manner of death from 2004-2011.

Sleep related deaths are categorized for cause of death as “external injury”, “medical condition”, “undetermined”, and “unknown”. The category “medical condition” has the highest number of sleep related deaths by year (Figure 5). Further investigation into the medical conditions compromising the category for cause of death is needed.

**Risk Factors**

Risk factors that may contribute to infant death were evaluated. The most common item found in the sleeping space with an infant was a blanket. However, 29 percent of the deaths occurred when the infant was co-sleeping with an adult (Figure 6). There is a significant racial disparity among Blacks in that nearly 40 percent of infants are regularly placed to sleep in an adult bed and in nearly all instances an adult or child was co-sleeping in the adult bed (Figure 7 and Figure 8).

Other risk factors identified were the presence of a pillow or comforter. Non-significant risk factors included the presence of bumper pads. Protective factors of pacifier or fan use were not reported frequently enough to be included in this analysis.

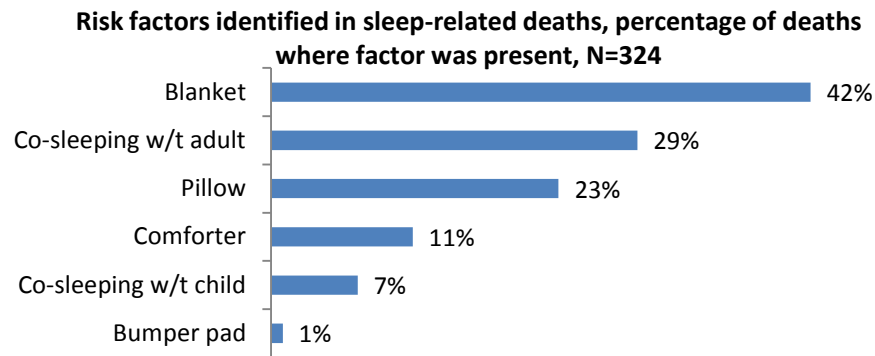


Figure 6. The percent of sleep-related deaths where identified risk factors were present.

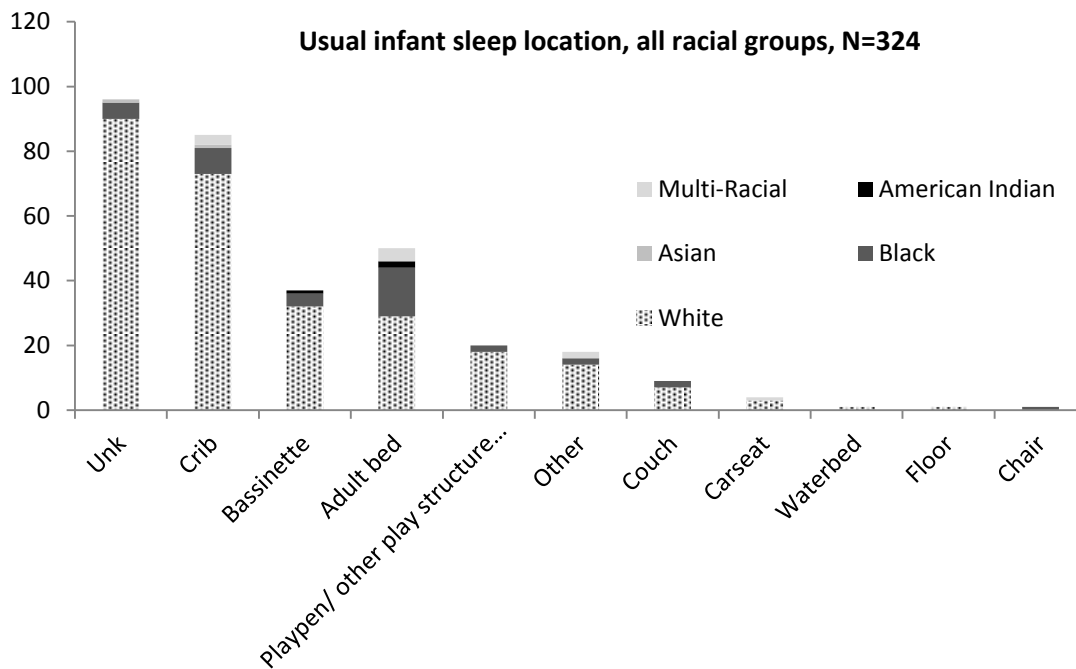
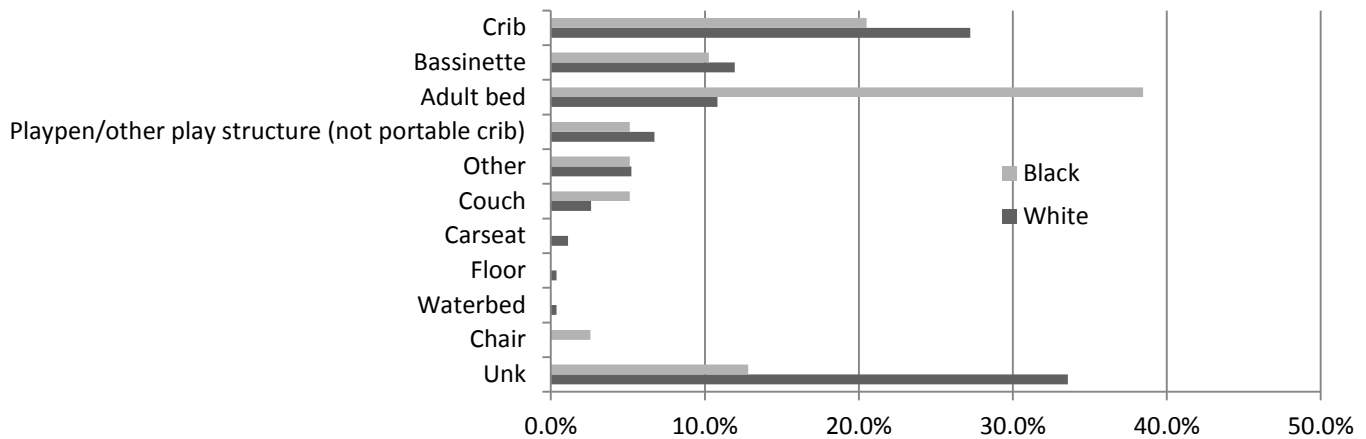


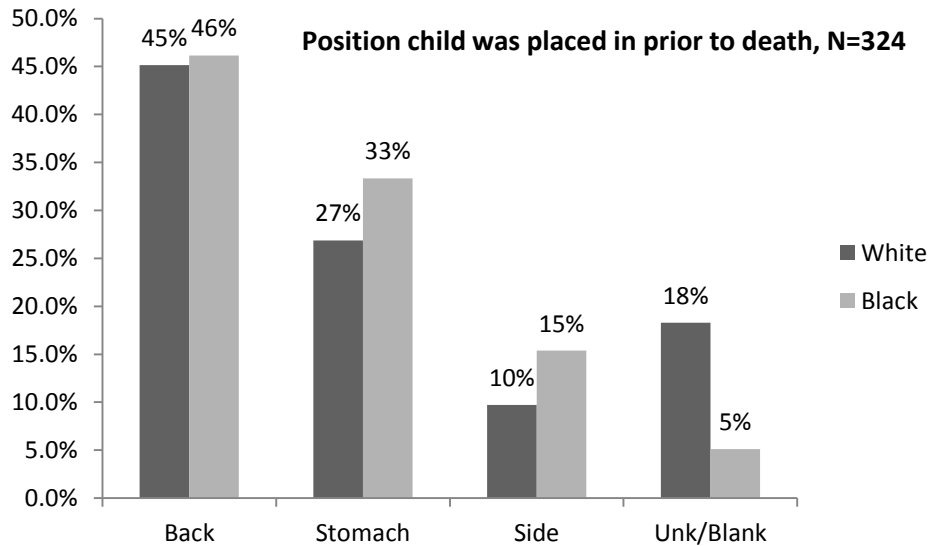
Figure 7. The case count of usual infant sleep locations for all race groups from 2004-2011.

**Usual infant sleep location, White and Black race groups, N=307**



**Figure 8. The percent distribution of usual infant sleep positions for White and Black race groups.**

Sleep positioning is a critically important aspect of preventing sleep-related infant deaths. In this evaluation, infants were reportedly placed on their backs, the recommended position, nearly half of the time. Infants were placed on their stomachs about one-third of the time and Black infants were placed in this position more often than Whites (Figure 9). However, the statistics reversed for the position that infants were found in when unresponsive or deceased (Figure 10). Infant development research demonstrates that ages 4-6 months is the most common age for infants to acquire the ability to roll-over<sup>1</sup>.



**Figure 9. The percent distribution of sleep positions infants were placed in prior to death for White and Black race groups.**

<sup>1</sup> <http://www.mayoclinic.com/health/infant-development/FL00099>

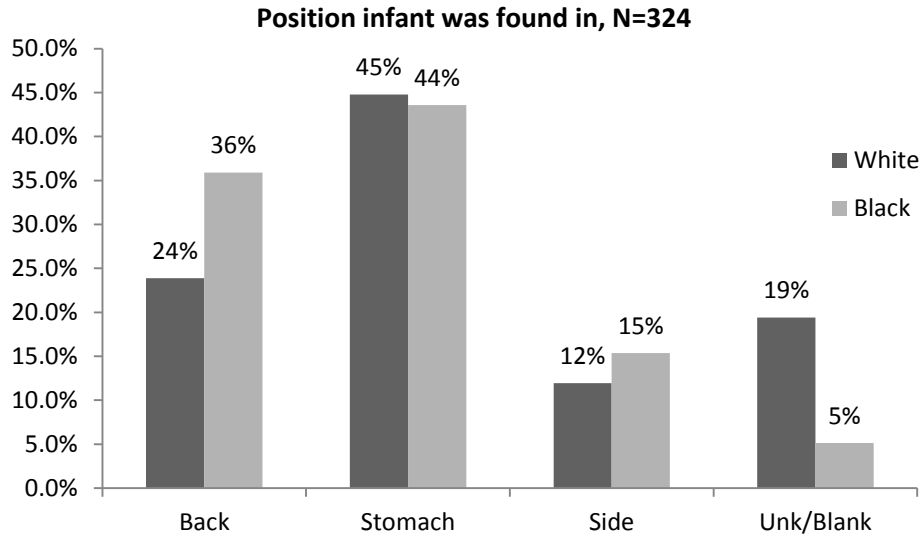


Figure 10. The percent distribution of sleep positions infants were found in after death for White and Black race groups.

Infants were most often found on top of the sleep surface they were placed on. However, other locations relative to the sleep surface varied and were not significant by position or race group (Figure 11). More than half of Black infants were reportedly sleeping on the same surface as another person or an animal and this statistic was quite close to others assessing co-sleeping with an adult or infant (Figure 12).

A crib (non-portable) was the most common location infants were placed in before death and portable cribs were the location of sleep in only 4 percent of cases.

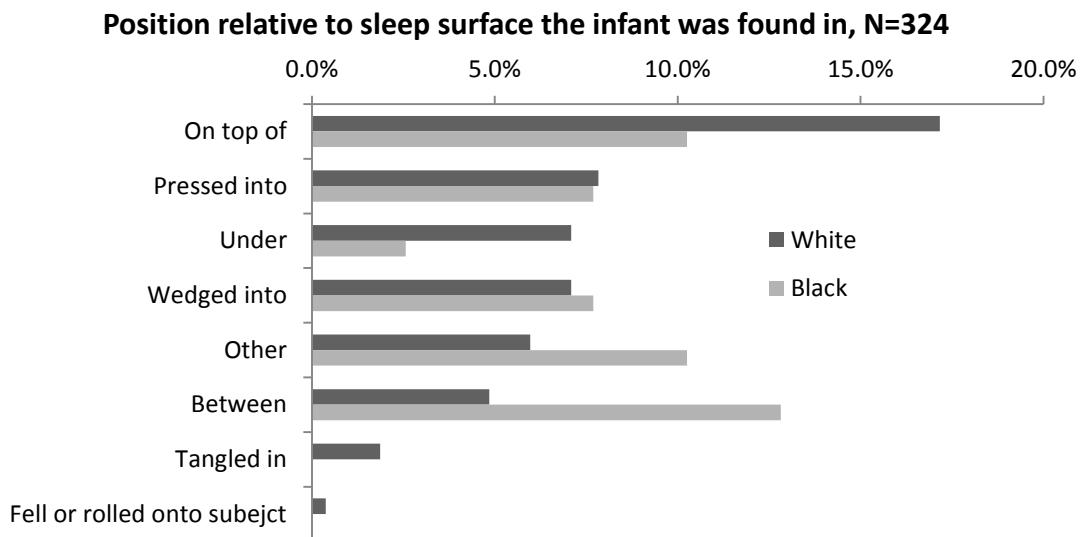
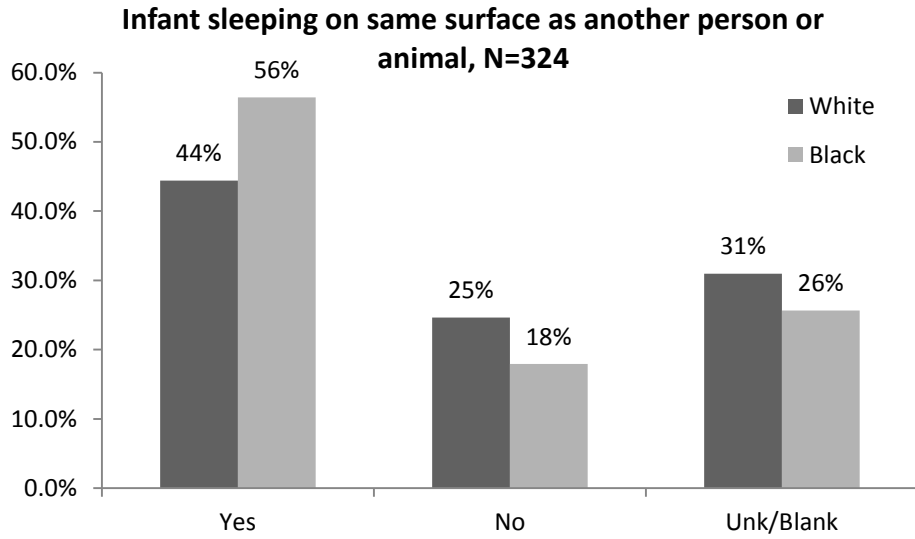


Figure 11. The percent distribution of position relative to sleep surface the infants were found in for White and Black race groups.



**Figure 12. The percent distribution of infants sleeping on the same surface as another person or animal for White and Black race groups.**



### Caregiver Profile

A profile of the primary and secondary caregivers for the 324 cases of sleep-related infant death was developed and includes frequency and percentage of significant factors. *Compared to the general population*, caregivers of infants who died from sleep-related causes were twice as likely to be unemployed, of low-income status and having completed only high school. At the time of infant death, one-third of caregivers were receiving social services, including 31 percent on Medicaid. Other negative factors include 24 percent of caregivers with a history of drug abuse, 12 percent were known perpetrators of child maltreatment and two percent had experienced a prior infant death (Table 3).

\*National average the last 10 years is 6.7%; Iowa rate in 2013 was 4.9%

\*\*Compared to 11.9% of Iowans living at or below the poverty level

†Percent of Iowans that have completed HS as of 2011 is 90.3%; Percent of Iowans that have completed college is 24.9%

‡Five year average of Iowa mothers receiving WIC is 37.49%

§In 2008-2010, 5.33% of Iowans reported illicit drug use (NSDUH).

	N=648	Frequency	Percent
<b>Employment status</b>			
Employed	167	26	
Unemployed*	62	10	
Stay at home	18	3	
Unknown	401	62	
<b>Income status</b>			
Low**	148	23	
High	2	0	
Medium	8	1	
Unknown	490	76	
<b>Educational attainment level</b>			
HS†	268	41	
College†	103	16	
Less than HS	99	15	
Post graduate	4	1	
Unknown	174	27	
<b>Receiving any social services</b>			
Yes‡	220	34	
No	109	17	
Unknown	319	49	
<b>Medicaid</b>			
Unknown	449	69	
Yes	199	31	
<b>History of drug abuse</b>			
Yes‡	158	24	
No	216	33	
Unknown	274		
<b>Perpetrator of maltreatment of a child</b>			
Yes	78	12	
No	388	60	
Unknown	182	28	
<b>Received mental health services</b>			
Yes	21	3	
No	220	34	
Unknown	407	63	
<b>Experienced prior death</b>			
Yes	11	2	
No	448	69	
Unknown	189	29	

**Table 3. Demographics of primary and secondary caregivers for sleep-related infant death cases from 2004-2011.**

**Pregnancy and access to prenatal care**

Pregnancy data were available on a subset of the 324 cases examined. Overall, 94 percent of mothers reported accessing prenatal care on a regular basis\*. However, 25 percent reported medical complications with pregnancy, nearly 44 percent reported smoking\*\* and 8 percent reported drug use during pregnancy. There were no cases of fetal alcohol syndrome reported and less than two percent of mothers reported drinking during pregnancy (Table 4).

*\*From 2004-2011, 96.29% of Iowan mothers received prenatal care (IA Birth Certificate Data)*

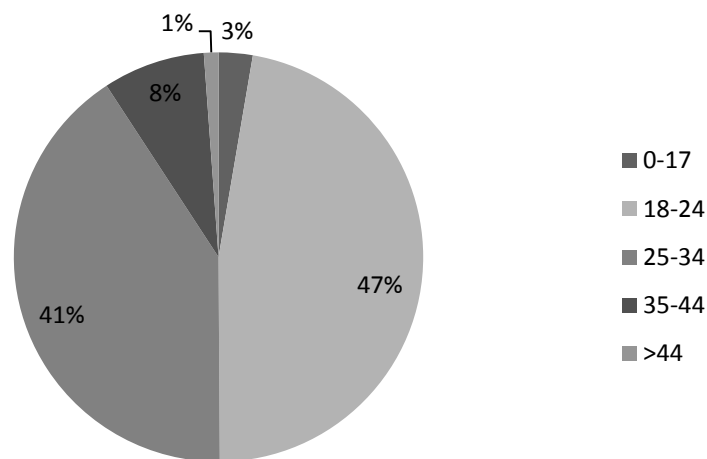
*\*\*Compared to 13.7% of Iowan mothers reported smoking during pregnancy from 2004-2011(IA Birth Certificate Data) and 16.1% of all Iowans reported smoking in 2011(BRFSS).*

	N=324	Frequency	Percent
<b>Medical complications</b>			
Unknown		244	75.3
Yes		80	24.7
<b>Smoked during pregnancy</b>			
Unknown		183	56.5
Yes		141	43.5
<b>Drug use during pregnancy</b>			
Unknown		297	91.7
Yes		27	8.3
<b>Baby drug test positive after birth</b>			
Unknown		312	96.3
Yes		12	3.7
<b>Used alcohol</b>			
Unknown		318	98.1
Yes		6	1.9
<b>Issues accessing prenatal care</b>			
Unknown		133	.9
Yes		20	6.2
No		171	52.8

**Table 4. Pregnancy data for mothers of infants in sleep-related deaths from 2004-2011.**

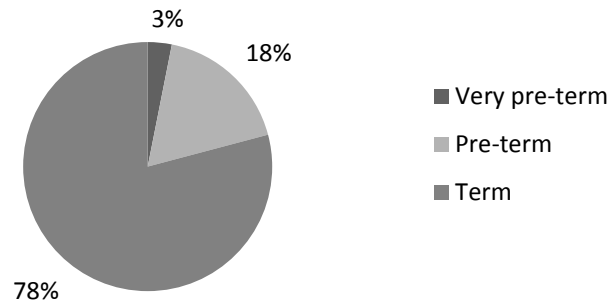
Female caregivers were most often aged 18-24 years followed by those aged 25 to 34 years (Figure 13). Cases were typically infants born full term, though risk for sleep-related death increased after 35 weeks gestation (Figure 14 and Figure 15). The frequency of low birth weight (<2500 grams) infants was at 19 percent.

**Age group category of female caregivers, N=521**

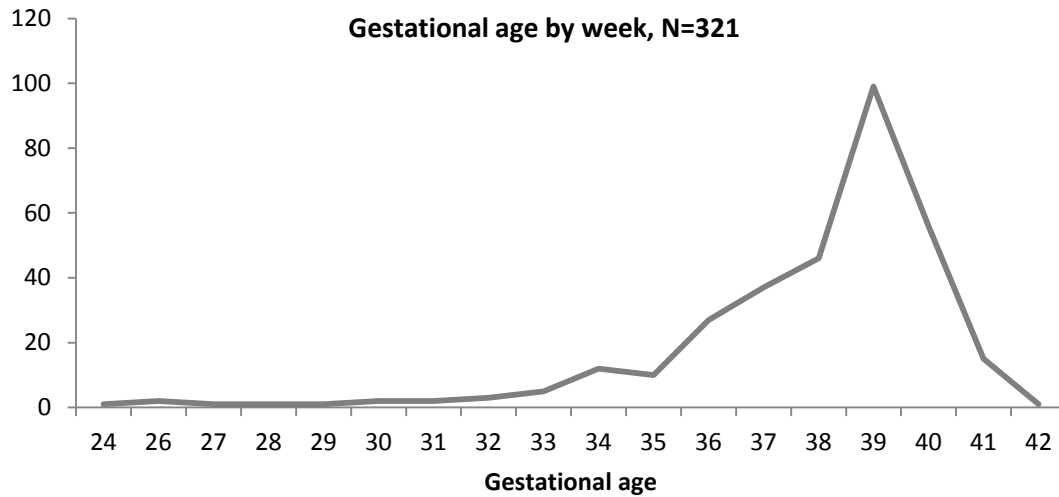


**Figure 13. The percent distribution of female caregivers by age group.**

**Percent category of term at delivery, N=321**



**Figure 14. The percent distribution of sleep-related death events by category of term at delivery from 2004-2011.**



**Figure 15. The case count of sleep related death events by gestational age by week from 2004-2011.**  
 \*From 2004-2011, 3.39% of infants were born at or before 33 weeks, 8.1% of infants were born between 34-36 weeks and 88.5% of infants were born at or after 37 weeks (IA Birth Certificate Data).