



Iowa's
CHILD DEATH
Review Team

Report to the Governor and General Assembly

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2014 Annual Report



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Contents

Introduction from the Chairperson	3
Iowa Child Death Review Team Members.....	4
Executive Summary.....	6
Recommendations to the Governor and the Iowa General Assembly.....	10
History of Iowa Child Death Review Team	11
Annual Summary.....	13
Deaths by Cause and Manner.....	15
Infant Mortality.....	17
Natural Deaths	20
Accidental Deaths	22
Drowning.....	25
Poisonings	26
Suicide.....	27
Homicide	29
Undetermined.....	32
Sleep-Related Mortality and SIDS.....	32

Tables

Table 1. Total number, five-year average, and percent change of deaths by age group	13
Table 2. Total number of deaths by race category ages 0-17 years from 2009-2014.....	13
Table 3. Total number of deaths by ethnicity ages 0-17 years from 2009-2014	13
Table 4. Neonatal, post-neonatal, and child deaths by year, 2009-2014.....	17
Table 5. Total number of infant deaths by infantile period, sex, and year from 2009-2014	18
Table 6. The total number of infant deaths by infantile period, cause of death category, and year from 2009-2014	18
Table 7. Location of incident, 2009-2014	19
Table 8. The total number, five year average, and percent change of natural deaths for infants less than one year of age by medical condition cause and year from 2009-2014.....	20
Table 9. The total number of natural deaths by age group and year from 2009-2014	21
Table 10. The total number, five-year average, and percent change of accidental deaths by cause and year from 2009-2014	22
Table 11. Motor vehicle accidents by type of conveyance, 2009-2014	23
Table 12. Motor vehicle or other transport accident deaths by gender for years 2009-2014	24
Table 13. Level of license gradation for drivers involved in fatal motor vehicle crashes	24
Table 14. The total number of poisoning deaths by type, age group, and year from 2009-2014	26
Table 15. The total number of suicide deaths by method and age group from 2009-2014	27

Table 16. The number of suicide deaths by method and sex from 2009-2014.....27
 Table 17. Number of homicides by age group and year from 2009-201429
 Table 19 Homicides by decedent age, manner, perpetrator, and sentencing31
 Table 20. Number and percent of undetermined deaths by age group, 201432
 Table 1 Frequencies of factors related to sleep-related mortality (n=490)34
 Table 2 Chi-square comparison of non-white to white infant usual sleep place, 2014 (n=39).....35
 Table 3 Chi-square comparison of non-white to white infants bed sharing at time of death, 2014 (n=39).....36

Figures

Figure 1. Total number of deaths by age group, 2009-201414
 Figure 2. Percent of deaths by sex, 2009-201414
 Figure 3. Number and percent of deaths by manner of death category, 201415
 Figure 4. Number of deaths by cause of death category for all age groups, 2008-201316
 Figure 5. Total infant deaths, either neonatal or post-neonatal, by year, 2009- 2014.....17
 Figure 6. Total number of natural deaths for the top four medical condition category causes by year, 2008-201321
 Figure 7. Accidental deaths from the top four causes, 2009-201422
 Figure 8 Position of decedent in motor vehicle in all accidents, 2009-2014.....23
 Figure 9 Drowning by location and month, 2009-2014.....25
 Figure 10. The number of drowning-related deaths by month and type of open water from 2009-201425
 Figure 11. Suicides by age and year, 2009-2014.....28
 Figure 12. Suicides by sex, 2009-201428
 Figure 13. Undetermined manner of death by cause category, count and percent, 2014.....32
 Figure 16 Sleep-related infant mortality due to asphyxia, SIDS, undetermined or unknown cause per 1,000 live births, 2004-2014 (n=490).....33
 Figure 17 Sleep-related infant mortality by group, 2005-2014 (n=456)34

Introduction from the Chairperson

Iowa's Child Death Review Team is comprised of a group of individuals who are dedicated to the effort of protecting our children. In order to complete this monumental task, we analyze the circumstances surrounding every non-natural death of a child in our state. These reviews are difficult and emotional; we read investigations of the most horrible occurrence possible. Following individual analysis of each death, the team comes together to discuss our thoughts regarding prevention and identification of trends.

The current team has worked together for several years and as such is comfortable enough with each other to allow for frank and honest discussion as we review the circumstances surrounding these deaths. A commonality among many cases is lack of supervision. Parents are often the primary guardian at time of death, but there are often numerous opportunities where oversight of a child failed and death was the outcome. Parents and guardians are faced with numerous challenges including, but not limited to, family structure instability; financial uncertainty and associated lack of proper care and daycare; drug and alcohol impairment of caregivers; teens and younger children who have been the target of bullying, both in school and via social media; availability of illegal substances to children; and severe mental health issues amongst children and teens.

This report will show an alarming increase in largely-preventable child deaths. Suicide among females is the highest ever; homicides have increased and infant mortality rates are stagnant. The Iowa Child Death Review Team compels each person who reads this report to take the data forward and evaluate what can be done to assist parents so they can be present in their children's lives enough to protect them from harm. Our recommendations continue to address the need for education and support of parents and caregivers, as well as the community in general. There are serious social issues that must be addressed; without such attention to these issues, our children will continue to die needlessly.

The honor and difficulty of serving on this team cannot be understated. Each member should be commended for their efforts. It is a calling, not a job to delve into the deepest fears of all parents and to try to find something that can be changed in a community in order for some good to come from the worst of circumstances. Many take lessons learned from experience on the team and implement change within their systems. Members have initiated policy change, trained law enforcement on investigation protocols, and even started crib provision programs to reduce sleep-related infant death. Special commendation is extended to the Office of the State Medical Examiner for all of its hard work in collecting and collating the different aspects of investigation so that the review is complete.

Respectfully submitted,
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EXECUTIVE SUMMARY

2014 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 2014 data shows child deaths increased over the previous year, and were unchanged compared to the previous five. 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 2014 report:

- There were 312 child deaths in 2014, which are 23 more cases than the previous year.
- The increase is largely attributed to motor vehicle accidents, including six deaths related to ATV use. Snowmobiles and motorcycles were indicated in child deaths this year.
- Males, both as drivers and passengers, were twice as often involved in fatal motor vehicle accidents.
- Deaths in infancy rose with cases continuing to be tied to dangerous sleep surfaces.
- Infant deaths in 2014 represented a 5 percent increase against the prior five years.
- Homicides of children nearly doubled from the previous year and were similar in number to the incidence of 2012.
- Homicides in 2014 were increasingly perpetrated by mothers, were directed towards children ages 1-6, and involved negligence or exposure to harmful substances.
- There was a marked increase in child deaths among those 1-4 years. The rise is attributed to homicides and motor vehicle accidents, as well as medical conditions resulting in death.
- Deaths due to suicide were slightly lower than in past years. However, for the first time since child death review, females accounted for nearly half of all suicides.

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. Consistent, frequent guidance should be given by health care providers and social supports to parents starting at birth, and should continue through the first year of life.

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 186 natural deaths in 2014 comprise 60 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 premature birth 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, constant supervision of children near bodies of water and increased use of personal floatation devices. Even older children with basic swimming skills should be properly fitted with personal floatation devices when swimming in open water such as ponds, lakes, and rivers. Swim lessons for young children are also strongly encouraged as most drowning deaths could be prevented if the child were equipped with swimming skills. Parents and caregivers must also be aware of the danger of flash flooding in culverts and ditches as fast moving water can be hazardous to small and even older children who lack the ability to swim.

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 2014, 62 children died from accidents, comprising 20 percent of all child deaths; the majority of deaths continue to be the result of motor vehicle collisions. Total motor vehicle-related

deaths dropped compared to the previous five years; however, motor vehicle and ATV driving or riding operation safety are still paramount to continued reductions and prevention of deaths. Safe ATV use, including the use of helmets for all children, is imperative. Following manufacturer's recommendations regarding ATV use with regard to size, age, and operation of certain vehicles is critical as well.

SUICIDES

In 2014, there were 14 suicides among children ages 18 and under. Unfortunately, incidence has remained steady for the past three years following a significant increase in 2010. Females comprised nearly half of all suicides for the first time ever.

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. Data consistently demonstrate children, particularly boys, are far more likely to use a firearm in a suicide attempt when a firearm is present in the home. This factor exists regardless of whether the firearm is locked and the majority of firearms used in suicides are owned by the parent.

HOMICIDES

There were 13 homicides in 2014, mainly in children under the age of 5. Multiple children died as a result of blunt force trauma inflicted by a parent or caregiver. One child had access to morphine and other drugs and died from an overdose. Three acts of violence against 17 year-old children accounted for the remaining homicides in 2014.

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 2014, there were 36 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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Iowa Child Death Review Team Annual Report Recommendations

1. The ICDRT recommends funding positions for a full-time State CDRT Coordinator and analyst and be allocated funding to support the Team's mission and activities.
2. 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 (October 2016), 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 1 year of age, the ICDRT recommends that mandatory safe sleep training is completed within the first three months of employment.
3. 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.
4. 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.
5. 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.
6. Continued high incidence of suicide and increasing suicides among females stresses the importance of early identification of mental health distress and intervention, whether in the home, social situations, or school.
7. 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.
8. 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.
9. 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 2014, 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 2014 there were 312 deaths involving Iowa children ages 17 years and younger (Table 1). This was a significant increase (more than 20 deaths) from the previous year.

	2009	2010	2011	2012	2013	2014	5-Year Avg	% Chg
Under age 1	175	179	178	199	155	178	177	0%
Ages 1 - 4	48	27	46	35	33	47	38	24%
Ages 5 - 9	19	16	28	16	24	19	21	-8%
Ages 10-14	29	26	31	31	31	29	30	-2%
Ages 15 - 18	39	53	58	37	46	39	47	-16%
Total	310	301	341	318	289	312	318	-2%

As the table below shows, a majority of

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

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 in 2014 were among Black children, which is three times the proportion of Blacks in the general population. Hispanics comprise 10 percent of Iowa's population and similarly 9 percent of the children who died in 2014 were Hispanic (Table 3).

Table 2. Total number of deaths by race category ages 0-17 years from 2009-2014

	2009	2010	2011	2012	2013	2014	2014 %*	Iowa Population %**	Total
White	269	244	206	193	157	175	89.3%	91.8%	1244
Black	36	34	18	28	26	14	7.1%	3.5%	156
Multi-racial	2	9	8	7	4	5	2.6%	1.50%	35
Pacific Islander	0	1	0	0	0	0	0.0%	<1%	1
Asian	1	5	7	8	5	1	0.5%	2.4%	27
American Indian	1	1	0	1	0	1	0.5%	<1%	4
Unknown	2	7	103	81	97	116			406
Total	311	301	342	318	289	312			1873

*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 years from 2009-2014

	2009	2010	2011	2012	2013	2014	%
Hispanic or Latino	42	26	21	27	19	15	9%
Non-Hispanic or Latino	269	275	321	291	275	297	91%
Total	311	301	342	318	289	312	

The majority of child deaths occurred in infants less than 12 months of age (Table 1). Refer to the Infant Mortality section on page 13 for additional information.

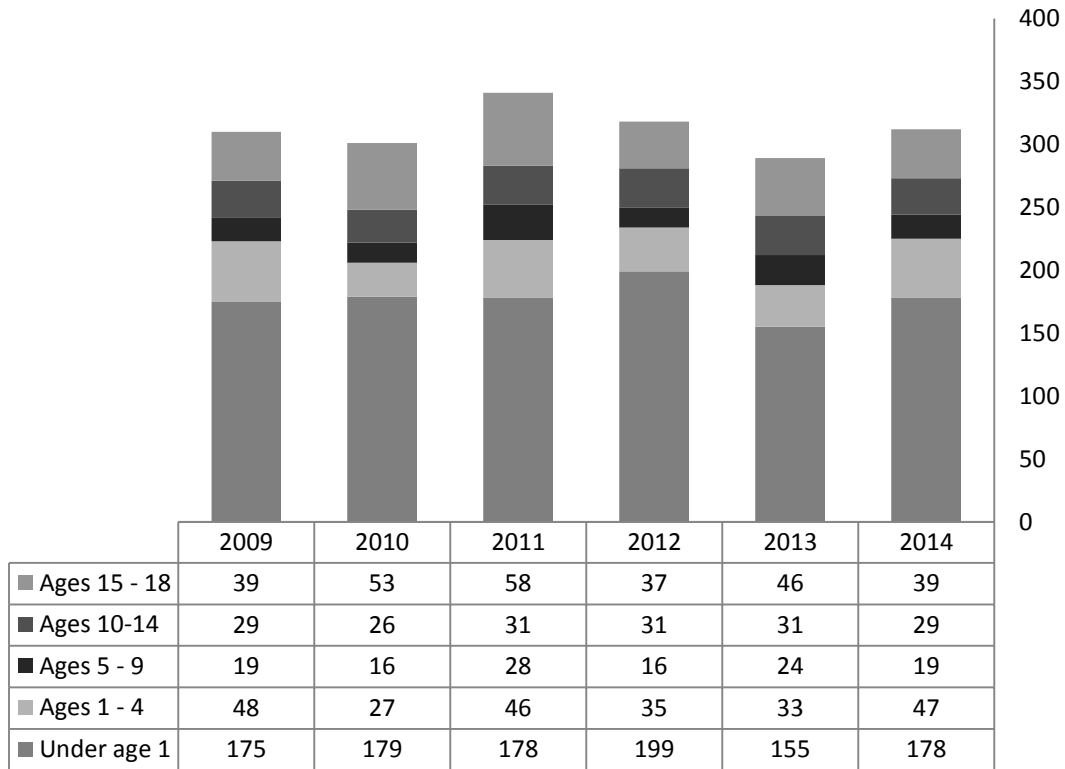


Figure 1. Total number of deaths by age group, 2009-2014

Age-group specific counts of deaths rose in children under the age of 4; however, the proportion of deaths by age group remains similar to previous years.

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

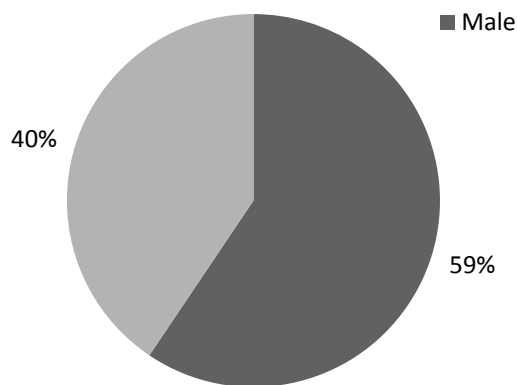


Figure 2. Percent of deaths by sex, 2009-2014

Deaths by Cause and Manner

In 2014, the majority of child deaths were attributed to a natural manner of death, followed by accidental, undetermined, suicide, and then homicide (Figure 3). There was a significant increase in motor vehicle accidents, undetermined deaths and homicides compared to previous years. Natural cases remained static and suicides decreased.

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.

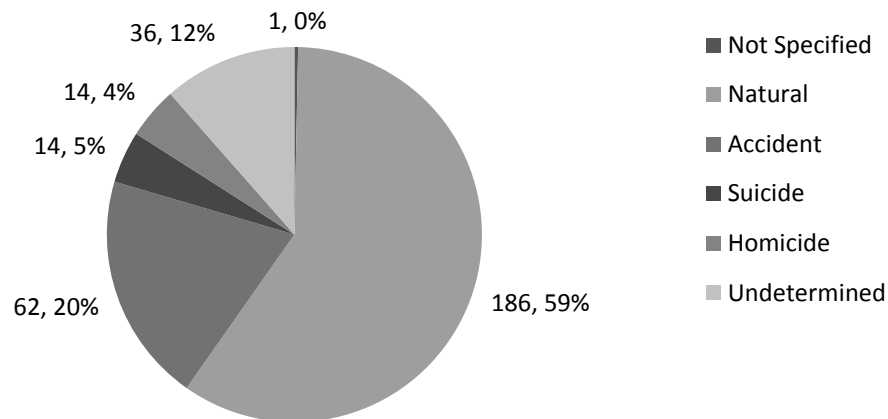


Figure 3. Number and percent of deaths by manner of death category, 2014

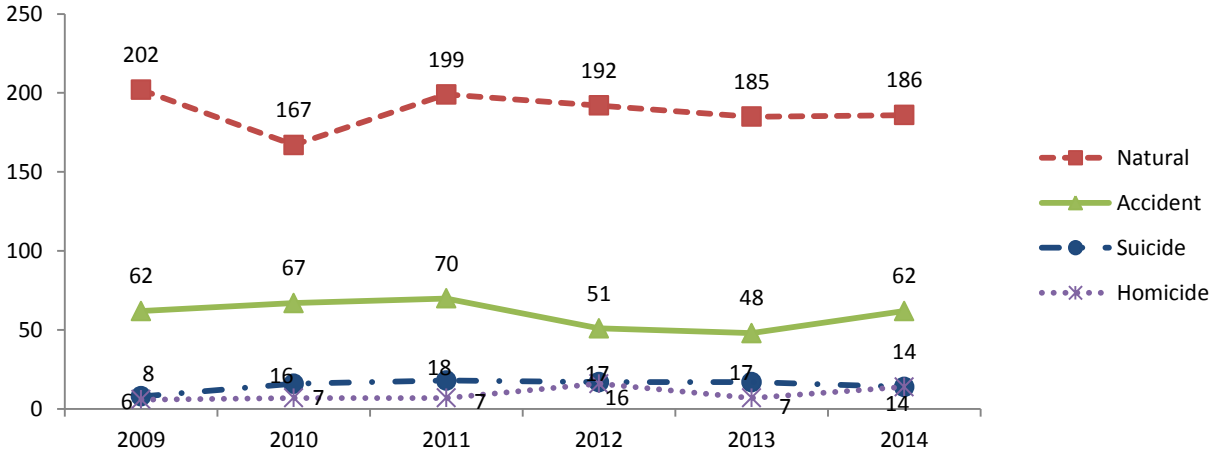


Figure 4. Number of deaths by manner and year, excluding Natural manner of death, 2009-2014

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 1 year of age (Table 8,

	2009	2010	2011	2012	2013	2014
Under age 1	132	128	129	148	112	137
Ages 1 - 4	30	11	24	15	22	18
Ages 5 - 9	11	8	18	7	916	9
Ages 10-14	15	9	14	13	20	14
Ages 15 - 18	13	11	14	9	15	8
Missing	1	0	0	0	0	0
	202	167	199	192	185	186

Table 9). Almost 70 percent of deaths caused by a medical condition happened in infants, followed by children ages 1 to 5.

Injury or trauma fatalities were higher in 2014 compared to the previous year. More detailed information on deaths involving trauma or injury is in the Accidental Deaths section of this report.

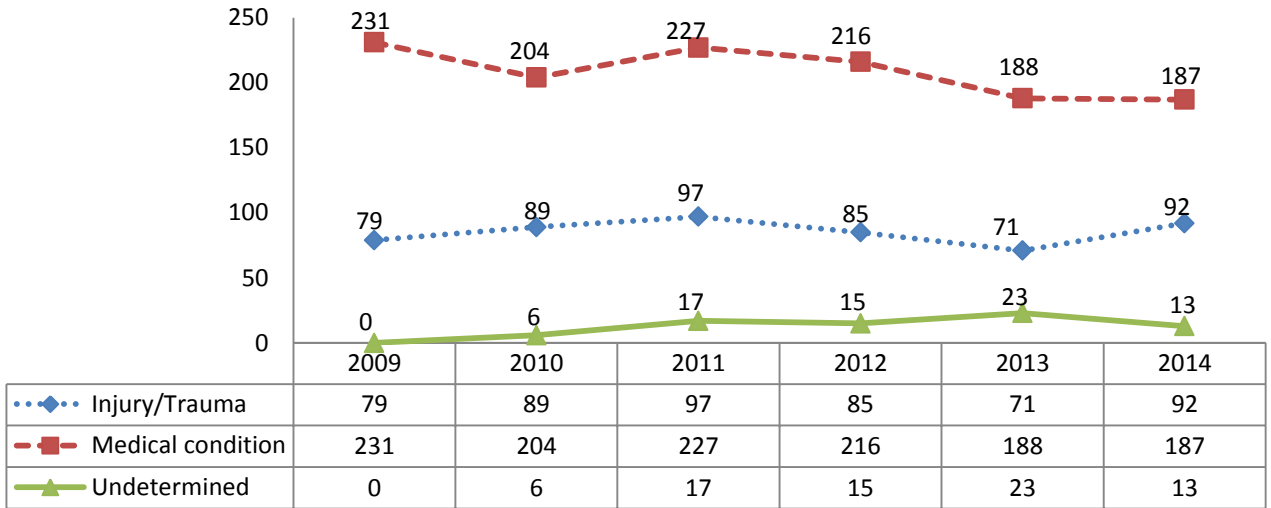


Figure 5. Number of deaths by cause of death category for all age groups, 2009-2014

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 “post-neonatal.” The neonatal period is defined as the period from birth through 27 days of life. The post-neonatal 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.

Deaths in neonates have fluctuated without a solid decline since before 2009. Males continue to account for almost 60 percent of deaths among neonates and post-neonates.

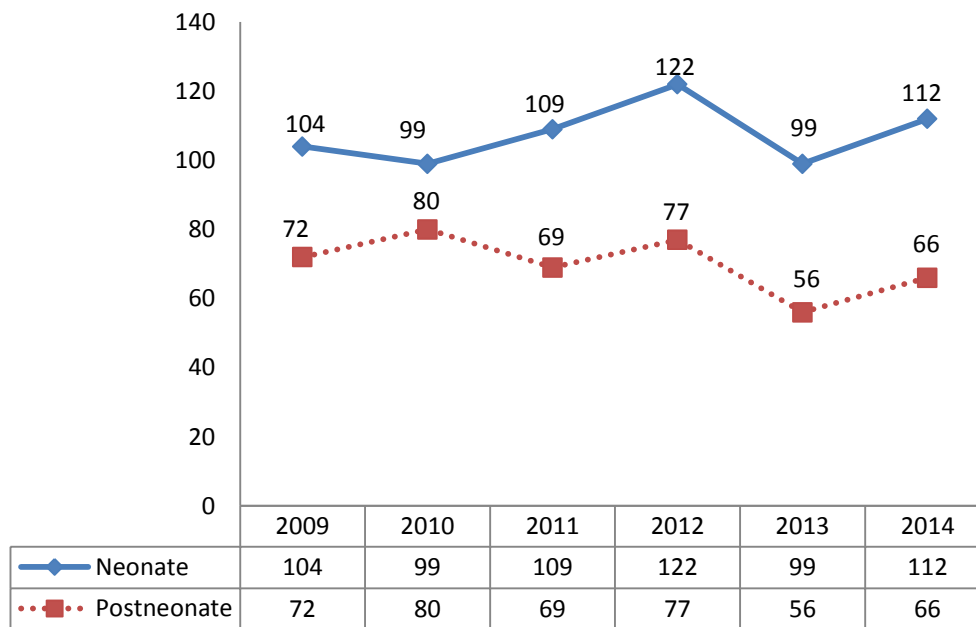


Figure 6. Total infant deaths, either neonatal or post-neonatal, by year, 2009- 2014

Table 4. Neonatal, post-neonatal, and child deaths by year, 2009-2014

	2009	2010	2011	2012	2013	2014	5-Yr Avg	% Chg	Total
Neonate	104	99	109	122	99	112	107	5%	645
Post-neonate	72	80	69	77	56	66	71	-7%	420
Child	135	122	164	119	134	134	135	-1%	808
	311	301	342	318	289	312	312	0%	1873

	Sex	Percent
Neonate	Male	56%
	Female	42%
Post-neonate	Male	60%
	Female	39%
Child	Male	60%
	Female	39%
Total	Male	59%
	Female	40%

Table 5. Total number of infant deaths by infantile period, sex, and year from 2009-2014

In the neonatal period, the manner of death is typically natural, and 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 post-neonatal periods, medical conditions were the leading cause of death. After the infantile period, this cause falls second to injury/trauma. The next leading causes of death for infants in 2014 were injury/trauma and undetermined, though both categories are significantly lower than deaths due to a medical condition (Table 6).

		2009	2010	2011	2012	2013	2014	Total
Neonate	Injury/ Trauma	0	2	1	3	1	1	8
	Medical condition	104	96	108	118	90	100	616
	Undetermined	0	0	0	1	5	2	8
	Unknown	0	1	0	0	2	0	3
	Total	104	99	109	122	99	112	645
Post-neonate	Injury/ Trauma	14	10	6	11	12	10	63
	Medical condition	58	66	47	53	30	40	294
	Undetermined	0	3	15	12	8	9	47
	Unknown	0	1	1	1	1	1	5
	Total	72	80	69	77	56	66	420
Child	Injury/ Trauma	65	77	90	71	58	81	442
	Medical condition	69	42	72	45	58	47	333
	Undetermined	0	3	2	2	10	2	19
	Unknown	1	0	0	1	10	1	3
	Total	135	122	164	164	134	134	853
Total	Injury/ Trauma	79	89	97	85	71	92	513
	Medical condition	231	204	227	216	258	187	1223
	Undetermined	0	6	17	15	23	23	74
	Unknown	1	2	1	1	3	2	10
	Total	311	301	342	318	289	312	1873

Table 6. The total number of infant deaths by infantile period, cause of death category, and year from 2009-2014

A review of location of the infant at time of death showed only a handful of infants were at the home of a friend or relative at time of death. Of note, more deaths among children and post-neonates occurred at the home of a friend or relative than in previous years. Fatalities in child care settings continue to be identified, highlighting the importance of safe infant care education and awareness among day care providers.

		2009	2010	2011	2012	2013	2014	Total
Neonate	Missing	81	94	108	115	72	110	594
	Childs home	2	3	0	4	4	2	23
	Friend or relative home	0	1	0	3	0	0	4
	Other	20	1	1	0	23	0	161
	Total	103	99	109	122	99	112	782
Post-neonate	Missing	24	33	24	37	14	29	173
	Childs home	33	39	31	24	29	31	239
	Friend or relative home	6	2	2	5	0	2	21
	Foster care	0	0	0	0	0	0	0
	Day care	5	4	8	7	7	1	37
	Other	4	2	4	4	6	3	37
Total	72	80	69	77	56	66	507	
Child	Missing	55	38	71	45	19	48	305
	Childs home	40	36	40	37	59	39	317
	Friend or relative home	6	5	4	3	3	8	36
	Foster care	0	1	0	0	1	0	2
	Day care	0	0	1	1	0	1	4
	Other	34	42	48	33	51	38	302
Total	135	122	164	119	133	134	966	
Total	Missing	160	165	203	197	105	187	1072
	Childs home	75	78	71	65	92	72	579
	Friend or relative home	12	8	6	11	3	10	61
	Foster care	0	1	0	0	1	0	2
	Day care	5	4	9	8	7	2	41
	Other	58	45	53	37	80	41	500
Total	311	301	342	318	289	312	2255	

Table 7. Location of incident, 2009-2014

Natural Deaths

A majority of child deaths in 2014 were the result of various medical conditions, prematurity, congenital anomalies 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 8).

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. SIDS and related deaths are typically classified as non-natural, natural, medical cause cannot explain deaths; however, the classification assignment is at the discretion of the medical examiner or physician attesting a death certificate.

	2009	2010	2011	2012	2013	5-Yr Avg	2014	% Chg
Prematurity	64	61	47	45	44	51	44	14%
Congenital anomaly	55	51	43	46	40	48	41	15%
Other medical condition	12	15	72	62	35	16	38	138%
Cardiovascular	11	9	13	18	29	39	32	18%
SIDS	29	33	24	19	18	25	17	NS
Pneumonia	10	6	4	7	10	9	11	NS
Cancer	15	9	6	10	7	5	9	NS
Neurological/seizure disorder	7	2	6	0	3	7	4	NS
Malnutrition	0	0	3	0	3	1	3	NS
Asthma	1	1	2	2	2	6	2	NS
Other perinatal condition	7	2	2	0	1	1	2	NS
Undetermined medical cause	0	2	1	0	0	1	1	NS
Other infection	16	7	2	3	0	3	0	NS
Influenza	2	1	0	0	0	1	0	NS
Unknown	2	5	2	3	0	2	0	NS
	231	204	227	215	192	215	204	

Table 8. The total number, five year average, and percent change of natural deaths for infants less than 1 year of age by medical condition cause and year from 2009-2014

Decreases in deaths due congenital anomaly and SIDS appear static for the last several years; the strongest contributor to the gradual decline in Iowa infant mortality is the reduction in deaths due to prematurity. However, deaths due to prematurity have plateaued over the last three years (Table 8).

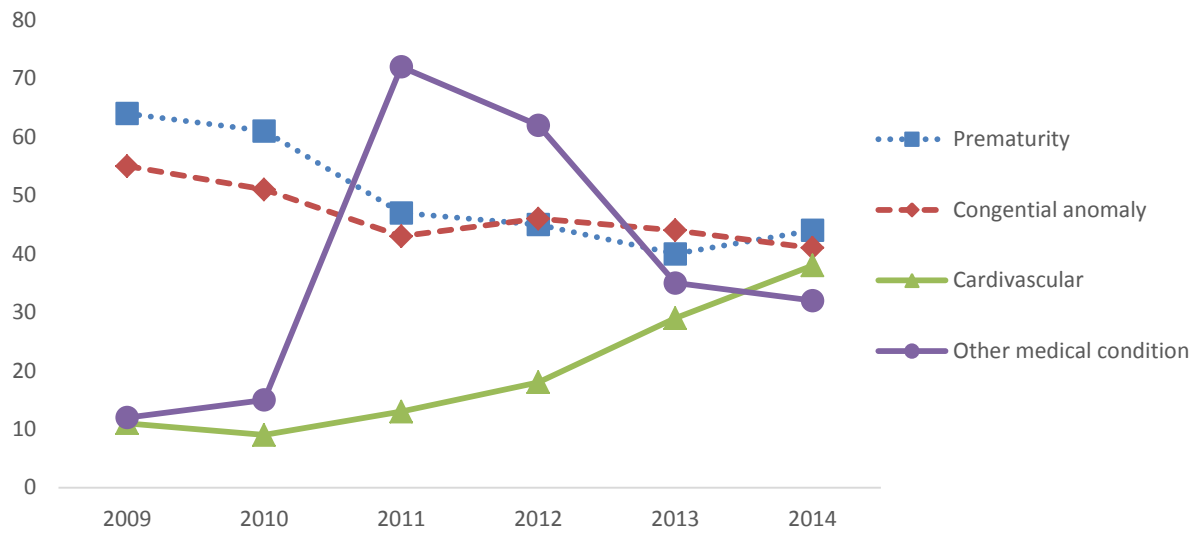


Figure 7. Total number of natural deaths for the top four medical condition category causes by year, 2009-2014

	2009	2010	2011	2012	2013	2014
Under age 1	132	128	129	148	112	137
Ages 1 - 4	30	11	24	15	22	18
Ages 5 - 9	11	8	18	7	916	9
Ages 10-14	15	9	14	13	20	14
Ages 15 - 18	13	11	14	9	15	8
Missing	1	0	0	0	0	0
	202	167	199	192	185	186

Table 9. The total number of natural deaths by age group and year from 2009-2014

Accidental Deaths

There were 61 reported accidental deaths in 2014 (Table 10). A vast majority of these deaths were the result of motor vehicle collisions, followed by drowning, fire, use of weapons (firearms) and falls. In 2014, there was a significant increase in motor vehicle accidents, largely attributed to ATV and snowmobile use and automobile accidents.

	2009	2010	2011	2012	2013	2014	5-Yr Avg	% Chg
MV	31	34	41	26	16	31	30	4.7%
Drowning	7	12	11	8	8	9	9	0%
Fire	9	4	4	6	3	6	5	15.4%
Asphyxia	10	11	7	6	11	6	9	-33.3%
Weapon	1	0	0	0	0	4	0	NS
Fall or crush	1	0	2	2	0	3	1	NS
Poisoning, overdose, or acute intoxication	2	5	3	1	4	2	3	NS
Not Specified	0	1	1	1	1	0	1	NS
Exposure	0	0	0	1	0	0	0	NS
Animal bite or attack	0	0	1	0	1	0	0	NS
Other	1	0	0	0	2	0	1	NS
Total	62	67	70	51	48	61	59	NS

Table 10. The total number, five-year average, and percent change of accidental deaths by cause and year from 2009-2014

Six fatalities were the result of fire, burns or electrocutions. Fire-related fatalities often occur in homes lacking functional smoke detectors and are frequently rental properties. Accidental deaths resulting from inappropriate electrical wiring in rental properties have also occurred in recent years. Oversight of rental property electrical and fire safety is a concern of the Child Death Review Team.

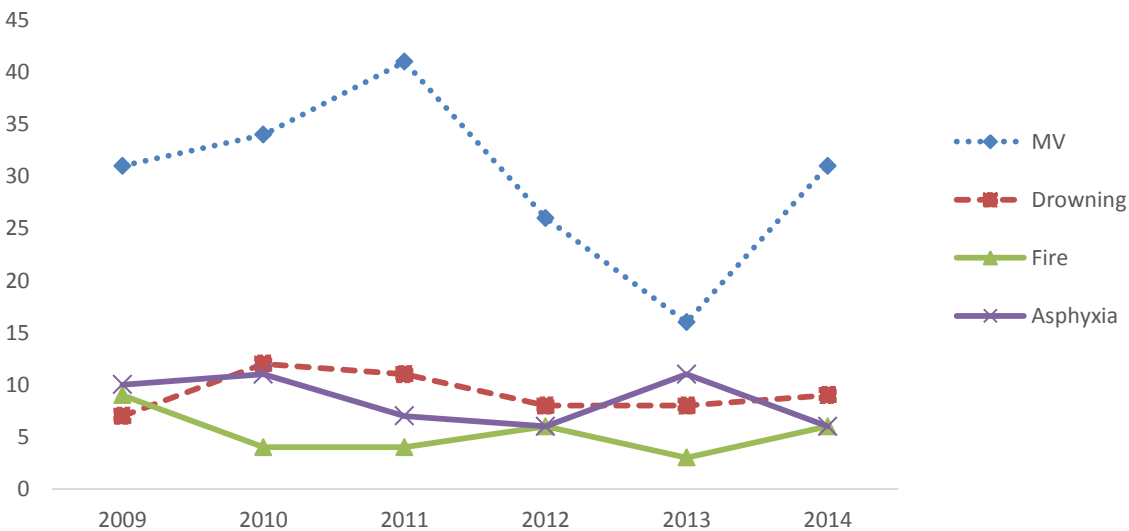


Figure 8. Accidental deaths from the top four causes, 2009-2014

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).

Motor Vehicle Accidents

When children reach the age of 1, the leading known cause of death changes to motor vehicle accidents and continues through age 17 (Table 10). Motor vehicle-related deaths in children 6-17 were more often male victims than females (Table 12).

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.

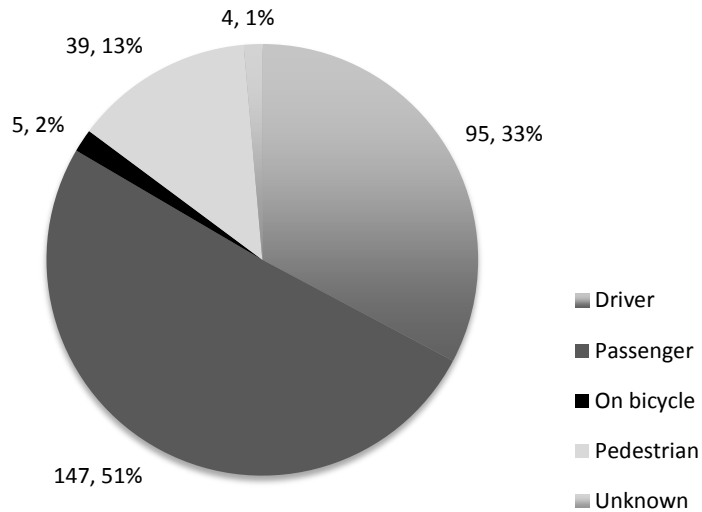


Figure 9 Position of decedent in motor vehicle in all accidents, 2009-2014

The primary types of motor vehicles involved in fatal accidents were automobiles and ATVs. In 2014 for all automobile accidents, slightly more than half were passengers.

Table 11. Motor vehicle accidents by type of conveyance, 2009-2014

	2009	2010	2011	2012	2013	2014	Total
All automobile	22	25	26	20	12	19	124
ATV	1	2	8	2	0	6	19
Other	4	3	3	1	1	2	14
Motorcycle	0	0	0	0	0	2	2
Not Specified	1	2	4	0	3	1	12
Tractor	0	0	0	0	0	1	1
Snowmobile	0	1	0	0	0	1	2
None	2	1	0	3	0	0	6
Bicycle	1	1	0	1	0	0	3
School bus	0	0	2	0	0	0	2
Unknown	0	0	0	0	0	0	0
Total	31	35	43	27	16	32	185

	2009	2010	2011	2012	2013	2014	Total
Male	17	21	27	18	8	21	112
Female	14	14	16	9	8	11	72
Total	31	35	43	27	16	32	184

Table 12. Motor vehicle or other transport accident deaths by gender for years 2009-2014

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.

Driver license status at time of accident

A cumulative review of license data for all adolescent drivers involved in fatal automobile crashes reveals that all but three drivers had permits or limited licenses at time of death. This finding highlights the importance of enforcing driving limitations for adolescents, particularly restrictions on passengers.

Table 13. Level of license gradation for drivers involved in fatal motor vehicle crashes

	2009	2010	2011	2012	2013	2014	Total
License Expired Instructional Permit	0	0	0	0	0	0	0
Instructional Permit	0	0	0	0	1	2	1
Unknown	2	2	0	0	0	1	5
School License	1	1	1	0	0	1	4
Full License	0	1	2	1	0	1	5
No License	0	0	2	2	0	2	6
Intermediate License	3	1	7	8	4	4	27
Total	6	5	12	11	5	11	48

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 nine drowning-related deaths in 2014. 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 11). Swimming pools are the second most common location, comprising 23 percent of accidental drowning, followed by bathtub drowning at 17 percent.

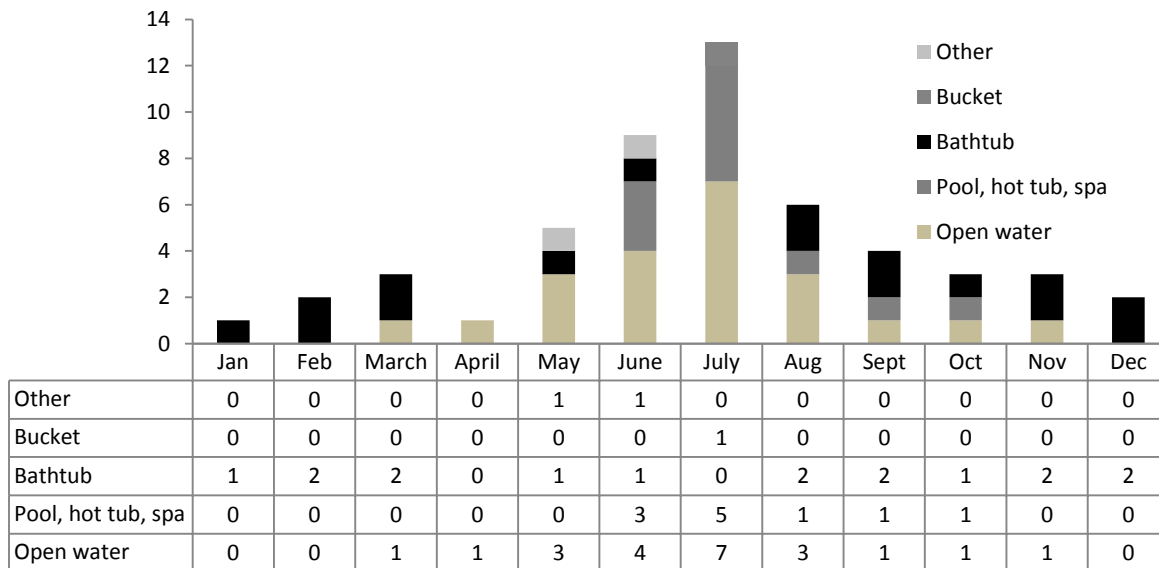


Figure 10 Drowning by location and month, 2009-2014

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 10). 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 6.

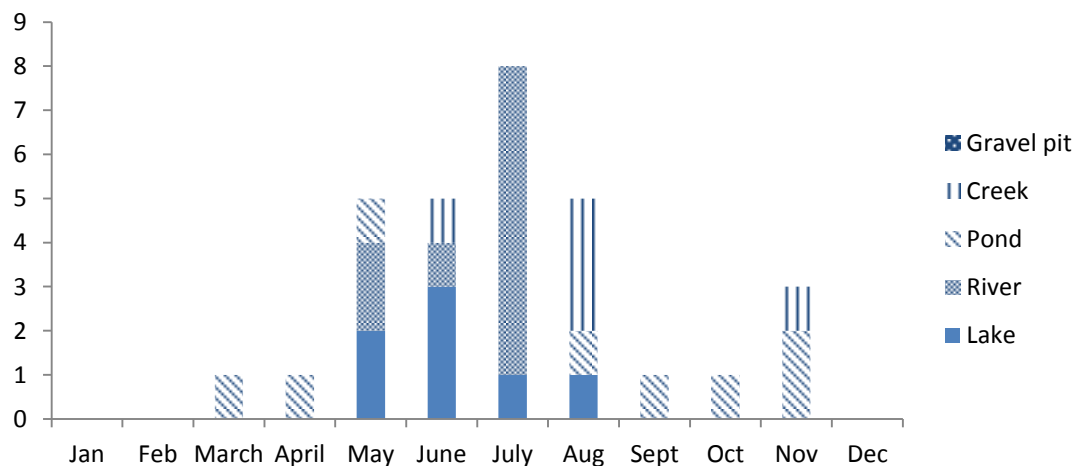


Figure 11. The number of drowning-related deaths by month and type of open water from 2009-2014

Poisonings

Five poisoning deaths occurred in 2014. Three were attributed to morphine intoxication; two accidents, one homicide. A fourth poisoning was the result of accidental acute mixed drug intoxication (Dextromethorphan, heroin, codeine, laudanosine, and amphetamine) with a manner of death as natural. The fifth poisoning was due to a blood pressure prescription drug with the manner of death as a suicide.

		2010	2011	2012	2013	2014	Total
Under age 1	Accidental overdose	0	1	0	0	0	1
	Other	0	0	0	0	0	1
	Unknown	0	0	1	0	0	1
	Total	0	1	1	0	0	3
Ages 1-4	Accidental overdose	0	1	0	0	0	1
	Deliberate poisoning	0	0	1	1	0	2
	Acute Intoxication	0	0	0	1	1	2
	Other	1	0	0	0	0	2
Ages 5-9	Total	1	1	1	2	1	7
	Acute Intoxication	0	0	0	0	1	1
Ages 10-14	Other	1	0	0	0	0	1
	Total	1	0	0	0	1	2
Ages 15-18	Accidental overdose	0	0	0	0	0	1
	Deliberate poisoning	1	0	0	0	0	1
Ages 15-18	Total	1	0	0	0	0	2
	Accidental overdose	2	0	1	1	2	6
	Adverse effect but not overdose	1	0	0	0	0	1
	Deliberate poisoning	1	0	1	0	0	2
	Acute intoxication	0	1	0	3	0	4
	Unknown	0	0	0	0	1	1
	Total	4	1	2	4	3	14
Total	Accidental overdose	2	2	1	1	2	9
	Adverse effect but not overdose	1	0	0	0	0	1
	Deliberate poisoning	2	0	2	1	0	5
	Acute intoxication	0	1	0	3	2	6
	Other	2	0	0	0	0	4
	Unknown	0	0	1	0	1	2
	Total	7	3	4	6	5	28

Table 14. The total number of poisoning deaths by type, age group, and year from 2009-2014

Suicide

In 2014, there were 14 suicides among children ages 18 and under (Table 15). Unfortunately, despite a slight decline in 2014, incidence has remained steady for the past three years following a significant increase in 2010. While males typically comprise the majority of suicide incidents, females accounted for nearly half in 2014. The number and proportion of females was the highest ever reported.

		2009	2010	2011	2012	2013	2014
10-14	Motor vehicle or other transport	0	0	0	0	0	0
	Asphyxia	2	2	2	5	1	4
	Weapon, including body part	0	0	3	2	3	1
	Poisoning, overdose or acute intoxication	0	1	0	0	0	0
	Total	2	3	5	7	4	5
15-18	MV	0	1	1	0	0	0
	Asphyxia	5	5	9	7	6	3
	Weapon	1	6	3	2	7	5
	Poisoning, overdose, or acute intoxication	0	1	0	1	0	1
	Total	6	13	13	10	13	9
Total	Motor vehicle or other transport	0	1	1	0	0	0
	Asphyxia	7	7	11	12	7	7
	Weapon, including body part	1	6	6	4	10	6
	Poisoning, overdose or acute intoxication	0	2	0	1	0	1

Table 15. The total number of suicide deaths by method and age group from 2009-2014

Of these 14 deaths, nine were between the ages of 15-17 years and five were between the ages of 13-14 years. Seven children hanged themselves, six used a firearm, and one used poison (Table 15). Females are more likely to die by asphyxia compared to males, though one female used a firearm.

		2009	2010	2011	2012	2013	2014
Male	Motor vehicle or other transport	0	1	1	0	0	0
	Asphyxia	6	5	8	9	3	3
	Weapon, including body part	1	5	6	4	10	5
	Poisoning, overdose or acute intoxication	0	0	0	0	0	0
	Total	7	11	15	13	13	8
Female	Motor vehicle or other transport	0	0	0	0	0	0
	Asphyxia	1	2	3	3	4	4
	Weapon, including body part	0	1	0	0	0	1
	Poisoning, overdose or acute intoxication	0	2	0	1	1	1
	Total	1	5	3	4	4	6
Total	Motor vehicle or other transport	0	1	1	0	0	0
	Asphyxia	7	7	11	12	7	7
	Weapon, including body part	1	6	6	4	10	6
	Poisoning, overdose or acute intoxication	0	2	0	1	1	1
	Total	10	8	16	18	17	14

Table 16. The number of suicide deaths by method and sex from 2009-2014

Despite the parity in sex in 2014, the continuous 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. From 2009 to 2010, the total number of suicides doubled and rose again from 2010 to 2011 (Table 16). The CDRT strongly recommends full investigation, including autopsy, in the case of a death by suicide to aid in characterizing these tragic events.

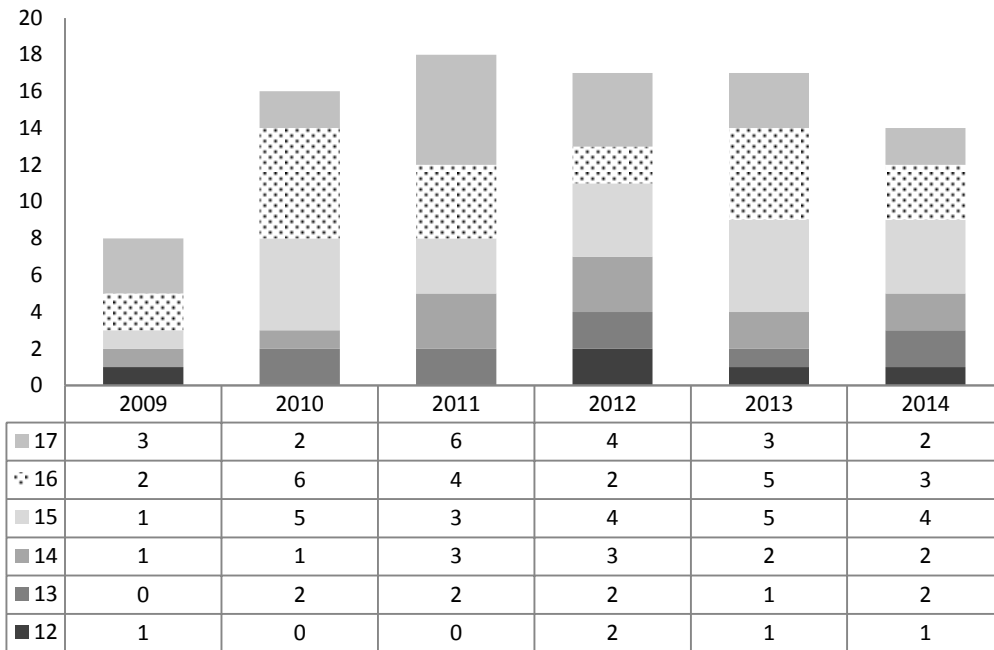


Figure 12. Suicides by age and year, 2009-2014

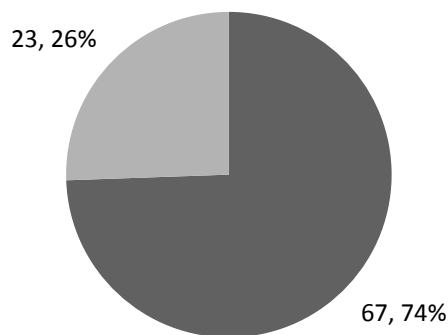


Figure 13. Suicides by sex, 2009-2014

Homicide

In 2014, Iowa experienced 13 homicides affecting children ages 17 and under. This was more than double the number of homicides from the previous year (Table 17). The increase was concentrated in children under the age of 5.

	2009	2010	2011	2012	2013	2014
Under age 1	2	2	2	5	2	3
Ages 1 - 4	3	4	1	6	2	6
Ages 5 - 9	0	0	2	0	1	1
Ages 10-14	0	0	1	1	2	0
Ages 15 - 18	1	1	1	4	3	3
Total	6	7	7	16	7	13

Table 17. Number of homicides by age group and year from 2009-2014

Anger leading to infliction of blunt force trauma by the mothers and male caregivers was a factor in several of these deaths and the caregiver's ability to cope with stressful situations in the home was lacking. Period of PURPLE Crying guidance and asking for assistance may have prevented these deaths.

An increasing number of mothers are the perpetrators of these crimes, and mental health and wellbeing may have been factors in the commission of these three crimes.

Age (yrs)	Race/Gender	Method	Perpetrator/ Criminal Charges	Sentencing
<1	White/ Male	Blunt force injuries of head	21 year old Male, biological father Charged with 1 st degree murder; guilty of involuntary manslaughter and two Child Endangerment counts	50 years in prison
<1	White/ Male	Malnutrition and dehydration	28 year old male, father, and 24 year old female, mother Guilty of neglect of a dependent person, child endangerment resulting in serious injury and child endangerment resulting in bodily injury	25 years in prison
<1	White/ Male		Information pending at time of report.	

<1	African American /Male	Traumatic brain and neck injury	18 year old male, biological father Charged with child neglect and 1st degree murder	Unknown sentence
1	African American /Female		Information pending at time of report.	
1	White/ Female	Blunt force injury to head	20 year old female, mother Charged with 1 st degree murder	Life in prison
1	White/ Female	Blunt force head trauma	26 year old male, father Charged and convicted of 1st degree murder	Life in prison
3	African American /Male	Blunt force injuries to abdomen	31 year old female, guardian Charged with 1 st degree murder	Trail in January 2017
3	White/ Female	Head trauma	28 year old male, mother's paramour Charged with child endangerment causing death	50 years in prison
5	African American /Female	Acute morphine intoxication	Unknown age, mother and unknown age, mother's paramour Charged with child endangerment causing death, neglect of a dependent person, possession of marijuana, possession with intent to deliver cocaine, possession with intent to deliver imitation substance, manufacturing cocaine and no drug tax stamp	40 years in prison for mother 65 years in prison for mother's paramour
17	White/ Male	Blunt force injuries to head	16 year old male, high school classmate No charges	N/A

17	American Indian/ Male	Sharp force injuries	20 year old male, half-brother Charged with 1 st degree murder; pled guilty to 2 nd degree murder	25 years in prison
17	White/ Male		Information pending at time of report.	

Table 18 Homicides by decedent age, manner, perpetrator, and sentencing

Undetermined

In 2014, the exact cause of death for 36 children could not be determined and occurred primarily in children less than 1 year of age. Undetermined deaths were examined more closely in the sleep-related mortality supplement in Appendix A.

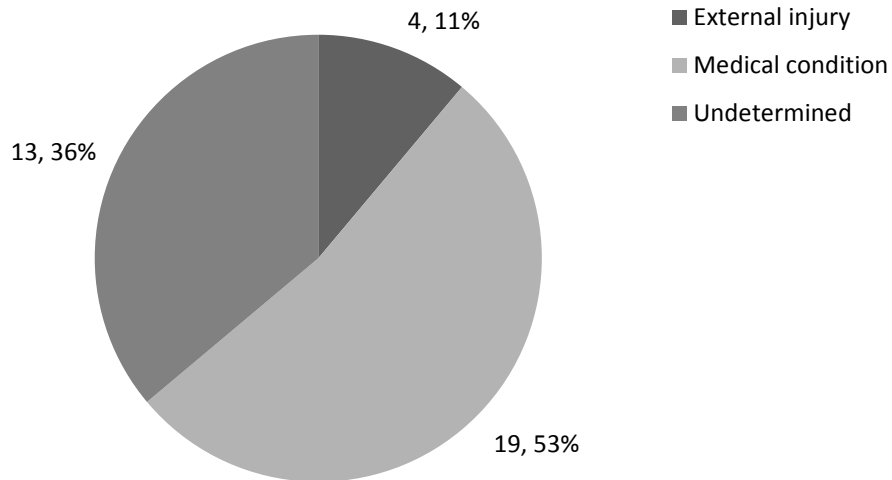


Figure 14. Undetermined manner of death by cause category, count and percent, 2014

	Frequency	Percent
Under age 1	29	80.6
Ages 1 - 4	5	13.9
Ages 5 - 9	0	0
Ages 10-14	2	5.6

Table 19. Number and percent of undetermined deaths by age group, 2014

Appendix A

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 (SUID or SIDS), and any undetermined/unknown cause of death.

The Child Death Review Team examines sleep related infant mortality differently from coding analyses drawn from death certificates. The Child Death Review Reporting System, the national registry for child deaths, captures extensive information on all child fatalities including sleep-related. Data contained within the reporting system allows for more detailed and accurate analyses than death certificates may provide.

Annual mortality rates for sleep-associated deaths were calculated per 1,000 live births. The rate of sleep-related mortality started in 2004 at a low of 0.83 deaths for every 1,000 live births. Since 2004, the rate gradually rose until recent years when a decline started in 2010 (Figure 15). Despite a decline since 2010, the projected trend indicates overall increases in successive years.

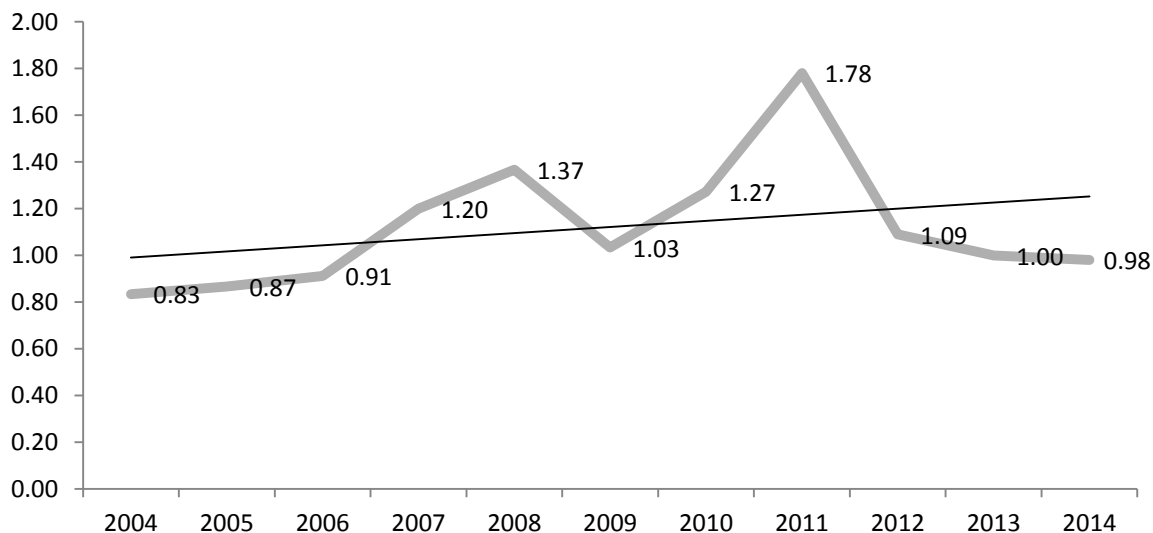


Figure 15 Sleep-related infant mortality due to asphyxia, SIDS, undetermined or unknown cause per 1,000 live births, 2004-2014 (n=490)

For the sake of comparison to national rates, sleep-related mortality rates were divided into subgroups of SIDS, asphyxia, and undetermined and unknown. SIDS rates were well below the national average of 0.67 deaths per 1,000 live births in 2004, but increased overall primarily due to three consecutive years of high rates in 2008-2010 and appear to have stagnated (Barfield et al., 2013). Rates in 2011 to 2014 slightly declined; however, the trend line indicates likely continued overall increase.

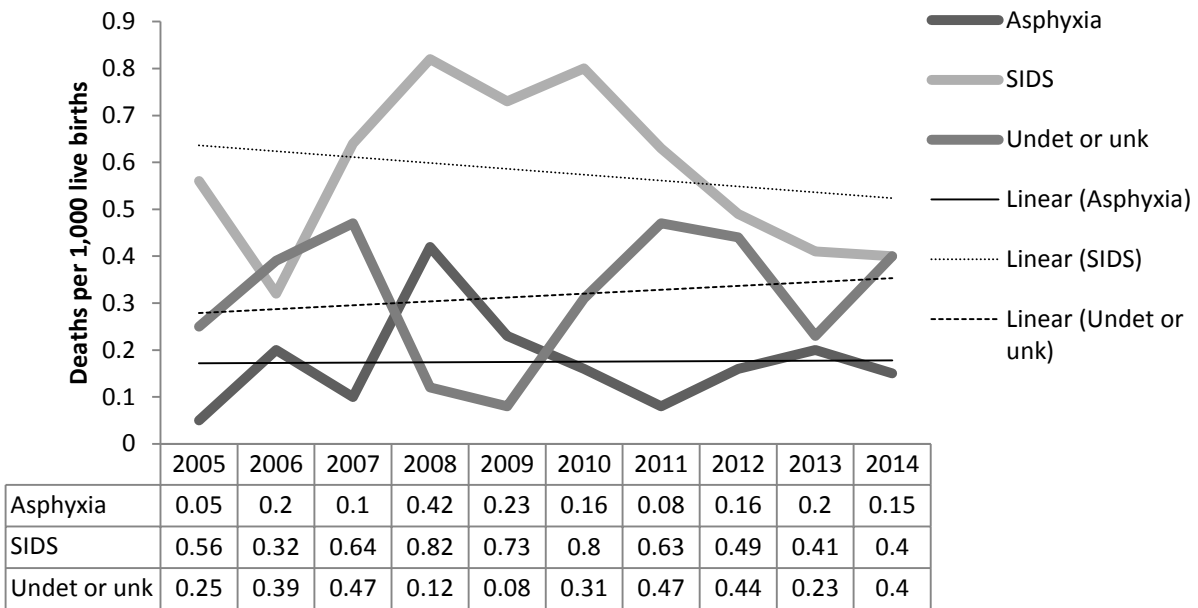


Figure 16 Sleep-related infant mortality by group, 2005-2014 (n=456)

Mortality rates due to undetermined or unknown cause have a gradually increasing trend line since 2005, but have fluctuated greatly over that time (Figure 15). Trend line trajectory indicates the increase will continue. Rates due to asphyxia have stabilized for this time period. This is in contrast to the national trend showing an increase in mortality in the same time period (Barfield et al., 2013).

Table 20 Frequencies of factors related to sleep-related mortality (n=490)

Factor	Response	Current Year	Current Year %	2004-2013	2004-2013 %
Infant sex	Male	26	68.4	225	58.6
	Female	12	31.6	157	40.9
	Unknown	0	0	2	0.5
Infant race	White	31	81.6	313	81.5
	African American	4	10.5	49	12.8
	American Indian/ Native Alaskan	0	0	3	0.8
	Asian	1	2.6	2	0.5
	Multi-racial	2	5.3	12	3.1
	Missing			5	1.3
	Date of death - Month	Jan	5	13.2	42
	Feb	1	2.6	28	7.3
	March	2	5.3	23	6
	April	1	2.6	35	9.1
	May	1	2.6	35	9.1
	June	3	7.9	34	8.9
	July	2	5.3	36	9.4
	Aug	3	7.9	34	8.9

	Sept	3	7.9	31	8.1
	Oct	8	21.1	34	8.9
	Nov	6	15.8	19	4.9
	Dec	3	7.9	33	8.6
Incident sleep place	Crib	10	26.3	75	19.5
	Not a crib	28	73.4	303	78.9
	Other			6	1.6
Usual sleep place	Crib	12	31.5	92	24
	Not a crib	11	28.9	192	50
	Other	15	39.4	100	26
Position child was placed to sleep	Back	12	31.6	166	43.2
	Side or stomach	21	55.2	129	33.6
	Unknown	5	13.1	89	23.2
Position child was found	Back	12	31.6	97	25.3
	Side or stomach	21	55.2	195	50.8
	Unknown	5	13.1	92	24
Child sleeping on the same surface as a child or adult	Yes	14	36.8	160	41.7
	No	19	50	97	25.3
	Unknown	5	13.2	127	33.1

Infants who died of sleep-related cause are more likely to be male and are disproportionately Black (Table 20). The most common month of death is January, which is also when respiratory illness is actively circulating and may contribute to undetermined/unknown or SIDS mortality. Babies were most often found sleeping outside of a crib at time of death and strikingly, 68.5 percent of infants did not usually sleep in a crib. Babies were reportedly sleeping with another child or adult at time of death in more than 37 percent of cases.

Approximately one-third of parents and caregivers appear to be following back to sleep recommendations. However, this rate could be improved by emphasizing that every sleep should occur in a safe sleep environment.

There are differences between race groups in sleep environments. Non-white babies did not typically sleep in a crib in 100 percent of cases compared to 80.1 percent of white babies (Table 21).

Table 21 Chi-square comparison of non-white to white infant usual sleep place, 2014 (n=39)

		Usual sleep place		
		Crib	Not a crib	Total
White	Count	6	25	31
	% within Infant race	19.3	80.1	100
Non-White	Count	0	7	7
	% within Infant race	0	100	100
Total	Count	6	32	38
	% within Infant race	15.8	84.2	100

The prevalence of bed sharing at death was assessed and it was found that 56 percent of non-white infants were bed sharing at time of death, indicating the absence of safe sleep environments (Table 22).

Table 22 Chi-square comparison of non-white to white infants bed sharing at time of death, 2014 (n=39)

		Bed sharing*		
		Yes	No	Total
White	Count	11	20	31
	% within infant race	35.4	64.5	100
Non-White	Count	3	4	7
	% within infant race	42.9	57.1	100
Total	Count	14	24	38
	% within infant race	36.8	63.2	100

In other analyses, younger mothers with increasing numbers of children appear to be at higher risk for experiencing a sleep-related infant mortality event. The presence of a blanket was reported in almost half of cases; a pillow in one-fourth of cases.

Conclusion

Sleep-related infant mortality rates are not moving in the right direction. Such events continue to occur too frequently and are largely preventable. The Child Death Review Team recommends the following to health care providers:

- The importance of a safe sleep environment should be emphasized at every encounter with an infant parent or caregiver.
- The American Academy of Pediatrics guidelines from 2016 are highly relevant and critical to follow in all health care settings.
- Physicians and nursing staff significantly influence parental behavior. Health care providers, especially those caring for infants after birth, must demonstrate appropriate behavior to parents and caregivers.
- Hospital policies and training should reflect the AAP 2016 recommendations.
- Whenever possible, screenings for whether parents have safe sleep environments should occur and efforts made to find cribs for families without one.
- Parents and caregivers are encouraged to share a room, but not a sleep surface, with infants through the age of 12 months.
- Parents and caregivers must be reminded that back to sleep is the best and only option for normal healthy newborn sleep and the most proven way to reduce the risk of SIDS.