



Iowa's
CHILD DEATH
Review Team

Report to the Governor and General Assembly

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2013 Annual Report



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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 among children and teens.

This report includes alarming data that will show while overall death decreased, we continue to experience an epidemic of children dying at their own hands. Infant mortality is steadily declining, though sleep-related infant deaths are not decreasing. 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 that 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

2013 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 2013 data show child deaths continued to decline in Iowa over the five years prior to 2013; the decline from 318 in 2012 to 289 in 2013 is attributed to lower incidents of injury/trauma and deaths due to medical conditions. 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 2013 report:

- There were 289 child deaths in 2013 representing a 13 percent reduction compared to the previous five years.
- Sleep-related infant mortality remains a concern as Iowa data demonstrate a consistent number of cases of Sudden Infant Death Syndrome (SIDS) and undetermined cause. Unsafe sleep environments are frequently reported in these cases, and are more often contributing factors than sleep position.
- Overall infant mortality continues to decrease in the categories of neonatal and post-neonatal mortality.
- Seven children between the ages of 2 and 12 months died while attending child care, another while in foster care. The same or higher number of deaths has occurred in these settings the previous two years. Continued progress on licensure and inspection of child care providers is strongly recommended by the Review Team.
- Deaths due to prematurity have significantly declined over the past several years, while natural deaths attributed to congenital anomalies and medical conditions have increased. However, deaths attributed to cardiovascular conditions in infancy have increased.
- Fewer children died at the hands of others in 2013. A total of seven homicides were reported, a decrease of 11 from 2012.
- Two homicides were the result of intoxication by a controlled substance.
- Accidental fatalities were the lowest in five years with reductions in motor vehicle accidents, drowning, and other accident deaths.
- The rate of suicide among teens has sustained a high rate for four consecutive years. In 2013, 17 children committed suicide, including two 12-year-olds.

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' (AAP) risk reduction recommendations for creating infant safe sleep environments. As of 2016, AAP recommendations include parents and caregivers sharing a room, but not a sleep surface, for the first year of life. 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 185 natural deaths in 2013 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 flotation 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 2013, 48 children died from accidents, comprising 17 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.

SUICIDES

In 2013, there were 17 suicides among children ages 18 and under. Unfortunately, incidence has remained steady for the past three years following a significant increase in 2010. Males comprised the majority of suicide victims with 13 deaths (there were only three female deaths).

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 homicides in 2013. Two homicides were the result of intoxication where parents and caregivers exposed children to lethal doses of controlled substances. One death occurred from head injuries inflicted by another child cohabitating in a foster home. Another child died after being abducted by a stranger and dying from sharp force injuries. One child died as a result of head trauma inflicted by the mother's paramour. In one case, a father inflicted a gunshot wound on his daughter.

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 2013, there were 28 deaths classified as undetermined, or 10 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 health care 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. 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.
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 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.



Annual Summary

In 2013, there were 289 deaths involving Iowa children ages 17 years and younger (Table 1). This was a significant reduction over the previous year and 40 fewer deaths than the average of the past five years.

	2008	2009	2010	2011	2012	2013	5-Year Avg	% Chg
Under age 1	225	175	179	178	199	155	191	-19%
Ages 1 - 4	60	48	27	46	35	33	43	-24%
Ages 5 - 9	26	19	16	28	16	24	21	14%
Ages 10-14	30	29	26	31	31	31	29	5%
Ages 15 - 18	45	39	53	58	37	46	46	-1%
Total	386	310	301	341	318	289	331	-13%

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. Nine percent of deaths in 2013 were among Black children, which is three times the proportion of Blacks in the general population. Hispanics comprise only 10 percent of Iowa's population, and similarly, nine percent of the children who died in 2013 were Hispanic (Table 3).

Table 2. Total number of deaths by race category ages 0-17 years from 2008-2013

	2008	2009	2010	2011	2012	2013	2013 %*	Iowa Population %**	Total
White	321	269	244	206	193	157	54.3%	91.8%	1390
Black	37	36	34	18	28	26	9.0%	3.5%	179
Asian	8	1	5	7	8	5	1.7%	2.4%	34
Multi-racial	8	2	9	8	7	4	1.4%	1.50%	38
Pacific Islander	1	0	1	0	0	0	0.0%	<1%	2
American Indian	3	1	1	0	1	0	0.0%	<1%	6
Unknown	8	2	7	103	81	97			298
Total	386	311	301	342	318	289			1947

*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 2008-2013

	2008	2009	2010	2011	2012	2013	2013%
Hispanic or Latino	38	42	26	21	27	19	9%
Non-Hispanic or Latino	348	269	275	321	291	275	91%
Total	386	311	301	342	318	289	

Infant mortality is again declining as had been the trend prior to 2010 (Table 1). Refer to the Infant Mortality section on page 13 for additional information.

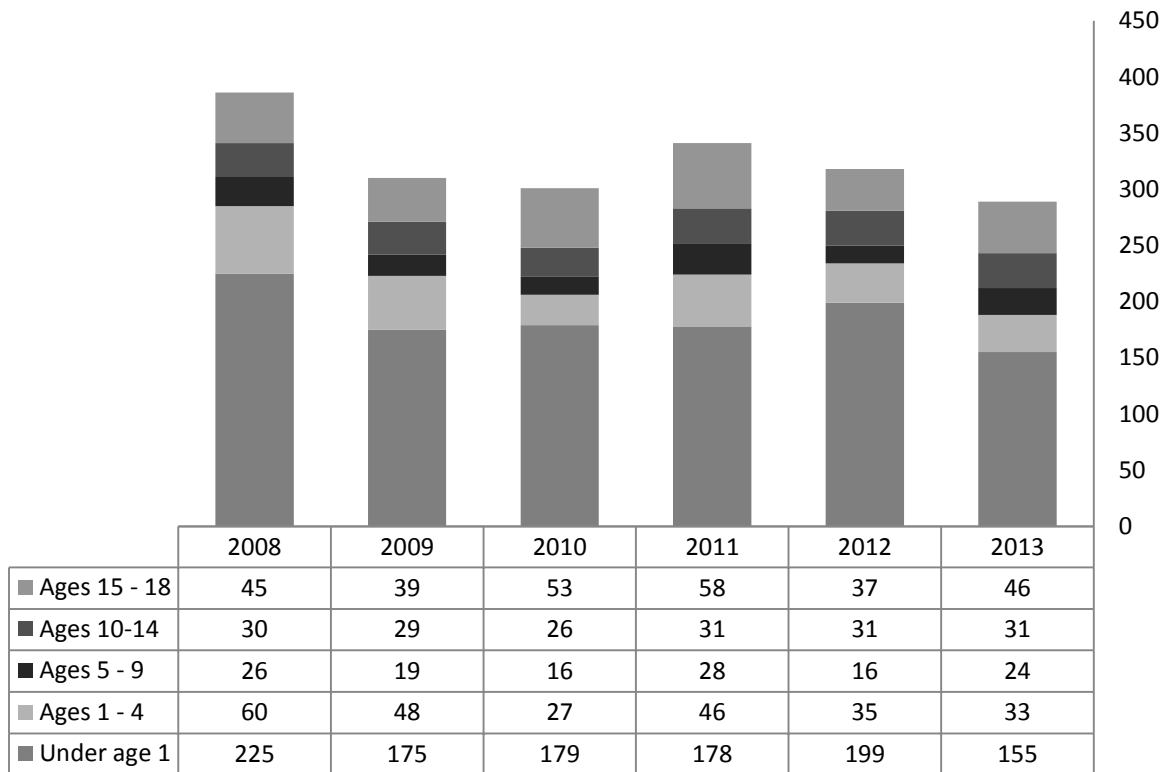


Figure 1. Total number of deaths by age group, 2008-2013

Since summative, annual mortality counts decreased, age group-specific rates decreased as well. Significantly fewer children ages 1-9 years were reported compared to the past five years. A decrease in mortality for teens ages 15-18 is largely attributed to fewer motor vehicle accidents.

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

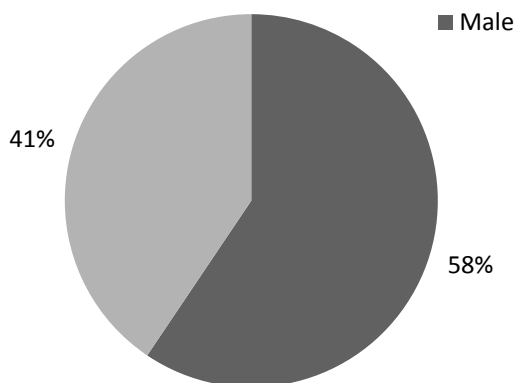


Figure 2. Total number of deaths by sex, 2008-2013

Deaths by Cause and Manner

In 2013, the majority of child deaths were attributed to a natural manner of death, followed by accidental, suicide, homicide, and then undetermined (Figure 3). There were significant decreases from 2012 to 2013 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.

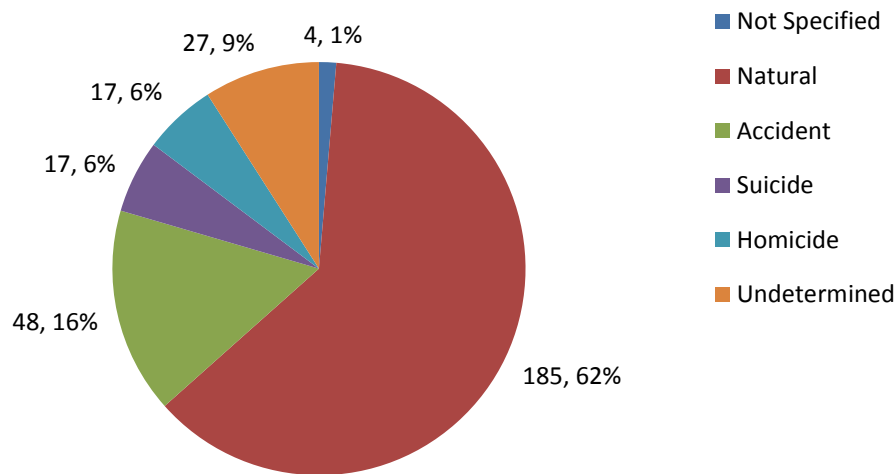


Figure 3. Number and percent of deaths by manner of death category, 2013

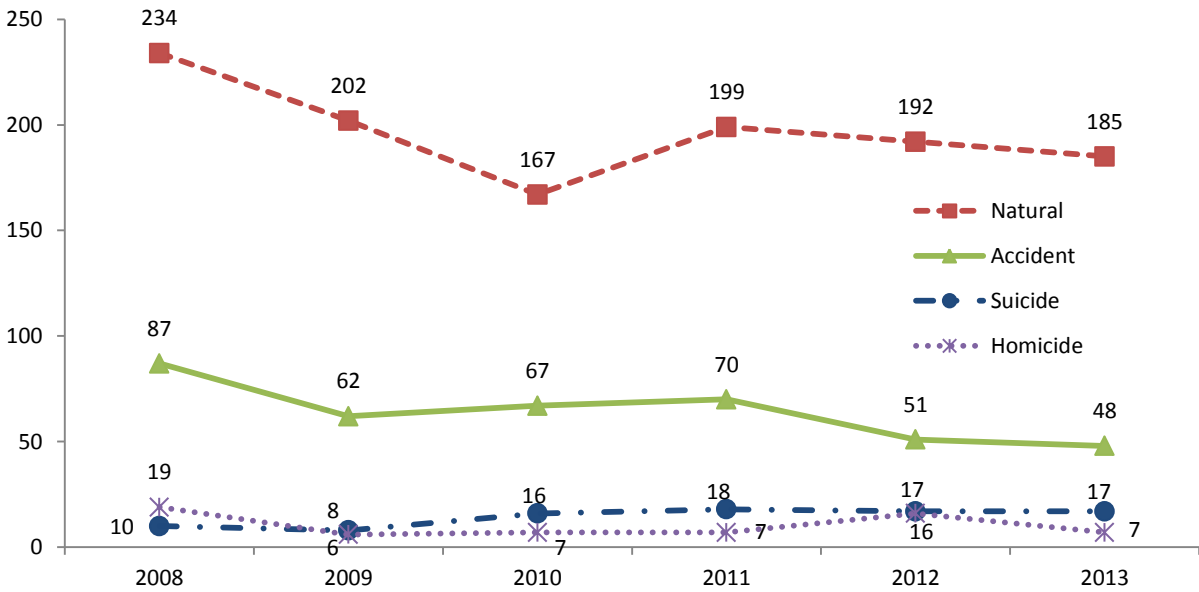


Figure 4. Number of deaths by manner and year, excluding natural manner of death

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 1 year of age (Table 8, 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 slightly lower in 2013 compared to the previous year (Figure 5). More detailed information on deaths involving trauma or injury is in the Accidental Deaths section of this report.

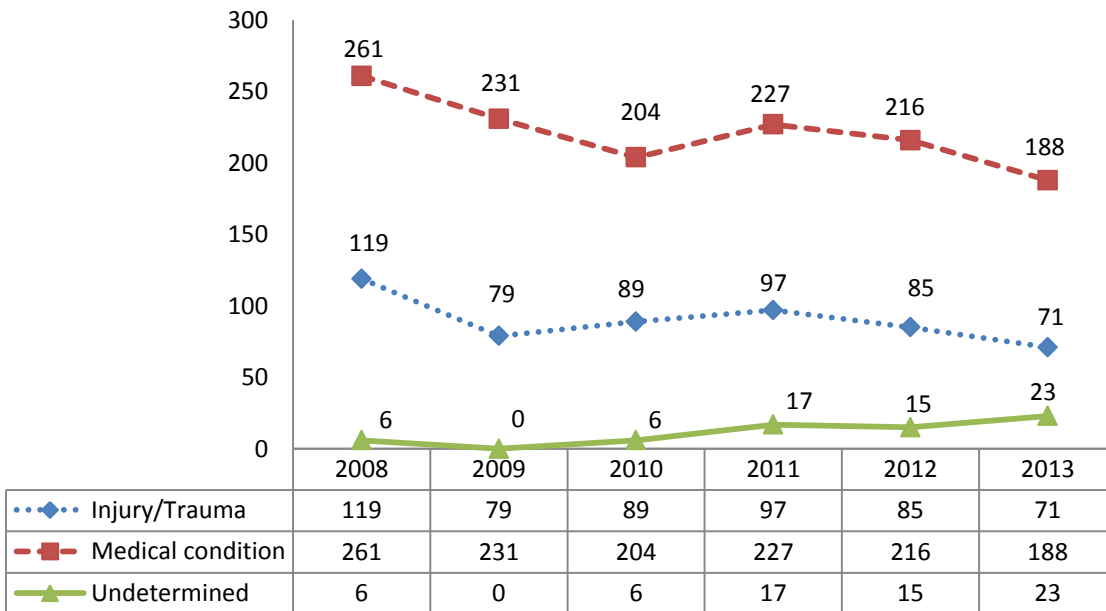


Figure 5. Number of deaths by cause of death category for all age groups, 2008-2013

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 decreased for the first time since 2010 (Figure 6, Table 4). Post-neonatal mortality remained relatively stable with a 5 percent change between 2013 and the past five years. A greater number of male infants do not survive the first year of life compared to females (Table 5).

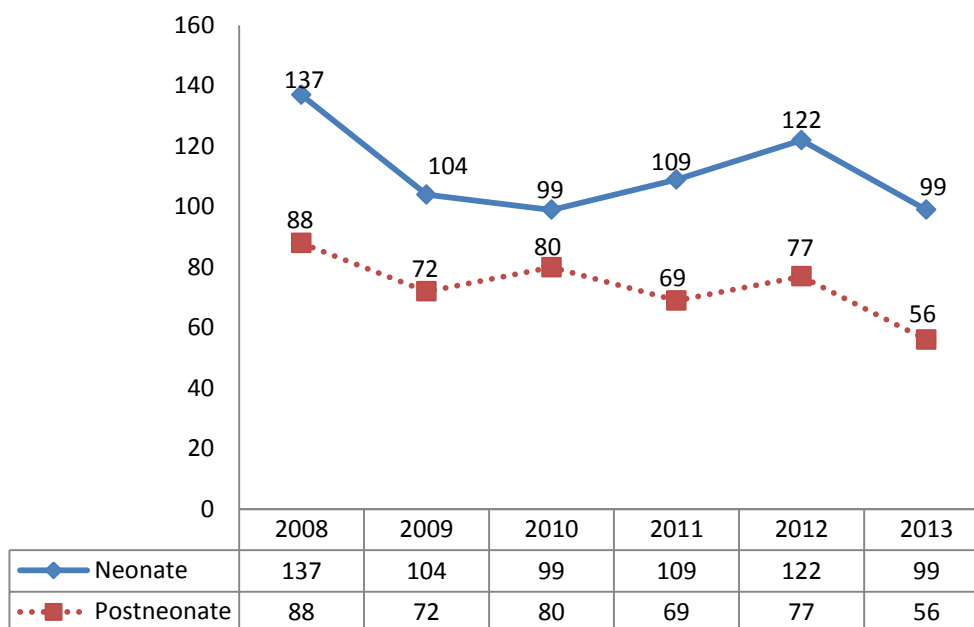


Figure 6. Total infant deaths, either neonatal or post-neonatal, by year, 2008- 2013

Table 4. Neonatal, post-neonatal, and child deaths by year, 2008-2013

	2008	2009	2010	2011	2012	2013	5-Yr Avg	% Chg	Total
Neonate	137	104	99	109	122	99	114	-13%	670
Post-neonate	88	72	80	69	77	56	77	-27%	442
Child	161	135	122	164	119	134	140	-4%	835
	386	311	301	342	318	289	332	-13%	1947

	Sex	Percent
Neonate	Male	54%
	Female	46%
Post-neonate	Male	60%
	Female	39%
Child	Male	59%
	Female	40%
Total	Male	58%
	Female	42%

Table 5. Total number of infant deaths by infantile period, sex, and year from 2008-2013

In the neonatal period, the manner of death is typically natural, attributed to birth defects, prematurity, cardiovascular conditions, 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 cause of death for infants in 2013 was injury/trauma, but at a significantly lower rate, only causing one death in a neonate and 12 in post-neonates (Table 6).

		2008	2009	2010	2011	2012	2013	Total
Neonate	Injury/ Trauma	4	0	2	1	3	1	11
	Medical condition	133	104	96	108	118	90	649
	Undetermined	0	0	0	0	1	5	6
	Unknown	0	0	1	0	0	2	3
	Total	137	104	99	109	122	99	670
Post-neonate	Injury/ Trauma	20	14	10	6	11	12	73
	Medical condition	63	58	66	47	53	30	317
	Undetermined	5	0	3	15	12	8	43
	Unknown	0	0	1	1	1	1	4
	Total	88	72	80	69	77	56	442
Child	Injury/ Trauma	95	65	77	90	71	58	456
	Medical condition	65	69	42	72	45	58	351
	Undetermined	1	0	3	2	2	10	18
	Unknown	0	1	0	0	1	10	2
	Total	161	135	122	164	164	134	880
Total	Injury/ Trauma	119	79	89	97	85	71	540
	Medical condition	261	231	204	227	216	258	1297
	Undetermined	6	0	6	17	15	23	67
	Unknown	0	1	2	1	1	3	8
	Total	386	311	301	342	318	289	1947

Table 6. The total number of infant deaths by infantile period, cause of death category, and year from 2008-2013

The locations of death data are only available for a subset of children. When examining location of death outside of the home, seven post-neonates died while at daycare and one child died while in foster care. The number of children who died while in child care has remained

consistent over the past several years. These data highlight the importance of safe infant care education and awareness among day care providers.

		2008	2009	2010	2011	2012	2013	Total
Neonate	Missing	14	81	94	108	115	72	594
	Childs home	8	2	3	0	4	4	23
	Friend or relative home	0	0	1	0	3	0	4
	Other	116	20	1	1	0	23	161
	Total	138	103	99	109	122	99	782
Post-neonate	Missing	12	24	33	24	37	14	173
	Childs home	52	33	39	31	24	29	239
	Friend or relative home	4	6	2	2	5	0	21
	Foster care	0	0	0	0	0	0	0
	Day care	5	5	4	8	7	7	37
	Other	14	4	2	4	4	6	37
Total	87	72	80	69	77	56	507	
Child	Missing	29	55	38	71	45	19	305
	Childs home	66	40	36	40	37	59	317
	Friend or relative home	7	6	5	4	3	3	36
	Foster care	0	0	1	0	0	1	2
	Day care	1	0	0	1	1	0	4
	Other	56	34	42	48	33	51	302
Total	159	135	122	164	119	133	966	
Total	Missing	55	160	165	203	197	105	1072
	Childs home	126	75	78	71	65	92	579
	Friend or relative home	11	12	8	6	11	3	61
	Foster care	0	0	1	0	0	1	2
	Day care	6	5	4	9	8	7	41
	Other	186	58	45	53	37	80	500
Total	386	311	301	342	318	289	2255	

Table 7. Location of incident, 2008-2013

Natural Deaths

A majority of child deaths in 2013 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 undetermined or natural because a medical cause cannot explain these deaths; however, the classification assignment is at the discretion of the medical examiner or physician attesting a death certificate.

	2008	2009	2010	2011	2012	5-Yr Avg	2013	% Chg
Prematurity	80	64	61	47	45	59	44	-26%
Congenital anomaly	39	55	51	43	46	47	40	-15%
Other medical condition	15	12	15	72	62	35	35	-1%
Cardiovascular	30	11	9	13	18	16	29	79%
SIDS	33	29	33	24	19	28	18	NS
Pneumonia	10	10	6	4	7	7	10	NS
Cancer	11	15	9	6	10	10	7	NS
Neurological/seizure disorder	1	7	2	6	0	3	3	NS
Malnutrition	1	0	0	3	0	1	3	NS
Asthma	1	1	1	2	2	1	2	NS
Other perinatal condition	19	7	2	2	0	6	1	NS
Undetermined medical cause	0	0	2	1	0	1	0	NS
Other infection	19	16	7	2	3	9	0	NS
Influenza	1	2	1	0	0	1	0	NS
Unknown	1	2	5	2	3	3	0	NS
	261	231	204	227	215	227	192	

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 2008-2013

The strongest contributors to the gradual decline in Iowa infant mortality are due to reductions in prematurity and congenital anomalies. There was a 26 percent decrease in deaths attributed to prematurity compared to the average of the prior five years (Table 8, Table 9, Figure 7).



Figure 7. Total number of natural deaths for the top four medical condition category causes by year, 2008-2013

	2008	2009	2010	2011	2012	2013
Under age 1	169	132	128	129	148	137
Ages 1 - 4	29	30	11	24	15	18
Ages 5 - 9	10	11	8	18	7	9
Ages 10-14	12	15	9	14	13	14
Ages 15 - 18	14	13	11	14	9	8
Missing	0	1	0	0	0	0
	234	202	167	199	192	185

Table 9. The total number of natural deaths by age group and year from 2008-2013

Accidental Deaths

There were 48 reported accidental deaths in 2013 (Table 10). The majority of these deaths were the result of motor vehicle collisions, followed by asphyxia, and then drowning, poisoning, fire-related, unknown causes of the accidental death and a death from an animal attack. In 2013, there was a marked decrease in the number of motor vehicle accidents. The number of deaths caused by drowning remained steady and the number of poisonings and asphyxia deaths increased.

	2008	2009	2010	2011	2012	2013	5-Yr Avg	% Chg
MV	39	31	34	41	26	16	34	-53.2%
Asphyxia	22	10	11	7	6	11	11	-1.8%
Drowning	7	7	12	11	8	8	9	-11.1%
Poisoning, overdose, or acute intoxication	2	2	5	3	1	4	3	53.8%
Fire	9	9	4	4	6	3	6	NS
Animal bite or attack	0	0	0	1	0	1	0	NS
Fall or crush	5	1	0	2	2	0	2	NS
Not Specified	0	0	1	1	1	2	1	NS
Exposure	0	0	0	0	1	0	0	NS
Weapon	1	1	0	0	0	0	0	NS
Other	2	1	0	0	0	2	1	NS
Total	87	62	67	70	51	48	67	NS

Table 10. The total number, five-year average, and percent change of accidental deaths by cause and year from 2008-2013

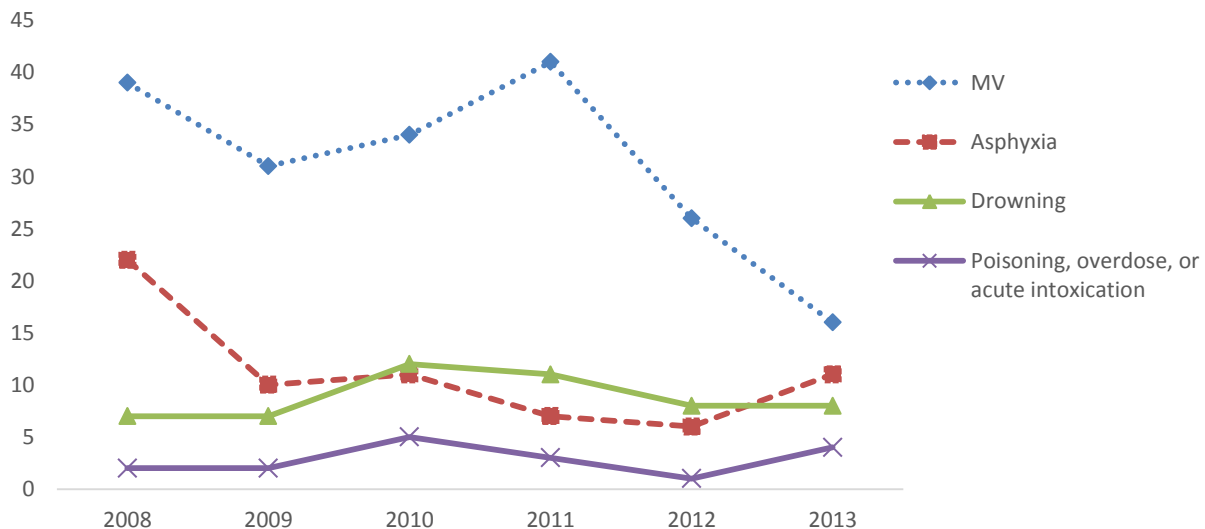


Figure 8. Accidental deaths from the top four causes, 2008-2013

Three fatalities were the result of fire. Fire-related fatalities often occur in homes lacking functional smoke detectors and some have been known to involve rental properties. Oversight of rental property electrical and fire safety is a concern of the Child Death Review Team.

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).

The number of motor vehicle-related accidental deaths declined in 2013, while all other major categories stayed static (Figure 8).

Motor Vehicle Accidents

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.

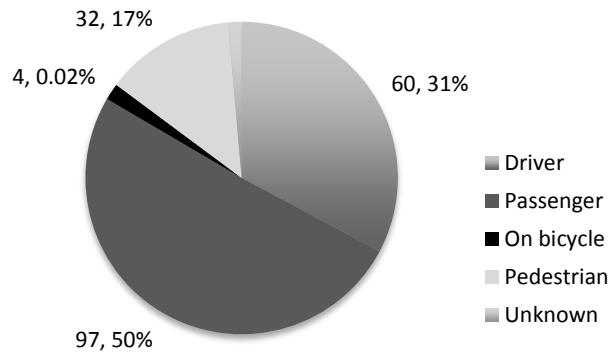


Figure 9 Position of decedent in motor vehicle in all accidents, 2008-2013

The primary types of motor vehicles involved in fatal accidents were automobiles and ATVs (Table 11). In 2013 for all automobile accidents, slightly more than half were drivers. (Figure 9).

Table 11. Motor vehicle accidents by type of conveyance, 2008-2013

	2008	2009	2010	2011	2012	2013	Total
All automobile	25	22	25	26	20	12	130
Not Specified	5	1	2	4	0	3	15
Other	2	4	3	3	1	1	14
None	2	2	1	0	3	0	8
ATV	1	1	2	8	2	0	14
Bicycle	1	1	1	0	1	0	4
School bus	0	0	0	2	0	0	2
Motorcycle	0	0	0	0	0	0	0
Tractor	4	0	0	0	0	0	4
Snowmobile	0	0	1	0	0	0	1
Unknown	1	0	0	0	0	0	1
Total	41	31	35	43	27	16	193

	2008	2009	2010	2011	2012	2013	Total
Male	19	17	21	27	18	8	110
Female	22	14	14	16	9	8	83
Total	41	31	35	43	27	16	193

Table 12. Motor vehicle or other transport accident deaths by gender for years 2008-2013

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

Instruction permits are 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

Intermediate licenses are 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

Full licenses are 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 most had intermediate licenses at the time of the accident. Of all motor vehicle accidents involving a car, truck, van, or public road-approved mode of transportation, 11 were driving at the time of the accident. Most of these drivers had intermediate licenses (Table 13).

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

	2008	2009	2010	2011	2012	2013	Total
License Expired Instructional Permit	1	0	0	0	0	0	1
Instructional Permit	0	0	0	0	0	1	1
Unknown	1	2	2	0	0	0	5
School License	0	1	1	1	0	0	3
Full License	1	0	1	2	1	0	5
No License	1	0	0	2	2	0	5
Intermediate License	2	3	1	7	8	4	25
Total	6	6	5	12	11	5	45

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 eight drowning-related deaths in 2013. When reviewing these deaths by location, they most often happen in open water, in the month of July, and in a river or other type of open water (Figure 10). Swimming pools are the second most common location of accidental drowning, followed by bathtub drowning.

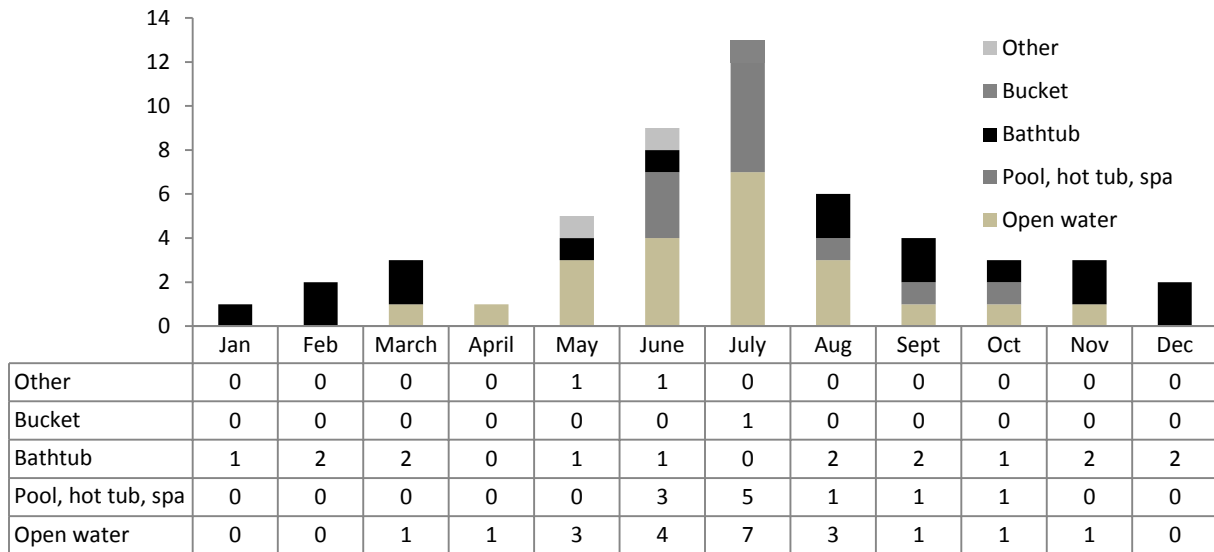


Figure 10 Drowning by location and month, 2008-2013

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 (Figure 11). 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.

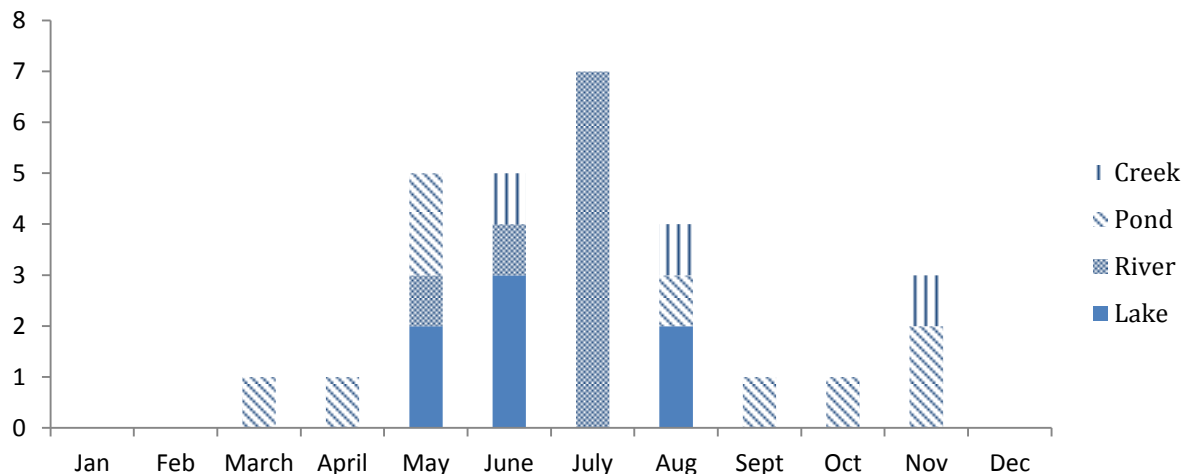


Figure 11. The number of drowning-related deaths by month and type of open water from 2008-2013

Poisonings

Six poisoning deaths occurred in 2013 (Table 14). One was attributed to a cleaning substance (dust cleaner) intoxication with a manner of death as accident. A second poisoning was an accidental alcohol intoxication. The third poisoning was the result of an accidental overdose with street drugs. The fourth poisoning was due to a prescription drug (SF and PP-22 Synthetic cannabinoid) intoxication with the manner of death accident. The fifth and sixth poisonings were two different homicides; one was a deliberate poisoning with a painkiller (opiate) and the other one was an acute intoxication with methadone.

		2008	2009	2010	2011	2012	2013	Total	Avg
Under age 1	Accidental overdose	0	0	0	1	0	0	1	0
	Other	0	1	0	0	0	0	1	0
	Unknown	0	0	0	0	1	0	1	0
	Total	0	1	0	1	1	0	3	1
Ages 1-4	Accidental overdose	2	0	0	1	0	0	3	1
	Deliberate poisoning	0	0	0	0	1	1	2	0
	Other	0	1	1	0	0	1	3	1
	Total	2	1	1	1	1	2	8	1
Ages 5-9	Acute Intoxication	0	0	0	0	0	0	0	0
	Other	0	0	1	0	0	0	1	0
	Total	0	0	1	0	0	0	1	0
Ages 10-14	Accidental overdose	0	1	0	0	0	0	1	0
	Deliberate poisoning	0	0	1	0	0	0	1	0
	Total	0	1	1	0	0	0	2	0
Ages 15-18	Accidental overdose	0	0	2	0	1	1	4	1
	Adverse effect but not overdose	0	0	1	0	0	0	1	0
	Deliberate poisoning	0	0	1	0	1	0	2	0
	Acute intoxication	0	0	0	1	0	3	4	1
	Total	0	0	4	1	2	4	11	2
Total	Accidental overdose	2	1	2	2	1	1	9	1
	Adverse effect but not overdose	0	0	1	0	0	0	1	0
	Deliberate poisoning	0	0	2	0	2	1	5	1
	Acute intoxication	0	0	0	1	0	3	4	1
	Other	0	2	2	0	0	0	4	1
	Unknown	0	0	0	0	1	0	1	0
	Total	2	3	7	3	4	6	25	4

Table 14. The total number of poisoning deaths by type, age group, and year from 2008-2013

Suicide

In 2013, there were 17 suicides among children ages 18 and under (Table 15). Unfortunately, incidence has remained steady for the past three years following a significant increase in 2010. Males comprised the majority of suicide victims with 13 deaths (there were four female deaths) (Table 16). Of these 17 deaths, 13 were between the ages of 15-18 years and four were between the ages of 10-14 years. Twelve children hanged themselves, four used a firearm, and one used a poisoning (Table 15). Three female children hanged themselves and one died of poisoning, whereas an almost even number of male children used either a firearm or hanging (Table 16).

		2008	2009	2010	2011	2012	2013
10-14	Motor vehicle or other transport	1	0	0	0	0	0
	Asphyxia	0	2	2	2	5	1
	Weapon, including body part	0	0	0	3	2	3
	Poisoning, overdose or acute intoxication	0	0	1	0	0	0
	Total	1	2	3	5	7	4
15-18	MV	0	0	1	1	0	0
	Asphyxia	3	5	5	9	7	6
	Weapon	6	1	6	3	2	7
	Poisoning, overdose, or acute intoxication	0	0	1	0	1	0
	Total	9	6	13	13	10	13
Total	Motor vehicle or other transport	1	0	1	1	0	0
	Asphyxia	3	7	7	11	12	7
	Weapon, including body part	6	1	6	6	4	10
	Poisoning, overdose or acute intoxication	0	0	2	0	1	0
	Total	10	8	16	18	17	17

Table 15. The total number of suicide deaths by method and age group from 2008-2013

		2008	2009	2010	2011	2012	2013
Male	Motor vehicle or other transport	0	0	1	1	0	0
	Asphyxia	2	6	5	8	9	3
	Weapon, including body part	5	1	5	6	4	10
	Poisoning, overdose or acute intoxication	0	0	0	0	0	0
	Total	7	7	11	15	13	13
Female	Motor vehicle or other transport	1	0	0	0	0	0
	Asphyxia	1	1	2	3	3	4
	Weapon, including body part	1	0	1	0	0	0
	Poisoning, overdose or acute intoxication	0	0	2	0	1	1
	Total	3	1	5	3	4	4
Total	Motor vehicle or other transport	1	0	1	1	0	0
	Asphyxia	3	7	7	11	12	7
	Weapon, including body part	6	1	6	6	4	10
	Poisoning, overdose or acute intoxication	0	0	2	0	1	1
	Total	13	10	8	16	18	17

Table 16. The number of suicide deaths by method and sex from 2008-2013

The disparity between the number of male and female suicide victims cannot be understated (Figure 12). Over the past six years, the proportion of males committing suicide has increased 44 percent (Table 16). From 2009 to 2010, the total number of suicides doubled and rose again from 2010 to 2011 (Figure 13). The CDRT strongly recommends full investigation, including autopsy, in the case of a death by suicide to aid in characterizing these tragic events.

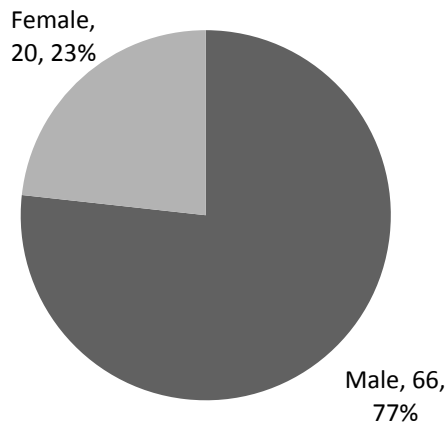


Figure 12. Suicides by sex, 2008-2013

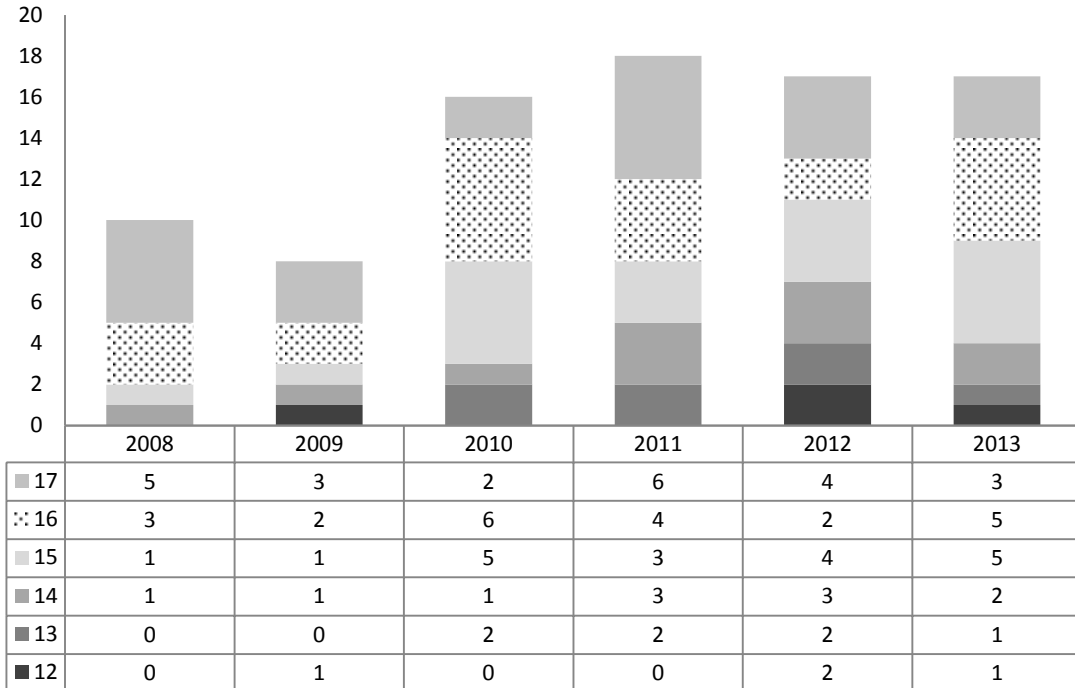


Figure 13. Suicides by single year age, 2008-2013

Homicide

In 2013, Iowa experienced seven homicides affecting children ages 17 and under. This was a significant decrease over the previous year (Table 17).

	2008	2009	2010	2011	2012	2013
Under age 1	5	2	2	2	5	2
Ages 1 - 4	5	3	4	1	6	2
Ages 5 - 9	4	0	0	2	0	1
Ages 10-14	2	0	0	1	1	2
Ages 15 - 18	3	1	1	1	4	3
Total	19	6	7	7	16	7

Table 17. Number of homicides by age group and year from 2008-2013

Age (yrs)	Race/Gender	Method	Perpetrator/ Criminal Charges	Sentencing
<1	White/Female	Head trauma	23 year old male, family friend/ boyfriend of mother Charged with child endangerment causing death	50-year in prison
<1	White/Female	Suffocation	15 years old female, mother Charged with child endangerment resulting in death but convicted of a Juvenile Delinquent Act	Probation
1	White/Female	Methadone intoxication	24 year old male, father, and 25 year old female, mother Charged with child endangerment resulting in serious injury (Alford Plea)	Up to 10 years in prison, each
1	White/Male	Acute oxycodone intoxication	Teenage biological sibling No charges filed	N/A
5	White/Male	Blunt force injuries of head	17 year old male, foster child in same foster home Charged with murder, not guilty by Reason of Insanity	Institutionalized
15	White/Female	Multiple blunt force injuries	42 year old male, stranger Committed suicide	N/A
17	White/Female	Gunshot wound to head	51 year old male, father Involuntary manslaughter	5 years in prison

Table 18. Homicides by age, race, and perpetrator

Undetermined

In 2013, the exact cause of death for 28 children could not be determined and occurred primarily in children less than 1 year of age (Table 19, Figure 14). Undetermined deaths were examined more closely in the sleep-related mortality supplement in Appendix A.

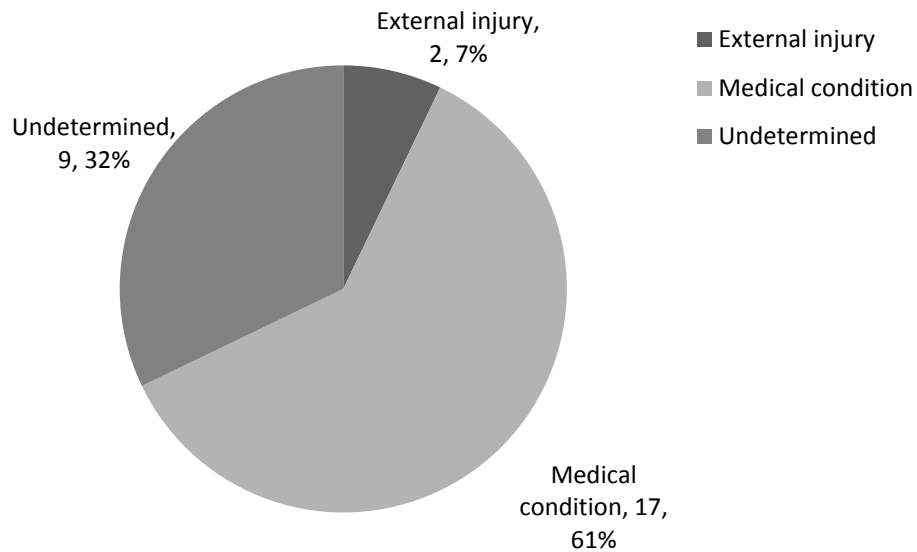


Figure 14. Undetermined manner of death by cause category, count and percent, 2013

	Frequency	Percent
Under age 1	25	89.3
Ages 1 - 4	3	10.7
Ages 5 - 9	0	0
Ages 10-14	0	0

Table 19. Number and percent of undetermined deaths by age group, 2013

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.

Average age at death is 39 days for 2013; 102 days for all deaths between 2004 and 2013.

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.

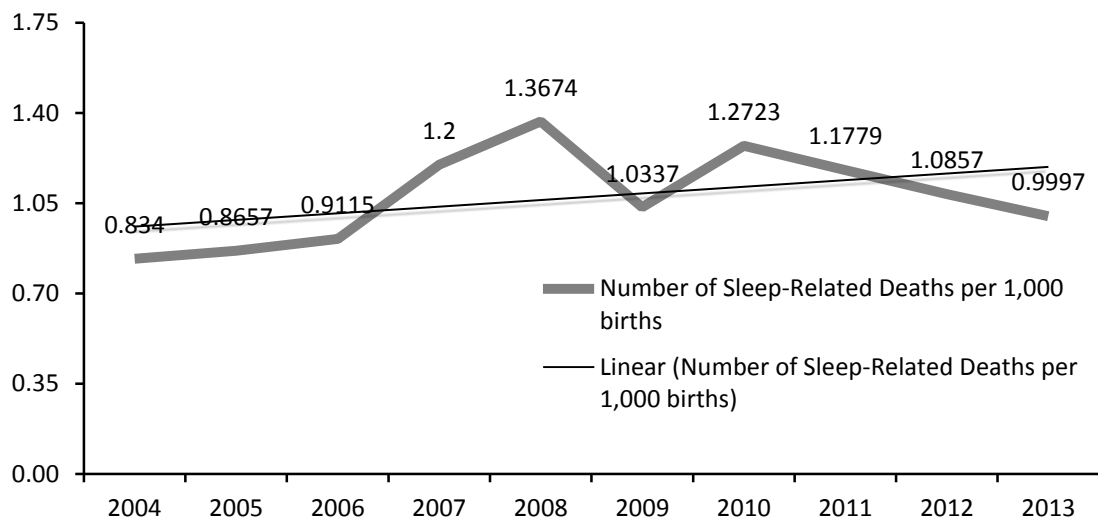


Figure 15. Sleep-related infant mortality due to asphyxia, SIDS, undetermined or unknown cause, 2004-2013 (n=384)

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. Rates in 2011 and 2012 were declining; however, the trend line indicates likely continued overall increase.

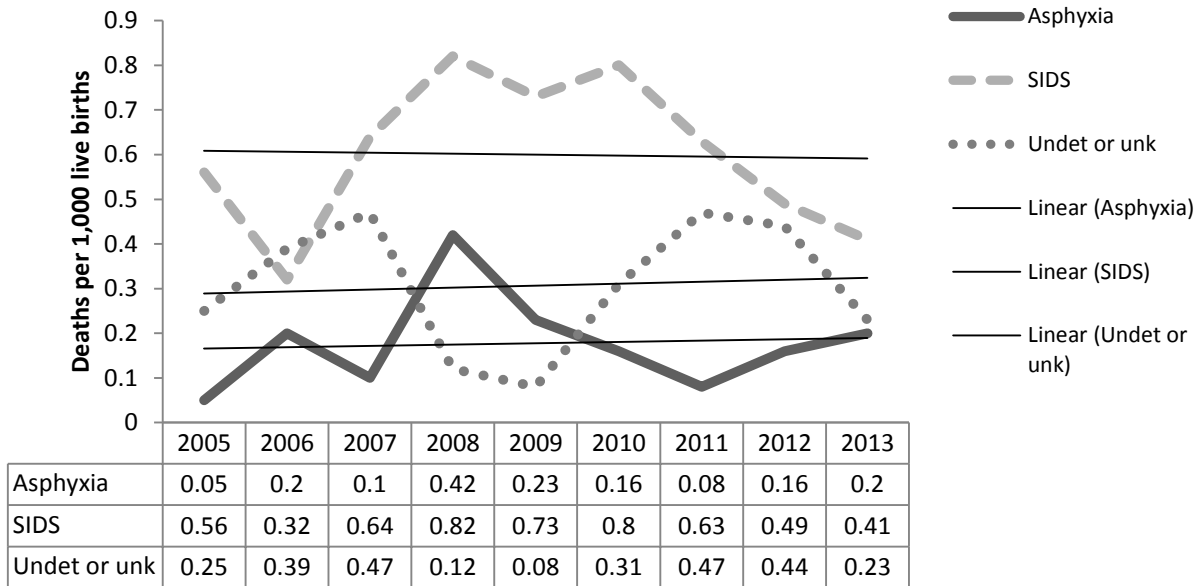


Figure 16. Sleep-related infant mortality by group, 2005-2013 (n=389)

Mortality rates due to undetermined or unknown cause have a gradually increasing trend line since 2004, but have fluctuated greatly over that time (Figure 16). Trend line trajectory indicates the increase will continue. Rates due to asphyxia were slightly decreasing over time. This is in contrast to the national trend showing an increase in mortality in the same time period.

Table 20 Frequencies of factors related to sleep-related mortality (n=384)

Factor	Response	Frequency	Percent
Infant sex	Male	24	62%
	Female	15	38%
Infant race	White	26	67%
	African American	10	26%
	Asian	1	3%
	Multi-racial	1	3%
	Missing	1	3%
Date of death - Month	Oct	4	10%
	Nov	3	8%
	Dec	1	3%
	Jan	4	10%
	Feb	3	8%
	March	5	13%
	April	3	8%
	May	2	5%
	June	2	5%
	July	6	15%
	Aug	2	5%
	Sept	4	10%
Incident sleep place	Crib	10	26%
	Not a crib	24	62%
	Other	5	13%

Usual sleep place	Crib	12	31%
	Not a crib	14	36%
	Other	13	33%
Position child was placed to sleep	Back	27	69%
	Side or stomach	9	23%
	Unknown	3	8%
Position child was found	Back	15	38%
	Side or stomach	21	54%
	Unknown	3	8%
Child sleeping on the same surface as a child or adult	Yes	16	41%
	No	19	49%
	Unknown	4	10%

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, 69 percent of infants did not usually sleep in a crib (Table 21). Babies were reportedly sleeping with another child or adult at time of death in more than 41 percent of cases (Table 20).

Parents and caregivers appear to be following back to sleep recommendations, as nearly half report placing his or her child to sleep on their back. 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 77 percent of cases compared to 65 percent of white babies (Table 21).

Table 21 Chi-square comparison of non-white to white infant usual sleep place, 2004-2013 (n=151)

	No Crib	Crib	Total
White	17, 65%	9, 35%	26
Non-White	10, 77%	3, 23%	13
Total	27	12	39

The prevalence of bed sharing at death was assessed and it was found that 46 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, 2004-2013 (n=151)

	Not Specified	Yes	No	Unknown	Total
White	2, 8%	10, 39%	13, 50%	1, 4%	26
Non-White	0, 0%	6, 46%	6, 46%	1, 8%	13
Total	2	16	19	2	39

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 a quarter of cases.

Table 23. Chi-square comparison of position child was put to sleep against how the child was found, 2004-2013

	Child found						
		Not specified	On back	On stomach	On side	Unknown	Total
Child put to sleep	On back	0, 0%	13, 48%	10, 37%	4, 15%	0, 0%	27
	On stomach	0, 0%	2, 33%	3, 50%	0, 0%	1, 17%	6
	On side	1, 33%	0, 0%	1, 33%	1, 33%	0, 0%	3
	Unknown	0, 0%	0, 0%	0, 0%	2, 67%	1, 33%	3
	Total	1, 3%	15, 39%	14, 36%	7, 18%	2, 5%	39

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.