



Iowa's
CHILD DEATH

Review Team

Report to the Governor and General Assembly

Terry E. Branstad
Governor

Kim Reynolds
Lt. Governor

2012 Annual Report



Gerd Clabaugh, MPA
Director of Public Health

Julia C. Goodin, MD
Iowa Chief State Medical Examiner

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	31
Sleep-Related Mortality and SIDS.....	31

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 2006-2011	13
Table 3. Total number of deaths by ethnicity ages 0-17 years from 2004-2011.....	13
Table 4. Neonatal, postneonatal, and child deaths by year, 2006-2012	17
Table 5. Total number of infant deaths by infantile period, sex, and year from 2007-2012.....	18
Table 6. The total number of infant deaths by infantile period, cause of death category, and year from 2006-2011.....	18
Table 7. Location of incident, 2008-2012	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 2007-2012	20
Table 9. The total number of natural deaths by age group and year from 2007-2012	21
Table 10. The total number, five-year average, and percent change of accidental deaths by cause and year from 2007-2012.....	22
Table 11. Motor vehicle accidents by type of conveyance, 2007-2012.....	23
Table 12. Motor vehicle or other transport accident deaths by gender for years 2006-2012	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 2007-2012.....	26
Table 15. The total number of suicide deaths by method and age group from 2007-2012.....	27

Table 16. The number of suicide deaths by method and sex from 2006-2011 27

Table 17. Number of homicides by age group and year from 2008-2012..... 29

Table 18. Homicides by age, race, and perpetrator 29

Table 19 Homicides by decedent age, manner, perpetrator, and sentencing 30

Table 20. Number and percent of undetermined deaths by age group, 2012..... 31

Table 21 Frequencies of factors related to sleep-related mortality (n=384) 33

Table 22 Chi-square comparison of non-white to white infant usual sleep place, 2004-2012 (n=151)
..... 34

Table 23 Chi-square comparison of non-white to white infants bed sharing at time of death, 2004-
2012 (n=151) 35

Table 24. Child death counts and five-year rate per population..... 36

Figures

Figure 1. Total number of deaths by age group, 2006-2012 14

Figure 3. Number and percent of deaths by manner of death category, 2012..... 15

Figure 5. Number of deaths by cause of death category for all age groups, 2007-2012..... 16

Figure 6. Total infant deaths, either neonatal or postneonatal, by year, 2007, 2012..... 17

Figure 7. Total number of natural deaths for the top four medical condition category causes by year,
2006-2012 21

Figure 11 Drowning by location and month, 2008-2012..... 25

Figure 12. The number of drowning-related deaths by month and type of open water from 2006-
2012..... 25

Figure 16. Undetermined manner of death by cause category, count and percent, 2012 31

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 each and every 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. Recently the team had a long discussion regarding something we have realized for some time. It all comes down to parents. Parents are dealing with different types of challenges while trying to raise healthy, safe children in today's environments. We have identified challenges parents must contend with. These include, but are 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. Parents are more stressed now than ever before. Their children are impacted by influences that parents not only cannot control, but often don't even realize have been living in their homes.

This report will show some alarming data, that while overall death has decreased, we continue to have an epidemic of children dying at their own hands or as the victims of homicide. The death of a child reverberates through a community and can never be underestimated. 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.

As always, it is an honor and a curse to serve on this team. Each member should be commended for their efforts, as it is a calling not a job to delve into the deepest fears of all parents and try to find something that can be changed in a community so that there can be some good from the worst of circumstances. Without the efforts of each member of the team this report would not reflect what really happens in Iowa and the recommendations would not be valid. Special commendation is extended to the Office of the State Medical Examiner for all of their hard work in collecting and collating the different aspects of investigation so that the review is complete.

Respectfully submitted,
Laurie Gehrke, R.N., BSN, CPEN, CEN
Chairperson, Iowa Child Death Review Team

Iowa Child Death Review Team Members

Michelle Catellier, MD

Office of the State Medical Examiner

Vidya Chande, MD

Pediatrician

Blank Children's Hospital

John Dagle, MD, PhD

Neonatologist

University of Iowa Hospitals and Clinics

Kristin DeMoss-Schloemer

Mental Health

Horizons

Jeff Dumermouth

Iowa Emergency Medical Services Association

Melissa Ellis

Iowa Department of Public Health

Laurie Gehrke RN, Chairperson

Emergency Room Nurse

Meghan Harris, MPH, MPA, EdD

Meridian Health Plan

Patty Keeley

Iowa SIDS Foundation

Dennis Kleen

Department of Transportation

Tom Kozisek

Police Chief

Garner Police Department

Josh Lundahl, LISW, Co-Chair

Social Worker

Ankeny School District

Jennifer Miller

Iowa County Attorney Association

Mitch Mortvedt

Department of Public Safety

Roxanne Riesberg

Department of Human Services

Adam Stark

Domestic Violence

James Swegle, MD

Trauma Services

Denise Timmins

Iowa Attorney General's Office

Theresa Wahlig, MD

Family Practitioner

Child Serve Medical Director

Iowa Department of Public Health

Patrick Goebel

Iowa Office of the State Medical Examiner

Julia Goodin, MD, Chief State Medical Examiner

John Kraemer, PA, F-ABMDI, Coordinator

Stacie Bridges, RN, Coordinator

Jenna Borron

EXECUTIVE SUMMARY

2012 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 2012 data shows child deaths continue to decline in Iowa over the five years prior to 2012; the year of this report is the first increase since 2008. The decrease started in 2008 with 386 deaths, to 311 deaths in 2009, and to 302 deaths in 2010. The incidence of child deaths continues to be higher in the counties with the highest populations: Black Hawk, Dubuque, Johnson, Linn, Polk, Scott, and Woodbury. Polk and Johnson counties have large and very active children's trauma centers. This accounts for higher incidences in these counties because many severe child trauma cases from across the state, and even outside of Iowa, are referred to these centers for treatment.

Key findings in the 2012 report:

- The number of child deaths in 2012 is lower than 2011, and deaths over the past five years continue to decline.
- Sleep-related infant mortality remains a concern as Iowa data demonstrate slight, consistent increases in Sudden Infant Death Syndrome (SIDS) and undetermined cause. Unsafe sleep environments are frequently reported in these cases.
- Overall infant mortality is decreasing, despite two consecutive years of increases in neonatal mortality. Decreases in postneonatal mortality have been offset by increases in neonatal mortality in recent years.
- Deaths due to prematurity have significantly declined over the past several years, while natural deaths attributed to congenital anomalies and medical conditions have increased.
- A strikingly high number of children died at the hands of others in 2012. A total of 16 homicides were reported; the highest number since 2008.
- Factors contributing to the 2012 homicide rate were caregiver-related issues, such as anger control, mental health and wellbeing, and lack of use of the Safe Haven law.
- Other factors in homicides in teenage decedents were careless use of firearms and senseless violence.
- Accidental fatalities were the lowest in five years with reductions in motor vehicle accidents, drowning, and other accident deaths.
- Despite a decrease in 2012, concern exists for ATV-related fatalities as eight were reported in 2011.
- The rate of suicide among teens has sustained a high rate for three consecutive years. In 2012, 17 children committed suicide including two 12-year olds.
- The proportion of females committing suicide in 2012 was higher than in 2011.

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 192 natural deaths in 2012 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 2012, 51 children died from accidents, comprising 16 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 2012, 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 16 homicides in 2012. Two homicides, twin sisters, were the result of suffocation inflicted by a mother shortly after home birth. In three cases where mothers were caregivers, mental health and wellbeing may have been factors in the commission of these three crimes. Two older victims died as a result of senseless violence where the perpetrators are still unknown. Two other, teenage victims died at the hands of friends carelessly handling firearms.

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 2012, there were 40 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.

John C. Kraemer, PA, F-ABMDI

Director, Forensic Operations
State Child Death Review Team Coordinator
Iowa Office of the State Medical Examiner
Iowa Department of Public Health

Meghan L. Harris, MPH, MPA, EdD

Vice President of Quality and Performance
Improvement
Meridian Health Plan

Iowa Child Death Review Team Annual Report Recommendations

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

History of the Iowa Child Death Review Team

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

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

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

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

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

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

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



Annual Summary

In 2012 there were 318 deaths involving Iowa children ages 17 years and younger (Table 1). This was a slight reduction compared to the previous year, and a small increase over the previous five-year average.

	2006	2007	2008	2009	2010	2011	2012	5-Year Avg	% Chg
Under age 1	216	243	225	175	179	178	199	203	-2%
Ages 1 - 4	42	44	60	48	27	46	35	45	-21%
Ages 5 - 9	24	26	26	19	16	28	16	23	-31%
Ages 10-14	26	35	30	29	26	31	31	30	5%
Ages 15 - 18	73	64	45	39	53	58	37	55	-33%
Total	381	412	386	310	301	341	318	355	-10%

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 2012 were among Black children, which is three times the proportion of Blacks in the general population. A similar disparity was evident among ethnicity as Hispanics comprise only 10 percent of Iowa's population, but nine percent of the children who died in 2012 were Hispanic (Table 3).

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

	2007	2008	2009	2010	2011	2012	2012 %*	Iowa Population %**	Total
White	372	321	269	244	206	193	61%	93%	1605
Black	36	37	36	34	18	28	9%	3%	189
Pacific Islander	0	1	0	1	0	0	0%	<1%	2
Asian	3	8	1	5	7	8	3%	2.00%	32
American Indian	1	3	1	1	0	1	0%	<1%	7
Multi-racial	0	8	2	9	8	7	25%	1.50%	34
Unknown	1	8	2	7	103	81	2%		202
Total	413	386	311	301	342	318			2071

*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 2004-2011

	2007	2008	2009	2010	2011	2012	2012%
Hispanic or Latino	43	38	42	26	21	27	10%
Non-Hispanic or Latino	370	348	269	275	321	291	90%
Total	413	386	311	301	342	318	

The majority of child deaths occurred in infants less than 12 months of age (**Error! Reference source not found.**). Infant mortality had been declining in past years and experienced a minor decrease of two percent compared to previous years (Table 1). Refer to the Infant Mortality section on page 13 for additional information.

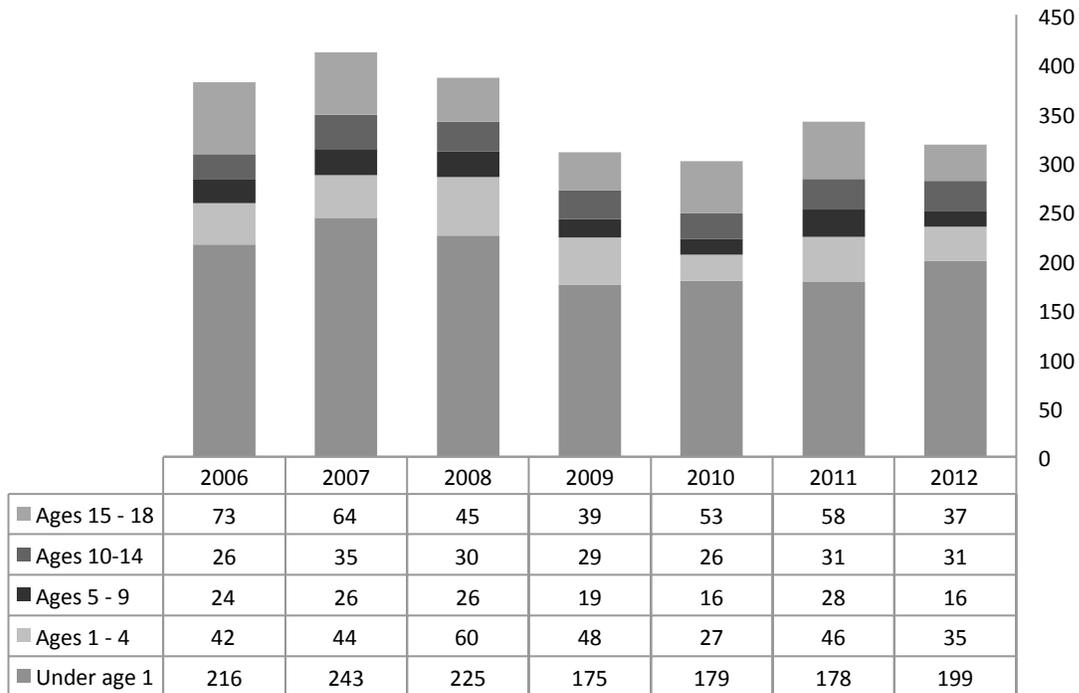


Figure 1. Total number of deaths by age group, 2006-2012

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.

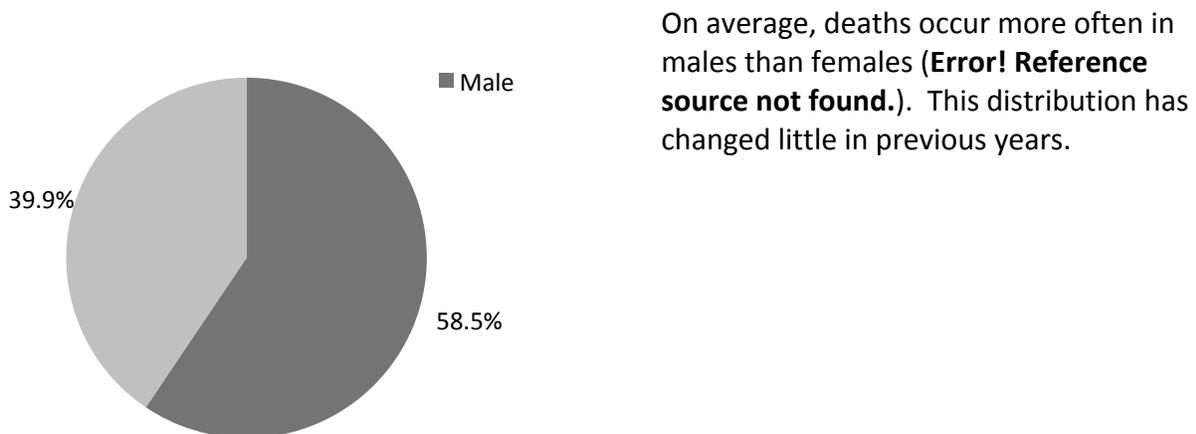


Figure 2. Percent of deaths by sex, 2006-2012

Deaths by Cause and Manner

In 2012, the majority of child deaths were attributed to a natural manner of death, followed by accidental, undetermined, suicide, and then homicide (**Error! Reference source not found.**). There were slight decreases from 2011 to 2012 in all manner of death categories except homicides, which dramatically increased in 2012 ().

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.

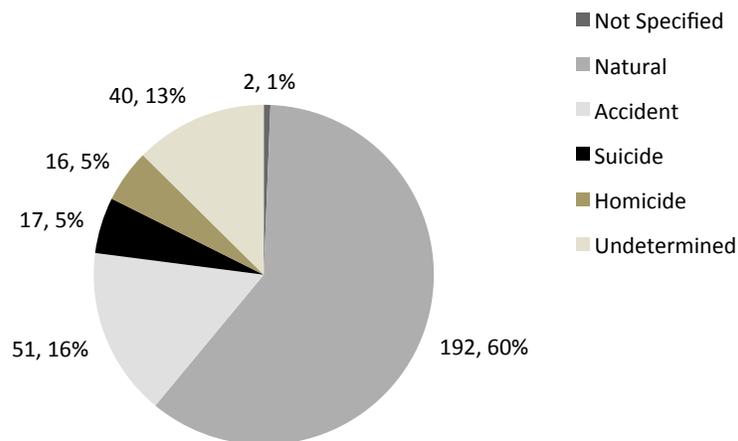


Figure 3. Number and percent of deaths by manner of death category, 2012

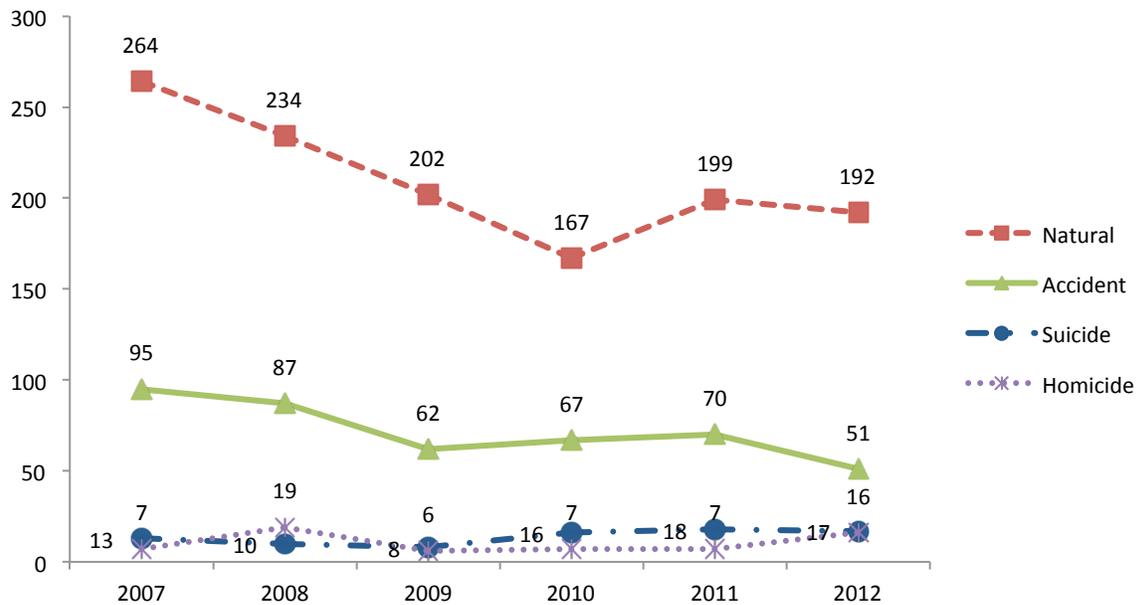


Figure 4. Number of deaths by manner and year, excluding Natural manner of death

Of deaths that were attributed to natural manner, medical conditions were the leading cause of death category, with most deaths due to birth defects or prematurity and occurring in infants less than one year of age (Table 8,

	2007	2008	2009	2010	2011	2012
Under age 1	206	169	132	128	129	148
Ages 1 - 4	19	29	30	11	24	15
Ages 5 - 9	13	10	11	8	18	7
Ages 10-14	14	12	15	9	14	13
Ages 15 - 18	12	14	13	11	14	9
Missing	0	0	1	0	0	0
	264	234	202	167	199	192

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

Injury or trauma fatalities were slightly lower in 2012 compared to the previous year (**Error! Reference source not found.**). More detailed information on deaths involving trauma or injury is in the 'Accidental Deaths' section of this report.

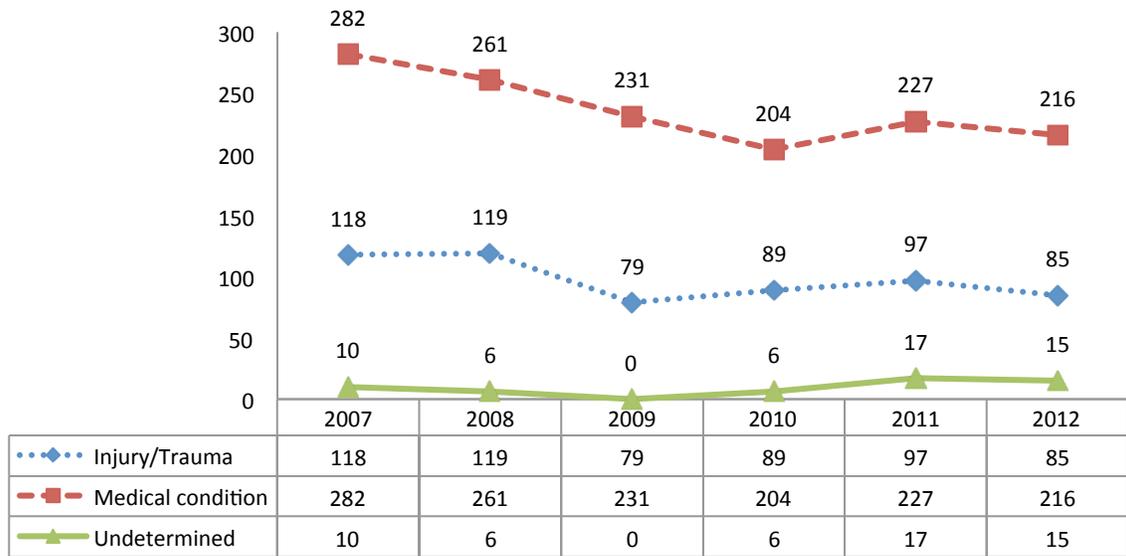


Figure 5. Number of deaths by cause of death category for all age groups, 2007-2012

Infant Mortality

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

Deaths in neonates have increased for the third consecutive year; however, the incidence in 2012 is only two percent higher compared to the previous five-year average (**Error! Reference source not found., Error! Reference source not found.**). Postneonatal mortality remained relatively stable with a 5 percent change between 2012 and the past five years. A greater number of male infants do not survive the first year of life compared to females (Table 5).

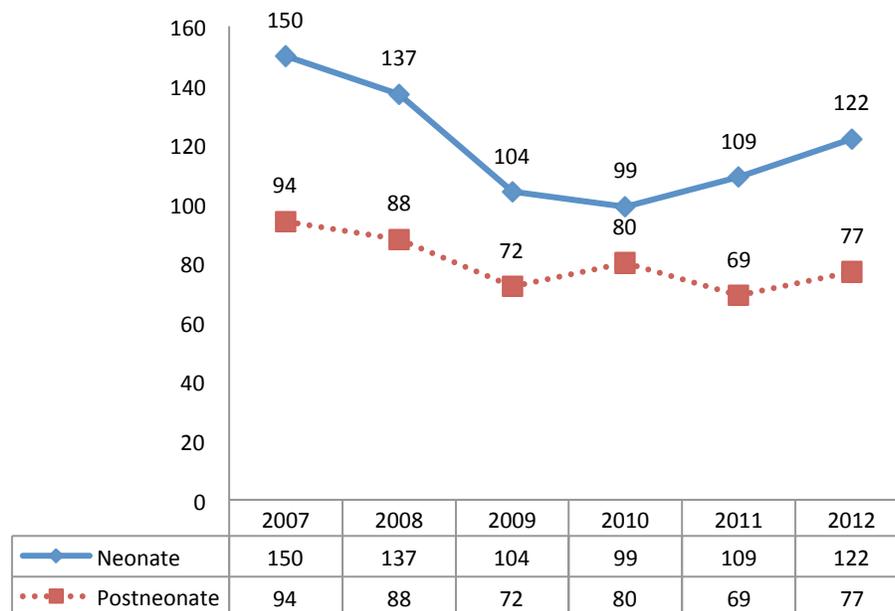


Figure 6. Total infant deaths, either neonatal or postneonatal, by year, 2007, 2012

Table 4. Neonatal, postneonatal, and child deaths by year, 2006-2012

	2006	2007	2008	2009	2010	2011	2012	5-Yr Avg	% Chg	Total
Neonate	140	150	137	104	99	109	122	120	2%	739
Postneonate	77	94	88	72	80	69	77	81	-5%	480
Child	165	169	161	135	122	164	119	150	-26%	916
	382	413	386	311	301	342	318	351	-10%	2135

	Sex	Percent
Neonate	Male	56%
	Female	44%
Postneonate	Male	58%
	Female	42%
Child	Male	60%
	Female	39%
Total	Male	58%
	Female	42%

Table 5. Total number of infant deaths by infantile period, sex, and year from 2007-2012

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

During the neonatal and postneonatal periods, medical conditions were the leading cause of death. After the infantile period, this cause falls second to injury/trauma. The next leading cause of death for infants in 2011 was injury/trauma, but at a significantly lower rate only causing one death in a neonate and six in post-neonates (Table 6).

		2007	2008	2009	2010	2011	2012	Total
Neonate	Injury/ Trauma	1	4	0	2	1	3	11
	Medical condition	147	133	104	96	108	118	706
	Undetermined	2	0	0	0	0	1	3
	Unknown	0	0	0	1	0	0	1
	Total	150	137	104	99	109	122	721
Postneonate	Injury/ Trauma	9	20	14	10	6	11	70
	Medical condition	76	63	58	66	47	53	363
	Undetermined	7	5	0	3	15	12	42
	Unknown	2	0	0	1	1	1	5
	Total	94	88	72	80	69	77	480
Child	Injury/ Trauma	108	95	65	77	90	71	506
	Medical condition	59	65	69	42	72	45	352
	Undetermined	1	1	0	3	2	2	9
	Unknown	1	0	1	0	0	1	3
	Total	169	161	135	122	164	164	915
Total	Injury/ Trauma	118	119	79	89	97	85	587
	Medical condition	282	261	231	204	227	216	1421
	Undetermined	10	6	0	6	17	15	54
	Unknown	3	0	1	2	1	1	8
	Total	413	386	311	301	342	318	2071

Table 6. The total number of infant deaths by infantile period, cause of death category, and year from 2006-2011

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. Data are largely missing for neonates, though postneonate data show approximately 10 percent died while in day care. This is slightly higher than in previous years with the exception of 2011. These data highlight the importance of safe infant care education and awareness among day care providers.

		2008	2009	2010	2011	2012	Total
Neonate	Missing	14	81	94	108	115	416
	Childs home	8	2	3	0	4	40
	Friend or relative home	0	0	1	0	3	4
	Other	116	20	1	1	0	671
	Total	138	103	99	109	122	1131
Postneonate	Missing	12	24	33	24	37	138
	Childs home	52	33	39	31	24	334
	Friend or relative home	4	6	2	2	5	40
	Foster care	0	0	0	0	0	3
	Day care	5	5	4	8	7	48
	Other	14	4	2	4	4	147
	Total	87	72	80	69	77	710
Child	Missing	29	55	38	71	45	262
	Childs home	66	40	36	40	37	478
	Friend or relative home	7	6	5	4	3	42
	Foster care	0	0	1	0	0	7
	Day care	1	0	0	1	1	4
	Other	56	34	42	48	33	600
	Total	159	135	122	164	119	1393
Total	Missing	55	160	165	203	197	816
	Childs home	126	75	78	71	65	852
	Friend or relative home	11	12	8	6	11	86
	Foster care	0	0	1	0	0	10
	Day care	6	5	4	9	8	52
	Other	186	58	45	53	37	1418
	Total	384	310	301	342	318	3234

Table 7. Location of incident, 2008-2012

Natural Deaths

A majority of child deaths in 2012 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 as natural, medical cause cannot explain deaths; however, the classification assignment is at the discretion of the medical examiner or physician attesting a death certificate.

	2007	2008	2009	2010	2011	5-Yr Avg	2012	% Chg
Prematurity	95	80	63	60	47	69	43	-38%
Other medical condition	6	6	12	26	38	17.6	43	144%
Congenital anomaly	46	28	33	22	33	32.4	40	23%
Cardiovascular	25	16	5	4	7	11.4	11	-4%
Pneumonia	4	3	2	2	0	2.2	4	NS
Unknown	0	0	2	4	2	1.6	3	NS
Other infection	7	8	8	5	0	5.6	2	NS
Cancer	0	1	0	1	0	0.4	1	NS
HIV/AIDS	0	0	0	0	0	0	1	NS
Not Specified	1	0	0	0	0	0.2	0	NS
Influenza	0	1	0	0	0	0.2	0	NS
Malnutrition/dehydration	0	1	0	0	0	0.2	0	NS
Neurological/seizure disorder	2	0	0	1	0	0.6	0	NS
SIDS	16	6	0	1	1	4.8	0	NS
Other perinatal condition	4	19	7	2	1	6.6	0	NS
	206	169	132	128	129		148	

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 2007-2012

The strongest contributor to the gradual decline in Iowa infant mortality is due to the reduction in deaths due to prematurity. When comparing the number of infant deaths attributed to prematurity in 2012 to the average of the previous five years, there is a 38 percent decrease (Table 8, **Error! Reference source not found.**)

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

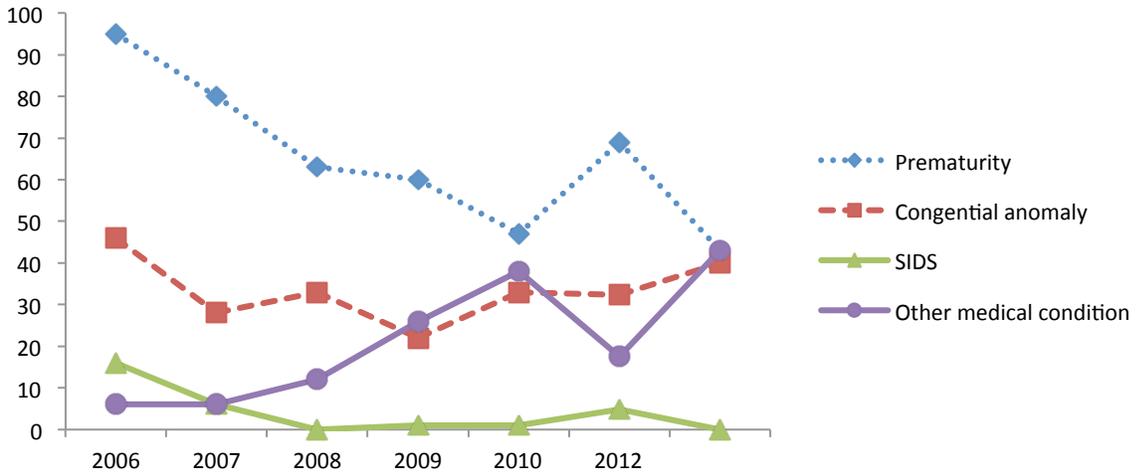


Figure 7. Total number of natural deaths for the top four medical condition category causes by year, 2006-2012

	2007	2008	2009	2010	2011	2012
Under age 1	206	169	132	128	129	148
Ages 1 - 4	19	29	30	11	24	15
Ages 5 - 9	13	10	11	8	18	7
Ages 10-14	14	12	15	9	14	13
Ages 15 - 18	12	14	13	11	14	9
Missing	0	0	1	0	0	0
	264	234	202	167	199	192

Table 9. The total number of natural deaths by age group and year from 2007-2012

Accidental Deaths

There were 66 reported accidental deaths in 2012 (Table 10). A vast majority of these deaths were the result of motor vehicle collisions, followed by drowning, asphyxia, fire-related, use of weapons (firearms), and falls. In 2012, there was a marked decrease in the number of motor vehicle accidents. The number of deaths caused by drowning remained steady.

	2007	2008	2009	2010	2011	2012	5-Yr Avg	% Chg
MV	66	39	31	34	41	26	42	-38.4%
Drowning	8	7	7	12	11	8	9	-11.1%
Fire	3	9	9	4	4	6	6	5.9%
Asphyxia	7	22	10	11	7	6	9	-35.7%
Fall or crush	7	5	1	0	2	2	1	NS
Not Specified	0	0	0	1	1	1	1	NS
Poisoning, overdose, or acute intoxication	1	2	2	5	3	1	3	NS
Exposure	2	0	0	0	0	1	0	NS
Weapon	1	1	1	0	0	0	0	NS
Animal bite or attack	0	0	0	0	1	0	0	NS
Other	0	2	1	0	0	0	0	NS
Total	95	87	62	67	70	51	66	NS

Table 10. The total number, five-year average, and percent change of accidental deaths by cause and year from 2007-2012

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 has also resulted in child deaths in recent years. Oversight of rental property electrical and fire safety is a concern of the Child Death Review Team.

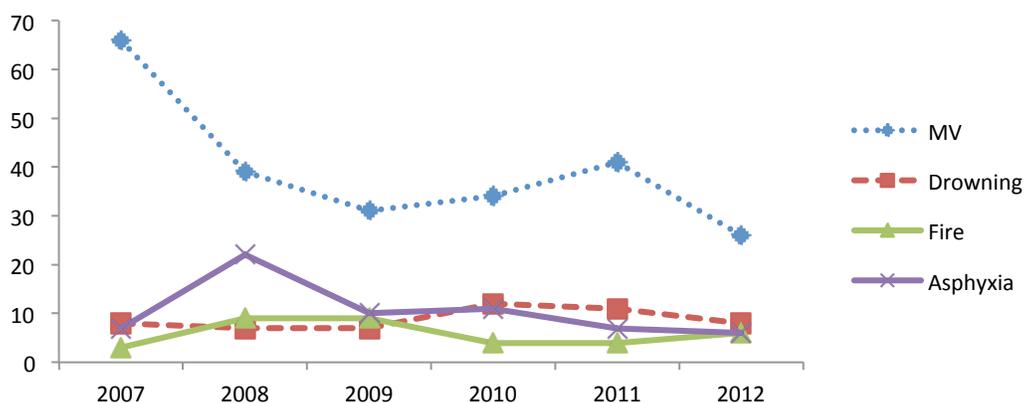


Figure 9. Accidental deaths from the top four causes, 2007-2012

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 2012, while all other major categories stayed static (Figure 9).

Motor Vehicle Accidents

When children reach the age of one the leading known cause of death changes to motor vehicle accidents and continues through age 17 (**Error! Reference source not found.**). 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.

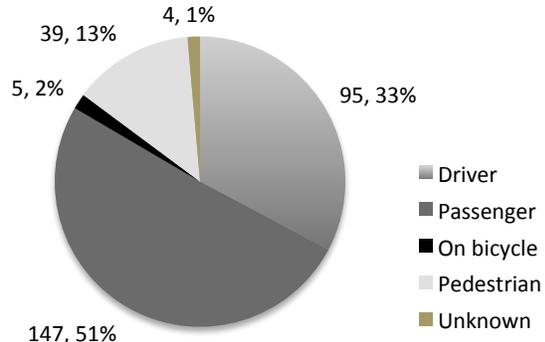


Figure 10 Position of decedent in motor vehicle in all accidents, 2007-2012

The primary types of motor vehicles involved in fatal accidents were automobiles and ATVs.

In 2012 for all automobile accidents, slightly more than half were drivers. This is the first year more deaths were reported among drivers than passengers or pedestrians (Figure 9).

Table 11. Motor vehicle accidents by type of conveyance, 2007-2012

	2007	2008	2009	2010	2011	2012	Total
All automobile	53	25	22	25	26	20	171
None	4	2	2	1	0	3	12
ATV	3	1	1	2	8	2	17
Bicycle	1	1	1	1	0	1	5
Other	1	2	4	3	3	1	14
Not Specified	2	5	1	2	4	0	14
School bus	0	0	0	0	2	0	2
Motorcycle	2	0	0	0	0	0	2
Tractor	0	4	0	0	0	0	4
Snowmobile	0	0	0	1	0	0	1
Unknown	1	1	0	0	0	0	2
Total	67	41	31	35	43	27	244

	2007	2008	2009	2010	2011	2012	Total
Male	36	19	17	21	27	18	138
Female	31	22	14	14	16	9	106
Total	67	41	31	35	43	27	244

Table 12. Motor vehicle or other transport accident deaths by gender for years 2006-2012

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 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 (**Error! Reference source not found.**).

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

		2007	2008	2009	2010	2011	2012	Total
License	Expired Instructional Permit	0	1	0	0	0	0	1
	Unknown	4	1	2	2	0	0	26
	School License	2	0	1	1	1	0	6
	Full License	1	1	0	1	2	1	7
	No License	1	1	0	0	2	2	4
	Intermediate License	7	2	3	1	7	8	35
Total		15	6	6	5	12	11	79

Drowning

Many of these drowning incidents can be attributed to inadequate supervision, failure of inexperienced swimmers to know their true swimming abilities, or not using a personal flotation device (PFD). There were 9 drowning-related deaths in 2012. When reviewing these deaths by location, they most often happen in open water, in the month of July, and in a river (Figure 12, Figure 12). Swimming pools are the second most common location comprising 23 percent of accidental drowning, followed by bathtub drowning at 17 percent. Only one swimming pool-related death occurred in 2012 and one bathtub-related fatality.

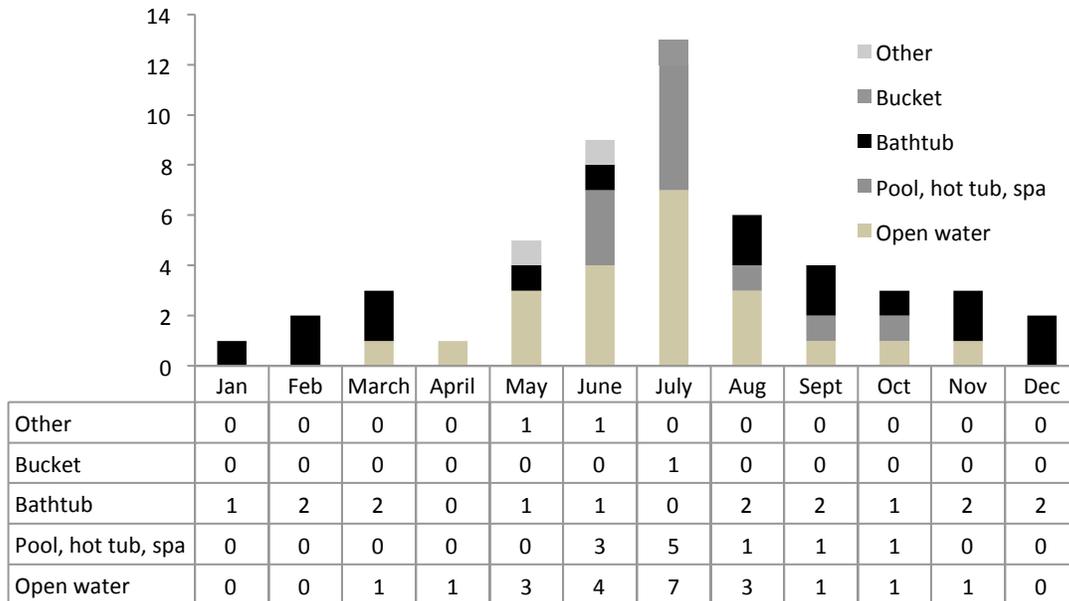


Figure 11 Drowning by location and month, 2008-2012

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 (**Error! Reference source not found.**). A small number of bathtub drowning accidents have involved infants. Across all age groups, drowning in open water is most common, but is not the leading location of drowning until children reach the age of six.

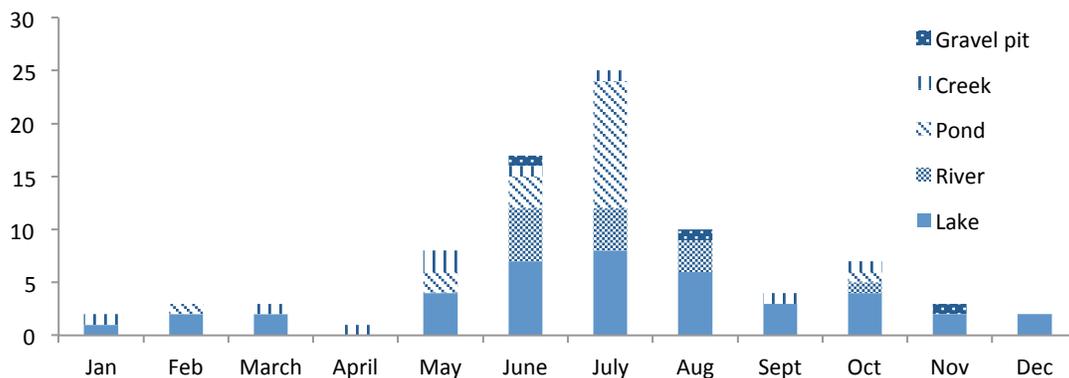


Figure 12. The number of drowning-related deaths by month and type of open water from 2006-2012

Poisonings

Four poisoning deaths occurred in 2012. Two were attributed to diphenhydramine (antihistamine medication) intoxication; one homicide, one suicide. A third poisoning was the result of acute morphine intoxication with a manner of death as “undetermined”. The fourth poisoning was due to difluoroethane (a refrigerant commonly used in “huffing”) intoxication.

		2007	2008	2009	2010	2011	2012
Under age 1	Accidental overdose	0	0	0	0	1	0
	Other	0	0	1	0	0	0
	Unknown	0	0	0	0	0	1
	Total	0	0	1	0	1	1
Ages 1 - 4	Accidental overdose	0	2	0	0	1	0
	Deliberate poisoning	0	0	0	0	0	1
	Other	0	0	1	1	0	0
	Total	0	2	1	1	1	1
Ages 5 - 9	Other	0	0	0	1	0	0
	Total	0	0	0	1	0	0
Ages 10-14	Accidental overdose	0	0	1	0	0	0
	Deliberate poisoning	0	0	0	1	0	0
	Total	0	0	1	1	0	0
Ages 15 - 18	Accidental overdose	0	0	0	2	0	1
	Adverse effect but not overdose	1	0	0	1	0	0
	Deliberate poisoning	0	0	0	1	0	1
	Acute intoxication	0	0	0	0	1	0
	Unknown	1	0	0	0	0	0
	Total	2	0	0	4	1	2
Total	Accidental overdose	0	2	1	2	2	1
	Adverse effect but not overdose	1	0	0	1	0	0
	Deliberate poisoning	0	0	0	2	0	2
	Acute intoxication	0	0	0	0	1	0
	Other	0	0	2	2	0	0
	Unknown	1	0	0	0	0	1
	Total	2	2	3	7	3	4

Table 14. The total number of poisoning deaths by type, age group, and year from 2007-2012

Suicide

In 2012, 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 only three female deaths) (

		2007	2008	2009	2010	2011	2012
Male	Motor vehicle or other transport	0	0	0	1	1	0
	Asphyxia	6	2	6	5	8	9
	Weapon, including body part	4	5	1	5	6	4
	Poisoning, overdose or acute intoxication	1	0	0	0	0	0
	Total	11	7	7	11	15	13
Female	Motor vehicle or other transport	0	1	0	0	0	0
	Asphyxia	2	1	1	2	3	3
	Weapon, including body part	0	1	0	1	0	0
	Poisoning, overdose or acute intoxication	0	0	0	2	0	1
	Total	2	3	1	5	3	4
Total	Motor vehicle or other transport	0	1	0	1	1	0
	Asphyxia	8	3	7	7	11	12
	Weapon, including body part	4	6	1	6	6	4
	Poisoning, overdose or acute intoxication	1	0	0	2	0	1
	Total	13	10	8	16	18	17

Table 16). Of these 17 deaths, 13 were between the ages of 15-17 years and five were between the ages of 13-14 years. Twelve children hanged themselves, four used a firearm, and one used a motor vehicle (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 (

		2007	2008	2009	2010	2011	2012
Male	Motor vehicle or other transport	0	0	0	1	1	0
	Asphyxia	6	2	6	5	8	9
	Weapon, including body part	4	5	1	5	6	4
	Poisoning, overdose or acute intoxication	1	0	0	0	0	0
	Total	11	7	7	11	15	13
Female	Motor vehicle or other transport	0	1	0	0	0	0
	Asphyxia	2	1	1	2	3	3
	Weapon, including body part	0	1	0	1	0	0
	Poisoning, overdose or acute intoxication	0	0	0	2	0	1
	Total	2	3	1	5	3	4
Total	Motor vehicle or other transport	0	1	0	1	1	0
	Asphyxia	8	3	7	7	11	12
	Weapon, including body part	4	6	1	6	6	4
	Poisoning, overdose or acute intoxication	1	0	0	2	0	1
	Total	13	10	8	16	18	17

Table 16).

		2007	2008	2009	2010	2011	2012
13-17	Motor vehicle or other transport	0	1	0	1	1	0
	Asphyxia	5	2	4	6	7	9
	Weapon, including body part	4	2	1	6	4	4
	Poisoning, overdose or acute intoxication	1	0	0	1	0	1
	Total	10	5	5	14	12	14
>17	Asphyxia	3	1	3	1	4	3
	Weapon, including body part	0	4	0	0	2	0
	Poisoning, overdose or acute intoxication	0	0	0	1	0	0
	Total	3	5	3	2	6	3
Total	Motor vehicle or other transport	0	1	0	1	1	0
	Asphyxia	8	3	7	7	11	12
	Weapon, including body part	4	6	1	6	6	4
	Poisoning, overdose or acute intoxication	1	0	0	2	0	1
	Total	13	10	8	16	18	17

Table 15. The total number of suicide deaths by method and age group from 2007-2012

		2007	2008	2009	2010	2011	2012
Male	Motor vehicle or other transport	0	0	0	1	1	0
	Asphyxia	6	2	6	5	8	9
	Weapon, including body part	4	5	1	5	6	4
	Poisoning, overdose or acute intoxication	1	0	0	0	0	0
	Total	11	7	7	11	15	13
Female	Motor vehicle or other transport	0	1	0	0	0	0
	Asphyxia	2	1	1	2	3	3
	Weapon, including body part	0	1	0	1	0	0
	Poisoning, overdose or acute intoxication	0	0	0	2	0	1
	Total	2	3	1	5	3	4
Total	Motor vehicle or other transport	0	1	0	1	1	0
	Asphyxia	8	3	7	7	11	12
	Weapon, including body part	4	6	1	6	6	4
	Poisoning, overdose or acute intoxication	1	0	0	2	0	1
	Total	13	10	8	16	18	17

Table 16. The number of suicide deaths by method and sex from 2006-2011

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

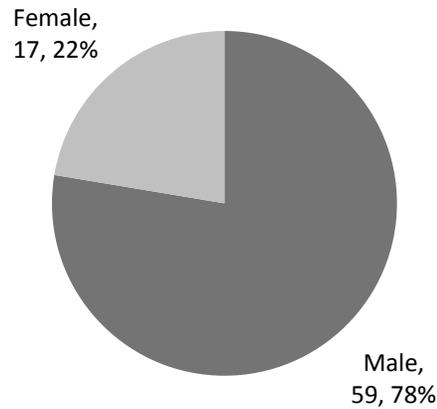


Figure 13. Suicides by sex, 2007-2012

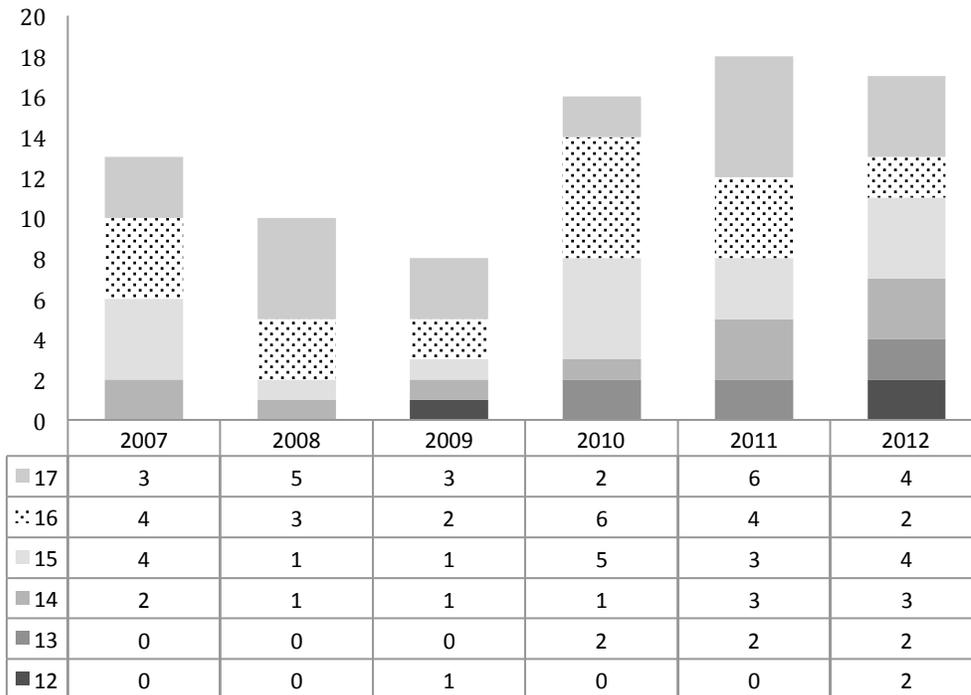


Figure 15. Suicides by single year age, 2007-2012

Homicide

In 2012, Iowa experienced 16 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 five.

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

Table 17. Number of homicides by age group and year from 2008-2012

Two homicides, twin sisters, were the result of suffocation inflicted by a mother shortly after home birth. These homicides could have been prevented if the mother had used Iowa's Safe Haven law to give up custody of her infants without consequence. Anger by the 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.

In three cases where mothers were caregivers, mental health and wellbeing may have been factors in the commission of these three crimes.

Two older victims died as a result of senseless violence where the perpetrators are still unknown. Two other, teenage victims died at the hands of friends carelessly handling firearms to which access should have been controlled.

Age (yrs)	Race/Gender	Method	Perpetrator/ Criminal Charges	Sentencing
<1	White/ Female	Suffocation	22 year old female, biological mother Charged with two counts of 2 nd degree murder	Sentenced to two 50-year, concurrent prison terms
<1	White/ Male	Under investigation	Pending investigation	N/A
<1	White/ Female	Blunt force injuries of head and neck	28 year old male, father 1 st degree murder, child endangerment causing death	Life in prison
1	White/ Male	Drowning	25 year old female, mother Involuntary manslaughter, child endangerment causing death	55 years in prison

Table 18. Homicides by age, race, and perpetrator

1	White/ Male	Blunt force injuries of head	23 year old male, mother's paramour Charged with child endangerment causing death	Up to 50 years in prison
1	White/ Female	Peritonitis due to rectal perforation	15 year old male, stepbrother Charged with sexual abuse in the 1 st degree	N/A
2	White/ Male	Burns and head trauma	35 year old male, mother's paramour Charged with child neglect (Alford Plea); guilty of possession of red phosphorous with intent to manufacture methamphetamine	15 years in prison
2	White/ Male	Acute alcohol and drug intoxication	23 year old female, mother Committed suicide	N/A
6	White/ Male	Blunt force injuries of head and neck	25 year old male, father Child endangerment causing death	Up to 50 years in prison
10	White/ Male	Strangulation	41 year old female, mother Suicide	N/A
15	African American / Male	Multiple gunshot wounds	Unknown	N/A
16	African American / Male	Gunshot wound to the head	15 year old male, friend of decedent Involuntary manslaughter and reckless use of a firearm	Up to 15 years in prison
17	African American / Male	Gunshot wound to the chest	Unknown	N/A
17	White/ Male	Gunshot wound to the abdomen	17 year old male, friend of decedent No criminal charges filed	N/A

Table 19 Homicides by decedent age, manner, perpetrator, and sentencing

Undetermined

In 2012, the exact cause of death for 40 children could not be determined and occurred primarily in children less than one year of age (

	Frequency	Percent
Under age 1	36	86.7
Ages 1 - 4	3	8.9
Ages 5 - 9	0	2.2
Ages 10-14	1	2.2

Table 20). Undetermined deaths were examined more closely in the sleep-related mortality supplement in Appendix A.

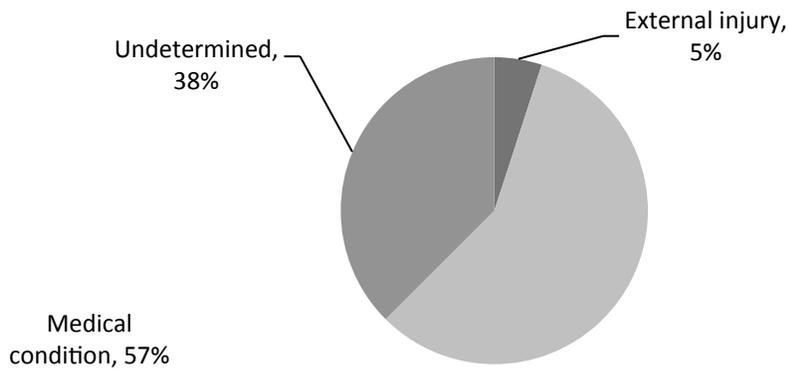


Figure 16. Undetermined manner of death by cause category, count and percent, 2012

	Frequency	Percent
Under age 1	36	86.7
Ages 1 - 4	3	8.9
Ages 5 - 9	0	2.2
Ages 10-14	1	2.2

Table 20. Number and percent of undetermined deaths by age group, 2012

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 (SUIDS 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 has gradually increased to 1.09 in 2012, reaching a high of 1.37 in 2008 (Figure 18). The trend line indicates this phenomenon will continue to increase in successive years.

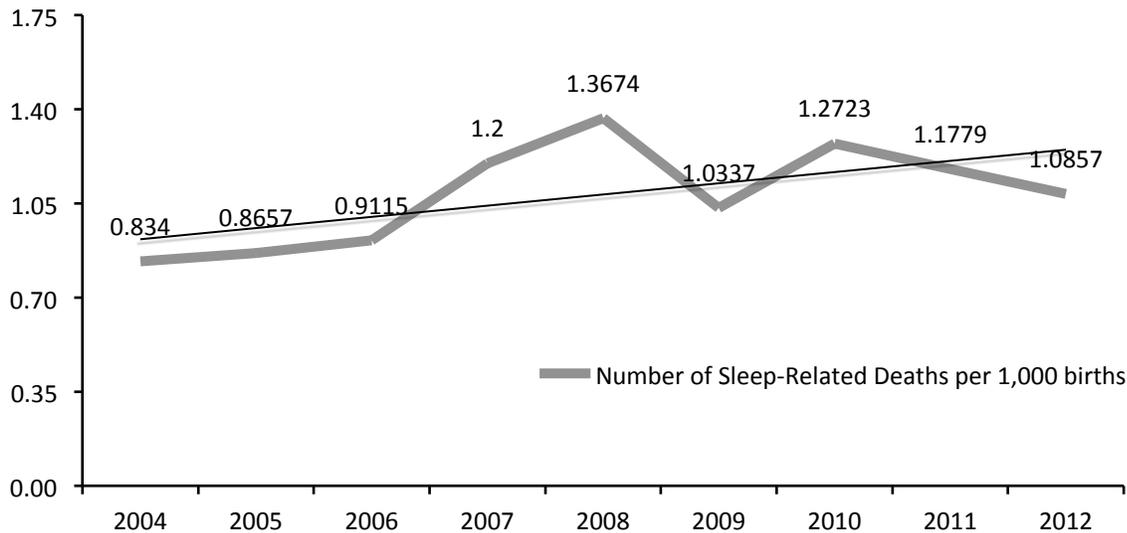


Figure 17 Sleep-related infant mortality due to asphyxia, SIDS, undetermined or unknown cause, 2004-2012 (n=384)

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 (Barfield et al., 2013). Rates in 2011 and 2012 were declining; however, the trend line indicates likely continued overall increase.

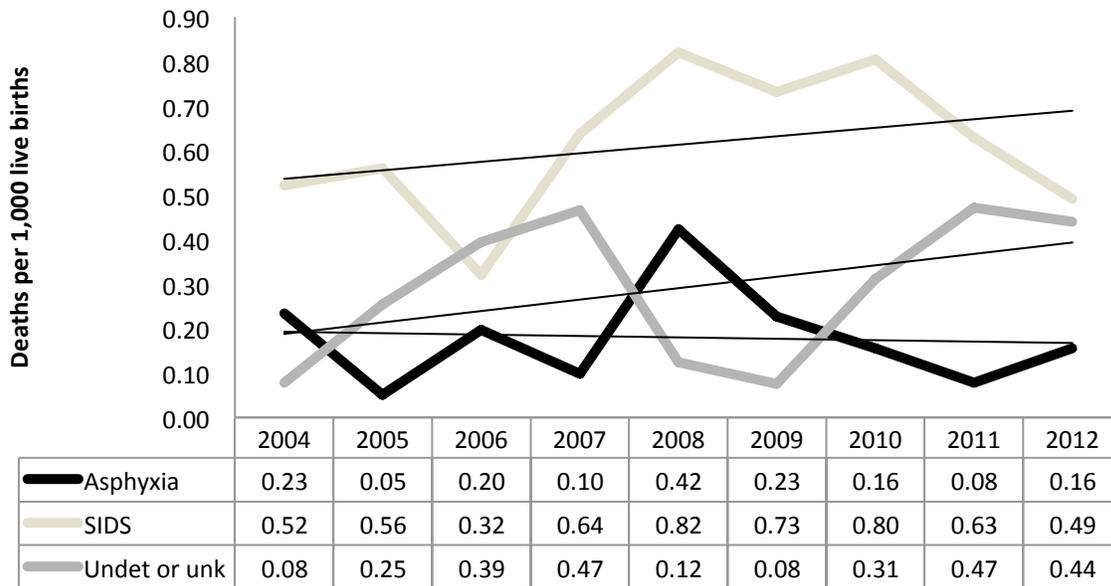


Figure 18 Sleep-related infant mortality by group, 2004-2012 (n=384)

Mortality rates due to undetermined or unknown cause have a gradually increasing trend line since 2004, but have fluctuated greatly over that time (Figure 18). 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 (Barfield et al., 2013).

Table 21 Frequencies of factors related to sleep-related mortality (n=384)

Factor	Response	Frequency	Percent
Infant sex	Male	225	58.6
	Female	157	40.9
	Unknown	2	0.5
Infant race	White	313	81.5
	African American	49	12.8
	American Indian/ Native Alaskan	3	0.8
	Asian	2	0.5
	Multi-racial	12	3.1
	Missing	5	1.3
	Date of death - Month	Jan	42
	Feb	28	7.3
	March	23	6
	April	35	9.1
	May	35	9.1
	June	34	8.9
	July	36	9.4
	Aug	34	8.9
	Sept	31	8.1
	Oct	34	8.9
	Nov	19	4.9

	Dec	33	8.6
Incident sleep place	Crib	75	19.5
	Not a crib	303	78.9
	Other	6	1.6
Usual sleep place	Crib	92	24
	Not a crib	192	50
	Other	100	26
Position child was placed to sleep	Back	166	43.2
	Side or stomach	129	33.6
	Unknown	89	23.2
Position child was found	Back	97	25.3
	Side or stomach	195	50.8
	Unknown	92	24
Child sleeping on the same surface as a child or adult	Yes	160	41.7
	No	97	25.3
	Unknown	127	33.1

Infants who died of sleep-related cause are more likely to be male and are disproportionately Black (Table 21). 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 50 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 40 percent of cases.

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 76.3 percent of cases compared to 55.8 percent of white babies (Table 22).

Table 22 Chi-square comparison of non-white to white infant usual sleep place, 2004-2012 (n=151)

		Usual sleep place		
		Crib	Not a crib	Total
Non-white	Count	9	29	38
	Expected Count	14.8	23.2	38
	% within Infant race	23.705	76.30%	100.00%
White	Count	50	64	113
	Expected Count	44.2	68.8	113
	% within Infant race	44.20%	55.80%	100.00%
Total	Count	59	92	151
	Expected Count	59	92	151
	% within Infant race	39.10%	60.90%	100.00%

The prevalence of bed sharing at death was assessed, and it was found that 73.7 percent of non-white infants were bed sharing at time of death indicating the absence of safe sleep environments (Table 23).

Table 23 Chi-square comparison of non-white to white infants bed sharing at time of death, 2004-2012 (n=151)

		Bed sharing*		
		Yes	No	Total
Non-white	Count	28	10	38
	Expected Count	21.1	16.9	38
	% within infant race	73.70%	26.30%	100.00%
White	Count	56	57	113
	Expected Count	62.9	50.1	113
	% within infant race	49.60%	50.40%	100.00%
Total	Count	84	67	151
	Expected Count	84	67	151
	% within infant race	55.60%	44.40%	100.00%

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.

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 2011 are highly relevant and critical to follow in all health care settings
- Hospital policies and training should reflect the AAP 2011 recommendations
- Health care providers, especially those interacting caring for infants after birth, must demonstrate appropriate behavior to parents and caregivers
- 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 must be reminded that back to sleep is the best and only option for normal healthy newborn sleep and the best known prevention of SIDS

Table 24. Child death counts and five-year rate per population

	2008	2009	2010	2011	2012	5-Yr Avg
Adair	5	1	1	0	1	1.6
Adams	0	1	1	0	0	0.4
Allamakee	0	2	0	0	1	0.6
Appanoose	1	0	1	2	1	1
Audubon	0	1	0	1	1	0.6
Benton	1	1	3	1	0	1.2
Black Hawk	20	11	14	12	17	14.8
Boone	1	1	6	4	3	3
Bremer	1	2	1	5	2	2.2
Buchanan	4	0	1	1	4	2
Buena Vista	3	2	1	4	1	2.2
Butler	0	1	2	1	0	0.8
Calhoun	0	1	2	0	5	1.6
Carroll	2	3	1	2	3	2.2
Cass	1	0	3	1	0	1
Cedar	3	3	2	2	2	2.4
Cerro Gordo	5	6	3	2	4	4
Cherokee	1	0	2	3	2	1.6
Chickasaw	2	1	1	2	0	1.2
Clarke	0	1	1	4	1	1.4
Clay	1	1	1	0	1	0.8
Clayton	2	2	2	2	0	1.6
Clinton	9	9	7	4	4	6.6
Crawford	2	1	0	0	1	0.8
Dallas	5	1	6	6	9	5.4
Davis	1	1	1	2	1	1.2
Decatur	0	0	2	0	0	0.4
Delaware	1	7	0	4	0	2.4
Des Moines	4	3	6	9	7	5.8
Dickinson	1	1	0	2	4	1.6
Dubuque	12	7	12	8	9	9.6
Emmet	1	0	0	0	0	0.2
Fayette	3	2	1	4	1	2.2
Floyd	3	2	1	1	3	2
Franklin	1	1	0	0	0	0.4
Fremont	3	1	0	0	0	0.8
Greene	1	0	0	1	0	0.4
Grundy	3	1	1	1	0	1.2
Guthrie	2	1	0	2	1	1.2
Hamilton	3	1	2	4	1	2.2
Hancock	1	0	2	0	0	0.6
Hardin	2	1	0	3	2	1.6
Harrison	1	1	2	3	0	1.4
Henry	3	1	0	0	1	1

Howard	4	0	1	2	2	1.8
Humboldt	3	1	1	0	2	1.4
Ida	2	1	0	2	1	1.2
Iowa	2	1	1	4	2	2
Jackson	1	0	3	4	2	2
Jasper	3	2	3	3	4	3
Jefferson	0	2	2	3	1	1.6
Johnson	14	34	15	7	10	16
Jones	3	1	3	0	0	1.4
Keokuk	2	0	1	3	0	1.2
Kossuth	0	0	2	1	1	0.8
Lee	5	4	2	5	3	3.8
Linn	30	18	14	23	19	20.8
Louisa	3	1	4	0	0	1.6
Lucas	2	1	5	3	0	2.2
Lyon	0	0	0	0	0	0
Madison	1	1	2	2	1	1.4
Mahaska	3	0	2	1	3	1.8
Marion	6	2	4	3	5	4
Marshall	5	3	3	2	8	4.2
Mills	5	1	0	1	1	1.6
Mitchell	2	0	0	1	0	0.6
Monona	0	0	0	1	1	0.4
Monroe	2	0	2	1	0	1
Montgomery	0	2	0	1	0	0.6
Muscatine	2	6	2	5	0	3
O'Brien	1	2	0	1	1	1
Osceola	0	0	0	1	1	0.4
Page	1	1	3	1	2	1.6
Palo Alto	0	0	0	2	0	0.4
Plymouth	2	0	2	2	1	1.4
Pocahontas	0	1	3	2	1	1.4
Polk	58	68	53	65	62	61.2
Pottawattamie	8	8	5	8	9	7.6
Poweshiek	1	0	1	3	1	1.2
Ringgold	0	0	2	3	0	1
Sac	0	0	0	1	1	0.4
Scott	20	13	20	19	19	18.2
Shelby	0	0	0	2	0	0.4
Sioux	4	3	2	7	0	3.2
Story	11	7	2	9	9	7.6
Tama	0	0	1	1	2	0.8
Taylor	1	0	0	1	0	0.4
Union	1	2	6	1	4	2.8
Van Buren	0	0	1	0	0	0.2
Wapello	5	3	5	1	5	3.8

Warren	5	3	7	6	3	4.8
Washington	2	3	2	3	3	2.6
Wayne	1	1	0	0	1	0.6
Webster	5	5	2	5	9	5.2
Winnebago	1	0	1	0	1	0.6
Winneshiek	0	1	0	0	2	0.6
Woodbury	18	13	5	5	5	9.2
Worth	1	1	1	1	2	1.2
Wright	1	2	2	2	0	1.4