

Reviews for 2006-2010, by Age Groups

In response to recommendations from the Ohio CFR Advisory Committee to present the data and findings in ways that are meaningful and useful to program developers and policy makers, this report presents the findings by age groups. It is reasonable to assume that some risk and protective factors may vary by age group. Presenting findings by age group may be beneficial for programs working with specific age groups.

Infant Deaths From All Causes

Background

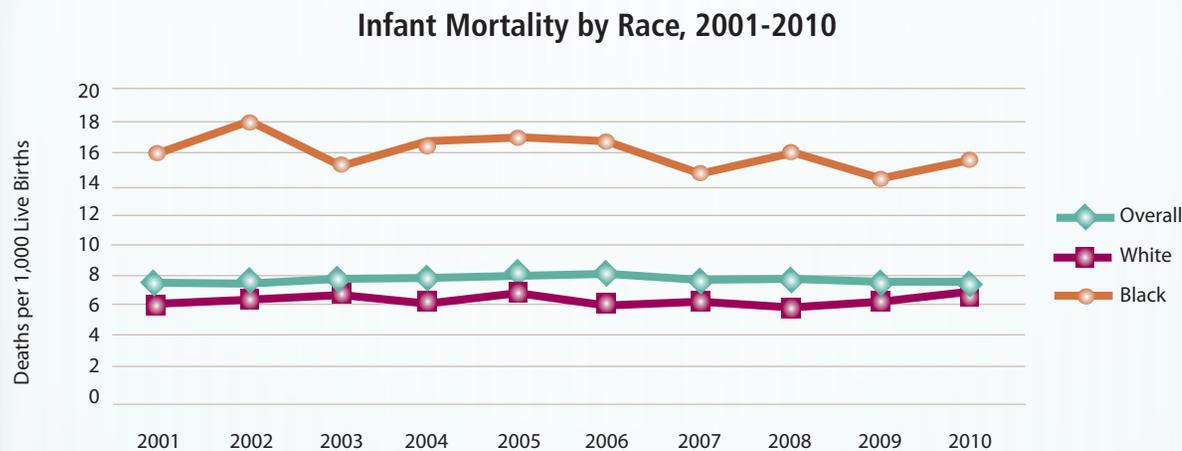
Infant mortality is an important gauge of the health of a community because infants are uniquely vulnerable to the many factors that impact health, including socioeconomic disparities. The U.S. infant mortality rate for 2010 was 6.1 infant deaths per 1,000 live births.¹² This represents a decrease of

3.9 percent from the final 2009 rate of 6.4. With the exception of 2002 and 2005, the infant mortality rate has statistically remained the same or decreased significantly each year from 1958 through 2010.

In 2010, Ohio's overall infant mortality rate was 7.7. Of particular concern is the black infant mortality rate of 15.5, which is more than double the white infant mortality rate of 6.4. These rates and proportions have changed little over the past decade.¹³

Vital Statistics

Ohio vital statistics data report 3,794 neonatal deaths (from birth to 28 days old) and 1,857 post-neonatal deaths (from 29 days to 1 year old) for a total of 5,651 infant deaths for the five-year period 2006-2010.



Caution should be used in interpreting rates and trends due to small numbers

CFR Findings

Local child fatality review boards reviewed 5,456 infant deaths for 2006-2010. These represent 66 percent of all reviews for all ages.

- ◀ Sixty-eight percent (3,688) were infants from birth to 28 days old.
- ◀ Thirty-two percent (1,768) were infants from 29 days to one year old.
- ◀ Reviews for infant deaths were disproportionately higher among boys (56 percent) and among black infants (37 percent) relative to their representation in the general population (51 percent for boys and 17 percent for black children).
- ◀ Five percent (267) of the infant deaths reviewed were to Hispanic infants. Hispanic infants account for 6 percent of Ohio's infant population.
- ◀ Twelve percent (660) of the deaths were deemed probably preventable.

Reviews of infant deaths are grouped by cause of death:

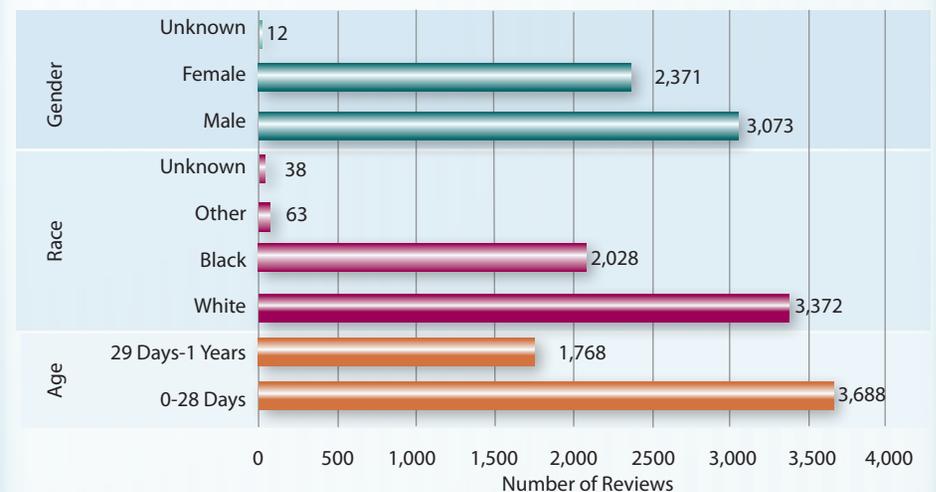
- ◀ 4,686 (86 percent) of all infant deaths were due to medical causes.
- ◀ 534 (10 percent) were due to external injury causes.
- ◀ 236 (4 percent) were unknown if caused by medical or external causes.

Prematurity and congenital anomalies account for 70 percent (3,274) of all infant deaths from medical causes and 60 percent of infant deaths from all causes. Prematurity and congenital anomalies account for 78 percent (2,879) of the deaths to infants 0-28 days old.

Asphyxia is the leading cause of infant death due to external injury (49 percent of the infant deaths due to external injury). The next leading external cause of death is "undetermined" (20 percent of the infant deaths due to external injury).

Sleep-related deaths accounted for 15 percent (830) of all infant deaths and 41 percent (732) of the deaths to infants 29 days to one year old.

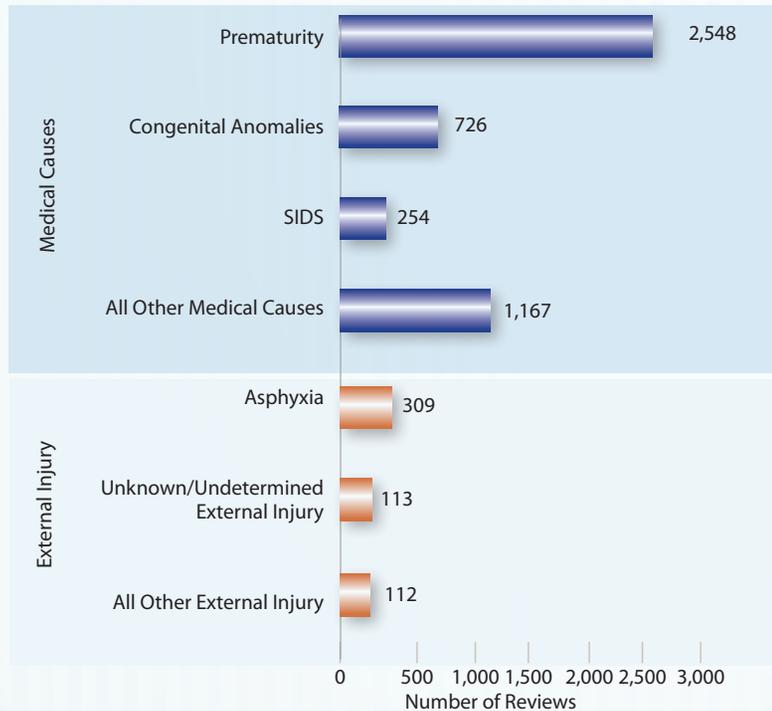
**Reviews of Infant Deaths by Age, Race and Gender
2006-2010, N=5,456**



Other factors related to infant deaths:

- Thirteen percent (710) of the infants were from multiple births, including 79 from triplet or higher order births.
- Thirty-eight percent (2,084) of the infants were very low birthweight (<1,500 grams) and an additional 9 percent (505) were low birthweight (1,500-2,499 grams). Twenty percent (1,093) were of normal birthweight (2,500-3,999 grams) or heavier. Thirty-three percent (1,774) of the infants were of unknown or missing birthweight. For all births in Ohio in 2010, nine percent were low or very low birthweight.
- Fifty-one percent (2,764) of the infants were born preterm (<37 weeks gestation), 21 percent (1,166) were born full term (37-42 weeks gestation) and 28 percent (1,523) were of unknown or missing gestation. For all births in Ohio in 2010, 13 percent were born less than 37 weeks gestation.
- Twenty percent (1,107) of the infant deaths reviewed were infants born to mothers who smoked during the pregnancy. For all births in Ohio in 2010, 18 percent were born to mothers who smoked during the pregnancy.

**Reviews of Infant Deaths
by Leading Causes of Death, 2006-2010, N=5,546**



**Birth History Factors for Infant Deaths
2006-2010, N=5,456**

	#	%
Multiple Birth	710	13
Very Low Birthweight (<1,500 g)	2,084	41
Low Birthweight (1,500-2,499 g)	505	10
Normal Birthweight (2,500-3,999 g)	1,042	20
Above Normal Birthweight (>3,999 g)	51	1
Unknown	1,412	28
Missing	362	
< 37 Weeks Gestation	2,764	53
37-42 Weeks Gestation	1,166	23
> 42 Weeks Gestation	3	<1
Unknown	1,244	24
Missing	279	
Mother Smoked during Pregnancy	1,107	20

Missing data have been excluded from the percentages. Percentages may not total 100 due to rounding.

Ohio Collaborative to Prevent Infant Mortality

In November 2009, the Ohio Infant Mortality Task Force published its report, *Preventing Infant Mortality in Ohio*, which contained the following recommendations to eliminate infant mortality and disparities among population groups in Ohio:

1. Provide comprehensive reproductive health services and service coordination for all women and children before, during, and after pregnancy.
2. Eliminate health disparities and promote health equity to reduce infant mortality.
3. Prioritize and align program investments based on documented outcome and cost effectiveness.
4. Implement health promotion and education to reduce preterm birth.
5. Improve data collection and analysis to inform program and policy decisions.
6. Expand quality improvement initiatives to make measurable improvements in maternal and child health outcomes.
7. Address the effects of racism and the impact of racism on infant mortality.
8. Increase public awareness of the effect of preconception health on birth outcomes.
9. Develop, recruit, and train a diverse network of culturally competent health professionals statewide.
10. Establish a consortium to implement and monitor the recommendations of the Ohio Infant Mortality Task Force.

The Ohio Collaborative to Prevent Infant Mortality was formed in 2010 as a permanent organization dedicated to implementation of the task force's recommendations. Membership consists of government agencies (including ODH), advocacy groups, medical and public health providers, and a wide variety of other organizations and individuals committed to eliminating infant mortality and disparities. The collaborative operates through five workgroups: Coordinated Healthcare, Disparities/Racism, Data/Metrics/Quality Improvement, Education/Outreach, and Public Policy, and is guided by an executive/steering committee.

Recent efforts of the collaborative include raising awareness of safe sleep practices, instituting universal screening and progesterone treatment of women at high risk of preterm delivery, and creating a website of resources to help women achieve good health and raise healthy babies.

For more information on the collaborative, visit the website at:

<http://www.odh.ohio.gov/odhPrograms/cfhs/OCTPIM/infantmortality.aspx>.

Infant Sleep-Related Deaths

Background

Since the beginning of the Ohio CFR program, local boards have been faced with a significant number of deaths of infants while sleeping. Some of these sudden unexpected infant deaths (SUIDs) are diagnosed as sudden infant death syndrome (SIDS), while others are diagnosed as accidental suffocation, positional asphyxia, overlay (the obstruction of breathing caused by the weight of a person or animal lying on the infant) or undetermined. SIDS is a subset of SUID and is a medical cause of death. It is the diagnosis given the sudden death of an infant under one year of age that remains unexplained after the performance of a complete postmortem investigation, including an autopsy, an examination of the scene of death and review of the infant's health history.¹⁴ The distinction between SIDS and other SUIDs is challenging. Many of the risk factors for SIDS and asphyxia are similar. Incomplete investigations, ambiguous findings and the presence of known risk factors for other causes of deaths result in many SUID being diagnosed as "undetermined cause" rather than SIDS.

The difficulty of obtaining consistent investigations and diagnoses of infant deaths led the CDC to launch an initiative to improve investigations and reporting.¹⁵ An Infant Death Investigation training was hosted by the Franklin County CFR board in June, 2011. Many Ohio counties have adopted the CDC's Sudden Unexpected Infant Death Investigation tool and procedures.

The CFR case report tool and data system captures information about deaths while sleeping as special circumstances, regardless of the cause of death. In order to better understand the contributing factors for these deaths and to develop prevention strategies, these sleep-related deaths including SIDS are analyzed and discussed as a group.

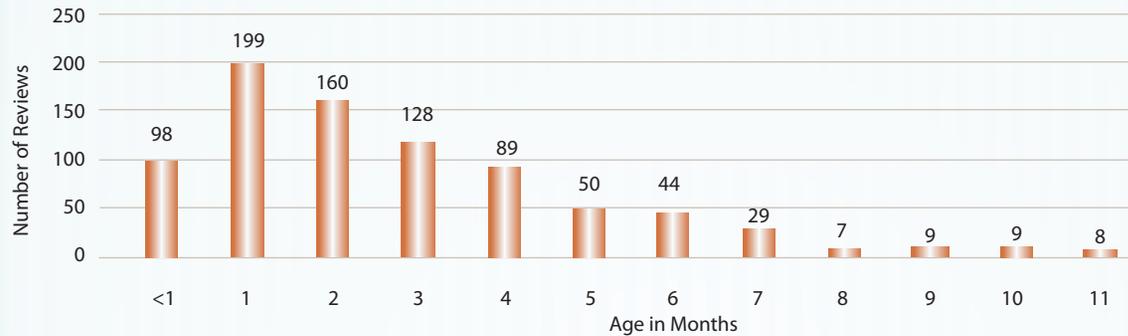
CFR Findings

From the reviews of deaths in the five-year period from 2006 to 2010, 931 cases of infants who died while in a sleep environment were identified. For the analysis of sleep-related deaths, cases of death from specific medical causes except SIDS were excluded, as were deaths from specific unrelated injuries such as fire, resulting in 830 infant sleep-related deaths. These cases include 207 SIDS reviews that included information about the circumstances.

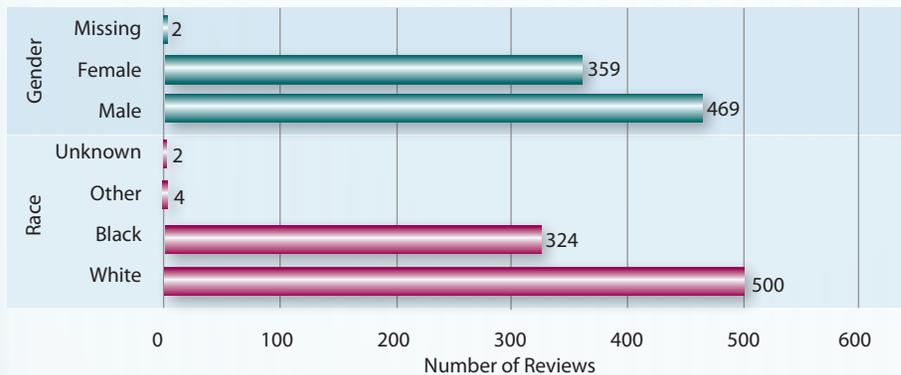
The 830 infant sleep-related deaths account for 15 percent of the 5,456 total reviews for infant deaths from 2006 to 2010, more than any single cause of death except prematurity. Over the five-year period, the percentage of infant deaths that were sleep-related has decreased from 17 percent in 2006 to 14 percent in 2010.

- ▶ More than three Ohio infant deaths each week are sleep-related. If the sleep-related deaths were prevented, the Ohio infant mortality rate for 2010 would have been reduced from 7.7 to 6.6 deaths per 1,000 live births.
- ▶ Of the 1,768 reviews of infant deaths from 29 days to 1 year of age, 41 percent (732) were sleep related.
- ▶ Thirty-nine percent (324) of deaths in a sleep environment were to black infants. This is disproportionately higher than their representation in the general population (17 percent).
- ▶ Eighty-seven percent (724) of the deaths occurred before 6 months of age; 55 percent (457) occurred before 3 months of age.

Sleep-Related Deaths by Age in Months, 2006-2010, N=830

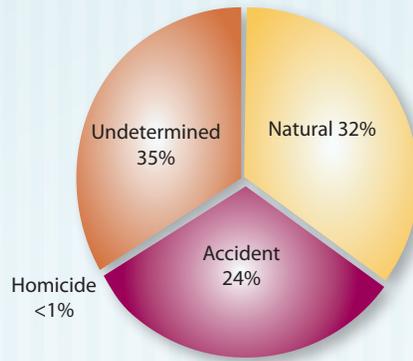


Reviews of Sleep-Related Deaths by Race and Gender, 2006-2010, N=830

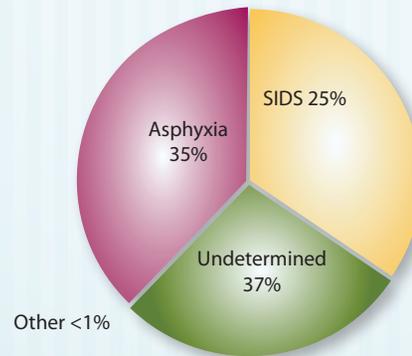


As discussed earlier in this section, determining the cause of death for infants in sleep situations is difficult, even when a complete investigation has occurred. Forty percent (334) of the sleep-related deaths were diagnosed as unknown or undetermined cause, even though autopsies had been completed for 99 percent of the cases.

Sleep-Related Deaths by Manner of Death 2006-2010, N=830



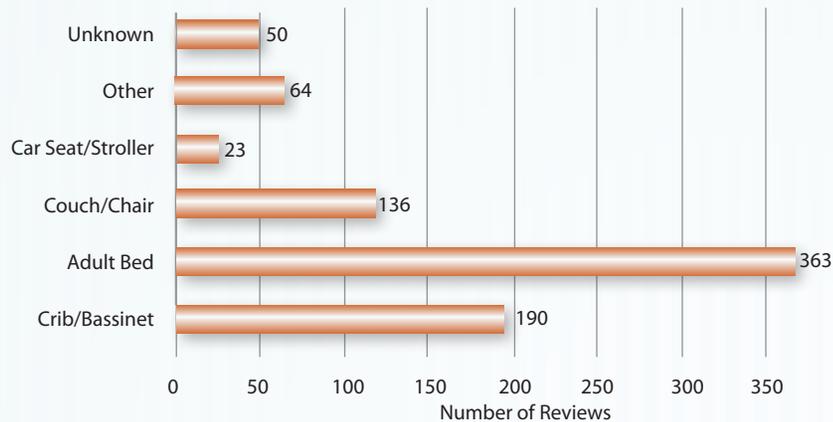
Sleep-Related Deaths by Cause of Death 2006-2010, N=830



Twenty-three percent (190) of sleep-related deaths occurred in cribs or bassinets. Sixty percent (499) of sleep-related deaths occurred in adult beds, on couches or on chairs.

Bedsharing was a commonly reported circumstance for sleep-related deaths. Sixty-two percent (514) of sleep-related deaths occurred to infants who were sharing a sleep surface with another person at the time of death.

Sleep-Related Deaths by Location of Infant When Found, 2006-2010, N=857



- ◀ Of those cases that indicated bedsharing, 401 of the infants were sharing a sleep surface with an adult, including 81 infants who were sharing with an adult and another child.
 - ◀ An additional 33 infants were sharing with another child only.
 - ◀ Two infants were sharing a sleep surface with pets.
 - ◀ Forty-three reviews indicated an adult fell asleep while feeding the infant. Nineteen were bottle feeding; 18 were breast feeding. The feeding type was unknown or missing for 6 reviews.
 - ◀ Of the 514 reviews indicating the infant was sharing a sleep surface, 358 (70 percent) indicated the infant's supervisor was impaired at the time of the incident.
 - ▶ Twenty-one supervisors (4 percent) were impaired by alcohol.
 - ▶ Thirteen supervisors (3 percent) were impaired by drugs.
 - ▶ Sixty-four percent (329) of the bedsharing supervisors were impaired by sleep.
- Exposure to smoking was another commonly reported circumstance for sleep-related deaths.
- ◀ Forty-two percent (346) of the infants were exposed to smoke either in utero or after birth.
 - ◀ Of the 401 infants sharing a sleep surface with an adult, 47 percent (188) were also exposed to smoke either in utero or after birth.

Infant Safe Sleep Recommendations

In October 2011, the American Academy of Pediatrics issued a policy statement expanding its 2005 recommendations for reducing the risk of SIDS and other sleep-related infant deaths. ODH continues to urge parents and caregivers to follow these recommendations as the most effective way to reduce the risk of infant death.

- ◀ Place infants for sleep wholly on the back for every sleep, nap time and night time.
- ◀ Use a firm sleep surface. A firm crib mattress is the recommended surface.
- ◀ Room-sharing without bedsharing is recommended. The infant's crib should be in the parents' bedroom, close to the parents' bed.
- ◀ Keep soft objects and loose bedding out of the crib.
- ◀ Pregnant women should receive regular prenatal care.
- ◀ Do not smoke during pregnancy. Avoid exposure to secondhand smoke.
- ◀ Avoid alcohol and illicit drug use during pregnancy and after birth.
- ◀ Breastfeeding is recommended.
- ◀ Offer a pacifier at sleep time after breastfeeding has been established.
- ◀ Avoid overheating.
- ◀ Avoid commercial devices marketed to reduce the risk of SIDS. None have been proven safe or effective.
- ◀ Encourage supervised "tummy time" when infant is awake to avoid flat spots on the back of the infant's head and to strengthen the upper torso and neck.
- ◀ All infants should be immunized in accordance with AAP and CDC recommendations.

The policy statement includes four recommendations directed toward health policy makers, researchers and professionals to endorse the recommendations; continue research and surveillance; adhere to safe sleep guidelines in media and manufacturing advertising; and expand the Back to Sleep campaign for parents, grandparents and all other caregivers with a major focus on the safe sleep environment.

Deaths to Children 1 to 4 Years Old

Background

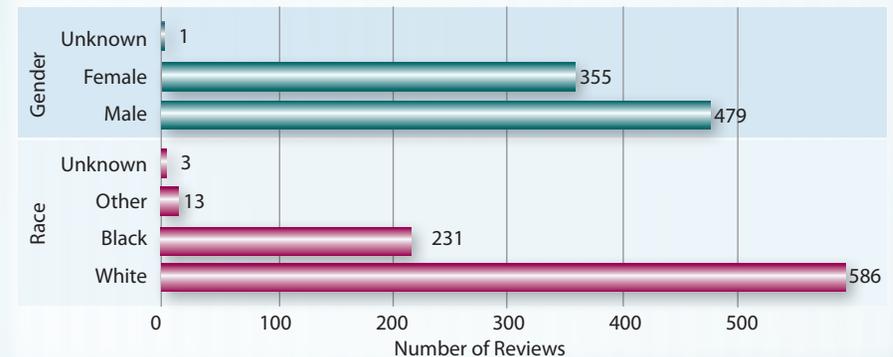
No longer babies, toddlers and preschoolers experience increased mobility and more awareness of their surroundings, but lack the reasoning skills to protect themselves from many dangers.¹⁶ According to the National Center for Health Statistics, the leading causes of death for 1 to 4 year olds are accidents, congenital anomalies and homicides. Nationally, the 2010 mortality rate for this age group was unchanged from 27 per 100,000 population in 2009.¹⁷

CFR Findings

For the five-year period 2006-2010, local CFR boards reviewed 835 deaths to children ages 1 to 4 years. These represent 10 percent of all 8,247 deaths reviewed.

- ◀ Reviews were disproportionately higher among boys (57 percent) relative to their representation in the general population (51 percent).
- ◀ A greater percentage of deaths in this age group occurred among black children (28 percent) relative to their representation in the general population (17 percent).
- ◀ Six percent (51) of the reviews were for Hispanic children.
- ◀ Thirty-eight percent (313) of the deaths were deemed probably preventable.

**Reviews of Deaths to 1-4 Year Olds
by Race and Gender, 2006-2010, N=835**



The 835 reviews were classified by manner as follows:

- ◀ Fifty-four percent (450) were natural deaths.
- ◀ Twenty-nine percent (244) were of accidental manner.
- ◀ Twelve percent (102) were homicides.
- ◀ Five percent (39) were of an undetermined manner.

Fifty-five percent (460) of the 835 reviews for 1 to 4 year olds were from medical causes.

- ◀ Congenital anomalies were the leading cause of death in this age group.
- ◀ Twenty-three percent (104) of the deaths from medical causes were due to congenital anomalies.
- ◀ Eighteen percent (82) were due to pneumonia and other infections.
- ◀ Cancer accounted for 11 percent (52) of the deaths from medical causes.

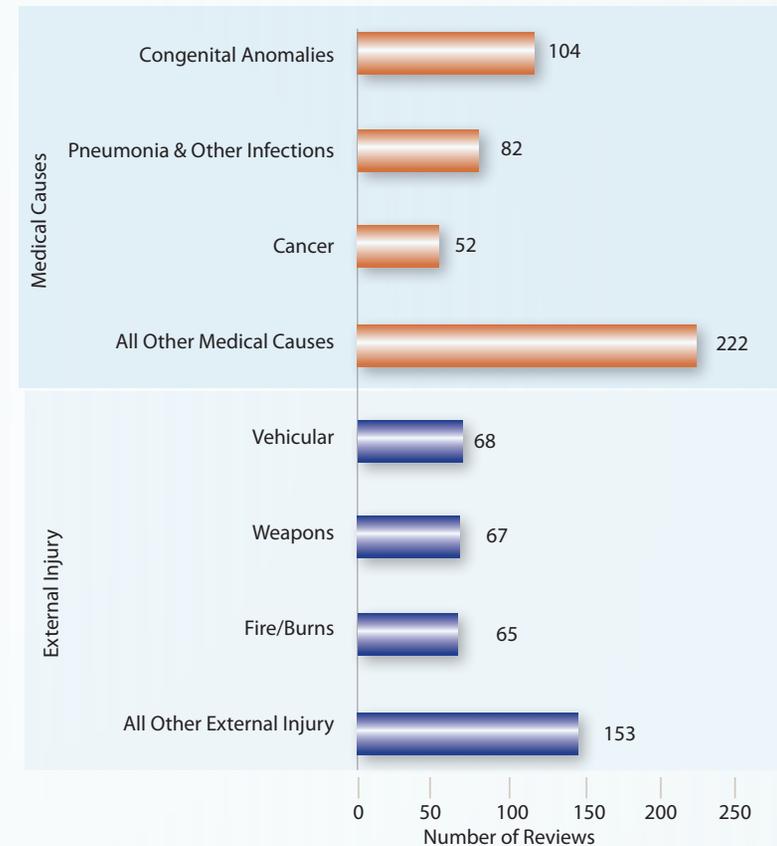
Forty-two percent (353) of the 835 reviews for 1 to 4 year olds were due to external causes. Vehicular crashes, weapons injuries, and fire and burn injuries were the three leading external causes of death for this age group.

- ◀ Nineteen percent (68) were due to vehicular injuries.
- ◀ Nineteen percent (67) were due to weapons injuries, including the use of body parts as weapons.
- ◀ Eighteen percent (65) of the 338 reviews were due to fire and burn injuries.

Vehicular injuries were the leading external cause of death for 1-4 year olds, accounting for 68 deaths.

- ◀ Sixty-three percent (43) of the 68 were passengers in vehicles. The average age of the child's driver was 31 years. Twelve of the 43 drivers (28 percent) were impaired at the time of the incident.
- ◀ Fifty-four percent (37) of the 68 vehicular deaths indicated the child killed was a passenger in a car, truck, van or SUV, where by law, children must use seat belts and safety seats or boosters. Of those 37, 41 percent (15) were properly restrained.
- ◀ Thirty-five percent (24) of the vehicular deaths were to pedestrians or children on bicycles or tricycles. Seven were back-over incidents. Eleven of the 24 pedestrians or cyclists had supervision at the time of the incident.

Reviews of 1-4 Year Old by Leading Causes of Death 2006-2010, N=835



Weapons deaths accounted for 67 deaths to 1 to 4 year olds. Sixty-three of the 67 weapons deaths were homicides.

- ◀ Of the 63 homicides, 29 percent (18) indicated the perpetrator was a biological parent. The parent's partner was cited in 40 percent (25) of the reviews.
- ◀ The weapon type was indicated as body parts in 63 percent (42) of the weapons deaths to 1 to 4 year olds. Firearms (handguns, shotguns and rifles) were indicated in 24 percent (16) of the reviews.

Local CFR boards identified 76 deaths from child abuse and neglect among 1 to 4 year olds. These represent 9 percent of all reviews for this age group, more than any other age group.

- ◀ Thirty-eight percent (29) of the reviews indicated the person causing the death was a biological parent.
- ◀ The parent's partner was cited in 36 percent (27) of the reviews.

Ohio's Booster Seat Law

Effective Oct. 7, 2009, Ohio's Child Restraint Law was revised to require Ohio's children to use belt-positioning booster seats when they outgrow their child safety seats (usually at 4 years old and 40 pounds). The belt-positioning booster seats must be used until the child is 8 years old, unless the child is at least 4 feet, 9 inches tall.

The revised law requires the following:

- ◀ Children younger than 4 years old or less than 40 pounds must use a child safety seat.
- ◀ Children younger than 8 years old must use a booster seat until they are at least 4 feet, 9 inches tall.
- ◀ Children ages 8 to 15 who have outgrown child safety seats and boosters must be restrained by the standard safety belts.

Booster seats raise the child so the shoulder and lap belt are correctly positioned across the strongest parts of the child's body, rather than riding up over the child's neck and stomach. By requiring the use of booster seats, the revised law will help prevent serious injuries and deaths to young children.

More information about the law and choosing the correct car seat or booster seat can be found at:

<http://www.odh.ohio.gov/odhPrograms/hpr/cpsafe/childbooster.aspx>.

Deaths to Children 5 to 9 Years Old

Background

Children ages 5 to 9 years continue to improve motor skills and have more regular contact with people outside their family. They have a growing understanding of consequences and of right and wrong. According to the National Center for Injury Prevention and Control, the leading causes of death for 5 to 9 year olds are accidents, cancers and congenital anomalies.¹⁹

CFR Findings

For the five-year period 2006-2010, local CFR boards reviewed 451 deaths to children ages 5 to 9 years. These represent 6 percent of all 8,247 deaths reviewed.

- ◀ Reviews were disproportionately higher among boys (55 percent) relative to their representation in the general population (51 percent).
- ◀ A greater percentage of deaths in this age group occurred among black children (23 percent) relative to their representation in the general population (17 percent).
- ◀ Four percent (17) of the reviews were for Hispanic children.
- ◀ Thirty-two percent (145) of the deaths were deemed probably preventable.

The 451 reviews were classified by manner as follows:

- ◀ Sixty percent (270) were natural deaths.
- ◀ Twenty-nine percent (132) were of accidental manner.
- ◀ Nine percent (42) were homicides.
- ◀ Less than 1 percent (1) were suicides.
- ◀ One percent (6) were of an undetermined manner.

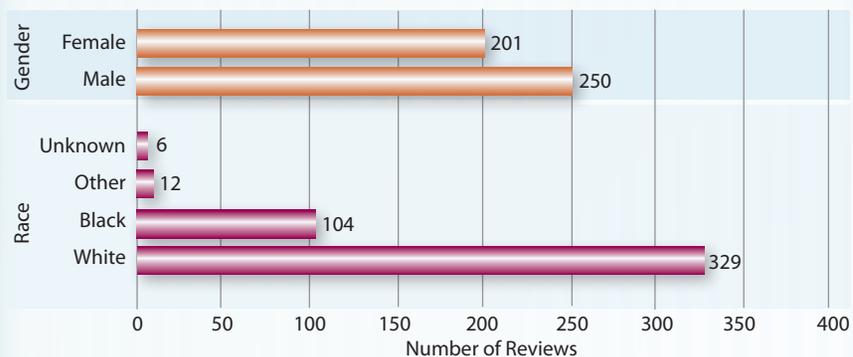
Sixty-one percent (274) of the 451 reviews for 5 to 9 year olds were from medical causes.

- ◀ Cancer was the leading medical cause of death in this age group.
- ◀ Twenty-five percent (68) of the deaths from medical causes were due to cancer.
- ◀ Sixteen percent (44) were due to pneumonia and other infections.
- ◀ Congenital anomalies accounted for 12 percent (32) of the deaths from medical causes.

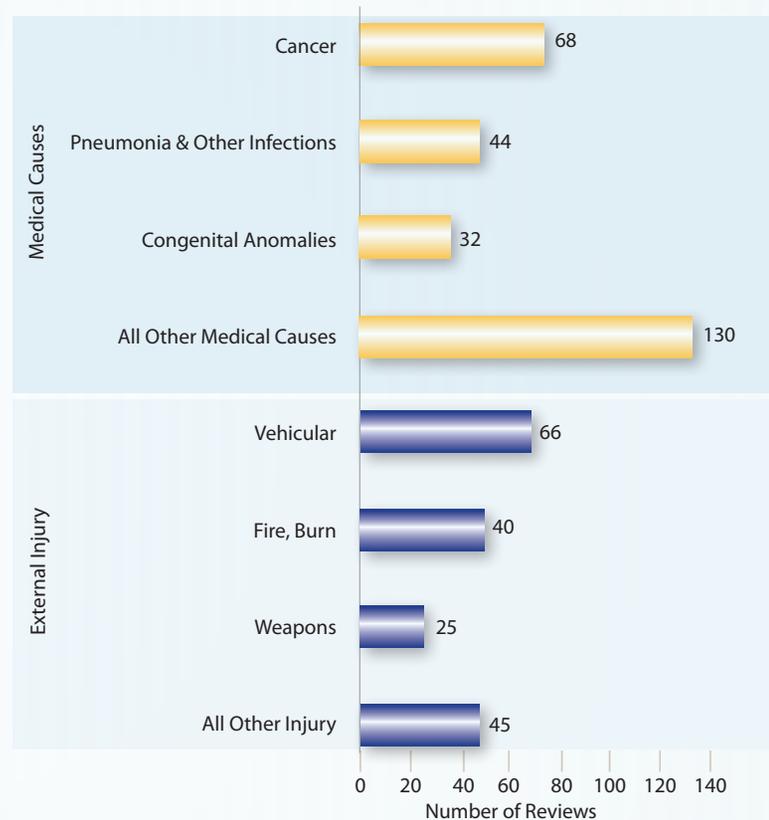
Thirty-nine percent (176) of the 451 reviews for 5 to 9 year olds were due to external causes. Vehicular crashes, fires and weapons injuries were the three leading external causes of death for this age group.

- ◀ Thirty-eight percent (66) of the 176 reviews were due to vehicular injuries.
- ◀ Twenty-three percent (40) were due to fires and burns.
- ◀ Fourteen percent (25) were due to weapons injuries, including the use of body parts as weapons.

**Reviews of Deaths to 5-9 Year Olds by Race and Gender
2006-2010, N=451**



**Reviews of 5-9 Year Olds by Leading Causes of Death
2006-2010, N=451**



Vehicular injuries accounted for 66 deaths to 5 to 9 year olds. One vehicular death was homicide; the remainder were accidental manner.

- ◀ Fifty-eight percent (38) of the 66 were passengers in vehicles. The average age of the child's driver was 32 years. Two of the 38 drivers (5 percent) were impaired at the time of the incident.
- ◀ Forty-eight percent (32) indicated the child killed was a passenger in a car, truck, van or SUV, where by law, children must use seat belts and safety seats or boosters. Of those 32, 47 percent (15) were properly restrained.
- ◀ Thirty-eight percent (25) of the vehicular deaths were to pedestrians or children on bicycles or other pedal cycles. Ten of the 25 pedestrians or cyclists had supervision at the time of the incident.



Fire and burn injuries (40) were the second leading cause of external death for 5 to 9 year olds. Twenty-five percent (10) of the 40 fire and burn deaths were homicides.

- ◀ Thirty-five percent (14) of the reviews indicated a smoke detector was present.

Local CFR boards identified 12 deaths from child abuse and neglect among 5 to 9 year olds. These represent 3 percent of all reviews for this age group, and 7 percent of the 165 child abuse and neglect deaths for all ages.

- ◀ Forty-two percent (5) of the reviews indicated the person causing the death was a biological parent.
 - ◀ Other perpetrators included other relatives, parents' partner and unknown persons.

Deaths to Children 10 to 14 Years Old

Background

Children in early adolescence experience many physical, cognitive and social-emotional changes. As 10 to 14 year olds experience more independence, they also encounter strong peer pressure.²⁰ According to the National Center for Injury Prevention and Control, the leading causes of death for 10 to 14 year olds are accidents, cancers and homicides.²¹

CFR Findings

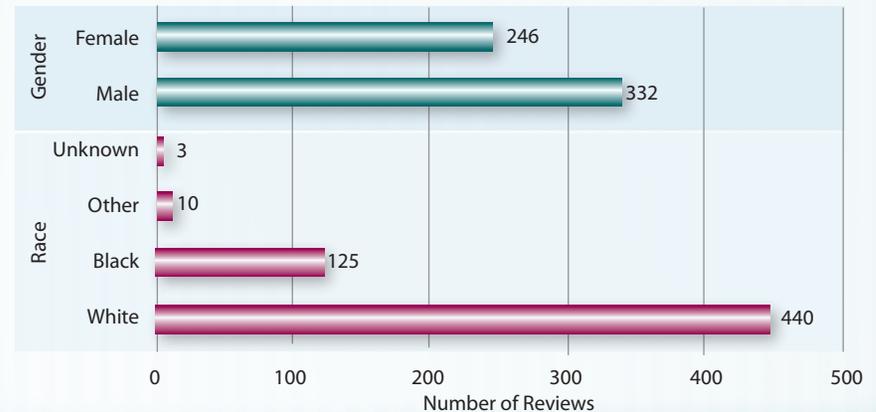
For the five-year period 2006-2010, local CFR boards reviewed 578 deaths to children ages 10 to 14 years. These represent 7 percent of all 8,247 deaths reviewed.

- ◀ Reviews were disproportionately higher among boys (57 percent) relative to their representation in the general population (51 percent).
- ◀ A greater percentage of deaths in this age group occurred among black children (22 percent) relative to their representation in the general population (17 percent).
- ◀ Three percent (16) of the reviews were for Hispanic children.
- ◀ Thirty-six percent (205) of the deaths were deemed probably preventable.

The 578 reviews were classified by manner as follows:

- ◀ Fifty-four percent (313) were natural deaths.
- ◀ Twenty-nine percent (170) were of accidental manner.
- ◀ Ten percent (56) were suicides.
- ◀ Five percent (28) were homicides.
- ◀ Two percent (11) were of an undetermined or unknown manner.

**Reviews of Deaths to 10-14 Year Olds by Race and Gender
2006-2010, N=578**



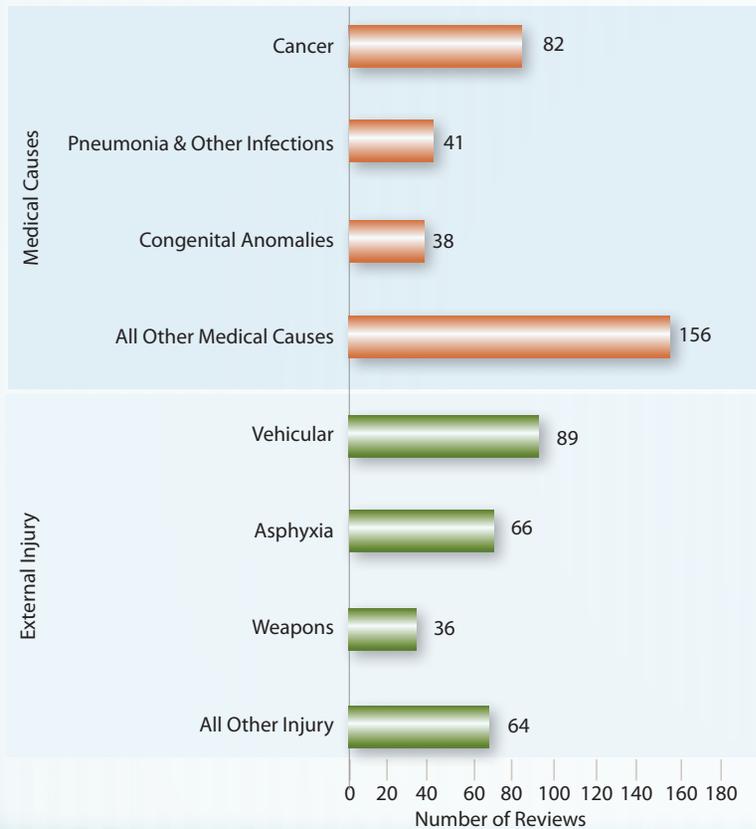
Fifty-five percent (317) of the 578 reviews for 10 to 14 year olds were from medical causes.

- ◀ Cancer was the leading medical cause of death in this age group.
- ◀ Twenty-six percent (82) of the deaths from medical causes were due to cancer.
- ◀ Thirteen percent (41) were due to pneumonia and other infections.
- ◀ Congenital anomalies accounted for 12 percent (38) of the deaths from medical causes.

Forty-four percent (255) of the 578 reviews for 10 to 14 year olds were due to external causes. Vehicular crashes, asphyxia and weapons injuries were the three leading external causes of death for this age group.

- ◀ Thirty-five percent (89) of the 255 reviews were due to vehicular injuries.

Reviews of 10-14 Year Olds by Leading Causes of Death 2006-2010, N=578



- ◀ Twenty-six percent (66) were due to asphyxia.
- ◀ Fourteen percent (36) were due to weapons injuries, including the use of body parts as weapons.

Vehicular injuries accounted for 89 deaths to 10 to 14 year olds. All but one of the vehicular deaths were accidental manner.

- ◀ Forty-six percent (41) of the 89 were passengers in vehicles. The average age of the child's driver was 29 years. Two of the 41 drivers (5 percent) were impaired at the time of the incident.
- ◀ Thirty-three percent (29) indicated the child killed was a passenger in a car, truck, van or SUV, where by law, children must use seat belts. Of those 29, 10 percent (3) were properly restrained.
- ◀ Thirty percent (27) of the vehicular deaths were to pedestrians or children on bicycles or other pedal cycles.

Asphyxia (66) was the second leading cause of external death for 10 to 14 year olds.

- ◀ Ninety-four percent (62) of the asphyxia deaths were due to strangulation. The remaining four were due to choking or suffocation.
- ◀ Sixty-five percent (43) of the 66 asphyxia deaths were suicides.

Local CFR boards reviewed 56 suicide deaths to 10 to 14 year olds. These represent 10 percent of all 578 reviews for this age group, and 26 percent of the 220 suicide deaths for all ages.

- ◀ Seventy-seven percent (43) of the suicides were by asphyxia. Twenty percent (11) were by weapons and two deaths were by poisoning.
- ◀ Twenty-seven percent (15) were receiving mental health services at the time of the incident.
- ◀ The most frequently indicated factors that might have contributed to the child's despondency were arguments with parents and friends, and school problems.

Deaths of Children 15 to 17 Years Old

Background

Known for challenging the limits, teenagers enjoy more independence from their family and develop strong relationships with peers.²² According to the National Center for Injury Prevention and Control, the leading causes of death for 15 to 17 year olds are accidents, homicides and suicides.²³

CFR Findings

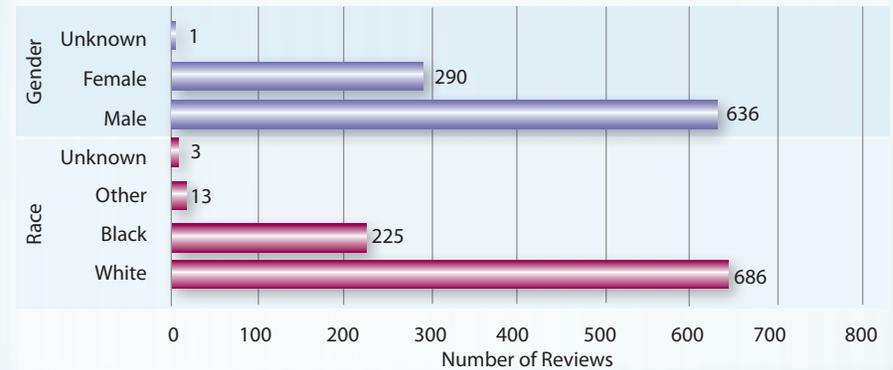
For the five-year period 2006-2010, local CFR boards reviewed 927 deaths of children ages 15 to 17 years. These represent 11 percent of all 8,247 deaths reviewed.

- ◀ Reviews were disproportionately higher among boys (69 percent) relative to their representation in the general population (51 percent).
- ◀ A greater percentage of deaths in this age group occurred among black children (24 percent) relative to their representation in the general population (17 percent).
- ◀ Three percent (30) of the reviews were for Hispanic children.
- ◀ Fifty-eight percent (536) of the deaths were deemed probably preventable.

The 927 reviews were classified by manner as follows:

- ◀ Twenty-seven percent (253) were natural deaths.
- ◀ Forty-one percent (376) were of accidental manner.
- ◀ Eighteen percent (163) were suicides.
- ◀ Fourteen percent (126) were homicides.
- ◀ One percent (9) were of an undetermined or unknown manner.

Reviews of Deaths to 15-17 Year Olds by Race and Gender 2006-2010, (N=927)

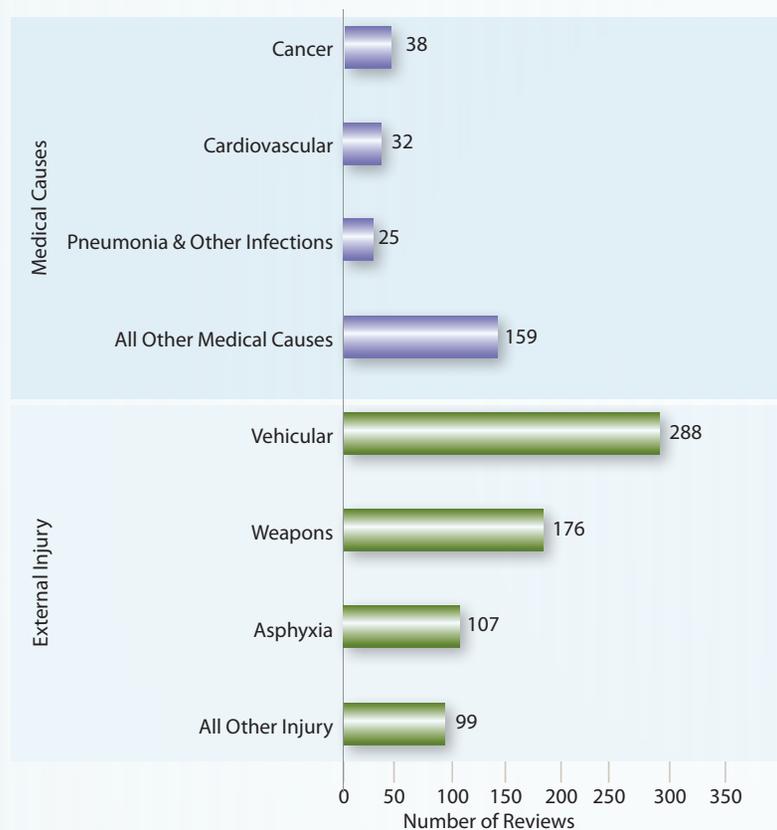


Of the 175 deaths from all causes to black boys ages 15 to 17 years, 53 percent (92) were homicides, while only 3 percent (14) of the 451 deaths from all causes to white boys ages 15 to 17 years were homicide.

Twenty-seven percent (254) of the 927 reviews for 15 to 17 year olds were from medical causes.

- ◀ Cancer was the leading medical cause of death in this age group.
- ◀ Fifteen percent (38) of the deaths from medical causes were due to cancer.
- ◀ Cardiovascular disorders accounted for 13 percent (32) of the deaths from medical causes.
- ◀ Ten percent (25) were due to pneumonia and other infections; and 10 percent (25) were due to neurological disorders.

Reviews of 15-17 Year Olds by Leading Causes of Death 2006-2010, N=927



Seventy-two percent (670) of the 927 reviews for 15 to 17 year olds were due to external causes. Vehicular crashes, weapons injuries and asphyxia were the three leading external causes of death for this age group.

- ◀ Forty-three percent (288) of the 670 reviews were due to vehicular injuries.
- ◀ Twenty-six percent (176) were due to weapons injuries, including the use of body parts as weapons.
- ◀ Sixteen percent (107) were due to asphyxia.

Of the 288 reviews for deaths from vehicular injuries to 15 to 17 year olds, 3 percent (8) were suicides and 3 percent (8) were homicides.

- ◀ Vehicular deaths to 15 to-17 year olds outnumbered deaths from all medical causes combined.
- ◀ Eighty-six percent (249) of the vehicular deaths to 15 to 17 year olds were white children, while 11 percent (33) were black children.
- ◀ Forty-eight percent (137) of the reviews were for children who were driving the vehicle.
 - ▶ Eighty-two percent (113) of the 137 child drivers were deemed responsible for the incident. Twenty-one were impaired.
 - ▶ Speed, recklessness and inexperience were the most frequently cited causes of crashes.
 - ▶ Of the 114 children who were driving cars, trucks, vans and SUVs, where by law, children must use seat belts, 32 percent (37) were properly restrained.

- ◀ Thirty-six percent (104) of the 288 vehicular deaths occurred to children who were passengers.
 - ▶ Seventy-three percent (76) of the drivers of the child's vehicle were deemed responsible for the incident. Twenty-two were impaired.
 - ▶ Speed, recklessness and inexperience were the most frequently cited causes of crashes.
 - ▶ Of the 94 children who were passengers in cars, trucks, vans and SUVs, where by law, children must use seat belts, 23 percent (22) were properly restrained.
 - ▶ For children who were passengers, the average age of the child's driver was 21 years.
- ◀ Fourteen percent (40) of the vehicular deaths were to pedestrians or children on bicycles or other pedal cycles.
- ◀ Of the 33 vehicular deaths to black 15 to 17 year olds, 39 percent (13) were pedestrians or cyclists, while 10 percent (26) of the 249 white 15 to 17 year olds were pedestrians or cyclists.

Weapons injuries, including the use of body parts as weapons, were the second leading cause of death for 15 to 17 year olds.

- ◀ The 176 weapons deaths represent 19 percent of all deaths to 15 to 17 year olds.
 - ◀ Weapons deaths were disproportionately higher among boys (88 percent) and black children (64 percent) relative to their representation in the general population (51 percent for boys and 17 percent for black children).
 - ◀ Sixty-five percent (114) of the weapons deaths were homicides and 30 percent (52) were suicides. Only 6 percent (10) were of accidental manner.
 - ◀ Firearms (handguns, shotguns and rifles) were involved in 94 percent (166) of the deaths. Other weapons included sharp instruments and other weapons.
 - ◀ Forty-three percent (75) of the reviews for weapons deaths indicated the child had a delinquent or criminal history.
- Asphyxia was the third leading cause of death for 15 to 17 year olds.
- ◀ The 107 asphyxia deaths represent 12 percent of all deaths to 15 to 17 year olds.
 - ◀ Ninety-three percent (100) of the asphyxia deaths were due to strangulation. The remaining seven were due to suffocation or other mechanism.
 - ◀ Eighty-eight percent (94) of the 107 asphyxia deaths were suicides.
- Local CFR boards reviewed 163 suicide deaths to 15 to 17 year olds. These represent 18 percent of all 927 reviews for this age group, and 74 percent of the 220 suicide deaths for all ages.
- ◀ Fifty-eight percent (94) of the suicides were by asphyxia. Thirty-two percent (52) were by weapons. Other causes included vehicular crashes, poisoning, falls and other causes.
 - ◀ Twenty-eight percent (47) were receiving mental health services at the time of the incident and twenty percent (33) were receiving medication for mental illness.
 - ◀ Twenty percent (33) of the suicide reviews indicated a history of child maltreatment and 8 indicated an open case with children's protective services at the time of the incident.
 - ◀ The most frequently indicated factors that might have contributed to the child's despondency were family discord including divorce and arguments with parents; arguments or breakups with boyfriend or girlfriend; and school problems.

Preventable Deaths

The mission of the Ohio Child CFR program is to reduce the incidence of preventable child deaths in Ohio. A child's death is considered preventable if the community or an individual could reasonably have changed the circumstances that led to the death.²⁴ The review process helps CFR boards focus on a wide spectrum of factors that may have caused or contributed to the death or made the child more susceptible to harm. After these factors are identified the board must decide which, if any, of the factors could reasonably have been changed. Cases are then deemed "probably preventable" or "probably not preventable."

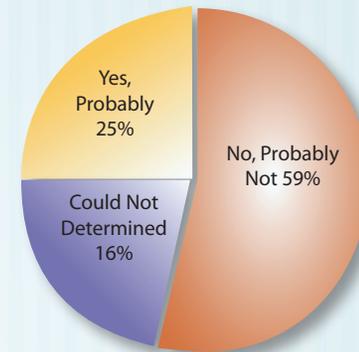
Even if a particular case is deemed "probably not preventable," the CFR process is valuable in identifying gaps in care, systemic service delivery issues or community environmental factors which contribute to less than optimal quality of life for vulnerable individuals. For this reason, many local boards make recommendations and initiate changes even when a particular death is not deemed preventable.

CFR Findings

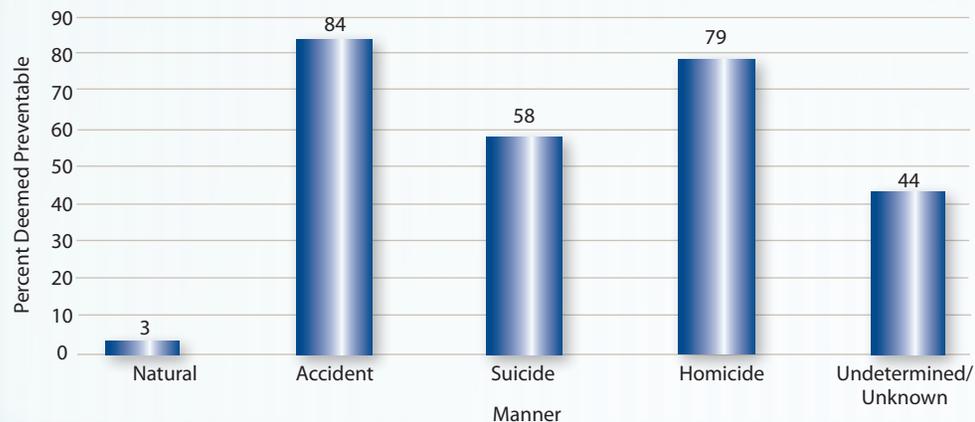
Local boards indicated 23 percent (1,859) of the 8,247 deaths reviewed from 2006 to 2010 probably could have been prevented. The percentage changed little over the period, from a high of 23 percent in 2006, 2008 and 2010 to a low of 22 percent in 2007 and 2009. Preventability differed by manner of death and by age group.

- ◀ Eighty-four percent (1,074) of the 1,284 deaths of accidental manner were considered probably preventable.
- ◀ Fifty-eight percent (536) of the 927 deaths to 15 to 17-year-olds were considered probably preventable.
- ◀ Only 3 percent (125) of the 3,688 deaths to infants less than 29 days old were considered probably preventable.

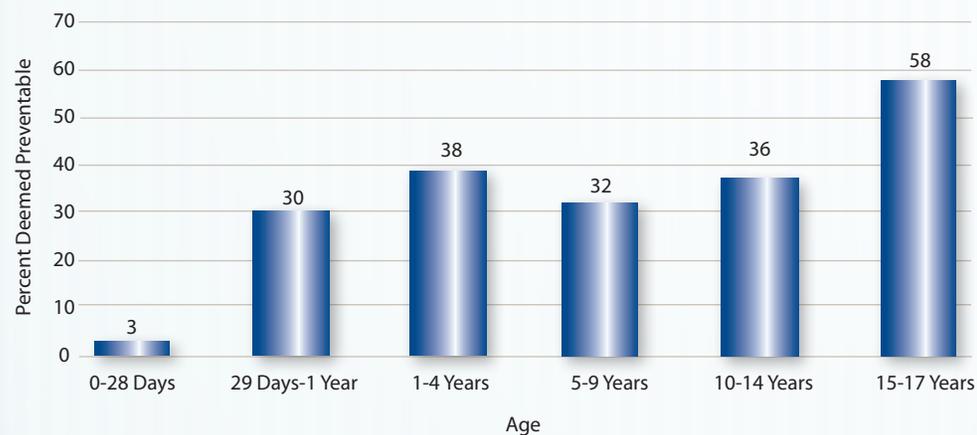
Reviews by Preventability
2006-2010, N=7,539



Reviews Deemed Preventable by Manner, 2006-2010, N= 7,539



Reviews Deemed Preventable by Age, 2006-2010, N= 7,539



Local CFR boards identify many deaths that likely could have been prevented through changes in laws or policies, such as mandating the use of booster seats in cars; or the implementation of programs, such as Cribs for Kids. Many other deaths likely could have been prevented through increased adult supervision, increased parental responsibility and the exercise of common sense. Through the sharing of perspectives during the CFR discussions, members have learned that often-repeated health and safety messages need to be presented in new ways to reach new generations of parents, caregivers and children.



Conclusion

The mission of CFR is the prevention of child deaths in Ohio. This report summarizes the process of local reviews by multi-disciplinary boards of community leaders, which results in data regarding the circumstances related to each death. Each child's death is a tragic story. As the facts about the circumstances of all the deaths are compiled and analyzed, certain risks to children become clear, including:

- ◀ Prematurity, which accounts for nearly half of all infant deaths.
- ◀ Unsafe sleep environments, which place healthy infants at risk of sudden death.
- ◀ Riding unrestrained in vehicles, which puts children at greater risk of death in the event of a crash.
- ◀ Racial disparity that results in black children dying from homicide at more than three times the expected rate.

This report is intended to be a vehicle to share the findings with the wider community to engage others in concern about these and other risks. Partners are needed to develop recommendations and implement policies, programs and practices that can have a positive impact in reducing the risks and improving the lives of Ohio's children. We encourage you to use the information in this report and to share it with others who can influence changes to benefit children. We invite you to collaborate with local CFR boards to prevent child deaths in Ohio.





Appendix

APPENDIX I

Overview of Ohio Child Fatality Review Program

Child deaths are often regarded as indicators of the health of a community. While mortality data provide us with an overall picture of child deaths by number and cause, it is from a careful study of each and every child's death that we can learn how best to respond to a death and how best to prevent future deaths.

Recognizing the need to better understand why children die, in July 2000 then Governor Bob Taft signed the bill mandating child fatality review (CFR) boards in each of Ohio's counties to review the deaths of children under 18 years of age. For the complete law and administrative rules pertaining to CFR, refer to the ODH website at www.odh.ohio.gov/rules/final/f3701-67.aspx. The mission of these local review boards, as described in the law, is to reduce the incidence of preventable child deaths. To accomplish this, it is expected that local review teams will:

- ◀ Promote cooperation, collaboration and communication among all groups that serve families and children.
- ◀ Maintain a database of all child deaths to develop an understanding of the causes and incidence of those deaths.
- ◀ Recommend and develop plans for implementing local service and program changes and advise ODH of data, trends and patterns found in child deaths.

While membership varies among local boards, the law requires that minimum membership include:

- ◀ County coroner or designee.
- ◀ Chief of police or sheriff or designee.
- ◀ Executive director of a public children service agency or designee.

- ◀ Public health official or designee.
- ◀ Executive director of a board of alcohol, drug addiction and mental health services or designee.
- ◀ Pediatrician or family practice physician.

Additional members are recommended and may include the county prosecutor, fire/emergency medical service representatives, school representatives, representatives from Ohio Family and Children First Councils, other child advocates and other child health and safety specialists. The health commissioner serves as board chairperson in many counties.

CFR boards must meet at least once a year to review the deaths of child residents of that county. The basic review process includes:

- ◀ The presentation of relevant information.
- ◀ The identification of contributing factors.
- ◀ The development of data-driven recommendations.

Local CFR board review meetings are not open meetings and all discussion and work products are confidential.

Each local CFR board provides data to ODH by recording information on a case report tool before entering it into a national web-based data system. The report tool and data system were developed by the National Center for Prevention and Review of Child Death (NCPKCD) with a grant from the federal Maternal and Child Health Bureau. The tool captures information about the factors related to the death and the

often-complex conversations that happen during the review process in a format that can be analyzed on the local, state or national level. This report is based on the analysis of data from the NCPRCD data system.

ODH is responsible for providing technical assistance and annual training to the CFR boards. In 2011, ODH provided two new board chair/coordinator orientations. ODH collaborated with the Franklin County CFR board and the SID Network of Ohio to present an Infant Death Investigation Training on June 8 and 9, 2011. The purpose of the training was to provide local teams from across Ohio with the knowledge and skills to complete consistent, thorough infant death investigations. The faculty was a team from Cuyahoga County that had been training in Sudden, Unexpected Infant Death Investigation (SUIDI) by the CDC. Throughout the year, NCPRCD webinars provided additional training opportunities for Ohio's local boards. ODH staff also coordinate the data collection, assure the maintenance of a Web-based data system and analyze the data reported by the local boards. The annual state report is prepared and published jointly with the Ohio Children's Trust Fund.

To assist moving CFR forward in Ohio, an advisory committee was established in 2002. The purpose of the advisory committee is to review Ohio's child mortality data and CFR data to identify trends in child deaths; to provide expertise and consultation in analyzing and understanding the causes, trends and system responses to child deaths in Ohio; to make recommendations in law, policy and practice to prevent child deaths in Ohio; to support CFR and recommend improvements in protocols and procedures; and to review and provide input for the annual report.

This report presents information from the reviews of deaths that occurred in 2010, as well as aggregate data for the five-year period 2006 to 2010. By reporting the information by year of death, it is possible to compare CFR data with data from other sources such as vital statistics. In making such comparisons, it is important to use caution and acknowledge the unique origins and purposes for each source of data. CFR data included in this report are the outcome of thoughtful inquiry and discussion by a multi-disciplinary group of community leaders who consider all the circumstances surrounding the death of each child. They bring to the review table information from a variety of agencies, documents and areas of expertise. Their careful review process results in a thorough description of the factors related to child deaths.

Despite their best efforts, CFR boards are not able to review every child death. Some reviews must be delayed until all legal investigations and prosecutions are completed. Some deaths occur outside the county of residence or outside the state, resulting in long delays in notification to the CFR board. Because of these variables, it is usually impossible to find an exact number-for-number match between CFR data and data from other sources such as vital statistics. The unique role of CFR data is to provide a comprehensive depth of understanding to augment other, more one-dimensional data sources.

APPENDIX II

Child Fatality Review Advisory Committee

Christy Beeghly

Ohio Department of Health, Violence and Injury Prevention

Rachel Belenker

Ohio Department of Health, Office of General Counsel

Jim Beutler

Putnam County Sheriff's Office

Jo Bouchard

Ohio Department of Health,
Bureau of Child and Family Health Services

Brian Carlson

Ohio Attorney General's Office

Lorrie Considine

Cuyahoga County Board of Health

David Corey

Ohio Coroners Association

Amy Davis

Ohio Department of Health
Bureau of Child and Family Health Services

Angela Cornelius Dawson

Commission on Minority Health

Lori Deacon

Ohio Department of Health
Bureau of Child and Family Health Services

Jolene DeFiore-Hyrmer

Ohio Department of Health
Ohio Violent Death Reporting System

Kelly Friar

Ohio Department of Health, Vital Statistics

Connie Geidenberger

Ohio Department of Health,
Center for Public Health Statistics and Informatics

Liz Henrich

Ohio Association of County Behavioral Health Authorities

Shelia Hiddleston

Champaign County Health District

Marla Himmeger

Ohio Department of Mental Health

Janice Houchins

Ohio Family and Children First, East Central District

Karen Hughes

Ohio Department of Health
Division of Family and Community Health Services

Jill Jackson

Ohio Department of Education

Arthur James

Ohio Department of Health
Nationwide Children's Hospital
The Ohio State University

Barbara Manuel

Ohio Department of Job and Family Services
Office of Families and Children

Ellen McManus

Nationwide Children's Hospital
Center for Family and Child Advocacy

Karen Gray-Medina

Columbus Public Health

Michael Mier

Copley Police Department

Kathleen Nichols

Attorney General's Office

Angie Norton

Ohio Department of Health
Bureau of Community Health Services and
Patient-Centered Primary Care

Emily Pelphrey

Ohio Attorney General's Office

Barbara Pryor

Ohio Department of Health
Bureau of Health Promotion and Risk Reduction

Leslie Redd

SID Network of Ohio

Kristen Rost

Ohio Department of Job and Family Services

Angela Sausser Short

Ohio Family and Children First

Cynthia Shellhaas

Ohio Department of Health
Bureau of Child and Family Health Services

Joe Stack

Ohio Department of Public Safety

Kelly Taulbee

Hocking County Health Department

Laurie Thuman

Delaware County Health Department

Tracy Tucker

Parent (SIDS)

Barbara Turpin

Ohio Children's Defense Fund

Crystal Ward Allen

Public Children Services Association of Ohio

APPENDIX III

Ohio Department of Health Bureau of Child and Family Health Services Child Fatality Review Program Staff

Jo Bouchard
Chief

Lori Deacon
Assistant Chief

Amy Davis
Health Planning Administrator

Merrily Wholf
CFR Coordinator



APPENDIX IV

Local Child Fatality Review Board Chairs

Adams

Bruce M. Ashley
Adams County Health Department
937-544-5547
adamcohd@odh.ohio.gov

Allen

Kathy Luhn
Allen County Health Department
419-228-4457
kluhn@allenhealthdept.org

Ashland

Dan Daugherty
Ashland Health Department
419-282-4317
ddaughe2@lycos.com

Ashtabula

Raymond J. Saporito
Ashtabula County Health Dept.
440-576-6010
ray.saporito@odh.ohio.gov

Athens

James R. Gaskell
Athens City-County Health Dept.
740-592-4431
jamesgaskell2000@yahoo.com

Auglaize

Charlotte Parsons
Auglaize County Health Department
419-738-3410
cparsons@auglaizehealth.org

Belmont

Linda Mehl
Belmont County Health Department
740-695-1202
lmchl@belmontcountyhealth.org

Brown

Christopher T. Haas
Brown County General Health District
937-378-6892
christopher.haas@odh.ohio.gov

Butler

Robert J. Lerer
Butler County Health Department
513-863-1770
boh@butlercountyohio.org

Carroll

Nicholas V. Cascarelli
Carroll County Health Department
330-627-4866
Ncascarelli@carroll-lhd.org

Champaign

Shelia Hiddleston
Champaign Health District
937-484-1605
shiddleston@champaignhd.com

Clark

Charles Patterson
Clark County Combined Health District
937-390-5600
cpatterson@ccchd.com

Clermont

Marty Lambert
Clermont County General Health District
513-732-7499
mlambert@co.clermont.countyohio.gov

Clinton

Pamela Walker-Bauer
Clinton County Health Department
937-382-3829
pbauer@clincohd.com

Columbiana

Wesley J. Vins
Columbiana County Health Department
330-424-0272
wvins@columbia-health.org

Coshocton

Rebecca J. Beiter
Coshocton County General Health District
740-295-7307
becky.beiter@odh.ohio.gov

Crawford

W. Scott Kibler
Crawford County General Health District
419-562-5871
cchc@crawford-co.org

Cuyahoga

Lori Mago
Help Me Grow
216-698-8973
lmago@helpmegrow.org

Darke

Terrence L. Holman
Darke County Health Department
937-548-4196
terrence.holman@odh.ohio.gov

Defiance

Kimberly J. Moss
Defiance County General Health District
419-784-3818
healthcommish@defiance-county.com

Delaware

Laurie Thuman
Delaware General Health District
740-203-2034
lthuman@delawarehealth.org

Erie

Peter T. Schade
Erie County General Health District
419-626-5623
pschade@eriecohealthohio.org

Fairfield

Larry Hanna
Fairfield Department of Health
740-653-2817
lhanna@co.fairfield.oh.us

Fayette

Robert G. Vanzant
Fayette County Health Department
740-335-5910
fayecohd@odh.ohio.gov

Franklin

Andrea Hauser
Columbus Public Health
614-645-1667
alhauser@columbus.gov

Fulton

Michael Oricko
Fulton County Health Department
419-337-0915
mike.oricko@odh.ohio.gov

Gallia

Melissa Conkle
Gallia County Health Department
740-441-2960
melissa.conkle@odh.ohio.gov

Geauga

Robert Weisdack
Geauga County Health District
440-279-1903
rweisdack@geaugacountyhealth.org

Greene

Mark McDonnell
Greene County
Combined Health District
937-374-5600
mmcdonnell@gcchd.org

Guernsey

LuAnn Danford
Cambridge-Guernsey
County Health Department
740-439-3579
luann.danford@odh.ohio.gov

Hamilton

Ted Folger
Hamilton County Family
513-946-4990
Ted.Folger@hamilton-co.org

Hancock

Greg Arnette
Hancock County
Health Department
419-424-7869
gaarnette@co.hancock.oh.us

Hardin

Kalyan Das
Kenton-Hardin Health Department
419-673-6230
hardcohd@odh.ohio.gov

Harrison

Luan Touvall
Harrison County Health Dept.
740-942-2616
luan.touvall@odh.ohio.gov

Henry

Anne Goon
Henry County Health Department
419-599-5545
agoon@henrycohd.org

Highland

James Vanzant
Highland Health Department
937-393-1941
jimvanzant@yahoo.com

Hocking

Kelly Taulbee
Hocking County Health District
740-385-3030
ktaulbee@hockingchd.com

Holmes

D. J. McFadden
Holmes County Health District
330-674-5035
dmcfadden@holmeshealth.org

Huron

Tim Hollinger
Huron County General Health Dist.
419-668-1652
thollinger@huroncohealth.com

Jackson

Gregory A. Ervin
Jackson County Health Department
740-286-5094
greg.ervin@jacksoncountyhealthdepartment.org

Jefferson

Frank J. Petrola
Jefferson County
General Health District
740-283-8530
jchd@jchealth.com

Knox

Julie Miller
Knox County Health Department
740-399-8000
jemiller@knoxhealth.com

Lake

Christine Margalis
Lake County General Health District
440-350-2879
cmargalis@lcghd.org

Lawrence

Kurt Hofmann
Lawrence County Health Dept.
740-532-3962
kurt.hofmann@odh.ohio.gov

Licking

Robert P. Raker
Licking County Coroner's Office
740-349-3633
lccoroner@alink.com

Logan

Boyd C. Hoddinott
Logan County Health District
937-592-9040
boyd.hoddinott@odh.ohio.gov

Lorain

Kenneth G. Pearce
Lorain County General Health Dist.
440-284-3219
kpearce@loraincountyhealth.com

Lucas

David Grossman
Toledo-Lucas County Health Dept.
419-213-4018
grossmad@co.lucas.oh.us

Madison

Mary Ann Webb
Madison County-
London City Health District
740-852-3065
mwebb@co.madison.oh.us

Mahoning

Patricia Sweeney
Dist. Board of Health, Mahoning County
330-270-2855
psweeney@mahoninghealth.org

Marion

Frederick Winegarner
Marion County Health Department
740-387-3604
maricohd@odh.ohio.gov

Medina

Daniel Raub
Medina County Health Department
330-723-9511
draub@medinahealth.org

Meigs

Larry Marshall
Meigs County Health Department
740-992-6626
larry.marshall@odh.ohio.gov

Mercer

Philip Masser
Mercer County -
Celina City Health Department
419-586-3251
healthdept@mccchd.org

Miami

Christopher Cook
Miami County Health District
937-440-5418
ccook@miamicountyhealth.net

Monroe

Linda Dick
Monroe County Health Department
740-472-1677
linda.dick@odh.ohio.gov

Montgomery

James W. Gross
Public Health - Dayton
and Montgomery County
937-225-4395
jgross@phdmc.org

Morgan

Richard D. Clark
Morgan County Health Department
740-962-4572
morge@odh.ohio.gov

Morrow

Krista Wasowski
Morrow County Health Department
419-947-1545
krista.wasowski@odh.ohio.gov

Muskingum

Corrie Marple
Zanesville Muskingum
County Health Department
740-454-9741
corriem@zmchd.org

Noble

Shawn E. Ray
Noble County Health Department
740-732-4958
shawn.ray@noblecohd.org

Ottawa

Nancy C. Osborn
Ottawa County Health Department
419-734-6800
nosborn@cros.net

Paulding

Larry Fishbaugh
Paulding County Health Dept.
419-399-3921
paulcohd@odh.ohio.gov

Perry

Angela DeRolph
Perry County Health Department
740-342-5179
aderolph@perryhealth.com

Pickaway

Elaine Miller
Pickaway County General Health
District
740-477-9667
emiller@pchd.org

Pike

Wally Burden
Pike County General Health District
740-947-7721
pcghd@bright.net

Portage

Duwayne Porter
Portage Health Department
330-296-9919
dporter@portageco.com

Preble

Mark Vosler
Preble County Health District
937-472-0087
pcdh@preblecountyhealth.org

Putnam

Mary Ann Myers
Putnam County General Health
District
419-523-5608
maryann.myers@odh.ohio.gov

Richland

Stan Saalman
Mansfield/Richland
County Health Department
419-774-4510
ssaalman@richlandhealth.org

Ross

Timothy Angel
Ross County Health District
740-779-9652
tangel@horizonview.net

Sandusky

David G. Pollick
Sandusky County Health Dept.
419-334-6377
dpollick@sanduskycohd.org

Scioto

Aaron Adams
Scioto County Health Department
740-543-241
aaron.adams@odh.ohio.gov

Seneca

Marjorie S. Broadhead
Seneca County Health Department
419-447-3691
marjorie.broadhead@odh.ohio.gov

Shelby

Steven Tostrick
Sidney-Shelby County Health Dept.
937-498-7249
steven.tostrick@odh.ohio.gov

Stark

Kirkland Norris
Stark County Health Department
330-493-9904
norrisk@starkhealth.org

Summit

R. Daryl Steiner
Children's Hospital
Medical Center of Akron
330-543-8124
dsteiner@chmca.org

Trumbull

James Enyeart
Trumbull County Health Department
330-675-2590
health@co.trumbull.oh.us

Tuscarawas

Deb Crank
Tuscarawas County Health Dept.
330-343-5555
debbie.crank@odh.ohio.gov

Union

Alexandria Jones
Union County Health Department
937-645-2054
alex.jones@health.co.union.oh.us

VanWert

Paul A. Kalogerou
Van Wert County Health Department
419-238-0808
vwchd@vanwertcountyhealth.org

Vinton

Susan Crapes
 Vinton County Health District
 740-596-5233
scrapes@vintonohhealth.org

Warren

Duane Stansbury
 Warren County Combined
 Health Department
 513-695-1566
duane.stansbury@co.warren.oh.us

Washington

Kathleen L. Meckstroth
 Washington County Health Dept.
 740-374-2782
healthadmin@washco-ohhealth.org

Wayne

Gregory L. Halley
 Wayne County Combined
 General Health Department
 330-264-9590
GHalley@wayne-Health.org

Williams

James Watkins
 Williams County Health Dept.
 419-485-3141
willcohd@odh.ohio.gov

Wood

Pam Butler
 Wood County Health Dept.
 419-352-8402
pbutler@co.wood.oh.us

Wyandot

Barbara Mewhorter
 Wyandot County Health Dept.
 419-294-3852
wchealthdept@co.wyandot.oh.us

APPENDIX V

ICD-10 Codes Used for Vital Statistics Data Included in CFR Report

Cause of Death	ICD-10 Codes
Animal Bite or Attack	W53-W59, X20-27, X29
Asphyxia	W75-W84, X47, X66, X67, X70, X88, X91, Y17, Y20
Child Abuse and Neglect	Y06-Y07
Drowning	W65-W74, X71, X92, Y21
Environmental Exposure	W92, W93, W99, X30, X31, X32
Fall and Crush	W00-W19, W23, X80, Y01, Y02, Y30, Y31
Fire, Burn, Electrocutation	X00-X09, X33, X76, X77, X97, X98, Y26, Y27, W85, W86, W87
Medical Causes (Excluding SIDS)	A000-B999, C000-D489, D500-D899, E000-E909, F000-F999, G000-G999, H000-H599, H600-H959, I000-I999, J000-J999, K000-K939, L000-L999, M000-M999, N000-N999, O000-O999, P000-P969, Q000-Q999, R000-R949
Other Causes (Residual)	All other codes not otherwise listed
Poisoning	X40-X49, X60-X65, X68, X69, X85, X87, X89, X90, Y10-Y16, Y18, Y19
Sudden Infant Death Syndrome	R95
Suicide	X60-X84
Vehicular	V01-V99, X81, X82, Y03, Y32
Weapon, Including Body Part	W26, W32-W34, X72-75, X78, X79, X93-96, X99, Y00, Y04, Y05, Y08, Y09, Y22-25, Y28-Y29, Y35.0 Y35.3

For this report, ICD-10 codes used for classification of Vital Statistics data were selected to most closely correspond with the causes of death indicated on the CFR case report tool. Therefore, the ICD-10 codes used for this report may not match the codes used for other reports or data systems.

APPENDIX VII

Data Tables

Table 1:
Reviews of 2010 Deaths by Manner of Death by Age, Race and Gender (N=1,542)

	Natural	Accident	Homicide	Suicide	Undetermined/ Unknown	Total
Age						
1-28 Days	694	9	7	0	14	724
29-364 Days	186	50	15	0	81	332
1-4 Years	94	58	10	0	10	172
5-9 Years	49	26	1	0	1	77
10-14 Years	63	28	1	7	2	101
15-17 Years	42	52	19	21	2	136
Unknown	-	-	-	-	-	0
Missing	-	-	-	-	-	0
Race*						
White	747	178	25	24	54	1,028
Black	535	41	28	4	56	664
Other	28	4	-	-	-	32
Unknown	-	-	-	-	-	0
Missing	-	-	-	-	-	0
Gender						
Male	612	132	38	21	61	864
Female	516	91	15	7	49	678
Unknown	-	-	-	-	-	-
Missing	-	-	-	-	-	-
Total	1,128	223	53	28	110	1,542

*37 cases with multiple races indicated were assigned to the minority race.



**Table 2: Reviews of 2010 Deaths by Age
All Medical Causes of Death by Age (N=1,130)**

	0-28 Days	29-364 Days	1-4 Years	5-9 Years	10-14 Years	15-17 Years	Total
Asthma	0	0	0	1	0	3	4
Cancer	0	0	11	14	17	6	49
Cardiovascular	16	2	9	4	8	5	44
Congenital Anomalies	100	40	28	4	8	6	186
Neurological Disorders	1	4	4	3	3	5	20
Pneumonia	5	16	6	2	4	1	34
Prematurity	475	34	2	1	0	0	512
SIDS	6	22	0	0	0	0	28
Other Infection	5	16	7	1	5	2	35
Other Perinatal Conditions	21	3	0	0	0	0	24
Other Medical Condition	63	48	28	18	17	14	188
Undetermined/Unknown	1	4	1	0	0	0	6
Medical Causes Total	694	188	96	48	62	42	1,130

All External Causes of Death by Age (N=334)

	0-28 Days	29-364 Days	1-4 Years	5-9 Years	10-14 Years	15-17 Years	Total
Vehicular	0	5	17	13	14	39	88
Asphyxia	8	38	9	1	9	13	78
Weapon (Including Body Part)	0	8	13	5	4	24	54
Fire, Burn or Electrocution	1	2	17	5	4	1	30
Drowning	0	1	13	7	5	2	28
Poisoning	0	0	4	0	0	12	16
Fall or Crush	0	1	4	1	2	1	9
Exposure	0	1	2	0	0	0	3
Other Injury	0	0	0	1	0	0	1
Undetermined/Unknown	2	24	0	0	0	1	27
External Causes Total	11	80	79	33	38	93	334

For 78 reviews, the cause of death could not be determined as either medical or external.

**Table 3: Reviews of 2010 Deaths by Race
All Medical Causes of Death by Race (N=1,130)**

	White	Black	Other	Unknown	Missing	Total
Asthma	0	4	-	-	-	4
Cancer	32	9	2	-	-	49
Cardiovascular	31	9	3	-	-	44
Congenital Anomalies	130	51	5	-	-	186
Neurological Disorders	13	6	1	-	-	20
Pneumonia	25	8	1	-	-	34
Prematurity	597	208	7	-	-	512
SIDS	24	3	1	-	-	28
Other Infection	29	5	1	-	-	35
Other Perinatal Conditions	14	10	-	-	-	24
Other Medical Condition	140	41	7	-	-	184
Undetermined	5	1	-	-	-	6
Medical Causes Total	747	355	28	0	0	1,130
<i>29 cases with multiple races indicated were assigned to the minority race.</i>						

External Causes of Death by Race (N= 334)

	White	Black	Other	Unknown	Missing	Total
Asphyxia	73	12	3	-	-	88
Vehicular	55	23	-	-	-	78
Weapon (Including Body Part)	28	26	-	-	-	54
Fire, Burn or Electrocution	27	3	-	-	-	30
Drowning	21	6	1	-	-	28
Poisoning	15	1	-	-	-	16
Fall or Crush	9	-	-	-	-	9
Exposure	2	1	-	-	-	3
Other Injury	1	-	-	-	-	1
Undetermined/Unknown	9	18	-	-	-	27
External Causes Total	240	*0	4	0	0	334

6 cases with multiple races indicated were assigned to the minority race.

For 78 reviews, the cause of death could not be determined as either medical or external.



Table 4: Reviews of 2010 Deaths by Gender
All Medical Causes of Death by Gender (N=1,130)

	Male	Female	Unknown	Missing	Total
Asthma	2	2	-	-	4
Cancer	26	23	-	-	49
Cardiovascular	22	22	-	-	44
Congenital Anomalies	92	94	-	-	186
Neurological Disorders	9	11	-	-	20
Pneumonia	18	16	-	-	34
Prematurity	286	226	-	-	512
SIDS	17	11	-	-	28
Other Infection	20	15	-	-	38
Other Perinatal Conditions	8	16	-	-	24
Other Medical Condition	109	79	-	-	184
Undetermined	1	5	-	-	6
Medical Causes Total	610	520	0	0	1,130

All External Causes of Death by Gender (N= 334)

	Male	Female	Unknown	Missing	Total
Vehicular	57	31	-	-	88
Asphyxia	43	35	-	-	78
Weapon (Including Body Part)	40	14	-	-	54
Fire, Burn or Electrocutation	18	12	-	-	30
Drowning	19	9	-	-	28
Poisoning	8	8	-	-	16
Fall or Crush	9	-	-	-	9
Exposure	-	3	-	-	3
Other Injury	10	-	-	-	1
Undetermined/Unknown	13	14	-	-	27
External Causes Total	208	126	0	0	334

For 78 reviews, the cause of death could not be determined as either medical or external.

Table 5: Child Population, Child Deaths and Reviews by County Type, 2010

County Type	Child Population		Child Deaths		Reviews Completed		Reviews Percent Deaths
	#	%	#	%	#	%	%
Rural Appalachian	340,024	13	288	15	218	14	94
Rural Non-Appalachian	403,976	15	208	13	206	13	99
Suburban	509,953	19	226	14	206	13	91
Metropolitan	1,477,009	54	913	58	912	59	100
Total	2,739,962	100	1,580	100	1,542	100	98

Table 6:
Reviews of 2006-2010 Deaths by Manner of Death by Age, Race and Gender (N=8,247)

	Natural	Accident	Homicide	Suicide	Undetermined/ Unknown	Total
Age						
0-28 Days	3,563	67	6	-	52	3,688
29-364 Days	1,063	298	63	-	347	1,768
1-4 Years	450	244	102	-	39	835
5-9 Years	270	132	48	1	6	451
10-14 Years	313	170	28	56	11	578
15-17 Years	253	376	126	163	9	927
Unknown	-	-	-	-	-	0
Missing	-	-	-	-	-	0
Race*						
White	3,804	963	158	181	262	5,368
Black	1,974	295	208	36	200	2,713
Other	90	16	-	3	2	111
Unknown	26	5	1	-	-	32
Missing	18	5	-	-	-	23
Gender						
Male	3,287	818	246	154	265	4,770
Female	2,613	465	121	66	198	3,469
Unknown	2	-	-	1	-	2
Missing	10	1	-	-	1	12
Total	5,912	1,284	367	220	464	8,247

*173 cases with multiple races indicated were assigned to the minority race.



**Table 7: Reviews of 2006-2010 Deaths by Age
All Medical Causes of Death by Age (N=5,991)**

	0-28 Days	29-364 Days	1-4 Years	5-9 Years	10-14 Years	15-17 Years	Total
Asthma	-	-	5	8	7	7	27
Cancer	1	5	52	68	82	38	246
Cardiovascular	111	50	41	20	27	32	281
Congenital Anomalies	498	228	104	32	38	22	922
Low Birth Weight	10	2	-	-	-	-	12
Malnutrition/Dehydration	-	6	2	-	-	1	9
Neurological Disorders	5	19	19	14	10	25	92
Pneumonia	20	76	39	19	22	15	191
Prematurity	2,381	167	7	3	-	-	2,558
SIDS	24	221	1	-	-	-	246
Other Infection	68	68	45	28	23	11	243
Other Perinatal Conditions	135	18	4	1	3	1	162
Other Medical Condition	314	195	133	79	103	101	925
Undetermined/Unknown	14	50	8	2	2	1	77
Medical Causes Total	3,581	1,105	460	274	317	254	5,991

All External Causes of Death by Age (N=1,988)

	0-28 Days	29-364 Days	1-4 Years	5-9 Years	10-14 Years	15-17 Years	Total
Asphyxia	47	262	44	11	66	107	537
Vehicular	3	19	68	66	89	288	533
Weapon (Including Body Part)	4	41	67	25	36	176	349
Fire and Burns	2	12	65	40	17	10	146
Drowning	1	9	58	20	27	23	138
Poisoning	-	5	12	1	9	50	77
Fall or Crush	1	3	19	7	9	13	52
Exposure	1	3	5	-	-	-	9
Other Injuries	2	6	9	4	1	2	24
Undetermined/Unknown	14	99	6	2	1	1	123
External Causes Total	75	459	353	176	255	670	1,988

For 268 reviews, the cause of death could not be determined as either medical or external.

**Table 8: Reviews of 2006-2010 Deaths by Race
All Medical Causes of Death by Race (N=5,991)**

	White	Black	Other	Unknown	Missing	Total
Asthma	10	17	-	-	-	27
Cancer	197	39	8	1	1	246
Cardiovascular	201	74	5	-	1	281
Congenital Anomalies	657	240	14	7	4	922
Low Birth Weight	10	2	-	-	-	12
Malnutrition/Dehydration	7	2	-	-	-	9
Neurological Disorders	60	27	4	-	1	92
Pneumonia	133	53	4	1	-	191
Prematurity	1,363	1,151	27	12	5	2,558
SIDS	188	54	4	-	-	246
Other Infection	166	71	5	-	1	243
Other Perinatal Conditions	113	47	2	-	-	162
Other Medical Condition	699	202	15	4	5	925
Undetermined	44	30	2	1	-	77
Medical Causes Total	3,848	2,009	90	26	18	5,991

128 cases with multiple races indicated were assigned to the minority race.

External Causes of Death by Race (N= 1,988)

	White	Black	Other	Unknown	Missing	Total
Asphyxia	370	159	4	1	3	537
Vehicular	450	72	8	2	1	533
Weapon (Including Body Part)	161	187	-	1	+	349
Fire and Burns	100	44	1	-	1	146
Drowning	96	36	4	2	-	138
Poisoning	67	10	-	-	-	77
Fall or Crush	46	4	2	-	-	52
Exposure	7	2	-	-	-	9
Other Injuries	18	6	-	-	-	24
Undetermined/Unknown	48	75	-	-	-	123
External Causes Total	1,363	595	19	6	5	1,988

34 cases with multiple races indicated were assigned to the minority race.

For 263 reviews, the cause of death could not be determined as either medical or external.

**Table 9: Reviews of 2006-2010 Deaths by Gender
All Medical Causes of Death by Gender (N=5,991)**

	Male	Female	Unknown	Missing	Total
Asthma	13	13	-	1	27
Cancer	128	118	-	-	246
Cardiovascular	149	132	-	-	281
Congenital Anomalies	495	424	1	2	922
Low Birth Weight	5	7	-	-	12
Malnutrition/Dehydration	4	5	-	-	9
Neurological Disorders	43	49	-	-	92
Pneumonia	118	72	-	1	191
Prematurity	1,466	1,387	2	3	2,558
SIDS	139	106	-	1	246
Other Infection	136	107	-	-	243
Other Perinatal Conditions	88	74	-	-	162
Other Medical Condition	511	412	-	2	925
Undetermined/Unknown	41	36	-	-	77
Medical Causes Total	3,336	2,642	3	10	5,991

All External Causes of Death by Gender (N= 1,988)

	Male	Female	Unknown	Missing	Total
Asphyxia	324	212	-	1	537
Vehicular	339	194	-	-	533
Weapon (Including Body Part)	274	75	-	-	349
Fire and Burns	71	75	-	-	146
Drowning	95	43	-	-	138
Poisoning	45	32	-	-	77
Fall or Crush	44	8	-	-	52
Exposure	2	7	-	-	9
Other Injuries	17	7	-	-	24
Undetermined/Unknown	67	56	-	-	123
External Causes Total	1,278	709	0	1	1,988

For 268 reviews, the cause of death could not be determined as either medical or external.

Table 10: Reviews of 2006-2010 Deaths by Year by Age, Race and Gender (N=8,247)

	2006	2007	2008	2009	2010	Total
Age						
0-28 Days	739	768	737	727	717	3,688
29-364 Days	366	364	371	340	327	1,768
1-4 Years	155	184	162	155	179	835
5-9 Years	116	87	89	78	81	451
10-14 Years	132	91	117	130	102	578
15-17 Years	200	221	199	171	136	927
Unknown	-	-	-	-	-	0
Missing	-	-	-	-	-	0
Race*						
White	1,093	1,141	1,075	1,033	1,028	5,370
Black	571	542	579	540	482	2,714
Other	13	23	18	25	32	111
Unknown	19	7	3	3	-	32
Missing	12	8	-	-	-	20
Gender						
Male	1,005	1,011	966	924	765	4,770
Female	698	701	709	677	678	3,463
Unknown	1	2	-	-	-	3
Missing	4	7	-	-	-	11
Total	1,708	1,721	1,675	1,601	1,542	8,247

* 173 cases with multiple races indicated were assigned to the minority race.

Table 11: Reviews of 2006-2010 Deaths by Year by Cause, Circumstances and Preventability (N=8,247)

	2006	2007	2008	2009	2010	Total
Medical Causes						
Prematurity	514	549	513	470	512	2,558
Congenital Anomaly	203	184	174	175	186	922
Cardiovascular	51	75	49	62	44	281
SIDS	75	55	43	45	28	246
Other Infections	56	44	56	52	35	243
Cancer	57	53	45	42	49	246
Pneumonia	45	43	36	33	34	191
Other Perinatal	23	36	47	32	24	162
Neurological	20	20	19	13	20	92
Asthma	5	11	4	3	4	27
Malnutrition/Dehydration	1	3	2	1	2	9
Other Medical	161	167	203	220	186	937
Undetermined/Unknown	26	25	9	11	6	77
External Causes						
Asphyxia	119	113	119	108	78	537
Vehicular	128	116	115	86	88	533
Weapon (Including Body Part)	72	76	70	77	54	349
Fire and Burns	38	26	34	18	30	146
Drowning	25	31	27	27	28	138
Poisoning	17	10	19	15	16	77
Fall or Crush	13	9	8	13	9	52
Exposure	1	2	1	2	3	9
Other Injuries	10	6	3	5	1	25
Undetermined/Unknown	30	17	26	23	27	123
Child Abuse & Neglect	33	38	36	34	24	165
Sleep-related Infant Deaths	183	178	168	153	148	830
Probably Preventable	402	374	394	349	340	1,859
Year Total	1,708	1,721	1,675	1,601	1,542	8,247

**Table 12: Reviews of 2006-2010 Deaths
by County Type by Age, Race and Gender (N=8,247)**

	Rural Appalachian	Rural Non-Appalachian	Suburban	Metropolitan	Total
Age					
0-28 Days	368	380	460	2,480	3,688
29 – 364 Days	216	231	228	1,093	1,768
1-4 Years	130	132	123	450	835
5-9 Years	58	77	65	251	451
10-14 Years	84	106	85	303	578
15-17 Years	132	159	160	476	927
Race*					
White	917	979	988	2,484	5,368
Black	65	78	115	2,455	2,713
Other	4	17	13	77	111
Unknown	1	8	2	21	32
Missing	1	3	2	14	20
Gender					
Male	597	589	653	2,931	4,770
Female	388	494	465	2,116	3,463
Unknown	0	0	0	3	3
Missing	3	2	3	3	11
Total	988	1,085	1,121	5,053	8,247

* 173 cases with multiple races indicated were assigned to the minority race.

**Table 13: Reviews of 2006-2010 Deaths
by County Type by Cause, Circumstances and Preventability (N=8,247)**

	Rural Appalachian	Rural Non-Appalachian	Suburban	Metropolitan	Total
Medical Causes					
Prematurity	209	199	296	1,854	2,558
Congenital Anomaly	116	108	129	569	922
Cardiovascular	32	39	36	174	281
SIDS	52	70	39	85	246
Other Infections	33	33	40	137	243
Cancer	37	40	30	139	246
Pneumonia	16	45	25	105	191
Other Perinatal	10	34	24	94	162
Neurological	14	10	9	59	92
Asthma	2	3	3	19	27
Malnutrition	0	3	0	6	9
Other Medical	140	152	151	482	925
Undetermined/Unknown	9	7	12	49	77
External Causes					
Asphyxia	68	59	98	312	537
Vehicular	96	132	99	206	533
Weapon (Including Body Part)	36	34	34	245	349
Fire and Burns	30	31	12	73	146
Drowning	25	24	19	70	138
Poisoning	14	9	16	38	77
Fall or Crush	6	18	6	22	52
Exposure	0	0	2	7	9
Other Injuries	7	5	5	7	24
Undetermined/Unknown	4	4	2	113	123
Child Abuse & Neglect	23	24	16	102	165
Sleep-related Infant Deaths	98	101	94	537	830
Probably Preventable-All Reviews	292	309	258	1,000	1,859
Total	988	1,085	1,121	5,053	8,247

APPENDIX VIII

References*

- ¹ National Center for Health Statistics and U.S. Census Bureau data. Processed through Ohio Department of Health, Vital Statistics, June 29, 2012. Note: For the Census data used in this report, persons with multiple races indicated were assigned by a complex algorithm including geographic area and proportions of all races in that area and other factors.
- ² Program Manual for Child Death Review. Ed. Covington T, Foster V, Rich S. The National Center for Child Death Review, 2005.
- ³ U.S. Census Bureau. Population Estimates. Annual Estimates of the Resident Population by Selected Age Groups and Sex for Counties: April 1, 2010 to July 1, 2011. Available at <http://www.census.gov/popest/counties/asrh/CC-EST2009-agesex.html>
- ⁴ National Center for Health Statistics and U.S. Census Bureau data. Processed through Ohio Department of Health, Vital Statistics, June 9, 2012.
- ⁵ National Center for Health Statistics and U.S. Census Bureau data. Processed through Ohio Department of Health, Vital Statistics, June 9, 2012.
- ⁶ National Center for Health Statistics and U.S. Census Bureau data. Processed through Ohio Department of Health, Vital Statistics, June 9, 2012.
- ⁷ National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999 – 2009 page. Available at: <http://webappa.cdc.gov/sasweb/ncipc/leadcaus10.html>
- ⁸ Centers for Disease Control and Prevention. Self-directed Violence Surveillance: Uniform Definitions and Recommended Data Elements, 2011. Available at: webappa.cdc.gov/violenceprevention/pdf/Self-Directed-Violence-a.pdf.
- ⁹ National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999 – 2009 page. Available at: <http://webappa.cdc.gov/sasweb/ncipc/leadcaus10.html>
- ¹⁰ Prevent Child Abuse America. *What You Can Do: Remember the Risk Factors*. Available at: http://www.preventchildabus.org/help/remember_risk_factors.shtml
- ¹¹ Ohio Department of Health. *Ohio Child Fatality Review Seventh Annual Report*. September 2007. Available at: www.odh.ohio.gov/~media/ODH/ASSETS/Files/cfhs/child%20fatality%20review/ohiochildfatalityreviewannualreport2007-3.ashx
- ¹² National Center for Health Statistics. *Deaths in the United States, 2010*. Available at www.cdc.gov/nchs/data/databriefs/db99.htm
- ¹³ National Center for Health Statistics and U.S. Census Bureau data. Processed through Ohio Department of Health, Vital Statistics, July 29, 2012.
- ¹⁴ Willinger M, James LS, Catz C. Defining the sudden infant death syndrome (SIDS): Deliberations of an expert panel, convened by the National Institute of Child Health and Human Development. *Pediatric Pathology*. 1991; 11:677-684.
- ¹⁵ Centers for Disease Control and Prevention. Sudden Infant Death Syndrome (SIDS) and Sudden Unexpected Infant Death (SUID): Sudden, Unexpected Infant Death (SUID) Initiative page. Available at: webappa.cdc.gov/sids/SUIDAbout.htm
- ¹⁶ National Center on Birth Defects and Developmental Disabilities. *Child Development*. Available at: webappa.cdc.gov/ncbddd/child/default.htm
- ¹⁷ National Center for Health Statistics. *Deaths: Preliminary Data for 2010*. Available at: webappa.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_04.pdf

¹⁸National Center on Birth Defects and Developmental Disabilities. *Child Development*. Available at: webappa.cdc.gov/ncbddd/child/default.htm

¹⁹National Center for Injury Prevention and Control. WISQARS Leading Causes of Death Reports, 1999-2009 page. Available at: webappa.cdc.gov/sasweb/ncipc/leadcaus10.html

²⁰National Center on Birth Defects and Developmental Disabilities. *Child Development*. Available at: webappa.cdc.gov/ncbddd/child/default.htm

²¹National Center for Injury Prevention and Control. WISQARS Leading Causes of Death Reports, 1999-2009 page. Available at: webappa.cdc.gov/sasweb/ncipc/leadcaus10.html

²²National Center on Birth Defects and Developmental Disabilities. *Child Development*. Available at: webappa.cdc.gov/ncbddd/child/default.htm

²³National Center for Injury Prevention and Control. WISQARS Leading Causes of Death Reports, 1999-2009 page. Available at: webappa.cdc.gov/sasweb/ncipc/leadcaus10.html

²⁴Program Manual for Child Death Review. Ed. Covington T, Foster V, Rich S. The National Center for Child Death Review, 2005.

*All Internet sites referenced were last accessed July 25, 2012.





