

# Infant Deaths from All Causes

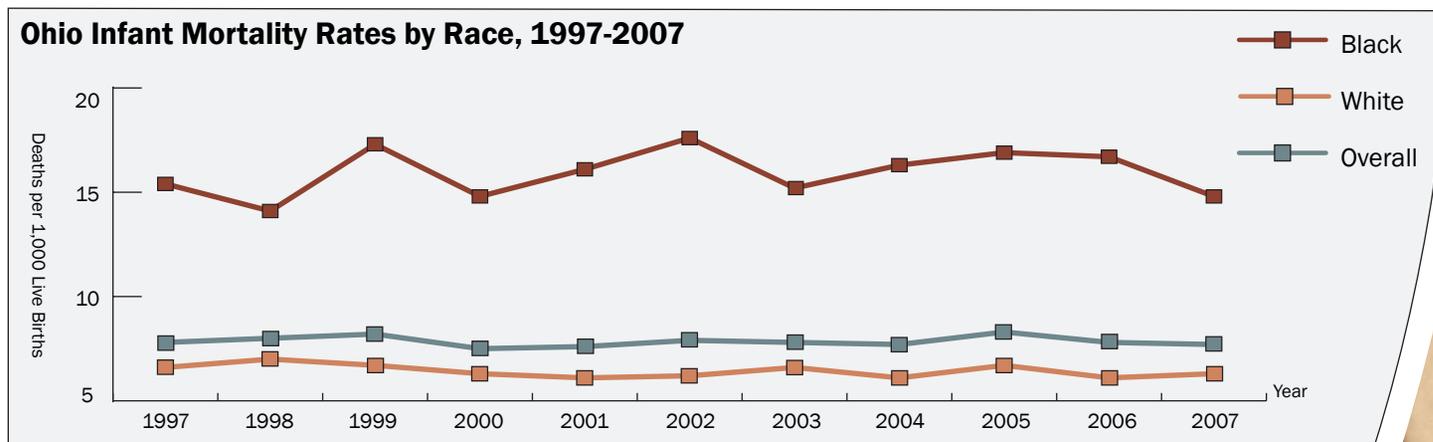
## Background

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 2007 was 6.4 infant deaths per 1,000 live births, and has changed little over the past decade. This rate is approximately 50 percent higher than the Healthy People 2010 target goal of 4.5.<sup>17</sup>

Ohio's infant mortality rate of 7.7 ranks eighth-worst among the 50 states. Of particular concern is the black

infant mortality rate of 14.8, which is more than double the white infant mortality rate of 6.3. These rates and proportions have changed little over the past decade.

In early 2009, Gov. Ted Strickland requested the Ohio Department of Health establish an Infant Mortality Task Force to take a fresh look at the reasons behind Ohio's infant mortality rate and disparities among different populations. The task force has been charged with developing both immediate and long-term recommendations to reduce infant mortality and disparities. The recommendations will be reported to the governor by September 2009 and can be accessed at <http://www.odh.ohio.gov/odhPrograms/cfhs/imtf/imtf.aspx>.



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



## Vital Statistics

Ohio Vital Statistics data report 781 neonatal deaths and 382 post-neonatal deaths for a total of 1,163 infant deaths in 2007.

## CFR Findings

Local child fatality review boards reviewed 1,086 infant deaths for 2007. These represent 66 percent of all reviews for all ages.

- Sixty-eight percent (734) were infants from birth to 28 days old.
- Thirty-two percent (352) were infants from 29 days to 1 year old.
- Reviews for infant deaths were disproportionately higher among boys (56 percent) and among black children (36 percent) relative to their representation in the general population (51 percent for boys and 16 percent for black children).

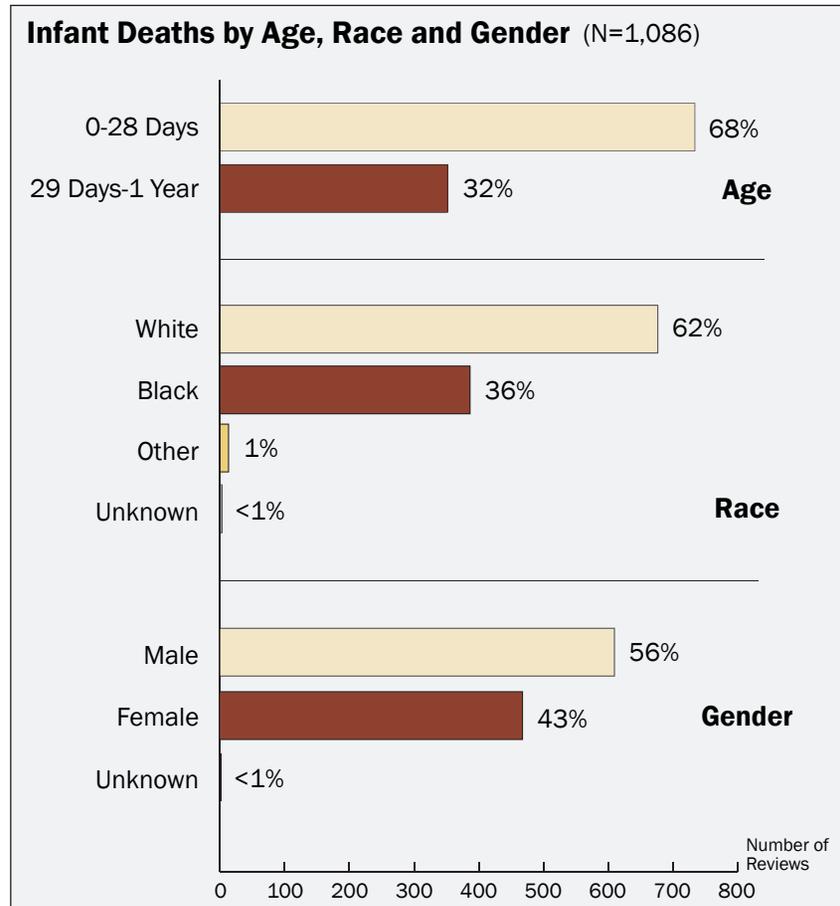
Reviews of infant deaths are grouped by cause of death:

- 936 (86 percent) of all infant deaths were due to medical causes.
- 102 (9 percent) were due to external injury causes.
- In 48 reviews (4 percent) the cause of death could not be determined as either medical or external.

Prematurity and congenital anomalies account for 70 percent (658) of all infant deaths from medical causes and 61 percent of infant deaths from all causes. Prematurity and congenital anomalies account for 78 percent (575) of the deaths to infants 0-28 days old.

Asphyxia is the leading cause of infant death due to external injury (67 percent of the infant deaths due to external injury). The next leading external cause of death is “undetermined” (16 percent of the infant deaths due to external injury).

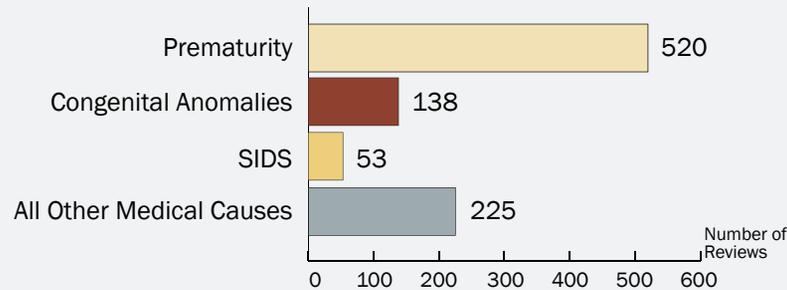
Sleep-related deaths accounted for 16 percent (175) of all infant



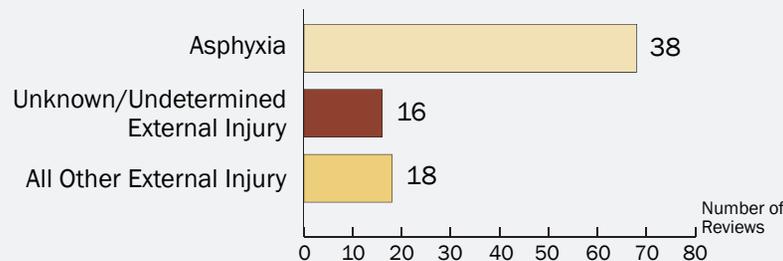
Missing data have been excluded from the percentages.

## Reviews of Infant Deaths by Leading Causes of Death (N=1,086)

### Medical Causes



### External Injury Causes



deaths and 45 percent (159) of the deaths to infants 29 days to 1 year old.

Other factors related to infant deaths:

- Fifteen percent (149) of the infants were from multiple births, including 25 from triplet or higher order births.
- Forty-two percent (420) of the infants were very low birthweight (<1,500 grams), an additional 11 percent (110) were low birthweight (1,500-2,499 grams) and 27 percent were of unknown birthweight.
  - Of the 732 reviews where the birthweight is known, 57 percent of the infants were very low birthweight and an additional 15 percent were low birthweight. For all births in Ohio in 2007, 2 percent were very low birthweight and an additional 7 percent were low birthweight.
- Fifty-five percent of the infants (569) were born preterm (< 37 weeks gestation), 21 percent (213) were born full term (37-42 weeks gestation) and 24 percent were of unknown gestational age.
  - Of the 782 reviews where the gestational age is known, 75 percent of the infants were born less than 37 weeks gestation. For all births in Ohio in 2007, 13 percent were born less than 37 weeks gestation.
- Twenty-one percent (229) of the infant deaths reviewed were infants born to mothers who smoked during the pregnancy. For all births in Ohio in 2006, 19 percent were born to mothers who smoked during the pregnancy.

### Birth History Factors for Infant Deaths (N=1,086)

	#	%
Multiple Birth	149	15
Singleton Birth	822	80
Unknown	53	5
<b>Birthweight</b>		
Very Low Birthweight (<1,500 g)	420	42
Low Birthweight (1,500-2,499 g)	110	11
Normal Birthweight (2,500-3,999 g)	196	19
Above Normal Birthweight (>3,999 g)	6	1
Unknown	276	27
<b>Gestational Age</b>		
< 37 Weeks Gestation	569	55
37-42 Weeks Gestation	213	21
Unknown	246	24
<b>Maternal Factors</b>		
Mother Smoked During Pregnancy	229	21

Missing data have been excluded from the percentages.

## Sudden Infant Death Syndrome (SIDS)

### Background

Sudden infant death syndrome (SIDS) is a medical cause of death. It is the diagnosis given the sudden death of an infant under 1 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.<sup>18</sup> According to the National Institute of Child Health and Human Development, SIDS is the leading cause of death in infants between 1 month and 1 year of age.<sup>19</sup> There is a large racial disparity, with the SIDS rate for black infants often more than twice the rate for white infants. While the national SIDS death rate has decreased, the post-neonatal mortality rate for all causes has not decreased and the rate of deaths due to "undetermined causes" has increased, suggesting that some

deaths previously classified as SIDS are now being classified as other causes.<sup>20</sup>

In an October 2005 policy statement, the American Academy of Pediatrics recognized nationwide inconsistencies in the diagnosis of sudden, unexpected infant deaths. Deaths with similar circumstances have been diagnosed as SIDS, accidental suffocation, positional asphyxia or undetermined.<sup>21</sup>

Because SIDS is a diagnosis of exclusion, all other probable causes of death must be ruled out through autopsy, death scene investigation and health history. Incomplete investigations, ambiguous findings and the presence of known risk factors for other causes of deaths result in many sudden infant deaths being diagnosed as "undetermined cause" rather than SIDS. The difficulty of obtaining consistent investigations and diagnoses of infant deaths led the

Centers for Disease Control and Prevention (CDC) to launch an initiative to improve investigations and reporting.<sup>22</sup> Many Ohio counties are developing protocols to adopt the CDC's Sudden Unexpected Infant Death Investigation tool and procedures.

Although the cause and mechanism of SIDS eludes researchers, several factors appear to put an infant at higher risk for SIDS. Infants who sleep on their stomachs are more likely to die of SIDS than those who sleep on their backs, as are infants whose mothers smoked during pregnancy and infants who are exposed to passive smoking after birth. Soft sleep surfaces, excessive loose bedding and bedsharing increase the risk of sleep-related deaths.<sup>23</sup>

### Vital Statistics

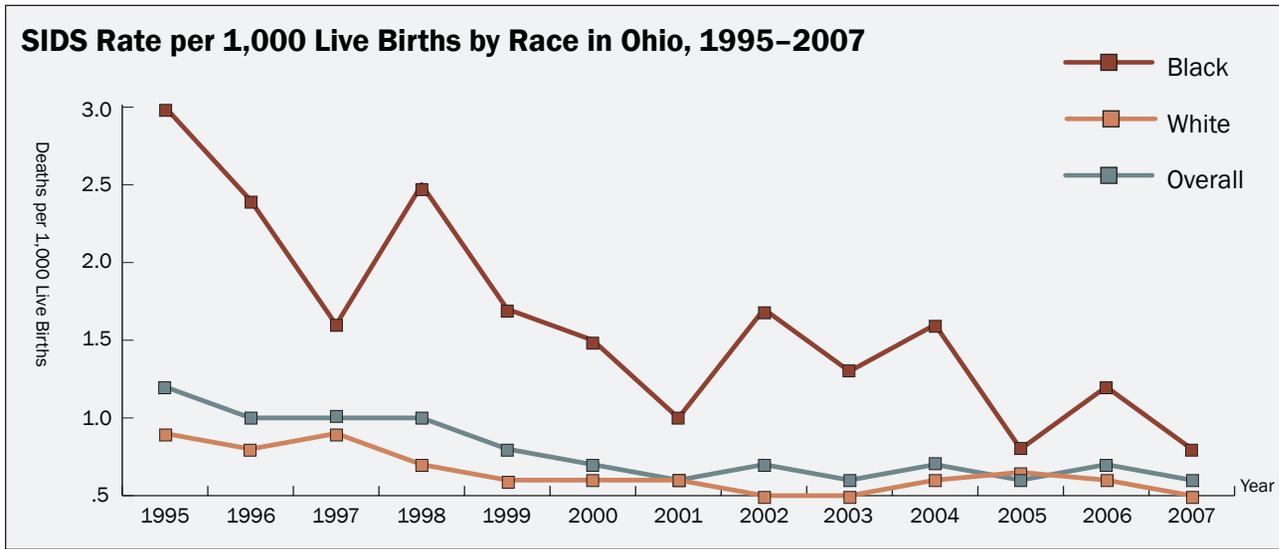
Ohio Vital Statistics reported 88

SIDS deaths in 2007. According to Ohio Vital Statistics, the Ohio SIDS rate has decreased 50 percent in the past decade, from 1.2 deaths per 1,000 live births in 1995 to 0.6 in 2007. For further information on the ICD-10 codes used to produce Vital Statistics data, please see Appendix 4.

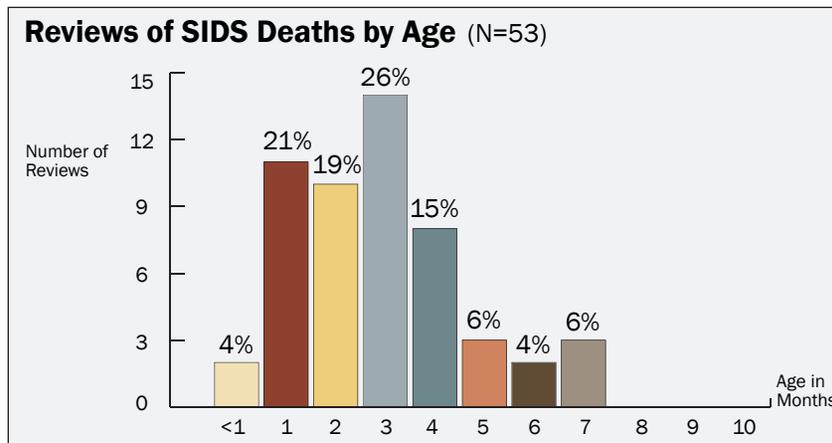
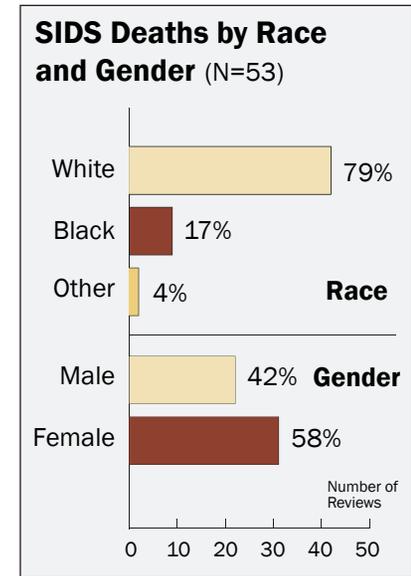
### CFR Findings

Local CFR boards reviewed 53 deaths to children from SIDS in 2007. These deaths represent 3 percent of all 1,656 reviews conducted and 5 percent of all infant deaths reviewed. It should be noted that the number of reviews for SIDS deaths has varied significantly in recent years, from 59 in 2005, to 74 in 2006, to 53 in 2007.

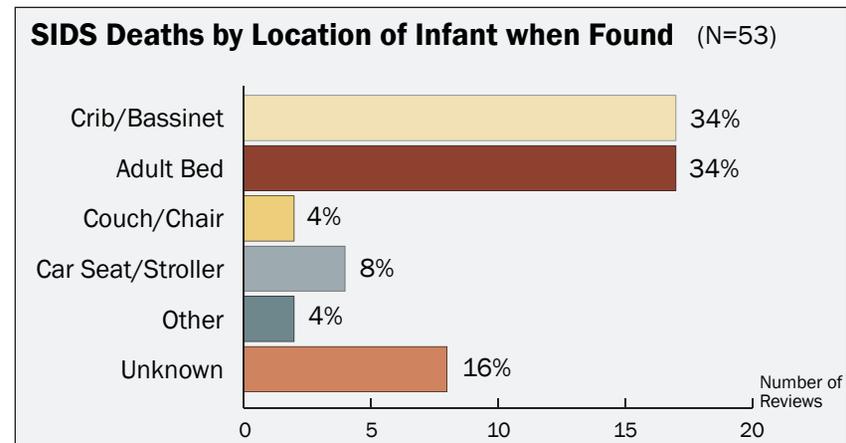
- There were greater percentages of SIDS deaths among girls (58 percent) relative to their representation in the general popula-



Note: Caution should be used in interpreting rates and trends due to small numbers and due to the updating of pending records.



Percents may not total 100 due to rounding.



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tion (49 percent). In CFR annual reports for previous years, a greater proportion of SIDS deaths have been boys.

- Eighty-one percent (43) of the SIDS deaths reviewed occurred between 1 and 4 months of age.

The CFR data reporting tool enables the collection of many variables surrounding the death, including the location of the infant when found, bedsharing and some birth health history, which can lead to better understanding of the circumstances of SIDS deaths. Many of these items are referred to as risk factors, because their presence seems to increase the risk of an infant dying of SIDS, but they are not the cause of SIDS. It is important to analyze these items so policies and interventions can be developed to prevent future deaths.

- Thirty-four percent (17) of SIDS deaths occurred in cribs or bassinets, while 38 percent (19) of SIDS deaths occurred in locations considered especially unsafe: in adult beds and on

couches and chairs. The location of the infant was unknown for 16 percent of reviews.

- Twenty-eight percent (15) of infants who died of SIDS were known to be sharing a sleep surface with an adult at the time of death. Five were sharing a sleep surface with another child, including four who were sharing with both an adult and another child.
- Ten percent (five) of the infants who died of SIDS were born with low (less than 2,500 grams) birthweight. Three of those low birthweight infants were born before 37 weeks gestation.
- Thirty-four percent (18) of children who died of SIDS were exposed to cigarette smoke in utero and 47 percent (25) were exposed either in utero or after birth. For all live births in Ohio in 2006, 19 percent were born to mothers who smoked during the pregnancy.

### Birth History Factors for SIDS Deaths (N=53)

	#	%
Multiple Birth	2	4
Singleton Birth	45	94
Unknown	1	2
<b>Birthweight</b>		
Very Low Birthweight (<1,500 g)	0	-
Low Birthweight (1,500-2,499 g)	5	10
Normal Birthweight (2,500-3,999 g)	34	69
Above Normal Birthweight (>3,999 g)	1	2
Unknown	9	18
<b>Gestational Age</b>		
< 37 Weeks Gestation	3	6
37-42 Weeks Gestation	36	73
Unknown	10	20
<b>Maternal Smoking</b>		
Mother Smoked During Pregnancy	18	34
<b>Autopsy Status</b>		
Autopsy Completed	53	100

Missing data have been excluded from the percentages.

## Infant Deaths in Sleep Environments

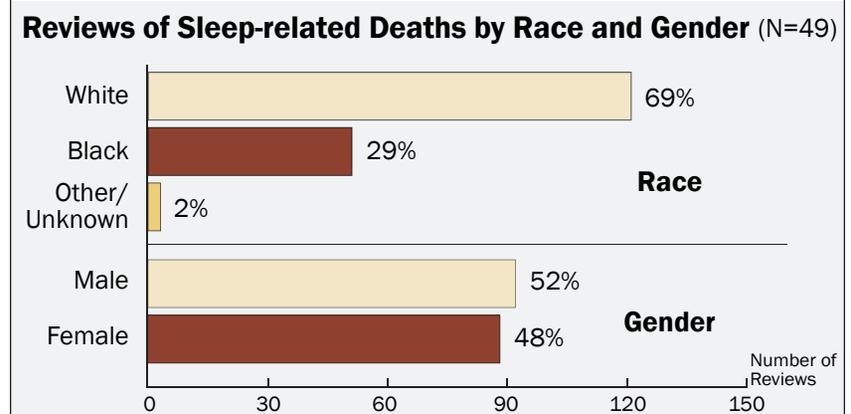
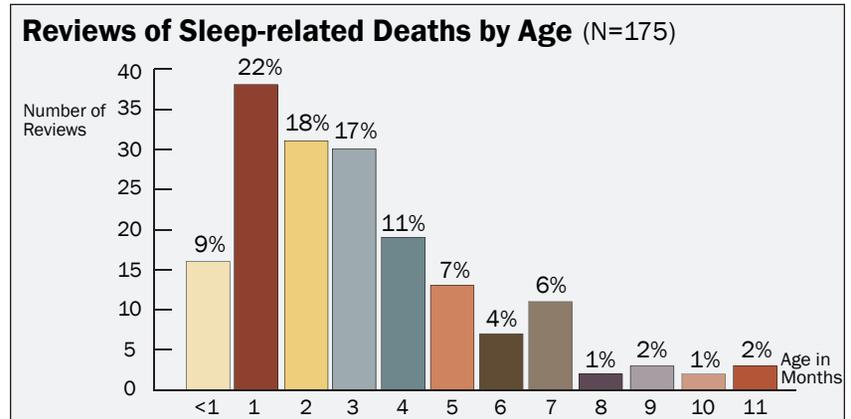
### Background

Since the beginning of the Ohio Child Fatality Review (CFR) program, local boards have been faced with a significant number of deaths of infants while sleeping. Some of these deaths are diagnosed as sudden infant death syndrome (SIDS), while others are diagnosed as accidental suffocation, positional asphyxia, overlay or undetermined. The reviews of these deaths are included in the discussions of these causes of death. 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 are analyzed and discussed as a group.

### CFR Findings

From the reviews of 2007 deaths, 204 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 175 infant sleep-related deaths. These cases include 53 SIDS deaths. The number of reviews for infant sleep-related deaths has decreased slightly from 179 in 2006.

- The 175 infant sleep-related deaths account for 16 percent of the 1,086 total reviews for infant deaths in 2007, more than any single cause of death except prematurity. More than three Ohio infant deaths each week are sleep-related.

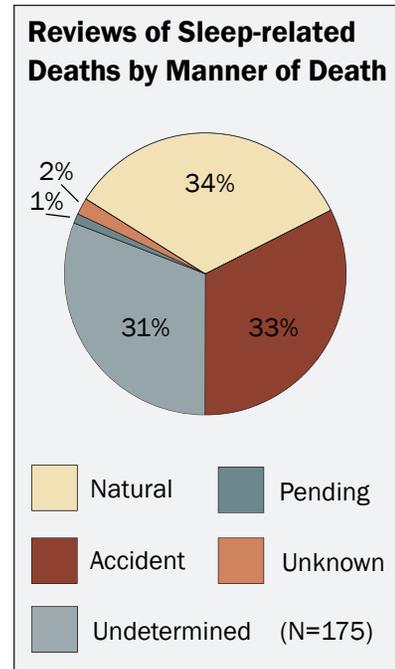


- Of the 352 reviews of infant deaths from 29 days to 1 year of age, 45 percent (159) were sleep related.
- Twenty-nine percent (51) of deaths in a sleep environment were to black infants. This is disproportionately higher than their representation in the general population (16 percent).
- Eighty-four percent (147) of the deaths occurred before 6 months of age.

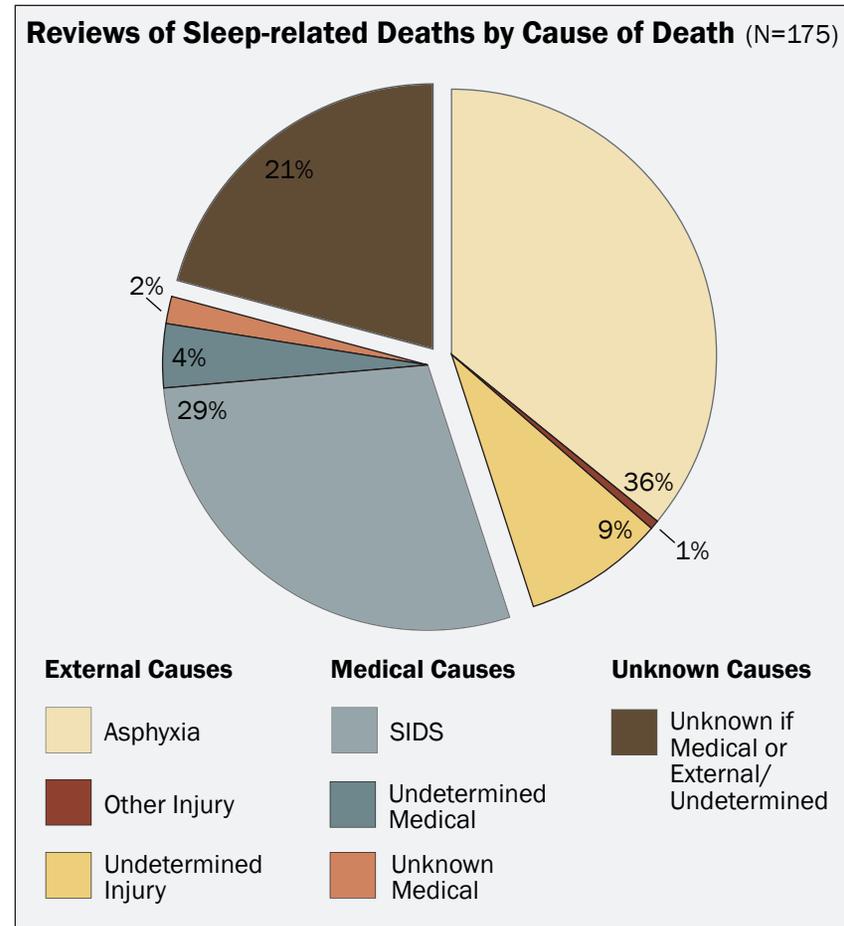
As discussed in the section on SIDS deaths, determining the cause of death for infants in sleep situations is difficult, even when a complete investigation has occurred. Thirty-five percent (61) of the sleep-related deaths were diagnosed as unknown or undetermined cause, even though autopsies had been completed for 99 percent of the cases.

Only 22 percent (39) of sleep-related deaths occurred in cribs or bassinets. Sixty percent (105) of sleep-related deaths occurred in adult beds, on couches or chairs.

Bedsharing was a commonly reported factor for sleep-related deaths. Forty-nine percent (86) of sleep-related deaths occurred to infants who were sharing a sleep surface with another person at the time of death.

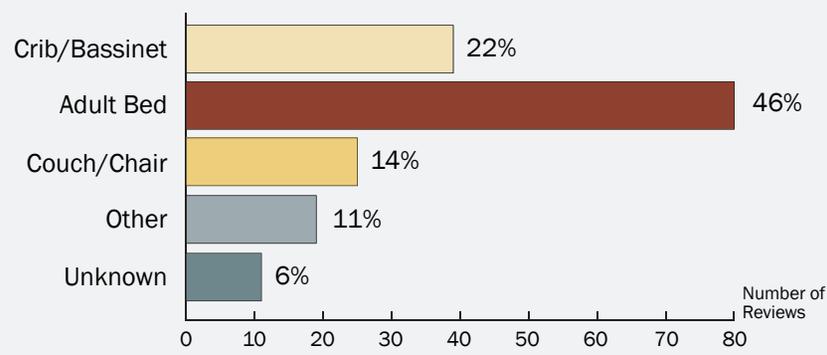


Percents may not total 100 due to rounding.



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### Reviews of Sleep-related Deaths by Location of Infant when Found (N=175)



Missing data have been excluded from the percentages.

- Eighty-one of the infants were sharing a sleep surface with an adult, including 17 infants who were sharing with an adult and another child.
- An additional five infants were sharing with another child only.

Exposure to smoking was another commonly reported factor for sleep-related deaths.

- Forty-four percent (77) of the infants were exposed to smoke either in utero or after birth.

### Infant Safe Sleep Recommendations

In October 2005, the American Academy of Pediatrics issued a policy statement outlining recommendations for reducing the risk of SIDS and other sleep-related infant deaths. The Ohio Department of Health 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.
- Keep soft objects and loose bedding out of the crib.
- Do not smoke during pregnancy. Avoid exposure to secondhand smoke.

- Maintain a separate but proximate sleeping environment. The infant's crib should be in the parents' bedroom, close to the parents' bed.
- Offer a pacifier at sleep time.
- Avoid overheating.
- Avoid commercial devices marketed to reduce the risk of SIDS. None have been proven safe or effective.
- Encourage "tummy time" when awake to avoid flat spots on the back of the head and to strengthen the upper torso and neck.
- Continue the Back to Sleep campaign for parents, grandparents and all other caregivers.

# Deaths by Homicide

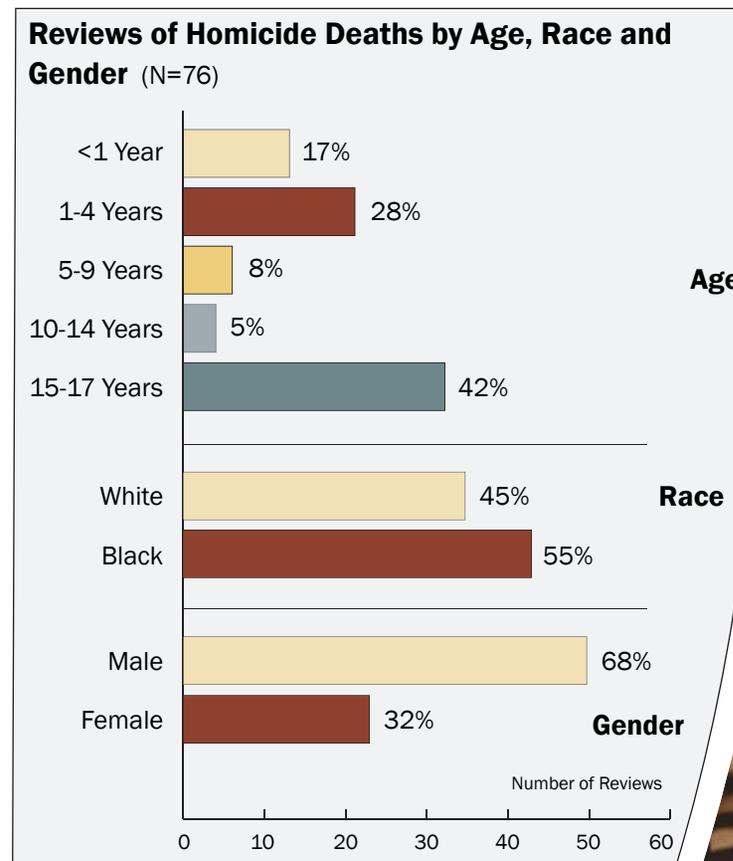
## Background

The Child Fatality Review (CFR) Case Report Tool and data system capture information about homicide as a manner of death and as an act of commission, regardless of the cause of death. Because homicide has unique risk factors and prevention strategies, homicide reviews from all causes of death have been combined for further analysis as a group.

According to the National Center for Injury Prevention and Control, in 2006 homicide was the second-leading cause of death for young people ages 10-17 and accounted for 12 percent of the deaths in this age group. Homicide was the leading manner of death for African-American young people ages 10-17, accounting for 31 percent.<sup>24</sup>

## Vital Statistics

Ohio Vital Statistics data report 83 deaths to children from homicide in 2007. For further information on the ICD-10 codes used to produce Vital Statistics data, please see Appendix 4.



## CFR Findings

Local CFR boards reviewed 76 deaths to children resulting from homicide in 2007. Homicides represent 5 percent of the total reviews and 25 percent of all reviews for children ages 10-17. The number of reviews of homicide deaths decreased from 84 in 2006.

- Homicide deaths to boys (68 percent) were disproportionately higher than their representation in the general population (51 percent).
- The proportion of homicide deaths to black children (55 percent) was more than three times their representation in the general population (16 percent).
- Forty-two percent (32) of homicide deaths were to children ages 15-17.

Seventy-four percent (56) of homicide deaths were caused by a weapon, including body parts.

- Fifty-nine percent (32) of weapons used were firearms.
- Twenty-four percent (13) of weapons used were body parts.

The perpetrator was a parent, stepparent or parent's partner in 43 percent (25) of homicide deaths reviewed.

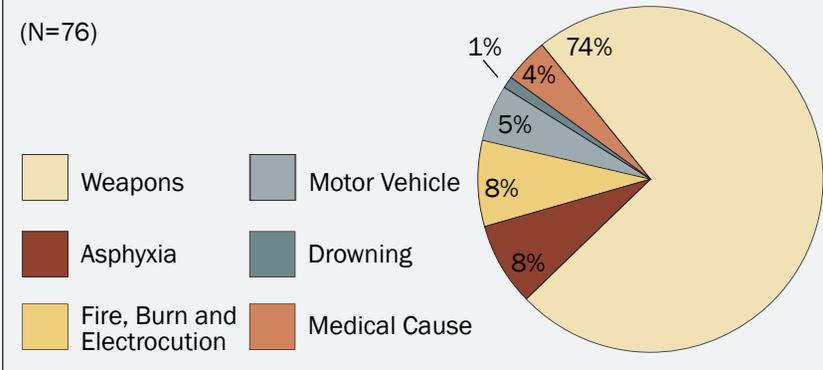
- For children less than 10 years old, the perpetrator was a parent, stepparent or parent's partner in 74 percent of reviews. In an additional 10 percent of reviews, the perpetrator was some other relative.
- For children ages 10-17, the most commonly reported perpetrator was a stranger (32 percent). There were three children ages 10-17 killed by a gang member (11 percent).

In 47 percent (34) of the homicide reviews, the place of incident was the child's home.

- For children less than 10 years old, the place of incident was the child's home in 77 percent of reviews.
- For children ages 10-17, the most commonly reported place of incident was a sidewalk, driveway or parking lot (40 percent) followed by a friend's home (17 percent).

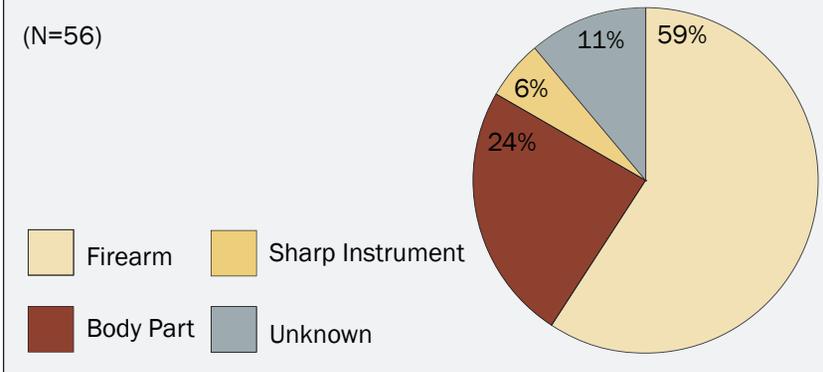
## Reviews of Homicide Deaths by Cause of Death

(N=76)



## Reviews of Homicide Deaths by Weapon Type

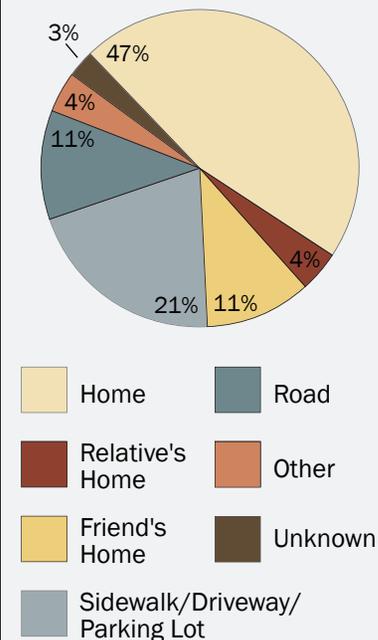
(N=56)



### Reviews of Homicide Deaths by Perpertrator (N=76)

Person Causing Death	#	%
Biological Parent	12	21
Stepparent	2	3
Mother's Partner	10	17
Father's Partner	1	2
Other Relative	6	10
Friend/Boyfriend/ Girlfriend	3	5
Acquaintance	8	14
Stranger	9	16
Gang Member	3	5
Law Enforcement	1	2
Other	3	5
Missing	18	
<b>Total</b>	<b>76</b>	<b>100</b>

### Reviews of Homicides by Place of Incident (N=76)



Percents may not total 100 due to rounding.



# Deaths by Suicide

## Background

The Child Fatality Review (CFR) Case Report Tool and data system capture information about suicide as a manner of death and as an act of commission, regardless of the cause of death. Because suicide has unique risk factors and prevention strategies, suicide deaths from all causes have been combined for further analysis.

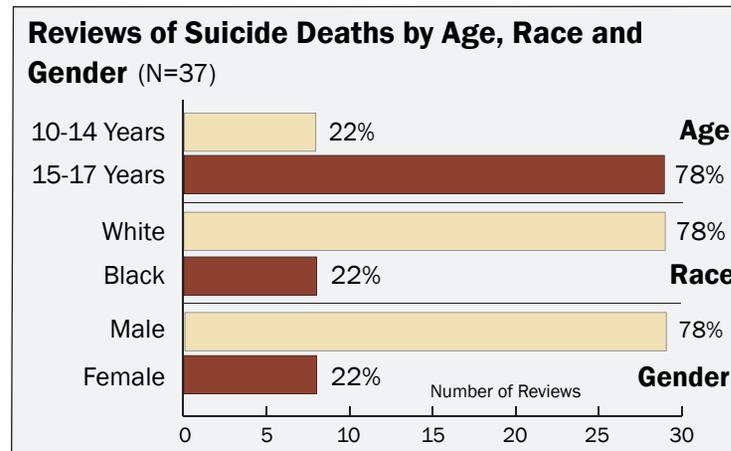
According to the National Center for Injury Prevention and Control, suicide was the third-leading cause of death for young people ages 10-17 in 2006 and accounted for 10 percent of the deaths in this age group.<sup>24</sup>

## Vital Statistics

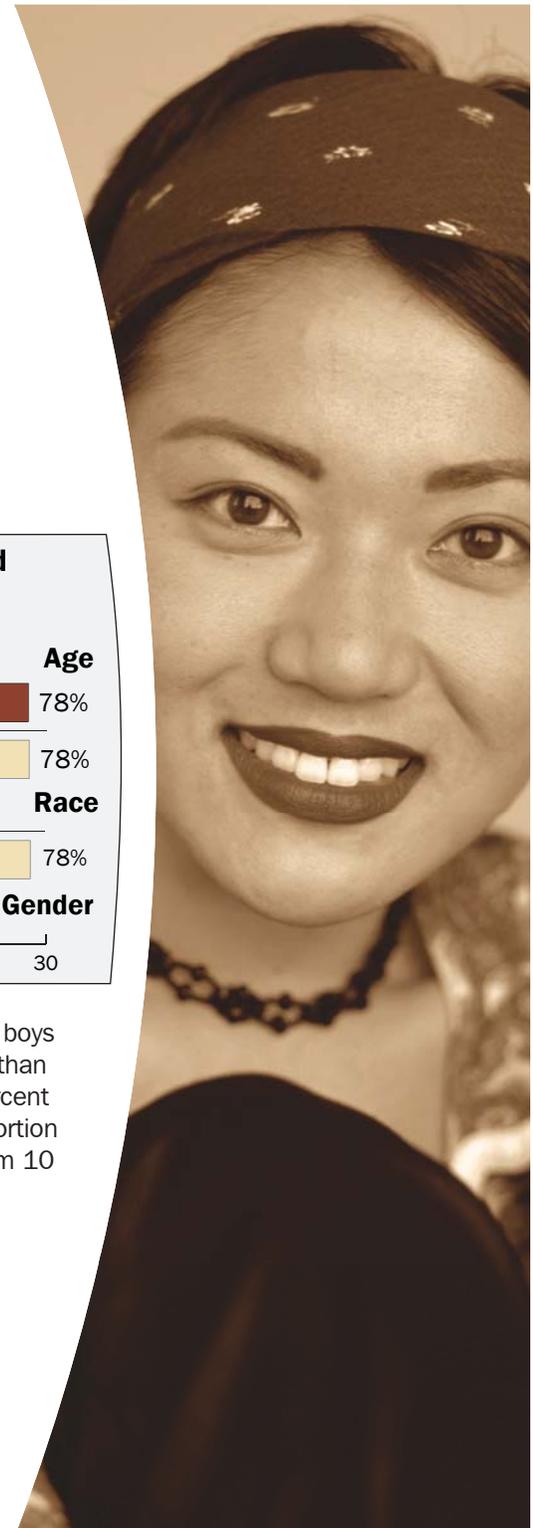
Ohio Vital Statistics data report 35 deaths to children from suicide in 2007. For further information on the ICD-10 codes used to produce Vital Statistics data, please see Appendix 4.

## CFR Findings

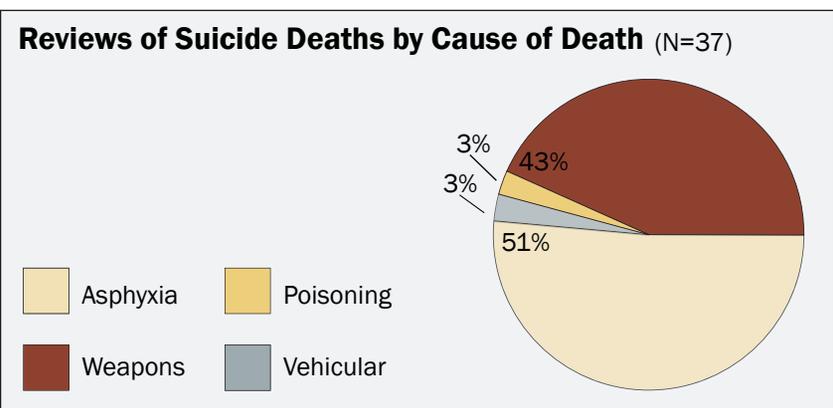
Local CFR boards reviewed 37 deaths to children from suicide in 2007. These represent 2 percent of the total 1,656 reviews and 12 percent of all reviews for children ages 10-17. The number of reviews for suicide deaths has decreased from 42 in 2006.



- Suicide deaths were disproportionately higher among boys (78 percent) and among black children (22 percent) than their representation in the general population (51 percent for boys and 16 percent for black children). The proportion of suicide deaths among black children increased from 10 percent in 2006.
- Seventy-eight percent (29) of the suicide deaths reviewed were to children ages 15-17.
- Fifty-one percent (19) of the suicide deaths were caused by asphyxiation and 43 percent (16) were caused by a weapon.



- The most frequently indicated factors that might have contributed to the child's despondency were school issues including failure; family problems including divorce and arguments with parents; victimization by bullying; drug and alcohol use; and other personal crises.
- Eight of the 37 reviews for suicide deaths indicated the child had a history of child abuse or neglect.



# Deaths from Child Abuse and Neglect

## Background

Child abuse and neglect is any act or failure to act on the part of a parent or caretaker that results in death, serious physical or emotional harm, sexual abuse or exploitation; or that presents an imminent risk of serious harm. Physical abuse includes punching, beating, shaking, kicking, biting, burning or otherwise harming a child and often is the result of excessive discipline or physical punishment that is inappropriate for the child's age. Head injuries and internal abdominal injuries are the most frequent causes of abuse fatalities. Neglect is the failure of parents or caregivers to provide for the basic needs of their children including food, clothing, shelter, supervision and medical care. Deaths from neglect are attributed to malnutrition, failure to thrive, infections and accidents resulting from unsafe environments and lack of supervision.

Some deaths from child abuse and neglect are the result of long-term patterns of maltreatment, while many other deaths result from a single incident. According to Prevent Child Abuse America, there are several factors that put parents at greater risk of abusing a child: social isolation, difficulty dealing with anger and stress, financial hardship, mental health issues, apparent disinterest in caring for the health and safety of their child and alcohol or drug abuse.<sup>25</sup>

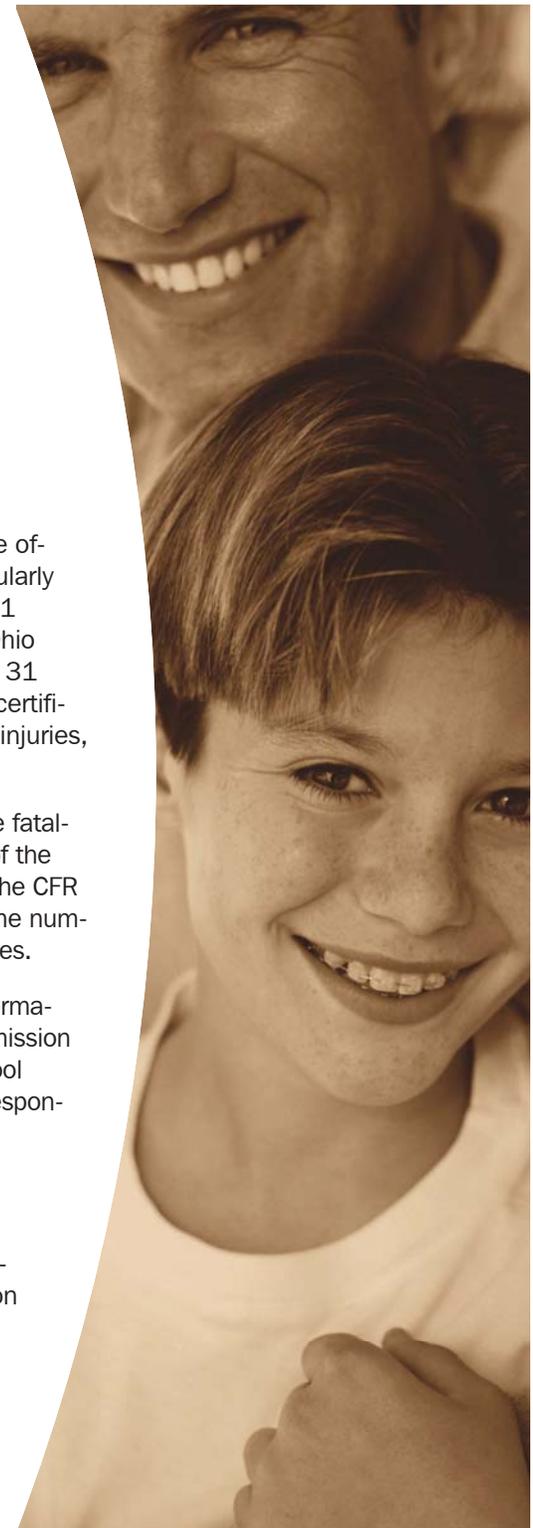
Many child abuse and neglect deaths are coded on the official death certificate as other causes of death, particularly unintentional injuries or natural deaths. In a study of 51 deaths identified as child abuse and neglect by local Ohio Child Fatality Review (CFR) boards in 2003 and 2004, 31 different causes of death were recorded on the death certificates. The causes included both medical and external injuries, both intentional and unintentional.<sup>26</sup>

Best estimates are that any single source of child abuse fatality data such as death certificates exposes just the tip of the iceberg. The interagency, multidisciplinary approach of the CFR process may be the best way to recognize and assess the number and the circumstances of child maltreatment fatalities.

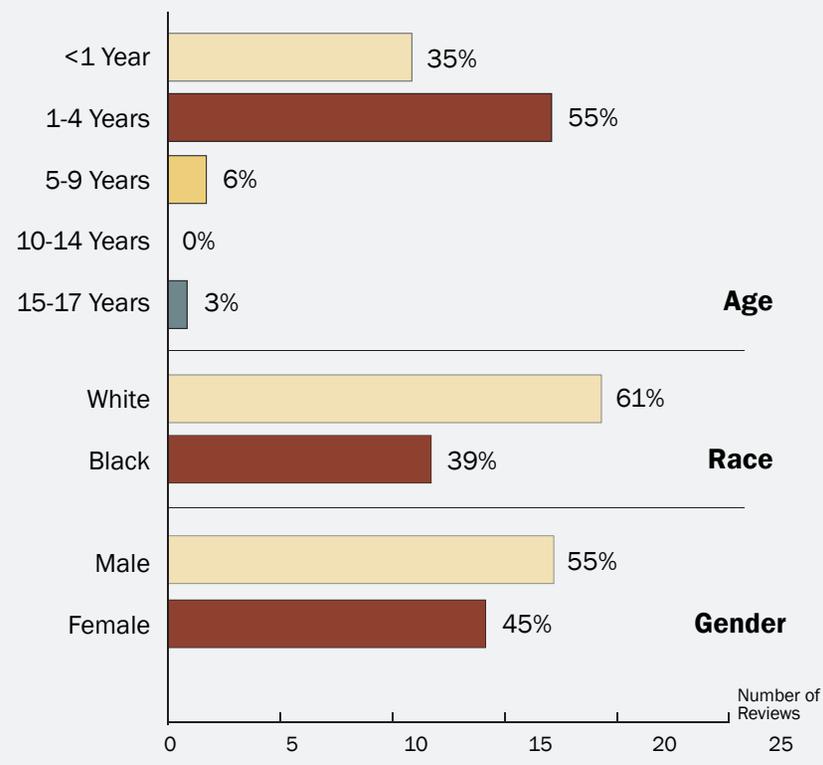
The CFR Case Report Tool and data system capture information about child abuse and neglect deaths as acts of omission or commission, regardless of the cause of death. The tool collects details about the circumstances and persons responsible for the death.

## Vital Statistics

Ohio Vital Statistics data report 11 child abuse and neglect deaths to children in 2007. For further information on the ICD-10 codes used to produce Vital Statistics data, please see Appendix 4.



### Reviews of Child Abuse and Neglect Deaths by Age, Race and Gender (N=31)

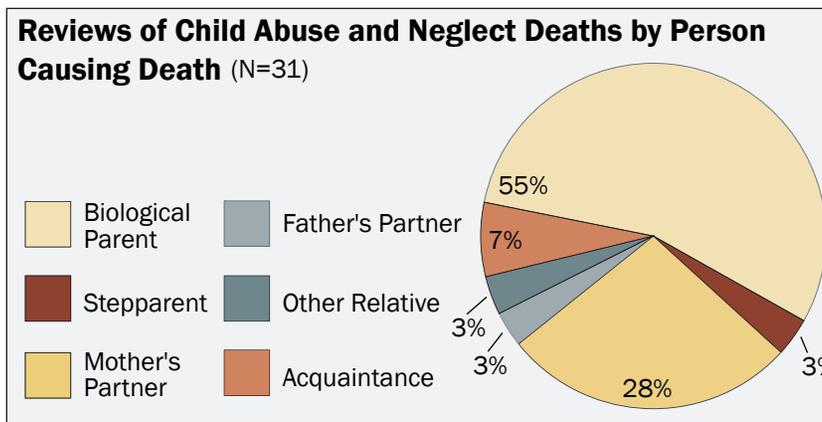
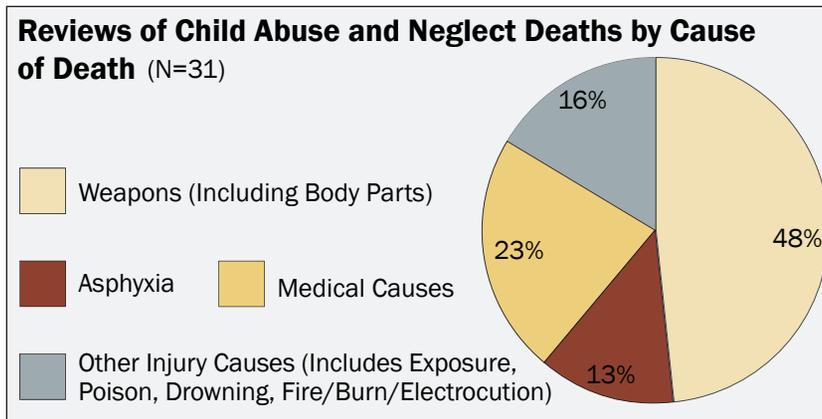


### CFR Findings

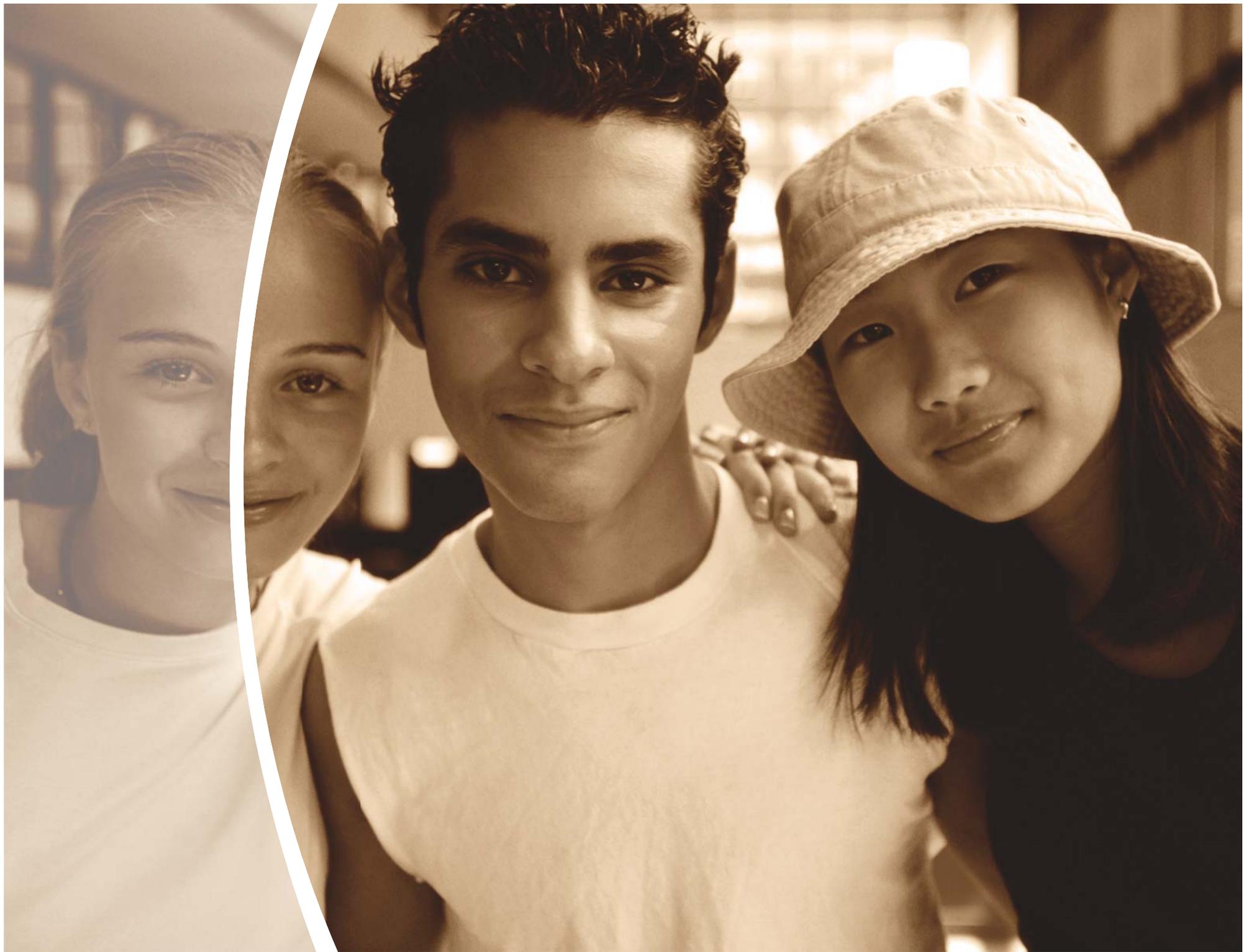
Local CFR boards reviewed 31 deaths to children from child abuse and neglect in 2007. These represent 2 percent of all 1,656 deaths reviewed.

- Nineteen of the 31 reviews indicated that physical abuse caused or contributed to the death, while 12 reviews indicated that neglect caused or contributed to the death.
- Ninety percent (28) of child abuse and neglect deaths occurred among children younger than 5 years old.
- A greater percentage of child abuse and neglect deaths occurred to black children (39 percent) and to boys (55 percent) relative to their representation in the general population (16 percent for black children and 51 percent for boys).
- The 31 deaths identified as child abuse and neglect were the result of several kinds of injuries to the child.
  - Forty-eight percent (15) were the result of weapons including use of a body part as a weapon.
  - Other causes of death included asphyxiation, fire/burn, drowning, exposure, poison and medical causes.
- The majority of the 31 child abuse and neglect deaths reviewed were violent deaths, with 19 resulting from physical abuse, including eight reviews indicating the child had been shaken.
- Of the 20 reviews where the information was available, 10 indicated the child had a prior history of child abuse and neglect.
- The person causing the death was a biological parent in 55 percent of the reviews. The mother's partner was cited in 28 percent of the reviews.

- For all 1,656 deaths reviewed from all causes for 2007, 88 indicated a prior history of child abuse or neglect, and 61 had an open case with Child Protective Services at the time of the death.



Percents may not total 100 due to rounding.



# Deaths by County Type

## Background

At the 2008 annual meeting, the Child Fatality Review (CFR) Advisory Committee expressed interest in examining potential variations across the state in the circumstances and factors related to child deaths and asked the Ohio Department of Health (ODH) to analyze CFR data by county type for this purpose. ODH categorizes Ohio's 88 counties into four county type designations (Rural Appalachian, Rural Non-Appalachian, Suburban and Metropolitan) based on similarities in terms of population and geography. The current county type designations originated with the Ohio Family Health Survey in 1988 and are based on the U.S. Code and U.S. Census information. See Appendix 5 for a map of Ohio counties by county type.

To ensure confidentiality, the CFR data system does not allow ODH access to case information regarding the county of residence, the county of death or county of review. ODH requested assistance from the National Center for Child Death Review (NCCDR) to assign county type designations to each case without identifying specific county names. NCCDR provided ODH with a county type designation for each case based on the county of review. In nearly all cases, the county of review is the county of the child's residence.

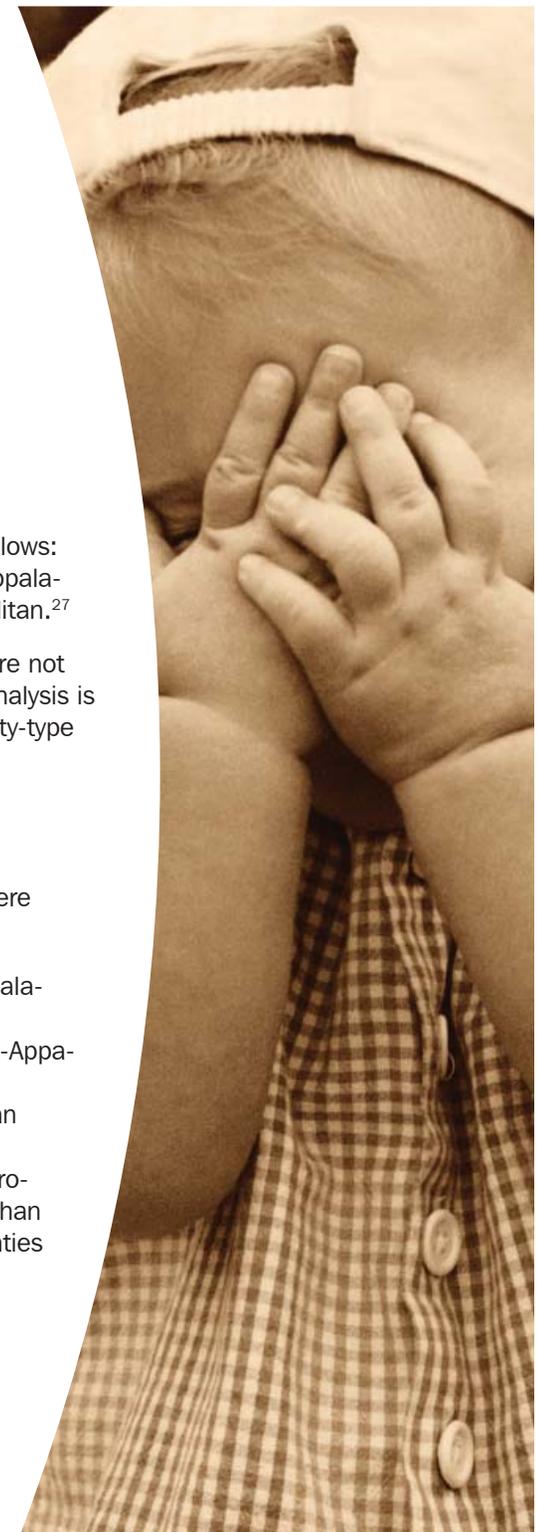
In 2007, Ohio's child population was distributed as follows: 13 percent rural Appalachian; 15 percent rural non-Appalachian; 17 percent suburban; and 56 percent metropolitan.<sup>27</sup>

It is known that many factors related to child deaths are not evenly distributed across the county types. Complex analysis is needed to determine the significance of the CFR county-type findings.

## CFR Findings

The 1,656 reviews of deaths that occurred in 2007 were distributed as follows:

- Twelve percent of reviews (202) were from rural Appalachian counties.
- Twelve percent of reviews (206) were from rural non-Appalachian counties.
- Fourteen percent of reviews (236) were from suburban counties.
- Sixty-one percent of reviews (1,012) were from metropolitan counties, which is disproportionately higher than the proportion of children living in metropolitan counties (56 percent).



## Manner of Death by County Type

- Sixty-three percent (767) of natural deaths reviewed were from metropolitan counties, which is disproportionately higher than the proportion of children living in metropolitan counties (56 percent).
- Eighteen percent (46) of accidental deaths reviewed were from rural Appalachian counties, which is disproportionately higher than the proportion of children living in rural Appalachian counties (13 percent).
- Thirty-two percent (12) of suicide deaths reviewed were from suburban counties, which is disproportionately higher than the proportion of children living in suburban counties (17 percent).
- Seventy-one percent (54) of homicide deaths reviewed were from metropolitan counties, which is disproportionately higher than the proportion of children living in metropolitan counties (56 percent).

## Manner of Death by County Type (N=1,656)

	Rural Appalachian		Rural Non-Appalachian		Suburban		Metropolitan		Total	
	#	%	#	%	#	%	#	%	#	%
Natural	135	11	142	12	165	14	767	63	1,209	<b>100</b>
Accident	46	18	46	18	37	15	125	49	254	<b>100</b>
Suicide	6	16	4	11	12	32	15	41	37	<b>100</b>
Homicide	4	5	10	13	8	11	54	71	76	<b>100</b>
Undetermined/Pending/Unknown	11	14	4	5	14	18	51	64	80	<b>100</b>
<b>Total</b>	<b>202</b>	<b>12</b>	<b>206</b>	<b>12</b>	<b>236</b>	<b>14</b>	<b>1,012</b>	<b>61</b>	<b>1,656</b>	<b>100</b>

Percents may not total 100 due to rounding.

## Three Leading Medical Causes of Death by County Type (N=1,217)

	Rural Appalachian		Rural Non-Appalachian		Suburban		Metropolitan		Total	
	#	%	#	%	#	%	#	%	#	%
Prematurity	36	7	47	9	74	14	366	70	523	<b>100</b>
Congenital Anomaly	23	13	17	9	21	12	118	66	179	<b>100</b>
Pneumonia/Other Infection	10	12	14	17	16	19	44	52	84	<b>100</b>
<b>All Medical Causes*</b>	<b>135</b>	<b>11</b>	<b>144</b>	<b>12</b>	<b>174</b>	<b>14</b>	<b>764</b>	<b>63</b>	<b>1,217</b>	<b>100</b>

Percents may not total 100 due to rounding. | \*Includes 3 leading causes plus all other causes.

## Medical Causes of Death by County Type

- Sixty-three percent (764) of the reviews of deaths from medical causes were from metropolitan counties, which is disproportionately higher than the proportion of children living in metropolitan counties (56 percent). Reviews of deaths due to prematurity were particularly over-represented in metropolitan counties. Seventy percent (366) of deaths due to prematurity were from metropolitan counties.

## External Causes of Death by County Type

- Nineteen percent (21) of vehicular deaths reviewed were from rural Appalachian counties and 25 percent (28) were from rural non-Appalachian counties, which is disproportionately higher than the proportion of children living in rural Appalachian counties (13 percent) and rural non-Appalachian counties (15 percent).
- Seventy-two percent (55) of

## External Causes of Death by County Type (N=385)

	Rural Appalachian		Rural Non-Appalachian		Suburban		Metropolitan		Total	
	#	%	#	%	#	%	#	%	#	%
Vehicular	21	19	28	25	19	17	43	39	111	<b>100</b>
Asphyxia	16	15	13	12	22	20	59	54	110	<b>100</b>
Weapon (Including body parts)	7	9	5	7	9	12	55	72	76	<b>100</b>
All External Causes*	<b>61</b>	<b>16</b>	<b>60</b>	<b>16</b>	<b>54</b>	<b>14</b>	<b>210</b>	<b>55</b>	<b>385</b>	<b>100</b>

Percents may not total 100 due to rounding. | \*Includes 3 leading causes plus all other causes.

weapons deaths reviewed were from metropolitan counties, which is disproportionately higher than the proportion of children living in metropolitan counties (56 percent).

- Fifteen percent of reviews (26) were from rural non-Appalachian counties.
- Thirteen percent of reviews (23) were from suburban counties.
- Fifty-six percent of reviews (98) were from metropolitan counties.

## Reviews of Special Interest

The distribution of the 175 reviews for sleep-related deaths closely matched the population distribution by county type.

- Sixteen percent of reviews (28) were from rural Appalachian counties.

Twenty-three percent of the reviews for child abuse and neglect were from rural non-Appalachian counties, which is disproportionately higher than the population of children living in rural non-Appalachian counties (15 percent).



# Preventable Deaths

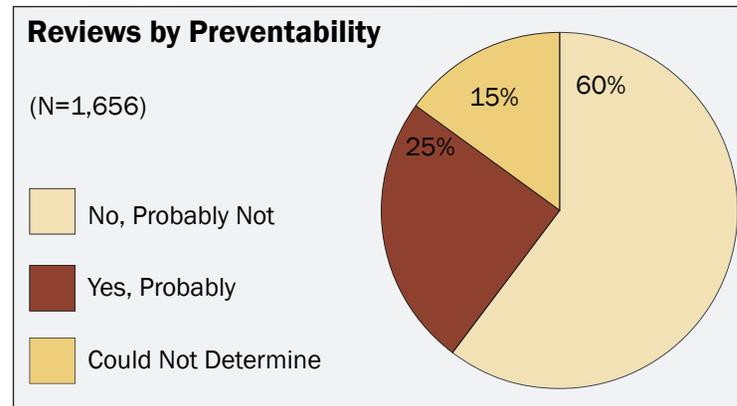
## Background

The mission of the Ohio Child Fatality Review (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. The review process helps CFR boards focus on a wide spectrum of factors that may have caused 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 have reasonably been changed. Cases are then deemed "probably preventable" or "probably not preventable."

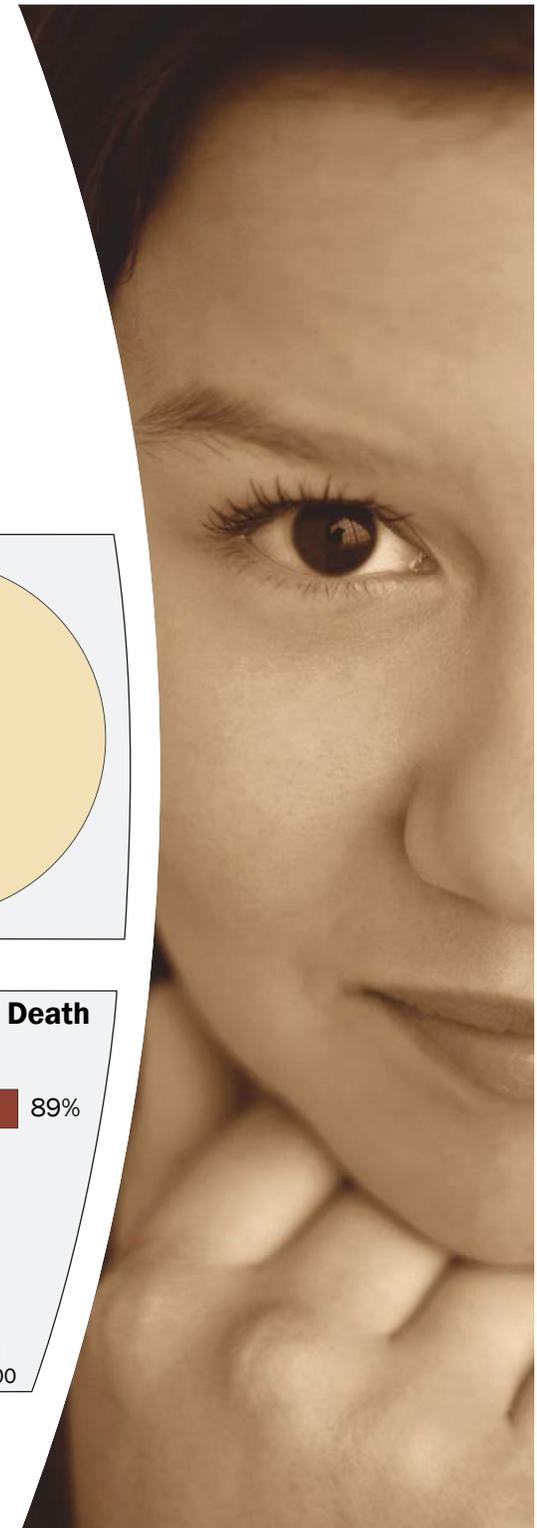
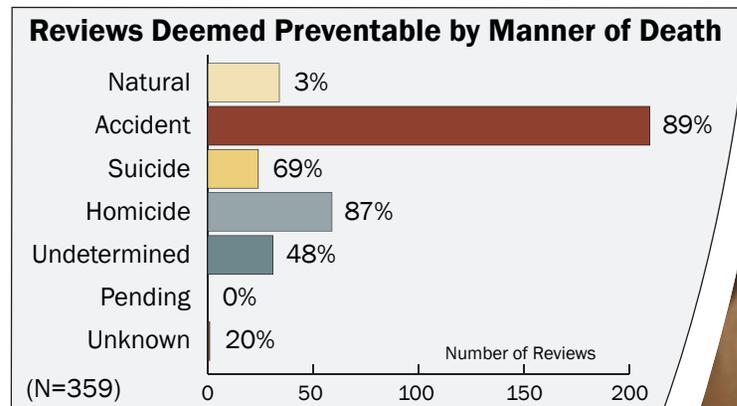
## CFR Findings

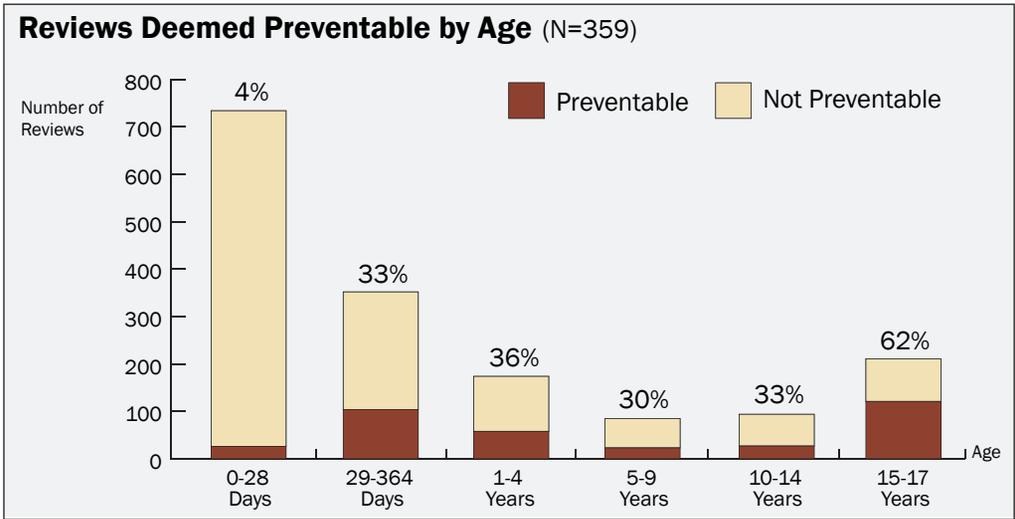
Local boards indicated 25 percent (359) of the 1,656 deaths reviewed probably could have been prevented. Preventability differed by manner of death and by age group.

- Eighty-nine percent (210) of the 254 deaths of accidental manner were considered probably preventable.
- Sixty-two percent (121) of the deaths to 15-17-year-olds were considered probably preventable.
- Only 4 percent (26) of the deaths to infants less than 29 days old were considered probably preventable.



Missing data have been excluded from the percentages.





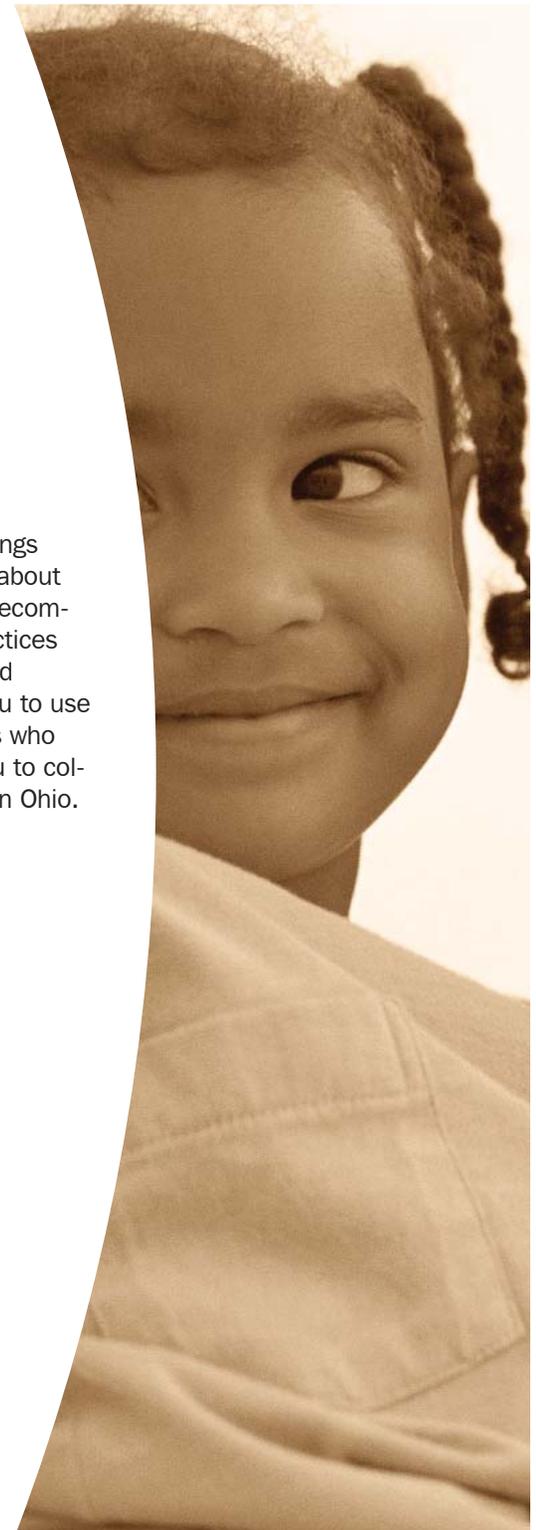
Local CFR boards identify many deaths that likely could have been prevented with increased adult supervision, increased parental responsibility and the exercise of common sense. Through the sharing of perspectives during the CFR discussions, members have learned that often-repeated health and safety messages need to be presented in new ways to reach new generations of parents, caregivers and children.

# Conclusion

The mission of Child Fatality Review (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:

- Racial disparity that results in black children dying from homicide at more than three times the expected rate.
- 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.

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 1

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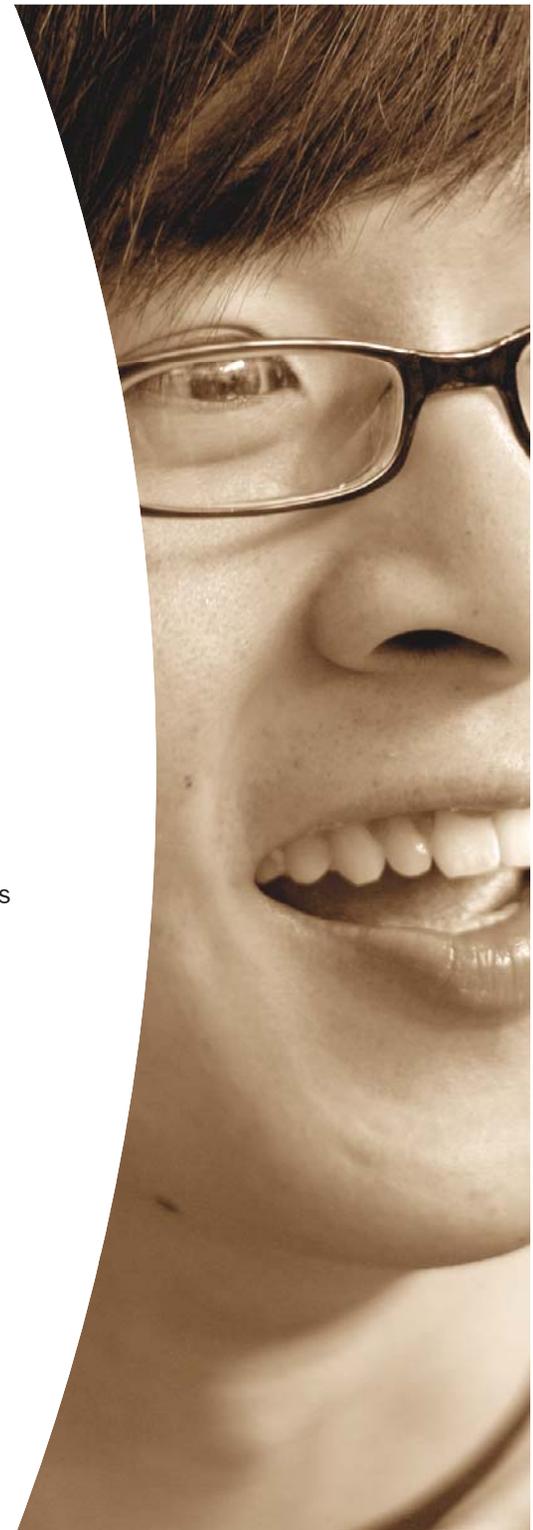
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## Appendix 2

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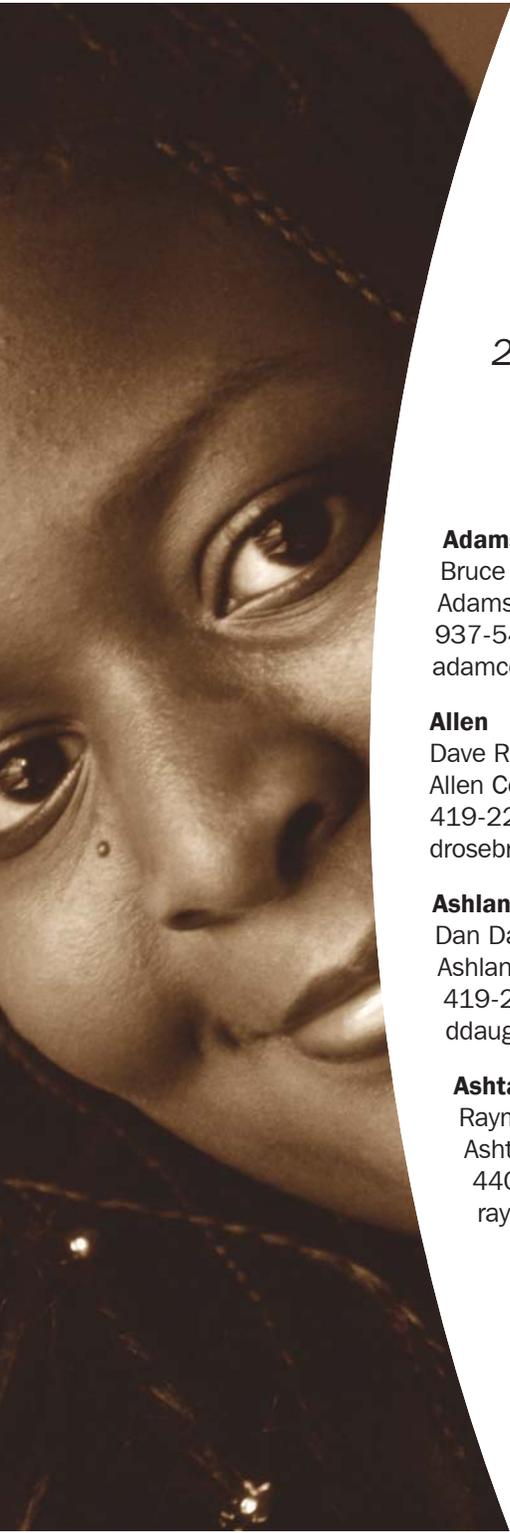
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## Appendix 3

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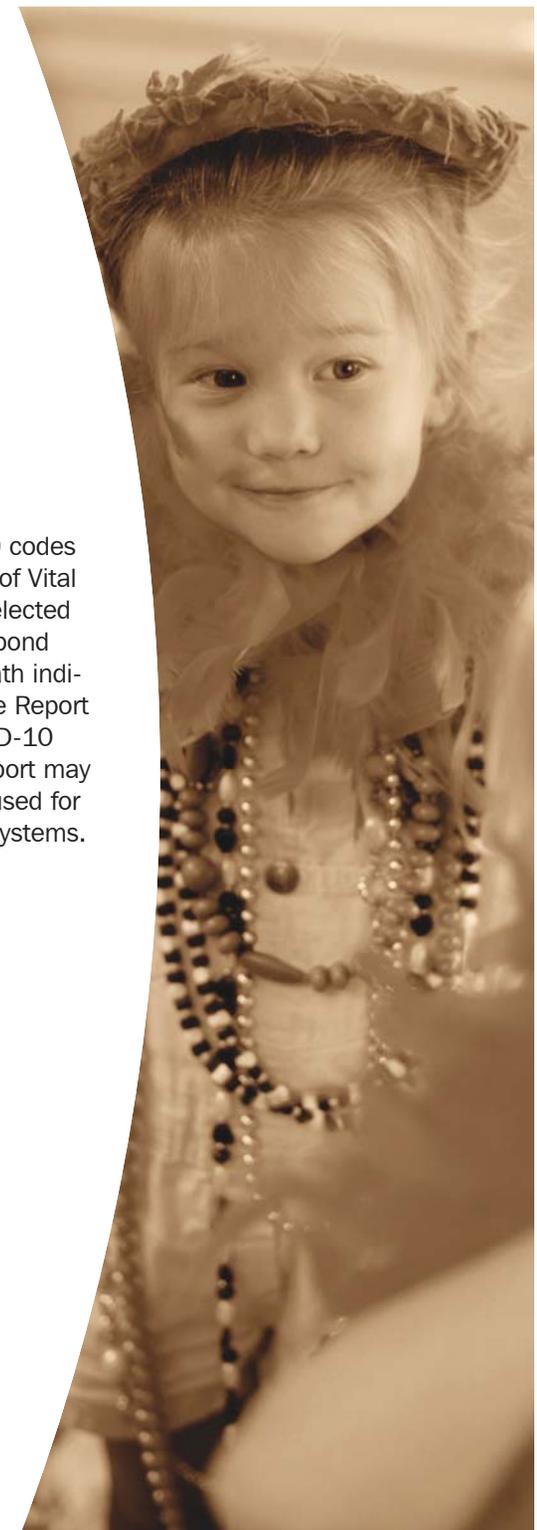
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# Appendix 4

## ICD-10 Codes Used for Vital Statistics Data Used For 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, Electrocution	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 parts)	W26, W32-W34, X72-75, X78, X79, X93-96, X99, Y00, Y04, Y05, Y08, Y09, Y22-25, Y28-Y29, Y35.0 Y35.3

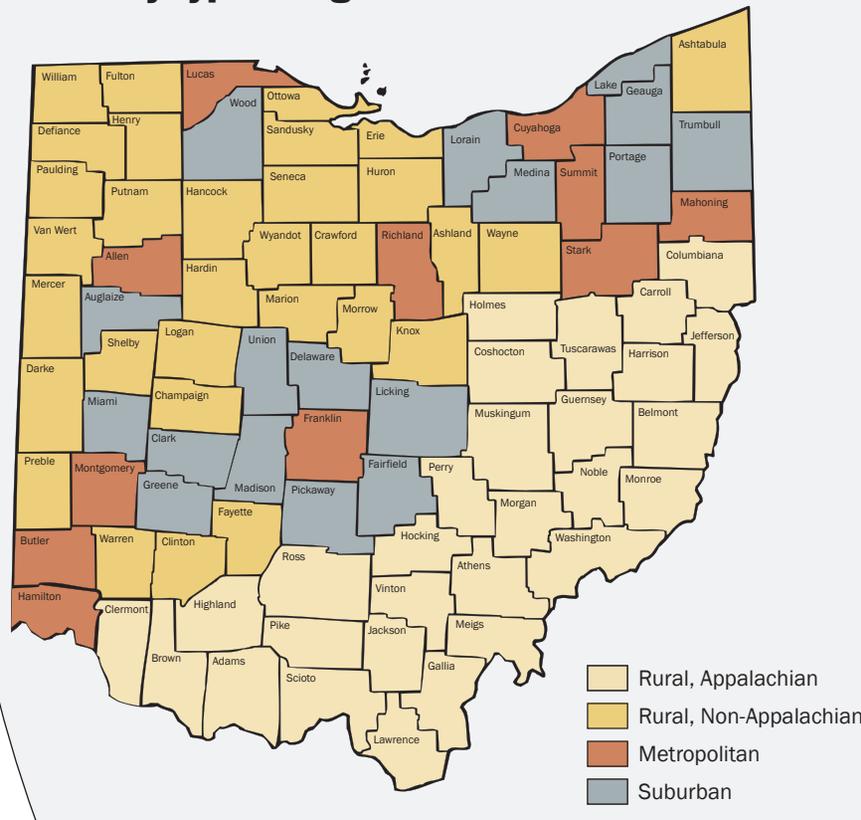
For this report, ICD-10 codes used for classification of Vital Statistics data were selected to most closely correspond with the causes of death indicated on the CFR Case Report Tool. Therefore, the ICD-10 codes used for this report may not match the codes used for other reports or data systems.



# Appendix 5

## 2007 Ohio County Type Designations

### Ohio County Type Designations



Ohio's county type designations originated from the Ohio Family Health Survey, which was first administered in 1988. The 88 counties have been categorized into four county types: Rural Appalachian; Rural Non-Appalachian; Metropolitan; and Suburban.

- The 29 rural Appalachian counties were identified from Section 403 of the U. S. Code, and most are geographically situated in the Southeast region of Ohio.
- The 12 Metropolitan counties were defined as non-Appalachian counties containing at least one city with 50,000 or more inhabitants as of the 1990 census.
- The 17 Suburban counties were non-metropolitan, non-Appalachian counties that met the criteria of an urbanized area as defined by the U.S. Census Bureau for the 1990 census. Thus, Suburban counties are essentially urbanized areas without large cities. All Suburban counties are also adjacent to at least one Metropolitan county.
- The 30 counties that were not Appalachian, Metropolitan, or Suburban were classified as Rural Non-Appalachian.

# Appendix 6

## Data Tables

**2007 Death Reviews by Manner of Death by Age, Race & Gender (N=1,656)**

	Natural	Accident	Homicide	Suicide	Undetermined	Pending	Unknown	Total
Age	#	#	#	#	#	#	#	#
1-28 Days	712	12	1	-	7	1	1	<b>734</b>
29-364 Days	216	57	12	-	60	3	4	<b>352</b>
1-4 Years	101	50	21	-	2	-	-	<b>174</b>
5-9 Years	54	25	6	-	-	-	-	<b>85</b>
10-14 Years	56	24	4	8	1	1	-	<b>94</b>
15-17 Years	64	86	32	29	-	-	-	<b>211</b>
Unknown	1	-	-	-	-	-	-	<b>1</b>
Missing	5	-	-	-	-	-	-	<b>5</b>
Race*	#	#	#	#	#	#	#	#
White	786	197	34	29	44	4	2	<b>1,096</b>
Black	393	53	42	8	25	1	3	<b>525</b>
Other	18	2	-	-	1	-	-	<b>21</b>
Unknown	7	-	-	-	-	-	-	<b>7</b>
Missing	5	2	-	-	-	-	-	<b>7</b>
Gender	#	#	#	#	#	#	#	#
Male	684	161	52	29	40	2	3	<b>971</b>
Female	517	92	24	8	30	3	2	<b>676</b>
Unknown	2	-	-	-	-	-	-	<b>2</b>
Missing	6	1	-	-	-	-	-	<b>7</b>
<b>Total</b>	<b>1209</b>	<b>254</b>	<b>76</b>	<b>37</b>	<b>70</b>	<b>5</b>	<b>5</b>	<b>1,656</b>

\*46 cases with multiple races indicated were assigned to the minority race.



**Reviews of 2007 Deaths: All Medical Causes of Death by Age (N=1,217)**

	<b>Birth – 364 Days</b>	<b>1-4 Years</b>	<b>5-9 Years</b>	<b>10-14 Years</b>	<b>15-17 Years</b>	<b>Unknown</b>	<b>Missing</b>	<b>Total</b>
Asthma	-	3	2	3	3	-	-	<b>11</b>
Cancer	2	15	15	10	9	-	-	<b>51</b>
Cardiovascular	45	14	4	5	8	-	-	<b>76</b>
Congenital Anomalies	138	20	10	8	2	-	1	<b>179</b>
Low Birth Weight	2	-	-	-	-	-	-	<b>2</b>
Malnutrition/ Dehydration	2	1	-	-	-	-	-	<b>3</b>
Neurological Disorders	3	2	3	3	6	-	1	<b>18</b>
Pneumonia	21	8	6	5	2	-	-	<b>42</b>
Prematurity	520	2	-	-	-	1	-	<b>523</b>
SIDS	53	-	-	-	-	-	-	<b>53</b>
Other Infection	22	10	4	3	1	-	2	<b>42</b>
Other Perinatal Conditions	32	1	1	1	1	-	-	<b>36</b>
Other Medical Condition	76	24	10	18	30	-	1	<b>159</b>
Undetermined	12	1	-	-	-	-	-	<b>13</b>
Unknown	8	-	1	-	-	-	-	<b>9</b>
<b>Medical Causes Total</b>	<b>936</b>	<b>101</b>	<b>56</b>	<b>56</b>	<b>62</b>	<b>1</b>	<b>5</b>	<b>1,217</b>

**Reviews of 2007 Deaths: All Medical Causes of Death by Race (N=1,217)**

	<b>White</b>	<b>Black</b>	<b>Other</b>	<b>Unknown</b>	<b>Missing</b>	<b>Total</b>
Asthma	4	7	-	-	-	<b>11</b>
Cancer	45	5	1	-	-	<b>51</b>
Cardiovascular	52	21	2	-	1	<b>76</b>
Congenital Anomalies	131	45	1	1	1	<b>179</b>
Low Birth Weight	1	1	-	-	-	<b>2</b>
Malnutrition/Dehydration	2	1	-	-	-	<b>3</b>
Neurological Disorders	12	5	1	-	-	<b>18</b>
Pneumonia	28	13	1	-	-	<b>42</b>
Prematurity	281	230	6	3	3	<b>523</b>
SIDS	42	9	2	-	-	<b>53</b>
Other Infection	31	10	1	-	-	<b>42</b>
Other Perinatal Conditions	19	16	1	-	-	<b>36</b>
Other Medical Condition	131	25	1	2	-	<b>159</b>
Undetermined	7	6	-	-	-	<b>13</b>
Unknown	4	3	1	1	-	<b>9</b>
<b>Medical Causes Total</b>	<b>790</b>	<b>397</b>	<b>18</b>	<b>7</b>	<b>5</b>	<b>1,217</b>

*\*46 cases with multiple races indicated were assigned to the minority race.*

**Reviews of 2007 Deaths: All Medical Causes of Death by Gender (N=1,217)**

	<b>Male</b>	<b>Female</b>	<b>Unknown</b>	<b>Missing</b>	<b>Total</b>
Asthma	6	5	-	-	<b>11</b>
Cancer	25	26	-	-	<b>51</b>
Cardiovascular	47	29	-	-	<b>76</b>
Congenital Anomalies	100	77	-	2	<b>179</b>
Low Birth Weight	1	1	-	-	<b>2</b>
Malnutrition/Dehydration	2	1	-	-	<b>3</b>
Neurological Disorders	9	9	-	-	<b>18</b>
Pneumonia	30	12	-	-	<b>42</b>
Prematurity	300	219	1	3	<b>523</b>
SIDS	22	31	-	-	<b>53</b>
Other Infection	26	16	-	-	<b>42</b>
Other Perinatal Conditions	19	16	1	-	<b>36</b>
Other Medical Condition	91	66	-	2	<b>159</b>
Undetermined	3	10	-	-	<b>13</b>
Unknown	7	2	-	-	<b>9</b>
<b>Medical Causes Total</b>	<b>688</b>	<b>520</b>	<b>2</b>	<b>7</b>	<b>1,217</b>

**Reviews of 2007 Deaths: All External Causes of Death by Age (N=385)**

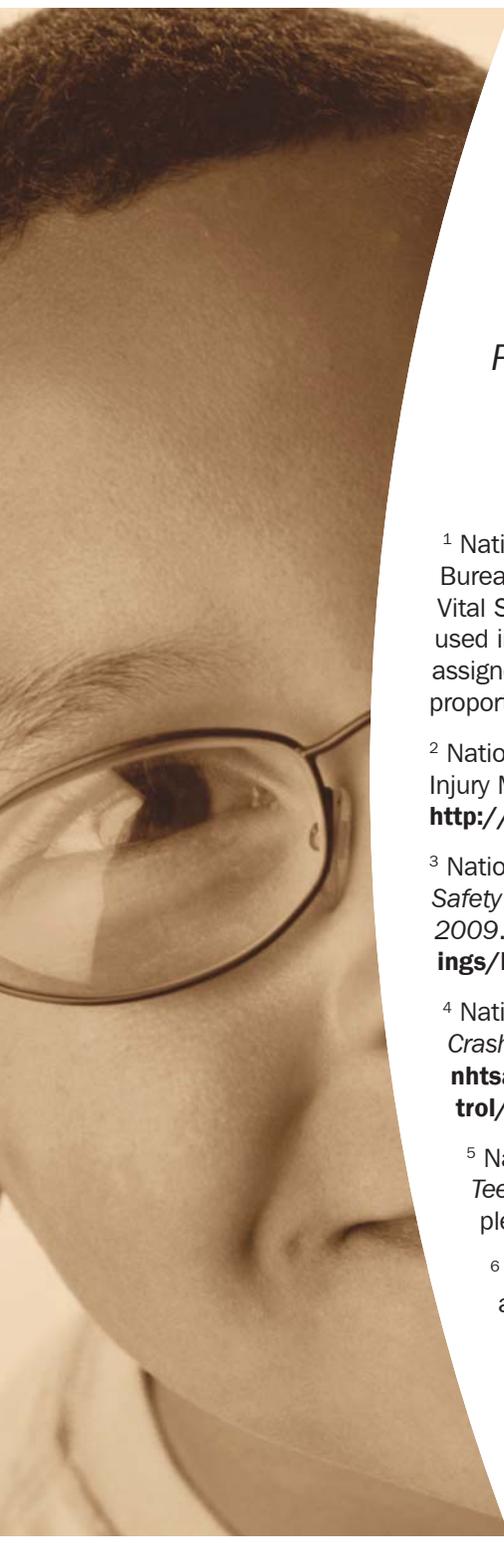
	<b>Birth-364 Days</b>	<b>1-4 Years</b>	<b>5-9 Years</b>	<b>10-14 Years</b>	<b>15-17 Years</b>	<b>Unknown</b>	<b>Missing</b>	<b>Total</b>
Motor Vehicle	5	15	12	10	69	-	-	<b>111</b>
Asphyxia	68	15	1	9	17	-	-	<b>110</b>
Weapon (Including body part)	8	15	3	8	42	-	-	<b>76</b>
Drowning	2	13	3	3	8	-	-	<b>29</b>
Fire, Burn or Electrocutation	-	6	8	3	4	-	-	<b>21</b>
Poisoning	-	-	-	2	8	-	-	<b>10</b>
Fall or Crush	1	4	2	1	-	-	-	<b>8</b>
Exposure	1	1	-	-	-	-	-	<b>2</b>
Undetermined	16	1	-	-	-	-	-	<b>17</b>
Other	1	-	-	-	-	-	-	<b>1</b>
<b>External Causes Total</b>	<b>102</b>	<b>70</b>	<b>29</b>	<b>36</b>	<b>148</b>	<b>-</b>	<b>-</b>	<b>385</b>

**Reviews of 2007 Deaths: All External Causes of Death by Race (N=385)**

	<b>White</b>	<b>Black</b>	<b>Other</b>	<b>Unknown</b>	<b>Missing</b>	<b>Total</b>
Motor Vehicle	95	16	-	-	-	<b>111</b>
Asphyxia	82	27	-	-	1	<b>110</b>
Weapon (Including body parts)	37	39	-	-	-	<b>76</b>
Drowning	21	6	2	-	-	<b>29</b>
Fire, Burn or Electrocution	10	10	-	-	1	<b>21</b>
Poisoning	10	-	-	-	-	<b>10</b>
Fall or Crush	6	2				<b>8</b>
Exposure	2	-	-	-	-	<b>2</b>
Undetermined	6	11	-	-	-	<b>17</b>
Other	1	-	-	-	-	<b>1</b>
<b>External Causes Total</b>	<b>270</b>	<b>111</b>	<b>2</b>	<b>-</b>	<b>2</b>	<b>385</b>

**Reviews of 2007 Deaths: All External Causes of Death by Gender (N=385)**

	<b>Male</b>	<b>Female</b>	<b>Unknown</b>	<b>Missing</b>	<b>Total</b>
Motor Vehicle	66	45	-	-	<b>111</b>
Asphyxia	72	38	-	-	<b>110</b>
Weapon (Including body parts)	61	15	-	-	<b>76</b>
Drowning	20	9	-	-	<b>29</b>
Fire, Burn or Electrocution	8	13	-	-	<b>21</b>
Poisoning	8	2	-	-	<b>10</b>
Fall or Crush	6	2	-	-	<b>8</b>
Exposure	-	2	-	-	<b>2</b>
Undetermined	8	9	-	-	<b>17</b>
Other	1	-	-	-	<b>1</b>
<b>External Causes Total</b>	<b>250</b>	<b>135</b>	<b>-</b>	<b>-</b>	<b>385</b>



# Appendix 7

## References\*

<sup>1</sup> National Center for Health Statistics and U.S. Census Bureau data. Processed through Ohio Department of Health, Vital Statistics, March 15, 2009. 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.

<sup>2</sup> National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999–2006 page. Available at [http://webappa.cdc.gov/sasweb/ncipc/mortrate10\\_sy.html](http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html).

<sup>3</sup> National Traffic Highway Safety Administration. *NHTSA Vehicle Safety Rulemaking and Supporting Research Priorities 2005-2009*. Available at <http://www.nhtsa.gov/cars/rules/rulings/PriorityPlan-2005.html#VI>.

<sup>4</sup> National Traffic Highway Safety Administration. *Teen Driver Crashes: A Report to Congress July 2008*. Available at <http://nhtsa.gov/staticfiles/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/811005.pdf>.

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<sup>6</sup> Safe Kids USA. Injury Trends Fact Sheet. Available at [http://www.usa.safekids.org/tier3\\_cd\\_2c.cfm?content\\_item\\_id=19011&folder\\_id=540](http://www.usa.safekids.org/tier3_cd_2c.cfm?content_item_id=19011&folder_id=540).

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<sup>10</sup> National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999–2006 page. Available at [http://webappa.cdc.gov/sasweb/ncipc/mortrate10\\_sy.html](http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html).

<sup>11</sup> Safe Kids USA. *Safe Kids U.S. Summer Safety Ranking Report May 2007*. Available at [http://www.usa.safekids.org/content\\_documents/Safe\\_Kids\\_U.S.\\_Summer\\_Safety\\_Ranking\\_Report.pdf](http://www.usa.safekids.org/content_documents/Safe_Kids_U.S._Summer_Safety_Ranking_Report.pdf).

<sup>12</sup> National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999–2006 page. Available at [http://webappa.cdc.gov/sasweb/ncipc/mortrate10\\_sy.html](http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html).

<sup>13</sup> Centers for Disease Control and Prevention. *Fire Deaths and Injuries: Fact Sheet*. Available at <http://www.cdc.gov/ncipc/factsheets/fire.htm>.

<sup>14</sup> National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999–2006 page. Available at [http://webappa.cdc.gov/sasweb/ncipc/mortrate10\\_sy.html](http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html).

<sup>15</sup> National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999–2006 page. Available at [http://webappa.cdc.gov/sasweb/ncipc/mortrate10\\_sy.html](http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html).

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<sup>18</sup> 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.

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<sup>20</sup> Task Force on SIDS. Changing concept of SIDS: Diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing the risk. *American Journal of Pediatrics*. November 2005:1245-1255.

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<sup>22</sup> 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 <http://cdc.gov/sids/suid.htm>.

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<sup>24</sup> National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999–2006 page. Available at [http://webappa.cdc.gov/sasweb/ncipc/mortrate10\\_sy.html](http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html).

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<sup>26</sup> Ohio Department of Health. *Ohio Child Fatality Review Seventh Annual Report*. September 2007. Available at [http://www.odh.ohio.gov/ASSETS/2F1E5D6D96D64186819E59CF2DD08BFE/2007\\_cfr\\_3.pdf](http://www.odh.ohio.gov/ASSETS/2F1E5D6D96D64186819E59CF2DD08BFE/2007_cfr_3.pdf).

<sup>27</sup> U.S. Census Bureau. Population Estimates. Annual Estimates of the Resident Population by Selected Age Groups and Sex for Counties: April 1, 2000 to July 1, 2008. Available at <http://www.census.gov/popest/counties/asrh/CC-EST2008-agesex.html>.

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