



# 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 6.8 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>21</sup>

Ohio's infant mortality rate of 7.7 ranks thirteenth-worst among the 50 states. Of particular concern is the black infant mortality rate of 16.2, which is more than double the white infant mortality rate of 6.0. These rates and proportions have changed little over the past decade.

## Vital Statistics

Ohio Vital Statistics data report 755 neonatal deaths (from birth

to 28 days old) and 389 post-neonatal deaths (from 29 days to 1 year old) for a total of 1,144 infant deaths in 2008.

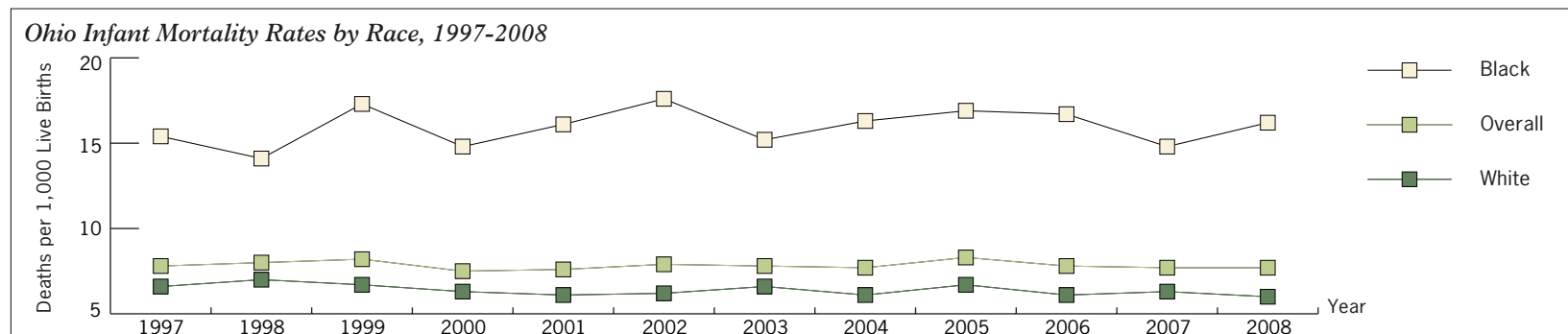
## CFR Findings

Local child fatality review boards reviewed 1,104 infant deaths for 2008. These represent 67 percent of all reviews for all ages.

- Sixty-seven percent (737) were infants from birth to 28 days old.

- Thirty-three percent (367) were infants from 29 days to 1 year old.
- Reviews for infant deaths were disproportionately higher among boys (57 percent) and among black children (39 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:



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

- 942 (85 percent) of all infant deaths were due to medical causes.
- 118 (11 percent) were due to external injury causes.
- 44 (4 percent) were unknown if caused by medical or external causes.

Prematurity and congenital anomalies account for 68 percent (642) of all infant deaths from medical causes and 58 percent of infant deaths from all causes. Prematurity and congenital anomalies account for 75 percent (556) of the deaths to infants 0-28 days old.

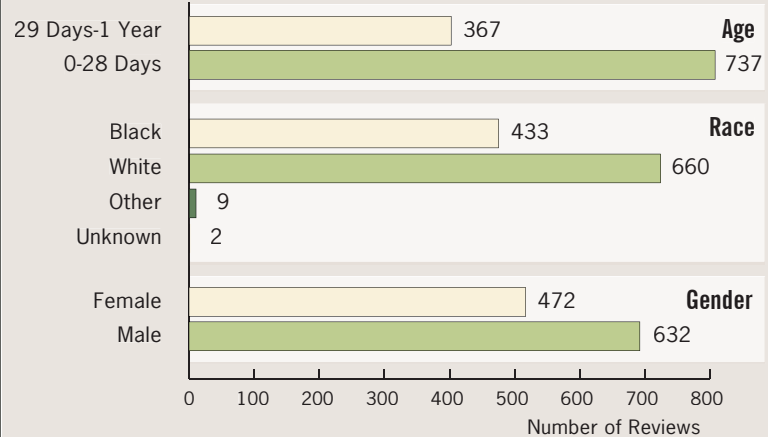
Asphyxia is the leading cause of infant death due to external injury (58 percent of the infant deaths due to external injury). The next leading external cause of death is “undetermined” (21 percent of the infant deaths due to external injury).

Sleep-related deaths accounted for 15 percent (166) of all infant deaths and 40 percent (145) of the deaths to infants 29 days to 1 year old.

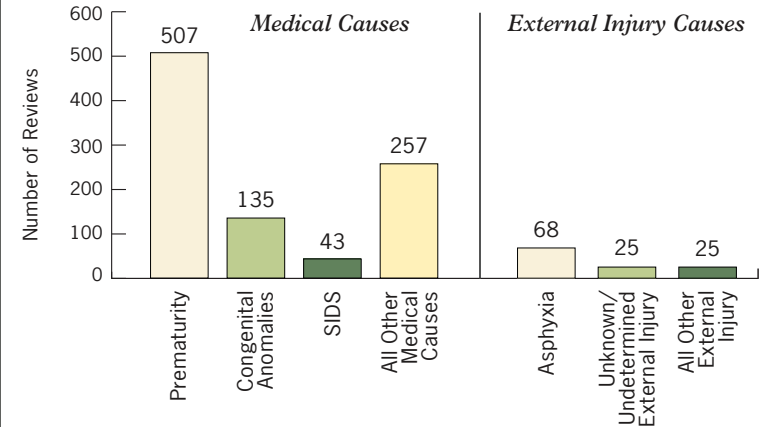
Other factors related to infant deaths:

- Fifteen percent (153) of the infants were from multiple births, including 12 from triplet or higher order births.
- Forty-one percent (428) of the infants were very low birthweight (<1,500 grams) and an additional 10 percent (100) were low birthweight (1,500-2,499 grams). Twenty-two percent (231) were of normal birthweight (2,500-3,999 grams) or heavier. Twenty-eight percent (299) of the infants were of unknown birthweight. For all births in Ohio in 2008, two percent were very low birthweight and an additional nine percent were low birthweight.
- Fifty-three percent (561) of the infants were born preterm (<37 weeks gestation), 22 percent (233) were born full term (37-42 weeks gestation) and 25 percent (262) were of unknown gestation. For all births in Ohio in 2008, 14 percent were born less than 37 weeks gestation.

*Reviews of Infant Deaths by Age, Race and Gender (N = 1104)*



*Reviews of Infant Deaths by Leading Causes of Death (N=1104)*



Twenty percent (215) 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=1,104)*

|                                     | #   | %  |
|-------------------------------------|-----|----|
| Multiple Birth                      | 153 | 15 |
| Singleton Birth                     | 831 | 79 |
| Unknown                             | 69  | 7  |
| Missing                             | 51  |    |
|                                     |     |    |
| Very Low Birthweight (<1,500 g)     | 428 | 41 |
| Low Birthweight (1,500-2,499 g)     | 100 | 10 |
| Normal Birthweight (2,500-3,999 g)  | 220 | 21 |
| Above Normal Birthweight (>3,999 g) | 11  | 1  |
| Unknown                             | 299 | 28 |
| Missing                             | 46  |    |
|                                     |     |    |
| < 37 Weeks Gestation                | 561 | 53 |
| 37-42 Weeks Gestation               | 233 | 22 |
| Unknown                             | 262 | 25 |
| Missing                             | 48  |    |

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

#### *Ohio's Infant Mortality Consortium*

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 was charged with developing both immediate and long-term recommendations to reduce infant mortality and disparities. The following recommendations were shared with the governor in September 2009:

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 measureable 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.

In the spring of 2010, the recommended consortium was organized and held its first meeting. The complete task force report can be accessed at <http://www.odh.ohio.gov/odhPrograms/cfhs/imtf/imtf.aspx>.

## Sudden Infant Death Syndrome

### 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>22</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>23</sup> There is a large racial disparity, with the SIDS rate for

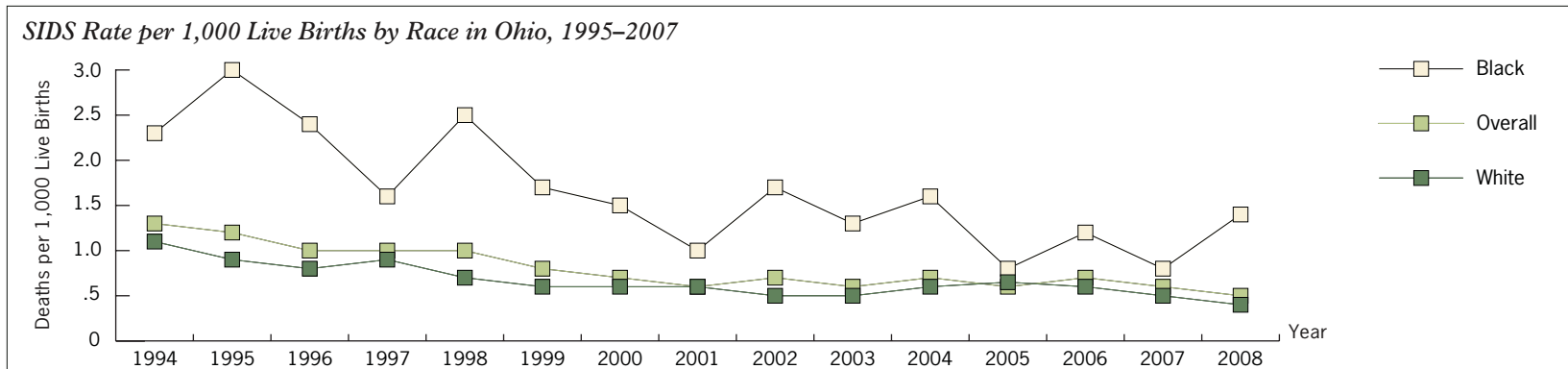
black infants more than twice the rate for white infants. While the national SIDS death rate has decreased, the post-neonatal mortality rate for all causes has not decreased and the rate of deaths due to "undetermined causes" has increased, suggesting that some deaths previously classified as SIDS are now being classified as other causes.<sup>24</sup>

In an October 2005 policy statement, the American Academy of Pediatrics (AAP) 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>25</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 death 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>26</sup> Many Ohio counties have adopted 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>27</sup>





### Vital Statistics

Ohio Vital Statistics reported 79 SIDS deaths in 2008. According to Ohio Vital Statistics, the Ohio SIDS rate has decreased 50 percent in the past decade, from 1.0 deaths per 1,000 live births in 1998 to 0.5 in 2008. For further information on the ICD-10 codes used to produce Vital Statistics data, please see Appendix IV.

### CFR Findings

Local CFR boards reviewed 43 deaths to children from SIDS in 2008. These deaths represent 3 percent of all 1,655 reviews con-

ducted and 4 percent of all infant deaths reviewed.

- There were greater percentages of SIDS deaths among boys (67 percent) and among black infants (33 percent) relative to their representation in the general population (51 percent for boys and 16 percent for black infants).
- Seventy-seven percent (33) of the SIDS deaths reviewed occurred between 1 and 4 months of age.

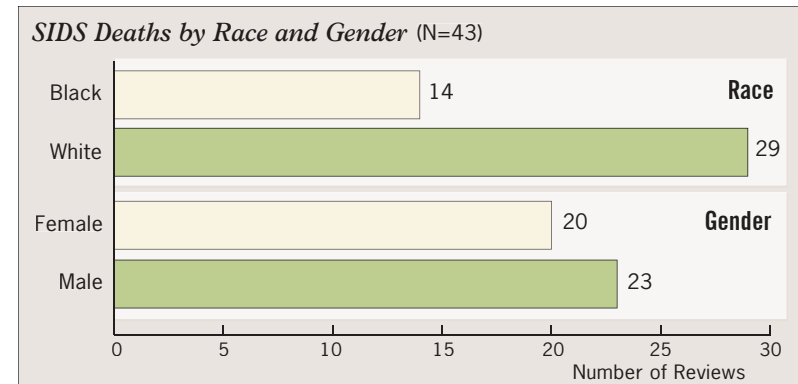
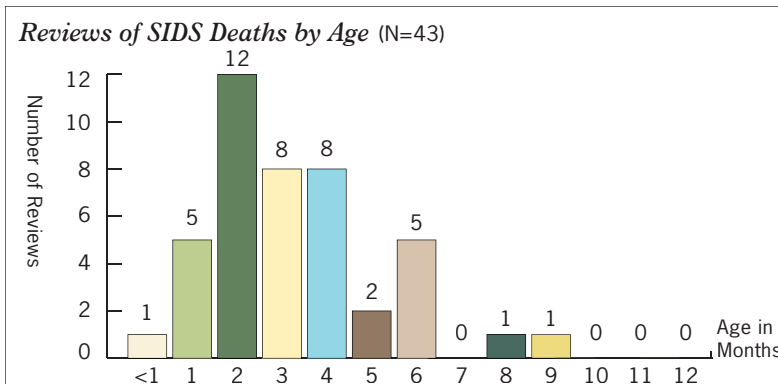
The CFR data reporting tool enables the collection of many variables surrounding the death,

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.

- Forty-six percent (17) of SIDS deaths occurred in cribs or bassinets, while 32 percent (12) 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 8 percent (3) of reviews and missing in six reviews (not included in percentages).

- Thirty percent (13) of infants who died of SIDS were known to be sharing a sleep surface with another at the time of death, including three who were sharing with both an adult and another child.
- Seventeen percent (seven) of the infants who died of SIDS were born with low (less than 2,500 grams) or very low (<1,500 grams) birthweight. Four of

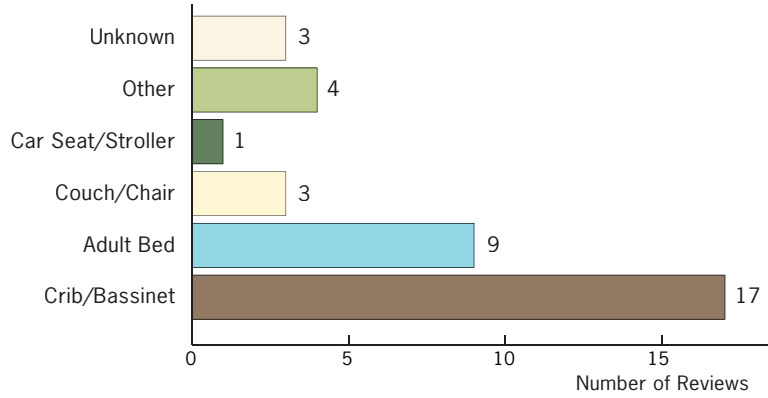


those low or very low birth-weight infants were born before 37 weeks gestation.

- Forty-two percent (18) of children who died of SIDS were

exposed to cigarette smoke in utero. For all live births in Ohio in 2006, 19 percent were born to mothers who smoked during the pregnancy.

**SIDS Deaths by Location of Infant when Found (N=37)**



*The number of reviews for SIDS deaths has decreased significantly over the five-year period 2004-2008, from 116 in 2004, to 59 in 2005, to 74 in 2006, to 55 in 2007, and 43 in 2008. Local boards report they are less likely to consider a death SIDS if all the criteria of the definition are not met. Boards are more likely to classify the cause of death as undetermined if the presence of multiple risk factors prevents other causes from being eliminated.*

**Birth History Factors for SIDS Deaths (N=43)**

|                                     | #  | %  |
|-------------------------------------|----|----|
| Multiple Birth                      | 2  | 5  |
| Singleton Birth                     | 37 | 88 |
| Unknown                             | 3  | 7  |
| Missing                             | 1  | -  |
|                                     |    |    |
| Very Low Birthweight (<1,500 g)     | 4  | 10 |
| Low Birthweight (1,500-2,499 g)     | 3  | 7  |
| Normal Birthweight (2,500-3,999 g)  | 27 | 64 |
| Above Normal Birthweight (>3,999 g) | 2  | 5  |
| Unknown                             | 6  | 14 |
| Missing                             | 1  | -  |
|                                     |    |    |
| < 37 Weeks Gestation                | 7  | 17 |
| 37-42 Weeks Gestation               | 28 | 68 |
| Unknown                             | 6  | 15 |
| Missing                             | 2  | -  |
|                                     |    |    |
| Mother Smoked during Pregnancy      | 18 | 42 |
|                                     |    |    |
| Autopsy Completed                   | 41 | 95 |

Missing data have been excluded from the percentages.

# Infant Death 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 (the obstruction of breathing caused by the weight of a person or animal lying on the infant) 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.

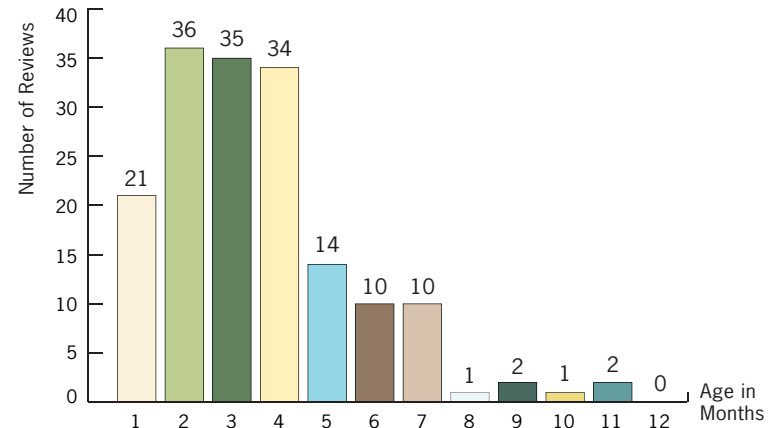
## CFR Findings

From the reviews of 2008 deaths,

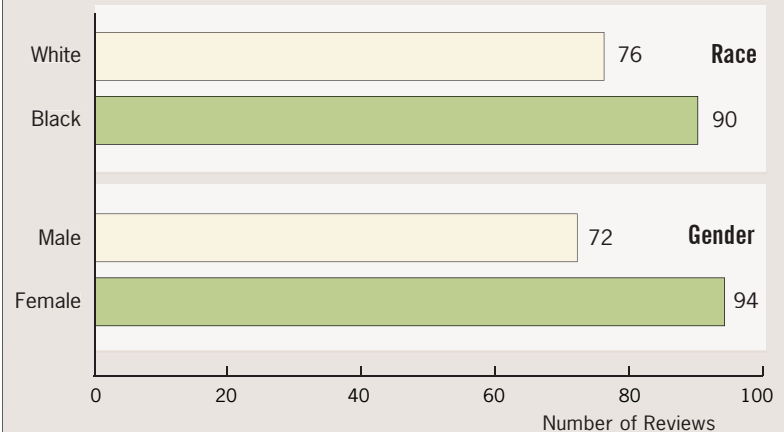
181 cases of infants who died while in a sleep environment were identified. For the analysis of sleep-related deaths, cases of death from specific medical causes except SIDS were excluded, as were deaths from specific unrelated injuries such as fire, resulting in 166 infant sleep-related deaths. These cases include 37 SIDS reviews that included information about the circumstances.

- The 166 infant sleep-related deaths account for 15 percent of the 1,104 total reviews for infant deaths in 2008, more than any single cause of death except prematurity.
- More than three Ohio infant deaths each week are sleep-related. If the non-SIDS sleep-related deaths were prevented, the Ohio infant mortality rate for 2008 would have been reduced from 7.7 to 6.1 deaths per 1,000 live births.
- Of the 367 reviews of infant deaths from 29 days to 1 year of age, 40 percent (145) were sleep related.
- Forty-six percent (76) of deaths

Reviews of Sleep-related Deaths by Age (N=166)



Reviews of Sleep-related Deaths by Race and Gender (N=166)





## 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 infant is awake to avoid flat spots on the back of the infant's head and to strengthen the upper torso and neck.
- Continue the Back to Sleep campaign for parents, grandparents and all other caregivers.

The National Center for CDR data system was modified in early 2010 to begin collection of data regarding pacifier use, sleeping in same room as caregiver and use of a fan to circulate air.

in a sleep environment were to black infants. This is disproportionately higher than their representation in the general population (16 percent).

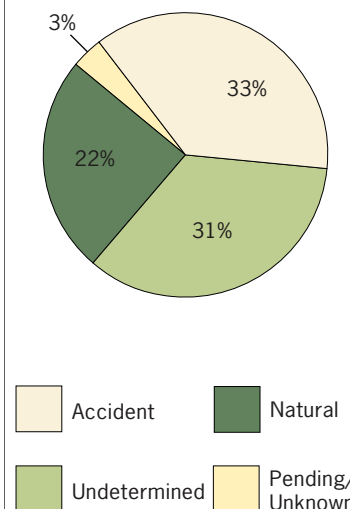
- Ninety percent (150) of the deaths occurred before 6 months of age.

As discussed in the section on SIDS deaths, determining the cause of death for infants in sleep

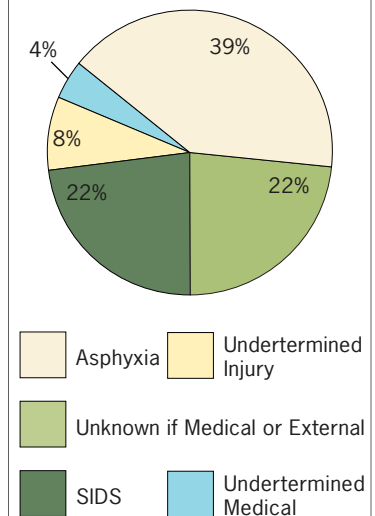
situations is difficult, even when a complete investigation has occurred. Thirty-nine percent (64) of the sleep-related deaths were diagnosed as unknown or undetermined cause, even though autopsies had been completed for 99 percent of the cases.

Only 19 percent (32) of sleep-related deaths occurred in cribs or bassinets. Sixty-six percent (109)

*Sleep-related Deaths by Manner of Death (N=166)*



*Sleep-related Deaths by Cause of Death (N=166)*



of sleep-related deaths occurred in adult beds, on couches or on chairs.

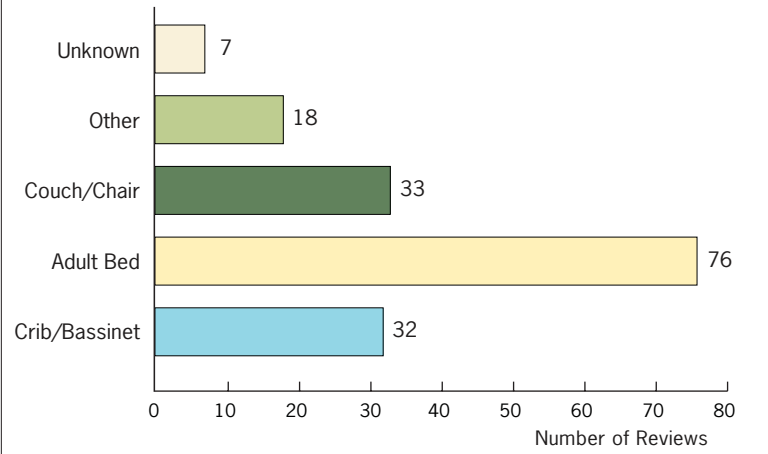
Bedsharing was a commonly reported circumstance for sleep-related deaths. Sixty percent (99) of sleep-related deaths occurred to infants who were sharing a sleep surface with another person at the time of death.

- Ninety of the infants were sharing a sleep surface with an adult, including 12 infants who were sharing with an adult and another child.
- An additional nine infants were sharing with another child only.

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

- Thirty-six percent (59) of the infants were exposed to smoke either in utero or after birth.

*Sleep-related Deaths by Location of Infant when Found* (N=166)



*For the five-year period 2004–2008, 16 percent of all infant deaths were sleep-related. The percentage of infant deaths that were sleep-related has not changed over the five-year period. Sleep-related deaths accounted for 43 percent of the post-neonatal infant deaths.*



# 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 2007 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>28</sup>

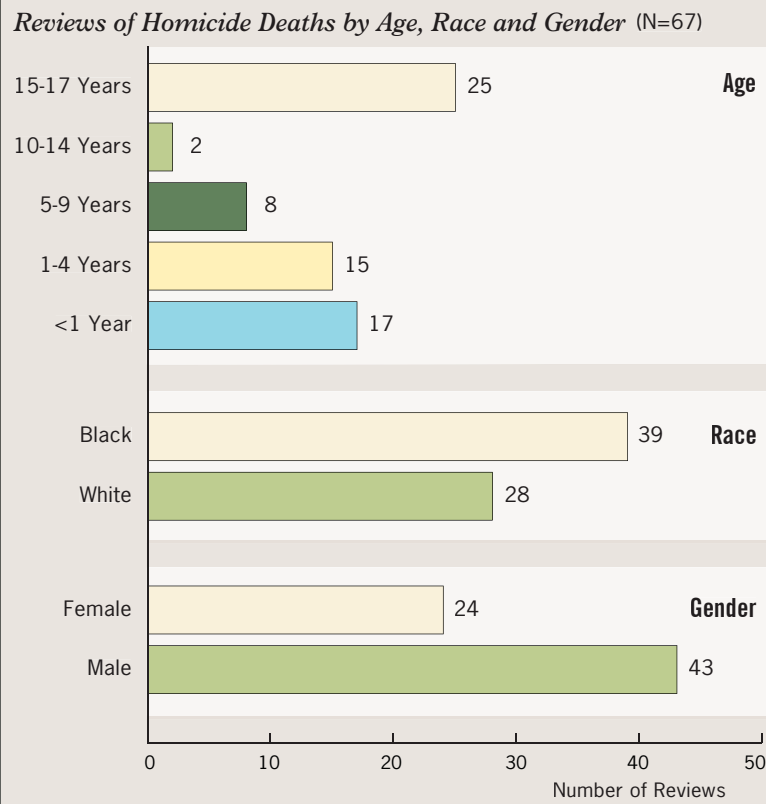
## Vital Statistics

Ohio Vital Statistics data report 74 deaths to children from homicide in 2008. For further information on the ICD-10 codes used to produce Vital Statistics data, please see Appendix IV.

## CFR Findings

Local CFR boards reviewed 67 deaths to children resulting from homicide in 2008. Homicides represent four percent of the total reviews and nine percent of all reviews for children ages 10-17. The number of reviews of homicide deaths decreased from 76 in 2007.

- Homicide deaths to boys (64 percent) were disproportionately higher than their representation in the general population (51 percent).
- The proportion of homicide



deaths to black children (58 percent) was more than 3.5 times their representation in the general population (16 percent).

For a better understanding of the factors related to homicides, the 67 reviews were divided by age: 40 reviews for children 0-9 years old, and 27 reviews for children 10-17 years old.

- Seventy percent (47) of homicide deaths were caused by a weapon, including body parts.
  - Ninety-three percent (25) of the homicides to children 10-17 years old involved firearms as the weapon. Only two of the homicides to children 0-9 years old involved firearms.
  - Fifty percent (20) of the homicides to children 0-9 years

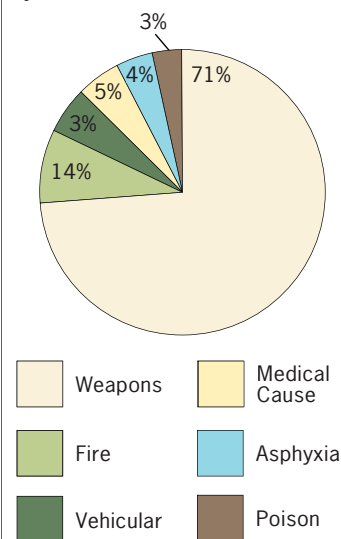
old involved the use of body parts as weapons.

- The perpetrator was more often a family member for children less than 10 years old.
  - For children less than 10 years old, the perpetrator was a parent, stepparent, parent's partner or other relative in 68 percent of reviews.
  - For children ages 10-17, the

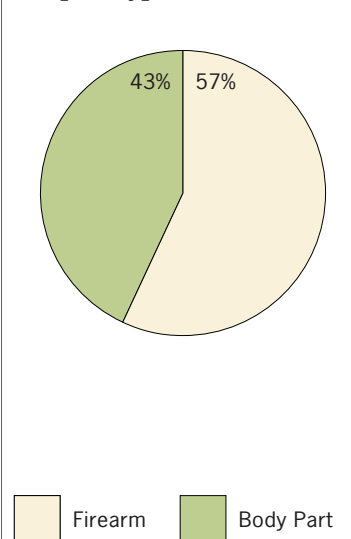
most frequently reported perpetrator was an acquaintance or friend (48 percent). There were four children ages 10-17 killed by a gang member (15 percent).

- In 49 percent (33) of the homicide reviews, the place of incident was the child's home.
  - For children less than 10 years old, the place of inci-

**Homicide Deaths by Cause of Death (N=67)**



**Homicide Deaths by Weapon Type (N=47)**



**Reviews of Homicides by Perpetrator (N=67)**

| Person Causing Death        | #         | %          |
|-----------------------------|-----------|------------|
| Biological Parent           | 18        | 28         |
| Stepparent                  | 1         | 2          |
| Parent's Partner            | 5         | 8          |
| Other Relative              | 5         | 8          |
| Acquaintance                | 10        | 16         |
| Friend/Boyfriend/Girlfriend | 9         | 14         |
| Gang Member                 | 4         | 6          |
| Stranger                    | 2         | 3          |
| Unknown                     | 7         | 11         |
| Other                       | 3         | 5          |
| Missing                     | 3         |            |
| <b>Total</b>                | <b>67</b> | <b>100</b> |

Percents may not total 100 due to rounding.

dent was the child's home in 73 percent of reviews.

- o For children ages 10-17, the most commonly reported

place of incident was a sidewalk, driveway or parking lot (37 percent) followed by a friend's home (15 percent).

#### *Reviews of Homicides by Place of Incident (N=67)*

| Place of Incident             | #         | %          |
|-------------------------------|-----------|------------|
| Home                          | 33        | 49         |
| Road                          | 7         | 10         |
| Friend's Home                 | 6         | 9          |
| Relative's Home               | 4         | 6          |
| Sidewalk/Driveway/Parking Lot | 4         | 6          |
| Other                         | 8         | 12         |
| Unknown                       | 5         | 7          |
| Missing                       | 0         |            |
| <b>Total</b>                  | <b>67</b> | <b>100</b> |

Percents may not total 100 due to rounding.

*For the five-year period 2004-2008, 4 percent (377) of the 8,447 deaths reviewed were homicides. Fifty-eight percent (217) were to black children, more than 3.5 times their representation in the population.*

- *Homicides accounted for eight percent of 2,754 reviews for black children and three percent (156) of the 5,507 reviews for white children.*
- *Of the 191 deaths from all causes to black boys ages 15-17 years, 50 percent (96) were homicides.*





# 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 accounted for nine percent of the deaths for young people ages 10-17 nationally in 2007.<sup>29</sup>

## *Vital Statistics*

Ohio Vital Statistics data report 61 deaths to children from suicide in 2008. For further information on the ICD-10 codes used to produce Vital Statistics data, please see Appendix IV.

## *CFR Findings*

Local CFR boards reviewed 56 deaths to children from suicide in 2008. These represent three percent of the total 1,655 reviews and 18 percent of all reviews for children ages 10-17. For the five-year period 2004-2008, there were 235 reviews for suicide deaths, with 2008 being the highest.

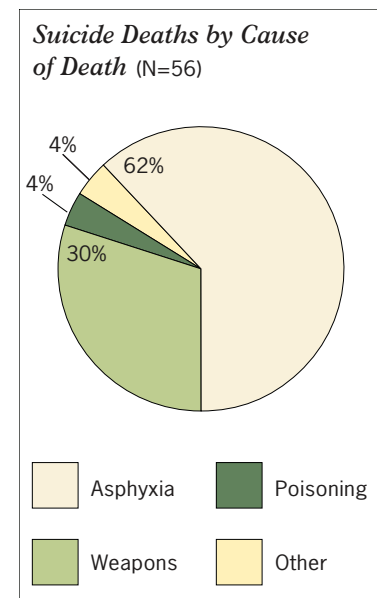
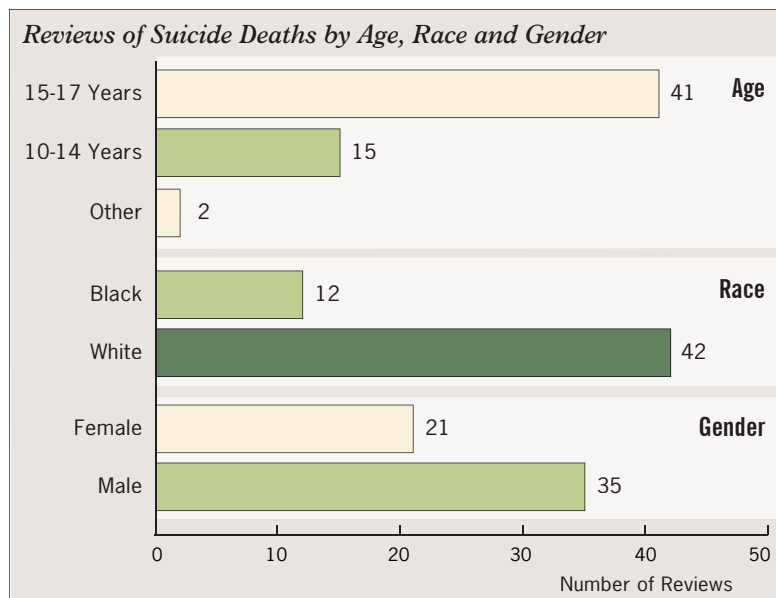
- Suicide deaths were disproportionately higher among boys (63 percent) and among black children (21 percent) than their representation in the general population (51 percent for boys, 16 percent for black children).

Seventy-three percent (41) of the suicide deaths reviewed were to children ages 15-17.

- Sixty-three percent (35) of the suicide deaths were caused by asphyxiation and 30 percent (17) were caused by a weapon.



- The most frequently indicated factors that might have contributed to the child's despondency included arguments and break-ups with friends; family problems including divorce and arguments with parents; school issues including failure; drug and alcohol use; victimization by bullying; and other personal crises.
- Twenty percent (11) of reviews for suicide deaths indicated the child had a history of child abuse or neglect. Five had an open child protective services case at the time of the incident.
- Thirty percent (17) of the suicide victims were receiving mental health services at the time of the incident. Thirteen had been prescribed medications for mental health conditions.



*For the five-year period 2004-2008, local boards reviewed 235 deaths from suicide. Fifty-nine percent (138) of the suicide deaths were due to asphyxia, while 30 percent (71) were due to a weapon. Twenty-two percent (52) of the reviews for suicide deaths indicated the child had a history of maltreatment.*



# 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>30</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>31</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 nine child abuse and neglect deaths in 2008. For further information on the ICD-10 codes used to produce Vital Statistics data, please see Appendix IV.

## *CFR Findings*

Local CFR boards reviewed 34 deaths from child abuse and neglect in 2008. These represent two percent of all 1,655 deaths reviewed.

- Twenty-seven of the 34 reviews indicated that physical abuse caused or contributed to the death, while eight reviews indicated that neglect caused or contributed to the death. One review indicated both abuse and neglect caused or contributed to the death.

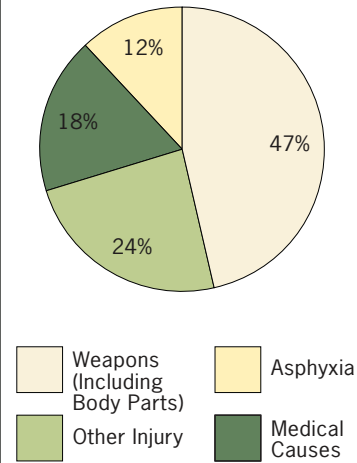


- Seventy-six percent (26) of child abuse and neglect deaths occurred among children younger than 5 years old.
- A greater percentage of child abuse and neglect deaths occurred to black children (24 percent) relative to their representation in the general population (16 percent).
- The 34 deaths identified as child abuse and neglect were the result of several kinds of injuries.
  - Forty-seven percent (16) were the result of weapons including use of a body part as a weapon.
  - Other causes of death included asphyxiation, poison, drowning, fire/burn and medical causes.
- The majority of the 34 child abuse and neglect deaths reviewed were violent deaths, with 27 resulting from physical abuse, including five indicating the child had been shaken.
- Of the 21 reviews where the information was available, 12 indicated the child had a prior history of child abuse and

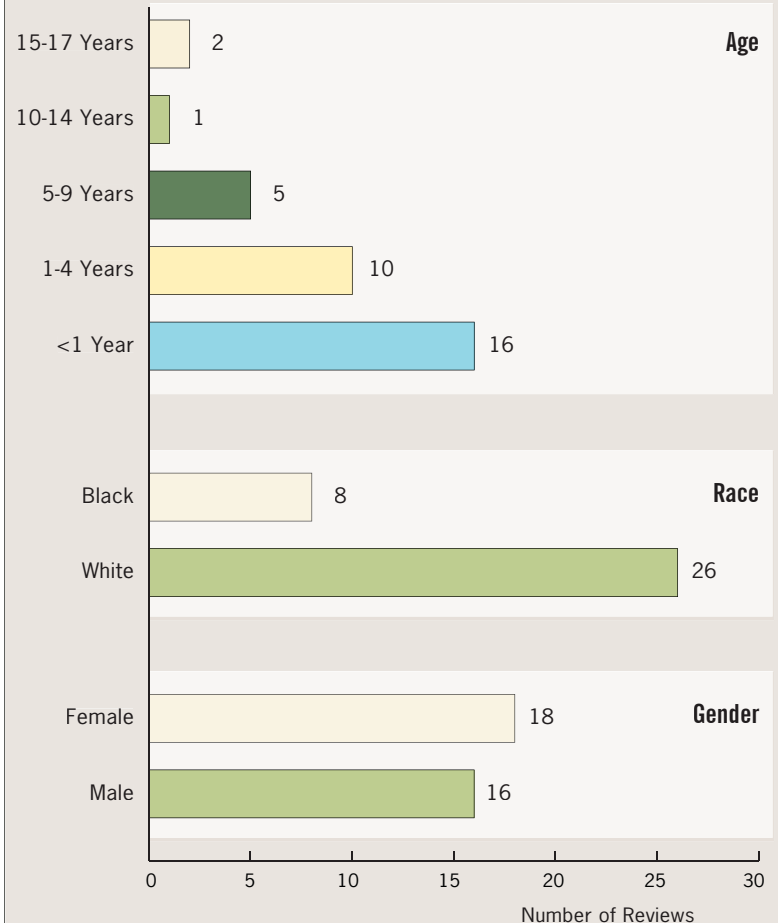
neglect, and eight had an open child protective services case at the time of the incident.

**Child Abuse and Neglect Deaths by Cause of Death**

(N=34)



**Reviews of Child Abuse and Neglect Deaths by Age, Race and Gender** (N=34)



- Sixty-five percent (22) of the reviews indicated the person causing the death was a biological parent. The parent's partner was cited in 9 percent of the reviews.
- For all 1,655 deaths reviewed from all causes for 2008, 84 indicated a prior history of child abuse or neglect, and 74 had an open case with child protective services at the time of the death.

*Reviews of Child Abuse and Neglect Deaths by Person Causing Death (N=34)*

| Person              | #         | %          |
|---------------------|-----------|------------|
| Biological Parent   | 22        | 65         |
| Stepparent          | 1         | 3          |
| Parent's Partner    | 3         | 9          |
| Other Relative      | 3         | 9          |
| Friend/Acquaintance | 1         | 3          |
| Unknown/Missing     | 4         | 12         |
| <b>Total</b>        | <b>67</b> | <b>100</b> |

Percents may not total 100 due to rounding.

*For the five-year period 2004-2008, 150 child abuse and neglect deaths were reviewed. The percentage of reviews of child abuse and neglect deaths has not changed over the five-year period. For the 129 reviews where the type of residence was known, 90 percent (116) of the children were living in a parental home. Only six were in official placement in foster homes, relative foster homes or licensed group homes.*





# County Type



## *Background*

The Ohio Department of Health 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 V for a map of Ohio counties by county type.

To analyze the CFR data by county type, the computer-assigned case number was used to determine the county of review. In nearly all cases, the county of review is the county of the child's residence.

In 2008, Ohio's child population was distributed as follows:

15 percent rural Appalachian; 14 percent rural non-Appalachian; 16 percent suburban; and 55 percent metropolitan.<sup>32</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 1,655 reviews of deaths that occurred in 2008 were distributed as follows:

- Ten percent of reviews (163) were from rural Appalachian counties.
- Fourteen percent of reviews (225) were from rural non-Appalachian counties.
- Thirteen percent of reviews (221) were from suburban counties.

- Sixty-three percent of reviews (1,046) were from metropolitan counties, which is disproportionately higher than the proportion of children living in metropolitan counties (55 percent).

## *Manner of Death by County Type*

- Sixty-five percent (758) of natural deaths reviewed were from metropolitan counties, which is disproportionately higher than the proportion of children living in metropolitan counties (55 percent).
- Twenty percent (53) of accidental deaths reviewed were from rural non-Appalachian counties, which is disproportionately higher than the proportion of children living in rural non-Appalachian counties (14 percent).
- Twenty-three percent (13) of

suicide deaths reviewed were from suburban counties, which is disproportionately higher than the proportion of children living in suburban counties (16 percent).

- Seventy-eight percent (52) of homicide deaths reviewed were from metropolitan counties, which is disproportionately higher than the proportion of children living in metropolitan counties (55 percent).

### Medical Causes of Death by County Type

- Sixty-four percent (770) 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 (55 percent). Reviews of deaths due to prematurity were particularly over-represented in metropolitan counties. Seventy-five percent (385) of deaths due to prematurity were from metropolitan counties.

### Manner of Death by County Type

|                                      | Rural Appalachian |            | Rural Non-Appalachian |            | Suburban   |            | Metropolitan |            | Total        |    |
|--------------------------------------|-------------------|------------|-----------------------|------------|------------|------------|--------------|------------|--------------|----|
|                                      | #                 | %          | #                     | %          | #          | %          | #            | %          | #            | %  |
| Natural                              | 114               | 70         | 145                   | 64         | 157        | 71         | 758          | 73         | 1,174        | 71 |
| Accident                             | 30                | 18         | 53                    | 24         | 39         | 18         | 144          | 14         | 266          | 16 |
| Suicide                              | 6                 | 4          | 10                    | 4          | 13         | 6          | 27           | 3          | 56           | 3  |
| Homicide                             | 4                 | 3          | 7                     | 3          | 4          | 2          | 52           | 5          | 67           | 4  |
| Undetermined/<br>Pending/<br>Unknown | 9                 | 6          | 10                    | 4          | 8          | 4          | 65           | 6          | 92           | 6  |
| <b>Total</b>                         | <b>163</b>        | <b>100</b> | <b>225</b>            | <b>100</b> | <b>221</b> | <b>100</b> | <b>1,046</b> | <b>100</b> | <b>1,655</b> |    |

Percents may not total 100 due to rounding.

### Three Leading Medical Causes of Death by County Type

|                            | Rural Appalachian |           | Rural Non-Appalachian |           | Suburban   |           | Metropolitan |           | Total        |            |
|----------------------------|-------------------|-----------|-----------------------|-----------|------------|-----------|--------------|-----------|--------------|------------|
|                            | #                 | %         | #                     | %         | #          | %         | #            | %         | #            | %          |
| Prematurity                | 33                | 6         | 35                    | 7         | 58         | 11        | 385          | 75        | 511          | 100        |
| Congenital Anomaly         | 17                | 10        | 17                    | 10        | 32         | 18        | 107          | 62        | 173          | 100        |
| Pneumonia/ Other Infection | 12                | 14        | 16                    | 18        | 4          | 5         | 56           | 64        | 88           | 100        |
| <b>All Medical Causes*</b> | <b>118</b>        | <b>10</b> | <b>150</b>            | <b>13</b> | <b>157</b> | <b>13</b> | <b>770</b>   | <b>64</b> | <b>1,195</b> | <b>100</b> |

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

*External Causes of Death by County Type (N=407)*

|                             | Rural<br>Appalachian |           | Rural<br>Non-Appalachian |           | Suburban  |           | Metropolitan |           | Total      |            |
|-----------------------------|----------------------|-----------|--------------------------|-----------|-----------|-----------|--------------|-----------|------------|------------|
|                             | #                    | %         | #                        | %         | #         | %         | #            | %         | #          | %          |
| Vehicular                   | 17                   | 15        | 25                       | 22        | 18        | 16        | 53           | 47        | 113        | 100        |
| Asphyxia                    | 10                   | 9         | 11                       | 10        | 22        | 19        | 72           | 63        | 115        | 100        |
| Weapons                     | 6                    | 9         | 6                        | 9         | 6         | 9         | 49           | 73        | 67         | 100        |
| <b>All External Causes*</b> | <b>43</b>            | <b>11</b> | <b>70</b>                | <b>17</b> | <b>55</b> | <b>14</b> | <b>239</b>   | <b>59</b> | <b>407</b> | <b>100</b> |

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

*External Causes of Death by County Type*

- Twenty-two percent (25) of vehicular deaths were from rural non-Appalachian counties, which is disproportionately higher than the proportion of children living in rural non-Appalachian counties (14 percent).
- Seventy-three percent (49) of weapons deaths reviewed were from metropolitan counties, which is disproportionately higher than the proportion of children living in metropolitan counties (55 percent).

*Reviews of Special Interest*

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

- Seven percent of reviews (11) were from rural Appalachian counties.
- Eleven percent of reviews (18) were from rural non-Appalachian counties.
- Eleven percent of reviews (18) were from suburban counties.
- Seventy-two percent of reviews (119) were from metropolitan counties.

The distribution of the 34 reviews for child abuse and neglect deaths also varies from the population distribution by county type.

- Fifteen percent of the reviews (5) were from rural Appalachian counties.
- Three percent of the reviews (1) were from rural non-Appalachian counties.
- Twelve percent of the reviews (4) were from suburban counties.
- Seventy-one percent of the reviews (24) were from metropolitan counties.





# Preventable Deaths

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.<sup>33</sup> 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 reasonably have been changed. Cases are then deemed "probably preventable" or "probably not preventable."

## *CFR Findings*

Local boards indicated 23 percent (383) of the 1,655 deaths reviewed probably could have been pre-

vented. Preventability differed by manner of death and by age group.

- Eighty-four percent (223) of the 266 deaths of accidental manner were considered probably preventable.
- Fifty-seven percent (111) of the deaths to 15-17-year-olds were considered probably preventable.
- Only 5 percent (33) of the deaths to infants less than 29 days old were considered probably preventable.

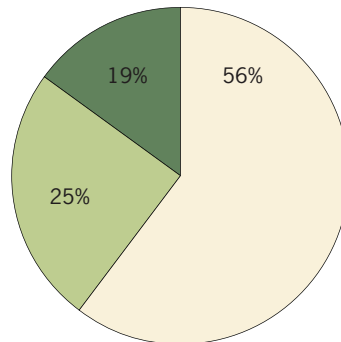
Local CFR boards identify many deaths that likely could have been prevented through changes in laws or policies, such as mandating the use of booster seats in cars; or the implementation of programs, such as Cribs for Kids. Many other deaths likely could have been prevented through increased adult supervision, increased parental responsibility and the exercise



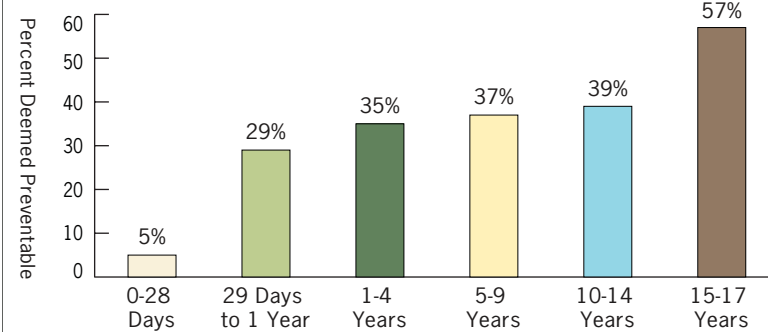
### Reviews by Preventability

(N=1514)

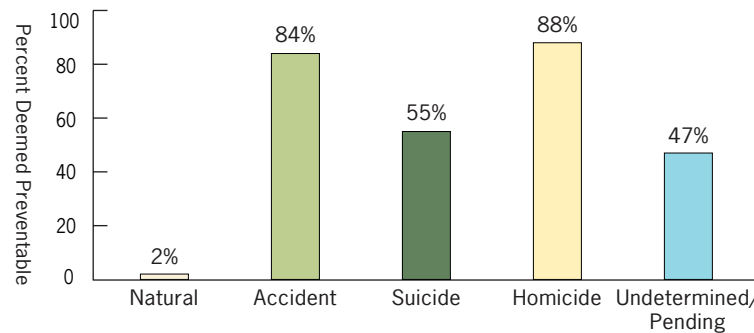
- No, Probably Not
- Yes, Probably
- Could Not Determine



### Reviews Deemed Preventable by Age (N=383)



### Reviews Deemed Preventable by Manner of Death (N=383)



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.

*For the five-year period 2004-2008, local CFR boards deemed 23 percent of the deaths reviewed were probably preventable. The percentage changed little over the period, from a high of 25 percent in 2004 to a low of 22 percent in 2007.*





# 2004-2008 Combined Years



2010 marks the tenth year of Ohio Child Fatality Review. During the first few years after CFR was established by state law in 2000, administrative rules were written, extensive trainings were provided, and local boards were convened in all 88 counties. Those boards created protocols and procedures for their work and began conducting reviews. The first data system provided only limited ability to analyze and use the data. In 2006, Ohio joined with other states in using a multi-state case report tool and Web-based data system developed by the National Center for Child Death Review (NCCDR). Reviews of deaths that occurred in 2004 were the first to be entered into the new system. To gain more understanding of the factors related to child deaths, data have been analyzed for the five-year period 2004-2008.

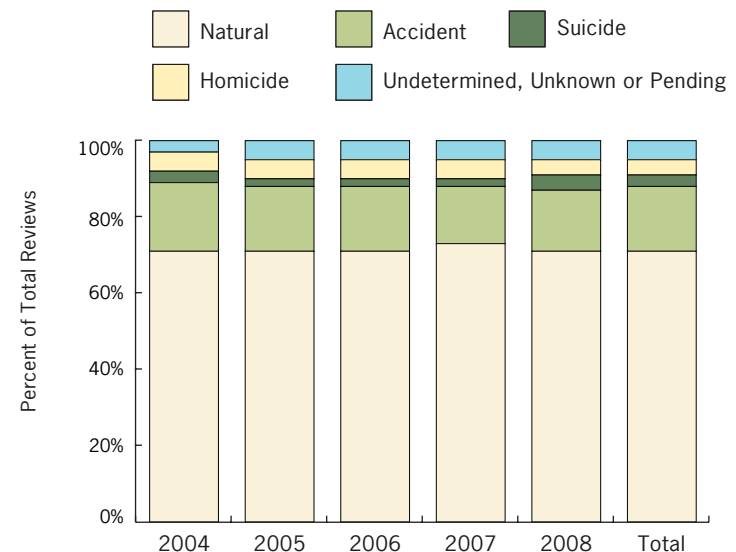
For the five-year year-of-death period 2004-2008, Ohio CFR boards have completed 8,447 reviews, which represents 94 percent of the 9,001 child deaths reported by Ohio Vital Statistics. For the five-year period, the proportional distribution of reviews across many factors such as manner of death, age, race, gender and preventability has changed very little.

- Seventy-one percent (6,030) of the reviews were natural manner of death. The percentage was 71 percent each year, except 2007 when the percentage was 73.
- Sixty-five percent (5,476) of the reviews were for infants less than 1 year old. The percentage has increased slightly each year, from 62 percent in 2004 to 67 percent in 2008. The increase is likely due to improved processes to identify and review these deaths.

- Fifty-nine percent (4,954) of the reviews were for boys. The percentage changed little over the period, from a high of 60 percent in 2005 to a low of 58

- percent in 2006 and 2007.
- Thirty-three percent (2,754) of the reviews were for black children. The percentage has increased over the period, from

*Manners of Death, 2004-2008*



31 percent in 2004 to 35 percent in 2008.

- Twenty-three percent of the deaths reviewed were deemed probably preventable. The percentage changed little over the period, from a high of 25 percent in 2004 to a low of 22 percent in 2007.

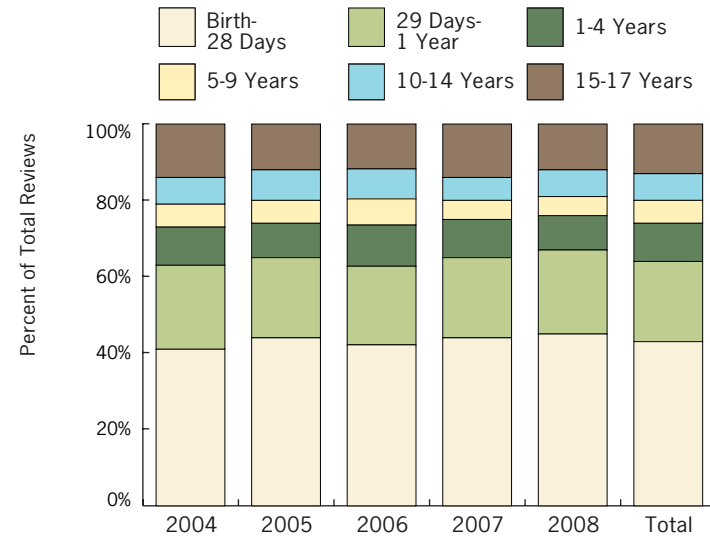
Over the five-year period, changes were noted in the percentage of reviews for some causes of death.

- Eight percent (635) of all reviews were due to vehicular crashes. This is 30 percent of the 2,136 reviews for deaths from external causes. The percentage of deaths from external causes due to vehicular crashes has decreased from 35 percent in 2004 to 28 percent in 2008. White boys ages 15–17 years accounted for 32 percent (202) of all vehicular deaths.
- Six percent (531) of all reviews were due to asphyxia. This is 25 percent of the 2,136 reviews for deaths from external causes. The percentage of deaths from external causes due to asphyxia

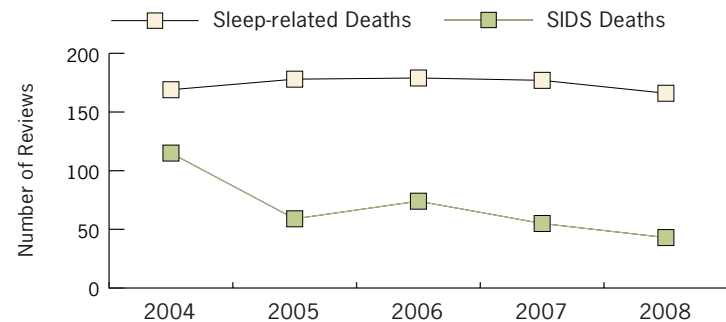
has increased from 22 percent in 2004 to 28 percent in 2007 and 2008. Each year, the largest numbers of asphyxia deaths are suffocation deaths to infants less than 1 year old. Fifty-four percent (288) of the asphyxia deaths were sleep-related infant deaths.

- Four percent (348) of all reviews were due to sudden infant death syndrome (SIDS). The number and percentage of deaths due to SIDS has decreased from seven percent (116) in 2004 to three percent (43) in 2008. This decrease may be due to changes in the diagnosis of sudden, unexpected infant deaths as noted in the SIDS section of this report. Reviews for sleep-related infant deaths account for 10 percent (869) of all reviews, and the percentage has remained unchanged for the five-year period.

*Reviews by Age, 2004-2008*



*Reviews of Sleep-related Deaths and SIDS Deaths, 2004-2008*



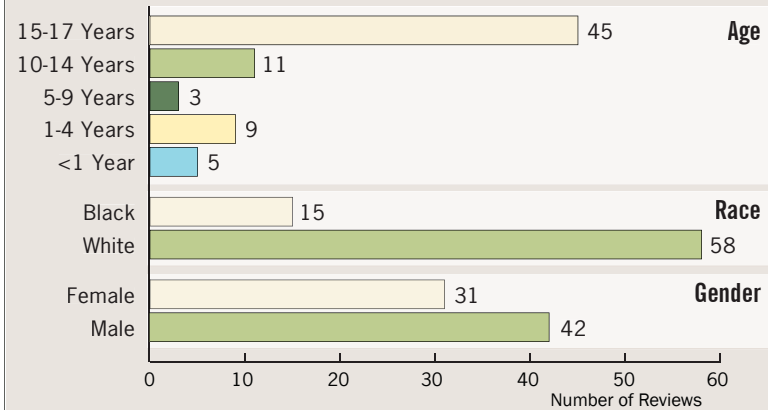
Combining data from five years allows more analysis for groups of deaths where in-depth analysis is limited by small numbers in a single year.

- Local CFR boards reviewed 73 poisoning deaths for 2004-2008. These deaths represent three percent of the 2,136 deaths from external causes for the period. Sixty-eight percent (49) of the deaths were accidental manner. Eighteen percent (13) were suicides.
  - Sixty-three percent (45) of the deaths occurred to 15-17 year olds.
  - The poison agents for this age group included medications, street drugs, alcohol, carbon monoxide, household cleaners and several inhaled substances.
  - Twenty-four percent (17) of the poisoning deaths occurred to children younger than 10 years.
  - The poison agents for this age group included medications, street drugs and carbon monoxide. None were

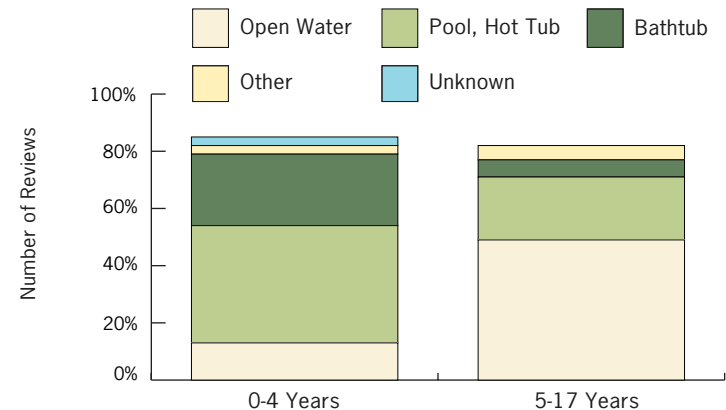
poisoned by household cleaners or plants.

- Local CFR boards reviewed 167 drowning deaths for 2004-2008. These deaths represent 8 percent of the 2,136 deaths from external causes for the period.
  - A greater percentage of drowning and submersion deaths occurred among boys (69 percent) and among black children (29 percent) relative to their representation in the general population (51 percent for boys and 16 percent for black children).
  - Fifty-one percent (85) of the deaths occurred to children younger than 5 years old.
  - Fifty-eight percent (49) of the deaths occurred in pools, while 28 percent (24) occurred in open water and 18 percent (15) in bath tubs.
  - Forty-nine percent (82) of the deaths occurred to children 5 years and older.
  - Sixty percent (49) of the deaths occurred in open water, while 27 percent (22) occurred in pools and 7 percent (6) in bath tubs.

*Reviews of Poisoning Deaths by Age, Race and Gender, 2004-2008 (N=73)*



*Reviews of Drowning Deaths by Location, 2004-2008 (N=167)*







# Conclusion

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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:

- 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 1: Child Fatality Review Advisory Committee

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# Appendix IV: ICD-10 Codes Used for Vital Statistics Data

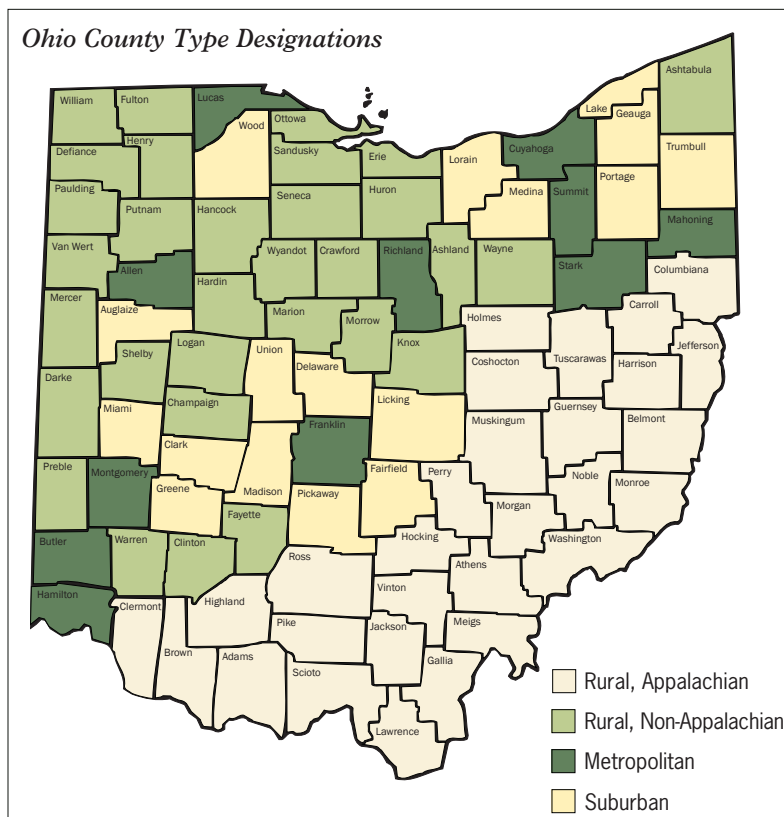


*ICD-10 Codes Used for Vital Statistics Data Included in CFR Report*

| 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, 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 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 V: 2008 Ohio County Type Designations



Ohio's 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.

In 2008, Ashtabula, Trumbull and Mahoning were added to the Appalachian counties. To maintain continuity for the five-year period 2004-2008, for the purpose of this report, Ashtabula remains Rural Non-Appalachian; Trumbull remains Suburban; and Mahoning remains Metropolitan.



# Appendix VI: Data Tables



*Reviews of 2008 Deaths by Manner of Death by Age, Race and Gender (N=1,655)*

|               | Natural     | Accident   | Homicide  | Suicide   | Undetermined/ Pending/ Unknown | Total        |
|---------------|-------------|------------|-----------|-----------|--------------------------------|--------------|
| Age           | #           | #          | #         | #         | #                              | #            |
| 1-28 Days     | 701         | 21         | 4         | -         | 11                             | 737          |
| 29 – 364 Days | 223         | 64         | 13        | -         | 67                             | 367          |
| 1-4 Years     | 85          | 48         | 15        | -         | 9                              | 157          |
| 5-9 Years     | 55          | 22         | 8         | -         | 2                              | 87           |
| 10-14 Years   | 59          | 36         | 2         | 15        | 1                              | 113          |
| 15-17 Years   | 51          | 75         | 25        | 41        | 2                              | 194          |
| Unknown       | -           | -          | -         | -         | -                              | -            |
| Missing       | -           | -          | -         | -         | -                              | -            |
| Race*         | #           | #          | #         | #         | #                              | #            |
| White         | 742         | 195        | 28        | 42        | 54                             | 1,061        |
| Black         | 415         | 70         | 39        | 12        | 37                             | 573          |
| Other         | 14          | 1          | -         | 2         | 1                              | 18           |
| Unknown       | 3           | -          | -         | -         | -                              | 3            |
| Missing       | -           | -          | -         | -         | -                              | -            |
| Gender        | #           | #          | #         | #         | #                              | #            |
| Male          | 655         | 167        | 43        | 35        | 54                             | 954          |
| Female        | 519         | 99         | 24        | 21        | 38                             | 701          |
| Unknown       | -           | -          | -         | -         | -                              | -            |
| Missing       | -           | -          | -         | -         | -                              | -            |
| <b>Total</b>  | <b>1174</b> | <b>266</b> | <b>67</b> | <b>56</b> | <b>92</b>                      | <b>1,655</b> |

\*26 cases with multiple races indicated were assigned to the minority race.

*Reviews of 2008 Deaths: All Medical Causes of Death (N=1,195) by Age*

|                             | Birth-364 Days | 1-4 Years | 5-9 Years | 10-14 Years | 15-17 Years | Unknown  | Missing  | Total        |
|-----------------------------|----------------|-----------|-----------|-------------|-------------|----------|----------|--------------|
| Asthma                      | -              | -         | 2         | 2           | -           | -        | -        | 4            |
| Cancer                      | 1              | 5         | 12        | 15          | 9           | -        | -        | 42           |
| Cardiovascular              | 28             | 6         | 5         | 4           | 6           | -        | -        | 49           |
| Congenital Anomalies        | 135            | 20        | 7         | 7           | 4           | -        | -        | 173          |
| Low Birth Weight            | 1              | -         | -         | -           | -           | -        | -        | 1            |
| Malnutrition/Dehydration    | 2              | -         | -         | -           | -           | -        | -        | 2            |
| Neurological Disorders      | 8              | 6         | 1         | -           | 4           | -        | -        | 19           |
| Pneumonia                   | 18             | 7         | 5         | 2           | 4           | -        | -        | 36           |
| Prematurity                 | 507            | 3         | 1         | -           | -           | -        | -        | 511          |
| SIDS                        | 43             | -         | -         | -           | -           | -        | -        | 43           |
| Other Infection             | 40             | 8         | 1         | 4           | 1           | -        | -        | 54           |
| Other Perinatal Conditions  | 48             | -         | -         | -           | -           | -        | -        | 48           |
| Other Medical Condition     | 104            | 29        | 22        | 25          | 24          | -        | -        | 204          |
| Undetermined                | 5              | -         | -         | -           | 1           | -        | -        | 6            |
| Unknown                     | 2              | -         | -         | 1           | -           | -        | -        | 3            |
| <b>Medical Causes Total</b> | <b>942</b>     | <b>84</b> | <b>56</b> | <b>60</b>   | <b>53</b>   | <b>-</b> | <b>-</b> | <b>1,195</b> |

*Reviews of 2008 Deaths: All Medical Causes of Death (N=1,195) by Race*

|                             | White      | Black      | Other     | Unknown  | Missing  | Total        |
|-----------------------------|------------|------------|-----------|----------|----------|--------------|
| Asthma                      | 2          | 2          | -         | -        | -        | 4            |
| Cancer                      | 32         | 8          | 1         | -        | -        | 42           |
| Cardiovascular              | 35         | 14         | -         | -        | -        | 49           |
| Congenital Anomalies        | 131        | 40         | 2         | -        | -        | 173          |
| Low Birth Weight            | 1          | -          | -         | -        | -        | 1            |
| Malnutrition/ Dehydration   | 1          | 1          | -         | -        | -        | 2            |
| Neurological Disorders      | 14         | 5          | -         | -        | -        | 19           |
| Pneumonia                   | 24         | 11         | 1         | -        | -        | 36           |
| Prematurity                 | 253        | 251        | 5         | 2        | -        | 511          |
| SIDS                        | 29         | 14         | -         | -        | -        | 43           |
| Other Infection             | 28         | 25         | 1         | -        | -        | 54           |
| Other Perinatal Conditions  | 37         | 10         | 1         | -        | -        | 48           |
| Other Medical Condition     | 160        | 41         | 3         | -        | -        | 204          |
| Undetermined                | 4          | 2          | -         | -        | -        | 6            |
| Unknown                     | 3          | -          | -         | -        | -        | 3            |
| <b>Medical Causes Total</b> | <b>754</b> | <b>424</b> | <b>14</b> | <b>3</b> | <b>-</b> | <b>1,195</b> |

\*26 cases with multiple races indicated were assigned to the minority race.

*Reviews of 2008 Deaths: All Medical Causes of Death (N=1,195) by Gender*

|                             | Male       | Female     | Unknown  | Missing  | Total        |
|-----------------------------|------------|------------|----------|----------|--------------|
| Asthma                      | 2          | 2          | -        | -        | 4            |
| Cancer                      | 23         | 19         | -        | -        | 42           |
| Cardiovascular              | 23         | 26         | -        | -        | 49           |
| Congenital Anomalies        | 98         | 75         | -        | -        | 173          |
| Low Birth Weight            | -          | 1          | -        | -        | 1            |
| Malnutrition/ Dehydration   | -          | 2          | -        | -        | 2            |
| Neurological Disorders      | 7          | 12         | -        | -        | 19           |
| Pneumonia                   | 21         | 15         | -        | -        | 36           |
| Prematurity                 | 297        | 214        | -        | -        | 511          |
| SIDS                        | 23         | 20         | -        | -        | 43           |
| Other Infection             | 30         | 25         | -        | -        | 55           |
| Other Perinatal Conditions  | 27         | 21         | -        | -        | 48           |
| Other Medical Condition     | 117        | 86         | -        | -        | 203          |
| Undetermined                | 3          | 3          | -        | -        | 6            |
| Unknown                     | 1          | 2          | -        | -        | 3            |
| <b>Medical Causes Total</b> | <b>672</b> | <b>523</b> | <b>-</b> | <b>-</b> | <b>1,195</b> |

*Reviews of 2008 Deaths: All External Causes of Death (N=407) by Age*

|                              | Birth –<br>364 Days | 1-4<br>Years | 5-9<br>Years | 10-14<br>Years | 15-17<br>Years | Unknown  | Missing  | Total      |
|------------------------------|---------------------|--------------|--------------|----------------|----------------|----------|----------|------------|
| Asphyxia                     | 68                  | 5            | 2            | 12             | 28             | -        | -        | 115        |
| Motor Vehicle                | 5                   | 14           | 12           | 22             | 60             | -        | -        | 113        |
| Weapon (Including Body Part) | 11                  | 10           | 2            | 6              | 38             | -        | -        | 67         |
| Fire, Burn or Electrocution  | 2                   | 17           | 10           | 2              | -              | -        | -        | 31         |
| Drowning                     | 2                   | 10           | 4            | 8              | 3              | -        | -        | 27         |
| Poisoning                    | 2                   | 4            | 1            | 2              | 9              | -        | -        | 18         |
| Fall or Crush                | -                   | 4            | -            | 1              | 3              | -        | -        | 8          |
| Other                        | 2                   | -            | -            | -              | -              | -        | -        | 2          |
| Undetermined/Unknown         | 25                  | 1            | -            | -              | -              | -        | -        | 26         |
| <b>External Causes Total</b> | <b>117</b>          | <b>65</b>    | <b>31</b>    | <b>53</b>      | <b>141</b>     | <b>-</b> | <b>-</b> | <b>407</b> |

*Reviews of 2008 Deaths: All External Causes of Death by Race (N=407)*

|                               | White      | Black      | Other    | Unknown  | Missing  | Total      |
|-------------------------------|------------|------------|----------|----------|----------|------------|
| Asphyxia                      | 72         | 41         | 2        | -        | -        | 115        |
| Motor Vehicle                 | 99         | 13         | 1        | -        | -        | 113        |
| Weapon (Including Body Parts) | 31         | 36         | -        | -        | -        | 67         |
| Fire, Burn or Electrocution   | 25         | 6          | -        | -        | -        | 31         |
| Drowning                      | 20         | 7          | -        | -        | -        | 27         |
| Poisoning                     | 12         | 6          | -        | -        | -        | 18         |
| Fall or Crush                 | 6          | 2          | -        | -        | -        | 8          |
| Other                         | 2          | -          | -        | -        | -        | 2          |
| Undetermined/Unknown          | 11         | 15         | -        | -        | -        | 26         |
| <b>External Causes Total</b>  | <b>278</b> | <b>126</b> | <b>3</b> | <b>-</b> | <b>-</b> | <b>407</b> |



*Reviews of 2008 Deaths: All External Causes of Death (N=407) by Gender*

|                               | Male       | Female     | Unknown  | Missing  | Total      |
|-------------------------------|------------|------------|----------|----------|------------|
| Asphyxia                      | 67         | 48         | -        | -        | 115        |
| Motor Vehicle                 | 76         | 37         | -        | -        | 113        |
| Weapon (Including Body Parts) | 51         | 16         | -        | -        | 67         |
| Fire, Burn or Electrocution   | 12         | 19         | -        | -        | 31         |
| Drowning                      | 16         | 11         | -        | -        | 27         |
| Poisoning                     | 11         | 7          | -        | -        | 18         |
| Fall or Crush                 | 6          | 2          | -        | -        | 8          |
| Other                         | -          | 2          | -        | -        | 2          |
| Undetermined/Unknown          | 15         | 11         | -        | -        | 26         |
| <b>External Causes Total</b>  | <b>254</b> | <b>153</b> | <b>-</b> | <b>-</b> | <b>407</b> |

*Reviews of 2004-2008 Deaths by Manner of Death by Age, Race and Gender (N=8,447)*

|              | Natural      | Accident     | Homicide   | Suicide    | Undetermined/<br>Pending/<br>Unknown | Total        |
|--------------|--------------|--------------|------------|------------|--------------------------------------|--------------|
| Age          | #            | #            | #          | #          | #                                    | #            |
| 1-28 Days    | 3,531        | 69           | 9          | -          | 55                                   | 3,664        |
| 29-364 Days  | 1,183        | 284          | 65         | -          | 280                                  | 1,812        |
| 1-4 Years    | 463          | 242          | 82         | -          | 27                                   | 814          |
| 5-9 Years    | 280          | 162          | 44         | 4          | 7                                    | 497          |
| 10-14 Years  | 293          | 197          | 336        | 61         | 8                                    | 595          |
| 15-17 Years  | 272          | 465          | 141        | 170        | 7                                    | 1,055        |
| Unknown      | 1            | -            | -          | -          | -                                    | 1            |
| Missing      | 7            | 2            | -          | -          | -                                    | 9            |
| Race*        | #            | #            | #          | #          | #                                    | #            |
| White        | 3,852        | 1,083        | 156        | 191        | 225                                  | 5,507        |
| Black        | 2,022        | 321          | 217        | 42         | 152                                  | 2,754        |
| Other        | 74           | 9            | -          | 2          | 3                                    | 88           |
| Unknown      | 56           | 3            | 4          | -          | 4                                    | 67           |
| Missing      | 26           | 5            | -          | -          | -                                    | 31           |
| Gender       | #            | #            | #          | #          | #                                    | #            |
| Male         | 3,407        | 902          | 253        | 169        | 223                                  | 4,954        |
| Female       | 2,598        | 517          | 124        | 65         | 160                                  | 3,464        |
| Unknown      | 6            | -            | -          | 1          | -                                    | 7            |
| Missing      | 19           | 2            | -          | -          | 1                                    | 22           |
| <b>Total</b> | <b>6,030</b> | <b>1,421</b> | <b>377</b> | <b>235</b> | <b>384</b>                           | <b>8,447</b> |

\* 152 cases with multiple races indicated were assigned to the minority race.

*Reviews of 2004-2008 Deaths by Year by Age, Race and Gender (N=8,447)*

|              | 2004         | 2005         | 2006         | 2007         | 2008         | Total        |
|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Age          | #            | #            | #            | #            | #            | #            |
| 1-28 Days    | 676          | 764          | 741          | 746          | 737          | 3,664        |
| 29-364 Days  | 358          | 368          | 363          | 356          | 367          | 1,812        |
| 1-4 Years    | 170          | 154          | 155          | 178          | 157          | 814          |
| 5-9 Years    | 95           | 115          | 115          | 85           | 87           | 497          |
| 10-14 Years  | 121          | 134          | 132          | 95           | 113          | 595          |
| 15-17 Years  | 232          | 216          | 198          | 215          | 194          | 1,055        |
| Unknown      | -            | -            | -            | 1            | -            | 1            |
| Missing      | 3            | -            | 1            | 5            | -            | 9            |
| Race*        | #            | #            | #            | #            | #            | #            |
| White        | 1,089        | 1,150        | 1,091        | 1,116        | 1,061        | 5,507        |
| Black        | 517          | 564          | 570          | 530          | 573          | 2,754        |
| Other        | 18           | 18           | 13           | 21           | 18           | 88           |
| Unknown      | 26           | 11           | 19           | 8            | 3            | 67           |
| Missing      | 5            | 8            | 12           | 6            | -            | 31           |
| Gender       | #            | #            | #            | #            | #            | #            |
| Male         | 964          | 1,049        | 1,002        | 985          | 954          | 4,954        |
| Female       | 681          | 698          | 698          | 686          | 701          | 3,464        |
| Unknown      | 1            | 2            | 1            | 3            | -            | 7            |
| Missing      | 9            | 2            | 4            | 7            | -            | 22           |
| <b>Total</b> | <b>1,655</b> | <b>1,751</b> | <b>1,705</b> | <b>1,681</b> | <b>1,655</b> | <b>8,447</b> |

\* 152 cases with multiple races indicated were assigned to the minority race.

*Reviews of 2004-2008 Deaths by Year by Cause, Circumstances and Preventability (N=8,447), Continued on Page 104*

|                      | 2004 | 2005 | 2006 | 2007 | 2008 | Total |
|----------------------|------|------|------|------|------|-------|
| Medical Causes       | #    | #    | #    | #    | #    | #     |
| Prematurity          | 497  | 537  | 513  | 531  | 511  | 2,589 |
| Congenital Anomaly   | 193  | 199  | 202  | 182  | 173  | 949   |
| SIDS                 | 116  | 59   | 74   | 55   | 43   | 347   |
| Cardiovascular       | 47   | 62   | 51   | 76   | 49   | 285   |
| Other Infections     | 57   | 57   | 54   | 43   | 54   | 265   |
| Cancer               | 51   | 49   | 57   | 51   | 42   | 250   |
| Pneumonia            | 20   | 42   | 45   | 42   | 36   | 185   |
| Other Perinatal      | 28   | 20   | 24   | 36   | 48   | 156   |
| Neurological         | 29   | 23   | 20   | 19   | 19   | 110   |
| Asthma               | 4    | 2    | 5    | 11   | 4    | 26    |
| Malnutrition         | 2    | 2    | 1    | 3    | 2    | 11    |
| Other Medical        | 167  | 192  | 161  | 163  | 205  | 888   |
| Undetermined/Unknown | 18   | 35   | 27   | 23   | 9    | 112   |

*Reviews of 2004-2008 Deaths by Year by Cause, Circumstances and Preventability (N=8,447), Continued from Page 103*

|                             | 2004         | 2005         | 2006         | 2007         | 2008         | Total        |
|-----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| External Causes             | #            | #            | #            | #            | #            | #            |
| Vehicular                   | 145          | 135          | 128          | 114          | 113          | 635          |
| Asphyxia                    | 90           | 97           | 118          | 111          | 115          | 531          |
| Weapons                     | 55           | 71           | 72           | 76           | 67           | 341          |
| Drowning                    | 40           | 46           | 25           | 29           | 27           | 167          |
| Fire and Burns              | 27           | 35           | 38           | 21           | 31           | 152          |
| Poisoning                   | 18           | 10           | 17           | 10           | 18           | 73           |
| Fall or Crush               | 11           | 11           | 13           | 8            | 8            | 51           |
| Exposure                    | 1            | 2            | 1            | 2            | 1            | 7            |
| Other Injuries              | 21           | 20           | 9            | 5            | 1            | 57           |
| Undetermined/Unknown        | 8            | 41           | 30           | 17           | 26           | 122          |
|                             | #            | #            | #            | #            | #            | #            |
| Child Abuse & Neglect       | 24           | 26           | 31           | 35           | 34           | 150          |
| Sleep-related Infant Deaths | 169          | 178          | 179          | 177          | 166          | 869          |
| Probably Preventable        | 408          | 431          | 401          | 368          | 383          | 1,973        |
| <b>Year Total</b>           | <b>1,655</b> | <b>1,751</b> | <b>1,705</b> | <b>1,681</b> | <b>1,655</b> | <b>8,447</b> |



# Appendix VII: References\*

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<sup>1</sup>National Center for Health Statistics and U.S. Census Bureau data. Processed through Ohio Department of Health, Vital Statistics, April 1, 2010.

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 – 2007 page. Available at [http://webappa.cdc.gov/sasweb/ncipc/mortrate10\\_sy.html](http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html).

<sup>3</sup>Safe Kids USA. Injury Trends Fact Sheet. Available at <http://www.safekids.org/our-work/research/fact-sheets/>.

<sup>4</sup>National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999 – 2007 page. Available at [http://webappa.cdc.gov/sasweb/ncipc/mortrate10\\_sy.html](http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html).

<sup>5</sup>National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999 – 2007 page. Available at [http://webappa.cdc.gov/sasweb/ncipc/mortrate10\\_sy.html](http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html).

<sup>6</sup>National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999 – 2007 page. Available at <http://webappa.cdc.gov/sasweb/ncipc/leadcaus10.html>.

<sup>7</sup>Safe Kids USA, Car Seat, Booster and Seat Belt Safety Fact Sheet. Available at <http://www.safekids.org/our-work/research/fact-sheets/car-seats-booster-and-belt-safety-fact-sheet.html>.

<sup>8</sup>National Traffic Highway Safety Administration. Teen Driver Crashes: A Report to Congress July 2008. Available at <http://www.nhtsa.gov/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/811005.pdf>.

<sup>9</sup>National Highway Traffic Safety Administration. Beginning Teenage Drivers. Available at <http://www.nhtsa.gov/DOT/NHTSA/Traffic%20Injury%20Control/Teen%20Driver/files/BegTeenDrivers810651.pdf>.

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<sup>10</sup>National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999 – 2007 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>12</sup>National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999 – 2007 page. Available at <http://webappa.cdc.gov/sasweb/ncipc/leadcaus10.html>.

<sup>13</sup>Centers for Disease Control and Prevention. Fire Deaths and Injuries: Fact Sheet. Available at <http://www.cdc.gov/HomeandRecreationalSafety/Fire-Prevention/fires-factsheet.html>.

<sup>14</sup>National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999 – 2007 page. Available at <http://webappa.cdc.gov/sasweb/ncipc/leadcaus10.html>.

<sup>15</sup>Safe Kids USA. Safe Kids U.S. Summer Safety Ranking Report May 2007. Available at <http://www.safekids.org/assets/docs/ourwork/research/research-report-safe-kids-week-2007.pdf>.

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<sup>18</sup>National Center for Injury Prevention and Control. WISQARS Injury Mortality Reports, 1999 – 2007 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>21</sup>National Center for Health Statistics. Deaths: Final Data for 2007. Available at [http://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58\\_19.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_19.pdf).

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