

CHILD DEATHS IN WEST VIRGINIA

1999-2004

**A Report of the
West Virginia Child Fatality Review Team**

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Governor**

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Department of Health and Human Resources**

July 2007

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LETTER FROM THE WVCFRT CHAIR

Of all the sad events a Medical Examiner must attend as part of his or her job, that which is by far the most tragic is a child's death that could have been prevented. The death might have occurred as the result of an opportunity missed by virtue of misinterpreted signals or a failure of vigilance on the part of persons who were responsible for that child's welfare, that is, parents and other family members or professionals in the fields of medicine, education, public health, and public safety.

Since coming to West Virginia in 1997, it has been my singularly high honor and privilege to serve with a group of colleagues who are deeply committed to helping prevent such unnecessary tragedies. The West Virginia Child Fatality Review Team performs focused multi-disciplinary reviews of all child deaths that occur in the state. The Team comprises a cross-section of professionals from many areas, including pediatrics, forensic pathology, county prosecutor offices, public safety (represented by officials from the West Virginia State Police, county sheriffs' offices, and municipal police departments), and school health (represented by the West Virginia Association of School Nurses). The state's interests in child welfare are represented by professionals from Child Protective Services, the Office of Maternal and Child Health, Behavioral Health Services, the Office of Epidemiology and Health Promotion, the Office of Social Services, the Department of Education, and the Division of Juvenile Services.

As Chief Medical Examiner, I can attest specifically to marked improvements in child death investigation conducted by my office as the result of initiatives born out of findings and insights developed and shared by various Team members over the past 10 years. Case-related data have been instrumental in changes to our policies and procedures that have expanded the scope and depth of all medical examiner child death investigations, especially those involving infants and young children, leading to more effective discovery and prosecution of crimes against children. Much more importantly, I am sure that each of the members of the Child Fatality Review Team would report that information gleaned from our multi-disciplinary review of child deaths has been invaluable in improving services provided by the various agencies represented around our table to the children and families living in our state.

To readers who have occasion to pick up this report, it is the fervent hope of the Child Fatality Review Team that the hard-won knowledge presented here will be useful to you in creating safer communities for our children.

James Kaplan, MD
Chief Medical Examiner
West Virginia Office of the Chief Medical Examiner

West Virginia Child Fatality Review Team

MISSION STATEMENT

The responsibility for the prevention and review of child fatality is not that of any individual or agency. It is the belief of the West Virginia Child Fatality Review Team that the death of a child deserves a comprehensive and multidisciplinary review. Our hope is that, through this review process, the number of preventable child fatalities will be reduced. Furthermore, we recognize that this review will lend to the improved delivery of services to the children and families of West Virginia.

ACKNOWLEDGMENTS

We wish to acknowledge the dedication and support of those who have been involved, past and present, with the child fatality review process in West Virginia since the inception of the process in 1994 and the formation of the Child Fatality Review Team in 1996. Many agencies and individuals have given of their time and talent as the Team has evolved over the last 13 years. Members of the Team, past and present, have served without recognition or compensation.

Executive Summary

In March 1996, the West Virginia Legislature passed House Bill 4474 mandating the creation of the West Virginia Child Fatality Review Team (WVCFRT). Then-Governor Gaston Caperton appointed the first members to the Team in December 1996. Funding was appropriated from the state Office of Social Services in 1998, at which time a part-time coordinator was hired. According to statute, the WVCFRT operates under the auspices of the West Virginia Office of the Chief Medical Examiner (WVOCME), with the Chief Medical Examiner acting as the chair of the Team and the part-time coordinator housed within that office. This report presents the findings of the WVCFRT from 1999-2004.

- A total of 1,506 children aged 0-17 died in West Virginia from 1999 through 2004. Of these deaths, 858 were infants under 1 year of age. Children aged 1-4 accounted for 126 deaths, those aged 5-9 for 111 deaths, those aged 10-14 for 150 deaths, and those aged 15-17 for 261 deaths. By gender, 867 of the children were male and 639 were female. By race, 1,390 were white, 87 were African American, and 27 were of other races. Nineteen were Hispanic.
- Natural deaths accounted for 1,011 of the deaths, 334 were the result of unintentional injury, 45 were suicides, 38 were homicides, and the manner for 78 was undetermined. All those deaths not classified as natural (as well as 118 natural deaths coded as sudden infant death syndrome [SIDS]) were reviewed by the Team as being potentially preventable.

SIDS

- From 1999-2004, there were 118 SIDS deaths in West Virginia. Of these, 60 were male and 58 were female; 110 were white, 7 were African American, and 1 was Asian. Over half (66 or 56%) of the deaths occurred among infants aged between 2 and 4 months.
- Only 34 of the infants who died from SIDS were known to be sleeping on their backs at time of death. Seventy-five of the infants had mothers who smoked during pregnancy, 58 of the deaths involved high-risk bedding (pillows, quilts, comforters, etc.), and 65 were known to be bed sharing with a parent or other individual. All the deaths occurred among infants born to mothers who were under 30 years of age.

Motor Vehicle Crashes

- A total of 237 children died as the result of a motor vehicle crash, either as a driver or passenger of a car, truck, ATV, or motorcycle or as a bicyclist or pedestrian. Males accounted for 147 of the fatalities, females for 90. Over half (125 or 53%) occurred among teenagers aged 15-17.
- Passenger cars, pickup trucks, or recreational vehicles were involved in 175 of the fatalities, with 149 of the deaths involving either the driver (89) or front seat passenger (60). Eight of the crash fatalities involved motorcycles. Only one-fourth (25%) of the deaths occurred when available restraints were in use.
- In West Virginia, 30 children ranging in age from 7 to 17 died from 1999-2004 as the result of an ATV accident, from a low of 1 death in 2001 to a high of 9 in 2003. Twenty-five of the children were male, 5 were female. Only 7 children were wearing helmets at the time of the accident.
- Six children died while riding a bicycle; only 1 was wearing a helmet. Twenty-six children died as the result of injuries received when struck by a motor vehicle, 12 males and 14 females.

Drowning

- There were 35 unintentional drowning deaths in West Virginia from 1999-2004, 27 males and 8 females. Fourteen of the children were aged 4 and under, 9 were aged 5-9, 2 were aged 10-14, and 10 were aged 15-17.
- Over half (51%) of the drowning deaths occurred in a creek or river.

Unintentional Fire Injury

- Twenty-two children died as the result of fire-related injury. One-half (11) of the deaths occurred among children aged 4 and under.

Airway Obstruction

- Airway obstruction, which includes suffocation, strangulation, and choking, accounted for 15 unintentional injury deaths among children from 1999-2004. All of the children were aged 4 and under. Wedging between a bed or couch and a wall or nightstand was the cause of 7, or nearly half, of the deaths.

Unintentional Poisoning

- Eight children died as the result of unintentional poisoning, 5 males and 3 females. Seven of the deaths involved teenagers aged 13-17 who had ingested lethal amounts of nonprescribed drugs and/or alcohol.

Other Unintentional Injury Deaths

- Four children died from an unintentional firearm injury, three deaths were the result of electrocution, and three children died from falls.
- Two children died as the result of sledding accidents. The remaining deaths of children in West Virginia from 1999-2004 occurred due to a logging accident, a crushing injury, unintentional starvation/dehydration, failure to obtain medical attention, and a home swing accident.

Suicide

- Forty-five children aged 10 to 17 committed suicide from 1999-2004. Over two-thirds (31) of the suicides were males, 14 were females.
- Over half (23) of the suicides were firearm-related, 15 were due to hanging/strangulation, and 7 were due to intentional poisoning.

Homicide

- There were 38 child homicides in West Virginia from 1999-2004, 23 males and 15 females. More than half (21) of the homicides involved children aged 4 and under, 6 involved children aged 5-14, and 11 involved children aged 15-17.
- Twenty-six deaths met the definition of child abuse or neglect. Seventeen of these homicides were committed by the child's parent, with fathers responsible for 10 deaths, mothers for 5 deaths, and an unspecified parent for 2 deaths. Five perpetrators were the mother's (or custodial grandmother's) boyfriend, with day care providers or babysitters responsible for 4 deaths.
- Of the 12 other homicides, siblings or peers of the child were responsible for 9, while 3 perpetrators were unknown. Ten of the homicides that were not the result of child abuse occurred among teenagers aged 15 through 17, with firearms the weapon most often used.

Undetermined Deaths

- There were 78 child deaths from 1999-2004 for which the manner of death was undetermined. Forty-eight of these children were male, 30 were female. The majority of the deaths (53) occurred among infants less than 1 year of age. Of these, 48 were classified as Sudden, Unexplained Infant Deaths (SUIDs). Eighteen deaths occurred among children aged 1-14, and 7 involved teenagers aged 15-17.
- The causes of death among those fatalities with undetermined manner that were not classified as SUIDs included drowning, fire/soot and smoke inhalation, firearms, drugs and alcohol, and other medical and nonmedical-related mortality.

WVCFRT RECOMMENDATIONS FOR AGENCIES AND POLICYMAKERS

2007

SIDS/SUIDs

- The West Virginia Department of Health and Human Resources, Office of the Secretary, will develop a standard state policy on the components of education on infant safe sleep practices within six months. This will include input from the Women, Infants and Children Program, the Right from the Start Program, the 0-3 Program, the West Virginia Academy of Pediatrics, birth hospitals, and Child Protective Services (CPS).
- The WVOCME will include new data collection elements in the scene investigation tool to ascertain the availability and use of cribs on all Sudden, Unexplained Infant Death (SUID) death scenes and sleep data elements within three months.
- The West Virginia Bureau for Public Health (WVBPH) should develop a prenatal smoking cessation program in coordination with the West Virginia Lung Association, March of Dimes, and others to be determined.
- The West Virginia Tobacco Prevention Program should coordinate with the WV Office of Maternal and Child Health (MCH), birth hospitals, and MCH providers to develop SIDS/SUID risk information into education, prevention, and cessation efforts.
- WVBPH/MCH should coordinate efforts with the Perinatal Wellness Summit to provide SIDS/SUID prevention information at the Summit.
- The West Virginia Legislature should fund intensive home visitation for all eligible first-time parents whose income is at 300% of the federal poverty level by March 2008.

Motor Vehicle Crashes

- The West Virginia Legislature should enact primary seat belt enforcement for all passengers by March 2008.
- The West Virginia Legislature should pass a comprehensive ATV law to:
 1. Require registration of all ATVs
 2. Prohibit registration to persons with revoked driver's licenses
 3. On public lands, prohibit drivers under the age of 14; children aged 15-17 must pass an ATV safety course to drive on public land
 4. Prohibit the use of ATVs on paved, public roads

Motor Vehicle Crashes (cont'd.)

- The WVBPH, in collaboration with the Department of Education, will work to incorporate the National Fire Prevention Association's *Risk Watch* curricula on motor vehicle safety and bike and pedestrian safety in schools throughout the state, as well in community education conducted by other organizations and agencies in the state that address issues of child safety.

Unintentional Injury Deaths

- The WVCERT should conduct an assessment throughout the state of ordinances relating to public and private pool safety and assess national models for swimming pool safety regulations and practices.
- The WVBPH, in collaboration with the Department of Education, will work to incorporate the National Fire Prevention Association's *Risk Watch* curricula in schools throughout the state, as well in community education conducted by other organizations and agencies in the state that address issues of child safety. The *Risk Watch* modules include:
 - fire and burn prevention
 - choking, suffocation, and strangulation prevention
 - poisoning prevention
 - falls prevention
 - firearms injury prevention
 - water safety

Suicide/Homicide

- The West Virginia Legislature should fund intensive home visitation for all eligible first-time parents whose income is at 300% of the federal poverty level by March 2008.
- The Bureau for Children and Families and the West Virginia State Police should establish a multidisciplinary team of physicians to provide consultation throughout the state for children presenting with suspected inflicted injuries within a year of this report's release.
- The WVCERT will facilitate a statewide assessment to identify the current status and effectiveness of the child abuse multidisciplinary death investigative teams (MDITs) throughout the state and develop strategies to improve the functioning of all MDITs by the end of 2007.

Recommendations for the Child Death Review Process

Recommendations for Membership

- Amend the WVCFRT legislation such that, if the Governor does not make an appointment to the Board within six months of a member's vacancy or expiration of a term, the Chair of the WVCFRT shall have the ability to appoint interim members, pending formal appointment by the Governor.
- Amend the WVCFRT legislation to include additional memberships: a rotating pediatric resident, a representative from the Office of Emergency Services, a practitioner specializing in children's mental health, and county law enforcement.
- Work with the West Virginia State Police to have better law enforcement representation.

Recommendations for Access to Records

- Obtain access to educational records.
- Review federal language concerning substance abuse treatment records.
- Obtain all law enforcement and toxicology records before each meeting, regardless of whether or not law enforcement personnel attend.
- Conduct increased agency follow-up with personnel directly connected to the death for clarification of information available in death records. Create a tool to remind team members of their assignments.

Recommendations for Case Review Outcomes

- Form subcommittees to bring in additional people and complete more issue briefs on specific topics.
- Provide training on the WVCFRT to CPS workers, law enforcement personnel, and others; update former training for WVCFRT members.
- Use information provided through the reviews to advocate for improved child death investigations from the perspective of law enforcement.

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INTRODUCTION

In June of 1994, a group of concerned professionals from multiple disciplines throughout the state began to meet on a monthly basis to discuss and review cases of child fatality in West Virginia. It was through this informal process that the need became evident for a statewide uniform process for the review and investigation of every child fatality in West Virginia. In March 1996, the West Virginia Legislature passed House Bill 4474 mandating the creation of the West Virginia Child Fatality Review Team (WVCFRT). Then-Governor Gaston Caperton appointed the first members to the Team in December 1996.

Without funding or staff support, the Team struggled to fill its mandate for two years. Funding was appropriated from the state Office of Social Services in 1998, at which time a part-time coordinator was hired. A data collection tool was developed for the Team by the state Health Statistics Center, and the Team began reviewing cases in late 1998.

WVCFRT Membership. According to statute, the WVCFRT operates under the auspices of the Office of the Chief Medical Examiner (OCME), with the state Chief Medical Examiner acting as the chair of the Team and the part-time coordinator housed within that office. Other mandated members of the Team include:

- two prosecuting attorneys or their designees;
- the state superintendent of the West Virginia State Police or his or her designee;
- one law enforcement official other than a member of the State Police;
- one Child Protective Services (CPS) worker currently employed in investigating reports of child abuse or neglect;
- one physician specializing in the practice of pediatric or family medicine;
- one physician specializing in the practice of pediatric critical care medicine;
- one social worker who may be employed in the area of public health;
- the director of the Office of Maternal, Family and Child Health (OMFCH) of the Department of Health and Human Resources (DHHR) or his or her designee;
- one representative of the Sudden Infant Death Syndrome Program in OMFCH;
- the director of the Division of Children's Mental Health Services of the Office of Behavioral Health Services or his or her designee;
- the director of the Office of Social Services of DHHR or his or her designee;
- the superintendent of the Department of Education or his or her designee;
- the director of the Division of Juvenile Services or his or her designee; and
- the president of the West Virginia Association of School Nurses or his or her designee.

Review Procedure. Death certificates for all West Virginia residents aged 0-17, as well as birth certificates for infants under the age of 1, are sent to the OCME from the state Vital Registration Unit within the Health Statistics Center on a monthly basis. All

deaths are initially reviewed by the Chief Medical Examiner and the WVCFRT coordinator (including any CPS records) and divided into (1) natural deaths (excluding SIDS) not slated for full review and (2) those deaths chosen for full review, i.e., that appear to have been preventable. A death is defined as preventable by the Team if the community or an individual could reasonably have done something that would have changed the circumstances leading to the death.

Following the initial review, the certificates of all deaths are distributed to the team members listed above, with a request for their consideration and input concerning those marked as chosen for full review. Sources of information available from team members include autopsy reports, medical records, law enforcement records, school attendance records, behavioral health records, emergency medical system records, and records from CPS. Each member who has relevant records or other information about a death provides that information at the next monthly team meeting. A full review of each death is conducted at that time, with recommendations made as to how to prevent similar deaths in the future.

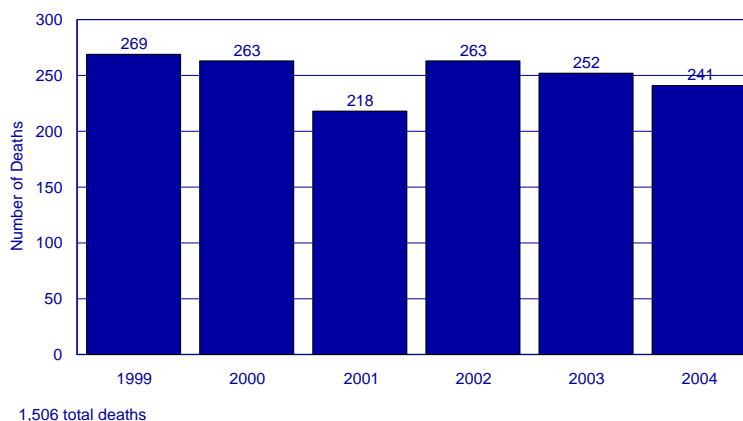
This report presents the findings and recommendations of the WVCFRT on 1,506 child deaths occurring from 1999 through 2004. Of these, 613 were considered at initial review to be potentially preventable and given a full review by the WVCFRT. This initial report of the findings and recommendations of the WVCFRT on child mortality in the State of West Virginia over those six years will be presented to the Governor and the West Virginia Legislature and will be made available to all those individuals and agencies interested in preventing the tragedy of preventable child death.

I. FINDINGS OF THE WEST VIRGINIA CHILD FATALITY REVIEW TEAM

Demographics

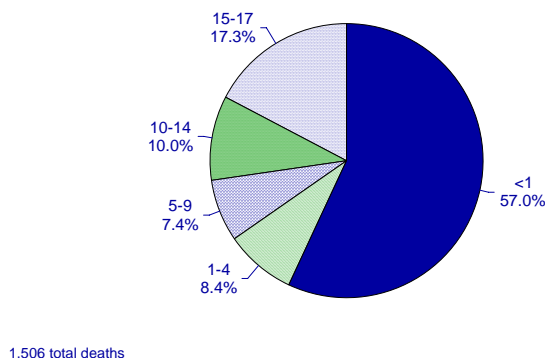
A total of 1,506 children aged 0-17 died in West Virginia from 1999 through 2004, an average of 251 children each year over the six-year period¹. The overall death rate for the six-year period was 64.2 deaths per 100,000 children, compared with a national rate of 64.1. As shown in Figure 1, the number of deaths ranged from a high of 269 deaths reported in 1999 to a low of 218 in 2001.

**Figure 1. Number of Child (Ages 0-17) Deaths by Year
West Virginia, 1999-2004**



The majority of child deaths from 1999-2004 occurred among infants aged less than 1 year. Of the 1,506 deaths, 858 or 57.0% were infants under 1 year of age. Children aged 1-4 accounted for 126 deaths (8.4%), those aged 5-9 for 111 deaths (7.4%), those aged 10-14 for 150 deaths (10.0%), and those aged 15-17 for 261 (17.3%). Figure 2 illustrates the distribution of child deaths by age group over the time period.

**Figure 2. Distribution of Child Deaths by Age
West Virginia, 1999-2004**

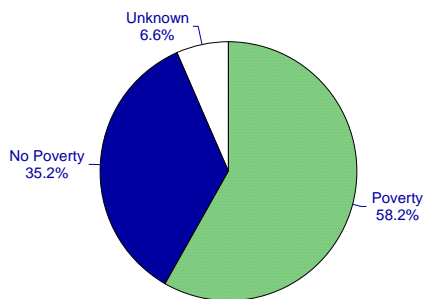


¹ There were 208 child deaths over the period that occurred out of state for which records were not received by the WVCERT and therefore not included in this report.

By gender, 867 of the children were male and 639 were female. Ninety-two percent (92.3% or 1,390) of the total fatalities were white, while 5.8% (87) were African American, 1.8% (27) were of other races; the race of 2 children was unknown. Nineteen (1.3%) were Hispanic.

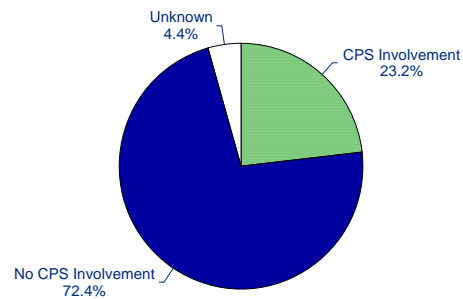
Nearly 6 out of 10 children (58.3%) who died between 1999 and 2004 lived with families whose incomes were at or below the federal poverty level² (Figure 3). Nearly 1 in 4 (23.2%) lived in families that had current or prior involvement with Child Protective Services (CPS)³ (Figure 4).

**Figure 3. Child Deaths by Poverty Status* of Family
West Virginia, 1999-2004**



*Family income at or below federal poverty level
1,506 total deaths

**Figure 4. Child Deaths by Family's CPS* Involvement
West Virginia, 1999-2004**

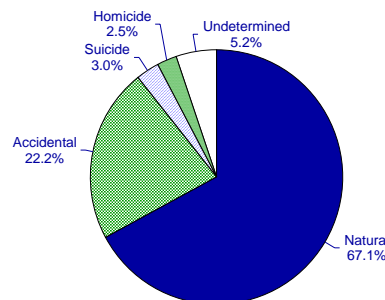


*Child Protective Services
1,506 total deaths

Manner of Death

The distribution of deaths from 1999-2004 by manner of death is illustrated in Figure 5. Natural deaths accounted for two-thirds (67.1%) of the mortality, 1,011 deaths out of the total of 1,506. Of the natural deaths, 118 were classified as SIDS (Sudden Infant Death Syndrome) and were reviewed by the WVCFRT. Over 1 in 5 child deaths (334 or 22.2%) were the result of unintentional injury, while 38 were homicides and 45 were suicides. The manner for 78 deaths, or 5.2% of the total, was undetermined. In all, 613 deaths were reviewed by the WVCFRT.

**Figure 5. Distribution of Child Deaths by Manner of Death
West Virginia, 1999-2004**



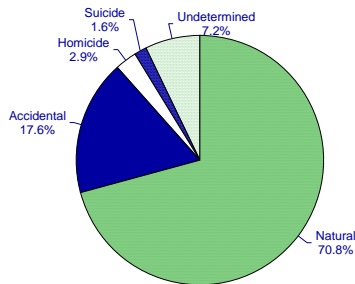
1,506 total deaths

² As determined by the family receiving Medicaid assistance at the time of the child's death.

³ Involvement with CPS is defined as the child or someone in the child's family having been reported to and investigated by CPS at some time prior to the child's death.

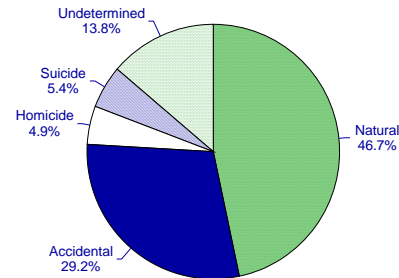
The distribution of deaths by manner of death and poverty status differed little from the overall distribution by manner of death (Figure 6). Among those deaths of children from families with CPS involvement, however, only 47% were determined to be from natural causes, while nearly 30% were accidental, over 5% were suicides, and nearly 5% were the result of homicide (Figure 7).

**Figure 6. Child Deaths with Family Poverty* by Manner of Death
West Virginia, 1999-2004**



*Family income at or below federal poverty level
877 total deaths

**Figure 7. Child Deaths with CPS* Involvement by Manner of Death
West Virginia, 1999-2004**



*Child Protective Services
349 total deaths

Causes of Non-Natural Deaths by Manner of Death

Table 1 presents the 495 non-natural deaths among children aged 0-17 from 1999-2004 by cause of death and manner of death, i.e., accidental, suicide, homicide, or undetermined. SUIDs are sudden, unexplained infant deaths, a category that includes those deaths classified as SIDS after a thorough investigation has been completed and all other causes have been eliminated. SIDS deaths, however, are considered to be natural deaths and are therefore not included in Table 1. The 48 SUIDs remaining after the 118 SIDS deaths from 1999-2004 were excluded are presented here as infant deaths of undetermined cause. (See page 37 for a further explanation of SUIDs.)

Table 1. Non-Natural Deaths among Children by Cause and Manner West Virginia, 1999-2004					
Cause	Manner				
	Accidental	Suicide	Homicide	Undetermined	Total
Motor Vehicle	237	0	1	0	238
Drowning	35	0	1	2	38
Fire/Burns	22	0	4	9	35
Strangulation/Suffocation	15	15	4	0	34
Poisoning	8	7	0	5	20
Firearm	4	23	13	2	42
Electrocution	3	0	0	0	3
Falls	3	0	0	0	3
Head Injury/SBS*	0	0	12	0	12
Other	7	0	3	12	22
SUID**	0	0	0	48	48
Total	334	45	38	78	495

* Shaken Baby Syndrome **Sudden, Unexplained Infant Death

II. Sudden Infant Death Syndrome

Sudden Infant Death Syndrome (SIDS) is defined as the sudden, unexpected death of an infant under the age of 1 that remains unexplained after a thorough investigation, including a complete autopsy with normal findings, an investigation of the scene, and a review of the medical history. SIDS is a diagnosis of exclusion, meaning that all other possible causes of death must be ruled out before the diagnosis is made⁴. SIDS deaths in the United States have declined significantly since 1990, from 5,417 in that year (a rate of 1.3 deaths per 1,000 live births) to 2,246 (a rate of 0.55) in 2004.

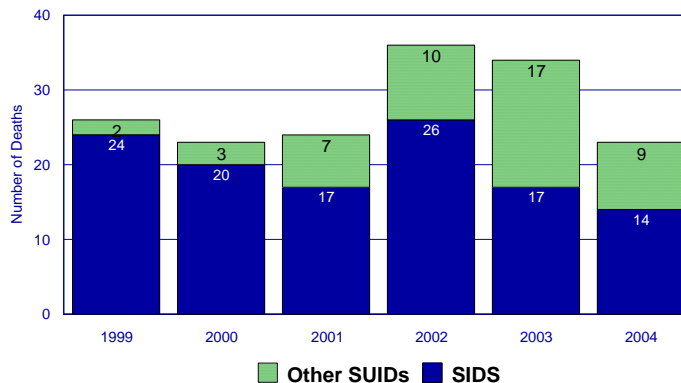
WVCFRT Data

From 1999 through 2004, there were 118 deaths from SIDS in West Virginia. Of these, 60 were male and 58 were female; 110 were white, 7 were African American, and 1 was Asian. Annual SIDS deaths ranged in number over the six years from a high of 26 in 2002 to a low of 14 in 2004 (Figure 8). In addition, there were 48 other sudden, unexplained infant deaths (SUIDs) over the time period, as depicted in Figure 8. These deaths, which could not be classified as SIDS, are discussed on page 37.

WVCFRT Case

A six-week-old baby girl was sleeping in an adult bed between both of her parents. There were two adult pillows, a blanket, and a comforter on the bed. When the parents awoke in the morning, they found the baby with her face turned into the pillow. She was not breathing.

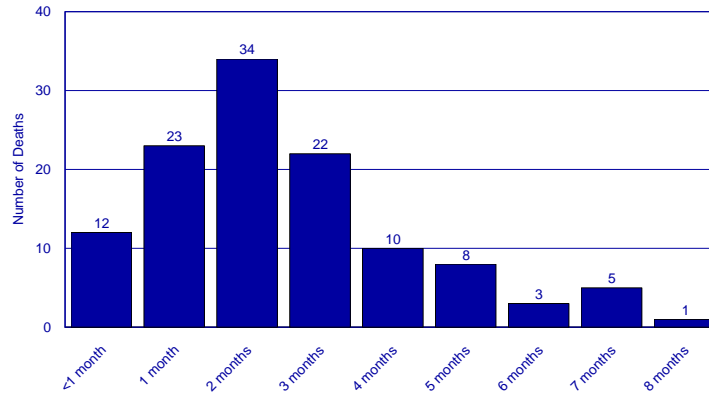
Figure 8. SIDS/Other Sudden Unexplained Infant Deaths by Year
West Virginia, 1999-2004



⁴ Since 2005, a decrease in the incidence of SIDS with a concomitant increase in the incidence of Sudden, Unexplained Infant Death (SUID) has occurred due to changing patterns of diagnostic nomenclature employed by the West Virginia OCME, pursuant to recommendations by the National Association of Medical Examiners (1).

Figure 9 shows the 118 deaths by age in months. Nationally, the majority of SIDS deaths occur among infants aged 2 to 4 months; 66 (55.9%) of state SIDS deaths occurred at these ages.

**Figure 9. SIDS Deaths by Age at Death in Months
West Virginia, 1999-2004**



The major risk factors for SIDS are listed below. The WVCFRT was able to examine the prevalence of the majority of these risk factors in reviewing the state's SIDS deaths.

Major Risk Factors for SIDS

- ▶ **Sleeping on stomach or side**
- ▶ **Prenatal smoking and exposure to secondhand smoke after birth**
- ▶ **Co-sleeping with others, particularly adults**
- ▶ **Soft bedding and other pillowlike items**
- ▶ **Overheating and use of heavy bedding**
- ▶ **Preterm birth and low birthweight**
- ▶ **Younger maternal age**

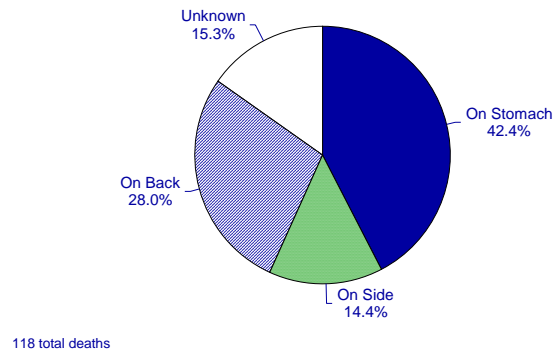
--National MCH Center for Child Death Review

Sleeping Position

Sleeping on the stomach or side has been recognized as a major risk factor for SIDS for many years. The national "Back to Sleep" campaign, begun in 1994 by the American Academy of Pediatrics (AAP) and the National Institutes of Health, has been credited for much of the decline in SIDS in the United States over recent years. According to the National Infant Sleep Position Study, the percentage of infants placed in

a prone position⁵ to sleep has decreased from 70.1% in 1992 to 12.8% in 2005 (2). However, the message to put babies to sleep on their backs has not yet reached everyone; despite the efforts of physicians and public health officials to educate parents about safe sleeping positions, 67 of the state's 101 infants who died from SIDS from 1999-2004 with a known sleep position were not sleeping on their backs when they died. Figure 10 illustrates the distribution of SIDS deaths by sleeping position.

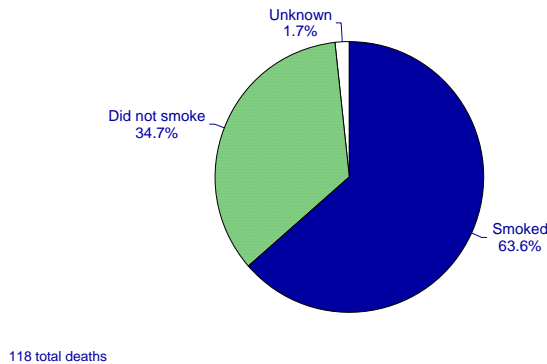
Figure 10. SIDS Deaths by Position at Time of Death
West Virginia, 1999-2004



Maternal Smoking

According to the Surgeon General's Report for 2004, "babies whose mothers smoke before and after birth are three to four times more likely to die from SIDS" (3).

Figure 11. SIDS Deaths by Maternal Smoking during Pregnancy
West Virginia, 1999-2004



Research has shown that the link between SIDS and maternal smoking remains strong even after controlling for maternal age, birth order, and birthweight. West Virginia has traditionally had a high prevalence of smoking among its adult population, including pregnant women. Data collected by the WVCERT indicate that 63.6% of the SIDS deaths from 1999-2004, or 75 deaths, were associated with maternal smoking during pregnancy (Figure 11).

FACT: Sixty-four percent (63.6%) of the SIDS deaths in West Virginia between 1999 and 2004 were associated with maternal smoking. In 2004, 26.8% of mothers in West Virginia reported smoking during pregnancy, compared with 10.2% of mothers nationwide.

--WV Health Statistics Center

⁵ Prone position is calculated as the sum of (1) on stomach with head face down and (2) on stomach with head turned to the side.

Unsafe Sleeping Environment

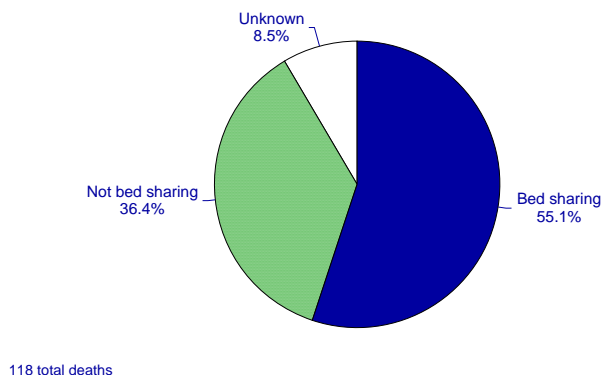
Unsafe sleeping environments include surfaces not designed for infants, bedding that is too soft or heavy, and bed sharing, i.e., sharing the same sleeping surface with other individuals. The AAP issued recommendations in 2005 concerning sleeping environments (1); these are listed in the box below.

AAP Recommendations on Infant Sleep Environment

- Infants should be put to sleep on a firm sleep surface without pillows, quilts, comforters, or sheepskins.
- Soft objects including stuffed animals and loose bedding should be kept out of the crib. Bumper pads should be thin, firm, well secured, and not “pillowlike.”
- Overheating is a risk; overbundling should be avoided, and the infant should not feel hot to the touch.
- A separate but proximate sleeping environment for the infant is recommended. While the risk of SIDS is reduced when the infant sleeps in the same room as its mother, the AAP task force concluded that evidence is growing that bed sharing (also called co-sleeping) is more hazardous than the infant sleeping on a separate surface and so recommends that infants not bed share.

The WVCFRT questionnaire contains several questions concerning the infant’s sleeping environment. From 1999-2004, information on bedding was collected for 88 of the 118 SIDS deaths, of which 58 (65.9%) involved high-risk bedding.

Figure 12. SIDS Deaths by Bed Sharing
West Virginia, 1999-2004



From 1999-2004, information on bedding was collected for 88 of the 118 SIDS deaths, of which 58 (65.9%) involved high-risk bedding. “Pillow” or “pillows” were terms used to define the bedding in 30 of the 58 deaths involving high-risk bedding. Nine deaths occurred when the infant was sleeping on a couch, sofa, or recliner. The bedding for the remaining 19 deaths for which the bedding was noted was described as soft, plush,

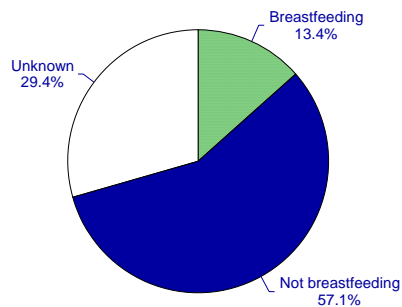
or blankets. Whether or not the infant was bed sharing was noted for 108 of the SIDS deaths (Figure 12). Sixty-five of these deaths involved bed sharing.

Breastfeeding

The relationship between breastfeeding and SIDS is not clear; what is clear is that babies who are breastfed are less likely than those who are formula fed to die from SIDS. The reasons for the lower risk are under debate, with some researchers attributing it to

other factors that often accompany a mother's decision to breastfeed, e.g., higher education, better prenatal care, being less likely to smoke, etc. Whatever the mechanism, several studies have found that breastfed infants are less likely to die from SIDS. The New Zealand Cot Death Study, a case-control study of 485 SIDS infants and 1,800 control infants, found a significantly lower rate of SIDS among breastfed infants than among formula-fed infants (4).

**Figure 13. SIDS Deaths by Breastfeeding Status
West Virginia, 1999-2004**



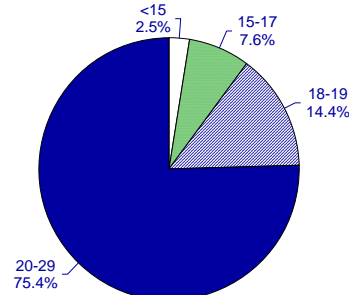
118 total deaths

The WVCFRT collected information on breastfeeding for 84 of the 118 SIDS deaths (Figure 13). Of these, only 16 had been breastfed. Breastfeeding status was unknown for 34 of the infants.

Maternal Age

There were no SIDS deaths in West Virginia from 1999-2004 among infants born to mothers aged 30 and older. Figure 14 shows the distribution of SIDS deaths by maternal age. Three-fourths (89) of the deaths were to infants of mothers aged 20-29, 17 had mothers aged 18-19, and 12 had mothers aged 17 and younger.

**Figure 14. SIDS Deaths by Maternal Age
West Virginia, 1999-2004**

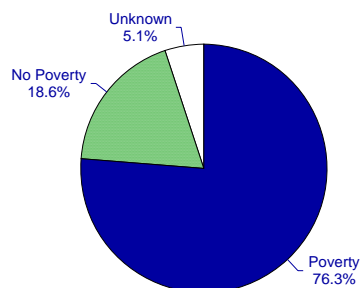


118 total deaths

Poverty Status and CPS Involvement

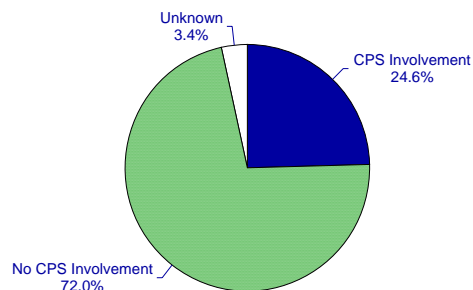
As Figures 15 and 16 on the following page show, over three-fourths (76.3%) of the 118 SIDS deaths from 1999-2004 in West Virginia occurred in families with incomes at or below the federal poverty level at the time of the infant's death. Nearly 1 in 4 (24.6%) of the deaths involved families who had current or prior CPS involvement.

**Figure 15. SIDS Deaths by Poverty Status of Family*
West Virginia, 1999-2004**



*Family income at or below federal poverty level
118 total deaths

**Figure 16. SIDS Deaths by CPS* Involvement
West Virginia, 1999-2004**



*Child Protective Services
118 total deaths

West Virginia and United States SIDS Rates

West Virginia's rates of SIDS have consistently exceeded the national rates over the six years from 1999-2004, as shown in Table 2 below. The gap has lessened, however, over the period, from a rate that was 78% higher than the national rate in 1999 (1.16 deaths per 1,000 live births vs. 0.66 deaths) to one that was 22% higher (0.67 deaths per 1,000 live births vs. 0.55 deaths) in 2004. Because of the small numbers of events, the state rates should be interpreted with caution.

Table 2. Rate* of SIDS Deaths by Year West Virginia and United States, 1999-2004			
	WV Number	WV Rate**	US Rate
1999	24	1.16	0.66
2000	20	0.96	0.62
2001	17	0.83	0.55
2002	26	1.25	0.57
2003	17	0.81	0.52
2004	14	0.67	0.55

*Rate is number of deaths per 1,000 live births.

**Rates based on 20 or fewer deaths may be unstable. Use with caution.

III. Motor Vehicle Crashes

WVCFRT Case

A 17-year-old male was an unrestrained driver in a single-vehicle crash. The teen had been drinking alcohol and was speeding. He lost control of the car and struck an embankment, which caused the car to roll. The driver was ejected and died at the scene of massive head trauma.

Motor vehicle crashes are the leading cause of unintentional injury, or accidental, mortality among children aged 0-17 in both West Virginia and the United States. Improper or no restraint use is the biggest risk factor in motor vehicle death among children under the age of 16. Child safety seats should be used until age 5, after which the American Academy of Pediatrics (AAP) recommends the use of booster seats until the child reaches a size (4'9" and 80-100 pounds, usually between the ages of 8 and 12) where the lap

and shoulder belts fit properly. It is estimated by Safe Kids USA that only about 19% of children who should be restrained in booster seats actually use them (5). Among older children, seatbelt use has been shown to have increased over the 15 years that the Youth Risk Behavior Surveillance System (YRBSS)⁶ conducted by the U.S. Centers for Disease Control and Prevention (CDC) has been monitoring the behavior. In 1991, 74% of students in grades 9 through 12 reported wearing a seatbelt; this percentage had risen to 90% by 2005 (6).

Major Risk Factors for Motor Vehicle Deaths Children under 16

- ▶ Not using or improper use of seatbelts or child restraints
- ▶ Not wearing helmets while riding bicycles, ATVs, or other recreational vehicles
- ▶ Riding in truck beds
- ▶ Riding recreational vehicles (ATVs, snowmobiles, jet skis, dirt bikes, etc.) without proper training or supervision
- ▶ Riding in the front seat of vehicles
- ▶ Playing in or around vehicles or streets without supervision

--National MCH Center for Child Death Review

The highest crash rates per mile driven are among drivers aged 16, the result of lack of driving experience and maturity (7). A recent study by the University of North Carolina found that almost 70% of 16-year-old drivers involved in motor vehicle crashes were at fault, with speeding indicated in 17% of the crashes (8). The risk of a crash increases when there are passengers in the car with a young inexperienced driver. Among 16-year-olds, having one teen passenger increased the risk of a crash-related

⁶ The YRBSS includes a national school-based survey conducted by the CDC as well as state and local school-based surveys conducted by education and health agencies.

fatality by 39%, with the risk increasing to 86% with two passengers and 182% with three or more (8). The risk increases even more among 17-year-old drivers: one teen passenger increases the risk of a fatal crash by 48%, two increase it by 158%, and three or more by 207%.

In 2000, the West Virginia Legislature passed legislation establishing a graduated driver's license system. In this three-level system, a person aged 15 or older may be issued a level-one instruction permit. Driving under the level-one permit has the following conditions: the driver may only operate a motor vehicle if he/she is under the direct supervision of a licensed driver aged 21 or older,

FACT: In the United States, 40% of all teen deaths are the result of motor vehicle crashes.

FACT: Teens are less likely to wear seatbelts than other drivers.

--Child Trends DataBank

FACT: When properly installed, child safety seats reduce fatalities by 71% among children under the age of 1 and by 54% among toddlers aged 1-4.

FACT: It is estimated that 82% of child safety seats are not installed and used correctly.

--Safe Kids USA

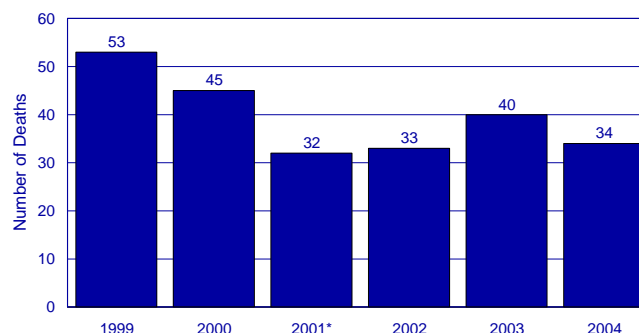
maintains school enrollment, and drives between 5:00 am and 11:00 pm. Only two additional passengers (excepting family members) are permitted. The level-two license allows the driver to drive unsupervised between 5:00 am and 11:00 pm (with some exceptions, such as going to and returning from work), as long as there is current school enrollment, no alcohol use, and no more than three passengers under the age of 19 (excepting family members). The level-three, full Class E license accords full driving privileges and

may be obtained at age 17 after driving with the level-two license for 12 months with no convictions or at age 18.

WVCFRT Data

From 1999 through 2004, a total of 237 children aged 0-17 died in West Virginia as the result of a motor vehicle crash, either as a driver, passenger, bicyclist, or pedestrian, 147 males and 90 females. By year, the number of motor vehicle fatalities ranged from a high of 53 reported in 1999 to a low of 32 in 2001 (Figure 17). A decrease in fatalities can be noted following the establishment of the graduated driver's license system in 2000.

**Figure 17. Motor Vehicle Deaths among Children by Year
West Virginia, 1999-2004**



*First full year following establishment of graduated driver's license system

Table 3 shows the breakdown of motor vehicle fatalities over the six-year period by age and gender. Among children under the age of 15, 28 were aged 1-4, 32 aged 5-9, and 52 were aged 10-14. Among children aged 15 through 17, 125 deaths occurred, with males over twice as likely to die as females.

Table 3. Motor Vehicle Fatalities among Children by Age and Gender West Virginia, 1999-2004			
Age	Male	Female	Total
0-4	17	11	28
5-9	13	19	32
10-14	33	19	52
15-17	84	41	125
Total	147	90	237

**Major Risk Factors for Motor Vehicle Deaths
Children 16-17**

- ▶ Driver inexperience or recklessness
- ▶ Riding in truck beds
- ▶ Riding in a car with two or more teenage passengers or with a new teen driver
- ▶ Exceeding safe speeds for driving conditions
- ▶ Not using appropriate restraints
- ▶ Using alcohol while driving or riding with a driver who is under the influence
- ▶ Driving between 12 midnight and 6:00 am

--National MCH Center for Child Death Review

Type of Vehicle/Position in Vehicle

The breakdowns of motor vehicle fatalities by type of vehicle involved and position in the vehicle are presented in Tables 4 and 5.

Table 4. Motor Vehicle Fatalities among Children by Type of Vehicle Involved West Virginia, 1999-2004		
Type of Vehicle Involved	Number	Percentage
Passenger car	146	61.6
Pickup truck	26	11.0
Recreational vehicle	3	1.3
Motorcycle	8	3.4
Bicycle	6	2.5
3 or 4 wheeler (ATV)	30	12.7
Train	1	0.4
Aircraft	1	0.4
Unknown	16	6.8
Total	237	100.0

Table 5. Motor Vehicle Fatalities among Children by Position in Vehicle West Virginia, 1999-2004		
Position in Vehicle	Number	Percentage
Driver	89	37.6
Front passenger	60	25.3
Rear left	17	7.2
Rear middle	8	3.4
Rear right	8	3.4
Rear of station wagon	1	0.4
Rear of truck bed	2	0.8
Other	21	8.9
Unknown	31	13.1
Total	237	100.0

Restraint Use

Ninety of the 237 motor vehicle fatalities involved vehicles that did not have restraints or for which restraint use or availability was unknown. Table 6 shows the status of restraint use among the 147 children for whom restraints were available and use status was noted. In over one-half (55.1%) of these deaths, restraints were available but not used.

Table 6. Motor Vehicle Fatalities among Children by Restraint Use West Virginia, 1999-2004		
Type of Restraint	Number	Percentage
Lap Belt	5	3.4
Lap and Shoulder Belt	42	28.6
Child Safety Seat	12	8.2
Air Bag	7	4.8
Not Used	81	55.1
Total	147	100.0

Driver Activity

Impaired driving was noted for 21 of the deaths due to motor vehicle accidents from 1999-2004, 13 attributed to alcohol, 1 to drugs, 5 to a combination of drugs and alcohol, and 2 to unknown substance abuse. According to 2005 YRBSS data, 28% of high school students in West Virginia reported that they had ridden with a driver who had been drinking alcohol one or more times during the 30 days preceding the survey (9). Ten percent (9.9%) admitted that they had driven when drinking alcohol one or more times in the preceding 30 days.

Looking at overall driver activity, only 31 of the deaths were the result of an accident involving no improper driving. Nearly one-half (111 or 46.8%) involved hazardous moving violations, while 50 involved unspecified improper driving.

Object Impacted and Roadway Surface

The object impacted by the vehicle involved in the accident was noted for 172 of the 237 deaths. Ninety-two of these deaths occurred when the vehicle involved struck another vehicle, 43 when the vehicle hit a tree, and 37 when the vehicle struck another object. Forty-nine of the deaths occurred when the roadway was wet or icy, and 134 happened on a dry roadway. Loose gravel was involved in 4 of the deaths, while roadway surface was unknown or not applicable for the remaining 50 deaths.

All-Terrain Vehicles (ATVs)

The AAP reports that 44,700 children under the age of 16 were sent to emergency rooms in 2004 with ATV-related injuries, with 130 deaths nationwide (10). These 130 deaths represented 28% of total deaths (all ages) due to ATV injuries in that year. According to data from the Consumer Product Safety Commission (CPSC), there was an average of 124 ATV-related deaths among children each year from 1999-2004 (10). The AAP's Committee on Injury, Violence and Poison Prevention has called for stricter restrictions on children operating or riding on ATVs, stating that "Children lack the strength, coordination, and judgment needed to operate ATVs and other off-road vehicles." Included in the AAP's recommendations is that children under the age of 16 should not operate any motorized off-road vehicle. Other recommendations include:

FACT: West Virginia leads the nation in the rate of ATV mortality. In 2004, the overall state rate of ATV-related fatality was 1.8 deaths per 100,000 population, compared with 0.3 in the nation as a whole.

--WV Health Statistics Center

WVCFRT Case

A 15-year-old girl was the driver of a Honda ATV with a male passenger on board. She was traveling at a high rate of speed on a dirt road and lost control of the vehicle. The ATV rolled twice and threw both occupants. The girl suffered severe head injuries and died. Neither rider was wearing a helmet or other protective gear.

- A driver's license should be required to operate an ATV.
- Carrying passengers on an ATV should be prohibited.
- All off-road vehicles should be redesigned with additional safety features such as roll bars and seatbelts.
- Alcohol use should be prohibited.

The majority of ATV-related deaths are the result of spinal cord and head injuries. Central nervous system injuries account for approximately 80% of fatalities in ATV-related crashes (11). Helmets are

estimated to reduce the risk of death by 42% (12). As of 2006, the West Virginia Legislature mandated that all ATV riders under 18 must wear helmets at all times. In addition, all riders under 18 must complete a rider safety course. No passengers are permitted except if the ATV is designed for a passenger or if the passenger is at least 18 and the operator is at least 18 and has a driver's license.

Major Risk Factors for ATV-Related Mortality

- ▶ No helmet use
- ▶ Lack of physical size, strength, and coordination to operate an ATV
- ▶ Operating an ATV larger than that recommended for size and age
- ▶ Operating on public roads, streets, and highways
- ▶ Riding with a passenger
- ▶ Poor judgment; risk-taking behavior
- ▶ Operating a three-wheeled ATV

--National MCH Center for Child Death Review

WVCFRT Data

In West Virginia, 30 children died from 1999-2004 as the result of an ATV accident. By year, the number of fatalities ranged from a low of 1 in 2001 to a high of 9 in 2003. Twenty-five (83.3%) of the children were male; 5 (16.7%) were female. Seven children (23.3%) were wearing helmets at the time of the accident; 23 (76.7%) were not wearing helmets. Two children were under the age of 10, 12 were 10-14, and 16 were 15-17. The youngest driver fatality was 7 years old, while the youngest passenger to die was 8 (Table 7).

**Table 7. Child ATV Deaths by Driver/Passenger Status and Age
West Virginia, 1999-2004**

	Total Deaths (#)	Drivers' Ages	Passengers' Ages
1999	4	15, 16, 16	11
2000	4	12, 13	13, 16
2001	1	15	
2002	7	12, 13, 13, 14, 15, 17	13
2003	9	7, 13, 14, 15, 16, 16, 17	8, 10
2004	5	15, 16, 16, 17, 17	
Total	30		

Bicycle-Related Fatalities

Bicycles account for more childhood injuries than any other consumer product but the car. Collisions with motor vehicles account for approximately 90% of all bicycle-related deaths nationwide (13); more than 80% of fatal crashes are the result of the bicyclist's behavior, e.g., running a stop sign or swerving into traffic. Head injury is the leading cause of death in bicycle accidents and is responsible for more than 60% of bicycle-related mortality. Wearing a bicycle helmet is the single most effective way to prevent bicycle-related injury and death. Studies have shown that bicycle helmets reduce the risk of head injury by as much as 85% (14). Nationally, however, 83% of older children (students in grades 9 through 12) reported in 2005 that they rarely or never wore a helmet while riding a bicycle (9).

WVCFRT Data

Six of West Virginia's children died between 1999 and 2004 after being struck by a motor vehicle while riding a bicycle. Four of the fatalities were male; 2 were female. Five of the children were aged 10-14, while 1 was 17. Although West Virginia law requires that riders under the age of 14 wear a bicycle helmet, only 1 child was wearing a helmet at the time of the incident.

Pedestrian Fatalities

According to Safe Kids USA, pedestrian injury is the second leading cause of unintentional injury mortality among children aged 5-14 (15). Children aged 4 and under are at the highest risk for death, accounting for more than 40% of all pedestrian injury mortality and 80% of all driveway-related pedestrian injuries nationwide. National statistics show that males are twice as likely to die as the result of pedestrian injuries as females.

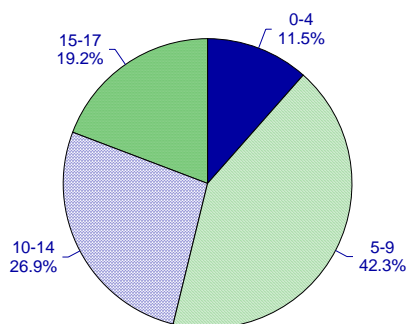
FACT: There are 4 times the number of child pedestrian deaths on Halloween evening than on any other night of the year. From 1999-2004 in West Virginia there were 3 such deaths.

--Safe Kids USA

WVCFRT Data

The WVCFRT reviewed a total of 26 children who died from 1999 to 2004 as a result of injuries received when struck by a motor vehicle. Twelve were male and 14 were female, with ages ranging from 2 to 17 (Figure 18). By year, the number of pedestrian deaths ranged from a high of 9 in 2000 to only 1 in 2003.

**Figure 18. Distribution of Child Pedestrian Deaths by Age
West Virginia, 1999-2004**



26 total deaths

West Virginia and United States Child Motor Vehicle Mortality Rates

The state mortality rates for motor vehicle deaths are presented below in Table 8, along with corresponding national rates where available. The West Virginia rate for overall motor vehicle deaths among children was 45% higher than the U.S. rate for the six-year period. The rates for ATV, bicycle, and pedestrian deaths may be unreliable because of the small number of events and should be interpreted with caution.

Table 8. Child Motor Vehicle Mortality Rates* West Virginia and United States, 1999-2004			
	WV Number	WV Rate**	US Rate
Overall Motor Vehicle	237	10.01	6.91
ATV	30	1.27	NA
Bicycle	6	0.25	0.21
Pedestrian	26	1.10	1.14

*Rate is number of deaths per 100,000 population.

**Rates based on 20 or fewer deaths may be unstable. Use with caution.

IV. Other Unintentional Injury

Drowning

Nationally, drowning is the leading cause of unintentional injury death among children aged 1-4, accounting for more than 60% of drowning deaths among children under the age of 15. Boys are much more likely than girls to be drowning victims; one study found that, on average, three-fourths of all drowning victims are male (16). It takes only a small amount of water or other liquid (as little as one inch) and a short time for a drowning to happen and usually occurs during a lapse in supervision. Most drownings among 1- to 4-year-olds occur in swimming pools. Drowning among infants and toddlers can also occur in buckets and toilets. Children aged 5 and older are more likely to drown in an open water site such as a lake, creek, or river. Alcohol and/or drugs are major factors in drowning deaths among teenage boys.

WVCFRT Case

A 17-year-old male was found dead in a river after swimming and drinking alcohol with friends. Several teens had gone into the river to swim on a hot summer day; when they got out of the water, they couldn't locate their friend. His body was found several days later up river from the original location. An autopsy and investigation revealed that he had drowned secondary to alcohol intoxication.

WVCFRT Data

From 1999-2004, 35 unintentional drowning deaths occurred among West Virginia children aged 0-17. Males were overwhelmingly more likely to die from drowning than females; 27 or 77.1% were male. Forty percent (40.0%) were aged 4 and under, 25.7% were 5-9, 5.7% were 10-14, and 28.6% were 15-17 (Figure 19).

**Figure 19. Unintentional Drowning Deaths among Children by Age
West Virginia, 1999-2004**

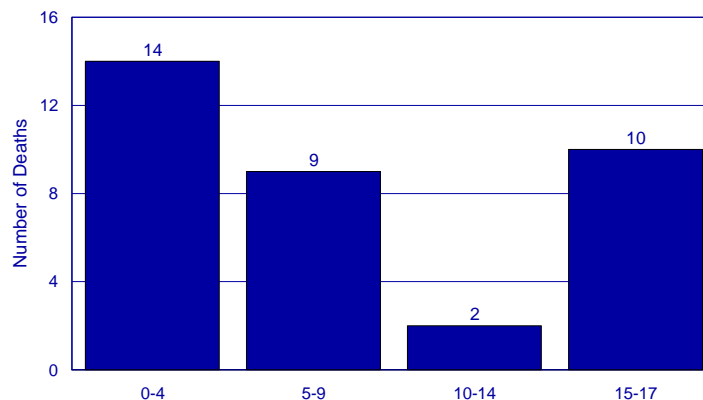
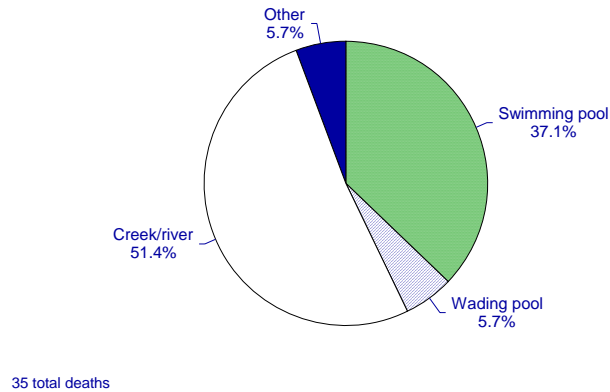


Figure 20 shows the distribution of deaths by place of occurrence. Over half (51.7%) of drowning deaths occurred in creeks or rivers, 42.8% in swimming or wading pools, and 5.7% in other locations.

**Figure 20. Drowning Deaths among Children by Place of Occurrence
West Virginia, 1999-2004**



Major Risk Factors for Drowning

- ▶ Inadequate supervision of children
- ▶ Incorrect or nonuse of personal flotation devices
- ▶ Unlocked gates or inadequate fencing of pools and ponds
- ▶ Drug or alcohol use by supervising adults
- ▶ Child's ability to gain access to pool
- ▶ Lack of swimming ability of child
- ▶ Easy, unsupervised access to open water sites

--National MCH Center for Child Death Review

Residential Fire Injury

In 2000, 1,946 children under the age of 18 died in fires in the United States (17).

WVCFRT Case

A 3-year-old girl died in a house fire that was started when an older brother found a parent's cigarette lighter. The boy caught some bedding on fire while playing with the lighter. The fire quickly consumed the house. The investigation revealed that there were no smoke alarms in the home.

Children under the age of 5, especially males, are at the greatest risk of fire-related death. While playing with matches or lighters by children accounts for only 5% of all residential fires, this scenario is responsible for 40% of fire-related deaths among children. More than 60% of these fires begin in the bedroom or living room by unsupervised children.

FACT: Home fire-related deaths are more likely to occur in December through February, the cold weather months.

--Safe Kids USA

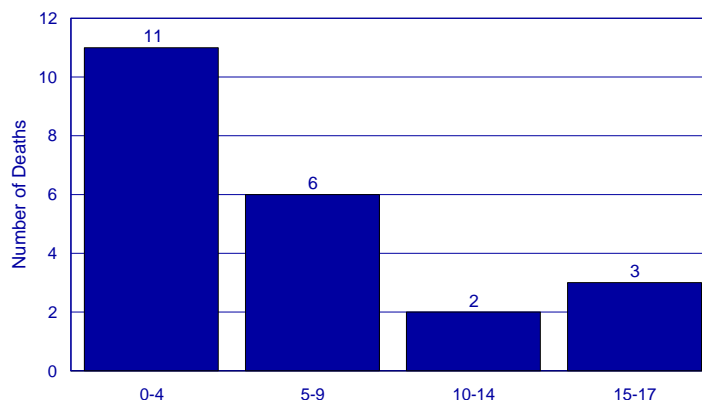
Poverty increases the risk of fire-related death. Lower-income families are more likely to live in substandard housing, more likely to use alternative heating sources, less likely to have a family escape plan, and less likely to have working smoke alarms. Having a working smoke alarm in the home is the single most important factor in reducing fire-related mortality among children.

Two-thirds of residential fires that result in injury or death occur in homes without a working smoke alarm (17).

WVCFRT Data

The WVCFRT reviewed 22 unintentional fire-related deaths among children aged 0-17 from 1999 through 2004. One-half of the deaths (50.0%) occurred among children aged less than 5. Figure 21 shows the breakdown of deaths by age. Twelve of the children were female, and 10 were male. Of the 14 deaths for which the cause of the fire was known, 7 were the result of an alternative heating source such as a kerosene heater, propane heater, or wood burning stove. Three fires were started by children playing with lighters, and 4 were the result of electrical malfunctions.

Figure 21. Unintentional Fire Deaths among Children by Age
West Virginia, 1999-2004



Major Risk Factors for Fire-Related Mortality

- ▶ **No working smoke detectors in home**
- ▶ **Child's access to lighters, matches, or other incendiary devices**
- ▶ **Members of household falling asleep while smoking or leaving candles burning**
- ▶ **Drug or alcohol use by supervising adults**
- ▶ **Use of alternative heating sources, substandard appliances, or outdated wiring**
- ▶ **Lack of a fire escape plan**
- ▶ **Failure of property to maintain code requirements**

--National MCH Center for Child Death Review

Airway Obstruction

Airway obstruction injuries, which include suffocation, choking, and strangulation, are the leading cause of unintentional injury death among infants. The majority (88%) of such deaths occur among children aged 4 and under (18). Airway obstruction deaths are the result of the child being in a position or situation where he or she cannot breathe. Most unintentional airway obstruction deaths occur when an infant is placed in an unsafe sleeping environment, through overlay by an adult or older sibling, or smothering resulting from inappropriate bedding (i.e., bedding that is too soft or bulky) or furniture (e.g., waterbeds, cribs with poor-fitting mattresses, or couches) that permits entrapment of the child between the furniture and a wall, bed slat, or cushion (i.e., wedging). According to research from the Consumer Product Safety Commission, infants sleeping in adults beds are 20 times more likely to suffocate than infants sleeping alone in cribs (19). (See also data presented on page 9 concerning SIDS deaths.)

Data from Safe Kids USA show that nationwide in 2002, 168 children ages 14 and under died from choking (18). Of these, 42% choked on food, 58% on other items such as toys and balloons. Small, round foods such as hot dogs, candies, nuts, grapes, and popcorn present the greatest risk of choking. The majority of unintentional strangulation deaths among children result from entanglement in blind cords and clothing drawstrings. Spaces in bunk beds, older cribs, playground equipment, and high chairs, etc., that can result in entrapment also present a strangulation risk for small children.

FACT: In the United States, at least 110 children, most of them aged 5 and under, have died from balloon-related suffocation since 1973.

--Safe Kids USA

WVCFRT Data

The WVCFRT reviewed 15 unintentional deaths due to suffocation or strangulation from 1999-2004. Ten of the children who died were male; 5 were female. All of the deaths occurred among children aged 4 and under.

Seven, or nearly one-half, of the airway obstruction deaths occurred as the result of the child being wedged between a bed or couch and a wall or nightstand. Three deaths were the result of overlying by a parent, 2 children died from choking on a food item, and 3 deaths occurred under other circumstances.

Major Risk Factors for Airway Obstruction

- ▶ **Infants bed sharing with other persons**
- ▶ **Unsafe/inappropriate bedding or sleep surfaces for infant or child**
- ▶ **Inadequate supervision/drug or alcohol use by supervising adults**
- ▶ **Easy access by infants or toddlers to small objects and balloons**
- ▶ **Obesity, fatigue, or drug or alcohol use by co-sleeping adult**
- ▶ **Easy access by infants and toddlers to cords and ropes**
- ▶ **Child's ability to gain access to objects causing confinement (e.g., toy chests without safety latches)**

--National MCH Center for Child Death Review

Poisoning

Poisonings fall into two general categories: (1) those among children younger than 14 who ingest over-the-counter or prescription medications or other substances such as vitamins or household cleaning products and (2) those among adolescents, which usually involve alcohol poisoning or illegal drug overdoses. Nationally, 291 children aged 17 and under died in 2004 due to accidental poisoning; children aged 15-17 accounted for 70% of these deaths, while children aged 4 and under accounted for 10.7% (20).

WVCFRT Data

The WVCFRT reviewed 8 deaths of children aged 0-17 from 1999-2004 that were the result of unintentional poisoning, 5 males and 3 females. Teenagers aged 13-17 accounted for 7 of these deaths, the result of ingestion of nonprescribed drugs and/or alcohol.

Unintentional Firearm Mortality

According to the National MCH Center for Child Death Review, unintentional firearm mortalities represent less than 2% of all firearm-related deaths; however, of this 2%, children and adolescents are involved in 55% (21). Most of these deaths occur while playing with guns or hunting. Fifty percent (50%) of all childhood unintentional firearm deaths occur in the victim's home; another 40% occur in the home of a friend or relative (22). Unintentional shootings typically occur when children are unsupervised and not in school, tending to happen in the late afternoon, during the weekend, and during the summer months and holiday seasons. Availability of and easy access to a loaded firearm is the number one risk factor in these deaths.

FACT: Two safety devices – gun locks and load indicators – could prevent more than 30% of all unintentional firearm deaths.

FACT: All shootings by children aged 5 and under could have been prevented by a safety device.

--Safe Kids USA

WVCFRT Data

Four children died in West Virginia from 1999-2004 as the result of an unintentional firearm injury. All the children were male; their ages ranged from 4 to 15.

Major Risk Factors for Unintentional Firearm Mortality

- ▶ **Easy availability of and access to firearms**
- ▶ **Living in areas with high rates of poverty, social isolation, and family violence**
- ▶ **Inadequate adult supervision**
- ▶ **Drug or alcohol use by supervising adults**

--National MCH Center for Child Death Review

Electrocution

Three deaths of children whose ages ranged from 1 to 15 occurred in West Virginia as the result of electrocution. A defective electrical wire, an electric fence, and a high-tension power line were responsible for the deaths.

FACT: Eighty-six percent (86%) of all electrocution injuries in 1997 were among children between the ages of 1 and 5.

-- CPSC

Falls

Falls claimed the lives of 3 children between 1999 and 2004. The deaths occurred among girls whose ages ranged from 4 to 16.

Other Unintentional Injury

Seven children died in West Virginia from 1999-2004 from other causes determined to be unintentional. These included a logging accident, a crushing injury from a home appliance, two sledding accidents, a death due to unintentional starvation/dehydration, a death due to a failure to obtain medical attention, and an accident that occurred on a home swing set.

West Virginia and United States Child Unintentional Injury Mortality Rates

West Virginia rates for unintentional mortality due to airway obstruction were lower than United States rates from 1999-2004, while the state's rates for deaths due to drowning, fire and burns, and poisoning were slightly higher. The numbers of events for these causes of death are small, however, making the rates unreliable; they should therefore be interpreted with caution.

Table 9. Child Unintentional Injury Mortality Rates* West Virginia and United States, 1999-2004			
	WV Number	WV Rate**	US Rate
Drowning	35	1.48	1.45
Fire/Burns	22	0.93	0.75
Airway Obstruction	15	0.63	1.20
Poisoning	8	0.34	0.32

*Rate is number of deaths per 100,000 population.

**Rates based on 20 or fewer deaths may be unstable. Use with caution.

V. Suicide

Suicide is the 3rd leading cause of death among teenagers in the United States, with nearly 2,000 teens aged 19 and under killing themselves each year (23). It is

FACT: More than 90% of all youth suicide victims have at least one major psychiatric disorder.

--National Alliance on Mental Illness

estimated that about 2 million teens attempt suicide annually; approximately 700,000 receive medical attention following an attempt (24). Data from the 2005 Youth Risk Behavior Surveillance System suggest that about one in six (16.9%) high school students had seriously considered suicide

during the previous year (9), with approximately half (8.4%) of those students actually making the attempt. Females are more likely to attempt suicide; males are four times more likely to be successful. Firearms are the most common means of suicide among teenagers and adolescents. Nationally, firearms account for approximately 60% of youth suicides, while hanging accounts for about one-fourth (26%) of suicides (25).

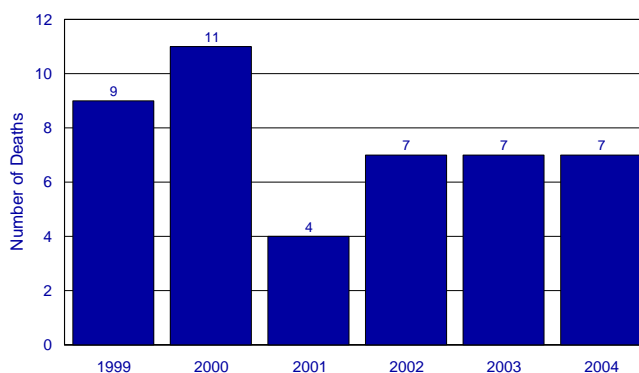
WVCFRT Data

In West Virginia, 45 children committed suicide during the six years from 1999 through 2004. The number of suicides by year is shown in Figure 22; they ranged from a low of 4 in 2001 to a high of 11 in 2000. Of the 45 suicides, 31 were males and 14 were females (Figure 23). Sixty percent (60.0%) of total suicides were aged 16-17, 35.6% were 13-15, and 4.4% were 10-12 (Figure 24). Forty-three of the children were white; 2 were African American. Over half of the suicides (51.1%) were firearm related, 33.3% were due to hanging/strangulation/suffocation, and 15.6% were due to poisoning (Table 10).

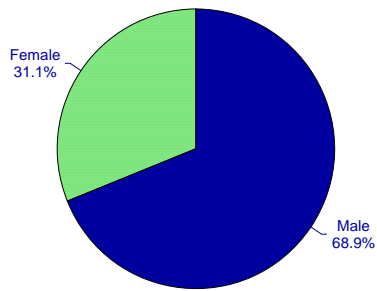
WVCFRT Case

A 13-year-old boy who had gotten into trouble at school found his parents' unsecured .38 automatic and shot himself in the head. There was no known history of depression or mental illness.

Figure 22. Suicides among Children by Year
West Virginia, 1999-2004

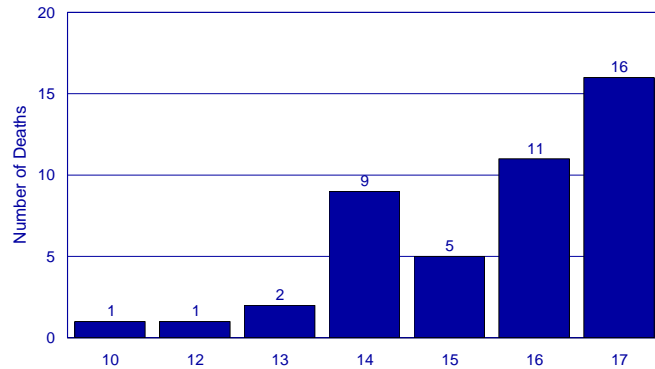


**Figure 23. Suicides among Children by Gender
West Virginia, 1999-2004**



45 total deaths

**Figure 24. Suicides among Children by Age
West Virginia, 1999-2004**

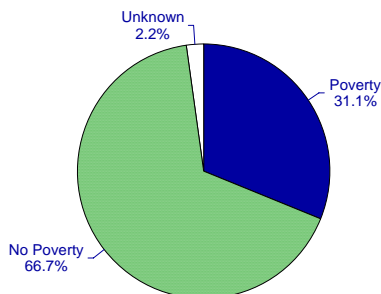


**Table 10. Child Suicides by Method and Gender
West Virginia, 1999-2004**

Method	Male	Female	Total
Poisoning	1	6	7
Firearm	18	5	23
Strangulation (hanging)	12	3	15
Total	31	14	45

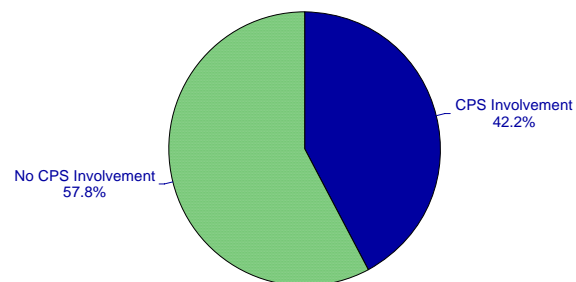
CPS and Income Status. Nearly 1 in 3 children (31.1%) who committed suicide were living in families with incomes at or below the federal poverty level (Figure 25). Nineteen (42.2%) of the 45 children who committed suicide from 1999-2004 were living in families that had current or prior CPS involvement (Figure 26).

**Figure 25. Suicides among Children by Poverty Status of Family
West Virginia, 1999-2004**



*Family income at or below poverty level
45 total deaths

**Figure 26. Suicides among Children by CPS* Involvement
West Virginia, 1999-2004**



*Child Protective Services
45 total deaths

Major Risk Factors for Suicide

- ▶ Previous suicide attempts
- ▶ Co-occurring mental illness and mood disorders
- ▶ Drug and/or alcohol abuse
- ▶ Family history of mental illness, substance abuse, or suicide
- ▶ Exposure to suicide of family member, friend, or other significant person
- ▶ History of physical or sexual abuse
- ▶ Easy access to lethal methods, especially firearms
- ▶ Stressful situation or loss
- ▶ Impaired relationship with parents

--National MCH Center for Child Death Review

West Virginia and United States Child Suicide Rates

The overall rate of suicide among children aged 17 and under in West Virginia from 1999-2004 was 37% higher than that in the United States for the same time period (1.90 deaths among children aged 0-17 vs. 1.39). As shown in Table 11, while the rate among males was 21% higher in the state, that among females was 92% higher in West Virginia than in the nation. The suicide rate among children aged 10-14 was 46% higher than the national rate; the state rate among teenagers aged 15-17 was 24% higher. The state rates are based upon small numbers of events, however, and therefore should be interpreted with caution.

Table 11. Child Suicide Rates* by Gender and Age West Virginia and United States, 1999-2004			
	WV Number	WV Rate**	US Rate
Gender			
Male	31	2.55	2.11
Female	14	1.21	0.63
Age			
10-14	13	1.87	1.28
15-17	32	7.49	6.03
Total	45	1.90	1.39

*Rate is number of deaths per 100,000 population.

**Rates based on 20 or fewer deaths may be unstable. Use with caution.

VI. Homicide

Nationally, physical assault is the leading cause of injury death among infants; in fact, according to the Child Trends Data Bank, the risk of homicide is greater in the first year of life than in any other year until age 17 (26). Statistics show that mothers of infants are the most likely perpetrators during the infant's first week of life, while males (either fathers, stepfathers, or boyfriends) are the most likely thereafter. Head injuries, either from striking or shaking, are the most frequent cause of homicide among infants, followed by punches or kicks to the abdomen, resulting in internal bleeding. Deaths from neglect can result from failure to provide adequate food and nurturing to a child, failure to seek appropriate medical care, or improper supervision of a child.

WVCRT Case

A 1-month-old baby girl was brought to the emergency room unresponsive. She was found to have three skull fractures, subdural and subarachnoid hemorrhages, retinal hemorrhages, and fractured ribs. She died four days later. The subsequent investigation revealed that her death resulted from being shaken by her father.

Major Risk Factors for Child Abuse or Neglect Deaths

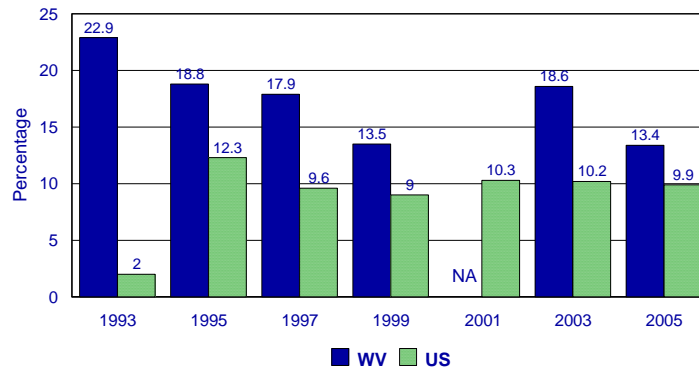
- ▶ **Parents or caregivers who are under the age of 30**
- ▶ **Low income, single parent families**
- ▶ **Drug and/or alcohol abuse**
- ▶ **Male caregivers with no emotional attachment to the child**
- ▶ **Lack of suitable childcare**
- ▶ **Unrealistic expectations of child development and behavior**
- ▶ **Children having health and emotional problems**
- ▶ **Family history of domestic violence**

--National MCH Center for Child Death Review

Homicide among older children most often involves teens killing other teens (27). It is the second leading cause of death for teenagers nationwide. Firearms are the predominant means of homicide in these cases; perpetrators and victims are usually of the same gender, age, and race. The deaths most often occur as the result of a dispute or argument. West Virginia teens are more likely than those in most other states to report carrying a firearm, according to the Youth Risk Behavior Surveillance System (28). Figure 27 presents the percentage of high school students in the United States and West Virginia who reported having carried a gun on one or more of the past 30 days. Males were significantly more likely than females to carry a gun, with a prevalence ranging

from nearly one in four (22.9%) in 1993 to 13.4% in 2005. The state's rate was higher than the national rate in all survey years, not a surprising finding given West Virginia's rurality and culture of hunting.

**Figure 27. Percentage of Male Students Who Carried a Gun on One or More of the Past 30 Days
West Virginia and United States YRBSS, 1993-2005**



Major Risk Factors for Youth Homicide

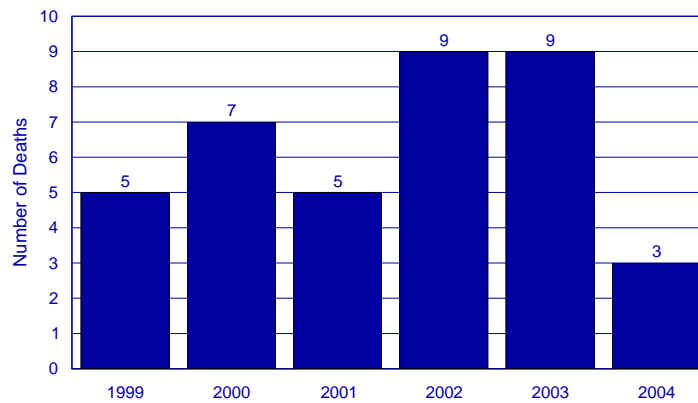
- ▶ Youth involvement in drug and gang activity
- ▶ Neighborhoods with high rates of poverty and social isolation
- ▶ Drug and/or alcohol abuse
- ▶ Easy access to firearms
- ▶ Inadequate supervision
- ▶ Child history of school failure, delinquency, and violence
- ▶ Family history of domestic violence
- ▶ Prior witnessing of violence

-- National MCH Center for Child Death Review

WVCERT Data

In West Virginia, there were 38 homicides of children aged 0-17 from 1999-2004. Figure 28 shows the distribution by year. Twenty-three of the homicide deaths were males, 15 were female. Twenty-one, or more than half, of the homicides involved children aged 4 and under, 6 involved children aged 5 through 14, and 11 involved children aged 15 through 17. Thirty-seven of the children were white, 1 was African American.

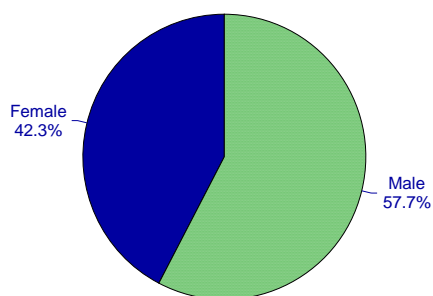
**Figure 28. Homicide Deaths among Children by Year
West Virginia, 1999-2004**



Homicides due to Child Abuse

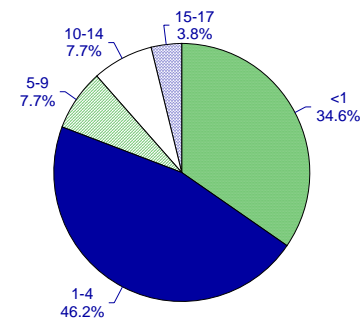
Fatal child abuse is defined as the fatal physical injury of a child by a caregiver of the child. Of the 38 total homicides among West Virginia children from 1999-2004, 26 met this definition. Fifteen were male, 11 female. Nine of the deaths occurred among infants under the age of 1, 13 of the victims were 1-4, 2 were 5-9, 3 were 10-14, and 1 was 15-17. Figures 29 and 30 show the distribution of child abuse deaths by gender and age.

**Figure 29. Child Abuse Deaths by Gender
West Virginia, 1999-2004**



26 total deaths

**Figure 30. Child Abuse Deaths by Age
West Virginia, 1999-2004**



26 total deaths

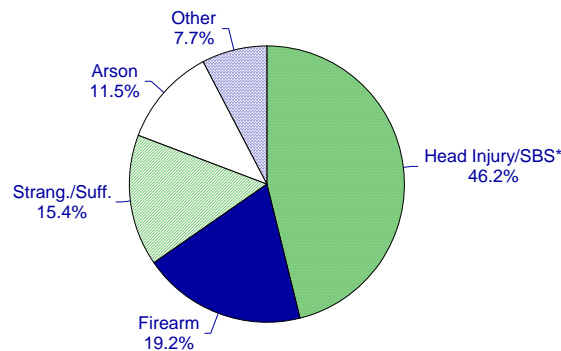
Seventeen of the child abuse homicides were committed by a parent, with fathers the most likely perpetrator. Ten (38.5%) of the child abuse deaths were committed by the child's father, while mothers were responsible for 5 of the deaths. Five of the perpetrators were the mother's (or custodial grandmother's) boyfriend, with day care providers or babysitters responsible for 4 fatalities. Table 12 presents the 26 child abuse deaths by child's age and perpetrator.

Table 12. Child Abuse Deaths by Child's Age and Perpetrator West Virginia, 1999-2004						
Age	Mother	Father	Parent, Unspecified	Mother's Boyfriend*	Babysitter/ Daycare	Total
<1	2	2	1	1	3	9
1-4	3	3	1	4	1	12
5-9		2				2
10-14		2				2
15-17		1				1
Total	5	10	2	5	4	26

*1 perpetrator was the custodial grandmother's boyfriend.

Nearly half (12, or 46.2%) of the child abuse deaths were due to traumatic head injury or shaken baby syndrome (SBS); firearms were used in 5 homicides, with strangulation/suffocation responsible for 4 deaths and arson for 3 deaths (Figure 31).

**Figure 31. Child Abuse Deaths by Method
West Virginia, 1999-2004**



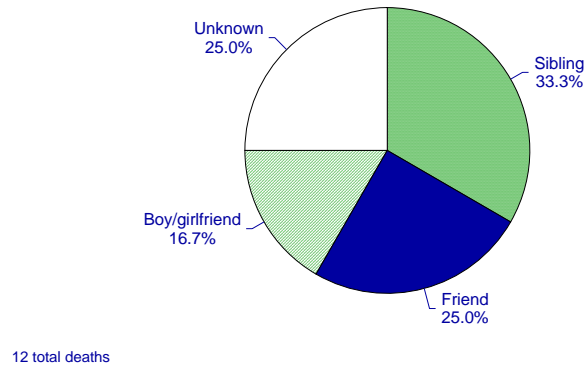
*Shaken baby syndrome
26 total deaths

Other Child Homicides

In addition to the 26 child abuse deaths from 1999-2004, there were 12 other child homicides over the time period. Ten of these deaths occurred among teenagers aged 15 through 17; 8 of the victims were male, 4 were female. Four were committed by siblings, 3 by friends or acquaintances, 2 by a boyfriend or girlfriend, and 3 by an unknown

perpetrator (Figure 32). Firearms were used in 8 homicides, with the remaining 4 due to arson, stabbing, drowning, and being hit by a motor vehicle.

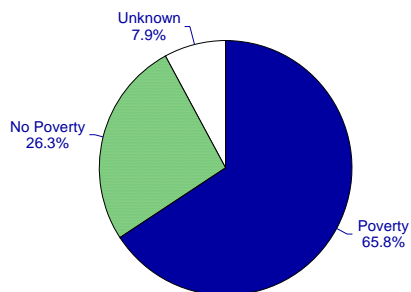
**Figure 32. Other Homicides among Children by Perpetrator
West Virginia, 1999-2004**



Poverty Status and CPS Involvement

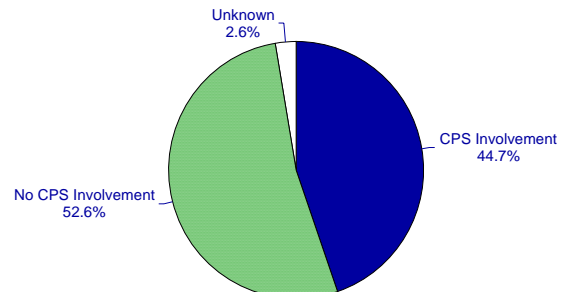
Nearly two-thirds of the homicides from 1999-2004 occurred among children whose families lived at or below the federal poverty level (Figure 33). Seventeen (44.7%) of the children who died as the result of a homicide lived in families with current or prior CPS involvement (Figure 34).

**Figure 33. Child Homicides by Poverty Status* of Family
West Virginia, 1999-2004**



*Family income at or below poverty level
38 total deaths

**Figure 34. Child Homicides by Family's CPS* Involvement
West Virginia, 1999-2004**



*Child Protective Services
38 total deaths

West Virginia and United States Child Homicide Rates

The overall rate of homicide among children aged 17 and under in West Virginia from 1999-2004 was 58% lower than that for the United States (1.60 deaths among children aged 0-17 vs. 2.53). The state's rates were lower than national rates for both genders and age groups (Table 14). The state rates are based upon small numbers of events, however, and thus should be interpreted with caution.

Table 14. Child Homicide Rates* by Gender and Age West Virginia and United States, 1999-2004			
	WV Number	WV Rate**	US Rate
Gender			
Male	23	1.89	3.34
Female	15	1.30	1.67
Age			
0-4	21	3.47	3.68
5-17	17	0.96	2.10
Total	38	1.60	2.53

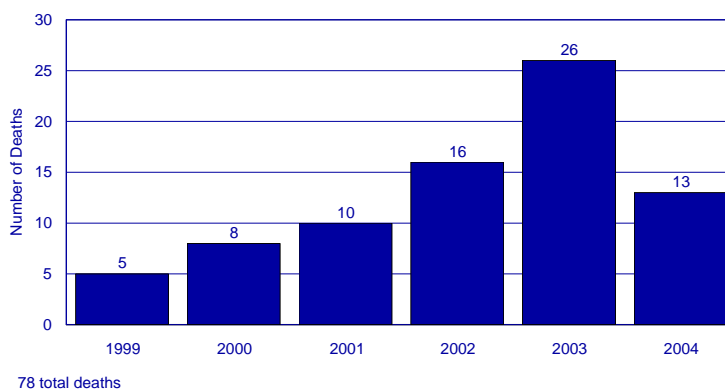
*Rate is number of deaths per 100,000 population.

**Rates based on 20 or fewer deaths may be unstable. Use with caution.

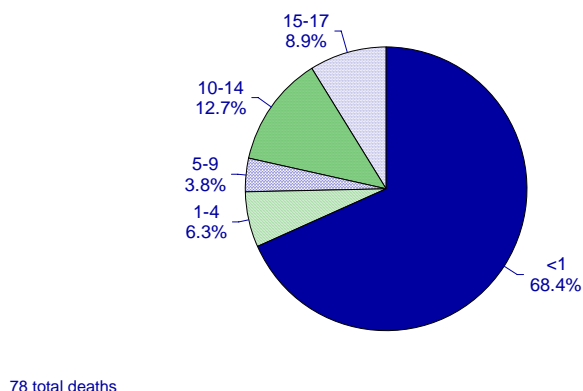
VII. Undetermined Deaths

There were 78 child deaths from 1999-2004 for which the manner of death was undetermined, ranging from a low of 5 in 1999 to a high of 26 in 2003 (Figure 35). Forty-eight, or 61.5%, of the deaths were male, 30 (38.5%) were female. The majority (53 or 68.4%) of deaths occurred among infants under 1 year of age; 5 deaths occurred among children aged 1-4, 3 deaths among children aged 5-9, 10 deaths among children aged 10-14, and 7 deaths among children aged 15-17 (Figure 36).

**Figure 35. Number of Child Deaths with Undetermined Manner of Death by Year
West Virginia, 1999-2004**



**Figure 36. Distribution of Child Deaths with Undetermined Manner of Death by Age
West Virginia, 1999-2004**

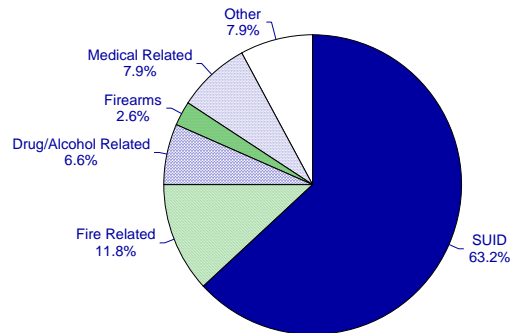


Cause of Death

Figure 37 presents the distribution of the 78 undetermined deaths by cause. Forty-eight (61.5%) of the 78 deaths were classified as Sudden, Unexplained Infant Deaths (SUIDs), infant deaths for which the cause of death remains unknown after a full autopsy, a review of medical and social services records, and a scene investigation and could not be diagnosed as SIDS because of circumstances surrounding the deaths. Possible causes of SUIDs could include accidental suffocation or strangulation in bed or otherwise, accidental poisoning, choking, or falling, neglect or abandonment, or homicide. Neglect was noted in 16 (33.3%) of these deaths.

Nine of the 78 deaths were fire related. All of these children died of smoke and soot inhalation secondary to a house fire for which the cause of the fire (i.e., accidental or arson) could not be determined. The manner of death (accident, suicide, or homicide) was also undetermined for 5 drug- or alcohol-related fatalities, 2 firearm-related fatalities, 2 drowning fatalities, 6 medical-related deaths, and 6 other deaths.

**Figure 37. Distribution of Child Deaths with Undetermined Manner of Death by Cause
West Virginia, 1999-2004**



78 total deaths

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