

# Kentucky Child Fatality Review System 2008 Annual Report



Cabinet for Health and Family Services





# KENTUCKY CHILD FATALITY REVIEW SYSTEM

## 2008 ANNUAL REPORT

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# **ACKNOWLEDGEMENTS**

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This report may be viewed at the following web address:  
<http://chfs.ky.gov/dph/ach/mch/childfatality.htm>



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### MESSAGE FROM THE COMMISSIONER

Any time a child dies it diminishes us all. This report summarizes causes of death for Kentucky children under the age of 18 and stresses related risk factors and prevention measures. The information in this report is based on Kentucky 2006 vital statistics data and other data sources including local child fatality review teams. In 2006, there were 678 deaths of children under the age of 18 in Kentucky. This report includes not only a breakdown of these deaths but recommendations for prevention, as that is our ultimate goal.

After two decades of scientific progress that lowered infant death rates (deaths less than one year old), those rates have stopped declining both in Kentucky and in the nation. In many southern states, infant death rates have begun to rise again and Kentucky is now joining that group. In 2006 Kentucky's infant mortality rate rose to 7.6 infant deaths per 1000, our highest rate since 2000. We are diligently studying that data and associated factors and looking for what we need to do differently to address this change in the trend. We continue to be grateful to all our partners for their ongoing work to improve the health of pregnant women and reduce infant deaths, but there is always more work to be done and new approaches may be required.

Injury related deaths are the leading cause of death for children ages 1-17, and these are the most potentially preventable type of child death. It remains imperative that Kentucky continue to reduce injury related deaths through education and awareness of the importance of child safety and injury prevention measures. No child should die due to preventable injuries, and no family should live with the knowledge that their child's death could have been prevented. The largest number of childhood injuries and deaths are from motor vehicle accidents. A significant number of these might be avoided by increasing car seat usage among infants and toddlers, booster seat usage among children ages four to eight, seat belt use among children older than eight, and among the adults whose behavior they emulate. We also need to work on improving safe driving habits among our young and inexperienced drivers, and ATV education programs on how to ride more safely.

Our goal is to increase the number of communities who are practicing injury prevention as a means of keeping their children alive and well, as this is a proven way to make a significant difference in reducing Kentucky child injury and fatality rates. We can help ensure that our children grow and explore more safely. The future of Kentucky's children depends on assuring a safe and quality community life for them and their families.

Sincerely,

William D. Hacker MD, FAAP, CPE  
Commissioner  
Department for Public Health

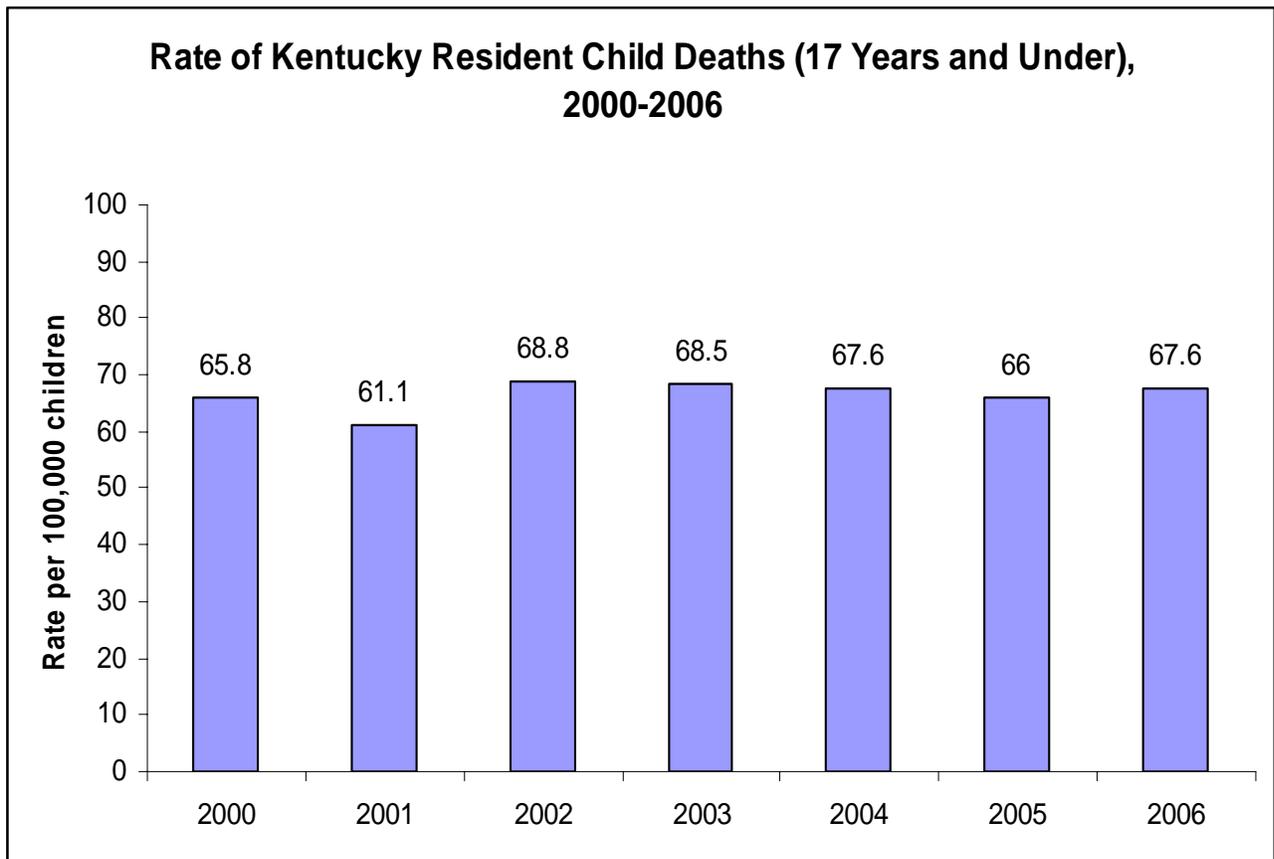


# KENTUCKY CHILD FATALITY REVIEW SYSTEM 2008 ANNUAL REPORT

## EXECUTIVE SUMMARY

This report depicts the fatalities for Kentucky's children for the year 2006, which is the latest year completed Kentucky Vital Statistics records are available. Kentucky Vital Statistics data for the year 2006 is still preliminary and numbers could change. Findings from the year include:

- 678 children from 0-17 years died in Kentucky in 2006
- 485 died from natural causes
- 174 died from injury related causes
- While the number of deaths to children 0-17 years in 2006 increased slightly compared to 2005, the rate remains comparable to the past five years.

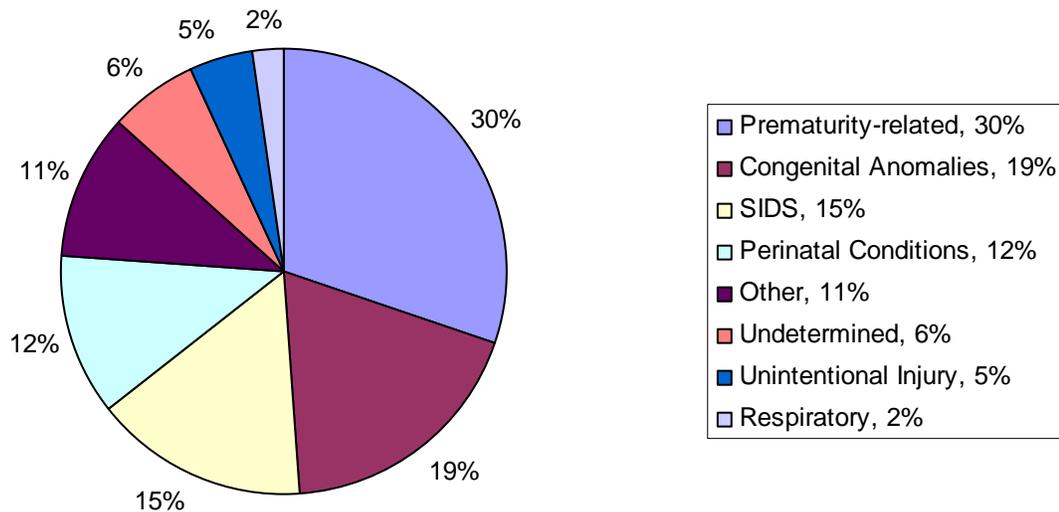


## Infant Deaths

In 2006, 427 Kentucky resident infants died. Infant death is any baby that dies after birth and before turning one year of age. Most infant deaths are considered “natural cause” deaths because they occur due to medical conditions. These conditions all share certain known risk factors, such as lack of prenatal care, poor nutrition, smoking during pregnancy, and others.

- The top three causes of infant death were prematurity/low birth weight, congenital anomalies, and SIDS. In 2006 in Kentucky:
- 110 Kentucky infants who died due to complications from *preterm birth*.
- *Congenital anomalies* were the cause of death in 80 infants
- The rate of *SIDS* was 1.1/1,000 live births, or 64 infants. This rate is higher than the national average, but may be due to how Kentucky defines SIDS deaths.
- The remainder of infants below one year of age died of various other causes.

**Infant Deaths by Cause in Kentucky, 2006**

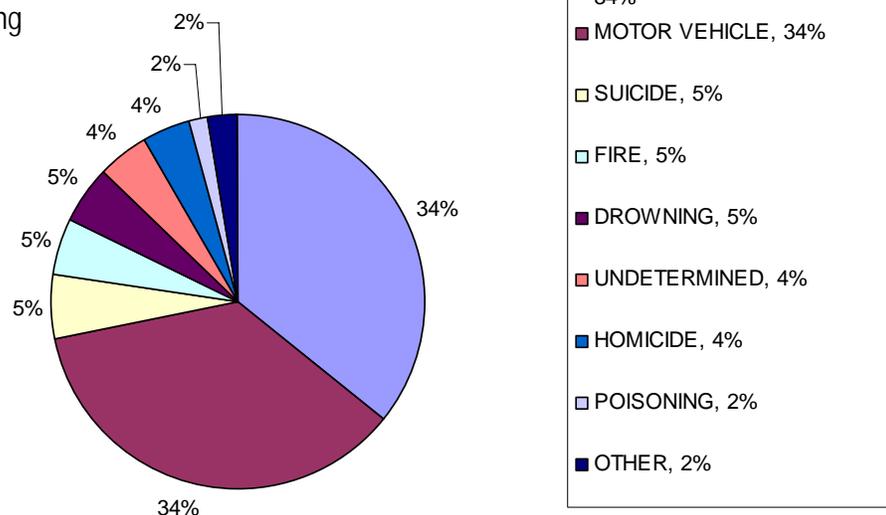


## Childhood Deaths

In 2006, 251 Kentucky resident children ages 1 to 17 died. Fifty-nine percent of these deaths were due to injuries, both intentional and unintentional. Thirty-seven percent of deaths in children were due to natural causes. The remaining four percent of deaths were due to unknown causes.

The leading cause of death for infants and children age 1-17 was unintentional injury, particularly motor vehicle crashes:

- More children 1 to 17 died from *motor vehicle crashes* than other types of injury. Motor vehicle crashes accounted for 49% of all injury deaths, and 34% of all childhood deaths
  - There were 86 deaths of children from motor vehicle accidents in 2006; the rate of motor vehicle crash fatalities was 8.6/100,000.
    - 37% were driving or riding in a car
    - 36% were driving or riding in other vehicle types
    - 11% were pedestrians
    - 6% were in driving or riding in an ATV
    - 4% were driving or riding on a motorcycle
    - 5% were driving or riding in a pick-up truck or van
    - 1% were bicyclists
- 31 child fatalities due to abuse or neglect were reported in 2006. This makes child abuse the ***second leading cause*** of injury deaths in childhood in Kentucky. This number is often masked by the fact that these deaths may be spread across several categories by cause of death, such as homicide, poisoning, suffocation, and others.
- Other major causes of death for Kentucky children, each comprising 7-8% of the childhood injury deaths, were:
  - Homicide
  - Suicide
  - Fire
  - Drowning



**Percent of Child Deaths (age 1 to 17) by Cause in Kentucky, 2006**

# LEADING CAUSES OF CHILD DEATH IN KENTUCKY

These are the top 10 leading causes of death in Kentucky by age groups from the years 2004 to 2006 combined. Unintentional injury is the leading cause of death for all age groups, after age 1.

**Table 1. Top Ten Leading Causes of Death in Kentucky by Age**

<b>10 Leading Causes of Death, Kentucky</b>					
<b>2004 - 2006</b>					
Age Groups					
Rank	<1	1 to 4	5 to 9	10 to 14	15 to 17
1	Prematurity related	Unintentional Injury	Unintentional Injury	Unintentional Injury	Unintentional Injury
2	Congenital Anomalies	Homicide	Malignant Neoplasms	Malignant Neoplasms	Suicide
3	SIDS	Malignant Neoplasms	Congenital Anomalies	Heart Disease	Homicide
4	Unintentional Injury	Congenital Anomalies	Homicide	Congenital Anomalies	Malignant Neoplasms
5	Maternal Pregnancy Comp.	Heart Disease	Heart Disease	Homicide	Heart Disease
6	Placenta Cord Membranes	Benign Neoplasms	Meningitis	Cerebro-vascular	Congenital Anomalies
7	Bacterial Sepsis	Anemias	Benign Neoplasms	Suicide	Five Tied
8	Neonatal Hemorrhage	Bronchitis, Emphysema, Asthma	Bronchitis, Emphysema, Asthma	Benign Neoplasms	Five Tied
9	Atelectasis	Nephritis	Perinatal Period	Diabetes Mellitus	Five Tied
10	Intrauterine Hypoxia	Cerebro-vascular		Seven Tied	Five Tied

NOTE: Shaded areas denote potentially preventive deaths.

# **KENTUCKY'S CHILD FATALITY REVIEW SYSTEM**

The deaths of infants, children and teens are indicators of the overall health and safety of all children in local communities, the state, and the nation. The accurate identification of cause and manner of death provides invaluable information that is used to determine vulnerable populations and elicit a response to protect and improve the lives of Kentucky's children.

KRS 211.680 was passed by the Kentucky General Assembly in 1996 to create a system for the purpose of learning from child deaths in order to reduce the number of child fatalities. The system was charged to establish priorities and develop child death prevention programs that require:

- Accurate determination of the cause and manner of death;
- Cooperation and communication among agencies responsible for the investigation of child fatalities; and
- Collection and analysis of data to:
  - Identify trends, patterns and risk factors; and to
  - Evaluate the effectiveness of prevention and intervention strategies.

With the passage of this legislation, the Kentucky Department for Public Health was approved to establish a state Child Fatality Review Team. The state team is a voluntary multidisciplinary body that is requested by legislation to assume certain duties which may include:

- Facilitation of local child fatality review team development that may include, but is not limited to the provision of joint training opportunities and technical assistance;
- Development and distribution of model protocols for direction of local child fatality review teams that investigate child fatalities;
- Review and approval of locally prepared and submitted child fatality review team protocols;
- Analysis of received data regarding child fatalities to identify trends, patterns and risk factors;
- Evaluation of the effectiveness of adopted prevention and intervention strategies; and to
- Making recommendations regarding state programs, legislation, administrative regulations, policies, budgets, and treatment and service standards that may facilitate development of strategies for prevention and reduction of the number of child deaths.

The Department for Public Health works through the state team to assure a strong child fatality review and injury prevention system throughout Kentucky. Local development of child fatality review teams continues to be one of the most important infrastructure building responsibilities of the state team. Local team composition includes multidisciplinary representation from coroners, law enforcement, health departments, and the Department for Community Based Services, at a minimum. Other agencies that enhance the process include mental health, emergency medical personnel, health care providers, county attorney offices, and other key community agencies and organizations that focus on child safety issues. The local team is to assist the coroner in gathering as much information as possible to determine the most accurate manner and cause of a child's death. Team members have the opportunity to share information, discuss and prioritize child health and risk factors and promote participation in various community prevention programs. Trends and risk factors identified in the community from local teams are then reported to the state, so that the state team can identify trends and develop strategies that will help save the lives of other children across the state.

Key partners in the child fatality review system include the Department for Public Health, local health departments, coroners, medical examiners, Department for Community Based Services, Kentucky Violent Death Reporting System, and the Kentucky Injury Prevention Research Center (KIPRC) at the University of

Kentucky. Numerous other agencies participate, both at the local and state levels, all working together to find ways to reduce child deaths.

- The Department for Public Health (DPH) is responsible for coordination of all local child fatality review teams throughout the state. DPH organizes the State Child Fatality Review Team to discuss and analyze the data from a statewide perspective. DPH also provides technical assistance to existing teams and facilitates the development of teams in counties that do not participate in the process. In addition to team coordination, DPH is responsible for producing a child fatality review annual report.
- Local Health Departments (LHD) provide vital records and epidemiological risk information for deaths in their communities. They help identify public health and safety issues in their communities. Sometimes the health department has had contact with the child or the family and can provide additional information. When the Coroner notifies the health department of a child's death, this begins the process of providing grief counseling services to families that have lost a child.
- Coroners are key partners for child fatality review. They have been given authority to obtain records from all agencies to be used to determine the cause and manner of death. Child Fatality Review teams are directed by the coroner.
- Medical examiners are an integral part of the child death review process. They work in conjunction with coroners to determine the cause and manner of death.
- The Department for Community Based Services (DCBS) has the legal authority and responsibility to investigate child fatalities and to provide protection to siblings who might remain in the home and be at risk.
- Law enforcement team members are best trained in scene investigation and can provide critical information as to how a child died.

## **KENTUCKY'S CHILD FATALITY REVIEW LAWS**

### **KRS 211.680-211.686**

- Does not limit, restrict or otherwise affect any power, authority, duty, or responsibility imposed by another provision of law upon any coroner, but rather is to aid, assist and complement the coroner in the performance of his/her statutory duties.
- Defines child fatality to mean the death of a person under the age of 18 years.
- Authorizes the Department for Public Health to establish a state team and suggests composition and responsibilities.
- Requires the Department for Public Health to submit an annual report to the Governor, Legislative Research Commission and the Chief Justice of the Kentucky Supreme Court. Copies are also to be made available to citizens of Kentucky.
- Authorizes coroners to establish local child fatality review teams and suggests membership and purpose.
- Protects proceedings, records, opinions, and deliberations of the local team as privileged and not subject to discovery or subpoena.

### **KRS 72.025**

- Childhood deaths that are specifically mentioned in KRS 72.025 as coroner's cases include homicide, violence, suicide, drug-related, Motor Vehicle Accident (MVA), fire, drowning, child abuse, Sudden Infant Death Syndrome (SIDS), injuries, and any sudden/unexplained death.

**KRS 72.029**

- Requires coroners to report child deaths by the 10th of each month to the Department for Public Health and requires reports to be on a form developed in cooperation with the Kentucky Coroner's Association.

**KRS 72.410**

- Requires coroners, upon being notified of a child death under the age of 18 years, which meets the criteria for a coroner's case according to KRS 72.025, to contact the local Department for Community Based Services, law enforcement agencies with local jurisdiction and the local health department to determine the existence of relevant information concerning the case.
- Requires agencies to provide cooperation, assistance and information to the coroner upon his request.
- Requires maintenance of confidentiality by all participants of records and discussions that occur during the CFR team meeting.

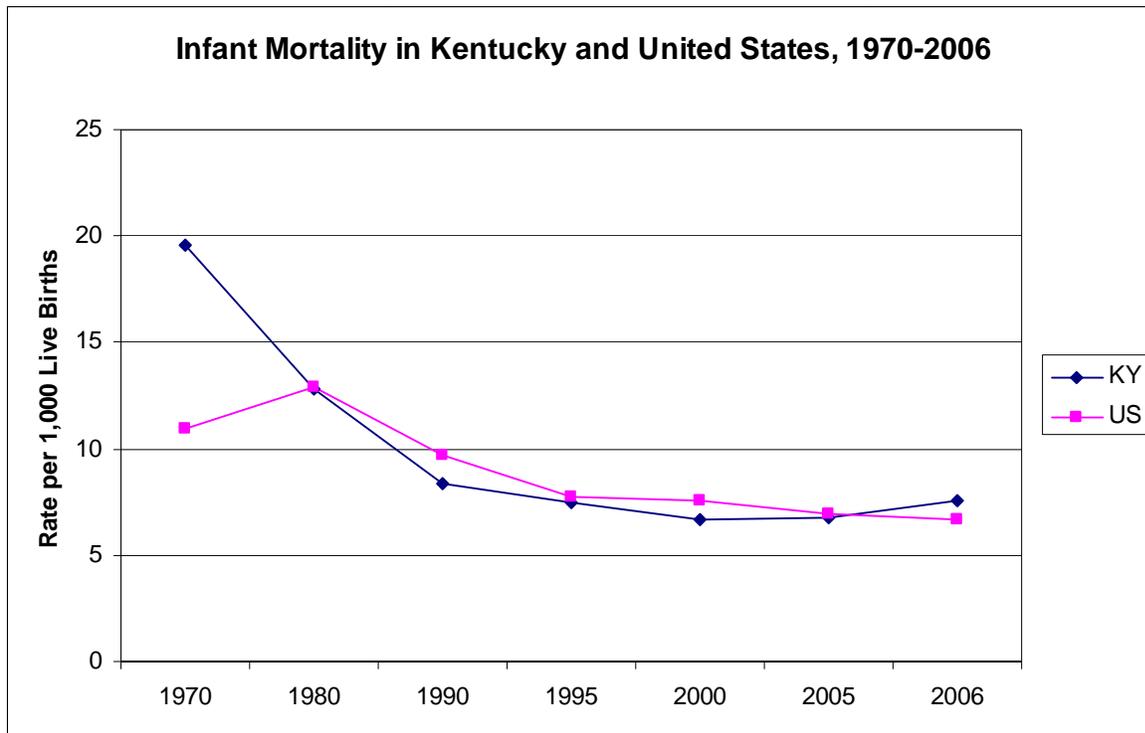


# I. INFANT DEATHS- INFANT MORTALITY

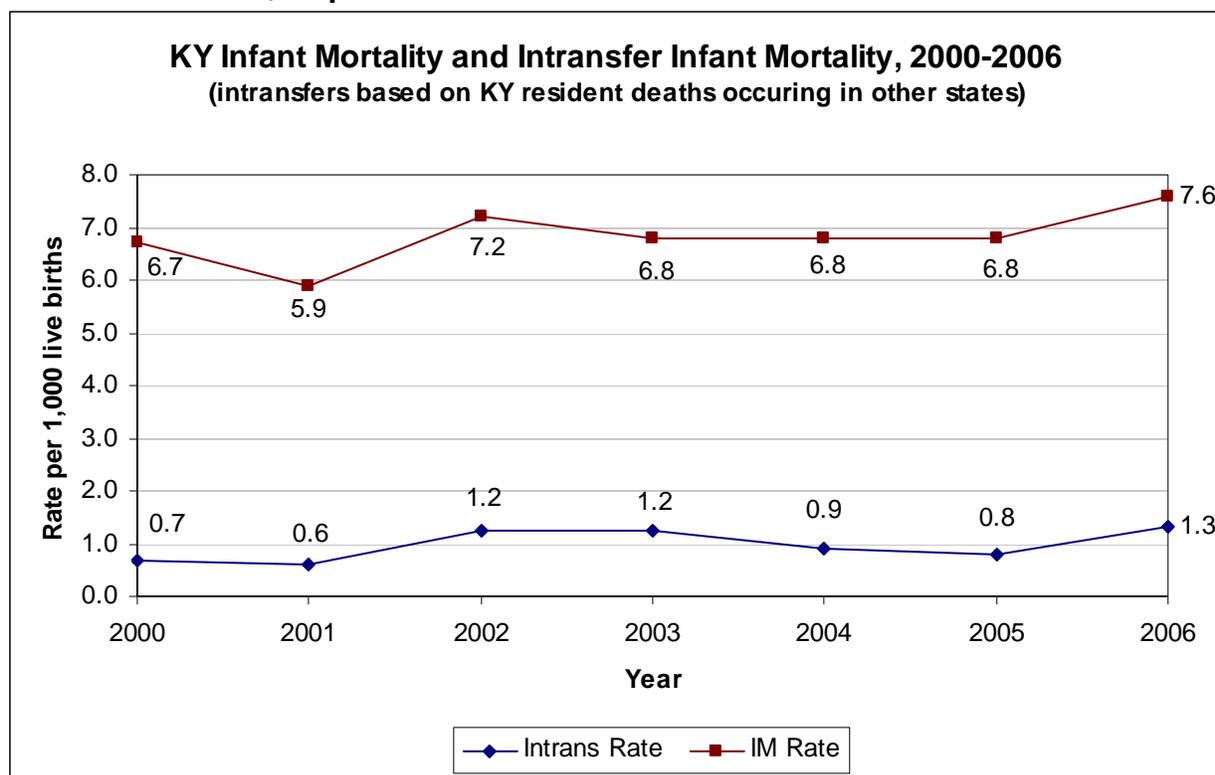
Infant mortality is the death of a child any time in the first year of life. It is often considered a reflection of the social, political, health care delivery systems of a state or nation.

In the last 20 years, Kentucky's infant mortality rate has fallen dramatically and has run very close to the national average for infant mortality (Figure 1). However, all across the country, infant mortality rates have leveled off and in many southern states, infant mortality is now beginning to increase again. Unfortunately, Kentucky is following that national trend. From 2005 to 2006, the infant mortality rate in Kentucky increased from 6.8 to 7.6 per 1,000 live births, which was the first increase in Kentucky since 2001. In Kentucky's 2006 data, 427 infants died, compared to 378 in 2005. The Kentucky Department for Public Health, Division of Maternal and Child Health has initiated an epidemiological investigation of this increase in deaths. The number of out of state deaths to infants who are Kentucky residents has consistently influenced Kentucky's infant mortality rate (Figure 2). However, this does not lessen the need to investigate ways Kentucky can address this significant rise in infant deaths. The Kentucky Department for Public Health is developing a subcommittee of the Child Fatality Review System to look more closely at the fetal and infant deaths in the state and determine what can be done to prevent these deaths. This information will be given to local child fatality review teams so that local strategies can be implemented.

**Figure 1. Infant Mortality Rate, 1970-2006 in Kentucky and US**



**Figure 2. Infant Mortality Rate and Rate of Out-of State Deaths of Kentucky Resident Infants, Reported for 2000-2006**



The three leading causes of infant mortality are prematurity, congenital anomalies, and sudden unexplained infant death (SUID, formerly SIDS). Of these three leading causes, preterm birth has become a major concern both at the national level and in Kentucky, as it is the only cause of the three that is rising over the last decade. Previously, estimates of infant deaths from prematurity were counted only by those with a specific diagnosis of prematurity as the cause of death, but did not include other conditions related to prematurity which caused deaths. The new recommendation from the National Center for Health Statistics is that deaths due to prematurity include all the diagnoses where the death is attributable as a consequence of preterm birth. Using this method, prematurity becomes the leading cause of infant mortality in Kentucky and in the United States. This is particularly concerning in light of the rising rates of prematurity over the last decade.

**Table 2. The Three Leading Causes of Infant Deaths in Kentucky, 2006.**

Cause	Total # of Deaths
Preterm-Related Causes of Death	110
Congenital Anomalies	80
SIDS	64

For 2006, there were a total of 110 preterm related infant deaths in Kentucky moving this category to the number one cause of infant deaths in the state followed by congenital anomalies and SIDS (Table 2).

Therefore infants in Kentucky were more likely to die from prematurity-related causes of death than any other single condition.

## A. PREMATURETY-RELATED DEATHS

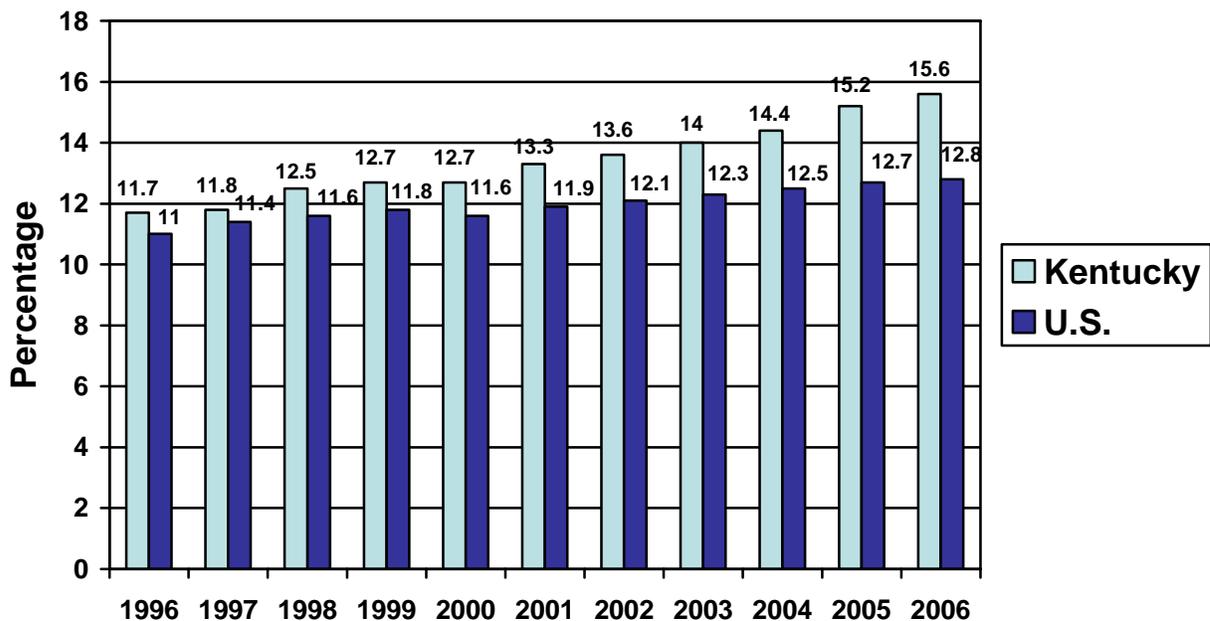
Prematurity/low birth weight is a leading cause of neonatal death in Kentucky and the United States. Preterm birth is defined as any birth occurring prior to 37 weeks of completed gestation, and low birth weight is defined as any infant weighing less than 2,500 grams (5lb. 8oz.) at birth. These two conditions often overlap and share similar risk factors. These factors include:

- Previous preterm or low birth weight birth
- Multiple births
- Short interpregnancy interval (Less than 18-24 months between babies)
- Maternal smoking during pregnancy
- Second-hand smoke exposure of the pregnant mother (even if she is not a smoker herself)
- Maternal drug use during pregnancy
- Certain infections during pregnancy including sexually transmitted diseases
- Little or no prenatal care
- Certain birth defects

Of all perinatal condition deaths, infants were more likely to die from prematurity (short gestation) and low birth weight than other conditions. Most of the infants who die of respiratory conditions in the perinatal period are also premature, thus the importance of preventing prematurity is even more apparent.

A major concern for Kentucky is that preterm birth rates are rapidly rising in the Commonwealth, at rates twice as fast as the rising rate nationally. Kentucky has the highest rate of preterm birth of any of our surrounding states, therefore, putting more infants at a higher risk for death (Figure 3).

**Figure 3. Preterm birth percentage, 1996-2006 in Kentucky and US.**



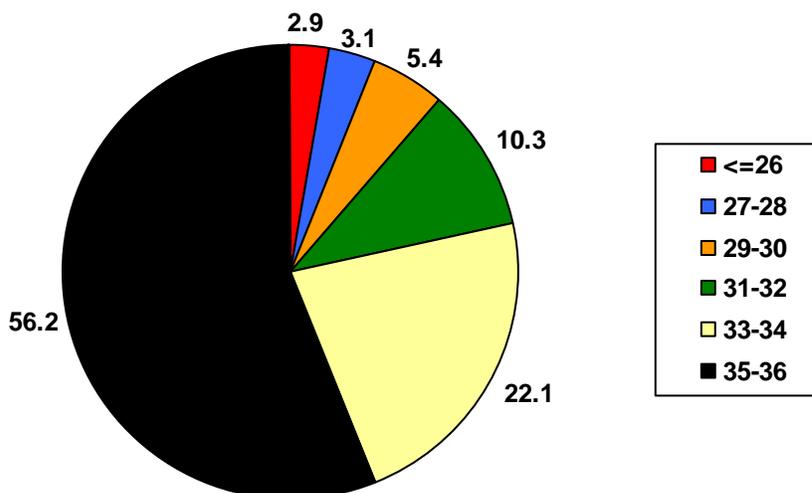
Note: Preterm is less than 37 weeks completed weeks gestation.

**Figure 4. Preterm Births in Kentucky by Gestational Age, 2006**

Of all the premature births in Kentucky and nationally, over 70% are babies born between 34 and 36 weeks gestation, or 4-6 weeks before their due date (Figure 4).

Although these babies may be “big premies” and have a high chance of survival, when compared to full term infants, they

are 6 times more likely to die in the first week of life, 3 times more likely to die in the first year of life, and 7 times more likely to have complications at delivery. Long term studies on these infants suggest that they are at higher risk also for behavior and learning problems, ADHD, and long term disabilities. Parents and families should not take lightly that these infants are at higher risk, and these babies should only be delivered for medical reasons.



Continued research into the causes and risk factors associated with prematurity and low birth weight is critical in order to develop effective prevention of preterm and low birth weight deliveries. This includes assuring access to early prenatal care, educating all women to receive prenatal care as early as possible in the pregnancy, and informing all women of the signs of preterm labor and the appropriate steps to follow. Kentucky DPH has a number of programs aimed at reducing premature births. However, it will take the efforts of entire communities to reverse the trend of increasing deliveries of premature infants, especially those in the last 4-6 weeks of the pregnancy. The entire community should be aware of the seriousness of preterm birth and the costs of prematurity, not only to the families of premature babies, but to the health care, educational, and other systems in the community. Preventing prematurity is possible in some cases, but must be addressed in the entire community, not just with providers and pregnant women. Preventing preterm birth not only saves babies’ lives, but improves the future of our whole community.

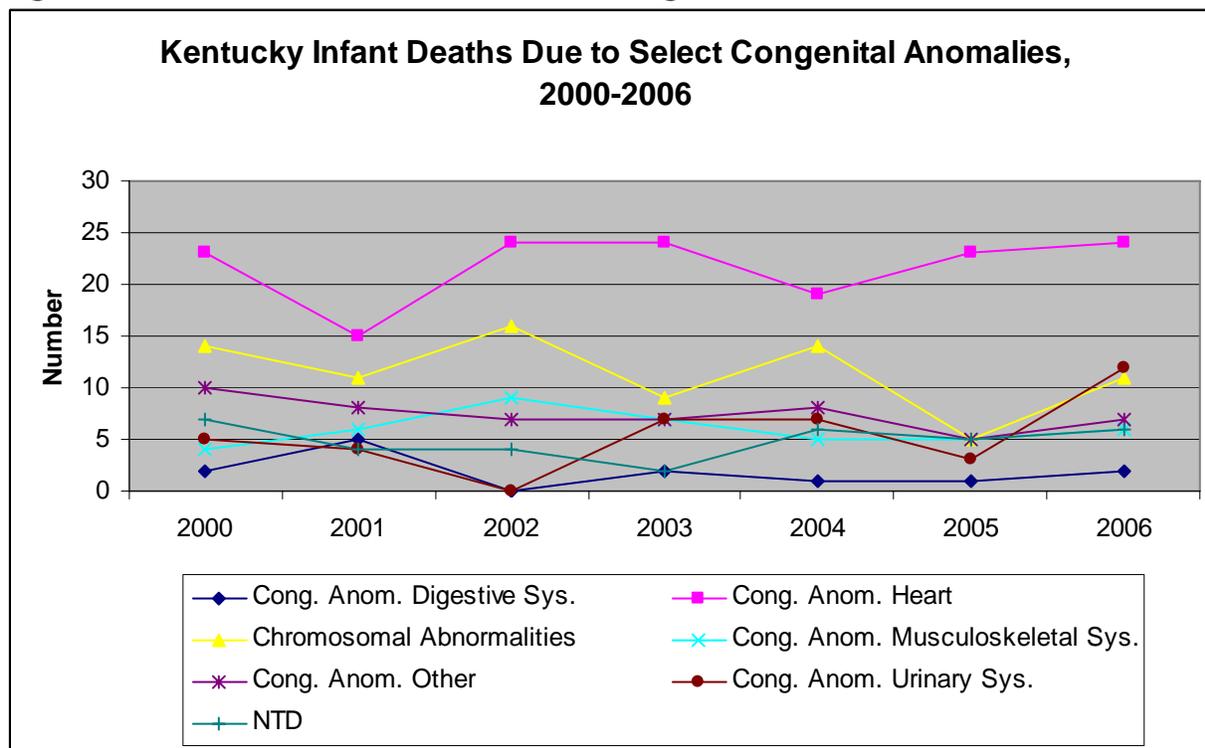
## **B. CONGENITAL ANOMALIES**

Congenital anomalies, also known as birth defects, accounted for 20% of the deaths among infants in Kentucky in 2006. Birth defects continue to remain the leading cause of morbidity and mortality in the U.S., accounting for more than one in five infant deaths.

Deaths due to congenital heart defects continue to remain the leading cause of congenital anomaly deaths among infants. Total deaths due to congenital heart defects have fluctuated over time but have not decreased, despite earlier diagnosis, often on fetal ultrasounds, and improved ways to treat congenital heart disease. Deaths due to chromosomal abnormalities are the second leading cause of congenital

anomaly deaths among infants. Deaths from chromosomal anomalies have decreased from 2000 to 2006 (Figure 5).

**Figure 5. Infant Deaths due to Select Congenital Anomalies**



Some birth defects are potentially preventable. One such type of congenital anomaly, neural tube defects (NTDs), occurs in approximately 4,000 infants each year in the U.S. NTDs are a group of congenital malformations involving defects in the skull and spinal column that are caused primarily by the failure of the neural tube to close during embryonic development. This group of defects consists of anencephaly, spina bifida and encephalocele. Total infant deaths due to neural tube defects have decreased slightly in Kentucky since 2000 (See Figure 5). As many as 70% of Neural tube defects can be prevented by women taking 400mcg of folic acid daily through the childbearing years. However, to be effective, the folic acid must be taken before the woman gets pregnant. The March of Dimes and CDC sponsored a public awareness campaign to improve the number of women of childbearing age taking folic acid daily. However, the CDC reports that since the campaign ended, not as many women are taking the vitamin, which may lead to a rise in neural tube defects again. Kentucky's rate of women taking a vitamin containing folic acid daily is one of the better rates among the states, and is most likely attributable to the ongoing efforts of the Kentucky Folic Acid Partnership, which continues to promote its use.

Multiple causes exist for birth defects. Proper risk education, along with preconception health promotion and appropriate spacing between pregnancies (18 to 24 months) are critical elements of targeted prevention in helping to reduce birth defects. Although all birth defects are not preventable, there are steps that a woman can take to increase her chance of having a healthy baby. Many birth defects happen very early in pregnancy, sometimes before a woman even knows that she is pregnant. Therefore, for the best outcomes, it is important that all women address their health issues even before getting pregnant.

Every woman of child bearing age should:

- Take a multivitamin that has 400 mcg of folic acid in it every day

- Have regular medical check-ups
- Talk to her health care provider about any medical problems such as diabetes or phenylketonuria
- Talk to her health care provider about any medicine use including over-the-counter and prescription medications
- Talk to her health care provider about substances at work or home that should be avoided as they might be harmful to a developing baby
- Keep vaccinations up-to-date
- Eat a healthy, balanced diet
- Avoid eating raw or undercooked meat
- Avoid alcohol, tobacco and street drugs
- Talk to her health care provider about any family history of birth defects or genetic conditions

## **C. SUDDEN UNEXPECTED INFANT DEATHS (SUID)**

Sudden Unexpected Infant Deaths are tragic for families. They require detailed investigations to determine the manner and cause of death, but even then many have no specific answers for what caused the death. This is frustrating for both families and the professionals investigating. In the past, many of these deaths were called SIDS. However, it is often difficult to distinguish SIDS deaths from other causes such as overlaying, accidental asphyxia, or those who do not fit the typical picture of SIDS. In 2006, Kentucky statistics show **92** infants died suddenly and unexpectedly. This number includes all categories now referred to as Sudden Unexpected Infant Deaths: typical SIDS, atypical SIDS, and Sudden Infant Death of Undetermined Cause.

### **1. SUDDEN INFANT DEATH SYNDROME (SIDS)**

SIDS (Sudden Infant Death Syndrome) is defined as “the sudden death of an infant under one-year of age, which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene and a review of the medical history.” SIDS is considered a “natural” manner of death. It is not caused by spitting up, choking or minor illnesses, such as a cold. It is not caused by immunizations, it is not contagious and it is not child abuse. SIDS is also not the cause of every sudden or unexpected infant death (see paragraph above). Although the cause is unknown there are several factors that have been identified that increase an infant’s risk for sudden infant death syndrome.

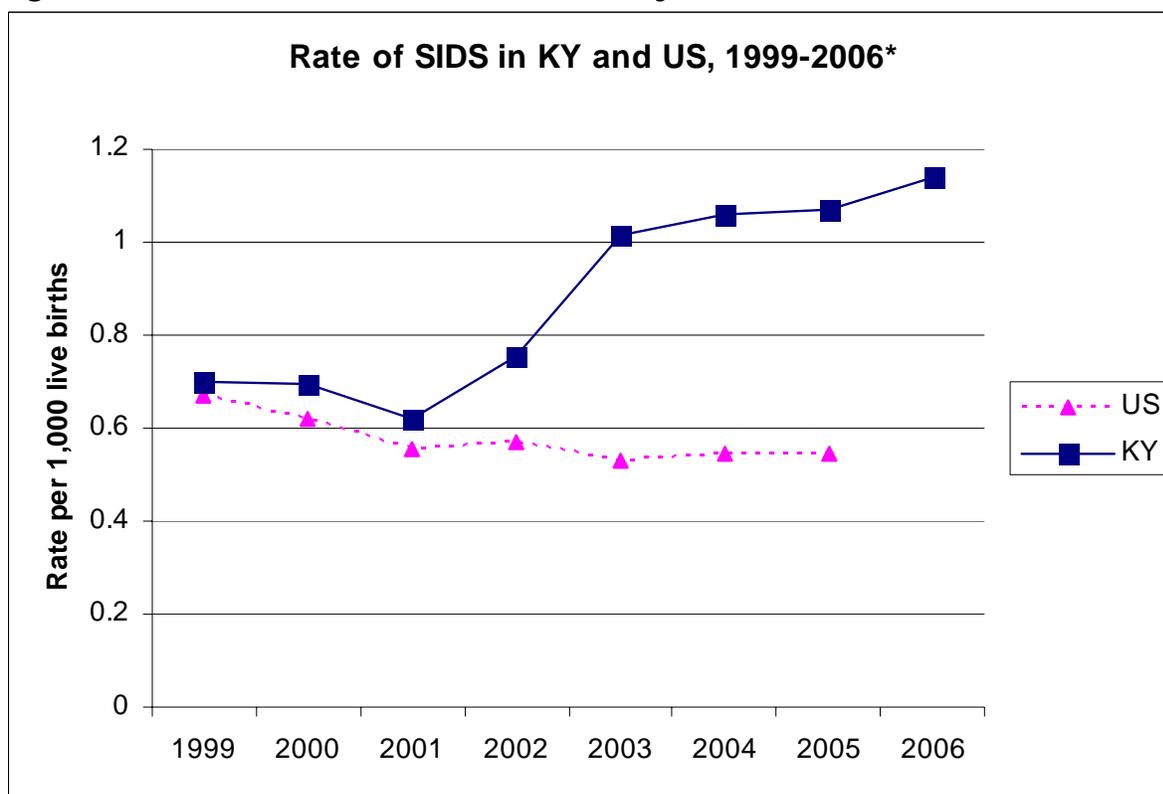
They include:

- Prone (tummy) or side sleeping
- Bed Sharing
- Soft Sleep Surfaces
- Loose Bedding
- Smoking by mother and caregivers
- Preterm and Low Birth Weight Infants

SIDS is a diagnosis of exclusion. There are no pathological markers that distinguish SIDS from other causes of sudden infant death. There are no known warning signs or symptoms. Ninety percent of SIDS deaths occur in the first six months of life, with a peak at 2 to 4 months. While there are several known risk factors, the cause, or causes, of SIDS are unknown at this time. Nationally, as well as in Kentucky, African-American babies are twice as likely to die of SIDS, than their white counterparts.

In July of 2003, the definition of SIDS was standardized by The Kentucky Medical Examiner Office as follows: 1) Group A - "Classic" SIDS cases in which the final opinion will include a sentence stating "death in this case is attributed to Sudden Infant Death Syndrome", 2) Group B -Atypical SIDS - those cases in which most of the findings are consistent with SIDS, but something is either lacking or questionable, in which cases the final opinion shall include a sentence stating "death in this case is consistent with SIDS" and 3) Group C – undetermined cases in which there is no anatomic, toxicologic or metabolic cause of death, but other evidence, either physical or historical, eliminates SIDS as a potential diagnosis. Kentucky is one of many states struggling with how to categorize these deaths, and the Medical Examiner's office has made significant progress in standardizing these designations. However, when the death certificate information is entered into the vital statistics electronic file, both SIDS A and SIDS B are coded the in the same diagnostic category. Therefore, on the electronic death file, both SIDS A and SIDS B are coded as SIDS, which inflates the deaths counted as SIDS when compared to other states, who only count "classic" SIDS cases. This may at least partly explain the recent increase in Kentucky's SIDS deaths.

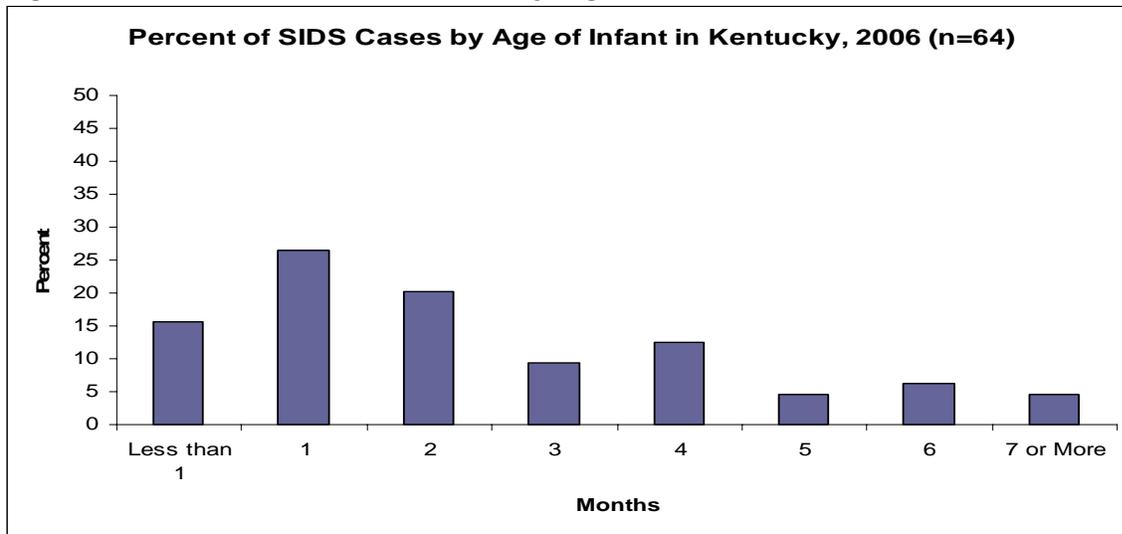
**Figure 6. Trends in SIDS rates in Kentucky**



\*US data not available for 2006.

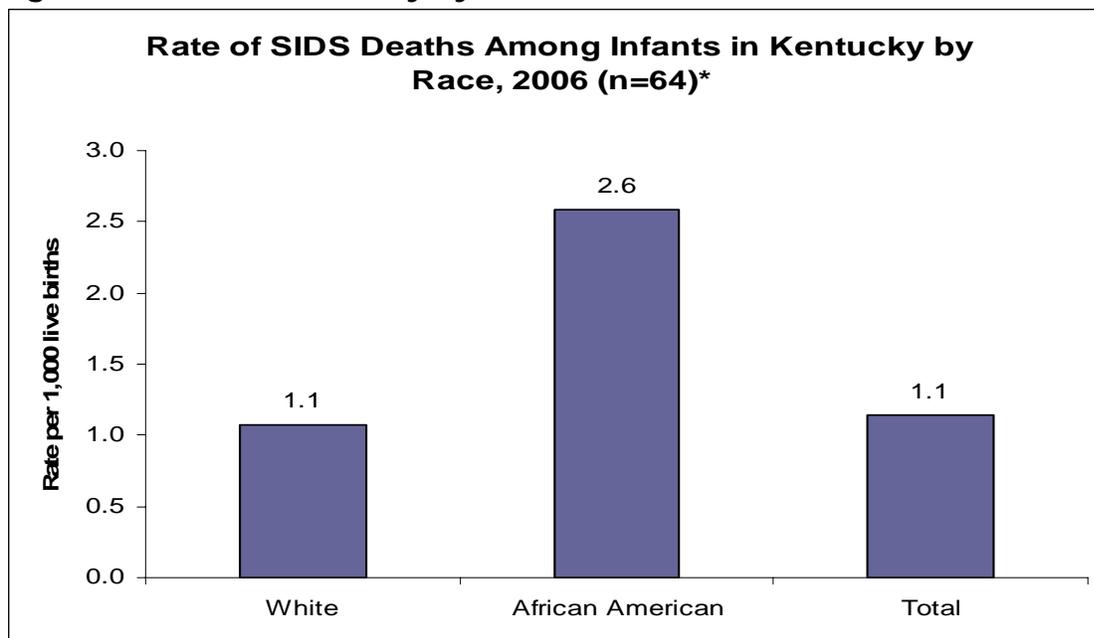
Kentucky's SIDS rate continues to climb and is well above the rate for the nation (**Figure 6**). However, as discussed above, at least part of this rise is due to definition. During the same time period that SIDS deaths increase, those in the "unexplained" category fell, so the overall infant deaths showed little change. Therefore, deaths may not have increased, but instead a shift in the cause of death may have occurred. This is also seen in a retrospective review of infant deaths from 2000 to 2004 done by Shields, et. al., which is described in the August 2007 KMA article, "Is SIDS on the Rise." The conclusions of this review are that the increase in the number of deaths consistent with SIDS and the decrease in cases reported as unexplained over the same time period are due to the standardization of terminology, rather than an actual increase in the number of infant deaths.

**Figure 7. Percent of SIDS Cases by Age of Infant.**



The rate of SIDS in Kentucky in 2006 is 1.1 per 1,000 live births. SIDS was the assigned cause of death for 64 of the sudden unexplained Kentucky resident infant deaths in 2006. The deaths occurred between the ages of 0 to 11 months (Figure 7). Of these 64 deaths, 44 (69 percent) were male and 20 (31 percent) were female. In addition, 50 (78 percent) of these infants were white, 13 (20 percent) were black, and one (2 percent) were classified as other race. Among white infants, one infant died due to SIDS for every 1,000 live births. However, the rate among black infants is higher, with at least two SIDS deaths for every 1,000 live births (Figure 8).

**Figure 8. SIDS in Kentucky by Race in 2006**

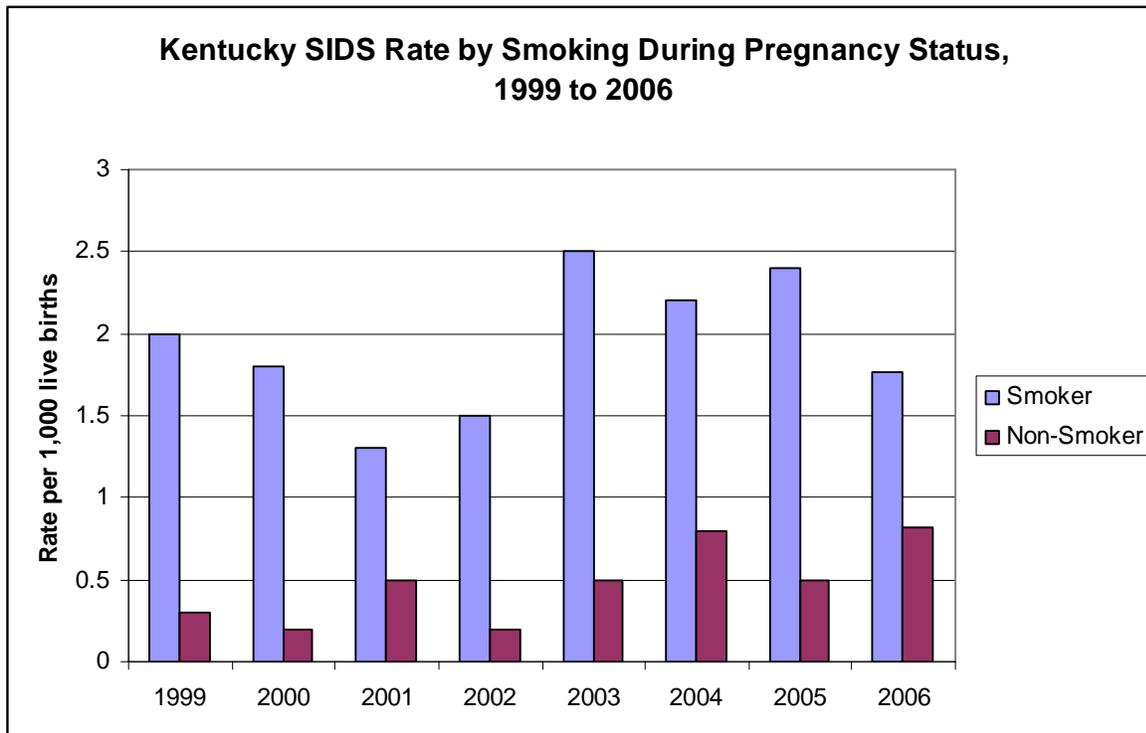


\*Rates may be based on 20 or fewer deaths and may be unstable. Use with caution.

Another risk factor for SIDS which may contribute to the higher rates in Kentucky is the association of smoking and SIDS. Infants of mothers who smoke during pregnancy are twice as likely to die of SIDS as infants of non-smoking mothers. If there is smoking in the home after the baby is born (second-hand smoke), this also increases the risk of SIDS and is additive to the prenatal exposure. Smoking during

pregnancy is much higher in Kentucky compared to the nation. Women in Kentucky are more than twice as likely to smoke during pregnancy as the women in the United States. The increased risk of SIDS for those who smoke during pregnancy is clearly demonstrated in (Figure 9). Kentucky babies born to women who smoke during pregnancy are 3 to 9 times more likely to die from SIDS than those born to women who did not smoke, as the rate of death due to SIDS is higher for all years shown for those who smoked during pregnancy. The rate of SIDS in non-smoking mothers in Kentucky is very low.

**Figure 9. Infant Mortality Rate Due to SIDS by Smoking Status during Pregnancy in Kentucky, 1999-2006**



Note: Deaths that could not be linked to birth certificates were excluded.

## **2. SUDDEN INFANT DEATHS OF UNDETERMINED CAUSE**

In 2006, the cause of death of **28** Kentucky infants could not be determined. This can be very frustrating as people look for reasons/causes of death. In some cases, even the most thorough and careful scene investigation and autopsy do not produce a definite cause of death, because several risk factors are present that are significant enough to have possibly contributed to the death. Sudden unexpected infant deaths involving an unsafe sleep environment may be classified as undetermined, for example, when accidental suffocation is suspected but not conclusively demonstrated by the scene investigation.

The Centers for Disease Control and Prevention has designed the Sudden Unexplained Infant Death Investigation (SUIDI) reporting form, which is now being used by coroners to collect data and assist medical examiners in Kentucky. Thanks to the help of the coroners, Kentucky has an extremely high rate of investigations and autopsies as required by the CDC to gather information on these deaths. This will hopefully provide more answers for families and aid communities in their efforts to prevent future infant deaths.

## RISK FACTORS AND RECOMMENDATIONS FOR SUDDEN UNEXPECTED INFANT DEATHS (SUID)

The most recent recommendations from The American Academy of Pediatrics are as follows:

- The American Academy of Pediatrics no longer recognizes side sleeping as a reasonable alternative to fully supine (lying on back). Studies found that the side sleep position is unstable and increases the chances of the infant rolling onto his or her stomach. The caregiver should use the back sleep position during every sleep period.
- Bed sharing is not recommended during sleep. Infants may be brought into bed for nursing or comforting, but should be returned to their own crib or bassinet, when the parent is ready to return to sleep. However, there is growing evidence that room sharing (infant sleeping in a crib in parent's bedroom) is associated with a reduced risk of SIDS. The AAP recommends that a baby sleep in the room with parents, but not share a bed with other children or adults.
- Research now indicates an association between pacifier use and a reduced risk of SIDS, which is why the revised policy recommends the use of pacifiers at nap time and bedtime, throughout the first year of life.
- Maternal smoking and second-hand smoke in the home are potent risk factors for Sudden Unexplained Infant Death. Babies whose mothers smoked when pregnant are twice as likely to die of SIDS, and the risk increases further if there is smoking in the home after they are born. In Kentucky, SIDS occurred three to nine times more frequently in mothers who smoked during pregnancy than in non-smoking mothers. Any homes with a young baby should make every effort to keep the home smoke-free.

## PREVENTION STRATEGIES

### Parents:

1. *Sleep position:* Infants should be placed on their backs to sleep throughout the first year of life.
2. *Sleep environment:* Do not place infants on adult beds or sofas to sleep; babies should sleep in their own bed, not with adults or other children.
3. *Bedding:* Avoid soft bedding. Place baby on a firm, tight-fitting mattress in a crib that meets current safety standards. Avoid placing the baby on soft quilts or comforters, sofas, pillows, waterbeds, or sheepskins. Stuffed animals should not be placed in the crib with the baby. Avoid using bumper pads.
4. *Temperature:* To avoid overheating, do not overdress the baby or over-bundle the baby. If a light blanket is needed, make sure you tuck it in on all sides and that it doesn't come above the baby's arms. Make sure the baby's feet are at the bottom of the crib. Never cover the baby's head and face.
5. *Smoking:* Avoid smoking during and after pregnancy. Create a smoke-free environment in the home during pregnancy and after the baby comes home from the hospital.
6. *Breastfeeding:* Mothers should be encouraged to breastfeed. Even if breastfeeding, infants should not sleep in the beds with their mothers, as this puts the baby at increased risk of suffocation and overlay.
7. *Prenatal Care and well-baby care:* Mothers should receive prenatal care as early as possible in the pregnancy. They should also make sure to keep their baby on the schedule given by the pediatrician.
8. *Pacifier use:* Research now indicates an association between pacifier use and a reduced risk of SIDS, which is why the revised policy recommends the use of pacifiers at nap time and bedtime, throughout the first year of life.

**Professionals:**

1. Newborn nursery personnel, physicians, nurses, and public health officials should instruct all new parents and child care personnel in safe sleeping practices and other strategies to reduce the risk of SIDS.
2. Child care staff should all receive training on SIDS prevention and follow AAP guidelines on safe sleep practices.
3. Promote Safe Sleep education and campaigns.

**CFR Teams:**

1. All sudden, unexplained deaths of infants <1 year of age require autopsy and should be reviewed by a county child fatality review team. The data pertaining to infant deaths is critical in identifying risk factors for SIDS and providing targeted prevention messages for communities.
2. Encourage a multidisciplinary approach that includes thorough completion of death scene reports by coroners in all counties, correction of death certificates after changes in cause of death is identified after an autopsy is completed, include metabolic screening reports with other case documents to more accurately define the cause of deaths, and classify the death correctly as SIDS, co-sleeping, suffocation, overlay, positional asphyxia, or an inborn systemic condition.

**RESOURCES**

American Academy of Pediatrics ..... [www.aap.org](http://www.aap.org)  
National SIDS/Infant Death Resource Center ..... [www.sidscenter.org](http://www.sidscenter.org)  
National Institutes of Health ..... [www.NICHD.NIH.gov/SIDS](http://www.NICHD.NIH.gov/SIDS)  
SIDS Kentucky Network ..... [www.SIDSKY.org](http://www.SIDSKY.org)  
First Candle ..... [www.FirstCandle.org](http://www.FirstCandle.org)



## II. CHILD DEATHS- CHILD FATALITY

Children in Kentucky continue to die of injury related causes in greater numbers than natural cause deaths. Injury related deaths are more likely to be preventable than natural cause deaths. Many factors have been associated with increased risk of injury or death in children. Factors affecting risk to children may include socioeconomic factors, cultural factors, geographical location, education level, and health and safety issues in the community. Understanding these factors is critical to addressing preventable injury related child death through state and community-based interventions.

### A. LEADING CAUSES OF DEATH/TRENDS BY AGE

#### Children 1 to 4:

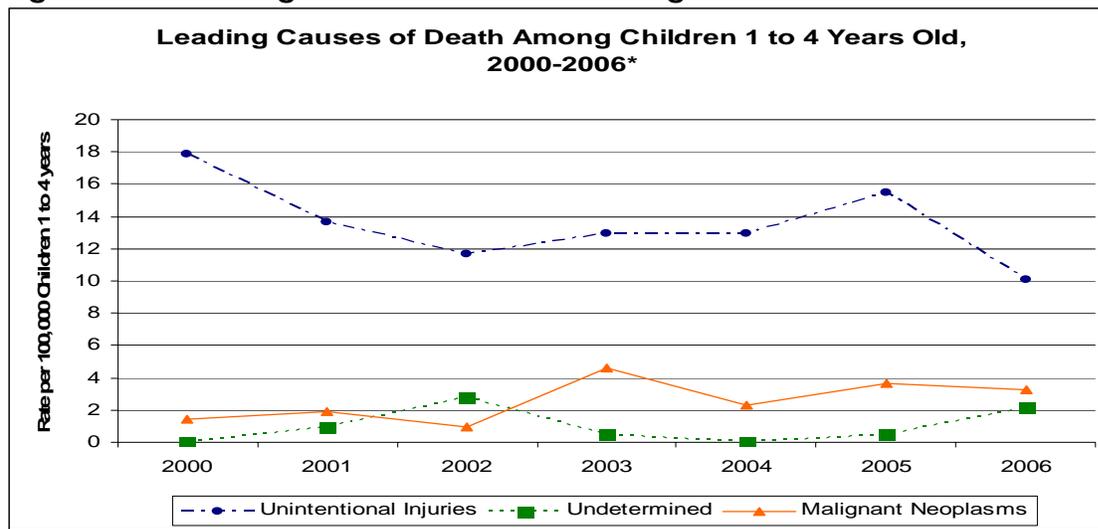
Unintentional injuries were the leading cause of death for children aged one to four during 2006 (Table 3). This particular age group can be especially vulnerable to injuries due to incomplete cognitive and physical development, a curious nature and often times lack of adult supervision.

**Table 3. Top Three Leading Causes of Death among Children Aged 1 to 4 in Kentucky, 2006**

Cause	Total # of Deaths
Unintentional Injuries	26
Malignant Neoplasm	9
Undetermined	6

Unintentional injury was the leading cause of death among children one to four years old from 2000 to 2006 (Figure 10). The rate of death from unintentional injury has decreased to 10.1 per 100,000 children in 2006. The rate of undetermined deaths among Kentucky children one to four years old increased from 2005 to 2006 (0.5 to 2.2 per 100,000 children). The death rate from malignant neoplasm among children 1 to 4 has remained somewhat constant from 2000 to 2006.

**Figure 10. Leading Causes of Death Among Children 1 to 4 Years Old**



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

### **Children 5 to 9:**

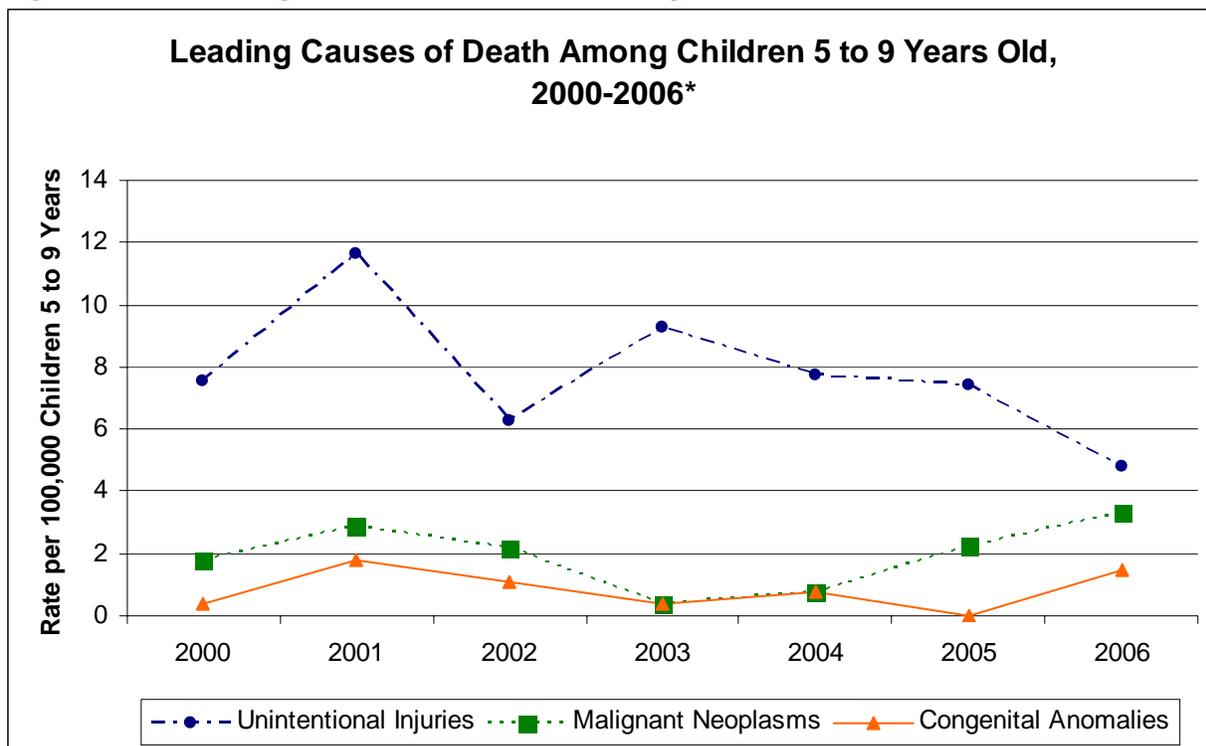
During 2006, the leading cause of death among children aged 5-9 was also unintentional injuries, which is shown in (Table 4). Unintentional injuries are followed by malignant neoplasm and congenital anomalies as the next leading causes of death for this age group.

**Table 4. Top Three Leading Causes of Death among Children Aged 5 to 9 in Kentucky, 2006**

Cause	Total # of Deaths
Unintentional Injuries	13
Malignant Neoplasm	9
Congenital Anomalies	4

From 2000 to 2006, the leading cause of death among children five to nine years old was unintentional injury (Figure 11). The death rate of unintentional injury among this age group has increased and decreased over the years. The next leading causes of death among five to nine year old children were malignant neoplasm and congenital anomaly. The death rate of malignant neoplasm per 100,000 children was higher than that of congenital anomalies in all years except 2003 and 2004.

**Figure 11. Leading Causes of Death Among Children 5 to 9 Years Old**



\*Rates for malignant neoplasm, congenital anomalies, and unintentional injuries in 2006 are based on 20 or fewer deaths and may be unstable. Use with caution.

### **Children 10 to 14:**

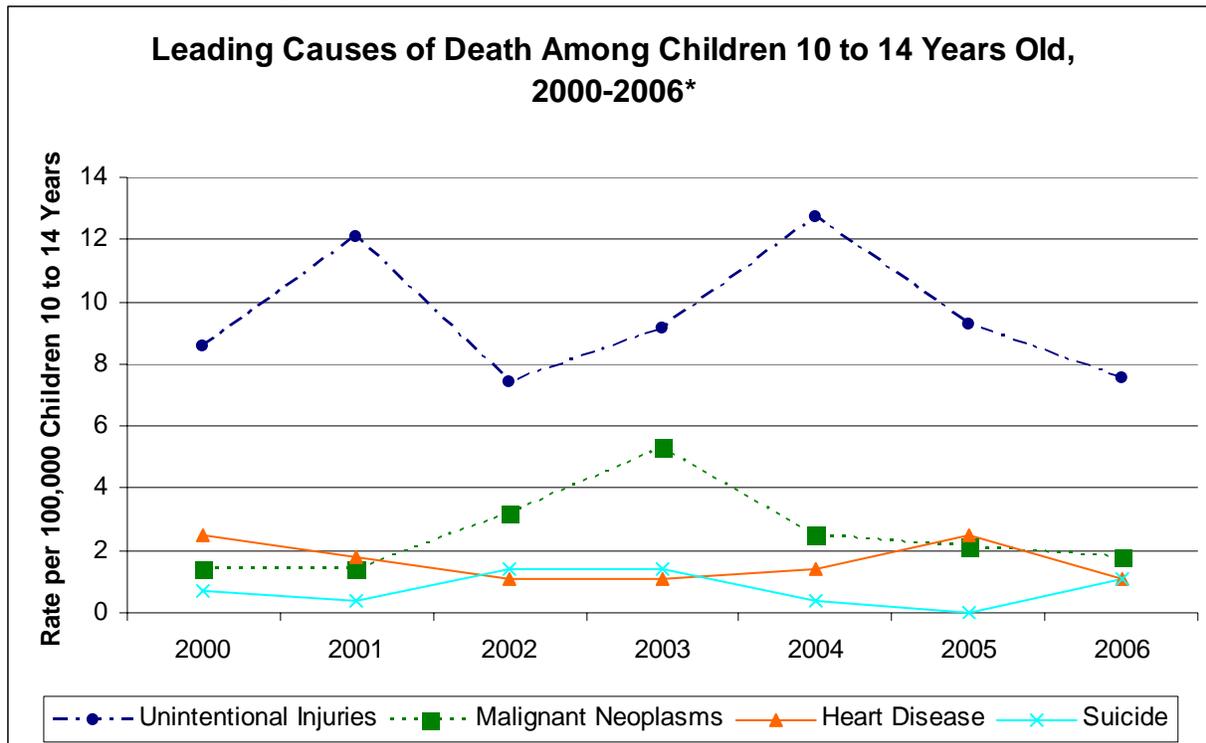
Unintentional injuries were again the leading cause of death among children aged 10 to 14 in 2006 (see Table 5). As children age, injuries continue to remain the leading cause of death followed by natural cause related illnesses.

**Table 5. Top Three Leading Causes of Death among Children Aged 10 to 14 in Kentucky, 2006**

Cause	Total # of Deaths
Unintentional Injuries	21
Malignant Neoplasm	5
Heart Disease	3
Suicide	3

Among children 10 to 14 years old, from 2000 to 2006, the leading cause of death was unintentional injury (Figure 12). The next leading causes of death for 10 to 14 year olds were malignant neoplasm, heart disease and suicide. The rate of death of malignant neoplasm disorder peaked at 5.3 per 100,000 children 10 to 14 years old in 2003. The rate of heart disease deaths among Kentucky children 10 to 14 years old decreased from 2005 to 2006, while the rate of suicide among this group increased.

**Figure 12. Leading Causes of Death Among Children 10 to 14 Years Old**



\*Rates for malignant neoplasm, heart disease, and suicide are based on 20 or fewer deaths and may be unstable. Use with caution.

**Children 15 to 17:**

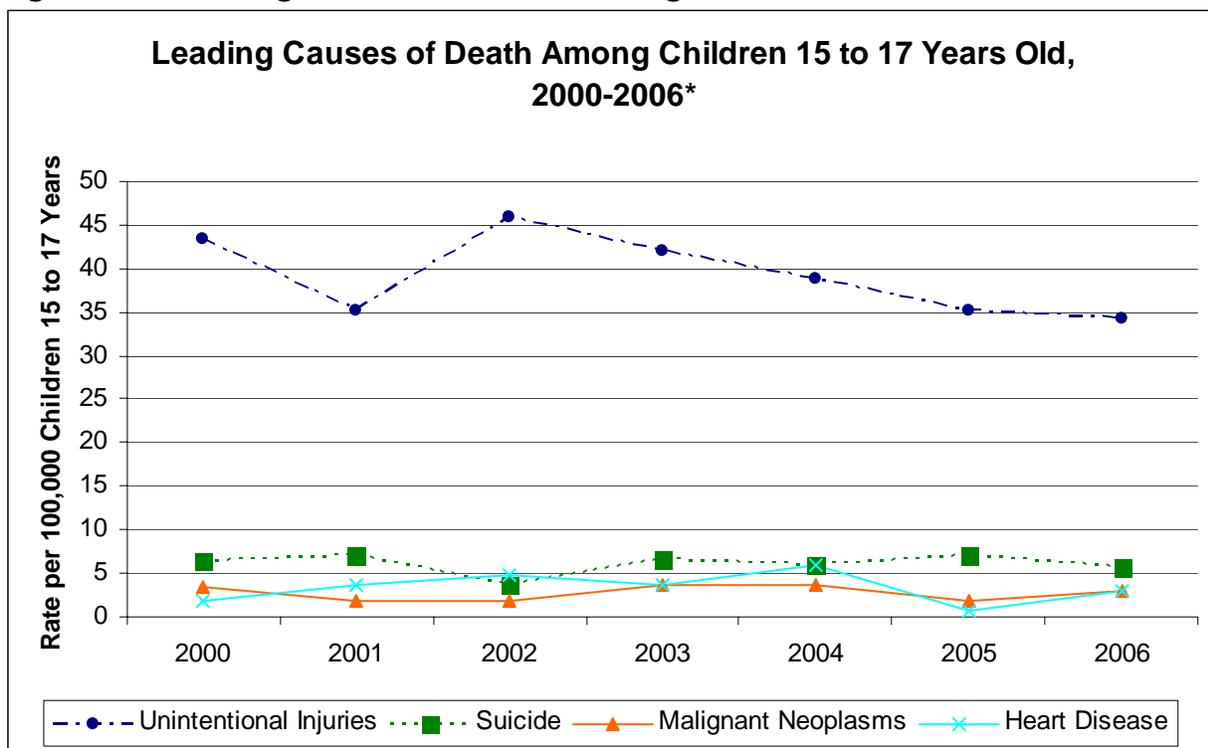
The leading cause of death among Kentucky teens aged 15 to 17 in 2006 was unintentional injuries followed by suicide, malignant neoplasm, and heart disease (see Table 6). As teens become older they may engage in more risk taking behavior than previously, and they may be more easily influenced by their peers.

**Table 6. Top Three Leading Causes of Death among Children Aged 15-17 in Kentucky, 2006**

Cause	Total # of Deaths
Unintentional Injuries	60
Suicide	10
Malignant Neoplasm	5
Heart Disease	5

From 2000 to 2006 the leading cause of death among teens 15 to 17 years old was also unintentional injury (Figure 13). Teens 15 to 17 years old have the highest rate of death from unintentional injury for all years shown, compared to other age groups. The next leading causes of death for 15 to 17 year old children are suicide, malignant neoplasm and heart disease. The rate of death of suicide is greater than malignant neoplasm and heart disease in 2005 and 2006.

**Figure 13. Leading Causes of Death Among Children 15 to 17 Years Old**



## **B. MANNER AND CAUSE OF CHILDHOOD DEATHS**

Childhood deaths are generally grouped into deaths from natural causes or deaths from injuries. "Natural cause" deaths include any fatality occurring due to innate, existing conditions. Natural causes include congenital anomalies, disease, SIDS, and other medical causes. "Injury cause" deaths include fatalities resulting from physical, chemical, thermal, or electrical forces. Injury-related deaths result from homicides, suicides and accidents. The total number of deaths for "natural cause" and "injury cause" fatalities in 2006 by gender and age is seen in (Table 7).

**Table 7 Comparison of "Natural Cause" Child Fatalities to "Injury Cause" Child Fatalities**

Causes of Child Death 2006	Natural Cause		Injury Cause		Grand Total	
	#	Rate*	#	Rate*	#	Rate*
<b>Total</b>	485	48	174	17	678**	68
<b>Male</b>	293	57	110	21	412	80
<b>Female</b>	192	39	64	13	265	54
<b>Age Groups:</b>						
<1	394	714	27	49	427	774
1-4	37	17	31	14	72	32
5-9	23	8	15	6	42	15
10-14	16	6	26	9	44	16
15-17	17	10	75	43	93	53

\*Rates are per 100,000 specified population; Denominator data are based on the 2006 population estimates for Kentucky from US Census.

\*\*19 records in the Preliminary Vital Statistics Death Certificate file did not have cause of death coded.

Note: Classification of death (Natural vs. Injury) is based on the ICD10 code as recorded on the death certificate;

**Table 8** shows the breakdown of natural and injury deaths by age of child in 2006. Thirty-seven percent of all deaths to children 1 to 17 years old were due to natural causes, while 59 percent were due to injuries. The remaining four percent did not have a cause of death listed on the death certificate. Injury deaths have the most potential for prevention. Injury deaths can be either from unintentional injury, like motor vehicle deaths, or from intentional injury/violent deaths. The majority of injury deaths are accidental, but the numbers of homicides and suicides in children are significant.

**Table 8. Child Deaths by Manner of Death and Age in Kentucky 2006**

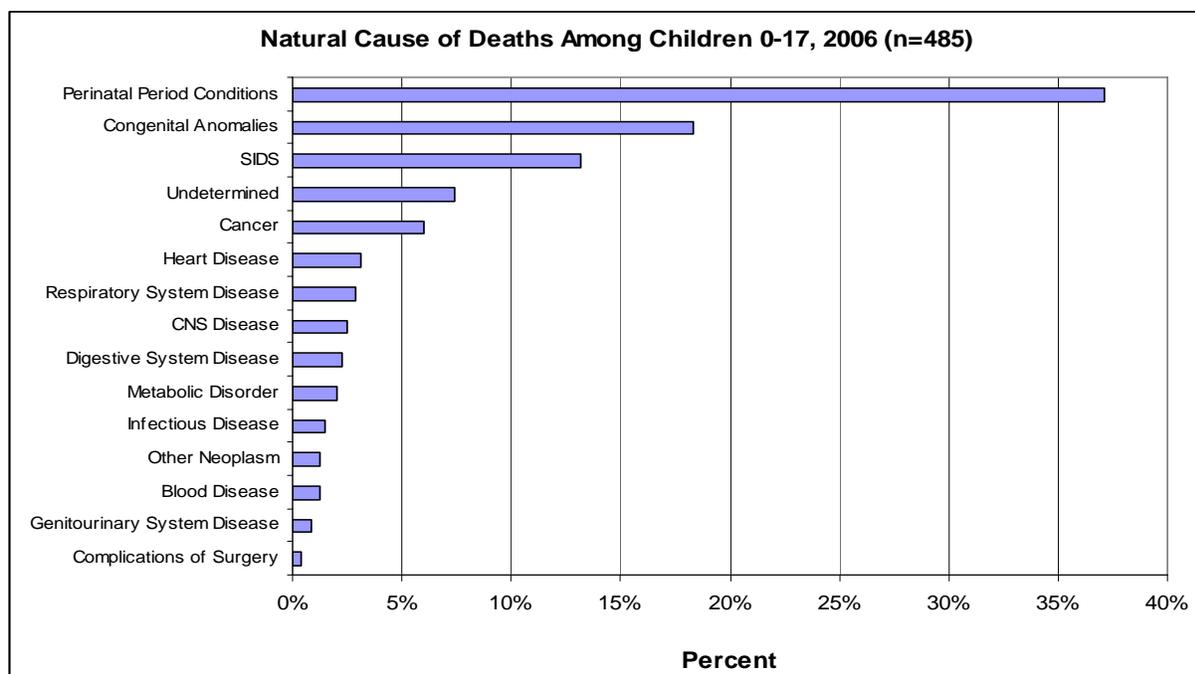
Age	Natural-				Total	
	Medical	Accident	Homicide	Suicide	#	%
1-4 Years	37	28	3	0	72	29
5-9 Years	23	13	1	0	42	17
10-14 Years	16	21	2	3	44	18
15-17 Years	17	60	4	10	93	37
Total	93	122	10	13	251	100

Note: 13 children in 2006 did not have a cause of death listed or intent was not determined, but are included in total.

## **C. NATURAL CAUSE DEATHS IN CHILDREN**

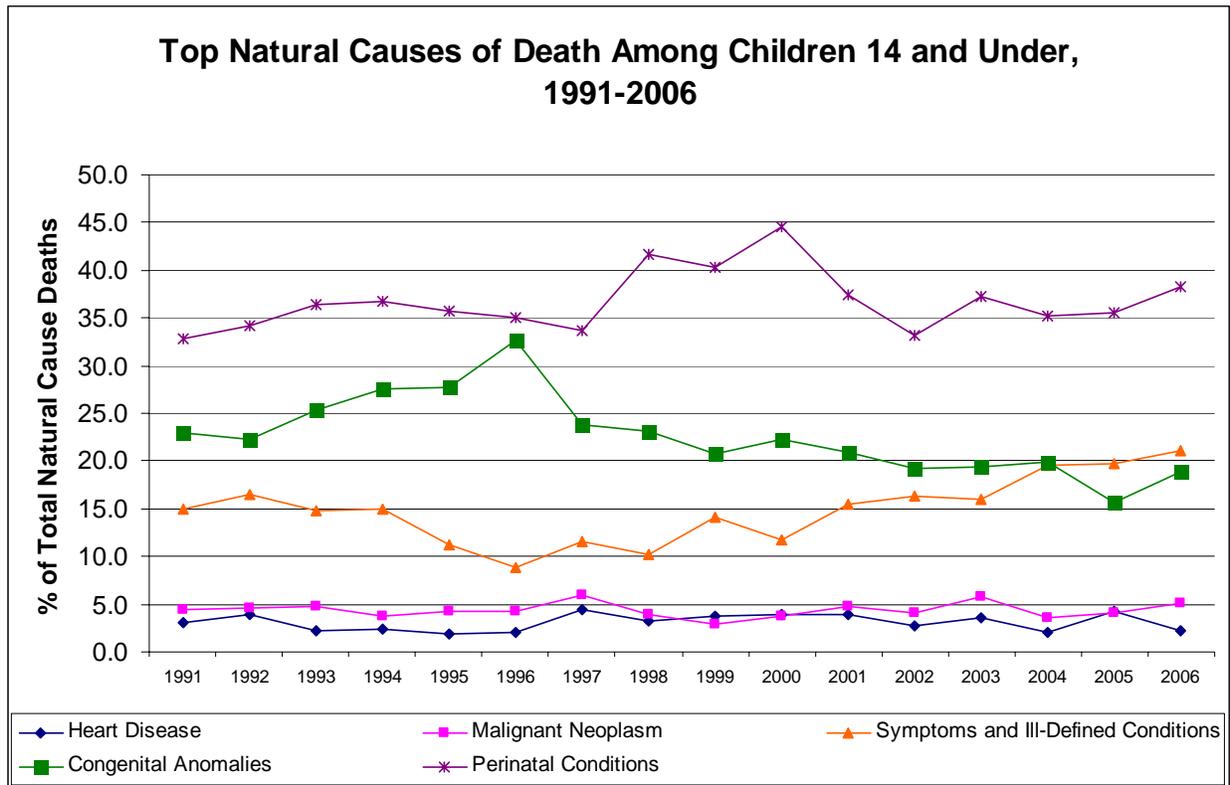
Deaths classified under the category of “natural cause” are generally linked to a specific disease or condition. **Figure 14** shows natural cause deaths among children birth to 17 years old for 2006 by cause of death groupings. Deaths due to perinatal conditions account for 37 percent of all natural deaths among children in 2006. SIDS alone make up 13 percent of natural deaths (see discussion of SIDS in part C of section one). Eighteen percent of natural deaths among children were due to congenital anomalies.

**Figure 14. Natural Cause Deaths Among Children Age 0-17**



The five leading natural causes of death among children aged 14 and under are shown as a percentage of total natural deaths over multiple years in (Figure 15). Causes are based on ICD code groupings, not on individual ICD codes. From 1991 to 2006, the leading cause of natural death among this age group was perinatal conditions. In 2005, Symptoms and Ill-Defined Conditions, which includes SIDS, surpassed congenital anomalies for the second leading cause of natural death. Ranking at number four and five, heart disease and malignant neoplasm have remained fairly steady over the time period shown.

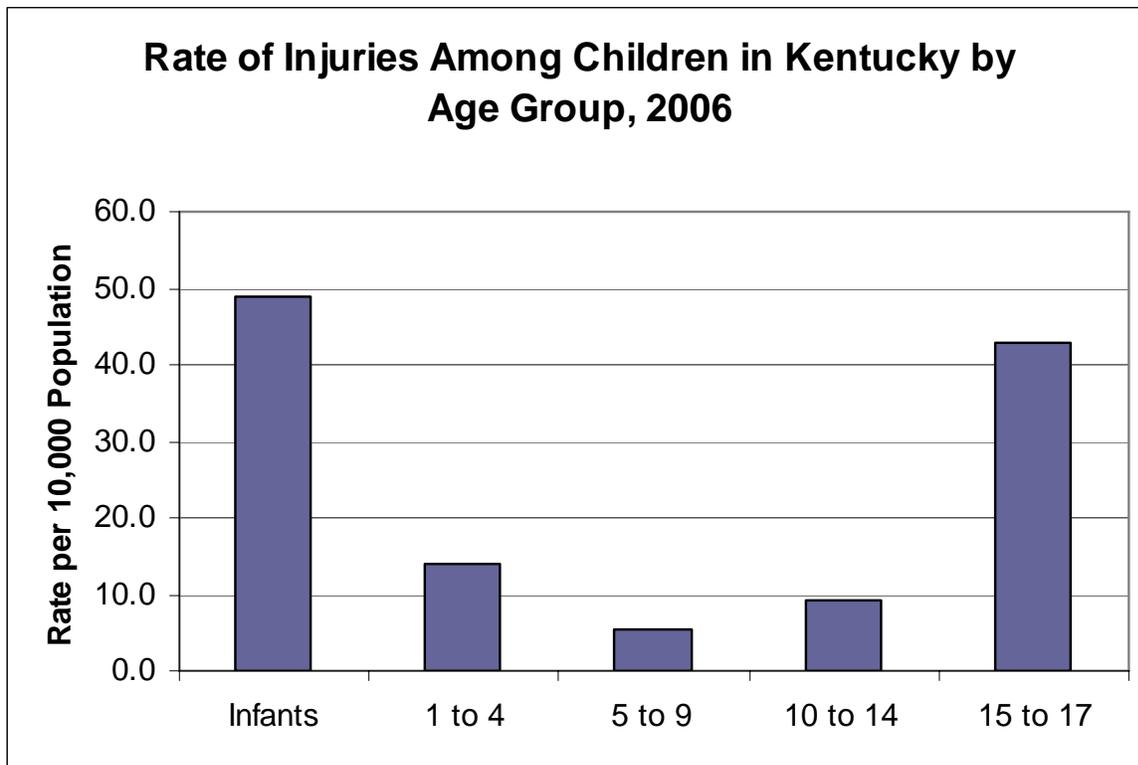
**Figure 15. Leading Natural Causes of Death Among Children 14 and under**



## **D. INJURY DEATHS IN CHILDREN**

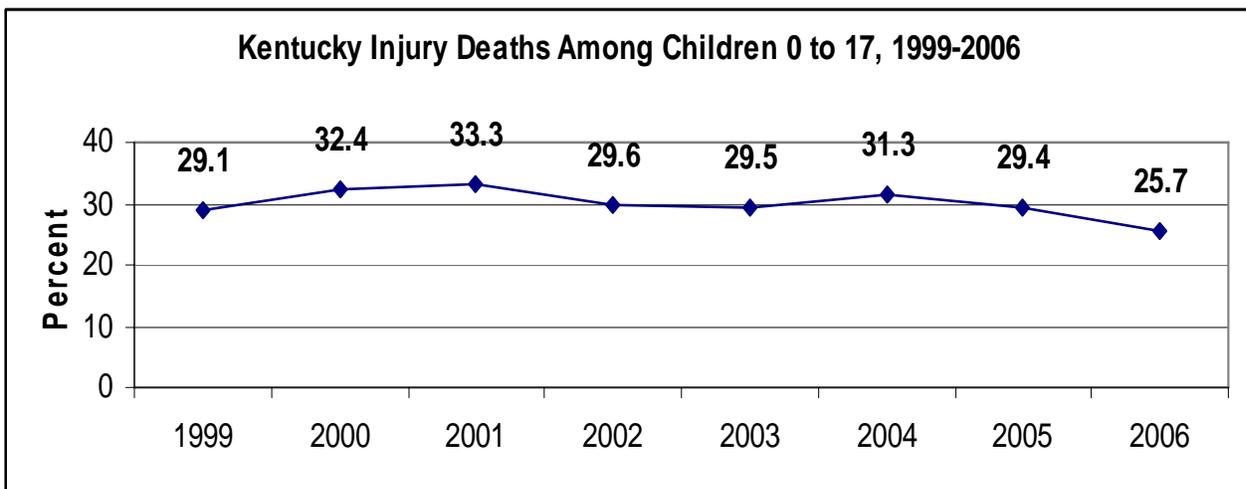
Kentucky continues to experience many deaths to children relating to injury. Injuries remain a major cause of morbidity and mortality, not just in Kentucky, but in the nation. The majority of childhood injuries are potentially preventable, yet they continue to increase and remain the leading cause of death to children over one year of age. The National Center for Injury Prevention and Control says the cost of injuries to our nation is estimated at more than \$224 billion each year. These costs include direct medical care, rehabilitation, lost wages and lost productivity. The federal government pays approximately \$12.6 billion each year in injury related medical costs and about \$18.4 billion in death and disability benefits. It is estimated that insurance companies and other private sources pay approximately \$161 billion annually.

**Figure 16. Rate of injury Deaths Among Children by Age Group.**



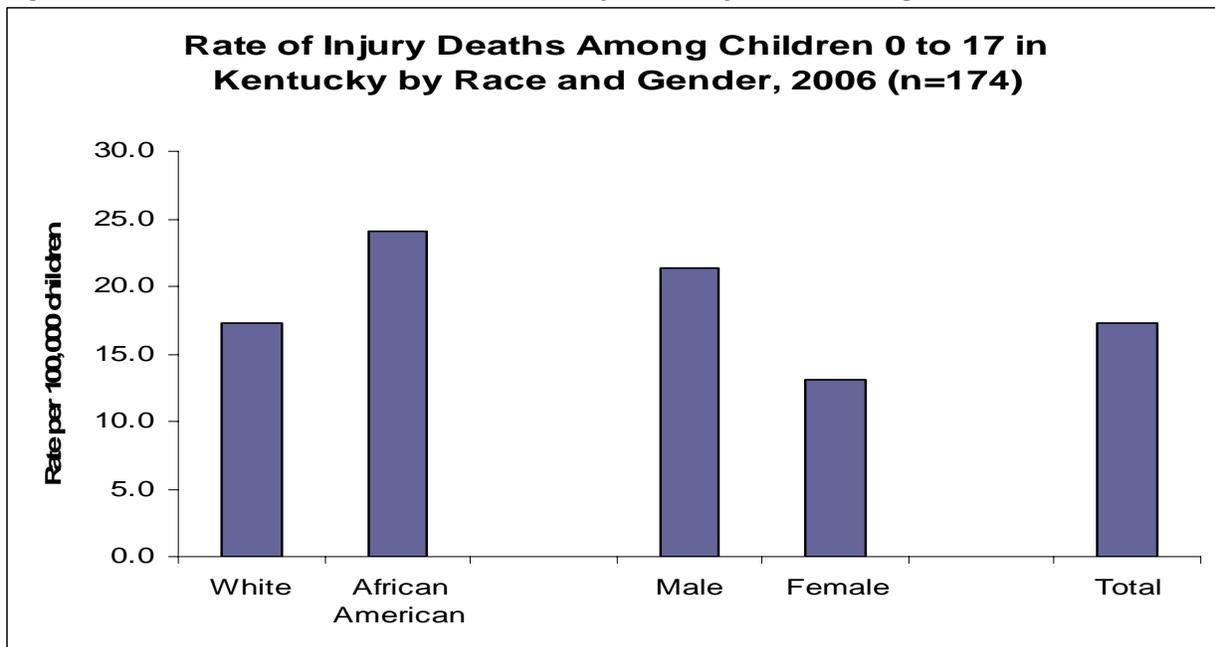
Injury related fatalities remain a leading cause of death for children of all ages in Kentucky, accounting for 26 percent of child deaths in 2006 (Figure 16).

**Figure 17. Percent of all child deaths due to Injury**



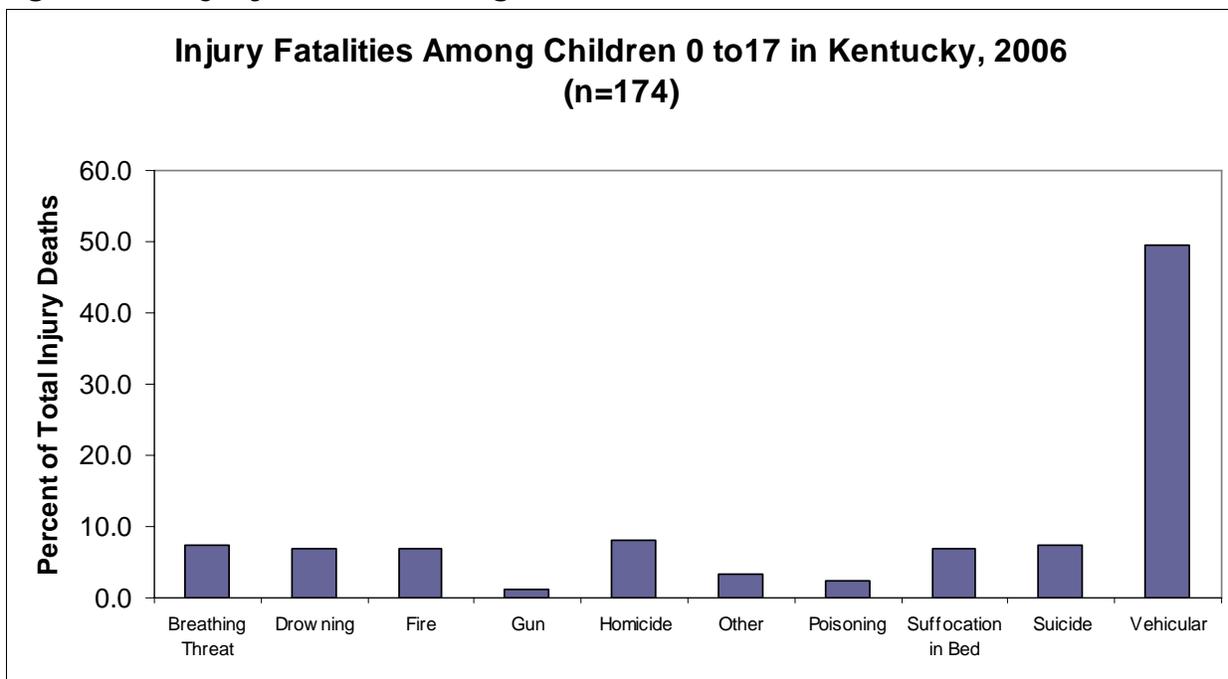
Since 1999, the percentage of total child deaths that are injury-related has decreased from 29 percent to 26 percent (Figure 17).

**Figure 18. Rate of child death from injuries by race and gender**



African American children died at a higher rate than white children in 2006 (24 per 100,000 compared to 17 per 100,000). In 2006, male children under 17 years old were one and a half times more likely to die from injuries than females. Twenty-one per 100,000 male children under 17 years old died from injuries in 2006, compared to 13 per 100,000 female children (Figure 18).

**Figure 19. Injury Deaths Among Children 0 to 17**



Overall, 174 children under 17 died from injuries in 2006. When looking at injury deaths by type, more children died from motor vehicle crashes than other injuries (Figure 19). The category for “Other” includes deaths due to circumstances involving falls, machinery, electrical lines and surgery complications.

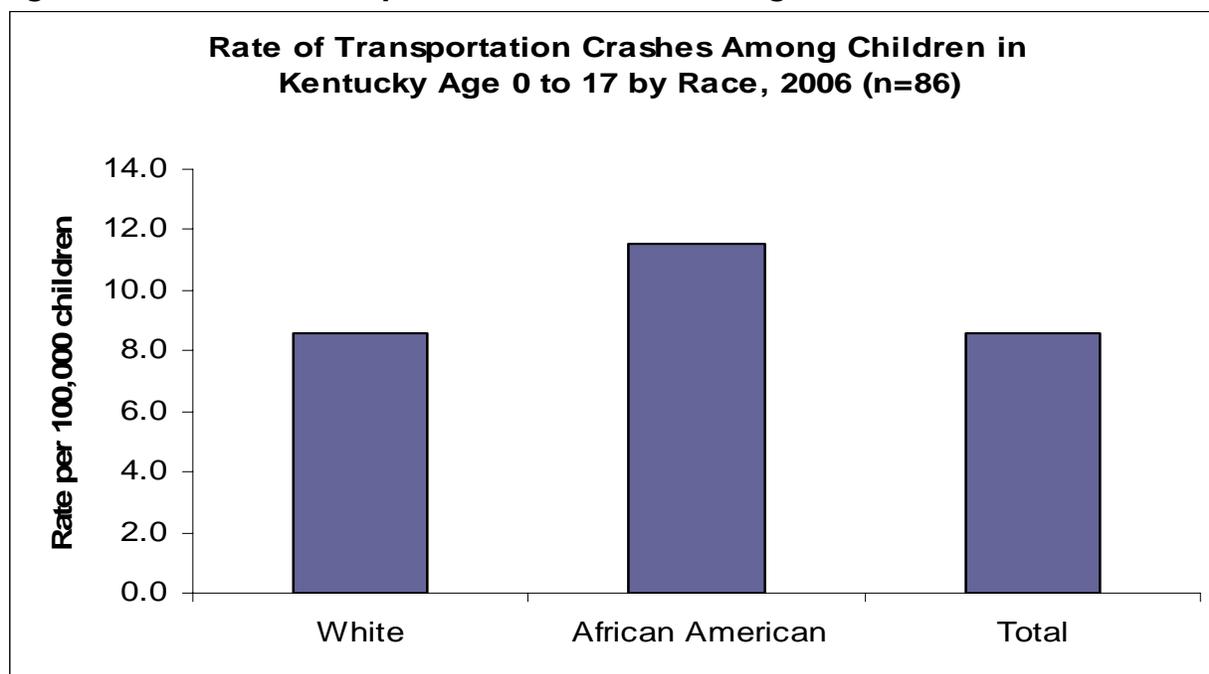
## E. UNINTENTIONAL INJURY RELATED DEATHS

### 1. TRANSPORTATION DEATHS

#### a. MOTOR VEHICLE FATALITIES

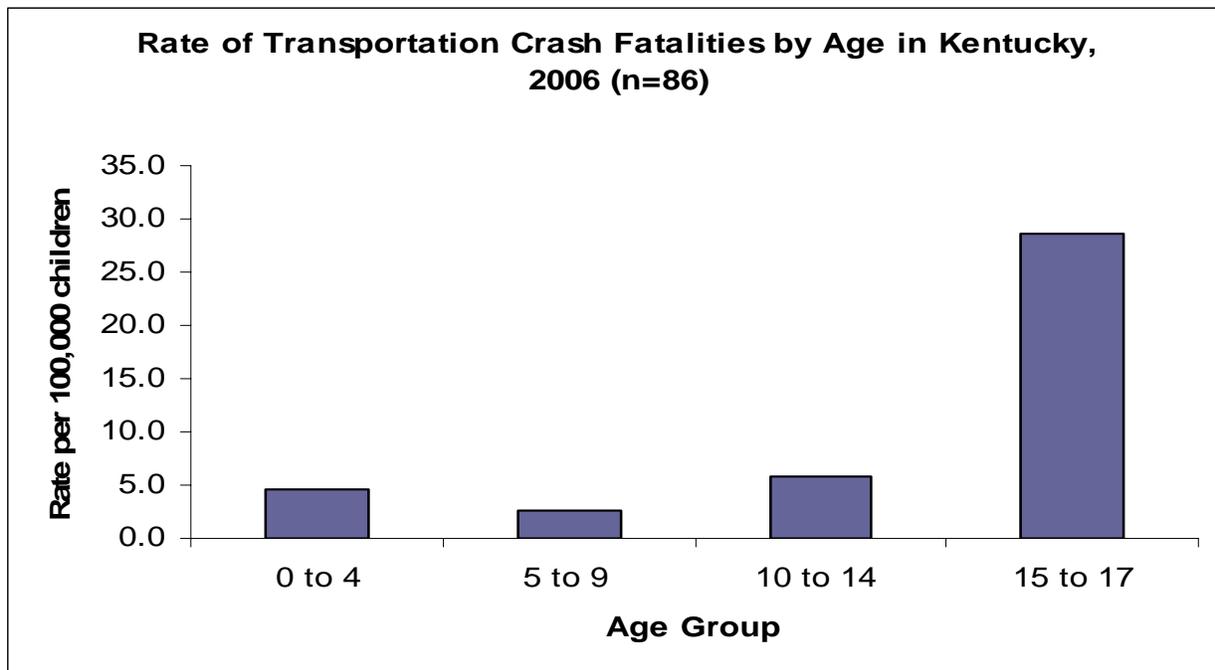
In the United States, motor vehicle crashes are the leading cause of injury death for people aged 1–44 years, the leading cause of death for children from 1-14 years, and the second leading cause of injury death for children less than one year. Kentucky Vital Statistics data show that in 2006, in children 17 and under, motor vehicle crashes accounted for 49 percent, or almost half, of all injury related deaths. In 2006, there were a total of 1,085 Kentuckians killed in motor vehicle crashes and **86** of those motor vehicle fatalities (8 percent) occurred in Kentucky's children less than 18 years of age. In the total number of crashes involving children less than 18 years (29,971) 8% (2275) were not restrained. Of those 86 child fatalities 54 (63%) were unrestrained. This is consistent with past years and continues to make *motor vehicle fatalities the leading cause of injury deaths for Kentucky's children 17 years and under*, according to Kentucky State Police Statistics. Motor vehicle fatalities include drivers, passengers, pedestrians who are struck by motor vehicles, bicyclists, and occupants in any other form of transportation, including all-terrain vehicles. In 2006, Kentucky's children were killed as car drivers or passengers (37 percent), unknown vehicle type (36 percent), pedestrians (11 percent), ATV drivers or passengers (6 percent), pick-up truck drivers or passengers (5 percent), motorcyclists (5 percent), and bicyclists (1 percent).

**Figure 20. Rate of Transportation Crashes Among Children 0 to 17**



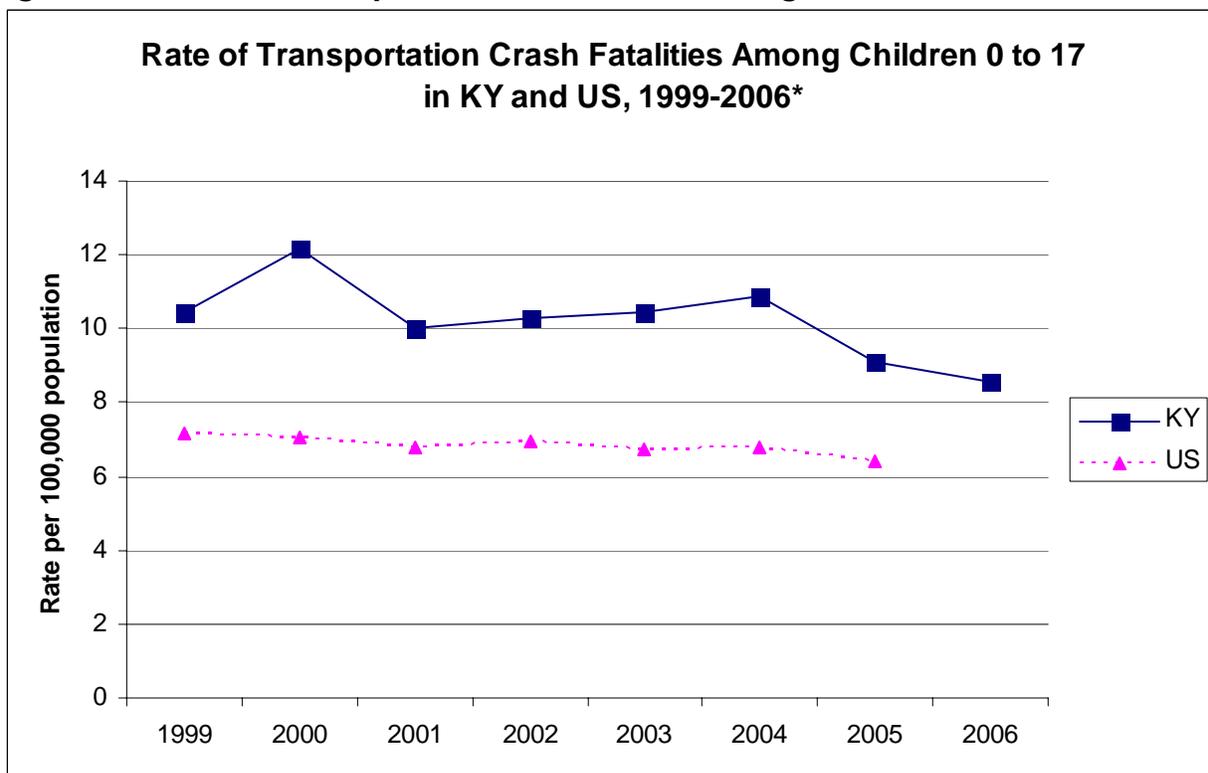
The rate of death of children under 18 in Kentucky in 2006 from transportation crashes is 8.6 per 100,000 children. Among white children, 9 per 100,000 died in transportation crashes in 2006. Nearly 12 per 100,000 African American children died in transportation crashes (Figure 20).

**Figure 21. Rate of Transportation Crash Fatalities by Age**



(Figure 21) shows the rate of transportation crash fatalities in Kentucky by age group. In 2006, nearly 29 youth per 100,000 aged 15 to 17 years died in crashes in Kentucky. Kentucky teens, aged 15 to 17 years were five times as likely to die in transportation crashes, compared to the rate of all other age groups.

**Figure 22. Rate of Transportation Fatalities Among Children 0 to 17**



From 1999 to 2006, the rate of transportation crash fatalities in Kentucky has been higher than the United States. However, the rate has decreased in Kentucky from over 12 per 100,000 in 2000 to 8.6 per 100,000 in 2006 (Figure 22).

## **b. PEDESTRIAN FATALITIES**

According to data from Kentucky Vital Statistics, nine children were killed as pedestrians in 2006 on public roadways. Young children are impulsive and have difficulty judging speed and distance. They are more likely to suffer injuries on residential streets with high traffic volume and large numbers of parked cars on the street.

Toddlers are at risk primarily due to their small stature and limited interactions with traffic. The majority of pedestrian injuries involving toddlers occur when a vehicle is backing up. Young children are at increased risk of death in driveways and other relatively protected areas. Parents, grandparents and caregivers must remember to never leave an infant/toddler unattended around a parked vehicle.

## **c. BIKE & MOTORCYCLE RELATED FATALITIES**

Motor vehicle fatalities also included bicycling. In addition to bicycles, children died as a result of injuries sustained in motorcycle accidents as either passengers or drivers.

The single, most effective safety device available to reduce brain injury from any type of bike crash is a helmet. In the event of a crash a bike helmet can reduce serious brain injury by 88 percent. Unfortunately national estimates on helmet usage suggest that only 25 percent of children under 14 years of age wear a helmet according to SAFE KIDS. According to the National Center for Injury Prevention and Control primary strategies to increase helmet use include: 1) education, 2) legislation and 3) helmet distribution programs.

## **d. ALL-TERRAIN VEHICLE (ATV) FATALITIES**

In 2006, Kentucky had five fatalities on ATVs among children under age 18, plus one death of a child on an off-road utility vehicle. Of the five ATV deaths, four resulted from crashes. One of the crashes involved an ATV running into another ATV, resulting in injury and death; none were wearing helmets. Drivers of the ATVs who were killed ranged from 11-17 years of age.

## **RISK FACTORS OF TRANSPORTATION FATALITIES**

The National Center for Injury Prevention and Control lists two factors as most significant in contributing to motor vehicle-related fatalities among children: 1) unrestrained children and 2) drunk drivers. The National Safe Kids Campaign reports that 42 percent of children aged 4 years and under ride unrestrained. This places them at twice the risk of death and injury as those riding restrained. Child restraint use directly correlates to the restraint use of the caregiver. As with all the other states, Kentucky has primary enforcement of child restraints, meaning a police officer can stop and cite a driver for not having a child 40 inches and under properly restrained. The most common reason restrained children are killed is misuse of child car seats and premature graduation to seat belts. Through voluntary car seat checks, done by certified child passenger safety technicians across Kentucky, 90 percent of the seats checked are used incorrectly.

Teenagers are three to four times more likely to be involved in a crash than the older driving population. According to the National Center of Injury Prevention and Control, risk factors faced by teens include inexperience, low rates of seatbelt use and alcohol. Inexperienced drivers lack perception, judgment and decision-making skills that are required to drive safely. Kentucky's graduated licensing system (KRS

186.450) was passed in the Kentucky Legislature in 2006. This should produce significant changes in the data surrounding teenage drivers in the near future.

## **PREVENTION STRATEGIES**

### **Parents:**

1. All children less than 13 years should ride properly restrained in the back seat.
2. Unless using a higher weighted harness seat, children between 40-100 pounds should ride properly positioned with a lap/shoulder belt in a booster seat.
3. Always model and teach proper pedestrian behaviors.
4. Children under the age of 16 years should not ride or operate ATVs of any size.
5. ATVs should never be ridden after dark.
6. Always wear protective gear when riding ATVs, motorcycles, bicycles, etc., especially a helmet.
7. Never leave children alone in the car, not even for a minute.
8. Helmets should be worn at all times when riding a bicycle, motorcycle, moped, or ATV.
9. ATVs should not be ridden by two people, unless the machine was manufactured to carry two riders.
10. Ask about ATV safety training courses in your community.
11. Education about ATV safety must include leaving it parked without keys in the ignition and with the emergency brake on. Children should be instructed not to play around a parked ATV, just as they should not play around a car.
12. Children should not ride as a passenger on off-road utility vehicles until they have graduated from booster seats in an automobile at age 8 or 4'9" in height, and they must use a seat belt when available.

### **Professionals:**

1. Educate parents on strategies to reduce injury and death at car seat check up events.
2. Educate parents on bike safety through bike rodeo programs.
3. Helmet distribution and education.
4. Institute the "Not Even For a Minute" Campaign.

### **CFR Teams:**

1. The state child fatality review team should continue to improve data collection and analysis. There are many opportunities to collect more information that can facilitate accurate reviews of the death. This will in turn, create better prevention activities in the future.

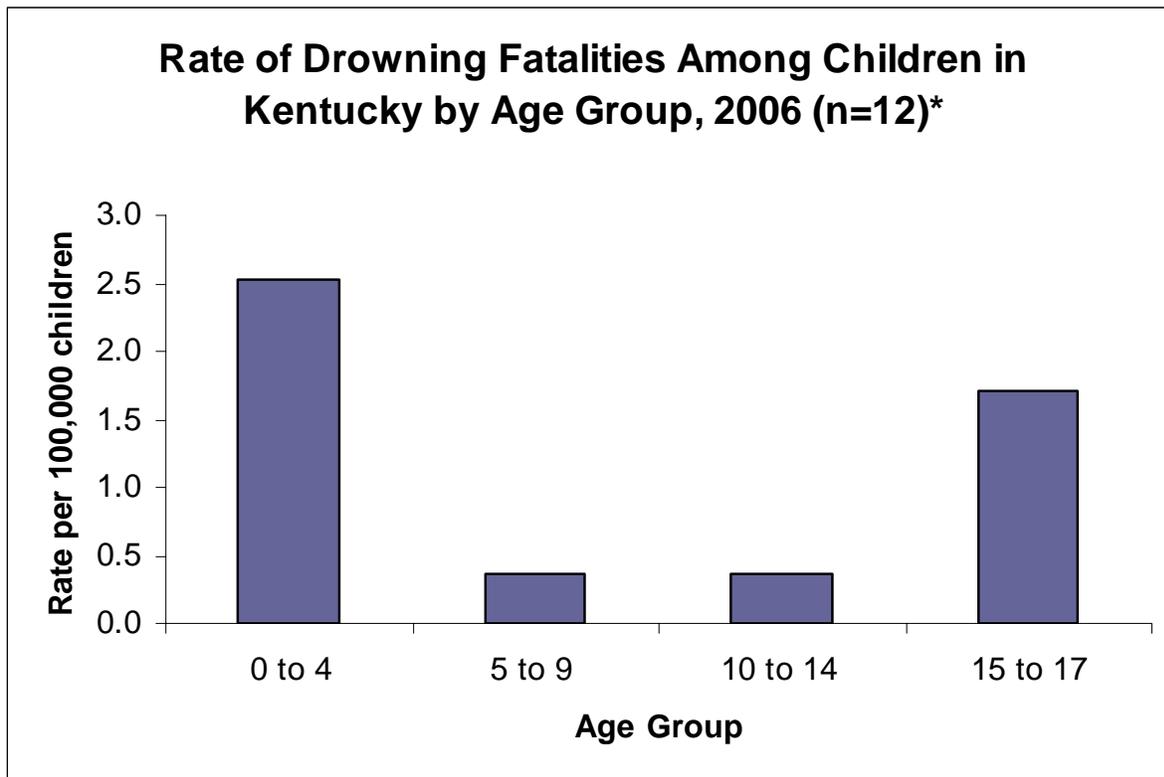
## **RESOURCES**

American Academy of Pediatrics ..... [www.aap.org](http://www.aap.org)  
Children's Safety Network ..... <http://research.marshfieldclinic.org>  
National SAFE KIDS Campaign ..... [www.safekids.org](http://www.safekids.org)  
Center for Injury Prevention and Control ..... [www.cdc.gov/ncipc](http://www.cdc.gov/ncipc)  
National Highway Transportation Safety Admin..... [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)  
ATV Safety Institute ..... [www.atvsafety.org](http://www.atvsafety.org)

## **2. DROWNING FATALITIES**

Drowning in infants under age 1, typically occur in bathtubs. Most drowning in children aged 1- 4 happen in swimming pools. Even so, children can drown in as little as an inch of water which makes wading pools, buckets, toilets, hot tubs, gold fish ponds, and other water sources dangerous as well. A child can drown in a matter of seconds and they usually drown when they are left unattended. Drowning occurs quickly and quietly. Older children are more likely to drown in creeks, lakes and rivers. In 2006 Kentucky lost 12 children due to drowning. The place of drowning for these children included natural water, swimming pools, and unspecified places.

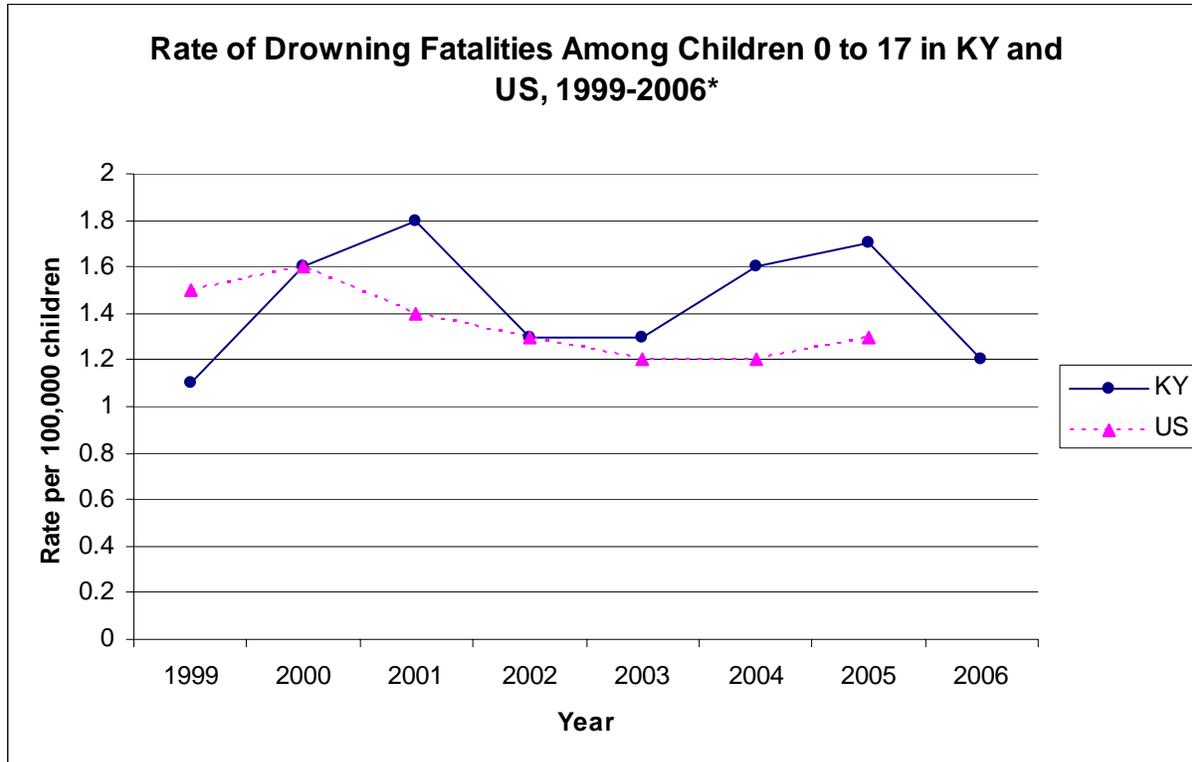
**Figure 23. Rate of Drowning Fatalities Among Children by Age**



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

In 2006 in Kentucky, nearly 3 per 100,000 children under four years old died by drowning. Children under 4 are at the highest risk and always need adult supervision (Figure 23).

**Figure 24. Rate of Drowning Fatalities Among Children 0 to 17**



\*US data not available for 2006. Rates for Kentucky are based on 20 or fewer deaths and may be unstable. Use with caution.

From 1999 to 2006, the rate of drowning deaths in the United States has decreased. However, the rate of drowning deaths in Kentucky has increased and decreased over time (Figure 24).

## **RISK FACTORS FOR DROWNING**

Children are at risk of drowning when they are unsupervised around any water source. The youngest children are at the highest risk. Pools without fences and steps that aren't properly secured also increase the risk of a small child gaining access to the pool. Older children are at more risk due to swimming in lakes or streams.

## **PREVENTION STRATEGIES**

Recommendations from drowning deaths that were reviewed by local child fatality teams included closer supervision of children around water sources, making sure pools are enclosed with fences, removing steps when the pool is not in use, having lifeguards at rivers or post no swimming signs, and access to pools should be limited when adult supervision is unavailable.

### **Parents:**

1. Never leave a child unsupervised in or around water inside or outside, not even for a moment.
2. Residential pools should have a four-sided pool fence with a self-closing, self-latching gate. The fence should be at least four feet tall and should completely separate the pool from the house and play area in the yard.
3. Make sure children always wear U.S. Coast Guard-approved personal flotation devices near open water or when participating in water sports.

4. Learn CPR.

**Community Leaders:**

1. Enact or enforce pool fencing ordinances.
2. Enforce the use of personal flotation devices when boating.

**Professionals:**

1. Adults and children should receive water safety education. This should include watercraft safety (wave-runners, boats, skis, etc) as well as the dangers of open water and other water hazards to small children.
2. Facilitate CPR trainings.

**CFR Teams:**

1. Promote public education.
2. Implement prevention strategies at the local level.

**RESOURCES**

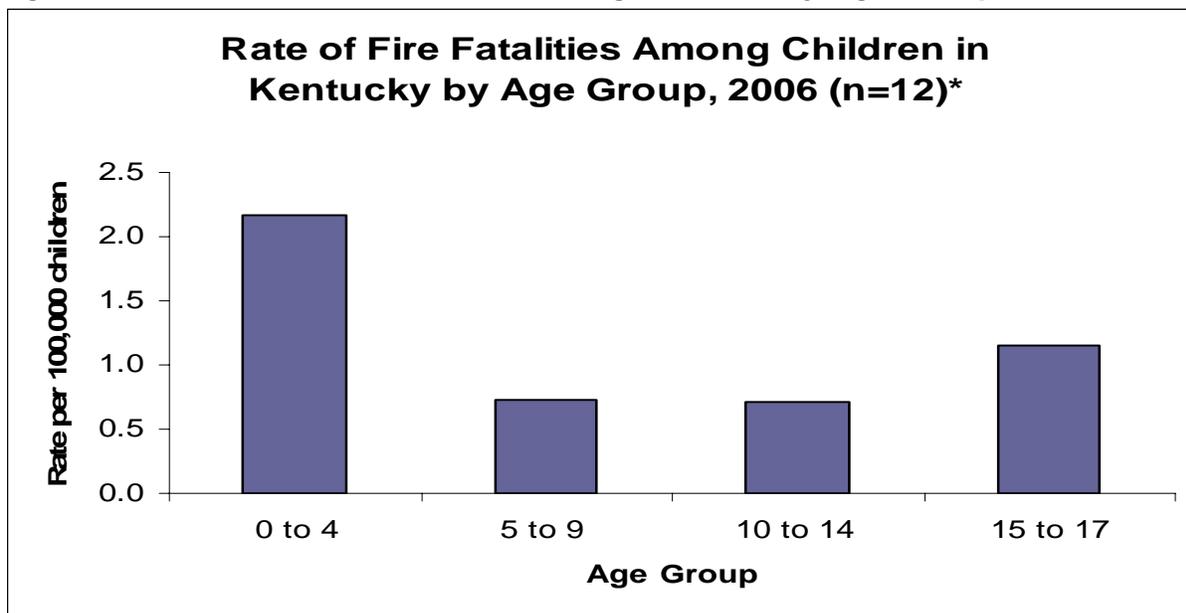
American Academy of Pediatrics .....	<a href="http://www.aap.org">www.aap.org</a>
National SAFE KIDS .....	<a href="http://www.safekids.org">www.safekids.org</a>
National Center for Injury Prevention .....	<a href="http://www.cdc.gov/ncipc">www.cdc.gov/ncipc</a>
Consumer Product Safety Commission .....	<a href="http://www.cpsc.org">www.cpsc.org</a>
American Red Cross .....	<a href="http://www.redcross.org">www.redcross.org</a>
United States Lifesaving Association .....	<a href="http://www.usla.org">www.usla.org</a>

**3. FIRE FATALITIES**

Each year in the United States, more than 600 children under age 14 die, and 47,000 are injured in fires. According to the National Fire Protection Association, Kentucky is ranked 8<sup>th</sup> in the United States on fire deaths. Children under age 5 are particularly vulnerable to fire related injury and death. They are twice as likely as the rest of the population to die in a fire. Safe Kids reports that more than half of the children under age five who die in house fires are asleep at the time of the fire, and recent studies have demonstrated that young children will sleep through sounding smoke detector alarms. Young children must often depend upon adults to help them get out, and in a fire may seek adults rather than exits, or may run and hide in a closet. The United States Fire Administration also reports that children living in rural areas have a dramatically higher risk of dying in a residential fire than do children living in more urban areas, probably related in part to the time it takes fire responders to reach rural fires.

The rate of fire deaths among children in Kentucky is 1.2 per 100,000 children. In 2006, 12 Kentucky children were killed in 7 house fires, per vital statistics records.

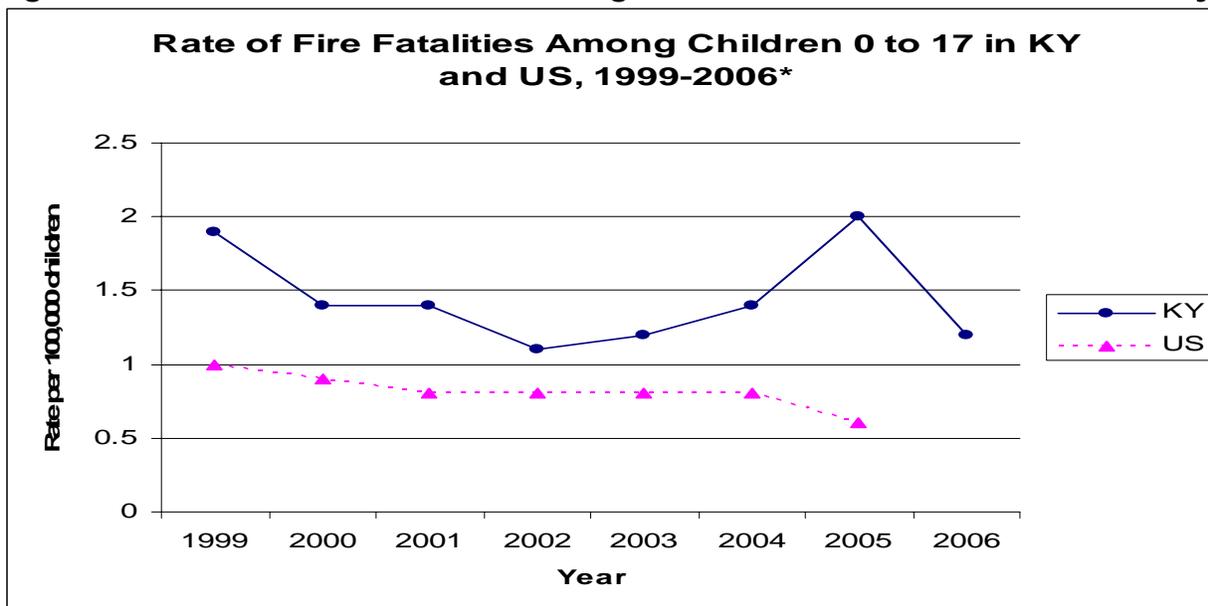
**Figure 25. Rate of Fire Fatalities Among Children by Age Group**



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

Almost half of the fires that occurred in 2006 killed multiple children. Children who died ranged in age from 2-17 years (Figure 25). Half of the children who died in 2006 were ages 4 and under, consistent with what is known about fire deaths to young children nationally. No African American children died of fire in Kentucky in 2006, but 25% of the children who died were Hispanic, the second year in a row that Hispanic fire deaths were documented.

**Figure 26. Rate of Fire Fatalities Among Children 0 to 17 in US and Kentucky.**



\*US data not available for 2006. Rates for Kentucky are based on 20 or fewer deaths and may be unstable. Use with caution.

From 1999 to 2006, the rate of death among children from fires was higher in Kentucky than the United States. In Kentucky, the rate has fluctuated over the last 8 years, with 2005 year being the highest rate since 1999 (Figure 26). However, in 2006, the rate decreased to 1.2 per 100,000 children.

## **RISK FACTORS FOR FIRE FATALITIES**

There are many issues revolving around fire injury and death to children. Prevention can be divided into primary prevention of fire, detection of a fire that does occur, and escape from a fire. According to the National Center for Injury Prevention and Control, children from low- income families are at greater risk due to factors such as lack of working smoke alarms, substandard housing, use of alternative heating sources, and having to leave children unattended to work due to not being able to afford (or in rural areas not having access to) child care.

Prevention of residential fires in Kentucky involves safe storage of matches and lighters, fully extinguishing cigarettes, fire standards for mobile homes, manufactured housing and rental home/apartment standards, code compliance by builders and families doing home maintenance/adaptation, code enforcement, adequate space around alternate heating sources, not overloading extension cords, eradication of methamphetamine home manufacturing labs, safe kitchen cooking, and safe use of candles. Data on specific fire causes can help direct more specific and efficient community prevention efforts.

When a fire does occur, smoke detectors save lives, because they give people the precious minutes of warning that permit them to get out. Smoke detectors with standard batteries should have the batteries replaced whenever the clocks change, so that there is never an opportunity for a battery to be dead and dysfunctional. Batteries should never be removed to be used in toys. 10-year batteries provide more lasting protection. In 2006, at least 3 fires occurred in residences without smoke detectors. As in 2005, in only one fire was the smoke detector actually sounding when fire departments arrived.

Escape is enhanced by families having made an escape plan in advance, and having practiced it. It is important to be sure in advance that windows actually do open and that people can fit to get out of them. Special planning needs to be done for fire evacuation of families with small children, as the children may know a plan but be unable to physically implement it. They may not be able to reach a window or have the strength to open it alone, and an advance plan for which adult will evacuate which child needs to be made.

Lack of access to fire departments within a time frame that permits possible fire suppression is part of what confers excess mortality risk on rural children. All of the children who died in 2006 fires lived in places that are considered rural rather than urban.

## **PREVENTION STRATEGIES**

### **Parents:**

1. Children should always be supervised.
2. Keep matches, lighters, gas, etc. locked up and out of reach of children.
3. Install smoke alarms on every level and in every sleeping area of your home.
4. Test smoke detectors/alarms at least one time per month.
5. Replace batteries when you change your clocks in the spring and fall.
6. Have a fire drill plan in place and practice with your family. Practicing may help children stay calm in an actual emergency.
7. Assign which adult is responsible for which child in case of an emergency.

### **Community Leaders:**

1. Work with local builders and inspectors to require smoke detectors in new and existing housing.

2. Work to make landlords responsible for ensuring that their properties have working smoke detectors.
3. Enforce building codes and inspections.

**Professionals:**

1. Partner with local agencies to go door-to-door to install smoke detectors in high risk communities, as distribution alone without installation has been proven to be an ineffective strategy.
2. Work with the fire department to help them disperse their fire safety messages.

**CFR Teams:**

1. Improve data gathering and sharing of information to obtain an accurate account of fire deaths.
2. When reviewing a fire death, explore code requirements in the community and determine the presence of a smoke detector at the home.
3. "Were children being supervised", should be a question asked at the review.
4. Develop an action plan based on the review.

**RESOURCES**

American Academy of Pediatrics .....www.aap.org  
 United States Fire Administration .....www.usfa.fema.gov  
 National SAFE KIDS Campaign .....www.safekids.org  
 Kentucky Injury Prevention/Research Center .....www.kiprc.uky.edu  
 State Fire Marshall's Office.....www.dhbc.ky.gov  
 National Fire Protection Association .....www.nfpa.org

**4. POISON FATALITIES**

The traditional picture of poisoning deaths is unintentional among young children with inadvertent ingestions and intentional ingestions among older, suicidal teens. In 2006, all deaths from accidental poisoning in Kentucky were among 15 to 17 year olds (see also suicide).

**PREVENTION STRATEGIES**

**For parents, caregivers, and community leaders such as teachers, neighbors, police, etc:**

1. Flush all unfinished medication after 6 months, thus reducing the amount of medication available to children.
2. Be especially careful when staying somewhere other than home, that may not be child-proofed.
3. The American Academy of Pediatrics recommends not to use over the counter cold medications in children younger than six months.
4. Store medications and cleaning solutions in original bottles. Lock up all potentially lethal substances including drain cleaner, dishwasher soap, kerosene and other volatile fluids.
5. Avoid use of over the counter cold and cough medications in children under age 2, and carefully review with doctor or other primary care provider and with pharmacist any medication ordered to be sure of correct strength and dose.
6. Be aware that giving cough and cold medication to children to make them stop crying, be quiet or go to sleep is a dangerous choice that can result in their death.

7. If nursing an infant, mothers should be careful about their own pain medication and other substance use and avoid anything that can affect their baby.
8. Pain medication in a household is a potential risk for a child, this is especially true of long-acting forms.
9. Methamphetamines in a household are a serious potential risk for children. Research has shown the harmful affects of the manufacture and production of this drug. Children should never be exposed to the process or the drug itself.
10. Everyone in a community must be vigilant about child abuse and about parental drug abuse, and must make it their responsibility to report potential child endangerment so that families can receive treatment and children can be protected. Ideally in the long term, drug abuse prevention is the goal.

**For community leaders and policy makers and professionals:**

1. Create a sense of community where the well-being of the children is important and people look out for one another.
2. Be aware of the potential lethality of familial drug abuse on any related children, including teenagers. Educate all in the child protection stream about this, including the judicial system.
3. Ensure that adequate drug treatment and mental health care exist for all community members, including women and teenagers.
4. Educate the public, clients and patients about the items listed above.
5. Ensure adequate access to childcare.
6. Ensure that children of military personnel and military contractors have adequate access to safe care during the time their caregiver is deployed.

**For child fatality review teams:**

1. Ensure that toxicology is obtained on all infant deaths.
2. Ensure that all child deaths receive full review by a multidisciplinary, multi-agency team and that all medical records are carefully reviewed.

**RESOURCES**

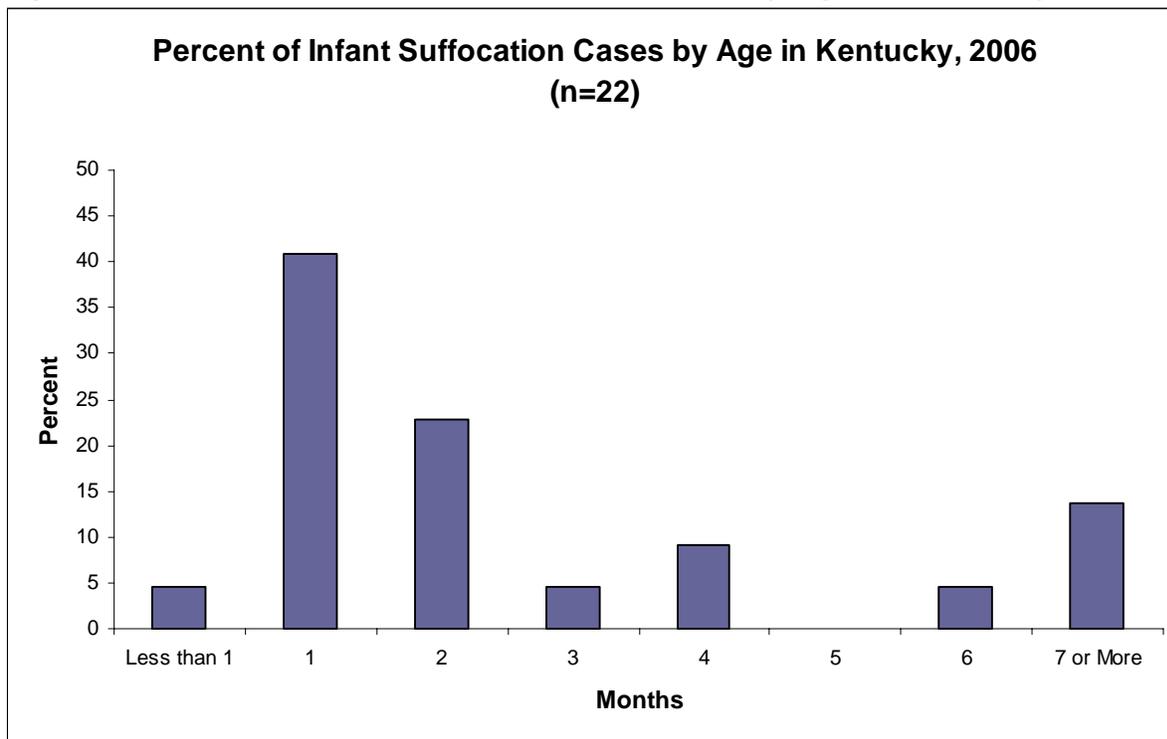
Poison Control Center .....1-800-222-1222  
 MMWR (article on deaths from cough and cold medications).....www.cdc.gov  
 American Academy of Pediatrics .....www.aap.org  
 Substance Abuse/Mental Health Administration .....www.samhsa.gov  
 SAFE KIDS.....www.safekids.org

**5. SUFFOCATION IN INFANTS**

Infant deaths due to suffocation are almost always related to an unsafe sleep environment. Parents and caregivers may not know the risks associated with unsafe sleeping arrangements. Infants can suffocate when their faces become positioned against or buried in a mattress, cushion, pillow, comforter or bumper pad, or when their faces, noses and mouths are covered by soft bedding, such as pillows, quilts and comforters. Most cases of unintentional suffocation happen in environments where normal infants would not be able to move themselves out of the unsafe circumstance (scooting between the back and bottom of sofa cushions). In addition to positioning, overlaying is a type of unintentional suffocation. This occurs when an infant is sleeping with one or more persons (bed sharing with adults or children, sharing sofas or armchairs) and someone rolls over on them or the baby wedges between the chair and the person. Most of

these types of cases are classified as undetermined because the actual position of the infant and other person at the time of death was not witnessed.

**Figure 27. Percent of Infant Suffocation Cases by Age in Kentucky**



Unintentional suffocation and unspecified threat to breathing were the cause of death of 22 Kentucky infants in 2006 (Figure 27). Nationally the rate of death from suffocation is 0.2 infants per 1,000 live births, or 2 infants in every 10,000 births. The rate of infant suffocation in Kentucky is somewhat higher at 0.4 per 1,000 live births. In Kentucky, the rate is higher among black infants; 1.4 per 1,000 live births. The rate among white infants in Kentucky is 0.3 per 1,000 live births. However, valid comparisons cannot be made from year to year due to numbers being too small.

Prevention Strategies and Safe sleeping practices for infants are described under I.C. Sudden Unexplained Infant Deaths.

## **F. INTENTIONAL INJURY RELATED DEATHS**

### **1. CHILD ABUSE/NEGLECT FATALITIES**

The Cabinet for Health and Family Services, Division of Protection and Permanency (DPP) is the agency in Kentucky responsible for receiving and investigating cases where child abuse or neglect is alleged to have resulted in a child fatality or near fatality.

The Division of Protection and Permanency investigates abuse/neglect related child fatalities and near fatalities and substantiates abuse or neglect when the burden of proof is met. Each investigation is reviewed by a policy analyst in Central Office. The following data were collected from the child abuse or neglect child fatalities reported during the 2006 fiscal year.

Child fatalities are the most tragic consequence of child abuse and neglect. During the 2006 state fiscal year in Kentucky, 31 children died from child abuse or neglect. However, this may be an underestimation. Child abuse and neglect fatalities often mimic illness and accidents, and are particularly difficult to diagnose for the treating physician or even for the investigating coroner. The Division of Protection and Permanency (DPP) works with local child fatality review teams to help improve the accuracy of child death reporting.

### **Age of Child Victims**

As in previous reporting periods, there continues to be a strong correspondence between the age of the child victim and the risk for serious or fatal injury. For child fatalities occurring in the 2006 fiscal year whose families had prior involvement with DPP (19 total), 84% of the victims were age 3 or younger and 42% were 1 year of age or younger. These data are consistent with trends seen previously in Kentucky as well as nationally.

### **Gender of Child Victims**

Of the 19 cases of child fatality reported during 2006 fiscal year whose families had prior involvement with DPP, 79% were male children and 21% were female children who were victims of a child fatality. This is somewhat different from other reporting periods where gender was more equally distributed among child fatality cases.

### **Type of Maltreatment**

The majority of child deaths from abuse whose families had prior involvement with DPP were from caretaker neglect (74%). Another 26% of the deaths were the result of caretaker physical abuse. Expectedly, physical abuse and neglect, being very different types of maltreatment, present quite differently as well. Inflicted head injury, drowning, and asphyxia were the most common cause of death in physical abuse fatalities with prior DPP involvement (21% each); others included motor vehicles and house fires (16% each). Perpetrators of fatal child physical abuse are more often male than female.

## **RISK FACTORS FOR CHILD ABUSE/NEGLECT**

In the child fatality cases from 2006, 89% of cases identified criminal history as a major risk factor for child fatality. Another common risk factor found in abuse or neglect related child fatality case review is substance abuse and domestic violence (32%).

## **PREVENTION STRATEGIES**

Kentucky Statute KRS 620.030 mandates that anyone who has reasonable cause to believe that a child is abused or neglected shall immediately make a report to proper authorities including local law enforcement, the cabinet or the commonwealth or county attorney. The 24 hour abuse or neglect hotline number to call to make a report of abuse or neglect is 1-800-752-6200.

### **Parents:**

1. Seek help if your family is in crisis.

### **Community Leaders:**

1. Support and fund home-visitation programs that assist parents.
2. Work with agencies such as Prevent Child Abuse Kentucky and Community Partners Protecting Children to further their missions of protecting Kentucky's children.

**Professionals:**

1. Support and facilitate public education programs that target male caretakers and child care providers.
2. Expand training on recognition of child abuse and neglect.
3. Educate the public on reporting procedures and laws.
4. Support local Division for Protection and Permanency offices in their investigation of child abuse and neglect allegations.
5. Improve collaboration and utilization of collateral resources during an investigation.
6. Recognize families that are at risk and identify potential services that may protect the children.
7. Use data to determine consistent risk factors.
8. Improve recognizing, reporting and documenting the child deaths.

**CFR Teams:**

1. Community-based teams are critical in identifying fatal child abuse and neglect and protecting surviving children.

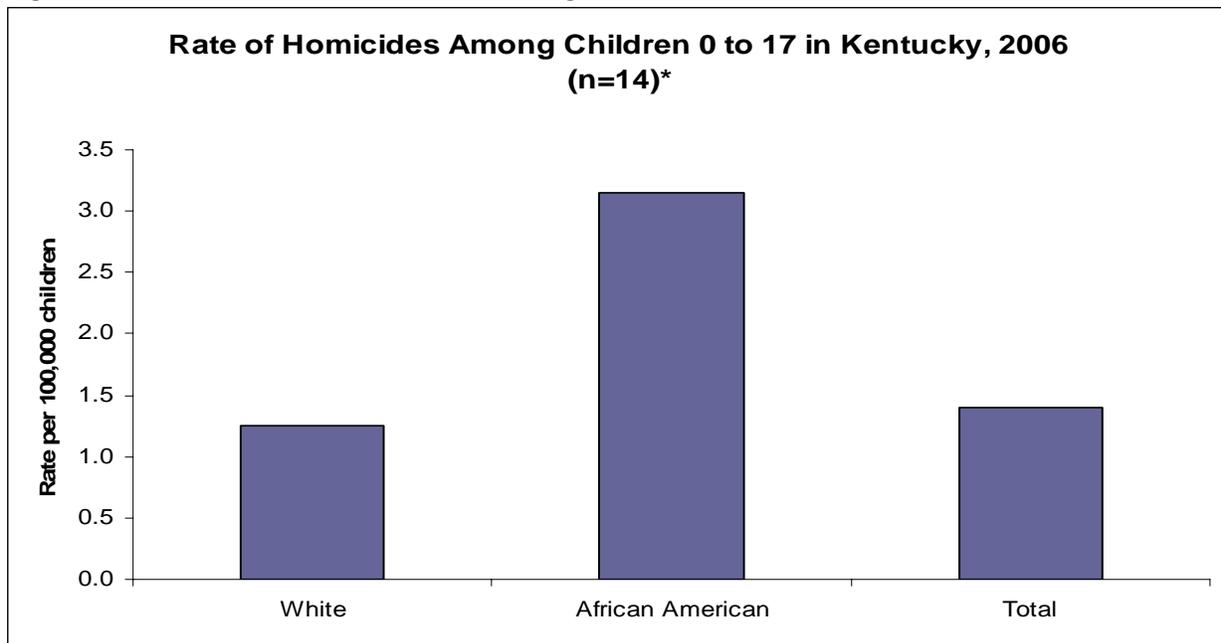
**RESOURCES**

National Center on Shaken Baby Syndrome .....	<a href="http://www.dontshake.org">www.dontshake.org</a>
U.S. Department for Justice.....	<a href="http://www.ojjdp.ncjrs.org">www.ojjdp.ncjrs.org</a>
Child Abuse .....	<a href="http://www.childabuse.com">www.childabuse.com</a>
National Center for Missing/Exploited Children .....	<a href="http://www.missingkids.com">www.missingkids.com</a>
Prevent Child Abuse Kentucky .....	<a href="http://www.pcaky.org">www.pcaky.org</a>
Community Partners Protecting Children.....	<a href="http://www.uky.edu/socialwork/trc">www.uky.edu/socialwork/trc</a>
Department for Community Based Services.....	<a href="http://www.chfs.ky.gov/dcbs">www.chfs.ky.gov/dcbs</a>
Kentucky Domestic Violence Association .....	<a href="http://www.kdva.org">www.kdva.org</a>

**2. HOMICIDE**

Death certificate data alone is not sufficient to identify child abuse or neglect deaths. Keep in mind that the homicide data discussed in this section pertain to death certificate information from vital statistics. Some of the children discussed in the previous section may be captured here as well. Of the **14** homicides to children under the age of 17 in the 2006 Kentucky death certificate file, the majority occurred among children four years old and under (2.5 per 100,000). Since 1999 Kentucky has ranked consistently higher than the United States with our rate of homicides in children 17 and under. Methods of homicide included gun, hanging/strangulation/suffocation, fire, maltreatment, drowning, and unspecified or other.

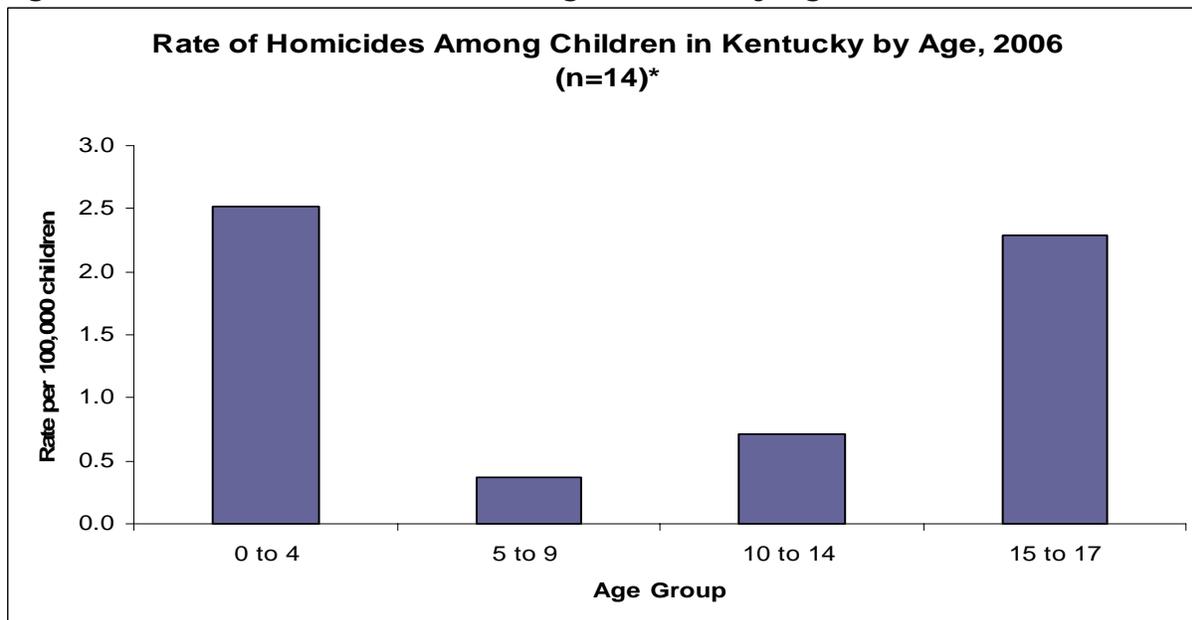
**Figure 28. Rate of Homicides Among Children 0 to 17**



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

In 2006 in Kentucky, the rate of homicide deaths among children 17 and under was 1.4 per 100,000 children (Figure 28). The rate of white children who died by homicide was lower than that of black children (1.3 per 100,000 compared to 3.1 per 100,000).

**Figure 29. Rate of Homicides Among Children by Age**

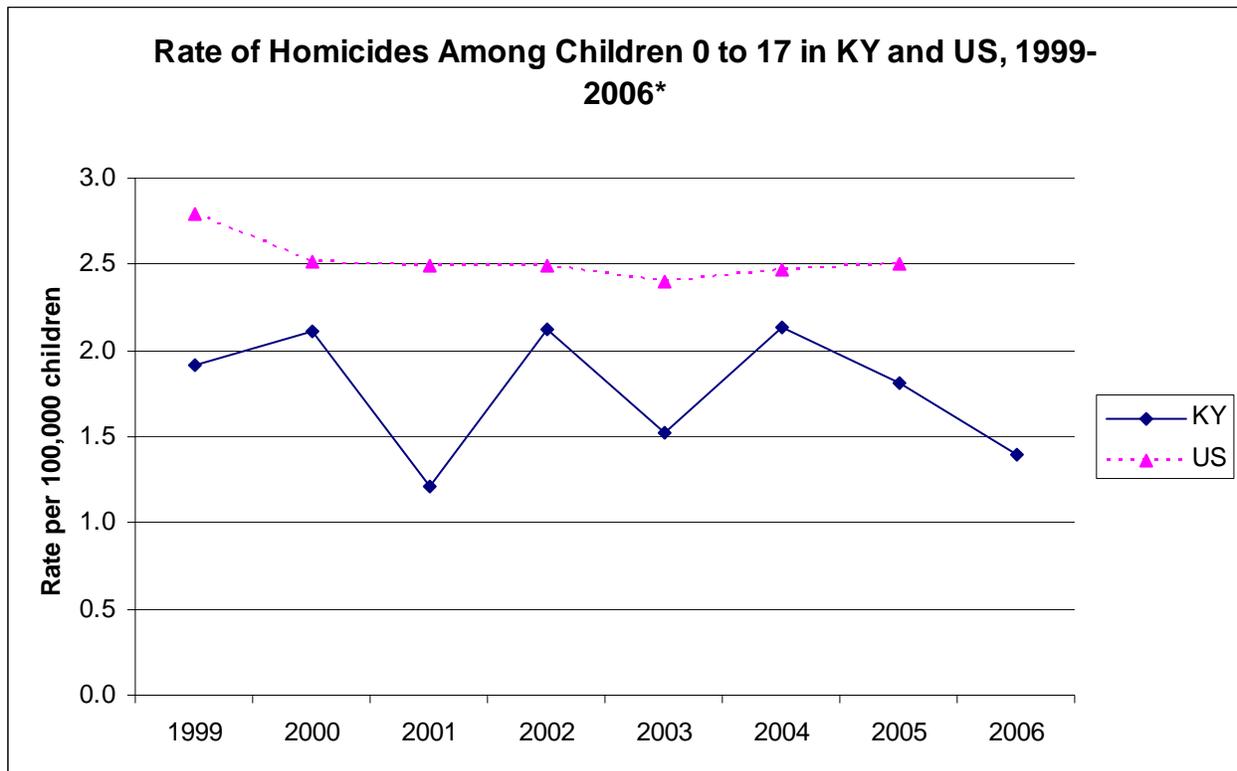


\*Rates are based on 20 or fewer deaths and may be unstable. Use with caution.

(Figure 29) shows that in 2006 in Kentucky, the rate of death by homicide of children under age 4 was highest compared to other age groups (2.5 per 100,000). The next highest age group was children ages 15 to 17 (2.3 per 100,000).

Between 1999 and 2006, the rate of homicide deaths among children 17 and under in Kentucky has been lower than that of the United States (Figure 30). The rate of homicide deaths has decreased since 1999 for the U.S., while Kentucky has seen the rate increase and decrease over the years, but low numbers make it difficult to determine if these increases and decreases are significant.

**Figure 30. Rate of Homicide Among Children 0 to 17 in Kentucky and US**



\*US data not available for 2006. Where data points for Kentucky are small circles on the graph, rates are based on 20 or fewer deaths and may be unstable. Use with caution.

## RISK FACTORS FOR HOMICIDE

The Kentucky Violent Death Reporting System (KVDRS), with funding from the Centers for Disease Control and Prevention, began collecting statewide violent death information in 2005. The KVDRS integrates investigative information from the Kentucky State Police, coroners, medical examiners, forensic crime laboratories and toxicology laboratories from deaths that occur within Kentucky (numbers will vary from Vital Statistics due to KVDRS reporting all deaths in occurring in Kentucky, while the remaining data in this report is all Kentucky resident deaths for children less than 17 years old).

In 2006, there were 16 KVDRS homicide cases and precipitating circumstances known in 15 (94%) of those cases. Of the 11 cases of homicide in children, 6 (55%) were intimate partner violence related (IPV) where the father attempted to or killed the mother as well as their children. Homicides in adolescents were associated with intimate partner violence, substance abuse, or arguments with someone they knew. When murders involved IPV-related circumstances, female victims were estimated to be 17.5 times more likely to die than males.

## **PREVENTION STRATEGIES**

### **Parents:**

1. Seek early treatment for children with emotional problems, possible mental disorders, particularly depression and impulse control disorder, and substance abuse problems.
2. Find help if your child appears angry, sad, lonely, is being bullied at school, has other school problems, or is withdrawn.
3. Make sure your child has appropriate adult supervision, especially in the hours after school and on weekends.
4. Help your child make good choices about personal safety, staying out of gang activity, substance use, and limiting access to firearms

### **Community Leaders:**

1. Advocate for mental health issues to be covered by insurance plans with the same coverage as physical illness.
2. Work to make firearms inaccessible to young people.
3. Support violence prevention programs in your community.
4. Create positive activities for youth, such as after-school programs.
5. Educate families about violence prevention.

### **Professionals:**

1. Provide appropriate treatment to children who exhibit violent behaviors.
2. Work with families to recognize signs of depression, anger, or loneliness that could lead to violence.
3. Partner with schools to help kids understand the issues of violence.

### **CFR Teams:**

1. Promote education/awareness about firearm safety and programs that keep guns out of the hands of children.
2. When reviewing homicide deaths, be mindful of prevention activities for the community.

## **RESOURCES**

KUTO (Kids Under Twenty-One) ..... [www.kuto.org](http://www.kuto.org)  
National Youth Violence Prevention Resource Center ..... [www.safeyouth.org](http://www.safeyouth.org)  
National Center for Injury Prevention and Control ..... [www.cdc.gov/ncipc](http://www.cdc.gov/ncipc)  
Best Practices of Youth Violence Prevention:  
A Sourcebook for Community Action ..... [www.cdc.gov/ncipc/dvp/bestpractices.htm](http://www.cdc.gov/ncipc/dvp/bestpractices.htm)

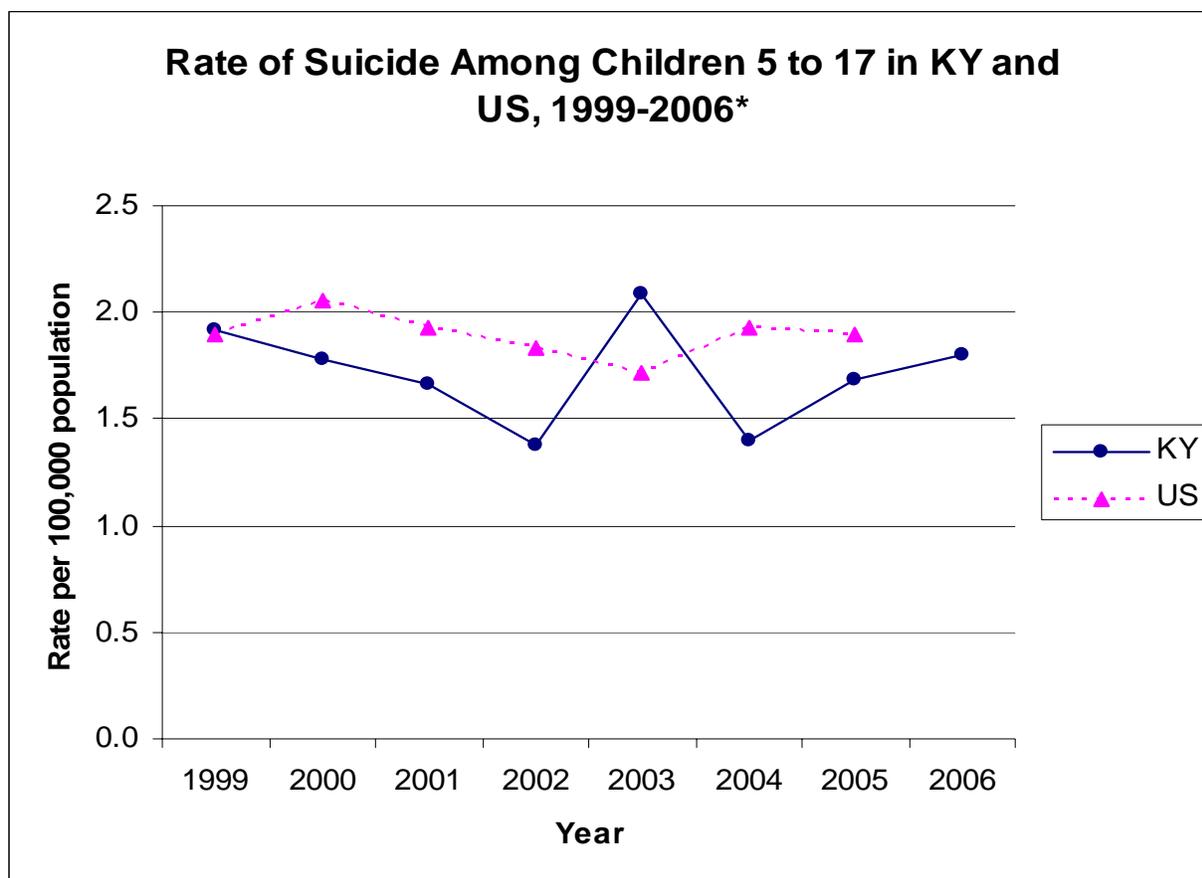
### **3. SUICIDE**

Approximately 32,000 people in the United States die by suicide every year. In the United States someone dies as the result of suicide every 16.2 minutes and a young person dies by suicide every 1 hour and 54.5 minutes per [www.suicidology.org](http://www.suicidology.org). Suicide is the second leading cause of death for Kentuckians ages 15-

34. The rate of suicide deaths among Kentucky children 17 and under was 1.8 per 100,000 children in 2006.

Of the suicides in 2006, there were no documented suicides in children under age 11 in Kentucky. The rate of suicide was highest among children 15 years old (10.3 per 100,000). From 1999 to 2006, the rate of death among children from suicide was lower in Kentucky than the United States for most years (Figure 31). Suicide is the second leading cause of death for teens 15-17 in Kentucky.

**Figure 31. Rate of Suicide Among Children 1 to 17**



\*US data not available for 2006. Rates for Kentucky are based on 20 or fewer deaths and may be unstable. Use with caution.

Ninety percent of suicide cases had two or more of the following immediate circumstances: current mental health problem, current treatment for mental health, crisis in the past two weeks, current depressed mood, substance abuse problem (other than alcohol), other relationship problem (not intimate partner), intimate partner problem, school problem, or perpetrator of interpersonal violence in the past month.

Firearms are the most common method of suicide among all groups (male, female, elderly, young, black, white, etc.) Suicide crosses all ethnic, economic, social, and age boundaries. Suicide has ramifications for the loved ones left behind, often referred to as "survivors." Survivors have lost a loved one, but they also have many questions and may experience emotional problems and become suicidal themselves. Survivors include not just family members but classmates, neighbors and entire schools.

The Kentucky Suicide Prevention Group has three key messages 1) A life is too much to lose, 2) Suicide is a preventable public health problem and 3) Suicide Prevention: It's Everybody's Business. The group's

mission is to decrease suicide deaths and attempts in the Commonwealth through advocacy and awareness, intervention, survivor support, and evaluation. The Kentucky Department of Mental Health and Mental Retardation Services (KDMHMRS) has an ongoing grant funded by SAMHSA. This grant, Kentucky Suicide Prevention in Youth - a Collaborative Effort (SPYCE) project, includes both public and professional education on suicide risk factors and protective factors for suicide prevention, as well as training in prevention, early intervention and post-intervention methods.

## RISK FACTORS FOR SUICIDE

In 2006, there were 13 KVDRS suicide cases and precipitating circumstances known in 12 (92%) of those cases.

In youth who died by suicide in 2006, all were white and the most commonly used mechanism was hanging. The second most common mechanism was firearms. Surprisingly, in the 2006 Kentucky data, females more often used firearms, whereas males more often died from strangulation/suffocation. (Table 9) is a list of precipitating suicide circumstances and frequency distribution.

**Table 9. Suicide Circumstances (11-17 years old)**

	<b>All (N=13)</b>
Crisis in the past two weeks	4 (31%)
Ever treated for mental illness	3 (23%)
Current mental health problem	4 (31%)
Current treatment for mental health problem	3 (23%)
Current depressed mood	2 (15%)
Substance abuse problem	2 (15%)
Intimate partner problem	4 (31%)
Other relationship problem	3 (23%)
School problem	2 (15%)
Suicide of family or friend in past 5 years	1 (8%)
Physical health problem	1 (8%)
History of suicide attempts	1 (8%)
Disclosed intent to commit suicide	5 (38%)
Left suicide note	3 (23%)

\*More than one circumstance can apply

The most common reasons for a male youth to die by suicide in 2006 were problems with a girlfriend, current mental health problems and a recent crisis, where in girls the most common reason was a substance abuse problem. Boys were more apt to disclose their intent to commit suicide while girls were more apt to leave a note and have a history of previous suicide attempts.

Research shows that most suicidal people desperately want to live. They are just unable to see alternatives to their problems. They want to 'stop the pain' and think suicide is the only answer. Most suicidal people give definite warning signals of their suicidal intentions, but others are often unaware of the significance of these warnings or unsure what to do about them.

To help identify youth at risk for suicide, the most important warning signs are:

- Any suicide threats
- Statements revealing a desire to die
- Sudden changes in behavior
- Prolonged depression
- Previous suicide attempt
- Alcohol and drug abuse
- Making final arrangements
- Giving away prized possessions
- Purchasing a gun or stockpiling pills

There is ample evidence that talking about suicide does not cause someone to become suicidal. Talking may be the one thing that saves someone.

## **PREVENTION STRATEGIES FOR SUICIDE**

### **Parents:**

1. Seek early treatment for children with emotional problems, possible mental disorders (particularly depression and impulse control disorder) and substance abuse problems.
2. Learn how to recognize the signs of suicide and ask your children if they are thinking about suicide. Gatekeeper training is widely available through the state and can be scheduled for any community group through the Kentucky Suicide Prevention Group (502-564-4456).
3. Limit access to lethal means of suicide, particularly firearms.
4. Provide supervision, support and constructive activities for children and adolescents.
5. Find professional help if your child appears angry, sad, lonely, is being bullied at school, has other school problems, or is withdrawn.

### **Community Leaders:**

1. Advocate for mental health issues to be covered to the extent that physical illness is covered by insurance plans.
2. Support local efforts to address suicide and the range of associated stressors, e.g. untreated mental illness, abuse, lack of access to care, bullying.
3. Work to make firearms inaccessible to young people.
4. Support suicide prevention programs in your community.
5. Create positive activities for youth such as after-school programs.
6. Educate families about suicide.
7. Become gatekeepers to ask youth about suicide and refer them to appropriate professional resources.

### **Professionals:**

1. Provide appropriate treatment to kids who exhibit suicidal behaviors.
2. Work with families to recognize signs of depression, anger, or loneliness that could lead to suicide.
3. Partner with schools to help kids understand the issues of suicide.
4. Become involved in state or local suicide prevention/postvention activities.

**CFR Teams:**

1. Support the Kentucky Suicide Prevention Group's efforts both locally and statewide.
2. Promote education/awareness about firearm safety and programs that keep guns out of the hands of children.
3. Promote other suicide prevention programs both locally and statewide.
4. When reviewing suicide deaths, be mindful of prevention/postvention activities for the community.

**RESOURCES**

Kentucky Suicide Prevention Group .....	www.mhmr.ky.gov
National Youth Violence Prevention Resource Center .....	www.safeyouth.org
Yellow Ribbon Suicide Prevention Program .....	www.yellowribbon.org
Youth Suicide Prevention Programs: A Resource Guide .....	www.cdc.gov
Suicide Prevention Resource Center .....	www.sprc.org
American Association of Suicidology .....	www.suicidology.org
National Suicide Prevention Lifeline .....	1-800-Suicide (784-2433)
Suicide Hopeline Hotline.....	1-800-273-TALK (8255)

# III. FEDERAL REPORTING OF CHILDHOOD INJURY PREVENTION INDICATORS

To receive funding for the Title V block grant from the Health Resources and Services Administration, Maternal and Child Health Bureau, Kentucky reports annually on a core set of measures. A section of these are performance measures, on which all states are required to report. Performance measures help to assess how maternal and child health needs are being met in each state. Table 10 highlights 2006 Kentucky and U.S. data for selected national and state performance measures that relate to child fatality.

**Table 10. Selected Performance Measures from Title V<sup>a</sup>**

<b>Performance Measures Relating to Child Fatality Review</b>	<b>KY</b>	<b>US</b>	<b>National Rank</b>
<b>Health Status Indicator 03C:</b> The death rate per 100,000 from unintentional injuries due to motor vehicle crashes among youth aged 15 through 24 years.	36.5	27.6	19
<b>Health Status Indicator 03B:</b> The death rate per 100,000 for unintentional injuries among children aged 14 years and younger due to motor vehicle crashes.	4.2	3.4	20
<b>National Performance Measure 10:</b> The rate of deaths to children aged 14 and younger caused by motor vehicle crashes per 100,000 children.	4.2	3.4	20
<b>Health Status Indicator 03A:</b> The death rate per 100,000 due to unintentional injuries among children aged 14 years and younger.	9.7	8.5	26
<b>Health Status Indicator 04C:</b> The rate per 100,000 of nonfatal injuries due to motor vehicle crashes among youth aged 15 through 24 years.	141.6 <sup>b</sup>	373.4	28
<b>Health Status Indicator 04B:</b> The rate per 100,000 of nonfatal injuries due to motor vehicle crashes among children aged 14 years and younger.	22.5 <sup>b</sup>	82.9	36
<b>National Performance Measure 16:</b> The rate (per 100,000) of suicide deaths among youths 15-19.	9.6	7.8	38
<b>Health Status Indicator 04A:</b> The rate per 100,000 of all nonfatal injuries among children aged 14 years and younger.	142.1 <sup>b</sup>	833.9	44
<b>State Performance Measure 1:</b> Decrease the death rate for children age 0-18 due to unintentional injury and/or violence.	8.3	17.8 <sup>c</sup>	N/A

<sup>a</sup> Data for Kentucky is 2006 from Title V; US data is calculated from state data in the Title V Information System. The data for the US is preliminary, from 2005 and 2006 (depending on what is available for each state), and may not include all 50 states. N/A represents national rank not available.

<sup>b</sup> Non-injury data for Kentucky is from Kentucky Injury Prevention Research Center and is based on in-patients hospitalizations, which excludes emergency room data.

<sup>c</sup> State performance measure data for US is from the Web-based Injury Statistics Query and Reporting System (WISQARS).



## **IV. CHILD DEATHS AND INJURY PREVENTION**

Many federal and state dollars are spent on important child health services including immunizations and well-child exams as a part of Kentucky's efforts of preventing illness, injury and deaths in children. However, the reality remains that unintentional injury continues to be the leading cause of death for children ages 1-17 in Kentucky. According to Kentucky Vital Statistics records, in 2006, Kentucky lost 147 children (22% of all childhood deaths) to unintentional injuries. This number is alarming when you consider the years of potential life lost to injury surpasses years of potential life lost for cancer and cardiovascular disease combined. The primary causes of unintentional injury deaths include motor vehicle crashes (ATV, bicycles and pedestrian), fire, drowning, and poisoning. This is certainly not new information. Children and adolescents have consistently been at risk of injury or death due to physical harm from these and other sources of trauma.

The Department for Public Health continues to support injury prevention activities by encouraging the development of local injury prevention coalitions and assisting communities in developing local child fatality review or community action teams. The Department also partners with the Pediatric and Adolescent Injury Prevention Program at the University of Kentucky to support statewide injury prevention efforts. Child Fatality Review and Injury Prevention Program exists to address injuries that are both predictable and preventable. The cost of prevention is minimal when compared to the cost of caring for children and families after they have been affected. The emotional cost of child injury and death cannot be measured, but the financial cost of unintentional injuries to society is staggering. Costs that have been cited for effectiveness of injury prevention include:

- Every child safety seat saves this country \$85 in direct medical costs and an additional \$1,275 in other costs to society.
- Every bicycle helmet saves this country \$395 in direct medical costs and other costs to society.
- Every working and properly maintained smoke detector saves this country \$35 in direct medical costs and an additional \$865 in other costs to society.
- Every dollar spent on poison control centers saves this country \$6.50 in medical costs.
- Every dollar spent on smoking cessation for mothers saves \$3 in initial hospital costs for the newborn.

Most health departments participate in some type of injury/death prevention education. Sixty-eight Kentucky counties have local child fatality review teams. Child Fatality Review is critical to preventing injury and death to children in Kentucky. By working as a team, agencies gather information that may have otherwise been missed had the death not been reviewed. This process combines the expertise of the local coroner, the local health department, the local Department for Community Based Services, and local law enforcement, at a minimum. Other agencies that are useful in the process include county attorneys, commonwealth attorneys, physicians, emergency medical personnel, fire personnel, school personnel, and local mental health. The team is critical in helping the coroner determine the exact cause of death, insuring that other children in the home are safe, and that grief counseling is offered to the family, identifying genetic factors that may affect other children, ruling out accidental vs. intentional injury, etc. The information, along with vital statistics data, fuel state and local efforts that focus on preventable conditions and injuries that may result in life-long disabilities or death (i.e. methamphetamine use, transportation safety, Sudden Infant Death Syndrome, suicide, fire, drowning, and others.) Child fatality review leads to prevention efforts at the

state and local level. We continue to work to increase the number of counties that have child fatality review teams by providing technical assistance and training to encourage this vital collaboration among agencies.

**For more information, please contact:**

Child Fatality Review/Injury Prevention Program Coordinator  
Maternal & Child Health  
275 East Main Street, HS2W-A  
Frankfort, KY 40621  
Phone: 502-564-2154

# V. Technical Notes and Data Sources

Data contained within this report are from:

- Kentucky Vital Statistics Death Certificate Files
- March of Dimes Peristats Data Center
- Child Fatality Coroner Report Form Database
- Kentucky State Police Statistics
- Kentucky Injury and Prevention Research Center (KIPRC)
- Kentucky Child Abuse and Neglect Annual Report
- TWIST Database
- Kentucky Violent Death Reporting System
- Centers for Disease Control and Prevention
- US Census Bureau

The data reflects only those deaths occurring to children age 17 and under. Data from the 2006 Vital Statistics Live Birth Certificate files were utilized for denominator data in calculating infant mortality rates. Causes of death are classified based on the International Classification of Diseases 10th revision (ICD-10). Whenever available, rates for the Nation were compared to rates for Kentucky. National rates were obtained from the Centers for Disease Control and Prevention WISQARS Fatal Injury Reports and WONDER Mortality Reports.

Certain limitations exist with death certificate data and should be acknowledged when interpreting results. First, problems exist in the completion of death certificates as well as the accuracy of completed information on the certificate. Physician interpretation of mortality causal events may differ which could lead to variation in coding the primary cause of death. Also, determining one specific underlying cause of death among decedents with multiple chronic diseases can become problematic since the etiologic sequence of diseases may be unclear, and one single disease may not adequately describe the cause of death. Second, data reported in this publication are from the primary cause of death field only and do not include supplemental causes of death. This could lead to under-reporting of certain causes of death. For example, an infant with a congenital heart defect that is born pre-term may have listed prematurity as the primary cause of death on the certificate with congenital anomalies listed as a contributing cause of death; since this report is based only on the primary cause of death, this infant would be counted in the prematurity deaths but not in the congenital anomalies deaths. Therefore, reporting based solely on the primary cause of death can lead to under-reporting of certain causes.

## **Calculation of Rates:**

Often times rates are used to relate the number of cases of a disease or outcome to the size of the source population in which they occurred. A rate is defined as a ratio in which there is a distinct relationship between the numerator and denominator, and some measure of time is included as part of the denominator. One example of a rate would be the number of newly diagnosed cases of breast cancer per 100,000 women during a given year.

Infant mortality rates are commonly used to measure the risk of dying during the first year of life. These rates are calculated by dividing the number of infant deaths in a calendar year for a given area by the number of live births registered for the same period and area and are presented as rates per 1,000 live births.

With the exception of infant mortality rates, rates presented within this report are on an annual basis per 100,000 estimated population residing in Kentucky. The 2006 Population Estimates for Kentucky from the US Census Bureau were utilized for denominator data in calculating death rates. Age specific death rates are calculated by dividing the total number of deaths for a specified age group for a given area and time frame by the total estimated persons within that same age group for the same area and time frame and expressed as a rate per 100,000 specified population.

### **Calculation of Preterm Related Causes of Death:**

Preterm birth has been steadily increasing in Kentucky over the last decade and has risen at a rate faster than that of the nation with a total of 8,802 babies born preterm in Kentucky during 2006. Despite this fact, in 2006, only 49 infant deaths were classified as being attributable to preterm birth with the standard classification of leading causes of death. In order to address this discrepancy, we utilized a newer method that estimates more accurately the contribution of preterm birth to infant mortality rates in Kentucky. One study published in the Journal *Pediatrics* ("The Contribution of Preterm Birth to Infant Mortality Rates in the United States") classified preterm related causes of death for the nation based off linked birth and death files and in so doing were able to classify 34.3% of all infant deaths as attributable to preterm birth compared to only 17% using the standard classification of leading causes of death. The National Center for Health Statistics has also published this new method of classifying preterm related causes of death in their publication "Infant Mortality Statistics from the 2004 Period Linked Birth/Infant Death Data Set." After reviewing these two publications along with the new method, Kentucky applied this method to its 2006 data.

In order to ascertain the gestational age of an infant who has died, death certificate files had to be linked to the birth certificate files so the infant could be classified as preterm or not at birth. Kentucky infant death certificates from 2006 were linked to birth certificates from 2005 and 2006 and this was the data set from which preterm related causes of death were determined. Following the criteria from Callaghan et. al. a specific list of ICD10 codes for the underlying cause of death was utilized to classify a death as either preterm related or not. This list was determined in their study by taking the top 20 leading causes of infant death in the linked file using the criteria outlined for cause of death rankings by NCHS and determined if  $\geq 75\%$  of infants whose deaths were attributed to that cause had been born at  $< 37$  weeks gestation. Based on this method, the following causes of death were determined to be attributable to preterm birth: short gestation/low birth weight, respiratory distress of newborn, bacterial sepsis of newborn, atelectasis, chronic respiratory disease originating in the perinatal period, necrotizing enterocolitis of newborn, maternal complications, cord and placental complications, neonatal hemorrhage, birth trauma, and vascular disorder of intestines. These corresponding ICD10 codes were then pulled from the linked infant death/birth file for Kentucky and these were the deaths that were classified as preterm related cause of death.

## VI. References

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4. National Fire Protection Association; [www.nfpa.org](http://www.nfpa.org). Last accessed 9-18-2008.
5. National Institute of Mental Health – Suicide Facts Brochure.
6. Mental Health Assistance; [www.suicidology.org](http://www.suicidology.org). Last accessed 9-18-2008.
7. Centers for Disease Control and Prevention. "National Poison Prevention Week." *MMWR* 2004; 53: 233.
8. Kentucky Revised Statutes; [www.lrc.state.ky.us](http://www.lrc.state.ky.us). Last accessed 9-18-2008.
9. National SAFEKIDS Campaign – Injury Fact Sheets; [www.usa.safekids.org](http://www.usa.safekids.org). Last accessed 9-18-2008.
10. Maternity Care Coalition – Cribs Brochure; [www.momobile.org/pdf/cribs\\_brochure.pdf](http://www.momobile.org/pdf/cribs_brochure.pdf). Last accessed 9-18-2008.
10. Preventing Child Deaths in Missouri; The Missouri Child Fatality Review Program Annual Report, 2005.
11. "Risk Factors Associated With Sudden Unexplained Infant Death: A Prospective Study of Infant Care Practices in Kentucky." *American Academy of Pediatrics: Pediatrics Journal*, July 7, 2005.
12. Callaghan W, MacDorman M, Rasmussen S, et al. "The contribution of preterm birth to infant mortality rates in the United States." *Pediatrics*. 2006;118;1566-1573.
13. "Infant Mortality Statistics from the 2004 period linked birth-infant death data set." National Center for Health Statistics National Vital Statistics Reports, Volume 55, Number 14.



# VII. Additional Resources

## SAFE KIDS Kentucky- Local Coalitions

- Safe Kids Barren River
  - Coalition Coordinator: Vickie Poore
    - [vickieLpoore@ky.gov](mailto:vickieLpoore@ky.gov) (270) 651-8321 x136
- Safe Kids Fayette County
  - Coalition Coordinator: Sherri Hannan
    - [srhann2@uky.edu](mailto:srhann2@uky.edu) (859) 323-1153
- Safe Kids Louisville and Jefferson County
  - Coalition Coordinator: Erika Kravic
    - [Erika.kravic@nortonhealthcare.org](mailto:Erika.kravic@nortonhealthcare.org) (502) 629-7335
- Safe Kids River Cities
  - Coalition Coordinator: Rene Clay
    - [Rene.clay@kdmc.net](mailto:Rene.clay@kdmc.net) (606) 327-4151

## SAFE KIDS Kentucky- Local Chapters

- Safe Kids Christian County
  - Chapter Coordinator: Deborah Lambert
    - [Deborah.Lambert@ky.gov](mailto:Deborah.Lambert@ky.gov) (270) 887-4160
- Safe Kids Estill County
  - Chapter Coordinator: Suzi Freeman
    - [Suzi.Freeman@ky.gov](mailto:Suzi.Freeman@ky.gov) (606)723-5873
- Safe Kids Madison County
  - Chapter Coordinator: Joan Welch
    - [JoanF.Welch@ky.gov](mailto:JoanF.Welch@ky.gov) (859) 576-4447 (cell)
- Safe Kids Metcalfe County
  - Chapter Coordinator: Stephanie Elmore
    - [Stephanie.Elmore@ky.gov](mailto:Stephanie.Elmore@ky.gov) (270) 651-8321 x 130
- Safe Kids Pulaski County
  - Chapter Coordinator: Judy Price
    - [judy.price@somersetpd.com](mailto:judy.price@somersetpd.com) (606)678-6670

Kentucky Injury Prevention and Research Center – [www.kiprc.uky.edu](http://www.kiprc.uky.edu)

333 Waller Avenue, Suite 206

Lexington, KY 40504

Contact : Susan Pollack, MD

859-257-4954 or [shpoll@uky.edu](mailto:shpoll@uky.edu)

Healthy Start in Childcare Program

Department for Public Health

Contact: Mary Beth Jackson

502-564-3756 or [marybeth.jackson@ky.gov](mailto:marybeth.jackson@ky.gov)

HANDS Program

Department for Public Health

Contact: Brenda Chandler

502-564-3756 or [brenda.chandler@ky.gov](mailto:brenda.chandler@ky.gov)

## **Resources for Educational Programs and Law Enforcement Activities**

Kentucky Crime Prevention Coalition  
859-727-2678  
www.kycrimeprevention.com

Prevent Child Abuse Kentucky  
300 East Main St, Suite 110  
Lexington, KY 40507  
1-800-CHILDREN  
www.pcaky.org

Kentucky Department of Community Based Services  
Division of Protection and Permanency  
1-800-752-6200

Kentucky Child Now!  
1491 Twilight Trail  
Frankfort, KY 40601-1700  
502-227-7722  
www.kychildnow.org

Kentucky Regional Poison Center  
PO BOX 35070  
Louisville, KY 40232-5070  
1-800-222-1222

Kentucky Coroners Association  
Dept of Criminal Justice  
www.coroners.ky.gov  
Brian Ritchie, Executive Secretary  
(502) 839-5151  
blritchie66@yahoo.com

Division of Fire Prevention  
101 Sea Hero Road, Suite 100  
Frankfort, KY 40601  
502-573-0365  
www.ohbc.ky.gov

Kentucky Suicide Prevention Group  
1-800-SUICIDE or 1-800-273-TALK (8255)  
www.kentuckysuicideprevention.com

Kentucky Department for Mental Health  
100 Fair Oaks Lane, 4E-D  
Frankfort, KY 40621  
502-564-4527

Hunter Education (Firearm Safety)  
KY Dept of Fish and Wildlife Resources  
#1 Sportsman's Lane  
Frankfort, KY 40601  
1-800-858-1549  
www.fw.ky.gov



Cabinet for Health and Family Services  
Department for Public Health  
Division of Maternal and Child Health  
275 E. Main St. HS2W-A  
Frankfort, KY 40621  
Telephone: (502) 564-2154  
Web: [chfs.ky.gov/dph/ach/mch/childfatality](http://chfs.ky.gov/dph/ach/mch/childfatality)

