



Kentucky Public Health

Prevent. Promote. Protect.

Child Fatality Report, 2020

A review of Kentucky child fatality data from years 2014-2018

**Prepared by the Kentucky
Department for Public Health**

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<https://chfs.ky.gov/agencies/dph/dmch/Pages/data.aspx>



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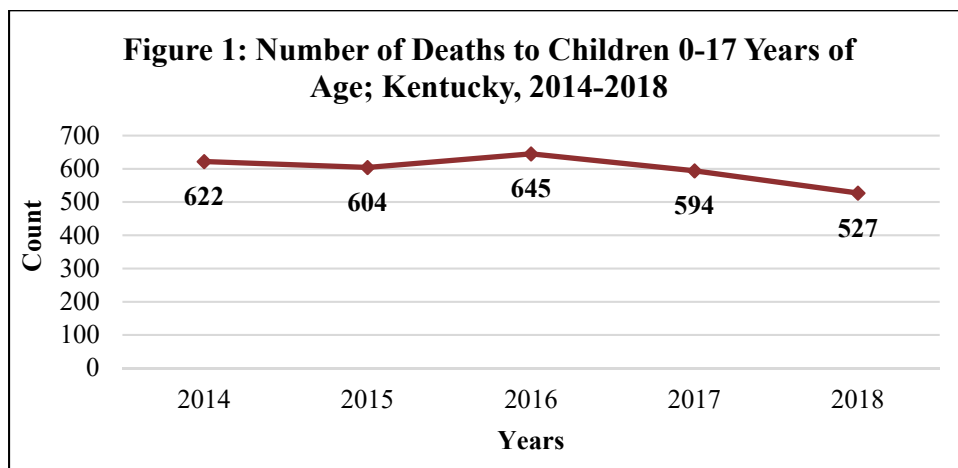
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Executive Summary

This is an annual report which was prepared and submitted in accordance with Kentucky Revised Statute 211.684. The 2020 report details data on child deaths occurring in the 2018 calendar year. When available, data for years 2014-2017 has also been included in order to demonstrate trends and fluctuations in causes of child fatality.

Although a marked decline is present in overall child deaths for years 2014-2018 as seen in figure 1, it is difficult to attribute such improvements to specific causative factors. As demonstrated within this report, causes of death for Kentucky children can vary quite a bit from year-to-year. Speculation and inferences explaining this fluctuation are largely absent from this report and have been reserved for more in-depth reports which can take into account additional datasets and input from subject experts.



Introduction

All data points included within this report, unless otherwise noted, are obtained from the Kentucky Office of Vital Statistics death certificate records. For this report on child fatality in Kentucky, only records for children who were Kentucky residents at the time of death have been included. This includes Kentucky residents who died out of state. Where appropriate, causes of death are broken down by a child's age and will include infants (less than 365 days of age) and children (aged 1-17 years).

Causes of death for this report are identified through the primary cause of death variable listed on the official death certificate. These causes of death are communicated using the 10th revision of the International Statistical Classification of Diseases and Related Health Problems codes (commonly known as ICD-10 codes) which are assigned to each decedent by the National Vital Statistics System through the Kentucky Office of Vital Statistics.

For this report, causes of death have been broken down into five overarching categories, which take into account the aforementioned primary cause of death variable as well as the manner of death. Manner is also a variable contained within a death certificate and includes accident, natural, homicide, suicide, undetermined, or pending. These overarching categories include unintentional injuries, natural, homicide, suicide, and undetermined deaths and sudden infant death syndrome (SIDS) and sudden

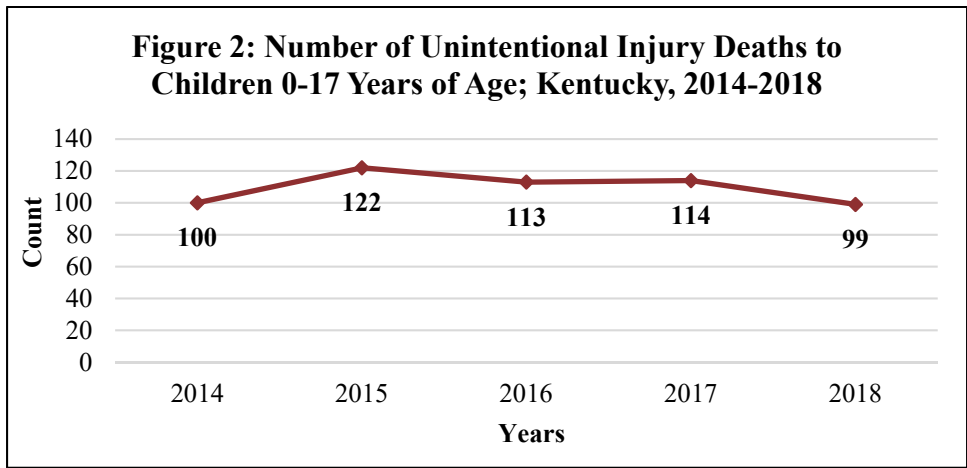
unexplained infant death (SUID). This approach is based on federal categorizations of death through the National Center for Fatality Review and Prevention.

Sub-categories will be included with each overarching category to draw attention to specific causes of death that affect larger portions of the population or otherwise require attention. Not all causes of death can be included as sub-categories due to the Cabinet for Health and Family Services’ data suppression restrictions which disallow releasing records with fewer than five occurrences for a given region. Causes of death with small numbers will be addressed in the most meaningful way possible while protecting anonymity.

Unintentional Injury Deaths

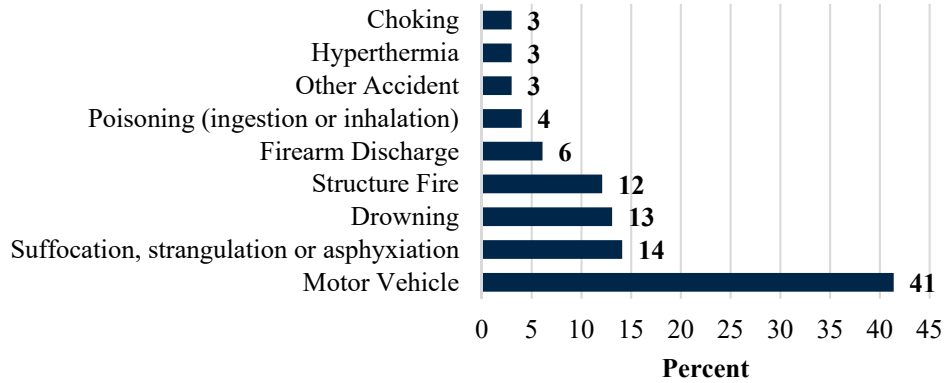
Shown in figure 2 are the number of unintentional deaths from 2014 to 2018. This category mainly consists of deaths where the manner is listed as “accident”. For that reason, these deaths do not include intentional causes (such as homicide or suicide) or deaths where the child died due to a health-related cause (such as congenital anomalies or cancer). Unintentional injuries are without a doubt the most preventable deaths for children but they don’t necessarily have the highest incidence. Some of these easily preventable deaths with low numbers include children who choke on food or toys, children who are left in a hot car (hyperthermia), and children who are accidentally shot with a firearm.

Infants account for **16%** of unintentional injury deaths to Kentucky children in 2018.



The unintentional injury category contains the most variety of any cause of death within this report, as shown in figure 3, but it only accounts for 19% of all deaths to children regardless of age. There are several sub-categories with fewer than five occurrences every year. These sub-categories subsequently vary quite a bit from year-to-year.

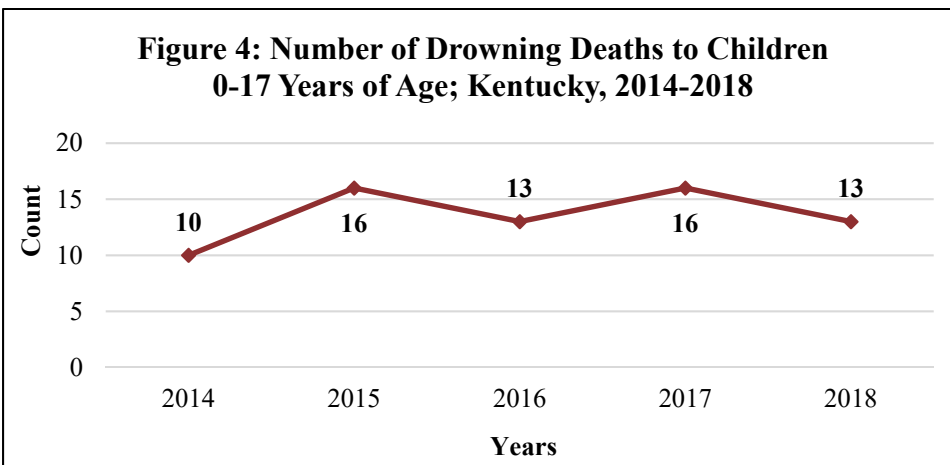
Figure 3: Percent of Unintentional Injury Deaths by Sub-Category for Children 0-17 Years of Age; Kentucky, 2018



Drowning

This sub-category only includes accidental drowning occurrences and figure 4 shows the number of cases for the past 5 years. Homicidal drownings are included in the category of homicide deaths. The type of water in which a drowning death occurs may include public or private freshwater, public or private pools, buckets, and bathtubs. This detail is not consistently included within the primary cause of death so these deaths cannot be broken down by the type of water which caused the drowning.

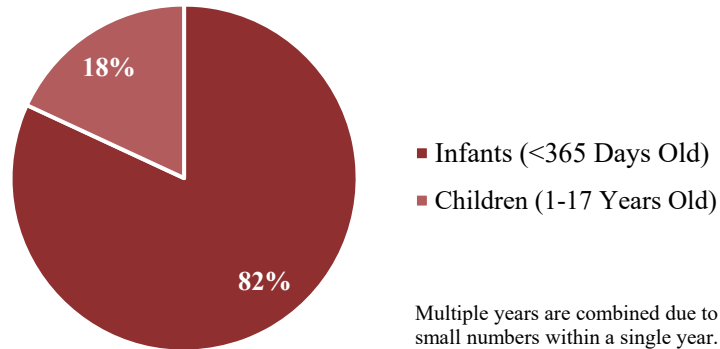
Figure 4: Number of Drowning Deaths to Children 0-17 Years of Age; Kentucky, 2014-2018



Suffocation, Strangulation or Asphyxiation

This sub-category includes any kind of unintentional suffocation, strangulation (including accidental hangings), or asphyxiation. This can also include cases where a child was trapped in a low-oxygen environment (such as a storage chest or old refrigerator) although those circumstances are quite rare. The vast majority of these fatality cases can be attributed to infants where the primary cause of death is listed as accidental suffocation and strangulation in bed (ICD-10 code W75) as seen in figure 5.

Figure 5: Number of Unintentional Injury Deaths by Suffocation, Strangulation or Asphyxiation by Age Range; Kentucky, 2014-2018



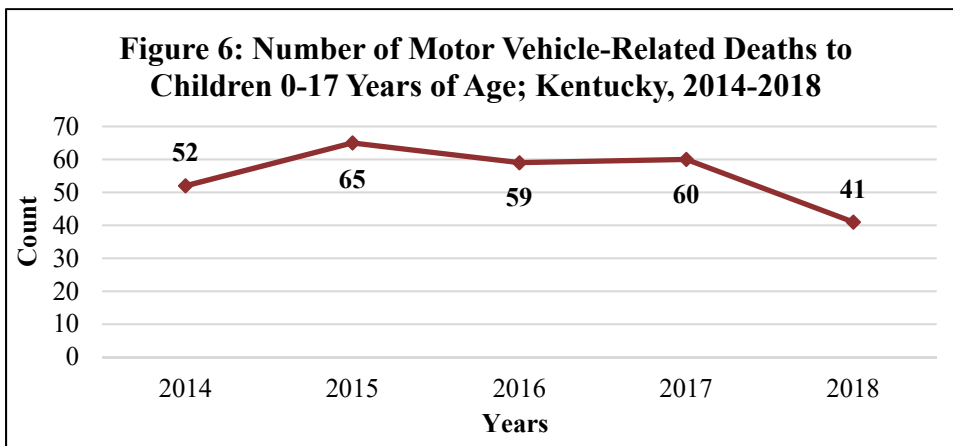
Motor Vehicle Accidents

Motor vehicle accidents include accidents where the deceased was either a pedestrian, passenger (unsecured or secured), or driver of a motor vehicle, motorcycle, train, pedal bike, watercraft, aircraft, or all-terrain vehicle. Although pedal bikes are not motorized vehicles, these unintentional injury deaths involve a collision with some form of motorized vehicle where the decedent was a passenger of the pedal bike, thus their inclusion with this sub-category.

Forty-one percent of unintentional injury deaths to Kentucky children are attributed to some form of motor vehicle accident.

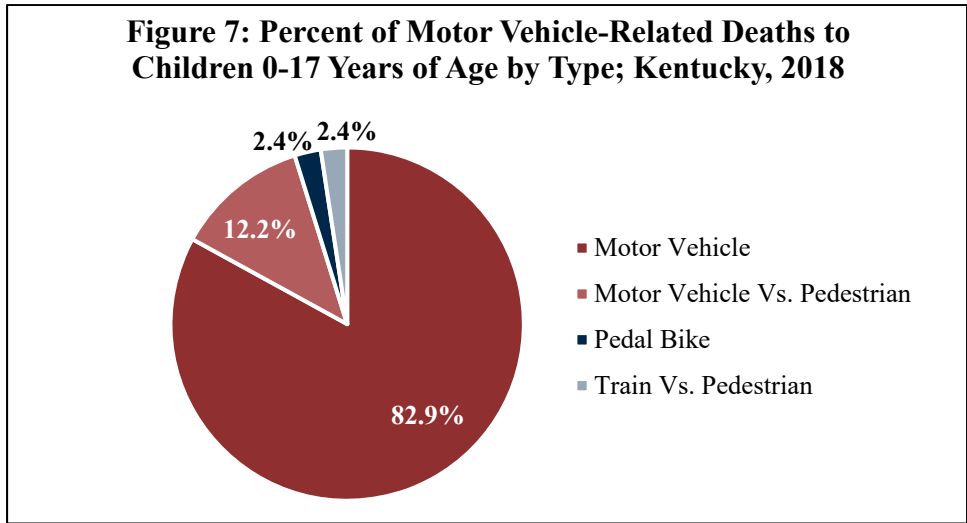
The number of motor vehicle accident-related deaths in the past five years is show in figure 6. Occasionally cases will exist where some form of motor vehicle accident occurred but the manner is either homicide or suicide. In these cases for this report, that child’s death will be categorized with either homicide or suicide causes of death since it was not an unintentional injury.

Figure 6: Number of Motor Vehicle-Related Deaths to Children 0-17 Years of Age; Kentucky, 2014-2018



The type of motor vehicle-related deaths can vary quite a bit from year to year but the leading type is consistently motor vehicle accidents where the child was either a passenger or driver of a motorized vehicle (including trucks or cars). This vehicle type is identified simply as a motor vehicle in

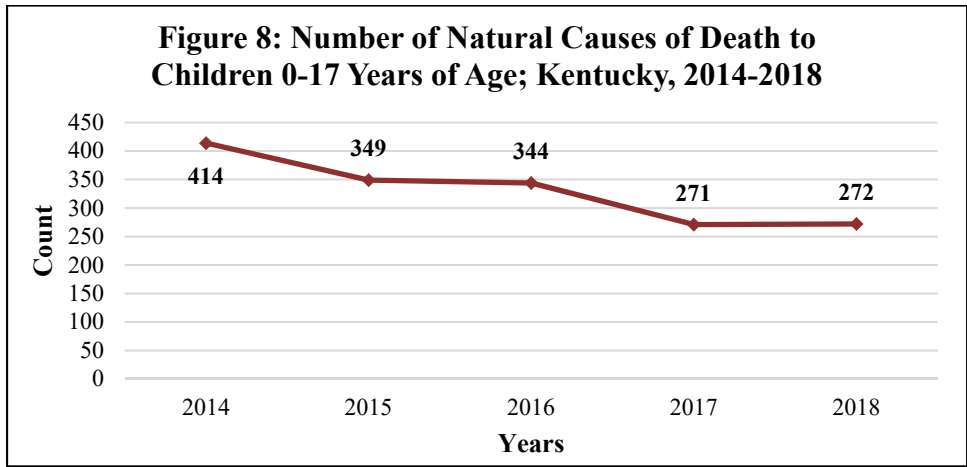
figure 7. These accidents include collisions with other motor vehicles as well as collisions with stationary objects (such as trees and light/electrical posts).



Natural Deaths

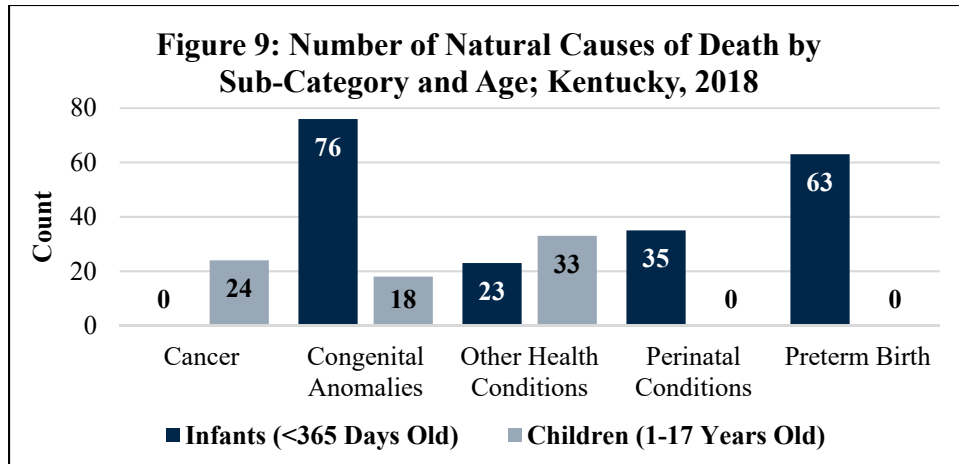
This category includes deaths due to cancer, congenital anomalies (birth defects), preterm births, perinatal conditions, and other health-related causes of death. A five year trend of natural deaths is demonstrated in figure 8. While some of these deaths could be preventable under ideal circumstances, these natural causes of death are not considered accidents or unintentional injuries as determined by the assigned manner of death on the death certificate. In this case, the manner is identified as natural.

Natural causes of death account for **52%** of all child deaths regardless of age for 2018 in Kentucky.



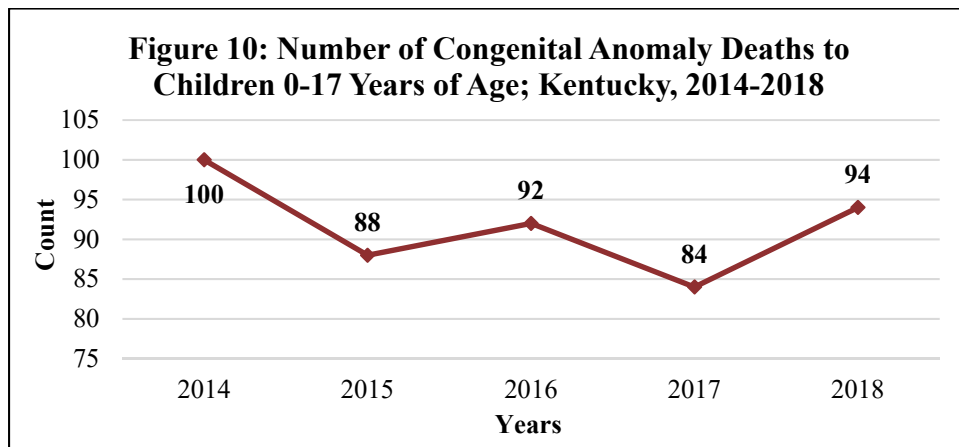
Preterm Birth

For preterm birth to be identified as a cause of death, the child must be born prior to 37 weeks gestation and the primary cause of death must be one of seventy specific ICD-10 codes (see appendix). Preterm birth has been identified by the National Center for Fatality Review and Prevention as one of the greatest predictors of infant mortality (NCFRP, 2020). Only 3% of Kentucky babies who ultimately died of preterm birth lived greater than 6 months for 2018. As seen in figure 9, preterm birth and perinatal condition deaths exclusively affect infants for 2018 while cancer deaths exclusively affect children 1-17 years of age.



Congenital Anomalies

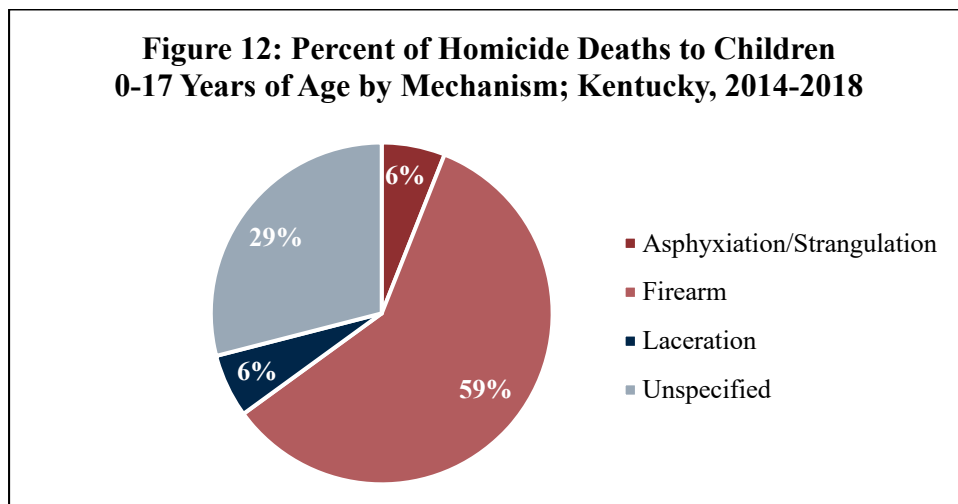
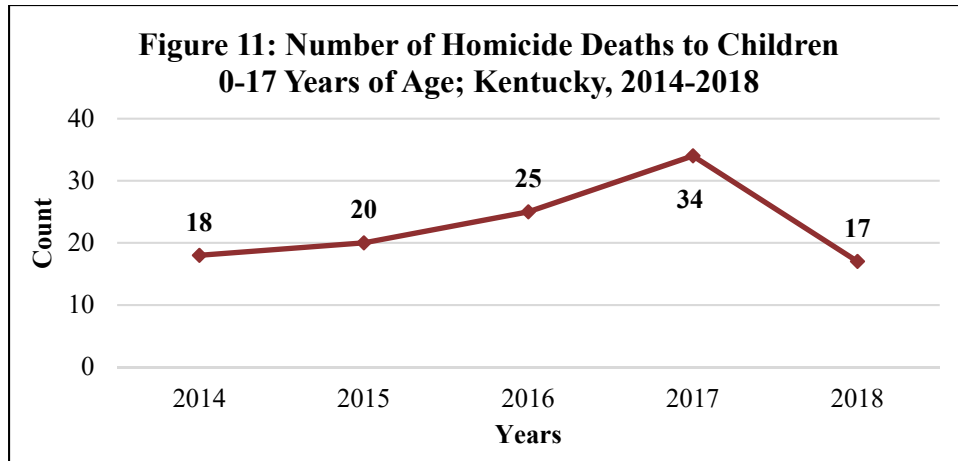
Congenital anomaly-related deaths are not exclusive to infants but they are the single most common cause of death for infants in 2018 accounting for 24% of all infant deaths. Forty-two percent of those infants died within their first 24 hours of life. Due to the complexity involved in diagnosing many congenital anomalies, it is not possible to provide an accurate and detailed breakdown of specific anomalies with death or birth certificate data alone. Death and birth certificate data also do not make it clear whether or not a child received any kind of genetic testing which is required for diagnosing several congenital anomalies. Figure 10 shows the number of deaths due to congenital anomalies for 2014-2018.



Homicide Deaths

Homicide deaths, demonstrated within figure 11, in this report include any death where the manner is listed as homicide. This means the death occurred at the hands of another in such a way that cannot be categorized as an unintentional injury or accident. While many homicide deaths do end with criminal investigations, homicide as a manner of death is primarily a medical term and is not necessarily analogous with legal definitions of manslaughter or malice aforethought. The mechanisms for homicide deaths are shown in figure 12.

Seventy-six percent of homicide deaths for 2018 were to children between ages 1 and 17 years old in Kentucky.



Abuse, Neglect, and Maltreatment

Incidence of abuse, neglect, and maltreatment deaths among Kentucky children are not represented within this report due to limitations in the data set. Such occurrences of child death are not clearly identified within death vital records because of the complexities of the circumstances which lead to the child's death and associated legal proceedings to identify responsible parties. For this reason,

abuse and maltreatment deaths have been suppressed and are included with unspecified homicide deaths in the previous graphic.

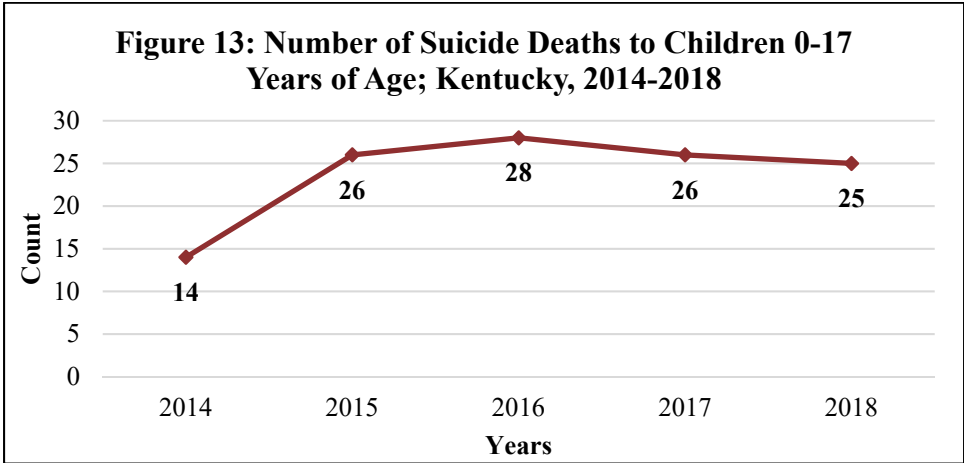
For an in-depth review of Kentucky's abuse, neglect, and maltreatment-related child deaths, please see the Annual Report of Child Fatalities and Near Fatalities prepared by the Division of Protection and Permanency in conjunction with the Department for Community Based Services (DCBS) and the Cabinet for Health and Family Services (CHFS):

<https://chfs.ky.gov/agencies/dcbs/dpp/cpb/Documents/reportofchildfatalitiesandnearfatalities.pdf>

Suicide Deaths

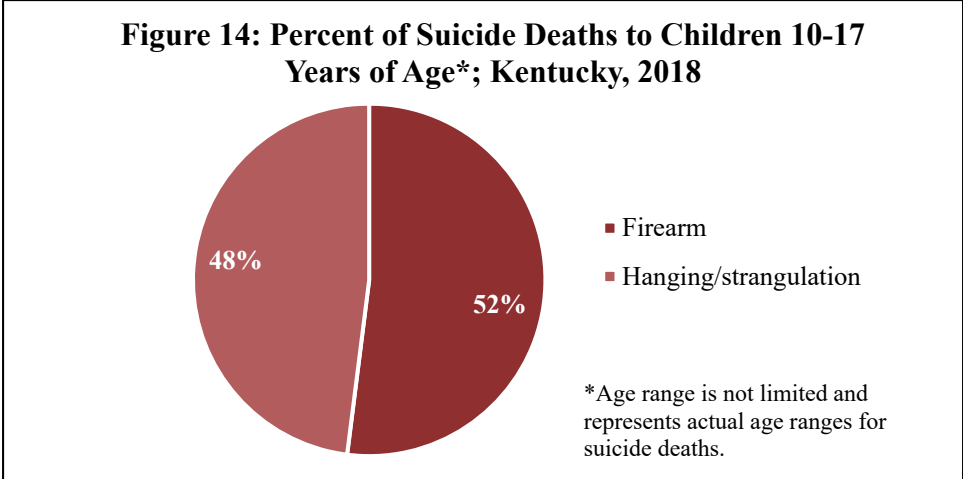
This category of death is strictly for deaths in which the manner is listed as suicide. In cases where the child's intentions are not clear, at the discretion of the coroner and/or medical examiner, the manner of death could be listed as undetermined. For this report, such deaths would be categorized with unintentional injuries since intent could not be clearly identified. Figure 13 shows the number of suicide deaths from 2014-2018.

The age range for death by suicide for Kentucky children extends from **10 to 17 years** for 2018.

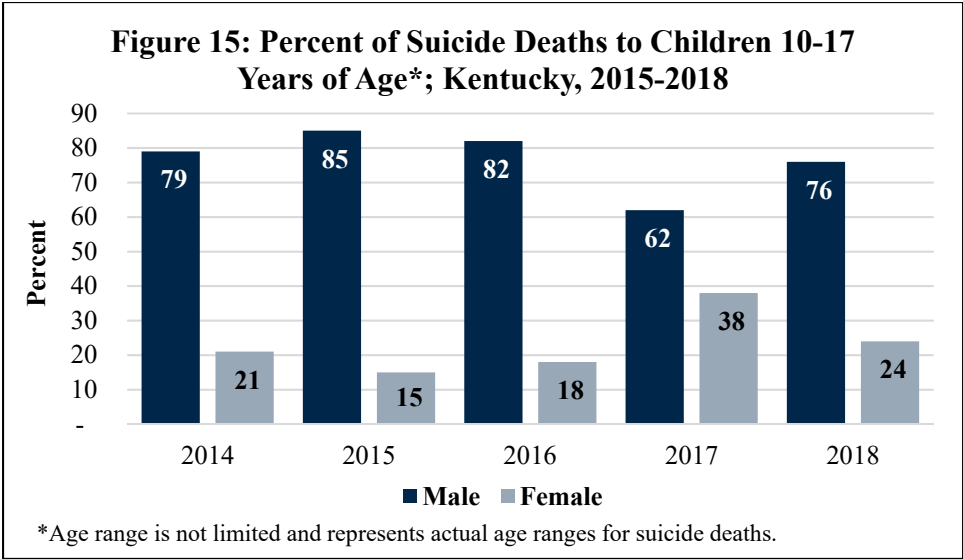


Suicide mechanism refers to the specific means in which a person has chosen to harm themselves. For Kentucky children, the mechanism of suicide mainly consists of two options; firearm and hanging/strangulation. Although there are none for 2018, suicide by poisoning/overdose does occur but is quite rare. Between 2014 and 2018 there were fewer than five suicide deaths to Kentucky children which can be attributed to poisoning (which includes illicit drugs, controlled substances, over-the-counter medications, and all other substances that can be consumed in lethal quantities).

Suicide by firearm is the most common mechanism for Kentucky children between 2014 and 2018 as seen in figure 14. Unfortunately, the specific type and/or caliber of firearm used in a death by suicide is not consistently reported as part of the primary cause of death. For that reason, it is not possible to identify common calibers or firearm types based on death certificate data alone.



While the mechanism has a pretty even split for Kentucky children in 2018, gender consistently has a very obvious imbalance where males are much more likely to die by suicide than females as demonstrated in figure 15.

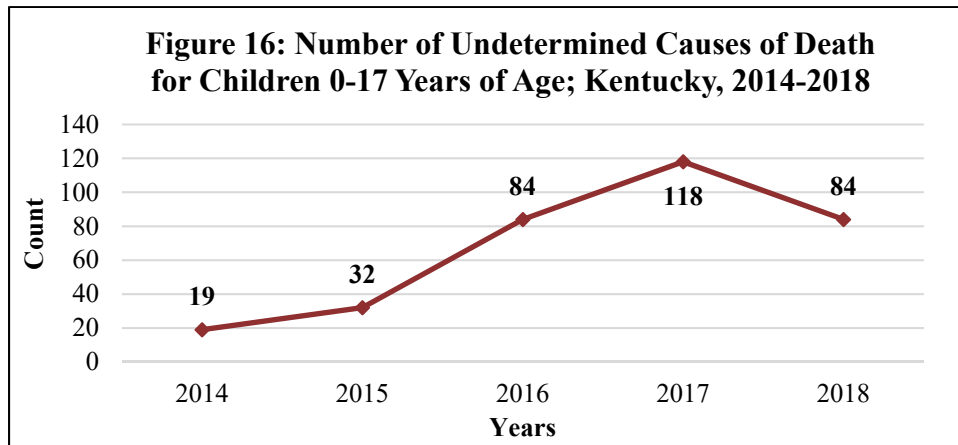


Undetermined Deaths, SIDS and SUID

Undetermined as a category of death includes causes which are undetermined or ill-defined; the five-year trend is shown in figure 16. A death can be categorized as undetermined because there is insufficient information on the death certificate or because the coroner and/or medical examiner was unable to determine a specific cause of death. Insufficient information most frequently occurs in cases where a Kentucky resident dies in another state. Every effort is made by the Kentucky Office of Vital Statistics to obtain death certificate information in such cases but delays in

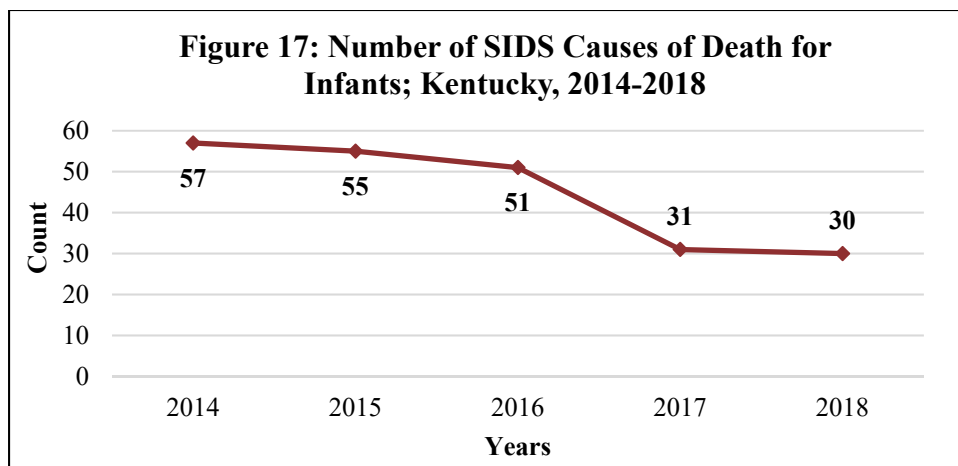
Sixty-eight percent of undetermined deaths to Kentucky children occurred in another state for 2018.

reporting and communication barriers often result in deaths where no clear cause can be delineated based on death certificate data alone.



SIDS

Sudden infant death syndrome, or SIDS, as a primary cause of death is identified through a specific ICD-10 code (R95). SIDS is an exclusionary cause of death in that it can only be used for deaths of an infant where a clear cause of death cannot be identified. Figure 17 shows SIDS causes of death for years 2014-2018.

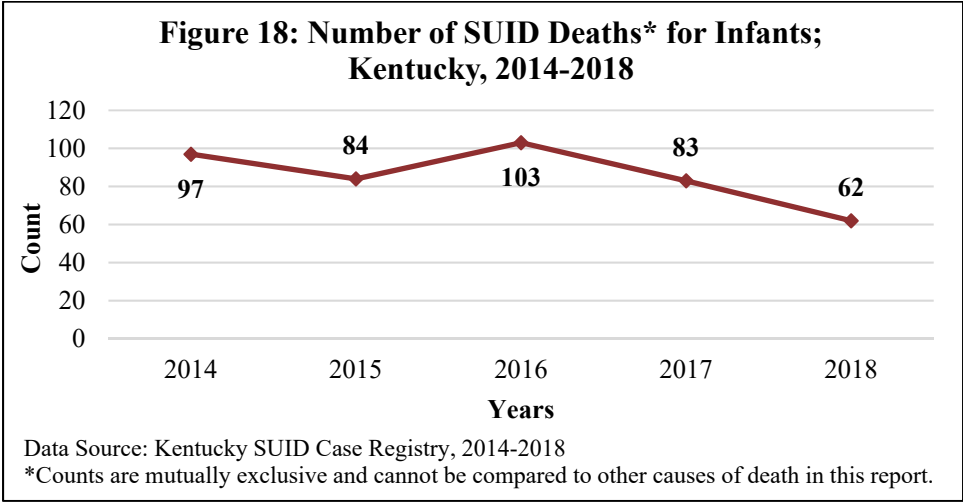


SUID

This category known as sudden unexpected infant death (SUID) was created in order to reduce confusion for parents, researchers, and other professionals. It is a category inclusive of all sudden unexpected infant deaths based on an algorithm developed by the Centers for Disease Control and Prevention (CDC). Although the difference might initially seem pedantic SUID and SIDS are not interchangeable terms. The main difference being that SIDS is a potential cause of death listed on a death certificate while SUID is a case determination inclusive of multiple causes of death.

In order for an infant to be considered a SUID case their primary cause of death must be one of six ICD-10 codes (R95: SIDS, R99: undetermined, W75: accidental strangulation and suffocation in bed, W83: other specified threats to breathing and W84: unspecified threats to breathing). Once those infant deaths are identified, a multidisciplinary team reviews details surrounding the child’s death and decides whether or not the death meets criteria to be considered a SUID case as seen in figure 18.

The overall goal of this review process is to prevent future infant deaths. This is done by understanding how and why the infant died, using the information gained to improve policies, and implementing programs to improve child health and safety. The primary prevention strategy utilized to reduce SUID in Kentucky is the Safe Sleep media campaign. More information may be found here: <http://www.safesleepky.com/safe-sleep-data/>



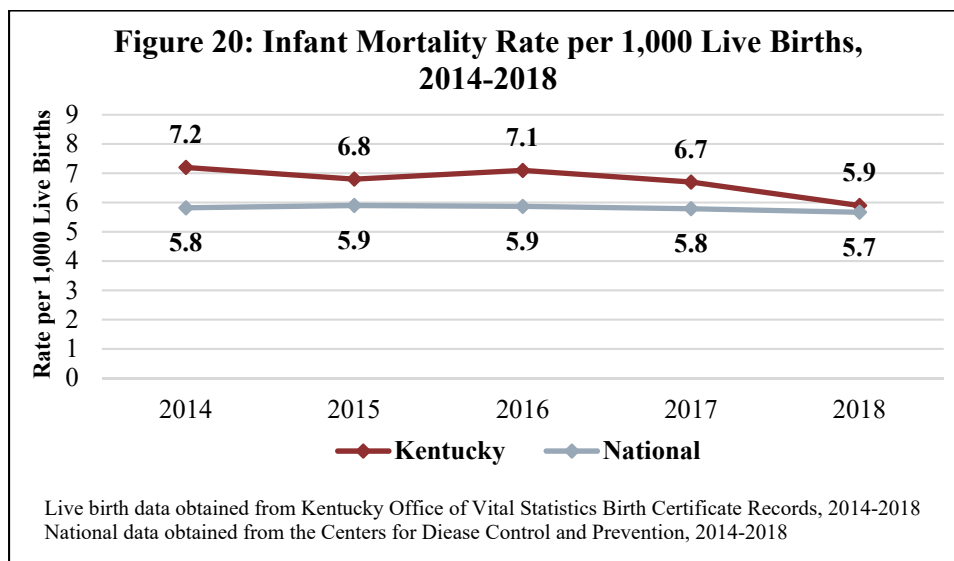
Infant Mortality

Although infant deaths have been discussed throughout this report it should be addressed in a bit more detail since infants consistently account for a majority of all child deaths in Kentucky as seen in figure 19. Infant mortality is widely recognized as an important indicator for assessing the overall health of a society (CDC, 2018). While infants do succumb to unintentional injuries and homicides, they are primarily affected by natural causes of death such a preterm birth and congenital anomalies as previously detailed within this report.

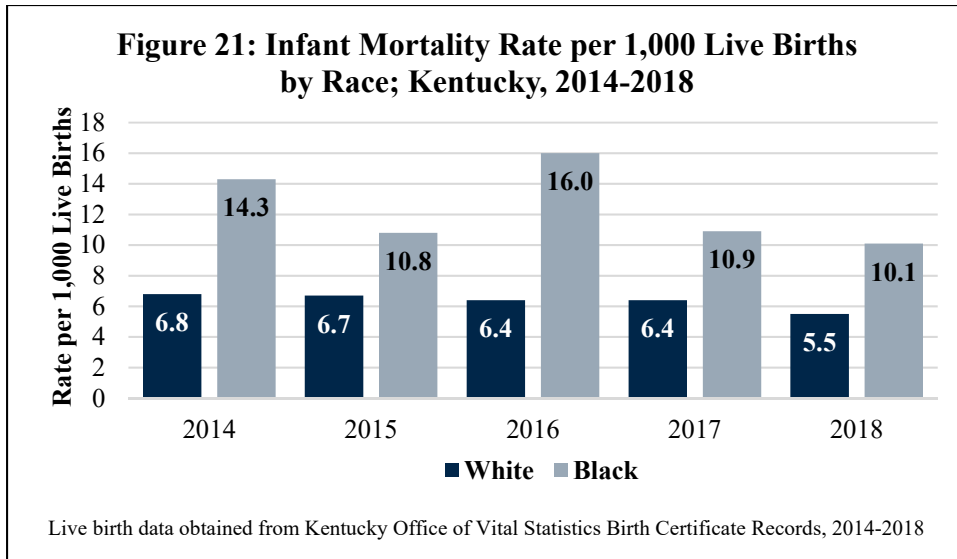
Infants account for **60%** of all deaths to Kentucky children for 2018.

Figure 19: Child Deaths by Age Ranges; Kentucky, 2014-2018					
	2014	2015	2016	2017	2018
Infants (<365 days old)	409	376	391	362	316
1-4 Years Old	53	69	69	51	61
5-9 Years Old	48	37	41	39	41
10-14 Years Old	47	56	58	52	36
15-17 Years Old	65	66	86	90	73
Total	622	604	645	594	527

A common way to express infant deaths is through the use of a mortality rate. This approach takes into account population size and allows for comparison between other states, regions, and even other countries. An infant mortality rate includes any death to an infant in a given year regardless of cause or manner of death per 1,000 live births within the specific geographic region of interest. While the United States consistently has one of the highest infant mortality rates among developed nations (America’s Health Rankings, 2018), for 2018 Kentucky ranks 24th in infant mortality among all 50 US states (CDC, 2018). Kentucky’s infant mortality rate has experienced an encouraging decrease between the years 2014 and 2018 as seen in figure 20.



Despite the encouraging decrease in the overall infant mortality within Kentucky, a consistent disparity persists when examining infant mortality among black and white populations. As demonstrated in figure 21, black infants in Kentucky die at nearly double the rate of white infants for 2018.



Recommendations

Due to the scope of this report and limitations of the dataset, some causes of child fatality have been addressed in a very brief manner. For this reason, the first recommendation resulting from this report is to create additional data visualizations or reports which address specific causes of child fatality in detail. Specific topics should include adolescent suicide, congenital anomalies, and sub-categories of unintentional injury deaths. These documents should consist of written reports, data briefs, or fact sheets about specific causes of death to Kentucky children. They should contain additional datasets and possibly even partnerships with subject experts. This approach will help develop an informed and detailed understanding of topics at hand with the ultimate goal of informing prevention efforts and reducing child fatality in Kentucky.

The second recommendation is for the Division of Maternal and Child Health to pursue and support more opportunities for programmatic prevention efforts. Child fatality prevention can be tricky because there is often a significant lag between the death of a child and the availability of the data created by said death. Additionally, many causes of death for children have small numbers which make identification of trends of geographic regions of interest challenging. That being said, additional programs that mirror the approach of the SUID case registry have the potential to improve child health and safety across the commonwealth.

The third recommendation focuses on improved data management by the Kentucky Child Fatality Review Program who has overseen the creation of child fatality review teams in 103 counties since 2017 (Kentucky CFR Program, 2020). This recommendation has the potential to allow for more meaningful insights regarding the causes of death included in this report. The Child Fatality Review Program works with local agencies to facilitate a thorough and guided review of child fatality cases across the commonwealth. Additional information is collected about the circumstances which contributed to a child's death from a local interdisciplinary team. If the resulting data can be consistently obtained, managed, and surveilled, it can offer tremendous insights into child fatality in Kentucky addresses in this report as well as other data visualization projects.

The final recommendation resulting from this report is to improve the collection of missing death certificate details for deaths of Kentucky residents. Between 2014 and 2018, Kentucky had 337 deaths to children under 18 years of age who had undetermined causes of death where 50% of those deaths occurred out of state. Additionally, there were 131 deaths for this same time period that have blank causes of death. Because of missing information, no meaningful determination about a cause of death can be made. Efforts should be made to understand the origin of this issue so it can be improved and outreach can be initiated as needed.

Acknowledgments

We would like to thank the tireless work of the Kentucky Office of Vital Statistics and the various individuals across the Commonwealth who contribute to death and birth certificate data. Without their work, this report would not be possible. We would also like to acknowledge each Kentucky child included in this report; they are so much more than a number in a graph.

Appendix

ICD-10 Codes for Cause of Death Determination for Preterm Birth

K550-Necrotizing enterocolitis of fetus or newborn.

P000-Fetus or newborn affected by maternal hypertensive disorders.

P010-Fetus and newborn affected by incompetent cervix.

P011-Fetus and newborn affected by premature rupture of membranes.

P015-Fetus and newborn affected by multiple pregnancy.

P020-Fetus and newborn affected by placenta previa.

P021-Fetus and newborn affected by other forms of placental separation and hemorrhage.

P027-Fetus and newborn affected by chorioamnionitis.

P070-Extremely low birth weight.

P071-Other low birth weight.

P072-Extreme immaturity.

P073-Other preterm infants-28 completed weeks or more but less than 37 completed weeks of gestation.

P102-Intraventricular hemorrhage due to birth injury.

P220-P229-Respiratory distress of newborn.

P250-P258-Interstitial emphysema and related conditions originating in the perinatal period.

P260-P269-Pulmonary hemorrhage originating in the perinatal period.

P270-P279-Chronic respiratory disease originating in the perinatal period.

P280-Primary atelectasis of newborn.

P281-Other and unspecified atelectasis of newborn.

P350-Congenital rubella syndrome.

P351-Congenital cytomegalovirus infection.

P352-Congenital herpes viral infection.

P353-Congenital viral hepatitis.

P360-P369-Bacteria sepsis of newborn.

P77-Necrotizing enterocolitis of fetus and newborn.

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