

# ANNUAL REPORT 2021

## Child Fatality Review:

A report of data from years 2015-2020



Kentucky Department for Public Health  
Division of Maternal and Child Health



KENTUCKY  
CABINET FOR HEALTH  
AND FAMILY SERVICES



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## Child Fatality Data Review – Annual Report 2021

The Child Fatality Review Annual Report is prepared by the Division of Maternal and Child Health, within the Kentucky Department for Public Health, under Commissioner Dr. Steven Stack. This report was made possible by the many individuals who contributed their time and efforts toward the prevention of child fatalities.

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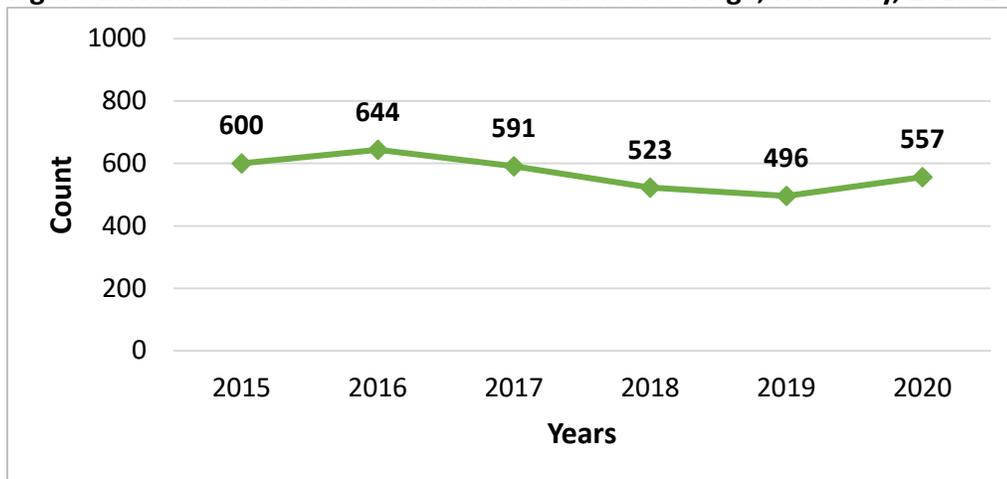
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## Executive Summary

This annual report was prepared and submitted in accordance with Kentucky Revised Statute 211.684. The 2021 report describes data on child deaths, or fatalities, occurring in the 2020 calendar year. When available, data for years 2015-2019 has also been included to demonstrate trends and fluctuations in causes of child fatality.

Although a decline has occurred in the overall number of child deaths for years 2015-2019, a 13% increase was noted in 2020 as seen in Figure 1. The change in number of child deaths over time is difficult to attribute to specific causative factors since the causes of death for Kentucky children can vary 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 matter experts.

**Figure 1. Number of Deaths to Children 0-17 Years of Age; Kentucky, 2015-2020**



## Introduction

All data points included within this report, unless otherwise noted, are obtained from the Kentucky Department for Public Health, 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 (ages 1-17 years).

Causes of death for this report refer to the primary cause of death listed on the official death certificate. These causes of death are indicated by codes using the 10th revision of the International Statistical Classification of Diseases and Related Health Problems codes (commonly known as ICD-10 codes); these codes 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 primary cause of death and the manner of death. Manner of death is contained within a death certificate and includes accident, natural, homicide, suicide, undetermined, or pending. These overarching categories are based on federal categorizations through the National Center for Fatality Review and Prevention and include unintentional injuries, natural, homicide, suicide, and undetermined deaths such as sudden unexpected infant death (SUID) and sudden infant death syndrome (SIDS). SUID occurs among infants less than 1 year old and have no immediately obvious cause of death, and includes three commonly reported types (SIDS, accidental suffocation and strangulation in bed, and unknown causes).

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 restrict 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 and families’ privacy.

## Infant Mortality

Infant deaths account for a majority of all child deaths in Kentucky as seen in Table 1. 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 as preterm birth and congenital anomalies as previously detailed within this report. The five leading causes of infant mortality in Kentucky compared to the US are shown in Figure 2.

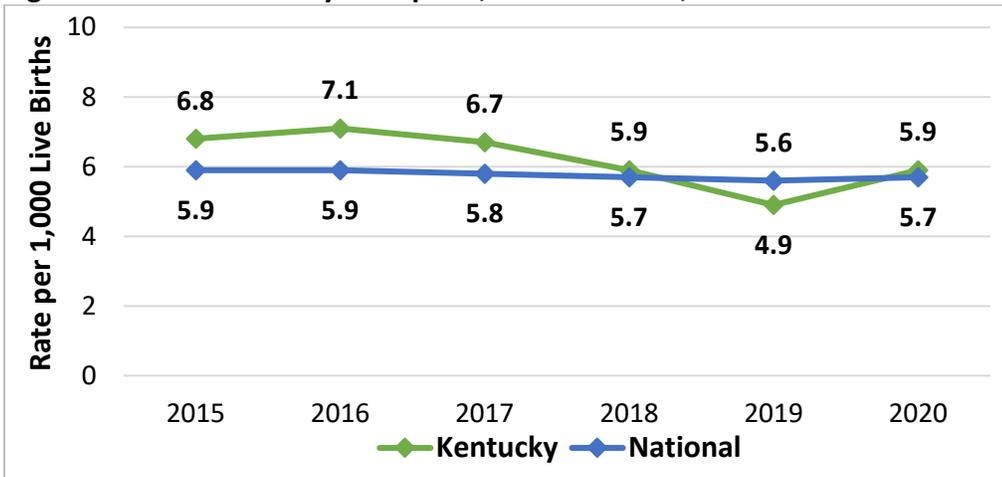
Infants account for 56% of all deaths to Kentucky children for 2020.

**Table 1: Child Deaths by Age Ranges; Kentucky, 2015-2020**

Age Range	2015	2016	2017	2018	2019	2020
Infants (<365 days old)	372	390	359	312	268	314
1-4 years old	69	69	51	61	58	46
5-9 years old	37	41	39	41	38	36
10-14 years old	56	58	52	36	59	69
15-17 years old	66	86	90	73	73	92
<b>Total</b>	<b>600</b>	<b>644</b>	<b>591</b>	<b>523</b>	<b>496</b>	<b>557</b>

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 (CDC, 2020), for 2019 Kentucky ranks 35<sup>th</sup> in infant mortality among all 50 US states (America’s Health Rankings, 2018). Kentucky’s infant mortality rate has experienced an encouraging decrease between the years 2015 and 2020 as seen in Figure 2.

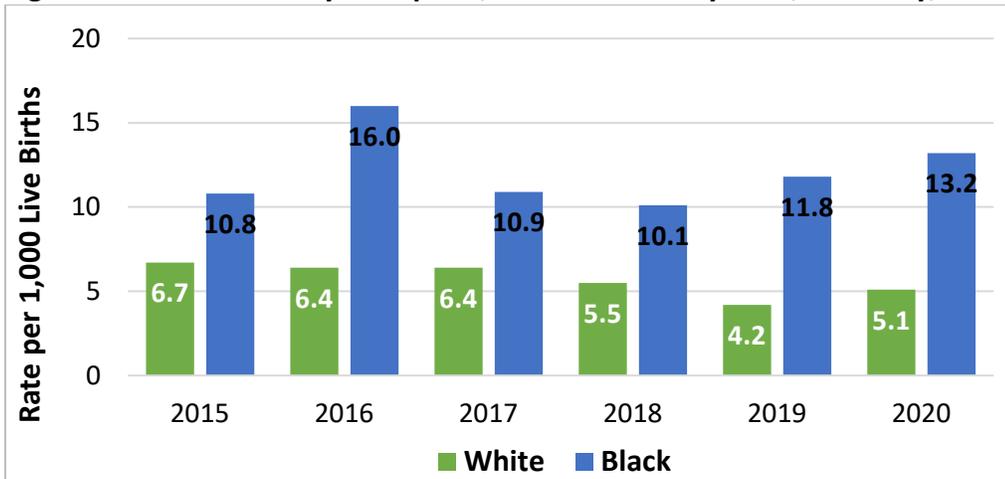
**Figure 2. Infant Mortality Rate per 1,000 Live Births, 2015-2020**



Live birth data obtained from Kentucky Office of Vital Statistics Birth Certificate Records, 2015-2020  
 National data obtained from the Centers for Disease Control and Prevention, 2015-2020

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 3, black infants in Kentucky die at more than double the rate of white infants for 2020.

Figure 3. Infant Mortality Rate per 1,000 Live Births by Race; Kentucky, 2015-2020



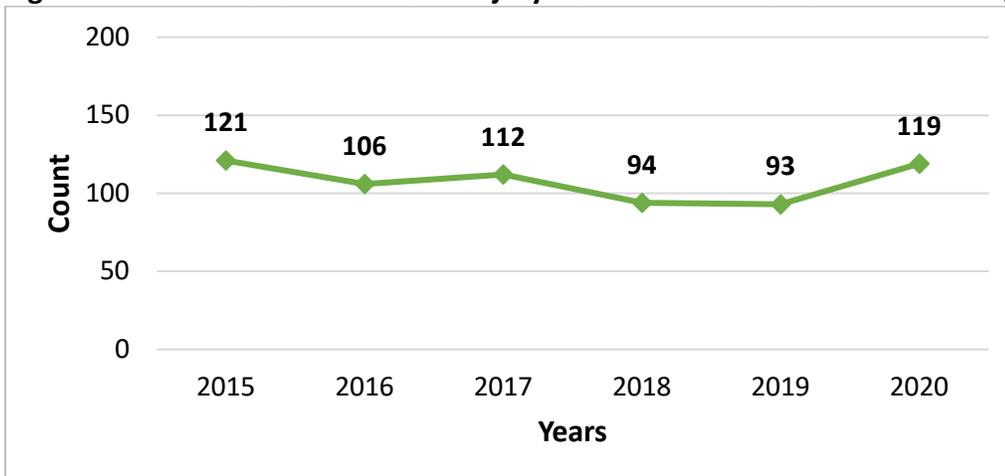
Live birth data obtained from Kentucky Office of Vital Statistics Birth Certificate Records, 2015-2020.

## Unintentional Injury Deaths

Shown in Figure 4 are the number of unintentional injury deaths from 2015 to 2020. This category mainly consists of deaths where the manner is listed as “accident.” For that reason, these deaths do not include intentional causes (e.g., homicide or suicide) or deaths where the child died due to a health-related cause (e.g., congenital anomalies or cancer). Unintentional injuries are often the most preventable deaths for children. Some of the preventable deaths include children that choke on food or toys, are left in a hot car (i.e., hyperthermia), and accidentally shot with a firearm.

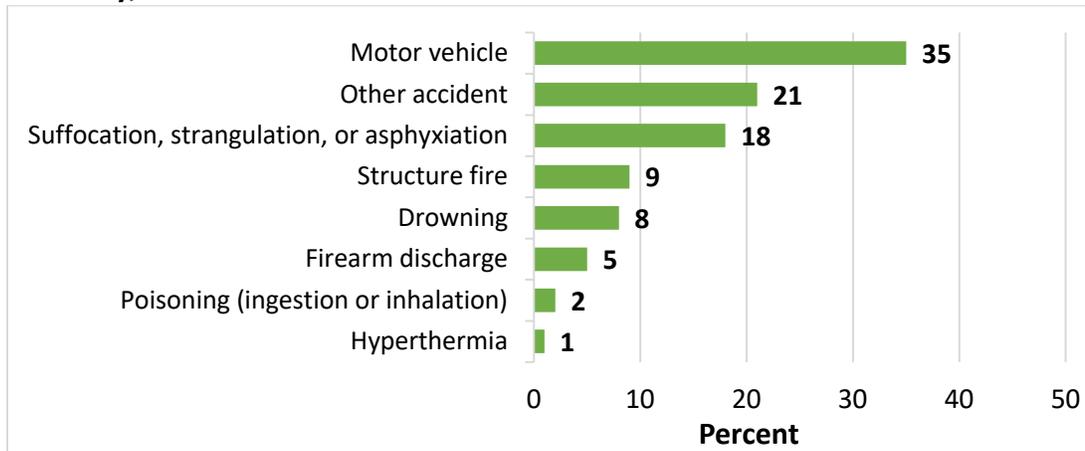
Infants account for 26% of unintentional injury deaths to Kentucky children in 2020.

Figure 4. Number of Unintentional Injury Deaths to Children 0-17 Years of Age; Kentucky, 2015-2020



The unintentional injury category contains the most variety of any cause of death within this report (see Figure 5) and accounts for 21% of all childhood deaths. There are several sub-categories but with yearly variation.

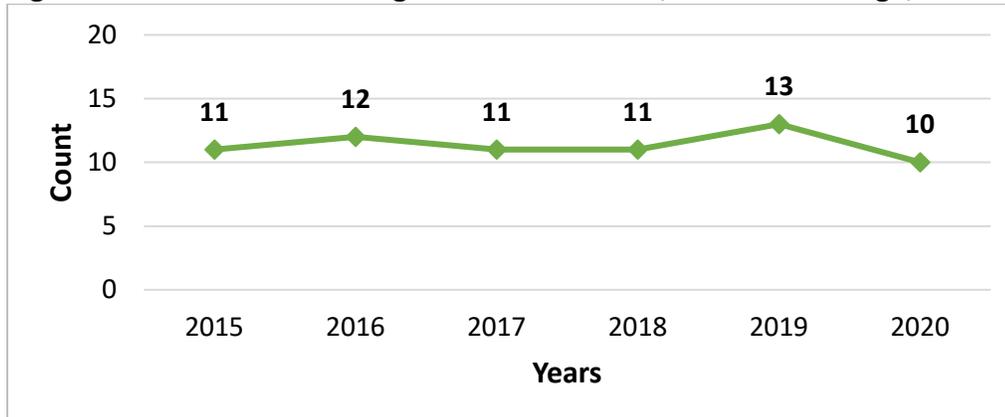
**Figure 5. Percent of Unintentional Injury Deaths by Sub-Category Children 0-17 Years of Age; Kentucky, 2020**



### Drowning

This unintentional injury sub-category only includes accidental drowning occurrences as shown in Figure 6. 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 reliably be broken down by the type of water in which the drowning occurred.

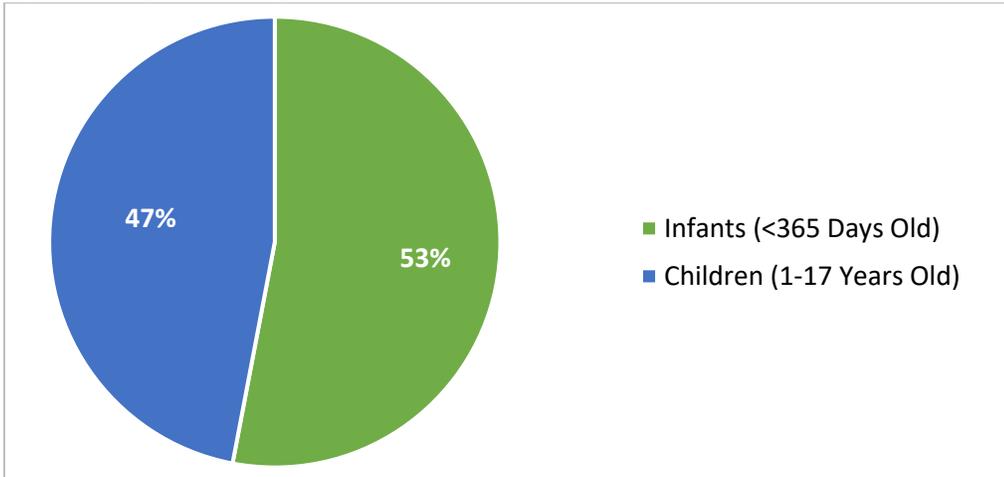
**Figure 6: Number of Drowning Deaths to Children, 0-17 Years of Age; Kentucky, 2015-2020**



### Suffocation, Strangulation, or Asphyxiation

This unintentional injury sub-category includes any kind of unintentional suffocation, strangulation (including accidental hangings), or asphyxiation. This may 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 7.

Figure 7: Number of Unintentional Injury Deaths by Suffocation, Strangulation, or Asphyxiation by Age Range; Kentucky, 2015-2020



Note: Multiple years are combined due to small numbers with a single year.

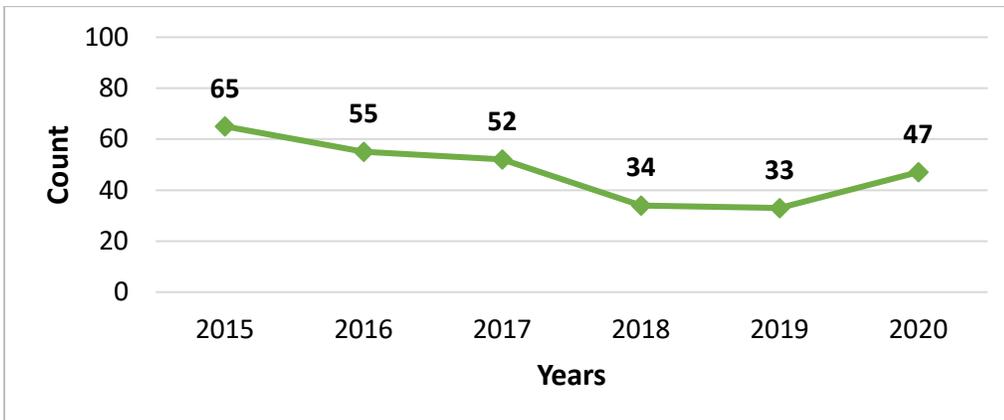
### Motor Vehicle Accidents

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, when unintentional injury deaths involve a collision with some form of motorized vehicle and the decedent was a passenger of the pedal bike, the death is included in this sub-category.

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

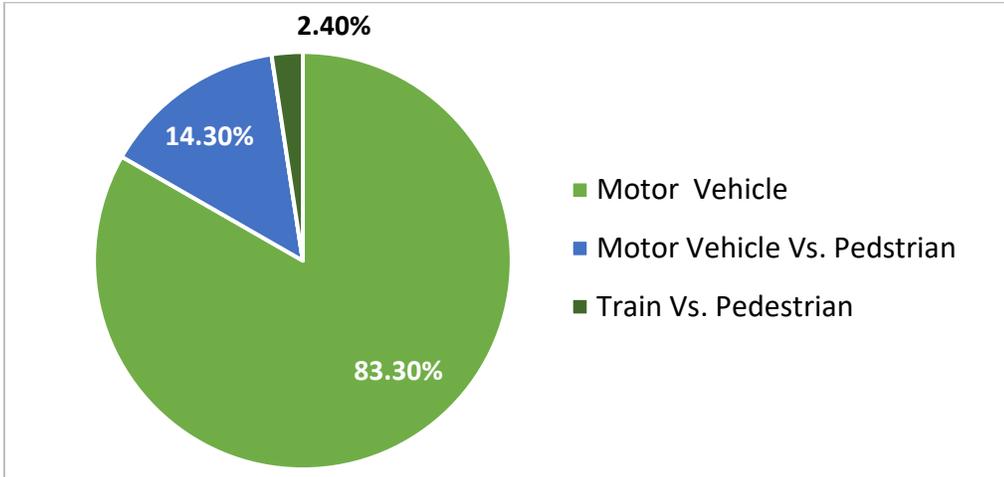
The number of motor vehicle accident-related deaths in the past five years is shown in Figure 8. When a motor vehicle accident occurs, but the manner is either homicide or suicide, the child’s death will be categorized with either homicide or suicide causes of death and not as an unintentional injury.

Figure 8: Number of Motor Vehicle Accident-Related Deaths to Children 0-17 Years of Age; Kentucky, 2015-2020



The type of motor vehicle-related deaths can vary from year to year, but the most common 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 referred to simply as a motor vehicle. Figure 9 shows the deaths by different vehicle type for the year 2020. These accidents include collisions with other motor vehicles and collisions based on federal categorizations of death through the National Center for Fatality Review and Prevention with stationary objects (e.g., trees and light/electrical posts).

**Figure 9: Percent of Motor Vehicle-Related Deaths to Children 0-17 Years of Age by Type; Kentucky, 2020**

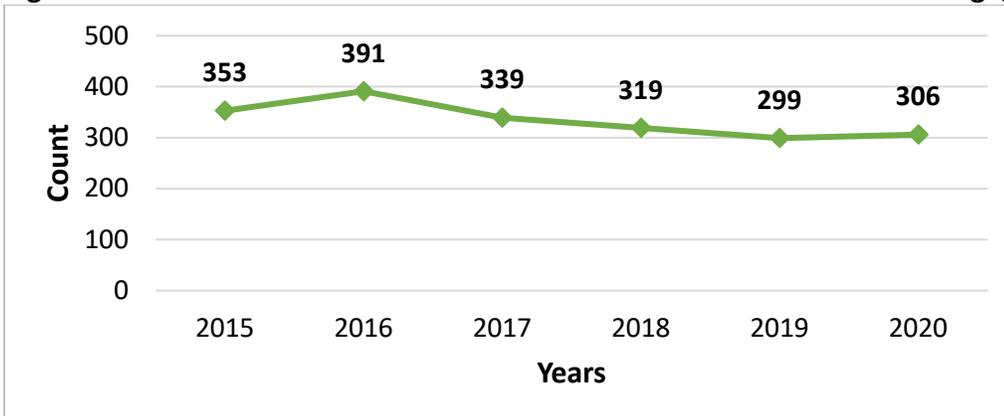


## Natural Deaths

This category includes deaths due to cancer, congenital anomalies (birth defects), preterm births, perinatal conditions, and other health-related causes of death. A six-year trend of natural deaths is demonstrated in Figure 10. 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 **54%** of all child deaths regardless of age for 2020 in Kentucky.

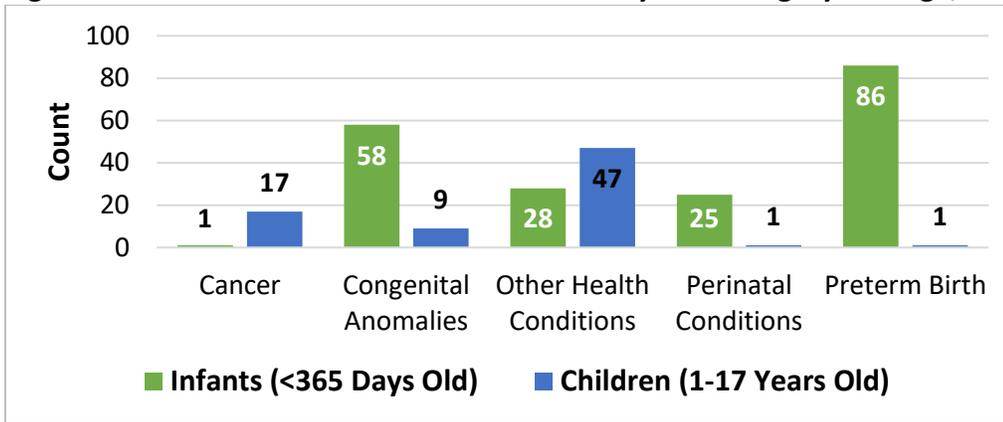
**Figure 10: Number of Natural Causes of Death to Children 0-17 Years of Age; Kentucky, 2015-2020**



### 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 2020. Figure 11 shows preterm birth and perinatal condition deaths primarily affect infants while cancer deaths primarily affect children 1-17 years of age.

**Figure 11. Number of Natural Causes of Death by Sub-Category and Age; Kentucky, 2020**



### Congenital Anomalies

Congenital anomaly-related deaths are not exclusive to infants, but they are the single most common cause of death for infants in 2020, 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 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 12 shows the number of deaths due to congenital anomalies for 2015-2020.

**Figure 12. Number of Congenital Anomaly Deaths to Children 0-17 Years of Age; Kentucky, 2015-2020**

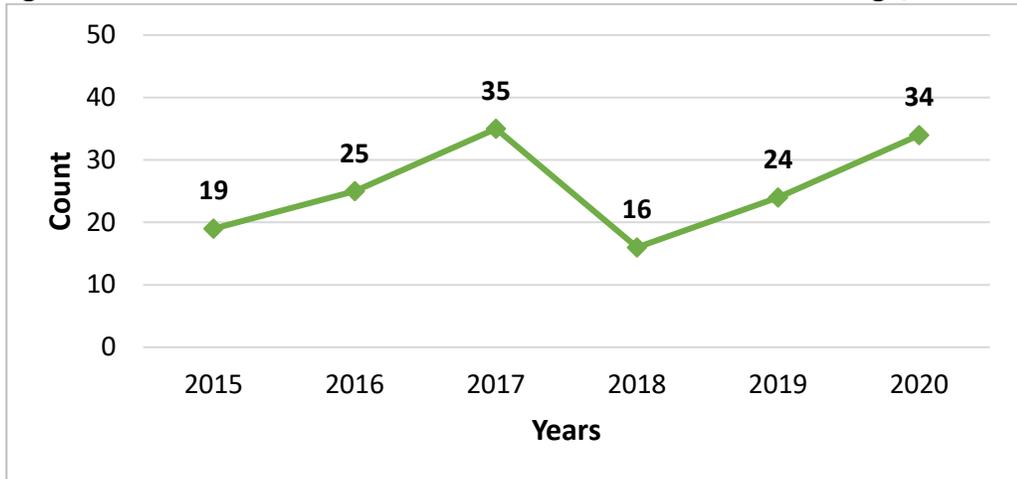


## Homicide Deaths

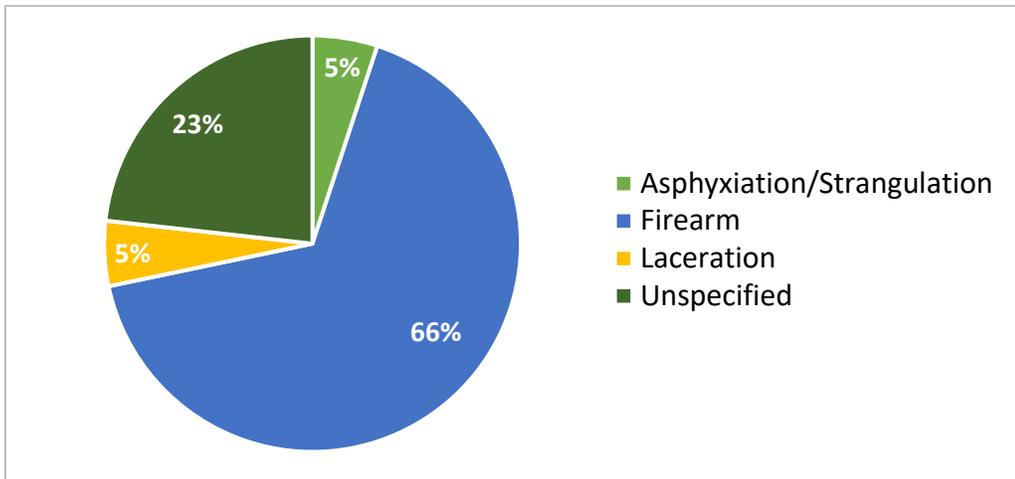
Homicide deaths, demonstrated within Figure 13, include any death where the manner is listed as homicide. This means the death occurred at the hands of another in such a way that cannot be categorized as an unintentional injury or accident. While many homicide deaths do end with criminal investigations, 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 14; the mechanism in over 60% of cases was by firearms.

**Ninety-one percent** of homicide deaths for 2020 were to children between ages 1 and 17 years old in Kentucky.

**Figure 13. Number of Homicide Deaths to Children 0-17 Years of Age; Kentucky, 2015-2020**



**Figure 14. Percent of Homicide Deaths to Children 0-17 Years of Age by Mechanism; Kentucky, 2015-2020**



### Abuse, Neglect, and Maltreatment

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 leading 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 Figure 14.

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):

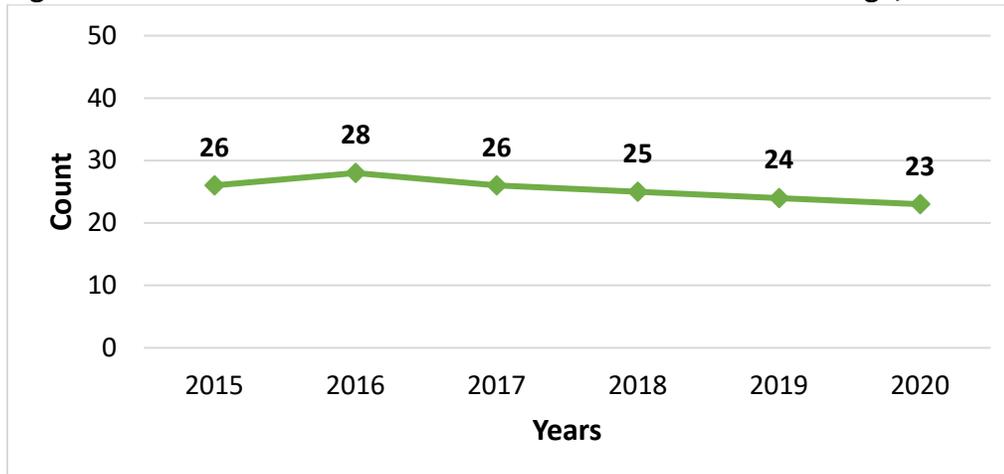
<https://chfs.ky.gov/agencies/dcbs/dpp/cpb/Documents/reportofchildfatalitiesandnearfatalities.pdf>

## 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 would be listed as undetermined. For this report, such deaths would be categorized with unintentional injuries since intent could not be clearly identified. Figure 15 shows the number of suicide deaths from 2015-2020.

The age range for death by suicide for Kentucky children extends from 10 to 17 years for 2020.

**Figure 15. Number of Suicide Deaths to Children 10-17 Years of Age; Kentucky, 2015-2020**

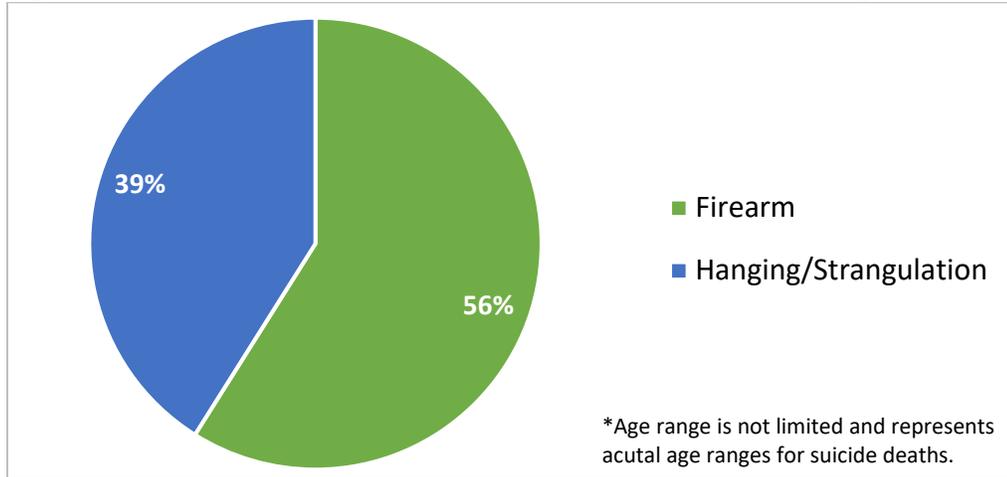


Suicide mechanism refers to the specific means in which a person has chosen to harm themselves. For Kentucky children, the mechanism of suicide mainly consists of firearm and hanging/strangulation. Although suicide by poisoning/overdose does occur, it is quite rare and there was one case for 2020. Between 2015 and 2020, 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 2015 and 2020 as seen in Figure 16. The specific type and/or caliber of firearm used in a death by suicide is not

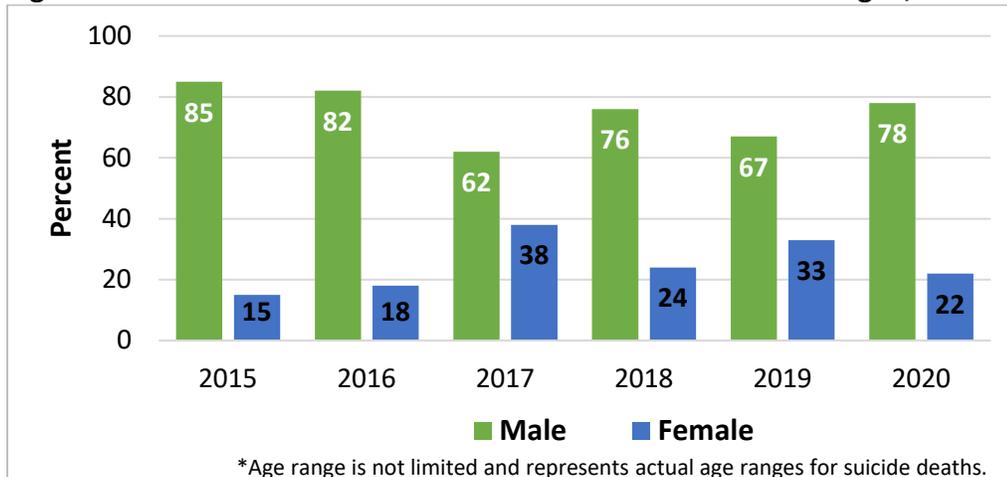
consistently reported as part of the primary cause of death. For that reason, it is not possible to identify common calibers or firearm types based on death certificate data alone.

**Figure 16. Percent of Suicide Deaths to Children 10-17 Years of Age\*; Kentucky, 2020**



As to gender, males are much more likely to die by suicide than females as demonstrated in Figure 17.

**Figure 17. Percent of Suicide Deaths to Children 10-17 Years of Age\*; Kentucky, 2015-2020**



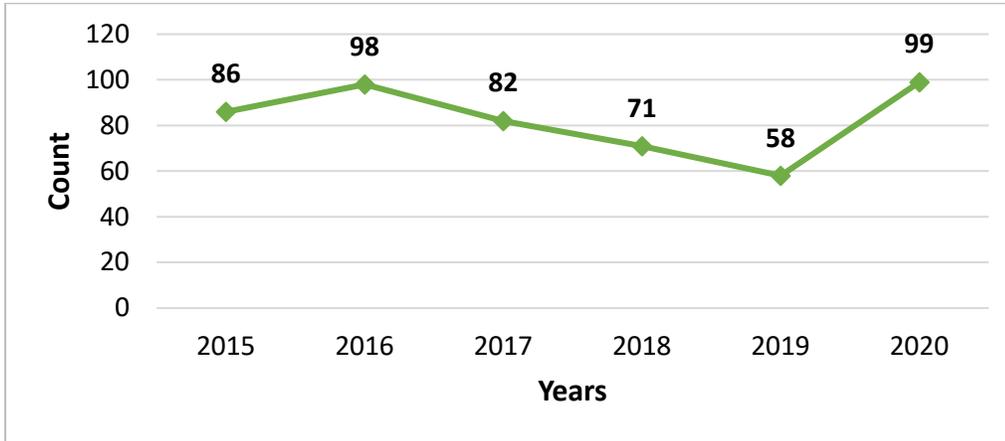
## Undetermined Deaths, SIDS and SUID

Undetermined as a category of death includes causes which are undetermined or ill-defined; the five-year trend is shown in Figure 18. 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 reporting

Sixty-eight percent of undetermined deaths to Kentucky children occurred in another state for 2020.

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

**Figure 18. Number of Undetermined Causes of Death for Children 0-17 Years of Age; Kentucky, 2015-2020**

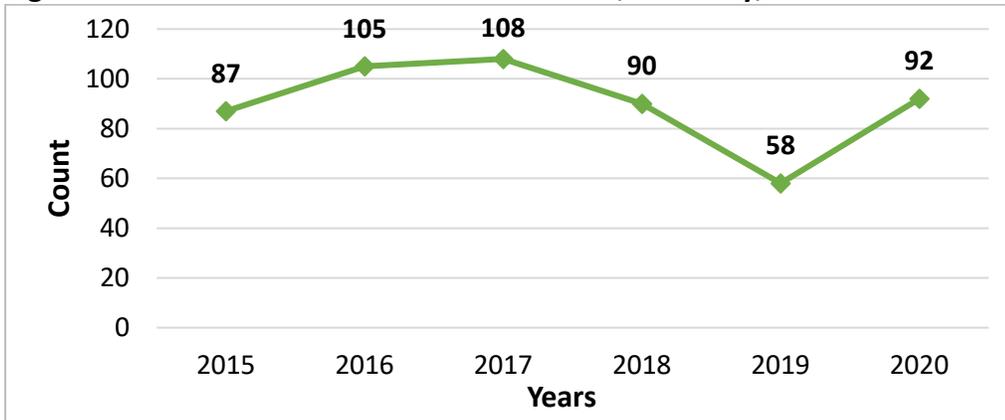


**SUID**

The Centers for Disease Control and Prevention defines Sudden Unexpected Infant Deaths (SUID) to describe the sudden and unexpected death of a baby less than 1 year old if the cause was not obvious before investigation. The three commonly reported types of SUID include the following: Sudden Infant Death Syndrome (SIDS), unknown cause, and accidental suffocation and strangulation in bed.

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). When potential 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. The cases of SUID over the past 6 years are shown in Figure 19.

**Figure 19. Number of SUID Deaths\* for Infants; Kentucky, 2015-2020**



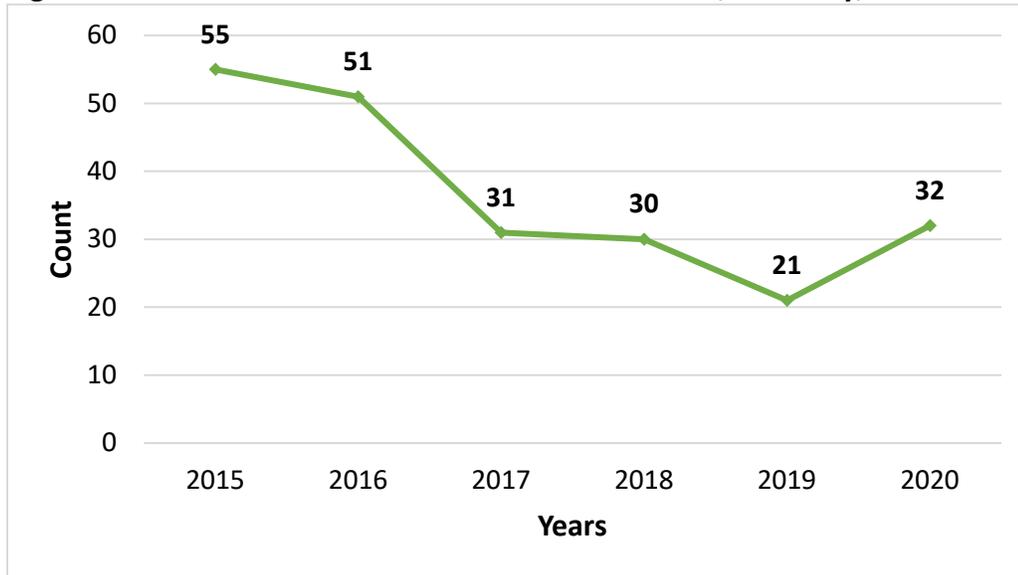
Data Source: Kentucky SUID Case Registry, 2015-2020

\*Counts are mutually exclusive and cannot be compared to other causes of death in this report.

**SIDS**

Sudden infant death syndrome (SIDS) as a primary cause of death is identified through a specific ICD-10 code (R95). SIDS is an exclusionary cause of death that can only be used for infant deaths where a clear cause of death cannot be identified. Figure 20 shows SIDS deaths for years 2015-2020.

**Figure 20. Number of SIDS Causes of Death for Infants; Kentucky, 2015-2020**



## Recommendations

Data and case reviews inform state recommendations for prevention efforts to address child abuse and neglect, mental health issues, substance use disorder, and child deaths. The Kentucky Child Fatality Review Program will continue to collaborate with local and state partners to prevent injury and death of Kentucky's children. The Child Fatality Review Program makes the following recommendations for the prevention of child deaths in Kentucky.

### **Recommendation #1: Increase collaboration on prevention education on preventable causes of death**

State and local agencies impact the lives of children in many ways. The opportunity to collaborate to incorporate a large prevention model across the whole community is critical in reducing child fatalities.

- Collaborate between many state and local agencies to work on initiatives related promoting and improving the policies around the Plan of Safe Care for infants and their parents.
- Increase prevention education on natural causes through regional referral centers while taking into consideration equity and social determinants of health to address gender, health, racial, and societal disparities.

### **Recommendation #2: Continue a campaign to promote Safe Sleep**

The primary prevention strategy utilized to reduce SUID in Kentucky is the Safe Sleep media campaign. Unsafe sleep practices are a leading cause of infant death. Recommendations for the prevention of sleep-related deaths are as follows:

- Birthing hospitals should participate in the Cribs for Kids® National Safe Sleep Hospital Certification program, which recognizes hospitals that demonstrate a commitment to reducing infant sleep-related deaths by promoting best safe sleep practices and by educating on infant sleep safety. By becoming certified, a hospital has demonstrated that it is committed to being a community leader and is proactively eliminating as many sleep-related deaths as possible. See more at: <https://cribsforkids.org>
- Healthcare providers, childcare providers, and other community organizations should provide the most current and evidence-based Safe Sleep materials free of charge, which are accessible from the Eunice Kennedy Shriver National Institute of Child Health and Human Development. These materials should be used to educate communities and families about safe sleep practices. <https://www.nichd.nih.gov/sts/Pages/default.aspx> or [www.safesleepky.org](http://www.safesleepky.org)
- Healthcare providers who care for substance-exposed infants or infants diagnosed with Neonatal Abstinence Syndrome should encourage birthing facilities to develop opportunities for the mother-infant dyad to allow the mother to practice safe sleep and calming the infant (abusive head trauma prevention).
- Childcare serving agencies, domestic violence shelters, and emergency shelters should have infant safe sleep policies.

More information may be found here: <http://www.safesleepky.com/safe-sleep-data/>.

### **Recommendation #3: Suicide Prevention**

Teen suicide rates are rising and the number of younger children committing suicide is increasing. There are many factors associated with teen suicide. It is imperative that parents, educators, and service providers from all systems of care that interact with children and youth are aware of the warning signs and are equipped to talk to children in crisis.

- Providers in both healthcare and behavioral healthcare should use the unique opportunities available to them to screen and assess for suicide risk and ensure that at-risk youth receive competent suicide treatment and management within and across systems of care (zerosuicide.com).
- School systems should have protocols for addressing suicide, which include evidence-based screening tools and resources. Middle schools should be included to target the younger children who are contemplating suicide (Substance Abuse and Mental Health Services Administration, 2012).
- Improve and increase educational efforts related to storage and access to firearms and prescription and over-the-counter medications. Specific outreach to healthcare providers and behavioral health professionals on identifying potential ideation and planning for intentional harm or death.

### **Recommendation #4: Improve data quality, validity, and sharing**

Data is critical to understanding the trends and causes of child fatalities. Efforts to improve and enhance data quality is crucial to further understanding the underlying causes.

- Additional datasets and possibly even partnerships with subject experts should be pursued. 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.
- Improved data management has the potential to allow for more meaningful insights regarding the causes of death included in this report. The local agencies 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.
- 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. 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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