Data
Statistics
Information
Graphs
Tables
Charts
Trends

Davidson County Child Death Review Team Annual Report

Data for 2014

Metro Public Health Dept
Nashville/Davidson County
Protecting, **Improving**, and **Sustaining** Health

Davidson County Child Death Review Team Annual Report, Data for 2014
Author: Brook McKelvey, MPH, MA, Lead Author
Epidemiology Program
Metro Public Health Department of Nashville/Davidson County, TN

Leaders of the Child Death Review Team:
William Paul, MD, MPH, Team Chair
Director of Health
Metro Public Health Department of Nashville/Davidson County, TN

Adele Lewis, MD, Team Chair
Deputy Chief Medical Examiner
Metropolitan Nashville/Davidson County, TN

Carol Jones, BSHA, Team Staff Support
Bureau of Population Health
Metro Public Health Department of Nashville/Davidson County, TN

Suggested Citation

McKelvey, B., Rogers, B., Mukolo, A., Vick, J. (2016). Davidson County Child Death Review Team Annual Report, Data for 2014. Nashville, TN; Metro Public Health Department of Nashville/Davidson County.

Table of Contents

The Child Death Review Process

When a child dies:

- Birth and death certificates are sent from the Tennessee Department of Health (TDOH) to the Metro Public Health Department (MPHD) Child Death Review Team Leader. Death records are put on the docket for review if the child resided in Davidson County at the time of death, was aged 0 to 17 years, and did not die out of state. Infants are included if they were born on or after 22 weeks gestation, or were born at a weight greater than 500 grams. Copies of the birth and death records are sent to the team members.
- All team members search their agency or organization records for applicable files and bring either the records or case summaries to team meetings.
- At the team's monthly meetings, each case is reviewed until a consensus is reached to close the case. A case remains under review (sometimes 2-3 months) until all information relating to the case is obtained and discussed. This information may include autopsy results, hospital medical records, school disciplinary records, investigation information provided by the police and the Department of Children's Services (DCS), and judicial information provided by the District Attorney and Juvenile Court.
- The team reviews available information and comes to a consensus on whether the child death was preventable. A preventable death is defined as one in which some action or actions of individuals or systems would have alleviated the circumstances that led to a specific child death.
- The TDOH data collection form is completed using the information obtained in the review process. The team leader enters the information into a statewide database managed by the National Center for the Review & Prevention of Child Deaths (NCRPCD).
- After all cases are reviewed for the calendar year, an annual report is produced. The purpose of the report is to share findings and assist in the development of data-driven recommendations for the prevention of child deaths.

Preface

The Davidson County Child Death Review Team (CDRT) reviewed seventy-nine infant and child deaths (ages 0 to 17) for the calendar year 2014, to better understand how and why these children died. Case review for children who died during the 2014 calendar year began in January 2014 and ended in Febrary 2016. Data cleaning and analysis started in March 2016. The CDRT is empowered by State statute (T.C.A. 68-42-101) and a Mayoral Executive Order to conduct reviews to achieve the following goals:

1. Ensure an accurate inventory of child fatalities by age, location, cause, manner, and circumstance.
2. Support adequate child death investigation.
3. Enable multi-agency collaboration, cooperation, and communication at the state and local levels regarding child fatalities.
4. Analyze patterns and trends in child deaths from all causes, including abuse and neglect, unsafe sleep environment, and inadequate medical care, or public health services.
5. Enhance the general awareness of child death through the understanding of why and how children die.
6. Develop community prevention initiatives from the findings of the child death review team.

This report presents the key findings and recommendations from the CDRT, designed to help prevent future deaths of children in Davidson County.

Recommendations and Actions

Each year, based on the results of child death investigations, the CDRT makes recommendations for policy, infrastructure, and service changes in an effort to prevent future childhood mortality. Recommendations are forwarded to the TDOH State Child Fatality Team where they are consolidated with recommendations from other teams across the State. These recommendations fuel legislative, programmatic, and policy agendas for the State of Tennessee.

When recommendations are applicable to the local level, the Davidson County CDRT takes a role in the implementation either through direct interaction with the agencies and organizations involved, or through facilitating contacts and partnerships with appropriate community groups. The Davidson County CDRT made the following recommendations based on review of 2014 cases:

1. The team discovered that women in domestic violence shelters rarely receive home visiting services. Domestic violence shelters are hesitant to make referrals for fear of unintended legal consequences for the woman and her children. In Davidson County, referrals for social services are funneled to a central agency, the Central Referral System (CRS), where people can be matched to the best program or programs suited for their needs. If referrals are not being made, then opportunities for intervention and prevention are being missed. For this reason, the team encouraged the Central Referral System (CRS) to reach out to shelters, and emphasize that referrals for home visiting are not the same thing as referrals to the Department of Children's Services (DCS).

   Action: Investigation into the issue revealed that families in domestic violence shelters have a case worker who connects them with needed services, so most needs are met. Referrals for home visiting services often result in one or two visits before the family relocates without leaving a forwarding address, and home visitors report that connecting with families in shelters is difficult. Privacy concerns prevent staff from telling home visiting workers whether someone is on the premises or not.

   Subsequent reviews raised concerns regarding the utilization of the CRS in general. As a result, this recommendation has been combined with others, and a MPHD led work group was formed to address agency barriers to the use of the referral system and improve the overall efficiency of the system.

2. A review is only as complete as the data available. The team noted that often the congenital anomaly section of the birth transcript is incorrect or inaccurate, with anomalies that either contributed or caused the death of the child not being noted at all. The CDR team recommends that the State expand the congenital anomaly section of the birth transcript to include a more extensive list of anomalies similar to that found on the birth certificate.

3. In 2014, the Davidson County CDRT assisted the State in filming a training video. This video will be included as part of the training materials offered to new CDR members across the State. The video can be found here.: https://www.youtube.com/watch?v=AMvV2uD_8_s.

Recommendations and Actions, continued

4. The CDR team continues to be an advocate for Safe Sleep education, and notes that many of the reviewed deaths occurred while the child was under the care of someone other than the parent. While continuing education to parents is important, the team recommends that the education be expanded to include non-custodial caregivers, such as babysitters, and relative caregivers, such as grandparents.

   Action: Metro Nashville Public Schools display Safe Sleep posters in the counseling areas of select schools. The MNPS representative noted that this is the same area where teen pregnancy groups meet. The Fetal and Infant Mortality Review Team (FIMR) at MPHD conducted safe sleep education sessions targeted at seniors in senior housing developments, churches, and senior community health fairs. Portable cribs were distributed to grandparents who were caregivers of infants and did not have a safe place for the baby to sleep. Safe sleep education was delivered to Nashville State Community College's early childhood education classes. In a continued effort to reach childcare providers, the Safe Sleep coordinator presented information at the Nashville Area Association for the Education of Young Children 2015 Early Childhood Education Conference and hosted a booth a the Tennessee Early Childhood Training Alliance's Summer Research Institute. Additional non-custodial caregiver Safe Sleep education was delivered to Metro Department Housing Authority social workers and Child Protective Service case workers.

Executive Summary

The CDRT reviewed the deaths of seventy-nine children who died in 2014.

Demographics

- 53 deaths (67.1%) occurred among children less than 1 year of age.
- 7 deaths (8.9%) occurred among children aged 1 to 4 years.
- 4 deaths (5.1%) occurred among children aged 5 to 9 years.
- 9 deaths (11.4%) occurred among children aged 10 to 14 years.
- 6 deaths (7.6%) occurred among children aged 15 to 17 years.
- 4 deaths (5.1%) occurred among Asians.
- 13 deaths (16.5%) occurred among Hispanics.
- 36 deaths (45.6%) occurred among non-Hispanic blacks.
- 26 deaths (32.9%) occurred among non-Hispanic whites.
- 43 deaths (54.4%) occurred among males.

Manner of Death

- 56 deaths (70.9%) were due to natural causes.
- 11 deaths (13.9%) were due to unintentional injuries.
- 2 deaths (2.5%) were due to homicide.
- 2 deaths (2.5%) were due to suicide.
- 8 deaths (10.1%) were due to undetermined[a] causes.

67.1% of child deaths occurred to children less than one year of age and 45.6% of deaths occurred to non-Hispanic black children.

[a] Undetermined deaths are defined as "any death for which manner is unknown after extensive autopsy and crime scene investigation". In 2014, 8 sleep-related deaths were categorized as undetermined, and 4 were categorized as accidental. A specific section on sleep-related deaths is included in this report.

Preventability of Deaths

For 2014, twenty-two deaths (27.9%) were judged to have been preventable, and in nine deaths (11.4%), preventability could not be determined.

- 11 (100%) deaths due to unintentional injury were judged as preventable.
- 4 (100%) homicide and suicide cases were judged as preventable.
- 4 (7.1%) natural deaths were judged as preventable.
- 3 (37.5%) undetermined deaths were judged as preventable.

Factors that Hindered Review or Resulted in Specific Action

- Inaccurate or incomplete death/birth certificates hindered case review in 21 (26.6%) cases.
- The CDRT disagreed with the official manner of death in 1 (1.3%) case, and disagreed with the official cause of death in 4 (5.1%) cases.
- In 2 (2.5%) cases, review was hindered by the absence of necessary team members, or adequate information not being brought to the meeting.
- Information was needed from another state or in-state locality in 4 (5.1%) cases.
- In 1 (1.3%) case, regulations of the Health Insurance Portability and Accountability Act (HIPAA) prevented access to or exchange of information.
- Inadequate investigation precluded having enough information for review in 2 (2.5%) cases.
- Official manner or cause was changed because of the case review in 1 (1.3%) cases.
- Action was taken by the Department of Children's Services (DCS) as a result of the death in 6 (7.6%) cases.

100% of homicide, suicide, and unintentional injury deaths were judged as preventable.

An Important Note on Interpretation

The data presented in this report are compiled from many different sources, and may not be representative of the characteristics of children in Davidson County as a whole. Substance use, for example, is generally underreported because of low testing rates and clinical practice patterns. Therefore, the rates reported here are conservative estimates.

Additionally, since details emerge from a variety of sources on each death, errors in the data are more readily identified. For this reason, the data presented in this report might differ from data published from other stand-alone sources, such as vital records. For example, an analysis of prenatal care based on information from vital records and medical records could differ from an analysis of prenatal care from vital records alone.

Death is the final outcome of a continuum of circumstances, and the data collected by the CDRT represents this extreme. Therefore, caution should be used when extrapolating these results to the general population. However, the data collected by the CDRT clearly illustrates areas where the systems, policies, and practices of a community fail to adequately protect children. As such, this information provides a valuable tool to promote and advocate for systems change.

Demographics and Spatial Analysis

Demographics

The population in Davidson County, according to the 2014 census estimates, was approximately 660,000, of which 21.5% were under the age of 18. The racial and ethnic composition of the population was mostly non-Hispanic white (65.6%) and non-Hispanic black (28.1%), with a growing percentage of Hispanic residents (9.9%)[1]. There were 10,275 births in Davidson County in 2014 (birth rate: 15.4 per 1,000 population), 8.9% of which were born weighing less than 2500 grams (low birth weight).

Five-year census estimates (2010-2014) indicate that among persons under the age of 18, 30.5% subsisted on an income below the federal poverty level[2]. Among family households, 24.5% contain children under the age of 18, and 44.5% of grandparents are the primary caretakers[3].

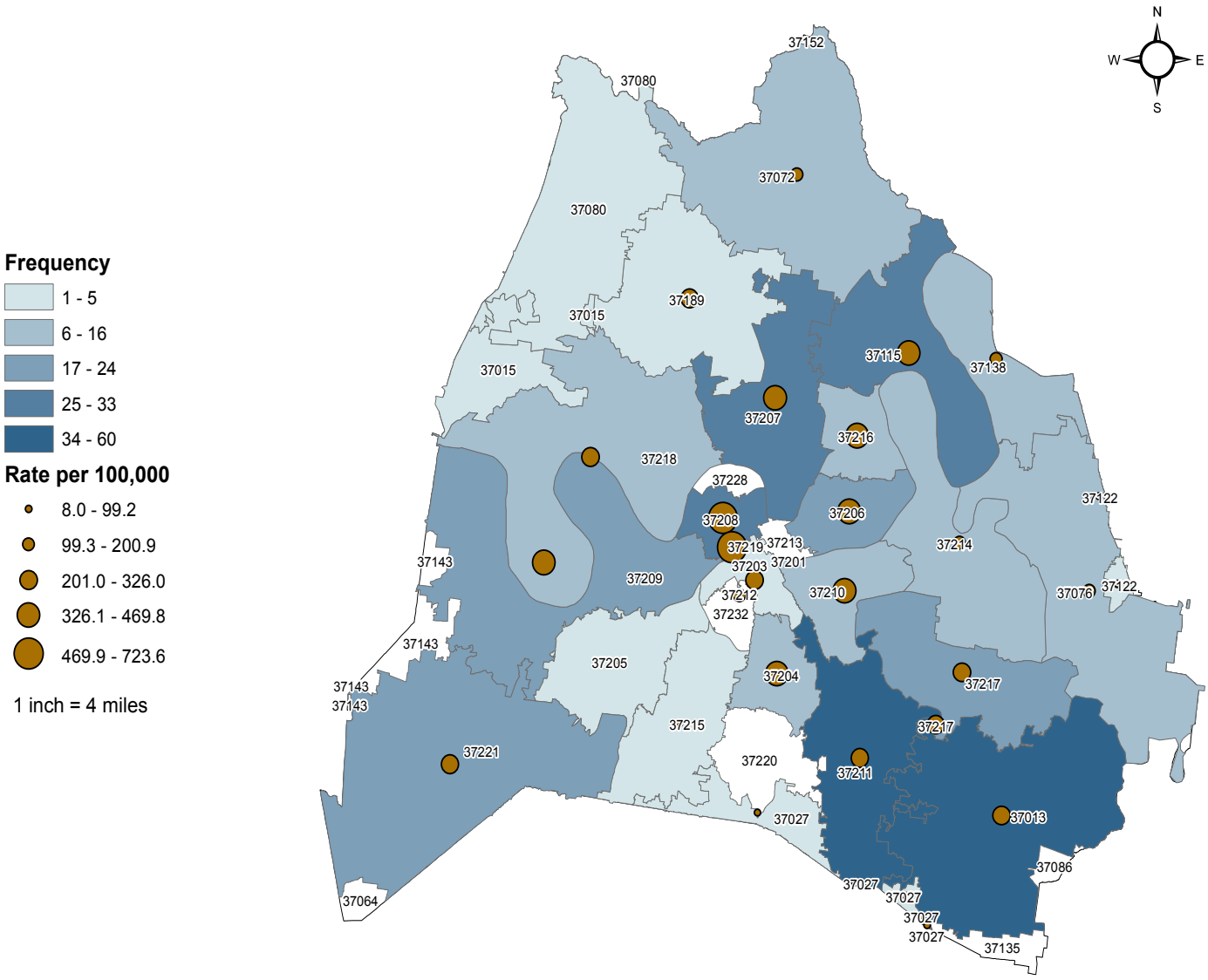
Spatial Analysis

Figure 1 depicts the distribution and rates of the reviewed infant and child deaths that occurred between 2010 and 2014 by zip code (416 deaths). The zip codes with the greatest number of deaths were located in the southeast of the county (37211 and 37013). A wide band of deaths also occurred from the center of the county and extended into the northeast (37208, 37207, 37115). According to the Census Bureau estimates for 2010 through 2014, the areas with the highest number of child deaths correspond to the zip codes with the highest percentage of families living below the poverty level ranging from 11.1% in zip code 37013 to 39.3% in zip code 37208. In stark contrast is zip code 37215, which had between 1 and 5 total child deaths for the 5-year period and 0.9% of families living below the poverty level[4].

The mortality rate (deaths per 100,000) in each zip code of children aged 0 to 17 years is also depicted in Figure 1. The zip codes with the highest mortality rates were 37208 (723.6), 37204 (469.8), and 37206 (433.4).

Rates calculated with small numbers can appear artificially inflated. For this reason, mortality rates were not mapped when the number of deaths in the zip code was 5 or less. Additionally, there are some zip codes that are not fully contained within the county line. As the CDRT only reviews deaths among resident children, the rates and frequencies present for some zip codes along the county border represent only the Davidson County portion of the area. Lastly, there were some zip codes for which no deaths were recorded during the 5-year period. These areas are indicated in white.

Figure 1: Child Deaths by Zip Code According to Resident Address at the time of Death, Davidson County, TN, 2010-2014



Infant Mortality in Davidson County[b]

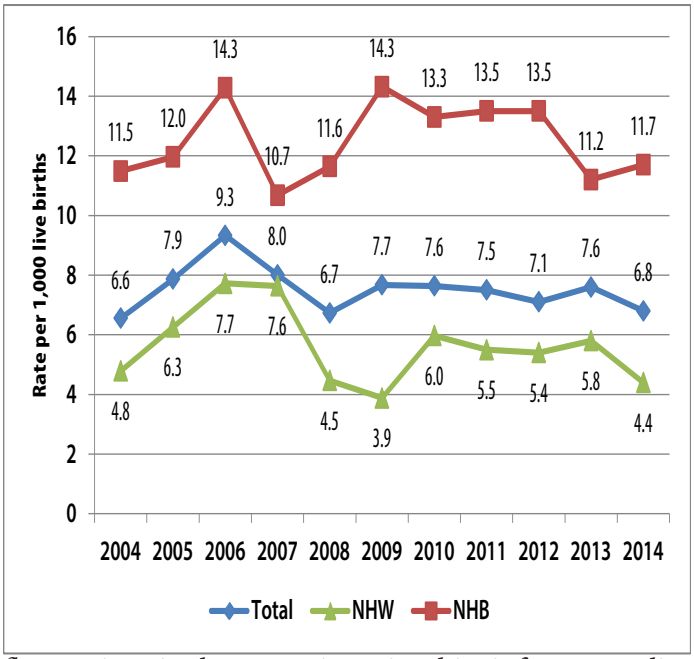
Infant and child mortality are important indicators of the health of a nation and are associated with several factors such as access to health care, maternal health, and socioeconomic status[5]. Nationally, the infant mortality rate has declined each year since 2007[6].

On average in Davidson County, infant deaths comprise sixty percent or more of the total number of child deaths. Fifteen to twenty percent of child deaths each year do not meet the CDRT review inclusion criteria[c]. This section presents data on the total number of infants and children residing in Davidson County who died in 2014 (regardless of case review) to provide the most accurate picture of the magnitude of infant and child mortality (Figure 2).

- In 2014, the infant mortality rate in Davidson County was 6.8 deaths per 1,000 live births, a 10% decrease from the rate in 2013 (7.6).
- The non-Hispanic white infant mortality rate in 2014 was 4.4 deaths per 1,000 live births, and the non-Hispanic black rate was 12.1. The non-Hispanic black infant mortality rate was 2.7 times higher than the non-Hispanic white rate.
- The non-Hispanic white infant mortality rate in 2014 was 8% lower than the rate in 2004. The non-Hispanic black infant mortality rate in 2014 was 1.7% higher than the rate in 2004.

Nationally, infant mortality has demonstrated a modest but steady decline since 2005. Despite these declines, non-Hispanic black infants continue to die at a rate that is nearly twice that of non-Hispanic white infants[7]. Davidson County does not share in the overall reduction of infant mortality. There is little difference in the non-Hispanic black rates between 2004 and 2013, and 2014 is the first year since 2012 that the non-Hispanic white rate has decreased. This means that any reduction or increase of the disparity between non-Hispanic black and non-Hispanic white rates is the result of small fluctuations in the non-Hispanic white infant mortality rate as opposed to reductions across all groups. This deviation from the national trend illustrates the need for continuing vigilance through review in order to identify the issues and find ways to resolve them.

Figure 2: Infant Mortality by Race, Davidson County, TN, 2004-2014



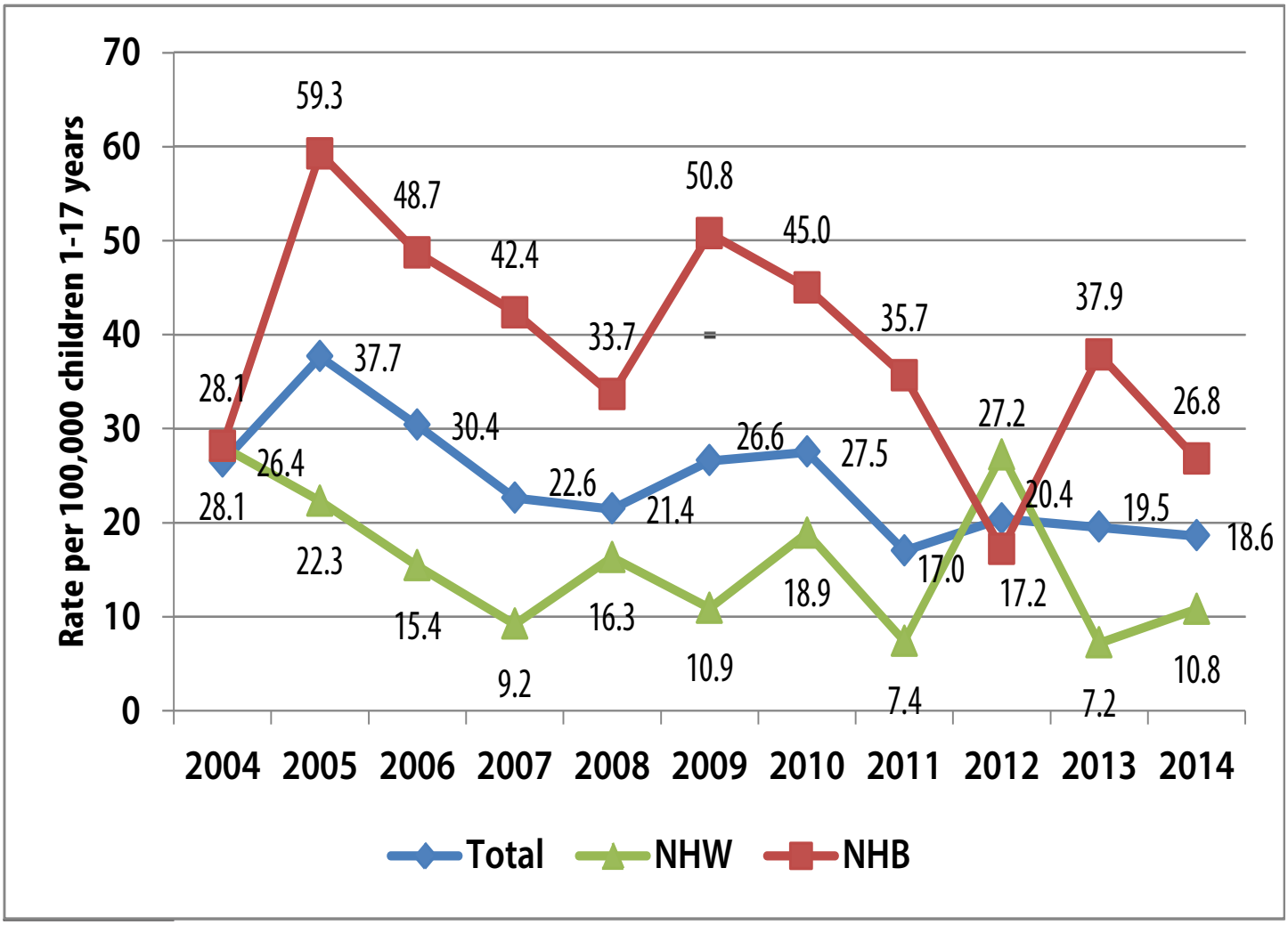
[b]Infant mortality rates were calculated by the Epidemiology Department at MPHD. Hispanic ethnicity is not presented due to the small numbers of infant deaths in that population, which would make the corresponding rates unreliable.

[c]Deaths that occurred out of state, and infants that were born before 22 weeks of gestation, or weigh less than 500 grams were excluded from review.

Child Mortality in Davidson County[d]

- In 2014, the mortality rate in Davidson County for children aged 1 to 17 years was 18.6 deaths per 100,000 population, which is 4.6% lower than the rate in 2013.
- The non-Hispanic white child death rate in 2014 was 10.8 deaths per 100,000 population, and the non-Hispanic black rate was 26.8. The non-Hispanic black rate was 2.5 times higher than the non-Hispanic white rate.
- The non-Hispanic white child death rate in 2014 was 61.6% lower than the 2004 rate. The non-Hispanic black child death rate in 2014 was 4.6% lower than the rate in 2004.
- There was an unexpected reversal of rates in 2012, with the non-Hispanic black rate being lower than the non-Hispanic white rate. Since the rates reverted to the previous pattern in 2013, we can attribute this to random variation in the data due to an uncharacteristically low number of deaths in this age group among non-Hispanic blacks.

Figure 3: Child Mortality by Race/Ethnicity, Davidson County, 2004-2014



[d]Race and ethnicity was analyzed for child mortality but due to small numbers, data for Hispanic child mortality was excluded from this report.

Age-Specific Mortality

Age is one of the most important factors to consider when describing the occurrence of any disease or illness[5]. In the United States, mortality rates are highest among children less than one year of age followed by those aged 15 to 17 years. Mortality rates are lowest among children aged 5 to 9. Nationally, the overall leading cause of death among children is unintentional injuries while the leading causes of death among infants are congenital anomalies (birth defects), disorders related to short gestation, low birth weight, and SIDS[6]. Key risk factors for these leading causes of death include maternal smoking and placing the infant in unsafe sleeping environments[7].

Nationally, the overall leading cause of death among children is unintentional injuries while the leading causes of death among infants are birth defects, disorders related to short gestation, low birth weight, and SIDS.

Infant Deaths

The CDRT in Davidson County reviewed seventy-nine deaths that occurred in 2014. Fifty-three (67.1%) of the cases reviewed were of children less than 1 year of age. The leading causes of death for infants were as follows: eighteen deaths (34.0%) resulted from prematurity, fifteen deaths (28.3%) resulted from birth defects, four deaths (7.6%) resulted from infections, and another four deaths (7.6%) resulted from other perinatal conditions. Prematurity is of primary concern because infants born before 37 weeks gestation have a higher risk of long-term disabilities such as breathing problems, cerebral palsy, developmental delay, and vision and hearing impairment.

Demographics, Manner of Death, and Risk Factors among Infants (Tables 1 & 4)

Demographics

- 3 (5.7%) were Asian.
- 7 (13.2%) were Hispanic.
- 23 (43.4%) were non-Hispanic black.
- 20 (37.7%) were non-Hispanic white.
- 26 (49.1%) were male.

Manner of Death

- 41 deaths: natural
- 8 deaths: undetermined
- 4 deaths: unintentional injury

Risk Factors[e]

- 27 (50.9%) were low birth weight (less than 2500 grams).
- 30 (56.6%) were premature (less than thirty-seven weeks gestation).
- 10 (18.9%) experienced intrauterine tobacco exposure.
- 6 (11.3%) experienced intrauterine drug exposure.
- 3 (5.7%) experienced intrauterine alcohol exposure.
- 4 (7.5%) received late (>6 months) or no prenatal care.

Child Deaths

Demographics and manner of death of the remaining twenty-six reviewed deaths are as follows (Table 1):

7 deaths (8.9% of total) occurred to children ***aged 1 to 4:***

Demographics

- 4 deaths: Hispanic
- 2 deaths: non-Hispanic black
- 1 death: non-Hispanic white
- 4 deaths: male

Manner of Death

- 5 deaths: natural
- 2 deaths: unintentional injury

4 deaths (5.1% of total) occurred to children ***aged 5 to 9:***

Demographics

- 1 death: Hispanic
- 3 deaths: non-Hispanic black
- 2 deaths: male

Manner of Death

- 4 deaths: natural

9 deaths (11.4% of total) occurred to children ***aged 10 to 14:***

Demographics

- 1 death: Asian
- 1 death: Hispanic
- 5 deaths: non-Hispanic black
- 2 deaths: non-Hispanic white
- 7 deaths: male

Manner of Death

- 5 deaths: natural
- 3 deaths: unintentional injury
- 1 death: suicide

6 deaths (7.6% of total) occurred to children ***aged 15 to 17:***

Demographics

- 1 death: Hispanic
- 5 deaths: non-Hispanic black
- 2 deaths: non-Hispanic white
- 6 deaths: male

Manner of Death

- 1 death: natural
- 2 deaths: unintentional injury
- 1 death: suicide
- 2 deaths: homicide

[e]Risk factors related to unsafe sleep are discussed in a later section in this report.

Deaths Due to Natural Causes

Nationally, deaths from natural causes are the leading cause of death in children under one and the second-leading cause of death to children over one year of age, following unintentional injuries. These deaths generally result from common health conditions such as prematurity, birth defects, genetic disorders and cancers. Although many health conditions that contribute to natural deaths are not preventable, case review provides quality assurance that medical and public health practices are working properly to ensure these children have the best chance for survival. Such practices include preconception health, genetic counseling and screening, decreasing exposure to environmental hazards, and increasing compliance with treatment regimens[8].

A total of fifty-six deaths reviewed by the CDRT were due to natural causes, representing 70.9% of the reviewed child deaths.

A total of fifty-six deaths reviewed by the CDRT were due to natural causes, representing 70.9% of the reviewed child deaths. (Table 1)

Demographics

- 41 deaths (73.2%) occurred to infants.
- 5 deaths (8.9%) occurred to children aged 1 to 4.
- 4 death (7.1%) occurred to children aged 5 to 9.
- 5 deaths (8.9%) occurred to children aged 10 to 14.
- 1 death (1.7%) occurred to a child aged 15 to 17.
- 4 children (7.1%) were Asian.
- 10 children (17.9%) were Hispanic.
- 24 children (42.9%) were non-Hispanic black.
- 18 children (32.14%) were non-Hispanic white.
- 26 children (46.4%) were male.

Causes of Death

In the United States, one in every nine babies (more than half a million) is born prematurely[9] and approximately one in every thirty-three babies is born with a birth defect[10]. Reflective of national trends, in Davidson County, prematurity and birth defects are the leading causes of natural deaths with most of these deaths occurring among infants. Many gaps exist in understanding why some women experience premature labor and why some babies are born with a birth defect; however, there are several known risk factors. These include having a previous preterm birth, maternal medical conditions such as hypertension, diabetes, and smoking/substance abuse, genetic predisposition, and maternal age. Early access to quality preconception and prenatal care, and the daily consumption of folic acid can reduce the likelihood of pre-term births and birth defects[9,10].

Eighteen deaths (32.1%) were due to prematurity. Of these:

- 15 (83.3%) had prenatal care, and prenatal care status was unknown in 2 (11.1%) cases.
- In 16 (88.9%) cases, the mother had a medical condition or complication during pregnancy.
- 4 (22.2%) of infants were exposed to tobacco or drugs during pregnancy.

Eighteen deaths (32.1%) were due to birth defects. Of these:

- 14 (77.8%) had prenatal care.
- In 10 (55.6%) cases, the mother had a medical condition or complication during pregnancy
- 1 (5.6%) infant was exposed to tobacco or drugs during pregnancy.

Of the remaining twenty deaths (35.7%):

- 4 deaths (7.1%) were due to perinatal conditions (any medical condition that occurred between three months before birth and twenty-eight days after birth).
- 5 deaths (8.9%) were due to infections (such as meningitis, adenovirus, tracheitis).
- 4 deaths (7.1%) were due to cancer.
- 3 deaths (5.4%) were due to asthma.
- 3 deaths (5.4%) were due to neurological or seizure disorders.
- 1 death (1.8%) was due to pneumonia.

Deaths Due to Sleep-Related Factors

Annually, more than 4,000 infants die suddenly and unexpectedly in the United States, without a prior known illness or injury[11]. These sudden unexpected infant deaths (SUID) can be from a variety of causes, including accidental suffocation, sudden infant death syndrome (SIDS), or may remain undetermined. The classification of SIDS is only declared after a rigorous autopsy, death scene investigation, and review of an infant's clinical history. It is a diagnosis of exclusion. With advances in death scene investigations and a growing recognition that many of the deaths previously thought unpreventable might have modifiable risk factors associated with them, the diagnosis of SIDS has declined[12]. The most important modifiable risk factor for SUIDs is the sleep environment of the infant[11].

Twelve of the seventy-nine deaths reviewed by the CDRT were determined to be sleep-related. This represents 15.2% of the total deaths, and 22.6% of infant deaths. Of these: four deaths were due to asphyxia (suffocation), and the remaining eight deaths were due to other causes, including unknown causes and deaths where it was undetermined if the death resulted from a medical or injury cause.

Demographics

- 12 deaths (100%) occurred to children less than 1 year of age.
- 2 deaths (16.7%) occurred to a Hispanic.
- 7 deaths (58.3%) occurred to non-Hispanic blacks.
- 3 deaths (25%) occurred to non-Hispanic whites.
- 8 deaths (66.7%) occurred among male children.

Risk factors (Table 5)

- 12 children (100%) were not placed to sleep in a crib or bassinet.
- 7 children (58.3%) were sleeping with other people.
- 7 children (58.3%) were not sleeping on their back.
- In 3 cases (25%) there was no crib in the home.
- In 4 cases (33.3%) an adult was alcohol or drug impaired at the time of the incident.
- 7 children (8.9%) were exposed to second-hand smoke.
- 3 children (25%) were premature.

Deaths Due to Unintentional Injuries

Nationally, unintentional injuries are the leading cause of death among people aged 1 to 19, and are the fifth leading cause of death among infants[13]. Further, for every child death from an unintentional injury, there are 1,000 nonfatal injuries that require treatment or medical consultation. It is estimated that child and adolescent unintentional injuries that result in death, hospitalization, or emergency room visits cost $11.5 billion in medical expenses[13]. These injuries are preventable and represent the most effective way for a community to reduce its mortality rates.

In 2014, there were eleven infant and child deaths due to unintentional injury in Davidson County, representing 13.9% of the total deaths. The greatest number of deaths occurred among infants (4, 36.4%), males (8, 72.7%), and non-Hispanic blacks (7, 63.6%). The leading causes of unintentional injury were drownings and deaths due to asphyxia, representing 5.1% of the total deaths and 36.4% of deaths due to unintentional injuries each. The additional deaths due to unintentional injury were caused by motor vehicle crashes (3, 27.3%) (Table 7). The circumstances are below:

Motor Vehicle Crash

All child deaths due to motor vehicle crashes were preventable through a combination of proper use of safety equipment, eliminating driving under the influence, or employing safe driver behaviors.

The child was a pedestrian in one death, and a passenger in two deaths. Speeding was indicated in two incidents, and reckless driving was indicated in two incidents. Drug or alcohol use was reported in one incident. Weather conditions were normal in all three incidents. Seatbelt use was applicable in one incident, and in that instance, the seatbelt was used improperly. A child seat was present, but used incorrectly in one incident. One incident involved "car surfing", or standing on the hood or roof of a moving vehicle. In one incident, the driver of the child's vehicle was unlicensed. In two incidents the driver of the child's vehicle was responsible for the crash.

Suffocation

All four incidents of suffocation were sleep-related.

Drowning

Two children died in a supervised outdoor outing in an area outside of Davidson County that is known for being dangerous for unskilled swimmers due to the undertow caused by the waterfalls. One child got caught in the undertow. The second child drowned while attempting rescue. One incident was the result of horseplay in waist deep water. One incident was due to an unattended child sneaking back to the water and swimming without a floatation device.

Deaths Due to Violence

Estimates indicate that 55,000 people in the United States die from injuries related to violence each year[14]. Deaths due to violence include weapons such as firearms, knives and other instruments, brute force such as a physical fight, and suffocation (Table 9). Both homicides and suicides are counted as violence-related deaths, and the CDRT considers them to be preventable. In Davidson County, a total of four child deaths were the result of violence, representing 5.1% of the total deaths in 2014. Three deaths (75%) occurred in children aged 15 to 17, and one death (25%) occurred among children aged 10 to 14 years. Violence-related deaths occurred most frequently to males (3, 75%). The same number of deaths occured to non-Hispanic black and non-Hispanic white children (2, 50%).

Suicides

Nationally, suicide is the third-leading cause of death among persons aged 10 to 14 and 15 to 19 years[14]. The three leading methods of suicide deaths include firearms, suffocations, and poisoning. Males are more likely than females to die from suicide, but females are more likely to report suicide attempts. Risk factors for suicide include previous attempts, alcohol or drug abuse, a history of mental illness, and exposure to the suicidal behavior of others[15].

There were two deaths due to suicide in Davidson County, representing 50% of deaths due to violence and 2.5% of the total deaths. (Table 9)

Circumstances

One death resulted from manual strangulation with a ligature, and one death resulted from the use of a weapon. Both children had a history of suicidal ideation, threats, and attempts. Neither child had a history of self-mutilation, or a history of suicide in the family. In one case the precipitating event was an argument with the parents or caregivers, and in one case the child had an argument with a sibling over a video game. A note was left in both cases.

Homicides

Nationally, homicide is the second-leading cause of death among persons aged 15 to 19 years, the third-leading cause of death for persons aged 1 to 4 years and the fourth leading cause of death for persons aged 5 to 9 and 10 to 14. Rates of homicide deaths among youth are highest among non-Hispanic black males, and can be precipitated by a variety of factors including poverty, mental health issues, drug or gang activity, and relationship problems[14].

In Davidson County, two deaths were due to homicide, representing 50% of deaths due to violence and 2.5% of the total deaths (Table 9).

Circumstances

Both deaths involved a firearm. One death was caused by a friend, and the other was the result of a confrontation with law enforcement. In both deaths, the victim had a history of problems in school. One child had a history of drug abuse, and one child had received prior mental health services. One victim had a history of criminal activity. CPS was involved with one family prior to the death.

Acts of Omission or Commission

The rate of child maltreatment in the United States during 2012 was estimated at 9.2 cases per 1,000 children, or 686,000 children. Most of these victims were maltreated by a parent (80.3%). Among those who died from maltreatment, 70% were under the age of three[16]. The CDRT recognizes that these deaths are preventable, and that prevention strategies need to promote safe, stable, and nurturing relationships and environments for children and families[17].

Acts of omission or commission are defined as any act, or failure to act, that either causes or substantially contributes to the death of a child. Although acts of omission or commission are not exclusively defined as child maltreatment, many cases involve types of abuse that are common to child maltreatment (neglect, physical, emotional, and sexual abuse). This section is designed to reveal any behaviors of others that may be involved in a child's death.

A total of twenty-seven deaths reviewed by the CDRT involved an act of omission (e.g. neglect) or commission (i.e. abuse or assault), and with one additional death, an act of omission or commission was probable. Together, the twenty-eight deaths represented 35.4% of all reviewed deaths. For the purposes of this analysis, the case when omission or commission was probable is included in the total number of cases. In eight cases (28.6%), the acts of omission or commission caused the death of the child. In eleven deaths (39.3%), the act contributed to the death of the child, with nine additional cases showing evidence of multiple acts that both caused and contributed to the death.

Demographics (Table 6)

- 14 deaths (50%) occurred among infants.
- 3 deaths (10.7%) occurred among children aged 1 to 4 years.
- 1 death (3.6%) occurred to a child aged 5 to 9 years.
- 6 deaths (21.4%) occurred among children aged 10 to 14 years.
- 4 deaths (14.3%) occurred among teens aged 15 to 17 years.
- 3 deaths (10.7%) occurred among Hispanic children.
- 17 deaths (60.7%) occurred among non-Hispanic black children.
- 8 deaths (28.6%) occurred among non-Hispanic white children.
- 19 deaths (67.9%) occurred among male children.

Circumstances

- In 9 cases (32.1%), the perpetrator was impaired (e.g. using substances, asleep, absent, ill).
- In 13 cases (46.4%), the perpetrator of the act was the biological parent of the child.
- In 15 cases (53.6%), the act of omission or commission was either chronic with the child or a pattern in the family or with the perpetrator.
- 12 cases (42.9%) involved child neglect.
- 6 victims (21.4%) were involved with DCS at the time of the death.
- 1 case (3.6%) involved child abuse.
- 1 case (3.6%) involved poor or absent supervision.
- 1 case (3.6%) involved assault.

Child Deaths from 2010 to 2014

Small numbers of events often make it difficult to discern patterns and opportunities for prevention. For this reason, all deaths reviewed by the Davidson County CDRT occurring from 2010 through 2014 were analyzed in aggregate. The CDRT reviewed the deaths of 416 resident children of Davidson County that died from 2010 to 2014.

Demographics

- 284 deaths (68.3%) occurred among children less than 1 year of age.
- 36 deaths (8.7%) occurred among children 1 to 4 years of age.
- 27 deaths (6.5%) occurred among children 5 to 9 years of age.
- 30 deaths (7.2%) occurred among children 10 to 14 years of age.
- 39 deaths (9.4%) occurred among children 15 to 17 years of age.
- 11 deaths (2.6%) occurred among Asian children.
- 49 deaths (11.8%) occurred among Hispanic children.
- 209 deaths (50.2%) occurred among non-Hispanic black children.
- 147 deaths (35.3%) occurred among non-Hispanic white children.
- 243 deaths (58.4%) occurred among male children.

Manner of Death

- 266 deaths (63.9%) were due to natural causes.
- 63 deaths (15.1%) were due to unintentional injuries.
- 21 deaths (5.1%) were due to homicide.
- 10 deaths (2.4%) were due to suicide.
- 56 deaths (13.5%) were undetermined[f].

[f]Undetermined deaths are defined as any death for which manner is unknown after extensive autopsy and crime scene investigation. Changes in classification of SIDS deaths have increased the number of deaths marked undetermined (see recommendations). A specific section on sleep-related deaths in included in this report.

Preventability of Deaths

From 2010 to 2014, 139 deaths (33.4%) were judged to have been preventable, and in 26 deaths (6.3%), preventability could not be determined.

- 100% of suicide and homicide cases were judged as preventable.
- 59 deaths (93.7%) due to unintentional injuries were judged as preventable.
- 38 undetermined deaths (67.9%) were judged as preventable.
- 11 deaths (4.1%) due to natural causes were judged as preventable.

Factors that Hindered Review or Resulted in Specific Action

- The CDRT team disagreed with the official manner of death in 10 cases (2.4%) and the official cause of death in 11 cases (2.6%).
- The review led to a change in the official manner or cause of death in 7 cases (1.7%)
- Confidentiality issues or HIPAA regulation prevented the full exchange of information in 4 cases (1%).
- Records were needed from another locality in 2 cases (0.5%)
- Review led to additional investigation in 5 cases (1.2%).
- Review led to implementation of a policy or prevention initiative in 2 cases (0.5%).
- Evidence of prior abuse was found in 17 cases (4.1%).
- Action was taken by DCS as a result of the death in 35 cases (8.4%).
- Other factors such as inaccurate or incomplete death/birth certificates hindered the review in 105 cases (25.2%).

Age-Specific Mortality

From 2010 to 2014, 284 (68.3%) of the child death cases reviewed were of children less than 1 year of age.

Demographics and Risk Factors among Infants (Tables 2 & 4)

Demographics

- 7 were Asian.
- 30 were Hispanic.
- 137 were non-Hispanic black.
- 110 were non-Hispanic white.
- 157 were male.

Manner of Death

- 205 deaths: natural
- 53 deaths: undetermined
- 23 deaths: unintentional injury
- 3 deaths: homicide

Risk Factors

- 182 (64.1%) were low birth weight (less than 2500 grams).
- 178 (62.7%) were premature (less than thirty-seven weeks gestation).
- 59 (20.8%) experienced intrauterine tobacco exposure.
- 22 (7.7%) received late or no prenatal care.
- 23 (8.1%) experienced intrauterine drug or alcohol exposure.

Demographics and manner of death of the remaining 132 reviewed deaths are as follows:

36 deaths (8.7% of total) occurred to children ***aged 1 to 4:***

Demographics

- 6 deaths: Hispanic
- 15 deaths: non-Hispanic black
- 15 deaths: non-Hispanic white
- 23 deaths: male

Manner of Death

- 20 deaths: natural
- 11 deaths: unintentional injury
- 3 deaths: homicide
- 2 deaths: undetermined

27 deaths (6.5% of total) occurred to children ***aged 5 to 9:***

Demographics

- 3 deaths: Hispanic
- 18 deaths: non-Hispanic black
- 6 deaths: non-Hispanic white
- 12 deaths: male

Manner of Death

- 17 deaths: natural
- 9 deaths: unintentional injury
- 1 death: undetermined

30 deaths (7.2% of total) occurred to children ***aged 10 to 14:***

Demographics

- 3 deaths: Asian
- 4 deaths: Hispanic
- 19 deaths: non-Hispanic black
- 4 deaths: non-Hispanic white
- 22 deaths: male

Manner of Death

- 18 deaths: natural
- 4 deaths: homicide
- 3 deaths: suicide
- 5 deaths: unintentional injury

39 deaths (9.4% of total) occurred to children ***aged 15 to 17:***

Demographics

- 1 death: Asian
- 6 deaths: Hispanic
- 20 deaths: non-Hispanic black
- 12 deaths: non-Hispanic white
- 29 deaths: male

Manner of Death

- 15 deaths: unintentional injury
- 11 deaths: homicide
- 6 deaths: natural
- 7 deaths: suicide

Deaths Due to Natural Causes

A total of 266 deaths (63.9%) reviewed by the CDRT from 2010 to 2014 were due to natural causes. (Table 2)

Demographics

- 205 deaths (77.1%) were to infants less than 1 year of age.
- 20 deaths (7.5%) occurred to children aged 1 to 4.
- 17 deaths (6.4%) occurred to children aged 5 to 9.
- 18 deaths (6.8%) occurred to children aged 10 to 14.
- 6 deaths (2.3%) occurred to children aged 15 to 17.
- 9 children (3.4%) were Asian.
- 32 children (12%) were Hispanic.
- 121 children (45.5%) were non-Hispanic black.
- 104 children (39.1%) were non-Hispanic white.
- 146 children (54.9%) were male.

Causes of Death

- 101 deaths (38%) were due to prematurity.
- 85 deaths (32%) were due to birth defects.
- 23 deaths (8.6%) were due to medical conditions.
- 15 deaths (5.6%) were due to cancer.
- 11 deaths (4.1%) were due to some type of infection.
- 15 deaths (5.6%) were due to perinatal conditions.
- 8 deaths (3.0%) were due to neurological and seizure disorders.
- 2 deaths (0.8%) were due to influenza or pneumonia.
- 2 deaths (0.8%) were due to cardiovascular issues.
- 2 deaths (0.8%) were due to Sudden Infant Death Syndrome (SIDS).
- 5 deaths (1.9%) were due to asthma.
- 1 death (0.4%) was due to undetermined medical causes.
- 1 death (0.4%) was due to malnutrition or dehydration.

Circumstances

- 247 children (92.8%) received treatment for the medical condition within 48 hours of death.
- In 156 cases (58.6%), death was the expected outcome of the medical condition.
- In 1 case (0.4%), the medical condition was associated with an outbreak.
- In cases in which family compliance to a medical treatment regime was necessary (n=131), 14 (10.7%) were not compliant.
- Environmental tobacco exposure was a contributing factor in 8 (3%) deaths.

Deaths Due to Sleep-Related Factors

A total of seventy-seven deaths (18.5%) reviewed by the CDRT from 2010 to 2014 were determined to be sleep-related (27.1% of infant deaths). Of these: twenty-three deaths were due to asphyxia, six deaths were due to medical conditions, and two deaths were due to Sudden Infant Death Syndrome (SIDS). Forty-six deaths were due to other causes[g] (Table 5).

Demographics

- 73 deaths (94.8%) occurred to children less than 1 year of age.
- 4 deaths (5.2%) occurred to children aged 1 to 4.
- 6 deaths (7.8%) occurred to Hispanic children.
- 48 deaths (62.3%) occurred to non-Hispanic black children.
- 23 deaths (29.9%) occurred to non-Hispanic white children.
- 47 deaths (61.1%) occurred among male children.

Risk factors

- 68 children (88.3%) were not placed to sleep in a crib or bassinette.
- In 14 cases (18.2%), there was no crib in the home.
- 52 children (67.5%) were sleeping with other people.
- 3 children (3.9%) were sleeping with an obese adult.
- 42 children (54.5%) were not sleeping on their back.
- 16 children (20.8%) were placed to sleep on unsafe bedding or with toys.
- 18 children (23.4%) were premature.
- 23 children (29.9%) were exposed to second-hand smoke.
- In 17 cases (22.1%), the supervising adult was alcohol or drug impaired.

[g]Other causes include child deaths for which it was undetermined if the death was due to injury or medical cause.

A total of seventy-seven deaths (18.5%) reviewed by the CDRT from 2010 to 2014 were determined to be sleep-related. 88.3% were not placed to sleep in a crib or bassinette.

Deaths Due to Unintentional Injuries

There were sixty-three deaths due to unintentional injuries, representing 15.1% of the deaths that occurred from 2010 to 2014. The greatest number of deaths occurred among infants (23, 36.5%), males (36, 57.1%), and non-Hispanic blacks (31, 49.2%). There were eleven deaths (17.5%) among Hispanic children. (Table 8)

Motor Vehicle Deaths

There were twenty-one deaths due to motor vehicle crashes, representing 33.3% of the deaths due to unintentional injuries and 5.1% of the total deaths.

Demographics (Table 8)

- 1 death (4.8%) occurred to a child less than one year old.
- 5 deaths (23.8%) occured to children aged 1 to 4.
- 4 deaths (19.1%) occurred to children aged 5 to 9.
- 1 death (4.8%) occured to a child aged 10 to 14.
- 10 deaths (47.6%) occurred to teens aged 15 to 17.
- 1 child (4.8%) was Asian.
- 7 children (33.3%) were Hispanic.
- 6 children (28.6%) were non-Hispanic black.
- 7 children (33.3%) were non-Hispanic white.
- 12 children (57.1%) were male.

Circumstances

- In 12 cases, children were passengers in the vehicle.
- In 7 cases, children were pedestrians.
- In 2 cases, children were drivers.
- Speeding was indicated in 7 cases, reckless driving in 5 cases, distracted driving in 3 cases, and driver inexperience in 1 case.
- The driver was alcohol/drug impaired in 4 incidents.
- Poor weather was cited in 1 case, and poor visibility in 1 case.
- Driving conditions were normal in 18 cases, and wet in 2 cases.
- The vehicle backed over the child in 1 incident, and flipped over in 2 incidents.
- The driver had a poor sight line in 1 incident, swerved to miss an animal in 1 case, was using a cell phone in 1 incident, and was fleeing from the police in 1 incident.
- The child was responsible for causing the incident in 1 case, and in an additional 11 cases the child's driver was responsible.
- In 5 cases, the drivers were in violation of the Tennessee graduated driver's license law, driving with a suspended license, or did not have a license.
- In 8 cases, vehicle protective measures (such as seatbelt, airbag, child seat, helmet) were present but used incorrectly.
- In 5 cases, seat belts were present in the vehicle but not used.

Additional Unintentional Injury Deaths

Additional deaths due to unintentional injuries were caused by suffocations (19, 30.2%), fires or burns (5, 7.9%), drowning (11, 17.5%), poisoning (3, 4.8%), weapons (1, 1.6%), exposure (1, 1.6%) and falls or crushing (1, 1.6%). One incident involved prematurity subsequent to maternal cocaine use and was ruled as accidental.

Deaths Due to Violence

Thirty-one deaths (7.5%) were attributed to violence from 2010 to 2014. The greatest number of deaths occurred among children aged 15 to 17 (18, 58.1%), and non-Hispanic blacks (21, 67.7%). There was one death (3.2%) among Hispanic children. (Table 10)

Suicides

There were ten deaths due to suicide, representing 32.3% of violence-related deaths and 2.4% of the total deaths. (Table 10)

Demographics

- 3 deaths (30%) occurred to children aged 10 to 14 years.
- 7 deaths (70%) occurred to children aged 15 to 17 years.
- 1 child (10%) was Hispanic.
- 4 children (40%) were non-Hispanic black.
- 5 children (50%) were non-Hispanic white.
- 5 children (80%) were male.

Circumstances

- 5 cases involved asphyxia.
- 5 cases involved the use of a weapon.
- In 6 cases, the suicide was unexpected. Of those, the child had threatened, attempted, or premeditated a suicide attempt in 3 cases.
- A note was left in 7 cases.
- An argument with a parent was noted in 3 cases, family discord in 1 case, divorce in 1 case, an argument with a boyfriend/girlfriend in 1 case, and a breakup with a boyfriend/girlfriend in 1 case.
- The child had a history of self-mutilation in 2 cases.
- Social media was reported as a factor in the suicide in 2 cases, and computer or video gaming was a factor in 1 case.
- There was a family history of suicide in 1 case.
- One case involved a victim of bullying.
- The child had problems with the law in 1 case.
- The child had a history of drug or alcohol abuse in 1 case.

In 6 cases, the suicide was unexpected. Of those, the child had threatened, attempted, or premeditated a suicide attempt in 3 cases.

Homicides

There were 21 deaths due to homicide, representing 67.7% of violence-related deaths and 5% of the total deaths. (Table 10)

Demographics

- 3 deaths (14.3%) occurred among children less than 1 year of age.
- 3 deaths (14.3%) occurred among children aged 1 to 4 years.
- 4 deaths (19.1%) occurred among children aged 10 to 14 years.
- 11 deaths (52.4%) occurred among teens aged 15 to 17 years.
- 1 child (4.8%) was Asian
- 17 children (81%) were non-Hispanic black.
- 3 children (14.3%) were non-Hispanic white.
- 19 children (90.5%) were male.

Victim Factors in Homicide Deaths

- Criminal History: 10 (47.6%)
- Juvenile detention history: 6 (28.6%)
- Positive drug screen at autopsy: 11 (55%) of 20 cases with toxicology screens
- Open DCS case: 5 (23.8%)
- Problems in school: 12 (57.1%)
- Received mental health services: 6 (28.6%)
- History of drug abuse: 2 (9.5%)
- Victim of child maltreatment: 3 (14.3%)
- Had disability or chronic illness: 2 (9.5%)

Type of Weapon Involved in Homicide Death

- Firearm: 14 (66.7%)
- Physical trauma (such as beating, kicking): 4 (19%)
- Sharp or Blunt Instrument: 1 (4.8%)

Circumstances Related to Homicide Deaths Involving the Use of Weapons (n=19):

- 14 incidents (73.7%) were related to the commission of a crime.
- 7 incidents (36.8%) involved gang activity.
- 5 incidents (26.3%) involved an argument.
- 1 incident (5.3%) involved jealousy.

Other homicide deaths that were not weapon-related:

There were two homicide deaths that were not weapon-related: a poisoning and a suffocation. Both homicides were committed by the mother of the child. In one case, the mother had documented mental health issues, and in two cases there was maternal drug and alcohol abuse. DCS had prior involvement with the family in one case.

In 47.6% of homicide deaths, the child had a criminal history, and in 57.1%, the child had documented problems in school.

Acts of Omission or Commission

A total of 137 deaths (32.9%) reviewed by the CDRT involved an act of omission (i.e. neglect) or commission (i.e. abuse or assault), with an additional 17 deaths (4.1%) where an act of omission or commission was probable. Together, the 154 deaths represented 37% of all reviewed deaths. For the purposes of this analysis, probable omission or commission is included in the total number of cases with evidence of omission or commission. In 59 cases (38.3%), the acts of omission or commission caused the death of the child. In 80 cases (52%), the act contributed to the death of the child, with 15 additional cases showing evidence of multiple acts that both caused and contributed to the death.

Demographics

- 84 deaths (54.6%) occurred among infants.
- 17 deaths (11.1%) occurred among children aged 1 to 4 years.
- 10 deaths (6.5%) occurred among children aged 5 to 9 years.
- 16 deaths (10.4%) occurred among children aged 10 to 14.
- 27 deaths (17.5%) occurred among teens aged 15 to 17 years.
- 2 deaths (1.3%) occurred among Asian children.
- 14 deaths (9.1%) occurred among Hispanic children.
- 96 deaths (62.3%) occurred among non-Hispanic black children.
- 42 deaths (27.3%) occurred among non-Hispanic white children.
- 97 deaths (63%) occurred among males.

Circumstances (Table 6)

- In 96 cases (62.3%), the perpetrator of the act was a biological parent of the child.
- In 66 cases (42.9%), the perpetrator was impaired (such as using substances, asleep, absent, ill).
- 31 victims (20.1%) were involved with DCS at the time of the death.
- 19 cases (12.3%) involved poor or absent supervision.
- In 50 cases (32.5%), the act of omission or commission was either chronic with the child or a pattern in the family or with the perpetrator.
- 26 cases (16.9%) involved child neglect.
- 6 cases (3.9%) involved child abuse.

A total of 137 deaths (32.9%) reviewed by the CDRT involved an act of omission (i.e. neglect) or commission (i.e. abuse or assault). Over half of these deaths, 54.6%, occurred among infants.

References

1. U.S. Census Bureau; State and County QuickFacts, Davidson County, Tennessee; generated by Brook McKelvey; using Quick Facts; http://quickfacts.census.gov/qfd/index.html; (23 May 2016).
2. U.S. Census Bureau; American Community Survey, 2009-2013 American Community Survey 5-year Estimates, Selected Economic Characteristics, Table DP03; generated by Brook McKelvey; using American FactFinder; http://factfinder.census.gov; (23 May 2016).
3. U.S. Census Bureau; American Community Survey, 2009-2013 American Community Survey 5-year Estimates, Selected Social Characteristics in the United States, Table DP02; generated by Brook McKelvey; using American FactFinder; http://factfinder.census.gov; (23 May 2016).
4. U.S. Census Bureau; American Community Survey, 2009-2013 American Community Survey 5-year Estimates, Selected Economic Characteristics by Zip Code Tabulation Area, DP03; generated by Brook McKelvey; using American FactFinder; http://factfinder.census.gov; (23 May 2016).
5. MacNorman, M.F. and Matthews, M.S. (2008). Recent Trends in Infant Mortality in the United States. Centers for Disease Control and Prevention National Center for Health Statistics Data Brief, no 9.
6. MacDorman, M.F., Hoyert, D.L., Matthews, T.J. (2013). Recent Declines in Infant Mortality in the United States, 2005-2011. National Center for Health Statistics Data Brief, no. 120.
7. Centers for Disease Control and Prevention. CDC Grand Rounds: Public Health Approaches to Reducing U.S. Infant Mortality. MMWR, 2013;62(31):625-628. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6231a3.htm.
8. National Center for Child Death Review: Natural Deaths Over One Year of Age. Retrieved April 7, 2016 from https://www.childdeathreview.org/reporting/natural-deaths-over-one-year-of-age/.
9. Centers for Disease Control and Prevention: Premature Births. Retrieved April 7, 2016 from http://www.cdc.gov/reproductivehealth/maternalinfanthealth/pretermbirth.htm.
10. Centers for Disease Control and Prevention: Facts about Birth Defects. Retrieved April 7, 2016 from http://www.cdc.gov/ncbddd/birthdefects/facts.html.
11. Schmitzer, P.G., Covington, T. M. & Dykstra, H.K. (2012). Sudden Unexpected Infant Deaths: Sleep Environment and Circumstances. American Journal of Public Health, e1-e9.
12. Task Force on Sudden Infant Death Syndrome. SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment. (2011) Pediatrics;128;e1341.
13. Centers for Disease Control and Prevention. Vital Signs: Unintentional Injury Deaths Among Persons Aged 0-19 Years - United States, 2000-2009. MMWR (2012);61(15):270-276.
14. Centers for Disease Control and Prevention. Surveillance for Violent Deaths – National Violent Death Reporting System, 16 States, 2010. MMWR (2014);63(SS01);1-33.
15. Centers for Disease Control and Prevention. Suicide Prevention. Retrieved April 7, 2016 from http://www.cdc.gov/violenceprevention/suicide/youth_suicide.html.
16. Centers for Disease Control and Prevention. Child Maltreatment: Facts at a Glance, 2014. Retrieved April 19, 2016 from http://www.cdc.gov/violenceprevention/pdf/childmaltreatment-facts-at-a-glance.pdf.
17. Centers for Disease Control and Prevention. Understanding Child Maltreatment: Fact Sheet, 2014. Retrieved April 19, 2016 from http://www.cdc.gov/violenceprevention/pdf/understanding-cm-factsheet.pdf.

Child Death Review Team Members

William Paul, MD, MPH
Director of Health
Metro Public Health Department of Nashville/Davidson County, TN (MPHD)
Child Death Review Team, Chair

Adele Lewis, MD
Deputy Chief Medical Examiner
Metropolitan Nashville/Davidson County, TN
Child Death Review Team, Chair

D'Yuanna Allen-Robb, MPH
Director, Child and Health Division, MPHD

Vickie Blair Fleming, LMSW
Metro Public Schools of Nashville/Davidson County, TN

Det. Sarah Bruner
Metro Police Department of Nashville/Davidson County, TN

Alison Butler, RN, BSN, CDE, ICCE
Fetal and Infant Mortality Review (FIMR), MPHD

Susan Campbell, MD
Pediatrix Medical Group of Tennessee

Amy Campbell-Pittz
TN Department of Children's Services, Legal

Erin Carney, MD
Assistant Medical Examiner
Metropolitan Nashville/Davidson County, TN

Det. Ron Carter
Metro Police Department of Nashville/Davidson County, TN

Valerie Cook
TN Department of Children's Services

Trevor Crowder
Prevent Child Abuse Tennessee

Emily J. H. Dennison, MD
Assistant Medical Examiner
Metropolitan Nashville/Davidson County, TN

Ashley Griffin
Prevent Child Abuse Tennessee

Leslie Howell
Emergency Medical Technician (EMT), Nashville Fire Department

Carol Jones, BSHA
Bureau of Population Health, MPHD
Child Death Review Team, Administrative Support

Atty. Robert Jones
Assistant District Attorney of Nashville/Davidson County, TN

Det. Selene Julia
Metro Police Department of Nashville/Davidson County, TN

Charlsi Legendre
Child Protective Investigative Team (CPIT)

Deborah Lowen, MD
Monroe Carrell Jr. Children's Hospital at Vanderbilt

Brook McKelvey, MPH, MA
Epidemiology Program, MPHD
Child Death Review Team, Team Leader

Michael Meadors, MD
St. Thomas Midtown Hospital

Katy Miller, JD
Assistant District Attorney of Nashville/Davidson County, TN

Abraham Mukolo, PhD
Epidemiology Program, MPHD

Janet Nielsen, MA
Juvenile Court of Nashville/Davidson County, TN

Renee Pratt, MPA
Metro Social Services of Nashville/Davidson County, TN

Sue Ross, RNC, PNP
Our Kids of Nashville/Davidson County, TN

Danielle Russell, RN, BSN
Fetal and Infant Mortality Review (FIMR), MPHD

Tom Sharp
Office of the Director of Health, MPHD

Brad Strohler, MD
The Children's Hospital at TriStar Centennial

John Vick, PhD
Epidemiology Program, MPHD

Jennifer Weatherly, RN, BSN
Help Us Grow Successfully Program (HUGS), MPHD

Lacey Wilkins, RN
Nurses for Newborns of TN

Appendix

Table 1: Number and Percentage of Deaths by Manner of Death and Age, Race/Ethnicity, and Sex, Davidson County, Tennessee, 2014

	Total		Age					Sex		Race/Ethnicity			
Manner of Death	N	%	< 1 year	1-4 years	5-9 years	10-14 years	15-17 years	Male	Female	non-Hispanic white	non-Hispanic black	Asian	Hispanic
Natural	56	70.9	41	5	4	5	1	26	30	18	24	4	10
Unintentional Injury	11	13.9	4	2	0	3	2	8	3	3	7	0	1
Suicide	2	2.5	0	0	0	1	1	1	1	2	0	0	0
Homicide	2	2.5	0	0	0	0	2	2	0	0	2	0	0
Undetermined	8	10.1	8	0	0	0	0	6	2	3	3	0	2
Total	79		53	7	4	9	6	43	36	26	36	4	13
Percentage*		100	67.1	8.9	5.1	11.4	7.6	54.4	45.6	32.9	45.6	5.1	16.5

*Percentage of total deaths.

Table 2: Number and Percentage of Deaths by Manner of Death and Age, Race/Ethnicity, and Sex, Davidson County, Tennessee, 2010–2014

	Total		Age					Sex		Race/Ethnicity			
Manner of Death	N	%	< 1 year	1-4 years	5-9 years	10-14 years	15-17 years	Male	Female	non-Hispanic white	non-Hispanic black	Asian	Hispanic
Natural	266	63.9	205	20	17	18	6	146	120	104	121	9	32
Unintentional Injury	63	15.1	23	11	9	5	15	36	27	20	31	1	11
Suicide	10	2.4	0	0	0	3	7	5	5	5	4	0	1
Homicide	21	5.1	3	3	0	4	11	19	2	3	17	1	0
Undetermined	56	13.5	53	2	1	0	0	37	19	15	36	0	5
Total	416		284	36	27	30	39	243	173	147	209	11	49
Percentage*		100	68.3	8.7	6.5	7.2	9.4	58.4	41.6	35.3	50.2	2.6	11.8

*Percentage of total deaths.

Table 3: Deaths by Manner and Preventability, Davidson County, 2014 and 2010–2014					
	Could the Death Have Been Prevented?				
2014					
Manner	No	Yes	Could not determine	Unknown	Total
Natural	48	4	4	0	56
Unintentional Injury	0	11	0	0	11
Suicide	0	2	0	0	2
Homicide	0	2	0	0	2
Undetermined	0	3	5	0	8
Unknown	0	0	0	0	0
Total	48	22	9	0	79
2010-2014					
Natural	246	11	9	0	266
Unintentional Injury	2	59	2	0	63
Suicide	0	10	0	0	10
Homicide	0	21	0	0	21
Undetermined	3	38	15	0	56
Unknown	0	0	0	0	0
Total	251	139	26	0	416

Table 4: Characteristics of Infant Deaths by Manner of Death Listed on Death Certificate, Davidson County, 2014 and 2010–2014						
	Manner of Death on Death Certificate*					
	Natural	Unintentional Injury	Homicide	Undetermined	Unknown	Total
2014						
Total Deaths Reviewed	41	4	0	8	0	53
Premature (<37 weeks)	27	2	0	1	0	30
Low Birth Weight (<2500 grams)	24	1	0	2	0	27
Late (> 6 months) or No Prenatal Care	3	0	0	1	0	4
Intrauterine Drug Exposure	2	1	0	3	0	6
Intrauterine Smoke Exposure	6	1	0	3	0	10
2010-2014						
Total Deaths Reviewed	205	23	3	53	0	284
Premature (<37 weeks)	158	7	1	12	0	178
Low Birth Weight (<2500 grams)	164	4	1	13	0	182
Late (> 6 months) or No Prenatal Care	14	2	2	4	0	22
Intrauterine Drug Exposure	8	4	1	7	0	20
Intrauterine Smoke Exposure	27	8	0	24	0	59
*Categories are not mutually exclusive. Infants should not have a suicide manner of death, so this manner is not included in this table.						

Table 5: Factors Involved in Sleep-Related Deaths By Age Group, Davidson County, 2014 and 2010–2014							
	Age Group						
2014	0-1 mos	2-3 mos	4-5 mos	6-7 mos	8-11 mos	1-4 years	Total
Total Deaths Reviewed	3	1	3	1	4	0	12
Not in a crib or bassinette	3	1	3	1	4	0	12
Not sleeping on back	1	1	2	1	2	0	7
Placed on unsafe bedding or with toys	0	0	0	0	0	0	0
Sleeping with other people	3	0	1	0	3	0	7
Obese adult sleeping with child	1	0	0	0	0	0	1
Adult was alcohol or drug impaired	1	0	0	0	3	0	4
2010-2014							
Total Deaths Reviewed	26	23	13	7	4	4	77
Not in a crib or bassinette	24	19	12	7	4	2	68
Not sleeping on back	11	14	9	3	2	3	42
Placed on unsafe bedding or with toys	5	6	4	0	0	1	16
Sleeping with other people	21	13	8	5	3	2	52
Obese adult sleeping with child	2	0	1	0	0	0	3
Adult was alcohol or drug impaired	7	5	2	0	3	0	17
*Categories are not mutually exclusive.							

Table 6: Acts of Omission and Commission By Age Group, Davidson County, 2014 and 2010–2014

2014	Total Deaths Reviewed	Poor/Absent Supervision	Child Abuse	Child Neglect	Other Negligence	Assault (not child abuse)	Suicide	Other
<1 year	14	0	1	8	10	0	0	0
1-4 years	3	1	0	1	1	0	0	0
5-9 years	1	0	0	1	0	0	0	0
10-14 years	6	2	0	4	1	0	1	0
15-17 Years	4	0	0	0	1	1	1	1
Total	28	3	1	14	13	1	2	1
2010-2014								
<1 year	84	5	3	17	48	3	0	15
1-4 years	17	6	3	2	5	0	0	0
5-9 years	10	3	0	2	3	0	1	1
10-14 years	16	3	0	5	2	4	3	1
15-17 Years	27	2	0	0	4	8	7	5
Total**	154	19	6	26	62	15	11	22

*Categories are not mutually exclusive. Includes all cases where action of omission/commision caused or contributed to the death was reported by the team as Yes or Probable. Five cases had an unknown type of omission/commision.

Table 7: Number and Percentage of Deaths Due to Unintentional Injury by Age, Sex, and Race/Ethnicity, Davidson County, Tennessee, 2014

	Total		Age					Sex		Race/Ethnicity		
Cause of Death	N	%	< 1 year	1-4 years	5-9 years	10-14 years	15-17 years	Male	Female	non-Hispanic white	non-Hispanic black	Hispanic
Vehicular	3	27.3	0	1	0	1	1	2	1	2	0	1
Fire/Burn	0	0	0	0	0	0	0	0	0	0	0	0
Drowning	4	36.4	0	1	0	2	1	4	0	1	3	0
Suffocation	4	36.4	4	0	0	0	0	2	2	0	4	0
Weapon	0	0	0	0	0	0	0	0	0	0	0	0
Poisoning	0	0	0	0	0	0	0	0	0	0	0	0
Total	11		0	2	0	3	2	8	3	3	7	1
Percentage*		100	36.4	18.2	0	27.3	18.2	72.7	27.3	27.3	63.6	9.1

*Percentage of total deaths due to unintentional injury.

Table 8: Number and Percentage of Deaths Due to Unintentional Injury by Age, Sex, and Race/Ethnicity, Davidson County, Tennessee, 2010–2014

	Total		Age					Sex		Race/Ethnicity			
Cause of Death	N	%	< 1 year	1-4 years	5-9 years	10-14 years	15-17 years	Male	Female	non-Hispanic white	non-Hispanic black	Asian	Hispanic
Vehicular	21	33.3	1	5	4	1	10	12	9	7	6	1	7
Fire/Burns	5	7.9	0	0	4	0	1	2	3	0	4	0	1
Drowning	11	17.5	1	4	1	4	1	7	4	4	6	0	1
Suffocation	19	30.2	18	1	0	0	0	9	10	5	13	0	1
Weapon	1	1.6	1	0	0	0	0	1	0	1	0	0	0
Fall/Crush	1	1.6	0	1	0	0	0	1	0	0	1	0	0
Poisonings	3	4.8	0	0	0	0	3	3	0	2	0	0	1
Exposure	1	1.6	1	0	0	0	0	1	0	1	0	0	0
Other*	1	1.6	1	0	0	0	0	0	1	0	1	0	0
Total	63		23	11	9	5	15	36	27	20	31	1	11
Percentage**		100	36.5	17.5	14.3	7.9	23.8	57.1	42.9	31.8	49.2	1.6	17.5

*This was a death due to prematurity subsequent to maternal cocaine use and was ruled accidental.

**Percentage of total deaths due to unintentional injuries.

Table 9: Number and Percentage of Deaths Due to Violence by Age, Sex, and Race/Ethnicity, Davidson County, Tennessee, 2014

		Total		Age					Sex		Race/Ethnicity		
Manner of Death	Cause of Death	N	%	< 1 year	1-4 years	5-9 years	10-14 years	15-17 years	Male	Female	non-Hispanic white	non-Hispanic black	Hispanic
Homicide	Weapon**	2	50	0	0	0	0	2	2	0	0	2	0
	Poisoning	0	0	0	0	0	0	0	0	0	0	0	0
Suicide	Suffocation	1	25	0	0	0	1	0	1	0	1	0	0
	Weapon	1	25	0	0	0	0	1	0	1	1	0	0
	Total	4		0	0	0	1	3	3	1	2	2	0
	Percentage*		100	0	0	0	25	75	75	25	50	50	0

*Percentage of total deaths due to violence for all ages.

**Weapon includes firearm, knives and other instruments, as well as punching, kicking, etc..

Table 10: Number and Percentage of Deaths Due to Violence by Age, Sex, and Race/Ethnicity, Davidson County, Tennessee, 2010–2014

		Total		Age					Sex		Race/Ethnicity			
Manner of Death	Cause of Death	N	%	< 1 year	1-4 years	5-9 years	10-14 years	15-17 years	Male	Female	non-Hispanic white	non-Hispanic black	Asian	Hispanic
Homicide	Suffocation	1	3.2	1	0	0	0	0	1	0	1	0	0	0
	Weapon**	19	61.3	2	2	0	4	11	17	2	1	17	1	0
	Poisoning	1	3.2	0	1	0	0	0	1	0	1	0	0	0
Suicide	Suffocation	5	16.1	0	0	0	2	3	2	3	2	2	0	1
	Weapon**	5	16.1	0	0	0	1	4	3	2	3	2	0	0
	Total	31		3	3	0	7	18	24	7	8	21	1	1
	Percentage*		100	9.7	9.7	0	22.6	58.1	77.4	22.6	25.8	67.7	3.2	3.2

*Percentage of total deaths due to violence.

**Weapon includes firearm, knives and other instruments, as well as a person's body part.