# Child Drowning Deaths in Virginia, 2014-2016

A report from the

Virginia State Child Fatality Review Team


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Virginia State Child Fatality Review Team

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## MISSION STATEMENT

As an interdisciplinary team, we review and analyze sudden, violent, or unnatural deaths of children so that strategies can be recommended to reduce the number of preventable child deaths in Virginia.

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## Executive Summary

Drowning is a leading cause of unintentional injury and death around the world and in Virginia. Between 2014 and 2016, 52 children in Virginia died as a result of drowning, making it the second leading cause of unintentional injury death among children ages 0-17.[1,2] In this same time period, there were 526 emergency department visits among children aged 0-17 years for a submersion or drowning-related injury.[3] While children are able to fully recover with no long-term neurological impacts following a drowning event, in cases of extended submersion (greater than six minutes), lack of cardiopulmonary resuscitation (CPR), or protracted resuscitation efforts, children can experience severe long-term neurological deficits. These deficits can effect memory, executive function, attention, and language, and most severely, result in a permanent vegetative state.[4,5]

Recognizing the significance of drowning to the health and safety of all of Virginia's children, Virginia's State Child Fatality Review Team (hereafter called the Team) conducted a comprehensive review of these 52 drowning deaths to address and develop recommendations for intervention and prevention of similar deaths. This report presents findings and recommendations from this review.

Key findings identified by the Team include the following:

- Age, gender, and race were key determinants in childhood drowning death. The highest frequency and rate of drowning occurred in male children between the ages of 15 and 17, followed by male children under the age of 5. Among female children, the highest frequency and rate of drowning occurred among those under the age of 5. Although White children died at a frequency of three and nine times higher than that of Black and Asian children, respectively, the fatality rate of drowning was similar among all racial categories.
- Half of all drowning deaths occurred in a pool setting, most often connected to the child's home. Other settings included open water and water within or around the home.
- Drowning deaths occurred most frequently during the summer months (May-August), with nearly half occurring between 4:00pm-9:00pm. Within Virginia, drowning deaths most frequently occurred within the coastal Eastern region. However, despite the coastal location, the majority of this region's drowning deaths occurred in a pool setting.
- Considering the circumstances of these deaths, in approximately a third of all drownings, the child left home without the caregiver's knowledge. Other circumstances included: the child got into the water without the caregiver's permission; the child was left alone by caregiver while in water; the child with a group of people with no appointed caregiver; caregiver was supervising the child but not within arm's reach; the child accidentally fell into water; or other circumstance.

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[1] Virginia Department of Health, Office of the Chief Medical Examiner. *Virginia Medical Examiner Data System*. Richmond, 2019.

[2] Center for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System. *10 Leading Causes of Unintentional Injury Deaths, United States, 2007-2016, All Races, Both Sexes.* Atlanta, 2019. Available at https://webappa.cdc.gov/cgi-bin/broker.exe.

[3] Virginia Department of Health, Office of Epidemiology. *Syndromic Surveillance data reported to the Virginia Department of Health, Office of Epidemiology*. Richmond, 2019.

[4] American Academy of Pediatrics. *Prevention of Drowning*. Pediatrics, 2019. Available at https://pediatrics.aappublications.org/content/143/5/e20190850.

[5] Edwards, T.P. *Childhood Drowning: Morbidity and mortality from a Johannesburg Paediatric ICU, 2003 to 2013*. Johannesburg, 2015. Available at: https://pdfs.semanticscholar.org/cf59/e10549409ec4325f65aacc661aadd2a9b0cb.pdf

- The Team noted a lack of adequate supervision was a key precipitating event in the majority of cases. In approximately 80 percent of cases, the caregiver responsible for supervising the child at the time of the fatal incident was impaired in some way, including the caregiver being absent, distracted, asleep, or impaired by alcohol, drugs, disability, or illness. Overall, the Team concluded at in 78.8% of cases the child was not appropriately supervised at the time of death, while 9.6% of children were appropriately supervised, and in 11.5% of cases, the Team was unable to determine if appropriately supervision was present due to a lack of evidence.

The Team concluded that nearly all of these children's deaths were preventable and offered recommendations for change in the following areas: parent and caretaker response, primary prevention, legislation, education, and child death investigation.

# Section I: Introduction

## Introduction

Although the rate of drowning death among US children and adolescents has declined by nearly 60 percent in the past three decades (2.68 per 100,000 in 1985 to 1.11 per 100,000 in 2017), drowning-related injuries and deaths remain a persistent and significant public health challenge. In the United States, drowning is a leading cause of unintentional injury death for children. Between 2007 and 2016, 8,359 children ages 0-17 died due to unintentional drowning in the United States, translating into two drowning-related deaths each day.[6] In this same period, in Virginia, a total of 175 children ages 0-17 died due to a drowning related event, making it the second leading cause of unintentional injury death among children ages 0-17.[7,8]

In addition to being a leading cause of unintentional injury death for children, drowning also remains a significant source of morbidity in children. In Virginia, between 2014-2016, there were 526 emergency department visits among children aged 0-17 years for a submersion or drowning-related injury.[9] Further, in this same time period, 48 children were hospitalized for drowning-related injuries.[10,11] Nonfatal drowning-related injuries can include neurological impacts such as learning disabilities, memory problems, and permanent vegetative state, as well as cardiovasular, pulmonary, and cervical spine impacts. Although there is variation in the long-term impacts of drowning-related injuries, studies have shown that irreverisble brain damage can occur within five minutes, with increased submersion duration associated with worse outcomes.[12] While immediate initiation of CPR at the location of the drowning event and shorter Emergency Medical Services (EMS) response times can reduce the severity of illness and improve the prognosis, drowning prevention remains an essential and life-saving strategy to reduce the burden of drowning morbidity and mortality.[13]

To address this public health challenge and improve prevention efforts, the Virginia State Child Fatality Review Team (hereafter called the Team) conducted a review of 52 drowning-related deaths of children ages 0-17 in Virginia that occurred in 2014-2016. Through multidisciplinary review, the Team sought to better understand the circumstances surrounding these deaths, to distinguish the characteristics of the children and their caregivers, and most importantly, make recommendations for the prevention of drowning injuries and deaths in the future. This report presents findings, conclusions,

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[6] CDC, *10 Leadings Causes*

[7] VDH-OCME, *VMEDS*.

[8] CDC, *10 Leadings Causes*.

[9] VDH-Office of Epidemiology, *Syndromic Surveillance Data*.

[10] Virginia Department of Health, Office of Information Management. *Virginia Inpatient Hospitalization Database*. Richmond, 2019.

[11] Please note: Hospitalization data are derived from the Virginia inpatient hospitalization database maintained by the Virginia Department of Health's Office of Information Management. Hospitalization cases represent Virginia resident injury hospitalizations occurring within Virginia. All data has been analyzed and aggregated by VDH epidemiology staff from the Office of Family Health Services, Division of Population Health Data. A transition in the type of coding used in medical billing occurred on October 1, 2015. The new coding standard, ICD-10-CM has many more codes and classifications of injuries than the previous coding standard, ICD-9-CM. Thus, data that crosses 2014-2016 may result in differences in numbers. The data presented include drownings that were unintentional only among the 0-17-year-old age group. Data reported and analyzed on August 2, 2019.

[12] MacKay JM, Steel A, Dykstra H. *Dangerous Waters: Profiles of Fatal Child Drowning in the U.S. 2005-2014*. Washington, 2016.

[13] Quan L, Wentz KR, Gore EJ, Copass MK. *Outcome and predictors of outcome in pediatric submersion victims receiving prehospital care in King County, Washington.* Pediatrics. 1990;86(4): 568-593.

and recommendations from the Team, which offer a public health perspective on the impact of drowning among Virginia's children and youth.

## Data Sources and Considerations

### OCME Jurisdiction

Pursuant to § 32.1-283 of the Code of Virginia, the following deaths fall under the jurisdiction of the OCME:

- Any death from trauma, injury, violence, poisoning, accident, suicide, or homicide;
- Any sudden death when person was in apparent good health or unattended by a physician;
- Any death to persons in jail, prison, other correctional institution or in police custody or receiving services in a state hospital or training center operated by the Department of Behavioral Health and Developmental Services;
- Any sudden death as an apparent result of fire;
- Any sudden death of an infant; and
- Any other suspicious, unusual or unnatural death.

During its investigation, the OCME determines not only an individual's cause of death but also the manner in which he or she died. Manner of death consists of one of the following: accident, homicide, natural, suicide, or undetermined. Suicide is not applicable to infants, so this report makes no mention of suicide deaths. Deaths are deemed undetermined when two or more manners are plausible and a forensic pathologist cannot designate with certainty one particular manner over another.

### Data Sources

The Team used a standardized protocol to request the law enforcement, medical examiner, educational, court service unit, social service, mental health, and medical records of the children in the review and gathered information to help characterize the children and adolescents who died. The child fatality team statute, §32.1-283.1, authorizes the Chief Medical Examiner to obtain records from these sources and it provides for strict confidentiality of the records reviewed by the Team. Thus, a rich collection of investigatory, medical, social, educational, and other records are available for review. The Team discusses each case in detail to determine if there may have been opportunities to prevent the death. This multidisciplinary discussion is the core of the fatality review: it yields insights, interventions, and strategies that formed the basis for the recommendations that were developed to decrease the occurrence of fatal drownings in children in Virginia.

### Case Selection and Definitions of Terms

In Virginia, this statewide child fatality review is retrospective and includes only Virginia residents less than 18 years old who met the criteria for inclusion as a case:

1. The incident occurred within the three-year period between 2014 and 2016;
2. The fatal injury occurred as a result of drowning; and

[14] Centers for Disease Control and Prevention, National Center for Health Statistics. *Underlying Cause of Death 1999-2017 on CDC WONDER Online Database, released December, 2018. Data are from the Multiple Cause of Death Files, 1999-2017, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program*. Atlanta, 2019. Available at http://wonder.cdc.gov/ucd-icd10.html.

3. Virginia's Office of the Chief Medical Examiner (OCME) took jurisdiction over the case.

While there is considerable variation in the definition of drowning, in this report, in accordance with the Utstein style, drowning is defined as "the process of experiencing respiratory impairment from submersion/immersion in liquid". Further, the outcomes of drowning are classified into "death," "no morbidity," or "morbidity" which is further defined as "moderately disabled," "severely disabled," "vegetative state/coma," and "brain death". Please note, the American Academy of Pediatrics recommends that terms such as active, dry, near, passive, secondary, silent, or wet drowning should not be used.[15]

In this report, a caregiver refers to the person who was responsible for the care, supervision and well-being of the child at the time of fatal injury. This person may be a parent, sibling, a child care provider, a babysitter, and or some other person responsible for the supervision of the child at the time of the fatal incident.

Drowning deaths were examined by setting (water within and around the child's home, including bathtubs; swimming pools; and open water), age, race, and ethnicity. Race was coded into three categories: White, Black, and Asian, including Other Pacific Islander. While included in population data for the purposes of data analysis, there were no decedents identified as American Indian, Alaskan Native, or more than one race in this review. This report differentiates ethnicity and race, as Hispanic persons can identify as a member of any race and are a separate ethnic group. In this report, age was divided into three 5-year age groups (0-4; 5-9; 10-14), and one three-year age group (15-17) for overall and setting-specific drowning deaths among each racial group and Hispanic ethnicity.

Where appropriate, tables include numbers, percentages, and rates. Rates measure the frequency of an event in a defined population over a specified period. Rates account for population size allowing for comparison among different sized populations, in different locations, and at different times. This method of reporting illustrates the risk present in a given population. Rates are calculated for every 100,000 persons aged 0-17 years in the population, and are specific to age, race, and/or sex unless otherwise specified. Rates based on 20 or fewer cases are considered statistically unreliable and should be interpreted with caution.

[15] American Academy of Pediatrics, *Prevention of Drowning.*

## Section II: Overview of Drowning Death in Virginia's Children, 2014-2016

The Team examined the records of 52 children ages 0-17 years who died as a result of drowning. Overall, drowning deaths occurred at a rate of 0.93 deaths per 100,000 persons aged 0-17 years. In this report, the Office of the Chief Medical Examiner (OCME) determined the manner of death was accidental in 50 (96.2%) drowning deaths, and undetermined in two (3.8%) drowning deaths.

Rates of drowning death vary with age, sex, and race. As seen in Table 1, males were more likely than females to die of drowning (1.08 deaths per 100,000 vs. 0.76 per 100,000), and age was found to be a key determinant in each setting, with children aged 0-4 and 15-17 years having a higher fatality rate than other age groups. White children accounted for a higher number of deaths (36 deaths; 69.2%), but the fatality rate was similar among all racial categories. The fatality rates of those who were identified as being of Hispanic origin was 1.39 per 100,000. The Eastern Health Planning Region had the largest proportion of drowning deaths, with an incidence rate that was over three times higher than the Northern district. Across Virginia, 50% of drowning deaths occurred in a pool setting, followed by open water settings and bodies of water within or around the child's home.

**Table 1: Characteristics of Child Drowning Deaths - Virginia, 2014-2016**

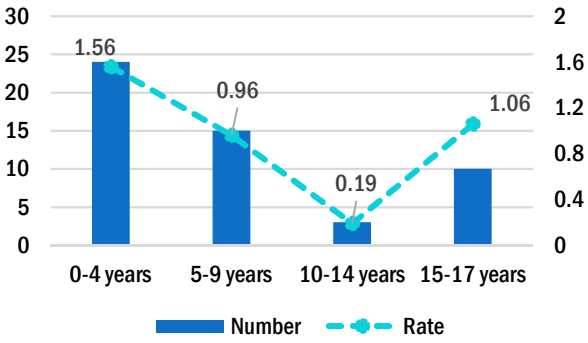
| | Number | Percentage | Rate |
|---|---|---|---|
| **Year** | | | |
| 2014 | 15 | 28.8 | 0.80 |
| 2015 | 25 | 48.1 | 1.34 |
| 2016 | 12 | 23.1 | 0.64 |
| **Age** | | | |
| 0-4 years | 24 | 46.2 | 1.56 |
| 5-9 years | 15 | 28.8 | 0.96 |
| 10-14 years | 3 | 5.8 | 0.19 |
| 15-17 years | 10 | 19.2 | 1.06 |
| **Sex** | | | |
| Male | 31 | 59.6 | 1.08 |
| Female | 21 | 40.4 | 0.76 |
| **Race** | | | |
| White | 36 | 69.2 | 0.94 |
| Black | 12 | 23.1 | 0.91 |
| Asian | 4 | 7.7 | 0.93 |
| **Ethnicity** | | | |
| Hispanic | 10 | 19.2 | 1.39 |
| **Health Planning Region of Injury** | | | |
| HPR I: Northwest | 8 | 15.4 | 0.92 |
| HPR II: Northern | 8 | 15.4 | 0.45 |
| HPR III: Southwest | 6 | 11.5 | 0.75 |
| HPR IV: Central | 10 | 19.2 | 1.00 |
| HPR V: Eastern | 20 | 38.5 | 1.63 |
| **Setting** | | | |
| Within and Around the Home | 8 | 15.4 | -- |
| Pool | 26 | 50.0 | -- |
| Open Water | 18 | 34.6 | -- |
| **Total** | **52** | **100.00** | **0.93** |

## Demographics

### Age

The mean age of children who died as a result of drowning between 2014 and 2016 was 6.81. Younger children died a higher frequency and rate than older children. Of the deaths reviewed by the Team, 46.2% occurred to those between the ages of 0 and 4, with a rate of 1.59 deaths per 100,000. Additionally, while children ages 5 to 9 experienced a higher number of deaths (15), children ages 15 to 17 had the second highest rate, with a rate of 1.06 deaths per 100,000. The fewest number of deaths were seen in children ages 10 to 14, with a rate of 0.19 deaths per 100,000.

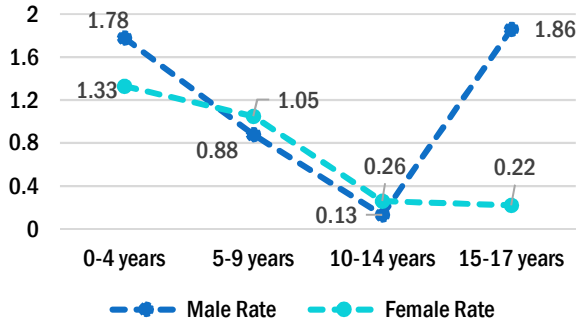
Figure 1: Number and rate of drowning death among children by age - Virginia, 2014-2016




### Sex

Males accounted for nearly 60% of the drowning deaths in children ages 0-17 years from 2014-2016. The drowning death rate for males was 1.08 per 100,000 and 0.76 per 100,000 for females. While from ages 0-4 years, males and females both had high death rates, rates for females decreased with age, while for males, the rate decreased until 15, when the rate increased significantly. Moreover, among ages 15-17, male children died at a rate over eight times that of female children (1.86 per 100,000 vs. 0.22 per 100,000), and the highest rate overall of any age and gender category.

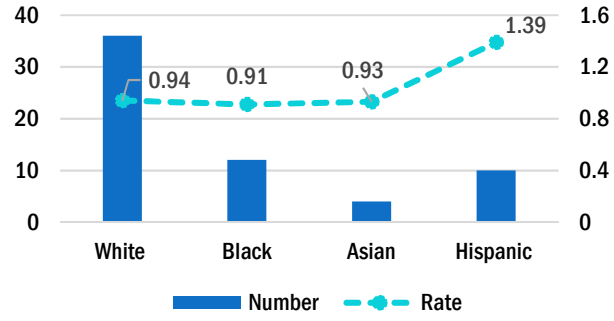
Figure 2: Rate of drowning death among children by gender - Virginia, 2014-2016




### Race and Ethnicity

Drowning impacts children regardless of race and ethnicity. In this review, 69.2% of all deaths were of White children, followed by 23.1% of Black children, and 7.7% of Asian children. The fatality rate among all racial categories was similar. Children of Hispanic ethnicity accounted for 19.2% of all children who died, with a rate of 1.39 deaths per 100,000. Related to ethnicity, 11 (21.2%) children were noted to be non-native English speakers, with English being their second language.

Figure 3: Number and rate of drowning death among children by race and Hispanic ethnicity - Virginia, 2014-2016



## Additional Demographic Characteristics

### *Special Health Needs*

The Team observed that some of the children had mild to severe medical issues at the time of death, including complex medical conditions and mental or behavioral disorders, which can create increased risk of drowning. Specifically, three (5.8%) of the children were diagnosed with a seizure disorder, five (9.6%) were diagnosed with Autism spectrum disorder, and five (9.6%) of the children were diagnosed with a mental or behavioral disorder. Four (7.7%) children in this review were being prescribed and taking medications to manage either a medical or a behavioral disorder.

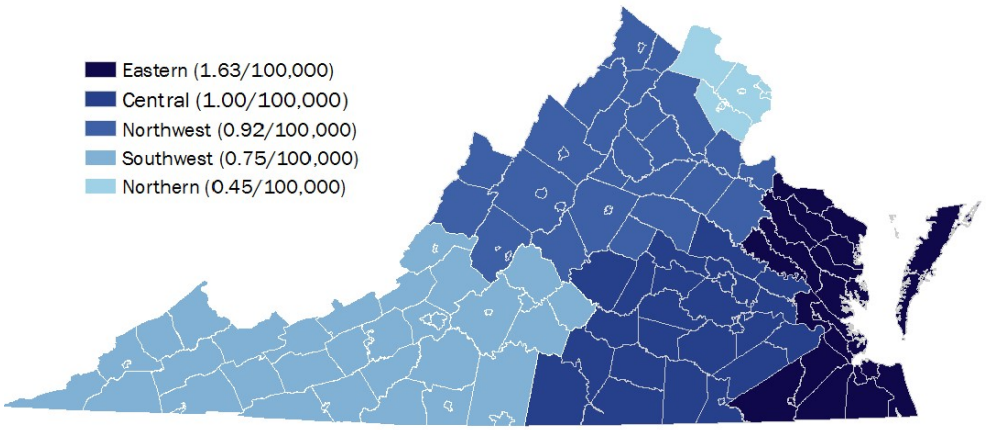
### *Social and Economic Factors of Children and their Families*

The Team considered factors related to the social and economic status of the children and their families. A total of nine (17.3%) of the children were Medicaid recipients, and two (3.8%) children either had no insurance or their families self-paid for their child's medical care. Five (9.6%) families in this review were receiving benefits from the Supplemental Nutrition Assistance Program (SNAP) or the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). These figures provide a rough indicator of socioeconomic status, suggesting that some families who lost a child to drowning lived at or below the poverty level, highlighting the need for equitable prevention programming.

## Regional and Temporal Variations in Child Deaths due to Drowning

The OCME investigated each of the 52 drowning deaths of children. The OCME has four district offices: Central, Northern, Tidewater, and Western. Among OCME Districts, the Central and Tidewater Districts each investigated nineteen cases, the Northern District investigated eight cases, and the Western District investigated six cases. The place of fatal injury for these child deaths is described by Health Planning Region (HPR).[16] Children died due to drowning most frequently in the Eastern HPR (20; 38.5%), which represents a rate of 1.63 deaths per 100,000. In the Central HPR, 10 (19.2%) children died, representing a rate of 1.00 per 100,000. Eight (15.4%) children died due to drowning in the each of the Northwest and Northern HPRs, representing rates of 0.92 and 0.45 per 100,000 respectively. In the Southwest planning region, six (11.5%) children died due to drowning, representing a rate of 0.75 per 100,000.

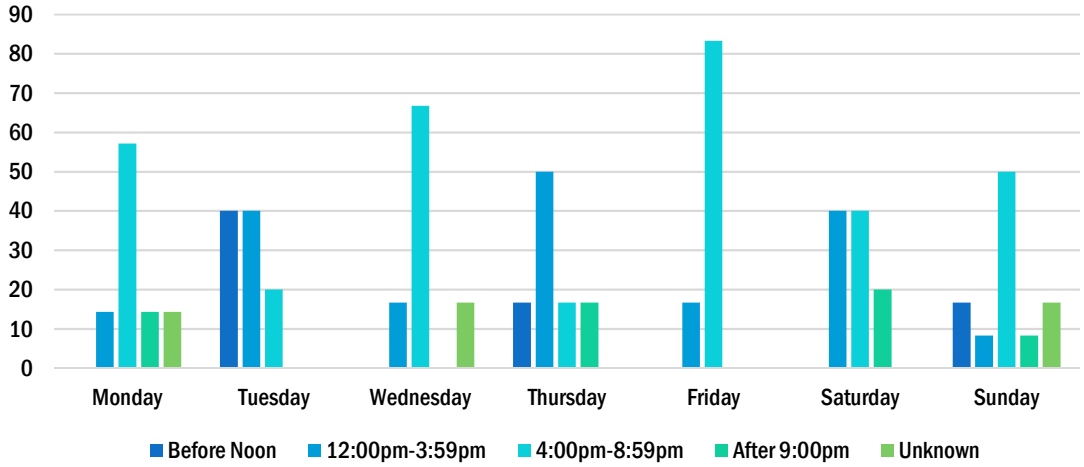
**Figure 4: Drowning death rates among children in Virginia by health planning region, 2014-2016**




[16] See Appendix A for a listing of Virginia localities by Medical Examiner District and Health Planning Region.

Drowning deaths occurred in every month except December, although the majority of fatal incidents occurred in warmer months. The highest number of drowning deaths occurred in the month of August, with 13 deaths. The months of May and July, each saw eight deaths, and the month of June saw seven deaths. Overall, 53.8% of all drowning deaths involving children occurred on a weekend.[17] Nearly half of all drowning deaths (48%) involving children occurred between 4:00pm-9:00pm.

**Figure 5: Percentage of drowning deaths among children by day of week and time of day - Virginia, 2014-2016**




## Place of Injury and Death

The majority of injuries resulting in drowning deaths occurred on public property, (22; 42.3%) including a lake, beach, or public pool, followed by the child's home (17; 32.7%). Seven children (13.5%) were injured at a friend or other family member's home; four children were injured on private property, including a hotel property, and one child each was injured at a childcare center or some other setting. The Team's review revealed that the majority of children (36; 69.2%) died at a hospital, in either an emergency room or inpatient setting, while sixteen children died at the scene (16; 30.8%).

## Characteristics of Caregivers at the Time of the Child's Death

The age of caregivers responsible for the child at the time of the fatal incident ranged from 18 to 54 years old. In 19 cases (36.5%), the child's mother was identified as the primary caregiver at the time of the fatal incident. In 10 cases (19.2%), the father was identified as the primary caregiver. A grandparent was identified as the primary caregiver in six cases (11.5%). Another relative was identified as the primary caregiver in four cases (7.7%), a babysitter or licensed childcare provider was identified as the primary caregiver in three cases (5.8%), a sibling was identified as the primary caregiver in one case (1.9%), and a teacher was identified as the primary caregiver in one case (1.9%). The primary caregiver was unknown in four cases (7.7%), and two cases (3.8%) a caregiver was not present at the time of the fatal incident, and thus the child was not being supervised.

As part of the review, the Team considered the role, if any of impairment had on the caregiver's supervision of the child during the fatal incident. According to investigative records, in 42 cases

[17] For this report, a weekend is considered the days of Friday, Saturday, and Sunday.

(80.8%), at least one caregiver was impaired at the time of the fatal incident. Types of impairment included the driving under the influence of alcohol (1.9%), illicit or prescription drugs (1.9%), impairment by an illness or disability (3.8%), a caregiver being distracted (13.5%), a caregiver being absent (25.0%), and a caregiver being asleep (13.5%), or some combination of these factors.

## Examining Child Drowning Deaths by Water Type & Setting

While the specific circumstances leading to a drowning death was different in each case reviewed by the Team, the circumstances surrounding these deaths were evaluated by the settings where these fatal incidents occurred – within or around the home, a pool, or an open water setting. In the Team's review, the most common setting of drowning death was in a pool, where 26 children drowned; 18 children drowned in an open water setting; and eight children drowned within or around the home, as seen in Figure 5. The following sections will highlight the circumstances of drownings in each setting, as well as differences in death rates in each setting when age, gender, and race/ethnicity were analyzed.

**Figure 6: Proportion of drowning deaths among children by age and setting - Virginia, 2014-2016**

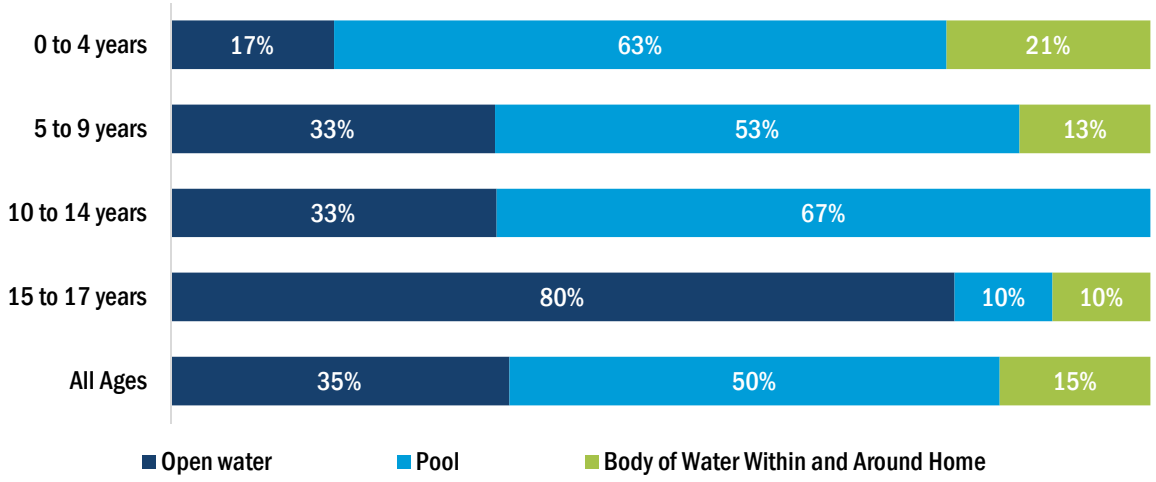


Table 2: Drowning deaths among children by age, race, ethnicity and setting - Virginia, 2014-2016

| | 0 to 4 | | 5 to 9 | | 10 to 14 | | 15 to 17 | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Rate | No. | Rate | No. | Rate | No. | Rate | No. | Rate |
| **All Settings** | | | | | | | | | | |
| White | 19 | 1.82 | 10 | 0.95 | 1 | 0.09 | 6 | 0.92 | 36 | 0.94 |
| Black | 4 | 1.09 | 4 | 1.09 | 1 | 0.28 | 3 | 1.34 | 12 | 0.91 |
| Asian | 1 | 0.84 | 1 | 0.80 | 1 | 0.82 | 1 | 1.53 | 4 | 0.93 |
| Hispanic | 5 | 2.24 | 2 | 0.95 | 1 | 0.54 | 2 | 1.98 | 10 | 1.39 |
| **Within and Around the Home** | | | | | | | | | | |
| White | 5 | 0.48 | 2 | 0.19 | -- | -- | 1 | 0.15 | 8 | 0.21 |
| Black | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Asian | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hispanic | 1 | 0.45 | -- | -- | -- | -- | -- | -- | 1 | 0.14 |
| **Swimming Pool** | | | | | | | | | | |
| White | 11 | 1.05 | 5 | 0.47 | -- | -- | -- | -- | 16 | 0.42 |
| Black | 3 | 0.82 | 3 | 0.82 | 1 | 0.28 | 1 | 0.45 | 8 | 0.61 |
| Asian | 1 | 0.84 | -- | -- | 1 | 0.82 | -- | -- | 2 | 0.46 |
| Hispanic | 3 | 1.34 | 1 | 0.47 | -- | -- | -- | -- | 4 | 0.55 |
| **Open Water** | | | | | | | | | | |
| White | 3 | 0.29 | 3 | 0.28 | 1 | 0.09 | 4 | 0.61 | 11 | 0.29 |
| Black | 1 | 0.27 | 1 | 0.27 | -- | -- | 2 | 0.89 | 4 | 0.30 |
| Asian | -- | -- | 1 | 0.84 | -- | -- | 2 | 3.06 | 3 | 0.70 |
| Hispanic | 1 | 0.45 | 1 | 0.47 | 1 | 0.54 | 2 | 1.98 | 5 | 0.69 |
| **Total** | 24 | 1.56 | 15 | 0.96 | 3 | 0.19 | 10 | 1.06 | 52 | 0.93 |

Table 3: Drowning deaths among children by age, gender, and setting - Virginia, 2014-2016

| | 0 to 4 | | 5 to 9 | | 10 to 14 | | 15 to 17 | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Rate | No. | Rate | No. | Rate | No. | Rate | No. | Rate |
| **All Settings** | | | | | | | | | | |
| Male | 14 | 1.78 | 7 | 0.88 | 1 | 0.13 | 9 | 1.86 | 31 | 1.08 |
| Female | 10 | 1.33 | 8 | 1.05 | 2 | 0.26 | 1 | 0.22 | 21 | 0.76 |
| **Within and Around the Home** | | | | | | | | | | |
| Male | 3 | 0.38 | 2 | 0.25 | 0 | 0.00 | 1 | 0.21 | 6 | 0.21 |
| Female | 2 | 0.27 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 2 | 0.07 |
| **Swimming Pool** | | | | | | | | | | |
| Male | 8 | 1.01 | 3 | 0.38 | 1 | 0.13 | 1 | 0.21 | 13 | 0.45 |
| Female | 7 | 0.93 | 5 | 0.66 | 1 | 0.13 | 0 | 0.00 | 13 | 0.47 |
| **Open Water** | | | | | | | | | | |
| Male | 3 | 0.38 | 2 | 0.25 | 0 | 0.00 | 7 | 1.45 | 12 | 0.42 |
| Female | 1 | 0.13 | 3 | 0.39 | 1 | 0.13 | 1 | 0.22 | 6 | 0.22 |
| **Total** | 24 | 1.56 | 15 | 0.96 | 3 | 0.19 | 10 | 1.06 | 52 | 0.93 |

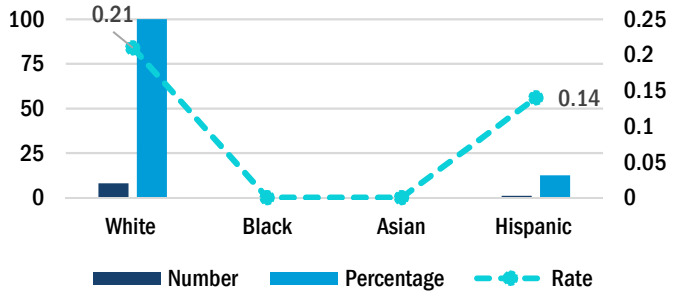
## Drownings Within and Around the Home

When water is present, elements of the built environment and household products within a child's home can pose a potentially fatal risk of drowning to children of all ages. Whether it is a bucket filled with water or a retention pond near the property, hazardous elements exist throughout the child's home environment.

### *Demographics and Location*

All eight children that died as a result of drowning within or around the home were White, and one child was of Hispanic ethnicity. Males had a higher risk than female children (0.21 vs. 0.07 per 100,000) and the majority of children were between the ages of 0 and 4 years (5; 62.5%). In the Team's review, eight children (15.4%) died either in or around the child's primary residence. Of these eight cases, five children drowned in a bathtub, and three children drowned in some other body of water immediately around the property, including a fishpond, retention pond, or septic tank.

**Figure 7: Number, percentage, and rate of drowning death among children within and around the home by race and Hispanic ethnicity - Virginia, 2014-2016**




### *Supervision*

All of the drownings that occurred in or around of the home were unwitnessed. In 87.5% of fatal drownings, 20 minutes or less had passed since the caregiver saw the child; however, in three cases, this period was 5 minutes or less. In one case, the time from last seen to the drowning was unknown. In six of the cases, the child's mother was identified as the primary caregiver at the time of the fatal incident, in one case the child's father was identified as the primary caregiver at the time of the fatal incident, and in one case the caregiver at the time of the fatal incident was unknown. The Team's review found that all of the caregivers were impaired at the time of the incident. Types of impairment included a caregiver being absent (3; 37.5%), absent and distracted (3; 37.5%), asleep (1; 12.5%), or under the influence of illicit drugs (1; 12.5%).

In cases where drowning death occurred in a bathtub, all caregivers were aware the child was in the water, but in four cases, the child was left alone by the caregiver, and in one case, the child got into the water without the caregivers' permission.

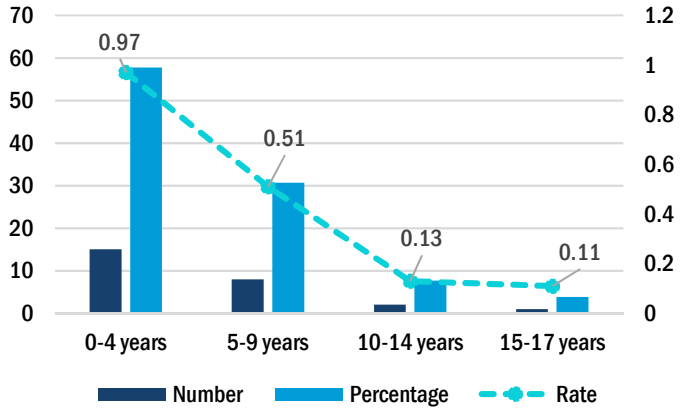
## Drowning in Pools

In the Team's review, drowning deaths in pools occurred in both public and private settings, and in both above ground and in ground pools. While pools are commonly associated with recreation and sport, without proper water safety measures and supervision, pools can pose a significant danger to children of all ages.

*Demographics and Location*

Male and female children died due to drowning at the same frequency (13) in a pool setting; however, the fatality rate of female children was slightly higher than male children (0.47 vs. 0.45 per 100,000). The majority (15; 57.5%) of children who drowned in this setting were between the ages of 0 and 4, followed by children ages 5 to 9 (8; 30.8%), 10-14 years old (2; 7.7%), and 15-17 years old (1; 3.8%). In this review, 61.5% of children who drowned in a pool setting were White, 30.8% were Black, and 7.7% were Asian. Children of Hispanic ethnicity accounted for 15.4% of all children who died. Although the number of White children who drowned in a pool was double that of Black children, the highest fatality rate was seen in Black children (0.61 per 100,000 vs. 0.42 per 100,000 for White children).

**Figure 8: Number, percentage, and rate of drowning death among children in pool settings by age - Virginia, 2014-2016**




Drowning deaths occurred in both in private and public settings, with 18 drownings (69.2%) occurring in an in-ground pool and eight drownings (30.8%) occurring in an aboveground pool. Of the 26 drowning deaths that occurred in a pool, 18 (69.2%) occurred in a private residential tool, with 10 drownings (38.5%) occurring in a pool in the child's primary residence. Seven drownings (26.9%) occurred in a pool at a friend or other family member's home, and one drowning (3.8%) occurred at a pool located at a licensed childcare center. Of private residential pools, two owners (11.1%) owned the pool less than six months; one owner (5.6%) owned the pool between six months and one year; seven owners (38.9%) owned the pool for greater than one year; and in eight (44.4%) drownings the length of ownership was unknown at the time of review. Aside from private residential pools, two drownings (7.7%) occurred in a private community pool, three drownings (11.5%) occurred in a public pool, and three drownings (11.5%) occurred in a hotel pool.

*Supervision*

The majority (22; 84.6%) of drowning deaths in pool settings were unwitnessed, although 11.5% (3) were witnessed and 3.8% (1) were unknown if witnessed. In 70% of drowning deaths, 45 minutes or less had passed since the supervisor saw the child; however, in two cases, it had been five or six hours. In half these cases, this period was 15 minutes or less. In six cases, the time from last seen to the drowning was unknown.

Similarly, to drownings that occurred in or around of the home, the child's mother was most frequently the caregiver at the time of the fatal incident (9; 34.6%). Other caregivers included the child's father (4; 15.4%), grandparent (4; 15.4%), other relative (3; 11.5%), babysitter (2; 7.7%), a Licensed childcare provider (1; 3.8%), an acquaintance (1; 3.8%), and in two cases (7.7%), the caregiver at the time of the fatal incident was unknown. The caregivers ranged in age between 18 and 62 years of age.

The Team's review found that all the caregivers were impaired at the time of the incident. Types of impairment included a caregiver being absent (9; 34.6%), asleep (6; 23.1%), distracted (4; 15.4),

impaired by illness (1; 3.8%), a combination of these types of impairment (4; 15.4%), or no caregiver present and thus the child was unsupervised (2, 7.7%). In five cases (19.2%), the fatal incident occurred during a party, which likely contributed to supervisor impairment. In four cases (15.4%), a lifeguard was on duty at the time of the fatal incident; however, the certification of the lifeguard was unknown. In one case (3.8%), the fatal incident occurred after lifeguard hours, and in 21 (80.8%) cases, there was no lifeguard on duty.

Considering the circumstances that lead to these drowning deaths, in 20 cases (76.9%), the caregiver was unaware that the child was in the water either because the child left without the caregiver's permission (14; 53.8%), the child had the caregiver's permission to leave but not get into the water (5; 19.2%), or the child fell into the water (1; 3.8%). In two cases (7.7%), it was unknown if the caregiver was aware that the child was in the water. The Team's review found that in 18 cases (69.2%), the child's parents or caregivers did not believe the child could swim, in four cases (15.4%) the child's parents or caregiver did believe the child could swim, and in four cases (15.4%) it was unknown if the child's parents or caregivers knew the swimming ability of the child.

### *Barriers and Safety Equipment*

One of the key ways to prevent drownings in pool settings is to ensure there are multiple layers of protection to act as barriers to entry to the pool area. According to the American Academy of Pediatrics, five evidence-based interventions to prevent drowning are the installation of four-sided pool fencing, at least four feet tall, with self-closing and self-latching gates that completely isolate the pool from the house and yard; the use of life jackets and lifeguards; the provision of swim lessons, and adequate and continuous supervision.[18]

In the Team's review, the most common barrier identified was a fence (10), followed by a door (8), a gate (8), a removable ladder (3), a pool cover (2), and safety or warning signs (1). In ten cases, there were two or more barriers preventing access to the pool. In five cases, it was unknown if any barriers were present around the pools. When fence details were known, three fences met the recommended height of at least four feet and were four-sided, two fences were four-sided but were too short, and one was three-sided but was four feet tall. When gate details were known, four gates were self-closing and self-latching, two gates had a lock, and two gates were part of a double gate.

Although barriers to entry were identified in 70% of pools, in the Team's review, only in two cases were these barriers intact and properly maintained. Moreover, in the eleven localities that had local ordinances regulating residential pools, the ordinances were violated in all eleven cases. In these two cases, the child accessed the pool by climbing the fence surrounding the pool. In the remaining 16 cases, the barrier was either improperly constructed, maintained, or used, allowing the child to breach the barriers and access the pool. Within these cases, the most common issue identified was a door left unlocked, followed by a pool cover left off. Additionally, while six cases had only one barrier, seven cases had two barriers, two cases had three barriers, and one case had five barriers. Overall, while the majority of cases reviewed had some form of barrier meant to prevent access to the pool area, nearly

[18] Denny, SA, Quan, L, Gilchrist, J, McCallin, T, Shenoi, R, Yusuf, S, Hoffman, B, Weiss, J, and the Council of Injury, Violence, and Poison Prevention. *Prevention of Drowning*. Pediatrics: March 15, 2019. Available at: https://pediatrics.aappublications.org/content/pediatrics/early/2019/03/13/peds.2019-0850.full.pdf

all were dysfunctional, thus allowing the child to access the water, ultimately leading to a fatal outcome.

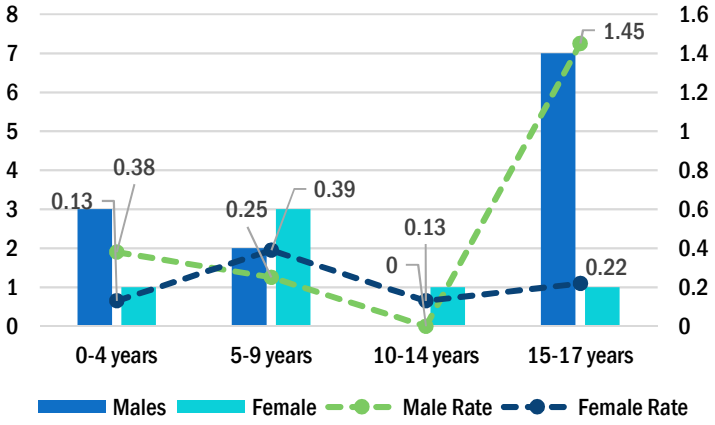
### *Rescue Efforts*

A rescue attempt was made in 24 cases (92.3%) of drowning that occurred in pools, with rescue attempts made by parents, EMS, Search and Rescue, another family member, hotel employee, babysitter, bystanders, and neighbors. In none of the cases was there a delay between the time the child was found and in calling EMS. In four cases (15.4%), the appropriate rescue equipment was present at the location of the fatal incident, but in 22 (84.6%) cases, there was either no appropriate rescue equipment available, or it was unknown whether such equipment was available. The depth of water that the child fatal drowned in was reported in 17 cases and ranged between three to eight feet in depth.

## Open Water Drownings

While all bodies of water pose a threat to children of all ages, open water settings can be particularly challenging swimming and recreational environments for children to navigate. Environmental features, such as sudden drop-offs, strong currents, rough waves, and poor weather, make open water settings significantly more dangerous to children, and can contribute to an increased risk for drowning.

**Figure 10: Number and rate of drowning death among children in open water settings by gender - Virginia, 2014-2016**




### *Demographics and Location*

In the Team's review, open water settings included creeks, rivers, ponds, lakes, and oceans. Of the eighteen children who died in an open water setting, the majority were White (12; 66.7%) and male (12; 66.7%). Although White children had the highest frequency of fatal drowning in open water settings, the highest fatality rate was in Asian children (0.70 per 100,000) and Hispanic children (0.69 per 100,000). Nearly half of all children who died in this setting were between 15 and 17 years of age (8; 44.4%), followed by 5-9 years of age (5; 27.8%), 0-4 years of age (4; 22.2%), and 10-14 years of age (1; 5.6%). Considering the interaction between race and age in open water settings, the highest death rate was in Asian children ages 15 to 17 (3.06 per 100,000), followed by Black children ages 15 to 17 (0.89 per 100,000). When Hispanic ethnicity and age was considered, ages 15 to 17 had the highest death rate at 1.98 per 100,000.

In the Team's review, nine (50%) children drowned in a lake, six (33.3%) children drowned in a river or creek, two (11.1%) drowned in the ocean, and one (5.6%) child drowned in a pond. Seventeen children died in a public open water setting, and one child died in a private open water setting near their primary residence. Within public settings, two children drowned in an open water setting in a state park.

Additionally, in two cases, the fatal drowning incident occurred while the child was boating in an either a jon boat or motorboat.

### *Supervision*

The majority (15; 83.3%) of drowning deaths in open water settings were witnessed; most frequently by either a parent or relative. In this setting, the child's father was most frequently the primary caregiver for the child at the time of the fatal incident (5; 27.8%). Other primary caregivers included the child's mother (4; 22.2%), grandparent (2; 11.1%), a sibling (1; 5.6%), some other relative (1; 5.6%), an acquaintance (1; 5.6%), a teacher (1; 5.6%), and in two cases (11.1%), the decedent was 17 years old and did not have a caregiver present. The caregivers ranged in age between 22 and 74 years of age.

The Team's review found that in eight cases (44.4%), the caregivers were impaired at the time of the incident. Types of impairment included a caregiver being distracted (3; 16.7%); absent (1; 5.6%), the child was left alone by the supervisor and while many people around, no one was appointed to supervise the child (1; 5.6%), driving under the influence of alcohol (1, 5.6%), impaired by disability (1; 5.6%), or some combination of these types of impairments (1; 5.6%). In three cases (16.7%), the fatal incident occurred during a party. In two cases (11.1%), a lifeguard was on duty at the time of the fatal incident; however, the certification of the lifeguard was unknown.

Similar to other settings, lack of active, continuous supervision contributed to the majority of the drowning deaths in open water settings. Although a caregiver was present during the majority of instances, in 12 (67%) cases, these individuals were not maintaining, "touch supervision" which is the practice of supervising a child at a distance of no more than an arm's length away.[19] Additionally, nine of the caregivers were nearby but not in the water with the child, creating a delay in noticing or responding to the child. In three cases, there were no adults present during the fatal incident, only friends of the child. Other circumstances included falling off docks into the water (2); the child leaving their home without their parent's knowledge (1); a boating accident (2); driving into a shallow area (1); a motor vehicle crash (1); and the child becoming overcome with exhaustion from swimming (1). Contributing to these circumstances, toxicological testing at death revealed that two children had legally intoxicated levels of alcohol in their system. Additionally, two children had a diagnosed seizure disorder, and one child was diagnosed with Autism spectrum disorder.

The Team's review found that in seven cases (38.9%), the child's parents or caregivers did believe the child could swim, in six cases (33.3%) the child's parents or caregivers did not believe the child could swim, and in five cases (27.8%) it was unknown if the child's parents or caregivers knew the swimming ability of their child. Of the 18 children who drowned in an open water setting, only one child was wearing a life jacket at the time of the fatal injury.

### *Environmental Factors*

As previously mentioned, environmental factors in open water settings can significantly increase drowning risks to swimmers. In the Team's review, 50% of cases had at least one environmental factor contribute to the fatal incident. Factors included poor weather, strong currents, a drop off, rough

[19] American Academy of Pediatrics, Swim Safety Tips from the American Academy of Pediatrics. 2018. Available at: https://www.aap.org/en-us/about-the-aap/aap-press-room/news-features-and-safety-tips/Pages/Swim-Safety-Tips.aspx

waves, and/or the child was swimming in a boating or jet ski area; with strong currents being the most commonly reported environmental factor.

## Investigations of the Injury and Death

### Office of the Chief Medical Examiner

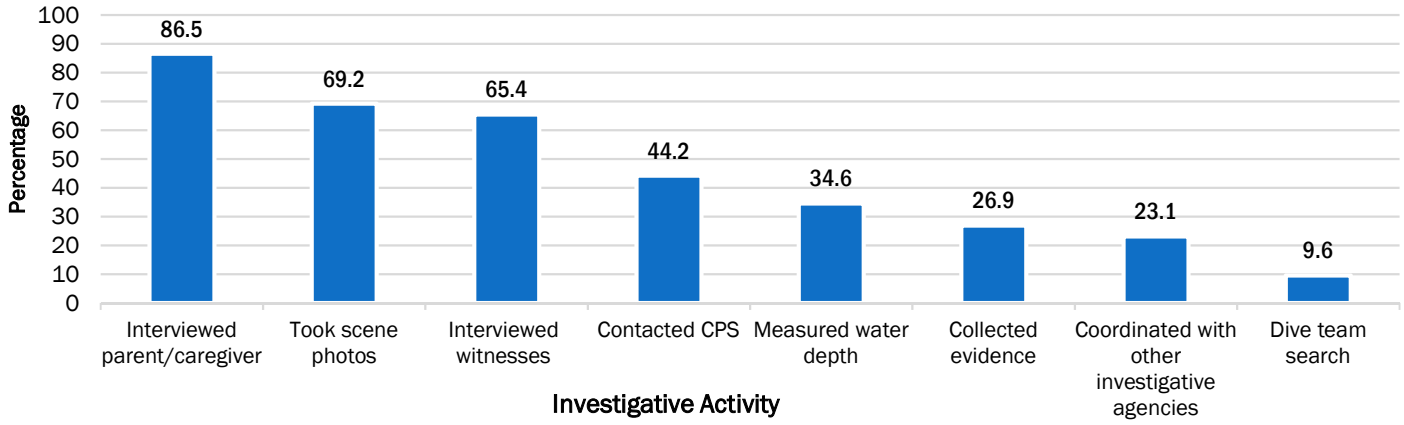
By law, the Virginia Office of the Chief Medical Examiner (OCME) conducts a comprehensive medico-legal death investigation to determine the cause and manner of death of any sudden, violent, and unexplained death that occurs within the boundaries of the Commonwealth[20]. The OCME investigated all 52 fatal drownings reviewed by the Team, performing an autopsy in 31 (59.6%) of cases, and external examinations in 21 (40.4%) of the cases. Toxicological testing at death revealed that three children had varying levels of alcohol in their system, and two children had either a sedative or antihistamine, or a combination of the two in their system.

The cause of death was drowning in 43 (82.7%) cases, and complications from drowning in four (7.7%) cases. The remaining deaths were attributed to asphyxia due to drowning with contributing seizures (1; 1.9%), drowning and hypothermia (1; 1.9%), drowning with hypothermia contributing (1; 1.9%); drowning due to blunt force injuries of head and neck (1; 1.9%), and drowning with possible contributing factor of cardiomegaly with myocardial bridging (1; 1.9%). Fifty cases were ruled an accident and two cases were ruled undetermined.

### Law Enforcement

Law enforcement agencies investigated 49 of the 52 cases (94.2%). To assess the quality and thoroughness of these investigations, the Team reviewed available documentation of the investigation and identified what actions law enforcement agencies took during the course of the investigations. An overview of these actions is seen in Figure 7:

**Figure 11: Percentage of cases with law enforcement investigative activities - Virginia, 2014-2016**




While the Team analyzed the actions taken by law enforcement as a measure of the thoroughness of the investigation, to assess the impartiality of the investigation, they used the phrase "index of suspicion". This phrase is meant to characterize their expectations that law enforcement made no prior judgement that the death was due to natural or accidental causes or unrelated to criminal or negligent intent. Based on these two assessment measures, the Team noted challenges to a thorough and impartial investigation in roughly 42% of cases. Moreover, the Team considered if an early

[20] Cause of death refers to specific injuries or diseases that lead to the cessation of life, such as blunt force trauma to the brain or pancreatic cancer. Manner of death clarifies the circumstances of the death as natural, accident, suicide, homicide, or undetermined.

determination of the case being the result of an accident by a law enforcement agency or the OCME hindered or changed the course of the death investigation. The Team concluded this happened in 23 (44%) of the cases.

As demonstrated in Figure 7, while the majority (45 cases; 86.5%) of cases included an interview with the parent(s) or caregiver(s), the Team's review found that a third (15) of these cases did not interview all parents or caregivers who were present and/or did not ask in-depth questions, despite concerning factors at the scene. Another significant factor affecting the thoroughness of the investigation was either the lack of or poor quality of coordination with Child Protective Services (CPS). Other barriers included language barriers between families and law enforcement agencies, incomplete or lack of scene photos, incomplete documentation of law enforcement actions, a low "index of suspicion", or the conclusion of investigation before a clear understanding of the circumstances or events leading to the fatality have been determined.

## Child Protective Services

In the investigation of child deaths suspected to be the result of child abuse and/or neglect, the role of CPS is to determine if abuse or neglect has occurred, to assess the risks to any surviving children in the home, and to offer services to address problems or issues identified during the investigation. While conducting their investigation, CPS professionals rely on input from law enforcement and from the Office of the Chief Medical Examiner in making their determination.

Of the 52 fatal drowning child deaths reviewed by the Team, CPS was notified and investigated 27 (51.9%) of cases. Of these 27 cases, CPS notification was made the same day of the incident in 20 cases, the day following the incident in five cases, and multiple days after the incident in two cases. In 23 cases, CPS was notified by law enforcement; however, in four of the cases they were notified by a CPS worker who saw the incident in the media, a family member, some other individual, or the child was already the subject of an open CPS case. Intake screened out one of the reported fatalities. One case was put into the Family Assessment Track.

In the Team's review, 48.1% of CPS investigations had a founded[21] disposition for abuse or neglect, while 44.4% were unfounded[22], and 7.4% of the final disposition was unknown. Of those that were founded, all 13 cases were founded for physical neglect and inadequate supervision.

While the Team considered the findings of the CPS investigation, they also reviewed past CPS involvement with the child and their family as a possible opportunity for intervention and prevention. In the Team's review, 13.5% of children who died were previously involved with CPS, including 7.7% having a prior Family Assessment, and 7.7% being the child victim of a current or previous investigation. Additionally, 17.3% of parents and caregivers had a history of involvement with CPS, including 9.6% with at least one prior Family Assessment, and 7.7% having a prior Founded disposition for abuse or neglect.

[21] According to 22VAC40-705-10, "Founded" means that a review of the facts shows by a preponderance of the evidence that child abuse or neglect has occurred. A determination that a case is founded shall be based primarily on first source evidence; in no instance shall a determination that a case is founded be based solely on indirect evidence or an anonymous complaint.

[22] According to 22VAC40-705-10, "Unfounded" means that a review of the facts does not show by a preponderance of the evidence that child abuse or neglect occurred.

## Prosecution

Charges were filed in five of the cases reviewed by the Team. In four cases, criminal charges, including felony murder, involuntary manslaughter, felony child abuse and neglect, felony child abuse, cruelty and injury to a child were filed against either a parent or a family acquaintance. All four cases resulted in convictions, including aggravated involuntary manslaughter, involuntary manslaughter, felony child abuse and neglect, and cruelty and injury to a child, with prison terms ranging from 15 months to 12 years, with the sentence suspended in part in three of the four cases. Additionally, in one case, a civil lawsuit was filed against a daycare, but this case was dismissed and settled out of court. Considering the circumstances that lead to the fatal event, in three of these cases, the child left the home without the parent or caregiver's knowledge, in one case, the child was left alone by the parent or caregiver, and in one case, the child was with a group of people with no appointed supervisor. Three cases resulted in convictions, one case was dismissed, and in one case, the defendant was found not guilty.

## Preventable Injuries and Death

After retrospective review, the Team determined that 94% of the deaths were preventable. Specifically, the Team determined that 40 cases were definitely preventable, and nine cases were probably preventable. The Team was unsure of the preventability of three deaths reviewed due to lack of information. The Team did not determine any deaths to be not at all preventable.

Considering the role of supervision in the deaths, the Team determined that at the time of the fatal incident, 80% of children were not appropriately supervised when supervision was needed. The Team determined that four children were appropriately supervised at the time of the fatal incident, while they were unsure if appropriate supervision was provided in six deaths reviewed.

## Section III: Discussion

Although childhood drowning remains a leading cause of unintentional injury and death for Virginia's children, the findings of the Team's review revealed that nearly all deaths reviewed were preventable, highlighting an acute need for intervention and prevention. Similar to national data on fatal drownings, in the Team's review, the highest rates of fatal drowning events occurred in male children 0-4 and 15-17 years of age. For children 0-4 years of age, in all three settings, male children had higher rates of fatal drowning than female children, with the highest rates observed in swimming pool settings at 1.01 per 100,000 persons. For children 15-17 years of age, nine out of ten children were male, resulting in higher rates of fatal drowning in male children than female children. In addition to age and gender, when the child's race was considered, White children accounted for the greatest number of drowning deaths in all settings, but the fatality rates observed were similar among all racial categories. While age and gender have traditionally been key determinants of drowning prevention programming, in developing the recommendations, the Team focused on strategies to address all disparities in a culturally competent, evidence-based, and trauma-informed manner.

In addition to identifying key sociodemographic characteristics that put children at increased risk for drowning death, the Team's review supported the critical need to ensure there are multiple layers of protection whenever children are in, on, or around water. The emphasis on employing multiple layers of protection is based on the Haddon Matrix Paradigm, which holds that interventions must be aimed at the environment, individual at risk, and the agent of injury. Thus, concluding that it is, "unlikely that the use of a single strategy will prevent drowning injuries and death."[23] These collective layers should always include active and continuous supervision, functionally operational barriers, and access to water safety competency and education programming, as well as rescue and resuscitation.

Across all settings, inappropriate supervision was a leading circumstance that contributed to the fatal incident. While there was variation in the way in which the child was improperly supervised at the time of the fatal incident, in 80% of cases, the child was in need of active and continuous supervision. The Team's findings have provided strategies for parents and caregivers to provide this essential supervision, but the findings underscore that all children need to be continuously supervised by a designated, responsible adult, who maintains constant visual supervision and is within arm's reach of the children, regardless of age, perceived swimming ability, and the presence of lifeguards.

While the Team's review primarily considered barriers to prevent access to water in the context of drownings in pool settings, the Team's findings revealed that similar to other child safety equipment, unless properly maintained, barriers were not effective at preventing children from accessing water. Moreover, while open water settings do not have traditional barriers, the findings related to the influence of environmental factors highlight the need to use designated swim areas, which have been assessed to be safe to swim in by local agencies.[24]

Although the Team's review did not explicitly assess past history of swim lessons or water safety education by either the child or supervising adult, nearly 25% of all children were reported as having limited to no swimming ability; highlighting the need for inclusive and widespread swimming lessons and water competency programming. Moreover, of the children who were not properly supervised at

[23] American Academy of Pediatrics, *Prevention of Drowning*.

[24] Jeong, J. et al. Relationship between drowning location and outcome. American Journal of Emergency Medicine, 2016

the time of the fatal incident, 62% of the parents or caregivers in these cases did not believe the child could swim. This interaction demonstrates the need to have multiple layers of protection, particularly for those children who are unable to swim or have low water competency. Finally, in addition to ensuring children have access to effective and inclusive water safety education, the findings from the review highlight that caregivers need access to water rescue strategies. As parents, caregivers, and other adults were most frequently making rescue attempts, it is important that they have access to and are properly trained to provide water rescue skills without further endangering themselves or others.

In addition to identifying opportunities for intervention and prevention directly related to drowning, the Team also considered the efficacy of coordination and communication between investigative agencies during the death investigation. After retrospective review, the Team concluded that in 64% of cases, investigative agencies did not collaborate well during the investigation. Unfortunately, the findings of the Team's review revealed that this lack of strong collaboration impacted the thoroughness of the investigation. Without a complete and thorough investigation, the opportunities to identify risk and protective factors, lessons learned, and develop prevention strategies, is significantly impacted. As such, in addition to providing strategies to improve coordination and collaboration during the investigative process, the Team also developed strategies to enhance the standardization of data collection and reporting of information on causes and circumstances of child death. With improved standardization of information related to systems contacts with the child and family before and after the fatal incident, stakeholders are able to evaluate existing strategies and develop improved data-driven and evidence-based strategies to prevent future fatalities.

## Section IV: Recommendations

The Virginia State Child Fatality Review Team carefully reviewed all child drowning deaths over a two-year time period, amassed data garnered throughout the review, and analyzed the data to obtain an accurate, comprehensive picture of child drowning deaths in the Commonwealth. Following careful consideration of the compiled evidence, the Virginia State Child Fatality Review Team presents the following recommendations to enhance the awareness and provision of drowning prevention strategies, to promote and strengthen communication and collaboration among state and local agencies providing services to families, and to enhance child death investigative practices throughout Virginia. The Team hopes the information published in this report along with its recommendations will be used in the continued effort to prevent the premature death of Virginia's children.

### Parents and Caregivers

1. When children are in, on, or around water, ensure there is at least one designated adult responsible for providing active and continuous visual supervision of all children present. To support this practice, Safe Kids Worldwide has developed the Water Watcher card strategy. A Water Watcher is a designated adult who is responsible for supervising the children in the water without distractions and wear a Water Watcher card for a defined period, such as 15-minutes. Upon transfer of this responsibility to another adult, the Water Watcher card passes physically to the other responsible adult, thus preventing lapses in supervision.

### Primary Prevention

1. The State Child Fatality Review Team recommends that elementary schools in Virginia, in partnership with the local Young Men's Christian Association (YMCA) or other community partners with swimming pool facilities, consider providing water safety and swim lessons as part of the Physical Education curriculum. The lessons should be designed for all students and accommodate various levels of swimming and other abilities. While lessons will be provided in a swimming pool, educators should educate students on the increased risks present in open water, and strategies to mitigate those risks. In areas where a swimming pool facility is not feasibly available, Physical Education and health educators should provide classroom-based learning activities aimed at teaching the basic principles of water safety and drowning prevention, and strategies for children to stay safe in, or, or around water.

2. The State Child Fatality Review Team recommends that all public places with pools or open water establish staffed life jacket loaner stations, where appropriately sized and typed U.S. Coast Guard approved life jackets are available to members of the public. These staffed stations should include:
    a. Prominent inclusive signage promoting the loaner program should be present throughout the area, including at both designated swimming areas and boating areas;
    b. Life jackets should be readily available and visible, and monitored using an inventory system;
    c. Trained attendants are available to ensure life jackets are appropriately fitted and used;
    d. Life jackets should be inspected on a routine basis for wear and unsafe life jackets removed, with maintenance records posted at each station.

3. The State Child Fatality Review Team encourages individuals with a septic tank on their property to routinely inspect the septic tank's lid or cover to ensure the lid or cover are safely secured to prevent easy access by children.

4. Whenever possible, all swimmers should use designated swimming and recreation areas. In areas with known hazards, signage should be posted regarding hazards and presence of lifeguards, including data on previous fatalities and near fatalities. This culturally and linguistically appropriate signage should be designed for readers of all ages and abilities, and should use both symbol and text-based safety warnings.

## Legislation and Regulation

1. The State Child Fatality Review Team encourages amending of § *32.1-248.1* of the Code of Virginia to broaden the authority of the Department of Health to provide routine evaluations of all public pools and barriers, ensuring public pools and their safety features are maintained safely and securely.

2. The State Child Fatality Review Team encourages the amending of § *32.1-248.1* of the Code of Virginia to broaden the authority of the Department of Health to develop and promulgate regulations for public pools, ensuring that all public pools are maintained safely and securely, and measures to enhance the safety of public pools are available.

3. The State Child Fatality Review Team encourages the amending of § *32.1-248.1* of the Code of Virginia to broaden the authority of the Department of Health to develop and promulgate regulations for the provision of certified lifeguards at pools in public areas and tourist establishments. Such regulations should include:
    a. Training and certification qualifications required for lifeguards;
    b. Design and spacing of lifeguard observation points;
    c. Required lifeguarding equipment;
    d. Standard operating procedures that lifeguard managers and companies should maintain for recreational water safety and emergency procedures;
    e. Specification of the lifeguard duty period and notification procedures when a lifeguard is not on duty;
    f. Specification of appropriate lifeguard staffing levels.

4. The State Child Fatality Review Team encourages the Department of Health to consider revising the Sewage Handling and Disposal regulations of Virginia Administrative Code 12VAC5-610-80 to include redundant child protection on access risers.

## Public Education and Awareness

1. The State Child Fatality Review Team encourages the Department of Health to provide routine messaging for parents, caregivers, and other supervising adults, as well as aquatics

professionals, beach staff and residential pool owners, on best practices for preventing drowning and swimming-related injuries, including the usage of the Water Watcher card strategy. Comprehensive messaging on pool safety should include advisories for parents, caregivers, and other supervising adults that lifeguards are not replacements for active and continuous supervision.

2. The State Child Fatality Review Team encourages the Department of Health to provide ongoing messaging for the public on the risks of drowning associated with unsecured septic tank lids or covers. Comprehensive messaging should include homeowners and property manager advisories on how to determine whether or not the septic tank lid or cover is effectively secured and strategies for correction.

## Health Care Providers

1. The Virginia Chapter of the American Academy of Pediatrics should encourage their members to discuss water safety and drowning prevention strategies with parents and caregivers at each well child visit. This patient education should align with the American Academy of Pediatrics' revised policy statement, *Prevention of Drowning*.

2. The State Child Fatality Review Team encourages the American Academy of Pediatrics to amend the '*Bright Futures Toolkit: A Parent's Guide to Water Safety*' education handout to include specific guidance for parents of children with underlying medical conditions, including but not limited to the following best practice recommendations:
    a. Pediatricians and other allied health professionals who work with families of children with seizure disorders should ensure that parents and caregivers are aware of the enhanced risks associated with all types of water. Providers should routinely provide education and counseling on the seizure triggers associated with swimming, the environmental risks of different swimming and recreational water activity areas, the importance of wearing personal flotation devices (PFDs) appropriate for the child's weight and water activity, and the need for constant supervision in and around water.
    b. Pediatricians and other allied health professionals who work with families with children with Autism Spectrum Disorder (ASD) should ensure that parents and caregivers are aware of the enhanced risk of drowning injury and death in this population. These providers should routinely provide education and counseling on best practices on drowning prevention and water safety, including the usage of PFDs appropriate for the child's weight and water activity, enhanced barriers to egress, and the need for increased, consistent supervision in and around water.

    Pediatricians should routinely review the basics of infant and child cardiopulmonary resuscitation (CPR) and water rescue skills with parents and caregivers, ensuring caregivers are able to respond appropriately in an emergency without putting themselves or others at risk.

## Social Services

1. The Virginia Department of Social Services (VDSS) should leverage funding to develop robust, uniform guidance for statewide prevention services that focus on intervening early. The State Child Fatality Review Team encourages VDSS to promote prevention services that focus on increasing statewide access to home visiting programs; improving Virginia's resources and capacity to serve substance-misusing families; and remaining an active partner in Plans of Safe Care at both the state and local level.

2. As the Virginia Department of Social Services develops a new employee training model, the State Child Fatality Review Team recommends that the following topics should be included as training modules:
   a. Child Fatalities – this module should provide specific guidance on conducting an appropriate and thorough child death investigation.
   b. Data Quality – this module should highlight strategies to improve data completeness, consistency, and overall quality. The module should also inform employees how they can use data to inform their work.
   c. Resource Availability – this module should identify the resources available at the state, regional, and local level, as well as subject matter experts available for workers to utilize, especially in complex cases.
   d. Family Engagement – this module should address ways to manage difficult conversations with caregivers particularly during service referral. The training should provide tips for effective ways to encourage caregivers to seek care and ways for workers to follow up after making referrals for services.
   e. Agency Collaboration – this module should offer strategies to enhance collaboration with local law enforcement agencies during multi-agency investigations and to build professional relationships with other investigative agencies.

   This training model should be routinely shared with law enforcement agencies, with statewide training sessions to include members of both law enforcement and social services agencies.

## Child Death Investigation

1. The State Child Fatality Review Team believes language should never serve as a barrier. Investigative agencies should routinely use interpreters during regular communication with families who do not speak English, particularly during investigations regardless of perceived suspicion or circumstances.

2. The Virginia Department of Criminal Justice Services should develop and promulgate a model policy and training curriculum for law enforcement on the thorough investigation of sudden and unexpected infant and child deaths. This policy and lesson plan should emphasize the need for a multidisciplinary investigation that includes the Office of the Chief Medical Examiner, and, where appropriate, Child Protective Services and Commonwealth's Attorneys.

   Any curriculum developed to highlight best practices in law enforcement child death investigations should include:
   a. Requirement for law enforcement agencies to notify local departments of social services in cases of child fatalities under age 10 and for children with disabilities age 18 and under.

b. Expectation for law enforcement agencies to coordinate and collaborate investigative responsibilities with Child Protective Services workers;
c. Encouragement for law enforcement officers to attend autopsies and bring scene photos and preliminary police reports with them;
d. Methods to have an open dialogue with the OCME about concerns during investigations;
e. Heightened awareness and understanding of neglect and its contribution to the fatal event;
f. The need for Law Enforcement Agencies to run a criminal background check on parents/caregivers during investigation, and to request the Department of Social Services to check the Social Services Central Child Abuse and Neglect Registry;
g. Encouragement for law enforcement officers to obtain and examine communication (phone calls, texts, emails, social media, etc.) between parents/caregivers around the time of the fatal incident; and
h. Strategies to address the barriers law enforcement agencies face during child death investigations.

3. At the onset of the investigation, investigative agencies should conduct a thorough assessment of the caretakers' capacity to provide appropriate supervision for the infant or child, to include all parents and caregivers involved with the infant or child prior to and leading up to the fatal incident. This assessment should evaluate the role, if any, of sources of impairment or distraction, including but not limited to alcohol, illegal drugs, drug paraphernalia, or technology, had on the supervision of the infant or child prior to death. When applicable, investigative agencies should request that parents and caregivers consent to a drug screening.

4. Commonwealth's Attorneys should review law enforcement reports to determine if the level of information is sufficient to criminal charges should be pursued, particularly in cases where the Office of the Chief Medical Examiner ruled the death to be accidental in manner. This will aid in improving the consistency and thoroughness of law enforcement documentation.

5. The State Child Fatality Review Team encourages all Commonwealth's Attorneys to continue to support, strengthen, and utilize local Multidisciplinary Teams (MDTs) as an opportunity to improve collaboration between local departments of social services and local law enforcement agencies. Teams should designate a representative from each agency to serve as an inter-agency liaison.

## Appendix A: Virginia Localities by Region

### Health Planning Region (HPR)

*Central:*

Counties of: Amelia, Brunswick, Buckingham, Charles City, Charlotte, Chesterfield, Cumberland, Dinwiddie, Goochland, Greensville, Halifax, Hanover, Henrico, Lunenburg, Mecklenburg, New Kent, Nottoway, Powhatan, Prince Edward, Prince George, Surry, Sussex.

Cities of: Colonial Heights, Emporia, Hopewell, Petersburg, and Richmond.

*Northern:*

Counties of: Arlington, Fairfax, Loudoun, and Prince William.

Cities of: Alexandria, Fairfax, Falls Church, Manassas, and Manassas Park.

*Eastern:*

Counties of: Accomack, Essex, Gloucester, Isle of Wight, James City, King and Queen, King William, Lancaster, Mathews, Middlesex, Northampton, Northumberland, Richmond, Southampton, Westmoreland, and York.

Cities of: Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg.

*Northwest:*

Counties of: Albemarle, Augusta, Bath, Caroline, Clarke, Culpeper, Fauquier, Fluvanna, Frederick, Greene, Highland, King George, Louisa, Madison, Nelson, Orange, Page, Rappahannock, Rockbridge, Rockingham, Shenandoah, Spotsylvania, Stafford, and Warren.

Cities of: Buena Vista, Charlottesville, Fredericksburg, Harrisonburg, Staunton, Waynesboro, and Winchester.

*Southwest:*

Counties of: Alleghany, Amherst, Appomattox, Bedford, Bland Botetourt, Buchanan, Campbell, Carroll, Craig, Dickenson, Floyd, Franklin, Giles, Grayson, Henry, Lee, Montgomery, Patrick, Pittsylvania, Pulaski, Roanoke, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe.

Cities of: Bristol, Covington, Danville, Galax, Lynchburg, Martinsville, Norton, Radford, Roanoke, and Salem.

### Office of the Chief Medical Examiner (OCME) District

*Central:*

Counties of: Albemarle, Amelia, Brunswick, Buckingham, Caroline, Charles City, Charlotte, Chesterfield, Cumberland, Dinwiddie, Essex, Fluvanna, Gloucester, Goochland, Greene, Greensville, Halifax, Hanover, Henrico, James City, King and

Queen, King George, King William, Lancaster, Louisa, Lunenburg, Mathews, Mecklenburg, Middlesex, Nelson, New Kent, Northumberland, Nottoway, Powhatan, Prince Edward, Prince George, Spotsylvania, Stafford, Surry, Sussex, Richmond, and Westmoreland.

Cities of: Charlottesville, Colonial Heights, Emporia, Fredericksburg, Hopewell, Petersburg, Richmond, and Williamsburg.

*Northern:*

Counties of: Arlington, Clarke, Culpeper, Fairfax, Fauquier, Frederick, Loudoun, Madison, Manassas, Orange, Page, Prince William, Rappahannock, Shenandoah, and Warren.

Cities of: Alexandria, Arlington, Fairfax, Falls Church, Manassas Park City and Winchester.

*Tidewater:*

Counties of: Accomack, Isle of Wight, Northampton, Southampton, and York.

Cities of: Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, and Virginia Beach.

*Western:*

Counties of: Alleghany, Amherst, Appomattox, Augusta, Bath, Bedford, Bland, Botetourt, Buchanan, Campbell, Carroll, Craig, Dickenson, Floyd, Franklin, Giles, Grayson, Henry, Highland, Lee, Montgomery, Patrick, Pittsylvania, Pulaski, Roanoke, Rockbridge, Rockingham, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe.

Cities of: Bristol, Buena Vista, Covington, Danville, Galax, Harrisonburg, Lexington, Lynchburg, Martinsville, Norton, Radford, Roanoke, Salem, Staunton, and Waynesboro.

## Appendix B: Virginia State Child Fatality Review Team Membership

**William T. Gormley, MD, Ph.D., Chair**
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**Kimberly Ayers, MA**
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**Michael Z. Blumberg, MD**
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**Christopher Spain, MPA**
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**Scott F. Wilkes MSgt (ret.), MS**
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Office of the Chief Medical Examiner Staff

**Jane C. Tingley, MPH**
Infant and Child Fatality Projects Coordinator, 2018 to present

**Allison A. Clevenger, MPH**
Infant and Child Fatality Projects Coordinator, 2016-2018

## Appendix C: Virginia State Child Fatality Review Team Statute

§ 32.1-283.1. State Child Fatality Review Team; membership; access to and maintenance of records; confidentiality; etc.

A. There is hereby created the State Child Fatality Review Team, referred to in this section as "the Team," which shall develop and implement procedures to ensure that child deaths occurring in Virginia are analyzed in a systematic way. The Team shall review (i) violent and unnatural child deaths, (ii) sudden child deaths occurring within the first 18 months of life, and (iii) those fatalities for which the cause or manner of death was not determined with reasonable medical certainty. No child death review shall be initiated by the Team until conclusion of any law-enforcement investigation or criminal prosecution. The Team shall (i) develop and revise as necessary operating procedures for the review of child deaths, including identification of cases to be reviewed and procedures for coordination among the agencies and professionals involved, (ii) improve the identification, data collection, and record keeping of the causes of child death, (iii) recommend components for prevention and education programs, (iv) recommend training to improve the investigation of child deaths, and (v) provide technical assistance, upon request, to any local child fatality teams that may be established. The operating procedures for the review of child deaths shall be exempt from the Administrative Process Act (§ 2.2-4000 et seq.) pursuant to subdivision B 17 of § 2.2-4002.

B. The 16-member Team shall be chaired by the Chief Medical Examiner and shall be composed of the following persons or their designees: the Commissioner of Behavioral Health and Developmental Services; the Director of Child Protective Services within the Department of Social Services; the Superintendent of Public Instruction; the State Registrar of Vital Records; and the Director of the Department of Criminal Justice Services. In addition, one representative from each of the following entities shall be appointed by the Governor to serve for a term of three years: local law-enforcement agencies, local fire departments, local departments of social services, the Medical Society of Virginia, the Virginia College of Emergency Physicians, the Virginia Pediatric Society, local emergency medical services personnel, attorneys for the Commonwealth, and community services boards.

C. Upon the request of the Chief Medical Examiner in his capacity as chair of the Team, made after the conclusion of any law-enforcement investigation or prosecution, information and records regarding a child whose death is being reviewed by the Team may be inspected and copied by the Chief Medical Examiner or his designee, including, but not limited to, any report of the circumstances of the event maintained by any state or local law-enforcement agency or medical examiner, and information or records maintained on such child by any school, social services agency or court. Information, records, or reports maintained by any attorney for the Commonwealth shall be made available for inspection and copying by the Chief Medical Examiner pursuant to procedures which shall be developed by the Chief Medical Examiner and the Commonwealth's Attorneys' Services Council established by § 2.2-2617. Any presentence report prepared pursuant to § 19.2-299 for any person convicted of a crime that led to the death of the child shall be made available for inspection and copying by the Office of the Chief Medical Examiner pursuant to procedures which shall be developed by the Chief Medical Examiner. In addition, the Office of the

Chief Medical Examiner may inspect and copy from any Virginia health care provider, on behalf of the Team, (i) without obtaining consent, the health and mental health records of the child and those perinatal medical records of the child's mother that related to such child and (ii) upon obtaining consent from each adult regarding his personal records, or from a parent regarding the records of a minor child, the health and mental health records of the child's family. All such information and records shall be confidential and shall be excluded from the Virginia Freedom of Information Act (§ 2.2-3700 et seq.) pursuant to subdivision 9 of § 2.2-3705.5. Upon the conclusion of the child death review, all information and records concerning the child and the child's family shall be shredded or otherwise destroyed by the Office of the Chief Medical Examiner in order to ensure confidentiality. Such information or records shall not be subject to subpoena or discovery or be admissible in any criminal or civil proceeding. If available from other sources, however, such information and records shall not be immune from subpoena, discovery, or introduction into evidence when obtained through such other sources solely because the information and records were presented to the Team during a child death review. Further, the findings of the Team may be disclosed or published in statistical or other form which shall not identify individuals. The portions of meetings in which individual child death cases are discussed by the Team shall be closed pursuant to subdivision A 21 of § 2.2-3711. In addition to the requirements of § 2.2-3712, all team members, persons attending closed team meetings, and persons presenting information and records on specific child deaths to the Team during closed meetings shall execute a sworn statement to honor the confidentiality of the information, records, discussions, and opinions disclosed during any closed meeting to review a specific child death. Violations of this subsection are punishable as a Class 3 misdemeanor.

D. Upon notification of a child death, any state or local government agency maintaining records on such child or such child's family which are periodically purged shall retain such records for the longer of 12 months or until such time as the State Child Fatality Review Team has completed its child death review of the specific case.

E. The Team shall compile annual data which shall be made available to the Governor and the General Assembly as requested. These statistical data compilations shall not contain any personally identifying information and shall be public records.

1994, c. 643; 1995, c. 499; 1999, cc. 703, 726; 2004, c. 690; 2007, c. 411; 2009, cc. 813, 840; 2014, c. 583.

## Appendix D: State Child Fatality Review Team Protocol

In 1994, the Virginia General Assembly enacted Virginia Code § 32.1-283.1, which established the State Child Fatality Review Team. The multidisciplinary Team consists of representatives from state and local agencies including, but not limited to, social services, law enforcement, public health, Emergency Medical Services, Commonwealth's Attorney, schools, health and behavioral health care, and child advocacy groups such as Safe Kids and Prevent Child Abuse Virginia. Pursuant to Virginia law, the Team develops and implements procedures to ensure child deaths that occur in Virginia are analyzed in a systematic way. Since 1995, the State Child Fatality Review Team has been reviewing child deaths by selecting an epidemiologic focus for each review (e.g., unsafe sleep, homicides, and motor vehicle collisions). Topically focused reviews allow the Team to garner information on specific types of deaths in order to develop evidence-based recommendations to improve agency collaboration, prevention initiatives, coordination of care, child death investigation, and legislative action pertaining to the type of death under review.

The information presented in this report was gathered through records from agencies or persons who provided services to children and their families who were included in this review. The Team is authorized by statute to review such records that may include, but are not limited to, records from the Office of the Chief Medical Examiner (OCME), local departments of social services, Emergency Medical Services providers (EMS), hospitals, physicians, law enforcement departments, counselors, schools, Community Services Boards, Juvenile and Domestic Relations District Courts, and Court Service Units of the Department of Juvenile Justice. The Chair sends initial record requests to law enforcement, EMS, hospitals, physicians, and DSS. Additional service providers are identified through the examination of these initial records. The Chair continues to send letters to identify service providers until all applicable records are compiled. Once the case file is complete, the case is assigned to Team members who review the materials, create a case summary, and present the summary to the Team during a closed and confidential meeting. During case review sessions, the Team identifies systematic gaps in services, potential prevention and intervention opportunities, agency best practices, areas for personnel training and public education as well as possible changes needed in legislation, policies, protocols, and procedures. Data garnered from records and Team discussions are entered into a database for summary and analysis. These data are used to craft evidence-based recommendations to increase agency collaboration, improve child death investigations, and to prevent future child fatalities. At the conclusion of the review, the Team presents a report summarizing its findings and recommendations to the General Assembly of Virginia and the public.

Throughout the review, confidentiality is protected in three ways. First, the records obtained by the Team are excluded from the Virginia Freedom of Information Act and they cannot be obtained by a third party. Second, each Team member signs a sworn confidentiality statement; violations of confidentiality are considered a Class 3 misdemeanor. Third, all records are destroyed upon the completion of the review.

**This report is available at the following website:**
http://www.vdh.virginia.gov/medical-examiner/fatality-review-surveillance-programs-reports/child-fatality-review-in-virginia/reports/

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# Office of the Chief Medical Examiner