

2023

Fatality Review and Prevention



2018-2021 Drowning Prevention Report



Indiana
Department
of
Health



2018-2021 DROWNING PREVENTION REPORT
INDIANA DEPARTMENT OF HEALTH
DIVISION OF FATALITY REVIEW AND PREVENTION

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INTRODUCTION

Each day in the United States, an average of 11 unintentional drowning deaths occur, with an annual total of nearly 4,000 deaths, and nationally, drowning is the leading cause of injury death for children ages 1 to 4 years ([CDC](#)). These deaths are preventable and have a significant impact on entire communities. Disparities also exist in drowning rates, with different populations at higher risk of experiencing a death, including communities of color and people who are neurodiverse.

To properly develop drowning prevention recommendations for Indiana, it is important to understand circumstances and risk factors that occur. The circumstances of drowning deaths may differ based on age, sex, race and ethnicity, and the presence of certain medical conditions. Fatal drownings are also associated with certain risk factors, including the inability to swim, lack of supervision, and alcohol consumption.

Data collection and analysis require a collaborative approach to successfully capture all relevant data. It is through partnership with the Indiana Department of Natural Resources (DNR), the Indiana Department of Child Services (DCS), the Indiana Department of Homeland Security (IDHS), and the Indiana Department of Health (IDOH) that drowning rates can be reviewed and preventive measures can be taken. The data analyzed for this report come from reports from the DNR. These reports are generated when DNR officers report to the scene of a drowning. We are all partners in this project and hope to continue to work together to prevent all water-related deaths.

While data collection and analysis allow for a better understanding of drowning and the barriers to prevention, it is vital to acknowledge those impacted by these tragedies. Each set of data represents an individual who left behind a family and friends. This report is dedicated to those who lost their lives, the loved ones who remain, and those who are working diligently to prevent additional drownings in Indiana.

For more information or questions, please contact Allie Houston, Fatality Prevention Programs director AHouston@health.in.gov

WHO IS DROWNING

A total of 216 drowning deaths occurred in Indiana from 2018 through 2021. Most of these deaths occurred among males (79%), while 21% were among females. Nearly four males died for every female who drowned during the reporting time period. Figure 1 shows drowning deaths by sex.

Individuals age 29 to 37 years represented the age group with the highest number of deaths (n=34), followed by individuals between the ages of 1 and 10 years (n=33). Of the 216 total drowning deaths, 49 (23%) were younger than 18 years, and 167 (77%) were age 18 years and older. Figure 2 shows drowning deaths by age, and Figure 3 shows the number of drownings of children in Indiana.

Figure 1. 2018-2021 Drowning Deaths by Sex, Indiana (n=216)

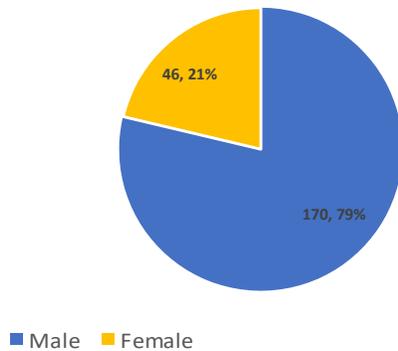


Figure 2. 2018-2021 Drowning Deaths by Age in Years, Indiana (n=216)

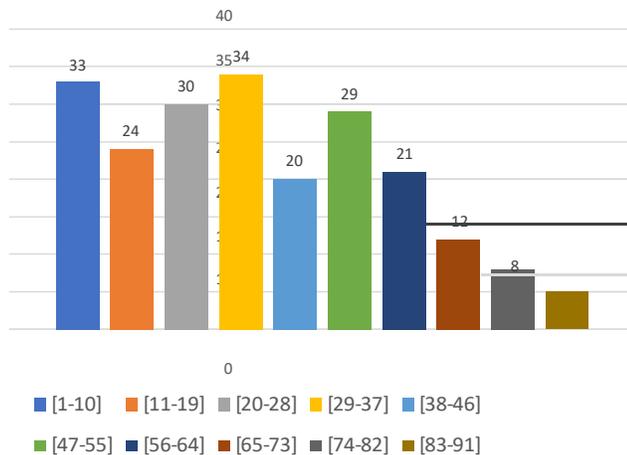
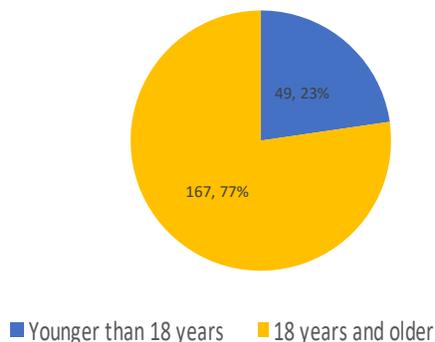


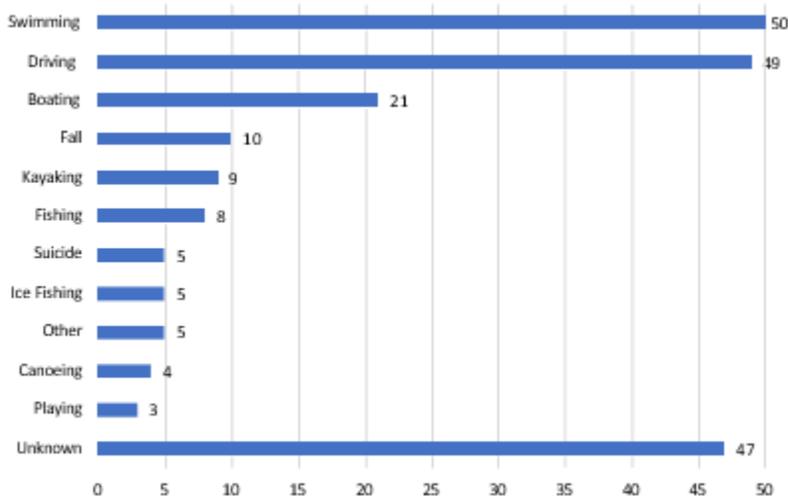
Figure 3. 2018-2021 Drowning Deaths for Adults and Children, Indiana (n=216)



ACTIVITIES PRIOR TO DROWNING

As expected, the most common activity prior to drowning was swimming (23%, n=50). Driving was the second-most-common activity prior to a drowning incident (23%, n=49), and boating was the third-most-common activity before the death occurred (10%, n=21). In 47 of the drowning deaths, the activity prior to drowning was unknown. Figure 4 shows a breakdown of the activities prior to the death. Other activities include one each of cliff jumping, scuba diving, snorkeling, tubing, and wake surfing.

Figure 4. 2018-2021 Drowning Deaths by Activity Performed at Time of Death, Indiana (n=216)



WHEN DROWNINGS OCCUR

Drownings occurred most often during the weekend, with Saturday (n=44) and Sunday (n=44) accounting for 40.7% of the total number of deaths. Figure 5 shows drownings by day of the week. July was the deadliest month in Indiana from 2018 through 2021, with 40 deaths (18.5%). June (n=34) and August (n=27) were the second and third deadliest, respectively.

This distribution aligns with previous DNR data trends. A [report](#) analyzing deaths from 2007 through 2017 also showed July to be the deadliest month. Figure 6 shows drownings by day of the week for 2018 through 2021, and Figure 7 shows drownings by day of the week for 2007 through 2021.

Figure 5. 2018-2021 Drowning Deaths by Day of Week, Indiana (n=216)

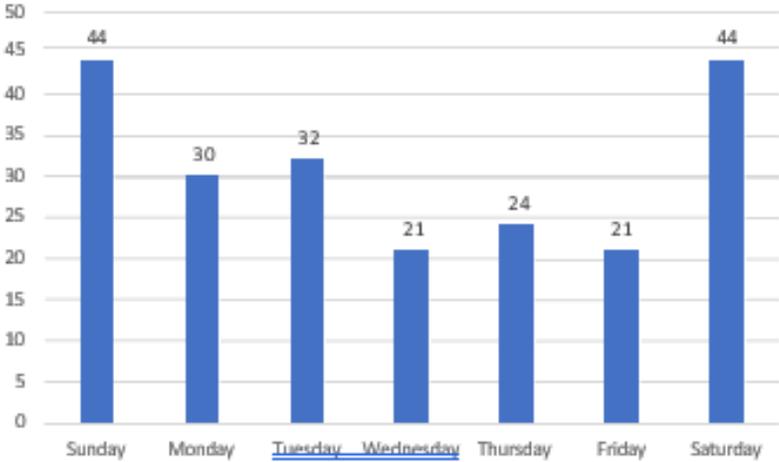


Figure 6. 2018-2021 Drowning Deaths by Month, Indiana (n=216)

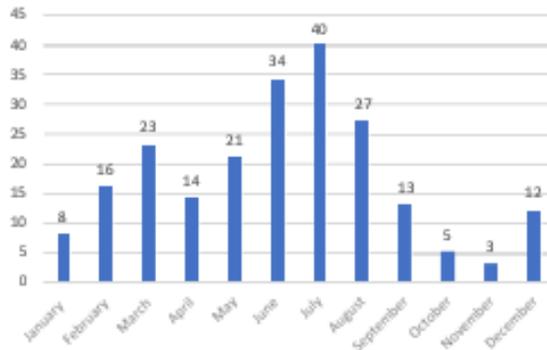
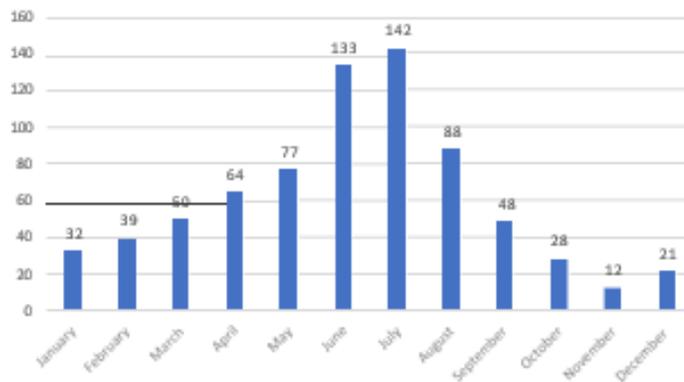


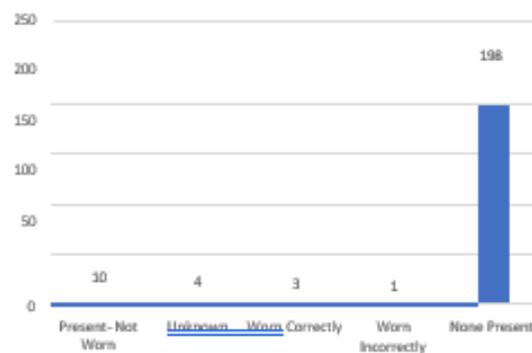
Figure 7. 2007-2021 Drowning Deaths by Month, Indiana (n=734)



CONTRIBUTING FACTORS

For 10 deaths, Personal Flotation Devices (PFDs) were present but not worn. For three deaths, the PFDs were present and worn correctly. For nearly all the deaths, no PFDs were present (92%, n=198). Figure 8 shows drownings by presence or absence of PFDs.

Figure 8. 2018-2021 Drowning Deaths by Personal Flotation Device Presence and Use, Indiana (n=216)



For children younger than 18 years, factors contributing to the deaths included water current and/or weather (n=13) and lack of adult supervision (n=9). For all ages, nearly a third of the total cases had toxicology tests that were positive for drugs and/or alcohol (n=61, 28%). Figure 9 shows drownings by contributing factors.

Figure 9. 2018-2021 Drowning Deaths by Known Contributing Factors, Children Younger than 18 Years, Indiana (n=49)

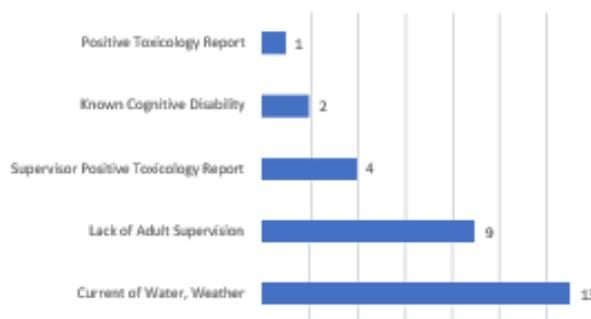


Figure 10 shows toxicology reports of drowning deaths in Indiana 2018-2021. A pending toxicology report means a toxicology screen was requested from the Department of Natural Resources and the results were still pending at the time of data collection and therefore not included in this report. A toxicology report not completed means no toxicology screen was requested for the death at hand. A negative report means a toxicology screen was done and substances were not found in the body. A positive report means a toxicology screen was completed and a substance or multiple substances were present in the body. Figure 11 shows the positive and negative toxicology results of reports requested and completed in Indiana drowning deaths, 2018-2021 and figure 12 shows the frequency of substances seen among positive toxicology reports.

Figure 10. 2018-2021 Drowning Deaths by Toxicology Reports, Indiana (n=216)

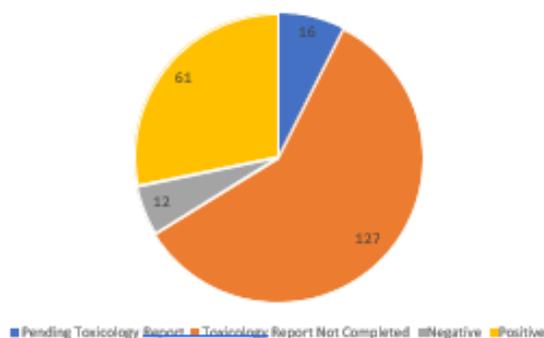


Figure 11. 2018-2021 Drowning Deaths by Completed Toxicology Reports, Indiana (n=73)

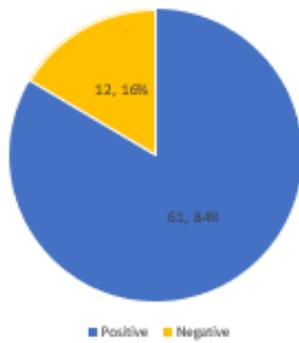
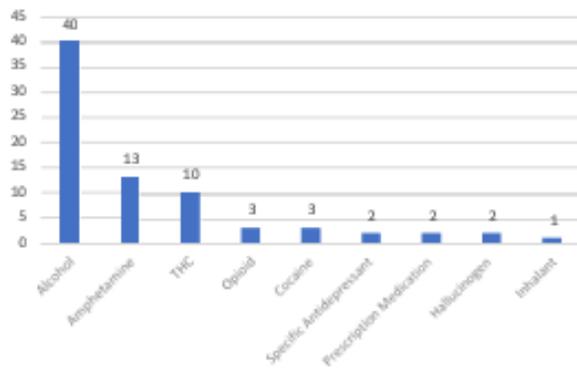


Figure 12. 2018-2021 Drowning Deaths by Substances Identified in Toxicology Reports, Indiana (n=76)



LOCATION OF DROWNINGS

Drowning deaths in Indiana from 2018-2021 most frequently occurred in lakes (31%, n=67). Rivers (25%, n=53) and creeks (12%, n=26) were the second- and third-most-common bodies of water in which deaths occurred. Most of these deaths happened on public property (73%, n=158). Deaths occurred on private property in 21% of cases (n=46). Figure 13 shows drownings by body of water, Figure 14 shows drownings by body of water for those under the age of 18, and Figure 15 shows drownings by property type.

The highest numbers of drownings occurred in Marion County (n=18), Lake County (n=16), and Porter County (n=14). Figure 16 shows drownings by the top 10 counties of incidence.

Figure 13. 2018-2021 Drowning Deaths by Body of Water, Indiana (n=216)

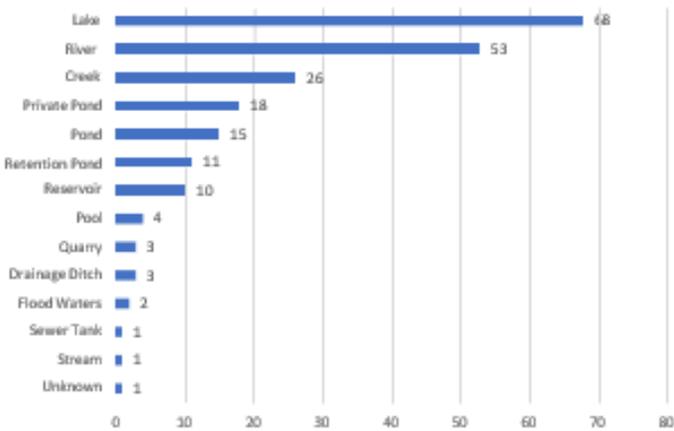


Figure 14. 2018-2021 Child Drowning Deaths by Body of Water, Indiana (n=49)

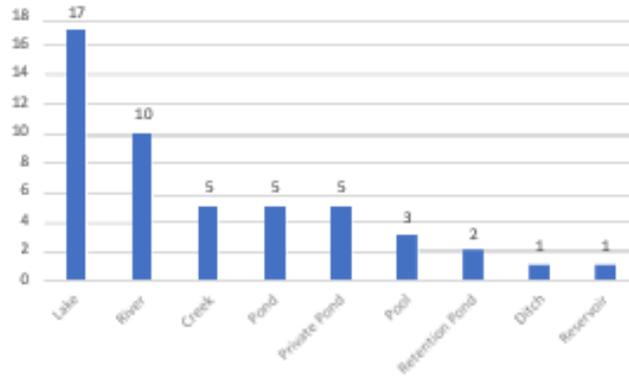


Figure 15. 2018-2021 Drowning Deaths by Property Type, Indiana (n=216)

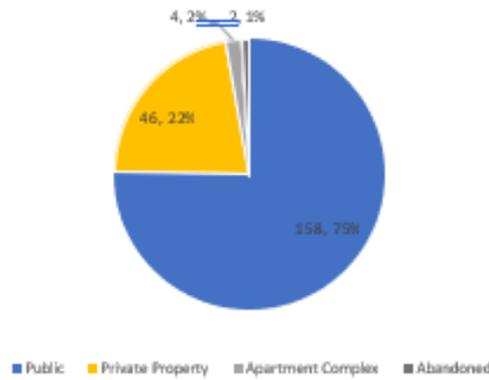
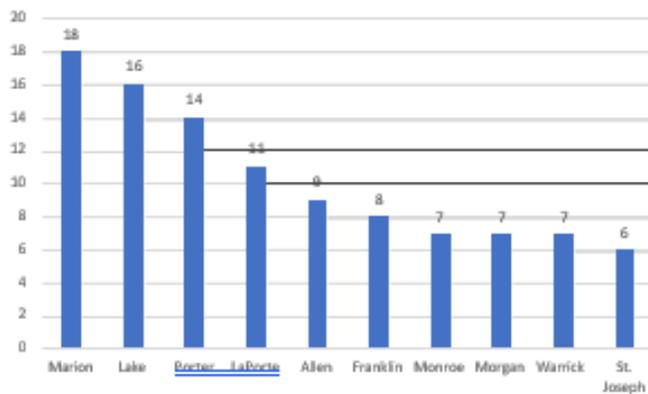


Figure 16. 2018-2021 Drowning Deaths 10 Most Common Counties, Indiana (n=103)

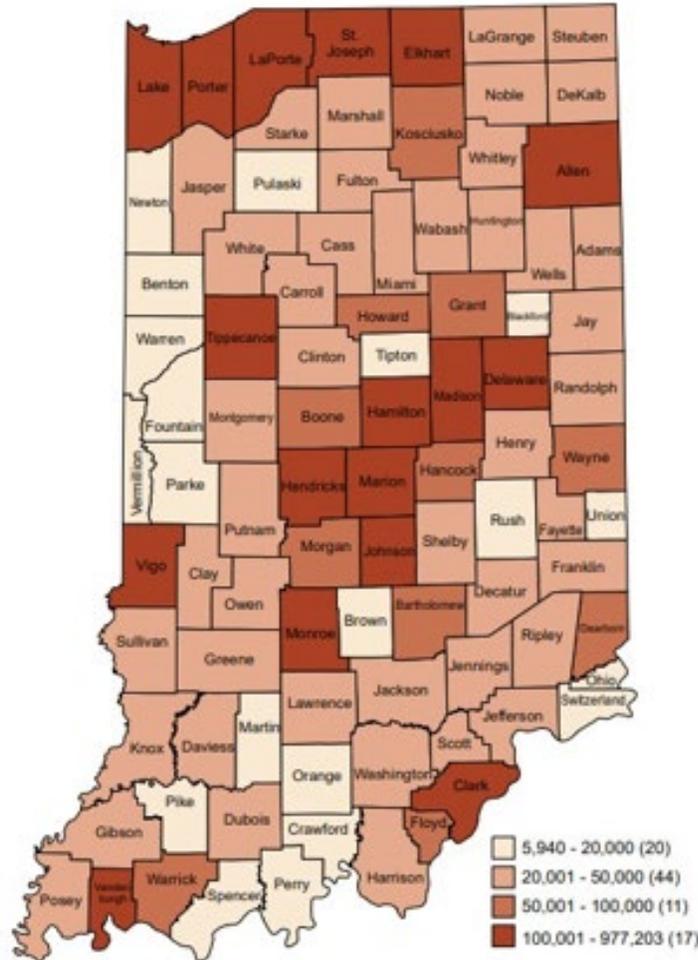


Although it cannot be seen in the maps below (Figures 17-19), it is important to acknowledge the presence of Lake Michigan north of Lake County and Porter County. Figure 17 is a map of major waterways throughout Indiana. Figure 18 shows population density in Indiana per county per 2020 census data. Figure 19 is a map of drowning deaths in Indiana (2018-2021), by county.

Figure 17. Map of Major Waterways in Indiana



Figure 18. Map of Population Density by County in Indiana (2020)



Source: Indiana Business Research Center, using the 2020 Census Redistricting Data Summary File from the U.S. Census Bureau, June 2022

Surveillance, Data Collection, and Data Entry

Accurate surveillance is the first step to developing effective preventive measures to reduce drowning deaths in Indiana. Surveillance and accurate data entry allow for a better understanding of drowning deaths, why they occur and the specific factors that play a role in Indiana.

A proper data collection system is necessary for tracking and reviewing drowning deaths throughout the state. The National Center for Fatality and Prevention ([NCFRP](#)) has launched a Drowning Death Scene Investigation and Child Death Review Project. Indiana is joining the NCFRP in this novel program as a pilot site to assist with the goals of developing a standardized investigation tool, enhance data collection in conjunction with current child fatality review programs, and determine the efficacy of a national drowning registry.

Current child fatality review teams will be vital in the process of data entry and case review. Along with data entry, the child fatality review teams will be able to properly review each child drowning death and determine specific recommendations for prevention. Without proper data collection, entry, and review, the preventive measures may not impact statewide drowning rates in the necessary manner.

COVID-19

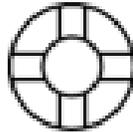
Drownings, along with other causes of death, have been impacted by the COVID-19 pandemic. A [special report](#) from the U.S. Centers for Disease Control and Prevention showed a 16.79% increase in unintentional drowning deaths in individuals aged 29 or younger in 2020. This is a critical finding, as unintentional drowning deaths have decreased each year from 2010 to 2019, with an average decrease of 1.81%. Along with an overall increase in 2020 in unintentional drowning deaths among those 29 or younger, an increase also was seen among specific populations. The largest increases were seen among males, African Americans, and those aged 20 to 24 years. This special report suggests an increased need for research to understand the impact of COVID-19 and reiterates the importance of swim lessons, water safety, and use of lifejackets.

PREVENTION

Reach



Throw



Row



Go



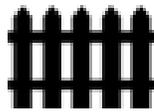
Learn CPR



Wear a Life Jacket



Adult Supervision



Use Barriers



Avoid Driving into Water



Avoid Alcohol



Learn First Aid



Respect all Weather



Respect Ice



Take Swim Lessons

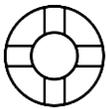
Try to get the victim to safety following these rescue techniques.

REACH



Extend an item to try to pull the victim to safety, such as a boat oar, tree branch, towel or any other item that may be extended to the victim. If an item is not available, lie flat near the water, grab the victim's wrists, and pull him or her to safety.

THROW



If the victim is unreachable, throw a life jacket or anything that will float to the victim. Pool rafts, spare tires, or any item that floats should be considered.

ROW



If a boat is available, row to the victim and use the oar to pull the victim to the back of the boat. The victim can either hold onto the oar or can be assisted by those in the boat if too weak to hold on alone. If using a powerboat, stop the engine and approach the victim from the downwind side.

GO



People without lifesaving training should not swim to a victim. Go get help instead. If you must swim, ensure you have a flotation device to keep between you and the victim.

LEARN CPR

Find a Class Near You

American Heart Association cpr.heart.org

1-800-AHA-USA-1

American Red Cross Redcross.org

1-800-RED-CROSS

WEAR A LIFE JACKET



Type I- inherently buoyant

Intended Use: Cruising, fishing or racing offshore, when boating alone or in stormy conditions



Type II- inherently buoyant or inflatable options

Intended Use: Inland cruising, sailing and fishing, boating in light craft



Type III- inherently buoyant and inflatable options

Intended Use: Supervised activities including sailing, water skiing, fishing, canoeing and kayaking during personal watercraft operation



Type IV- throwable device

Intended Use: Thrown to a victim overboard or to supplement a victim overboard with a personal flotation device present, not to be worn



Type V- special use and automatic inflation options

Intended Use: restricted use based on design (sailboard harness, belt pack, deck suit), must be worn to meet requirements

*Inflatable PFDs are not meant for children under the age of 16 ([Boat US Foundation](#))

ADULT SUPERVISION AND BARRIERS

- Constant visual contact is needed
- Actively supervise around water
- Designate an adult, use verbal handoffs

It only takes a few seconds for an accident to occur, and barriers can help save a life

- [CDC](#) recommends 4-sided fencing at least 4 feet tall
- The barrier should include a self-closing and self-latching gate with a latch out of reach to children
- Pool furniture should be away from the fence so it cannot be used as a step stool
- It is recommended that the state of Indiana follows CDC guidelines when creating laws and regulations regarding pool barriers

AVOID DRIVING INTO WATER

Never drive through flood waters. Driving into water can lead to hydroplaning and being swept from the roadway. Water may also disguise a roadway that has been washed away or that is unfit for driving.

AVOID ALCOHOL

Drinking alcohol around water can be a great risk. Intoxication can lead to:

- **Impaired judgment** - Alcohol alters your perception of risk and your abilities
- **Greater risk-taking behavior** - Alcohol removes inhibitions and increases the chances of risky behavior, including life-threatening behaviors
- **Lack of coordination** - Alcohol dulls senses and coordination and can make one sluggish
- **Impaired reaction time** - Alcohol is a depressant, which slows brain function and delay's reaction times

LEARN FIRST AID

Drowning victims are often rescued by family members or citizens. Knowing first aid can assist in saving a life.

RESPECT WEATHER

Weather can quickly change and impact water conditions. Currents, waves, and tides can make swimming difficult for even the most advanced swimmer. Respecting weather is a vital part of preventing drowning deaths.

Weather can also impact:

- Dehydration
- Hyperthermia
- Heat stroke or exhaustion
- Frost bite
- Hypothermia
- Sun burn

RESPECT ICE

- **No drinking** - Do not drink while on ice. Alcohol does not make you warmer.
- **Flowing water** - Do not step onto ice that is overflowing water.
- **Life jacket** - Always wear a life jacket while on ice.
- **Ice picks** - Always wear ice picks when ice fishing.
- **Ice thickness** - It take four inches of solid ice at minimum to hold an adult.

Check ice thickness frequently - Ice is not consistently the same thickness.

- **Nighttime** - Do not go onto ice when it is dark outside.
- **Pets and children** - Warn children not to retrieve pets from the ice.

TAKE SWIM LESSONS AND WATER SAFETY CLASSES

Swim lessons are critical to preventing drowning deaths of children and adults. While swim lessons cannot prevent drowning alone, they are an important part of ensuring individuals are confident and comfortable in and around water. The American Academy of Pediatrics ([AAP](#)) recommends water competency for all — the ability to be aware of, avoid, and survive common drowning situations. Basic swim lessons should ensure an individual is able to fully enter the water, resurface and exit the pool, float or tread water, swim 25 yards, and exit the water, with and without a ladder. It is important to acknowledge that water competency in one aquatic setting may not be transferred to another. The body of water, weather, current, and water temperature may impact one's swimming skills. After gaining confidence in a pool setting, it may be beneficial for individuals to gain experience swimming in clothes or a life jacket and practicing skills after unforeseen circumstances, such as falling into water (AAP). Not all swim lessons will be useful for every child or adult, and it is critical to gain knowledge about the swim lessons available prior to signing up for a class.

According to the [National Autism Association](#), the risk of death due to drowning is twice as high for those with an autism spectrum diagnosis than the general population. Many factors contribute to this disparity in mortality due to drowning. These factors may include wandering, seizures, and a general lack of water safety knowledge in communities. Adaptive swim lessons are a critical part of ensuring swim lessons are inclusive to all.

Traditional swim lessons may not be useful for those on the autism spectrum, those who are nonverbal, have sensory or motor challenges, or those with various other learning, physical, or mental disabilities. All children should have the ability to safely participate in supervised activities like pool parties, summer camps, and family vacations near water. Adaptive swim lessons may include one-on-one programs, shorter lessons, increased focus on motor skills, or other accommodations for an individual's abilities and needs.

Water safety for parents and caregivers is as important as swim lessons. Increasing knowledge around precautions that should be taken in and around water can help keep everyone safer in aquatic situations. Each preventive measure to decrease drownings should be considered during water safety lessons.

It is vital to acknowledge the many barriers and disparities that exist in preventive measures. A multitude of barriers exist that can hinder many from gaining necessary and lifesaving swim lessons. Cultural, religious, and racial barriers to swim lessons may contribute to the disparities seen among drowning and water competency.

Some families may be uncomfortable with swim lessons, as they are thought to require attire that may be against social norms. Religions that require modest clothing may feel swim lessons are not attainable. A [project](#) in Seattle, Ore., removed this barrier with the addition of gender-specific swim lessons. Offering time

for women to swim, for lessons or exercise, in a gender-specific setting allows for an increased level of comfort and the ability to gain water competency while accommodating religious beliefs.

[Historical racial barriers](#) and disparities regarding swimming and water competency continue to impact drowning deaths in the United States. Children in minority communities have disproportionately low swimming abilities; this is largely due to the fact that Black individuals in America were denied access to local swimming pools as the integration of public pools was mandated and many pools chose to privatize rather than partake in desegregation. Even today, socioeconomic status and social norms impact water competency. Those living in higher income and suburban areas are more likely to have access to pools and swim lessons. [USA Swimming Foundation](#) data shows disparities in swimming ability in children and parents among minority populations. This data shows 45 percent of Hispanic children and 64 percent of African American children have little to no swimming ability, in comparison to 40 percent of Caucasian children. Parental swimming ability can also factor into the water competency of children. USA Swimming Foundation data shows 62 percent of Hispanic parents, 78 percent of African American parents, and 67 percent of Caucasian parents have little to no swimming ability. These disparities in water safety and swimming ability, and the barriers which cause them, must be considered, and addressed.

Removing barriers, such as price and location, to swim lessons is a critical step in ensuring the proper preventive measures are taken to reduce drowning deaths. SwemKids is a non-profit school-based program based in Atlanta, Ga., that teaches swim lessons as part of a school's curriculum. This program partners with elementary and middle schools to ensure swim lessons and water safety are introduced at a young age. SwemKids provides transportation to local pools, where children are assessed on their swimming ability, learn important swimming techniques, are taught the history of swimming in their community, and are recognized for completing the course. This program removes multiple barriers to swim lessons, teaches vital safety information, and ensures children can have fun in water while remaining safe. An increase in programs such as SwemKids could greatly decrease the racial disparities seen regarding water competency and drowning rates. Ensuring all children have access to swim lessons and water safety classes is a critical step in preventing drowning throughout Indiana.