

Data Driven Strategies for Drowning Prevention

April 12, 2017



About the National Center

The National Center for Fatality Review and Prevention is a resource and data center that supports child death review (CDR) and fetal and infant mortality review (FIMR) programs around the country.

It is funded in part by Cooperative Agreement Number UG7MC28482 from the U.S. Department of Health and Human Services (HHS), Health Resources and Services Administration (HRSA), Maternal and Child Health Bureau (MCHB).



The Center aligns with MCHB priorities and performance and outcome measures such as:

- Healthy pregnancy
- Child and infant mortality
- Injury prevention
- Safe sleep

HRSA's overall vision for the Center

- Through delivery of data, training, and technical support, the Center will assist state and community programs in:
 - Understanding how CDR and FIMR reviews can be used to address issues related to adverse maternal, infant, child, and adolescent outcomes
 - Improving the quality and effectiveness of CDR/FIMR processes
 - Increasing the availability and use of data to inform prevention efforts and for national dissemination

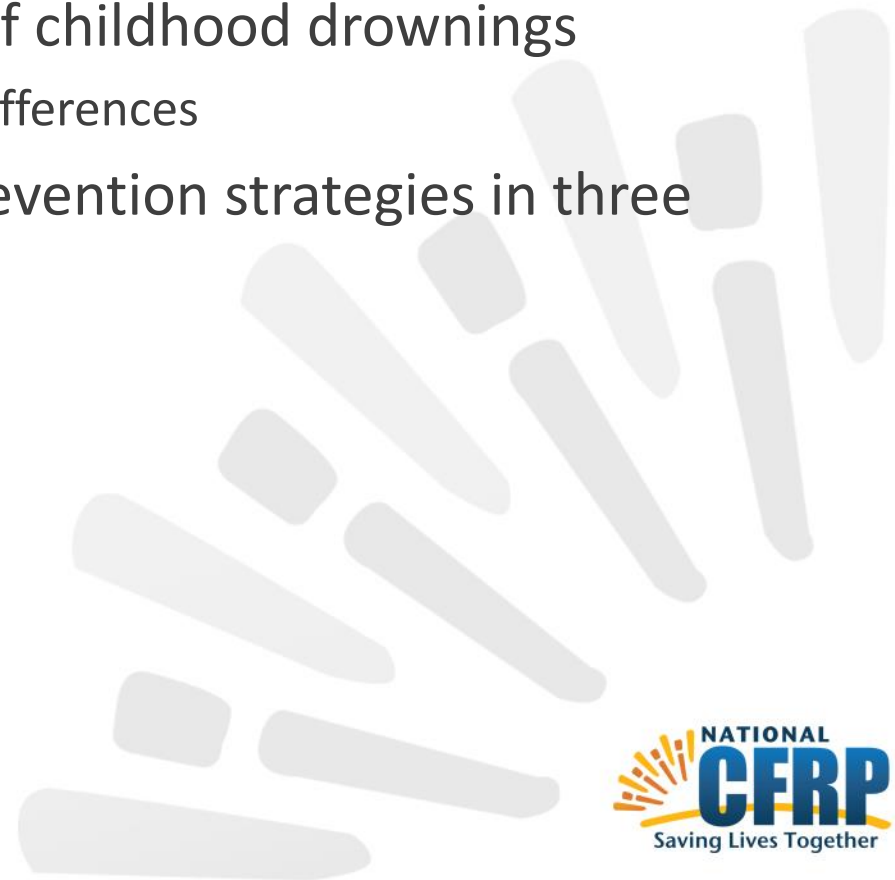
Ultimate goal: improving systems of care and outcomes for mothers, infants, children, and families



Webinar Goals

Participants will:

- Gain a general understanding of childhood drownings
 - Highlight age, race, gender and differences
- Understand evidence based prevention strategies in three settings:
 - In and around the home
 - Swimming pools
 - Open bodies of water



Speaker Panel



Diane Pilkey,
Health Resources
and Services
Administration



Angela Steel,
Safe Kids
Worldwide



Elizabeth
'Tizzy'
Bennett,
Seattle
Children's
Hospital



Linda Potter,
NCFRP
Q&A portion
of today's
webinar



Housekeeping

- **Webinar is being recorded and will be available with slides in a few days on our website: www.ncfrp.org. The Center will notify participants when it's posted**
- All participants will be muted in listen only mode
- Questions can be typed into the Question Window. Due to the large number of participants, we may not be able to get to all questions in the time allotted. The Center will answer all questions and post the answers on the NCFRP web site:

<https://www.ncfrp.org/>



Data Driven Strategies for Drowning Prevention

Angela Steel, BSN, CPN, MPH


Injury Epidemiologist, Safe Kids Worldwide




Dangerous Waters: Profiles of Fatal Childhood Drownings in the U.S. 2005-2014

**Background on Drowning Deaths:
What does the data show?**

Collaborations and Acknowledgments

- 
- This research was conducted in collaboration with the National Center for Fatality Review and Prevention and with the support of Nationwide's Make Safe Happen program.
 - SKW would like to acknowledge the input and support of the following individuals in the development and completion of the two reports referenced in this presentation:
 - Julie Gilchrist, Division of Unintentional Injury Prevention, National Center for Injury Prevention & Control, Centers for Disease Control and Prevention
 - Diane Pilkey, Emergency Medical Services for Children and Injury Prevention Branch, Maternal and Child Health Bureau, Health Resources and Services Administration, U.S. Department of Health & Human Services
 - Teri Covington, National Center for Fatality Review and Prevention at the Michigan Public Health Institute
 - Heather Dykstra, National Center for Fatality Review and Prevention at the Michigan Public Health Institute

Methodology

- 
- Conducted in-depth data analysis to explore national trends and circumstances surrounding fatal drownings among children ages 0-17 years of age for the years 2005 to 2014.
 - National fatality data from the National Child Death Review Case Reporting System (CDR-CRS)
 - Supervision, pool barriers, rescue and resuscitation and emergency services.
 - State and national fatality data from the Centers for Disease Control and Prevention's WONDER Online Database
 - Conducted a survey of 1,000 parents of children 1-12 years to understand attitudes, beliefs and behaviors of parents related to water safety.

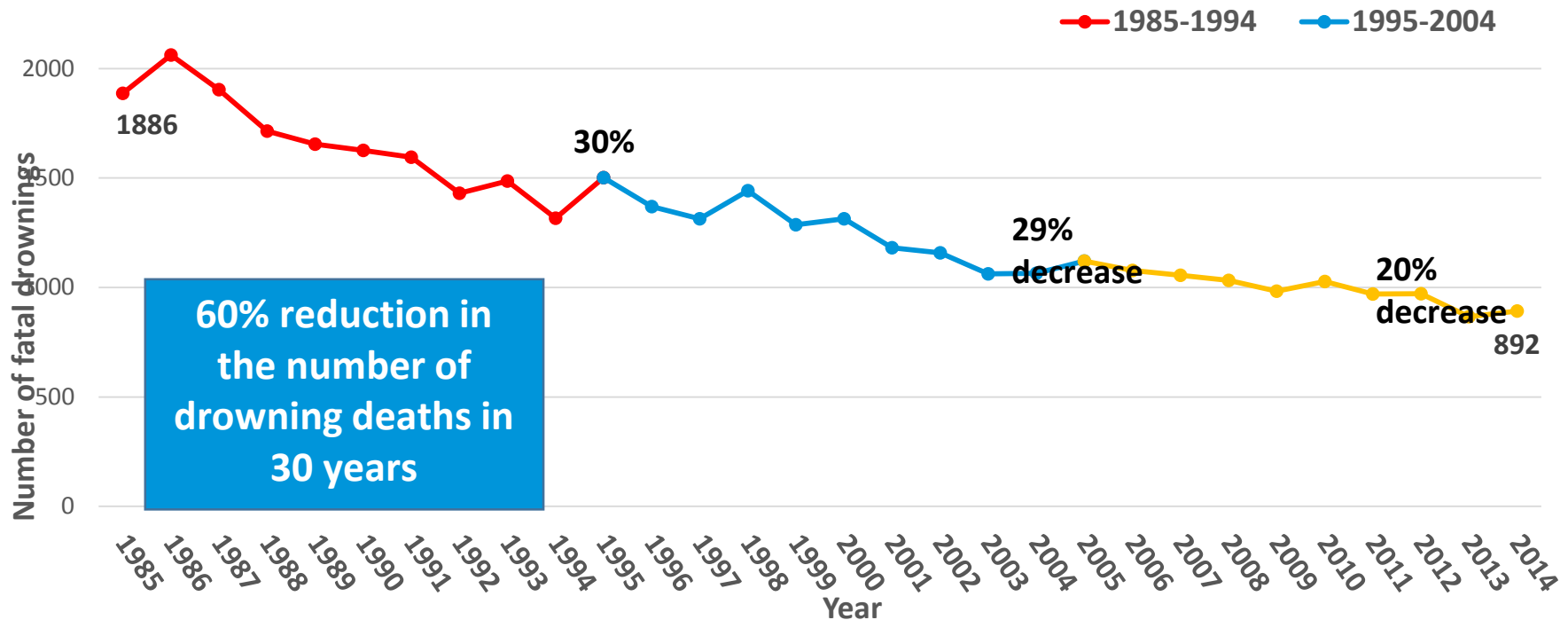


Datasets

- Timeframe: 2005 to 2014
- Age range: 0 to 17 years
- National Child Death Review Case Reporting System (CDR-CRS)
 - Supervision, pool barriers, rescue and resuscitation and emergency services.
- Centers for Disease Control and Prevention's WONDER Online Database
 - State and national fatality data

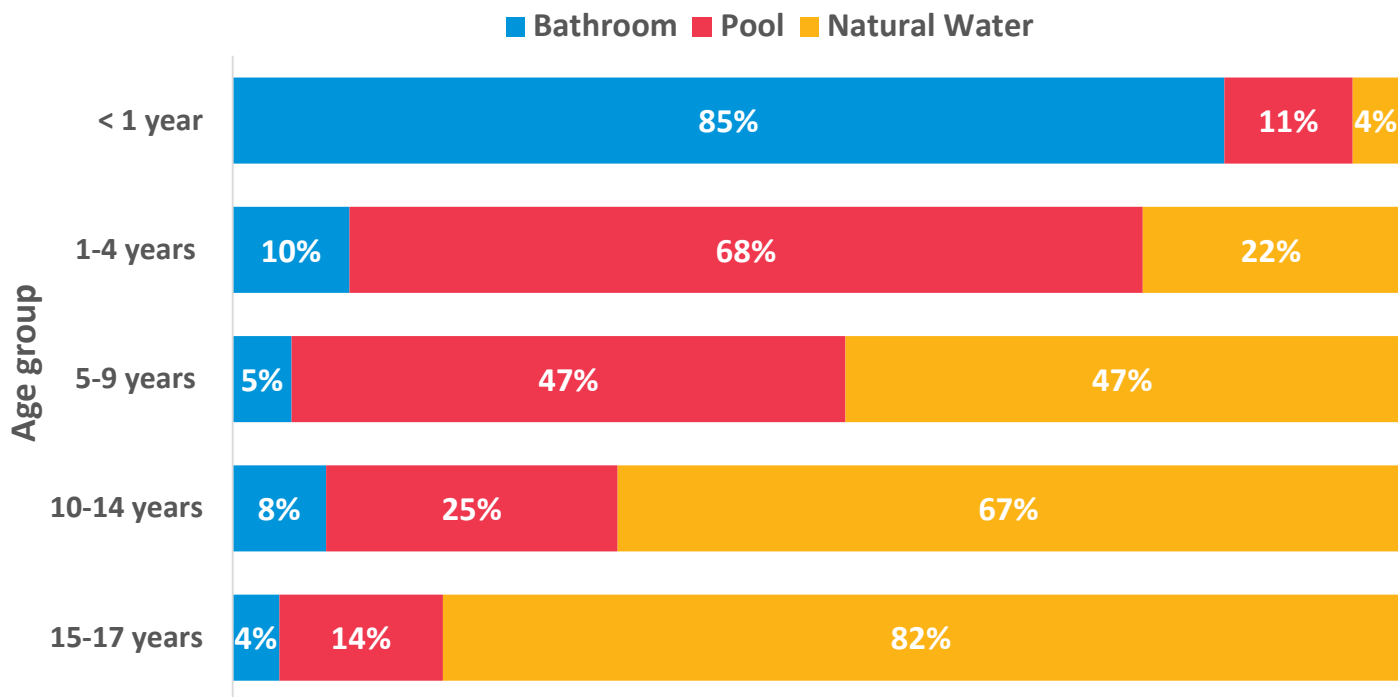
Comparison of CDR-CRS and CDC Drowning Data Demographics		
	Proportion (%)	
Age	CDR-CRS (N=3,328)	WISQARS (N=9,772)
<1 year	7.8	6
1-4 years	50	52.8
5-9 years	14.4	13.8
10-14 years	11.8	11.4
15-17 years	16	15.9
Gender		
Male	68.9	71
Female	30.5	29
Race		
White	65	72
Black	19.8	23.8
Native Hawaiian, Pacific Islander, Asian	3.8	3.9
American Indian	1.4	<1
Multi racial	2.3	
Missing	7.4	7.4

Fatal Drownings Among Children From 1985 to 2014¹

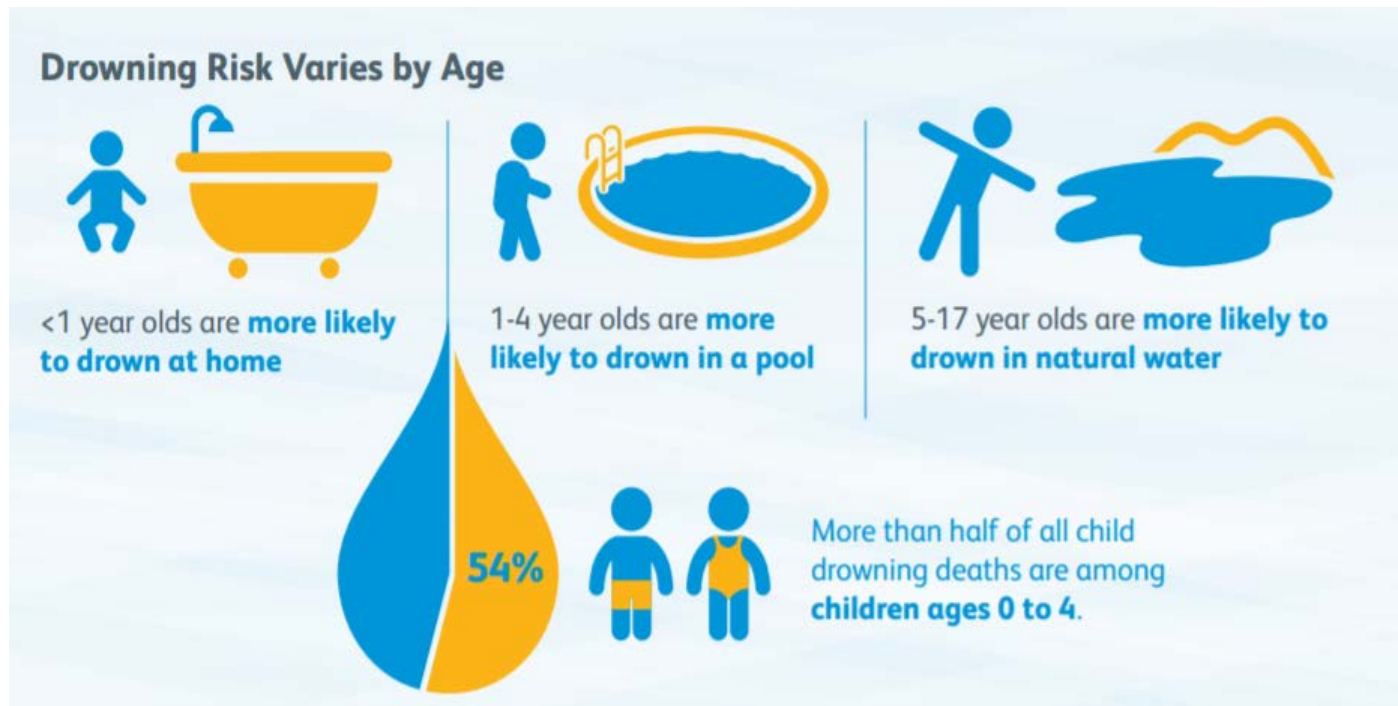


Proportion of Fatal Drownings by Age and Location

From 2005 to 2014¹



Age is a key determinant



DROWNINGS IN AND AROUND THE HOME

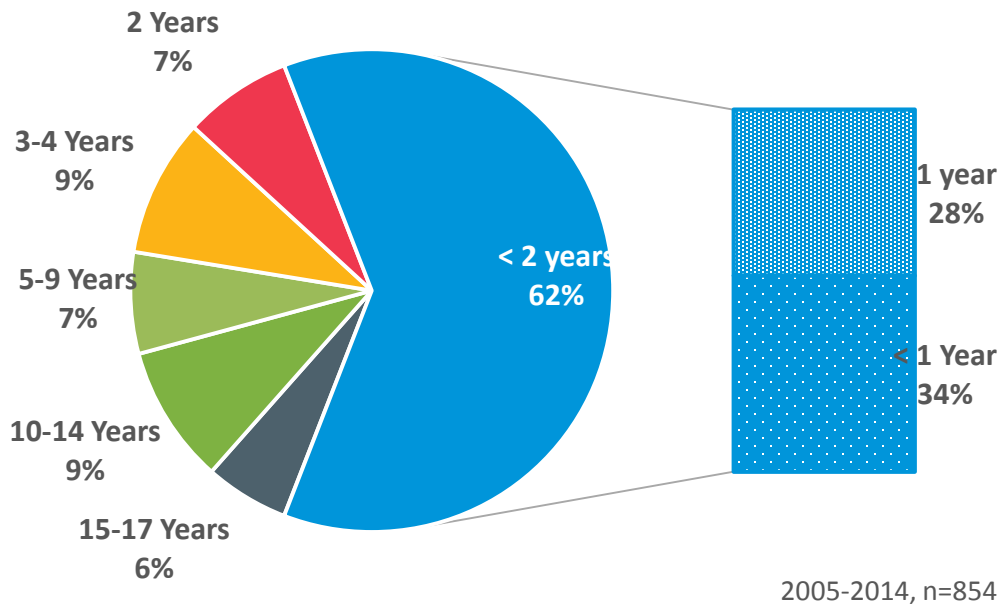


Drownings In and Around the Home

- Infants are at greatest risk for drowning in this setting
- Buckets, wells, cisterns, septic tanks, decorative ponds, toilets and bathtubs common hazards
- Bathroom– bathtub– accounts for most deaths



Bathtub Drownings¹

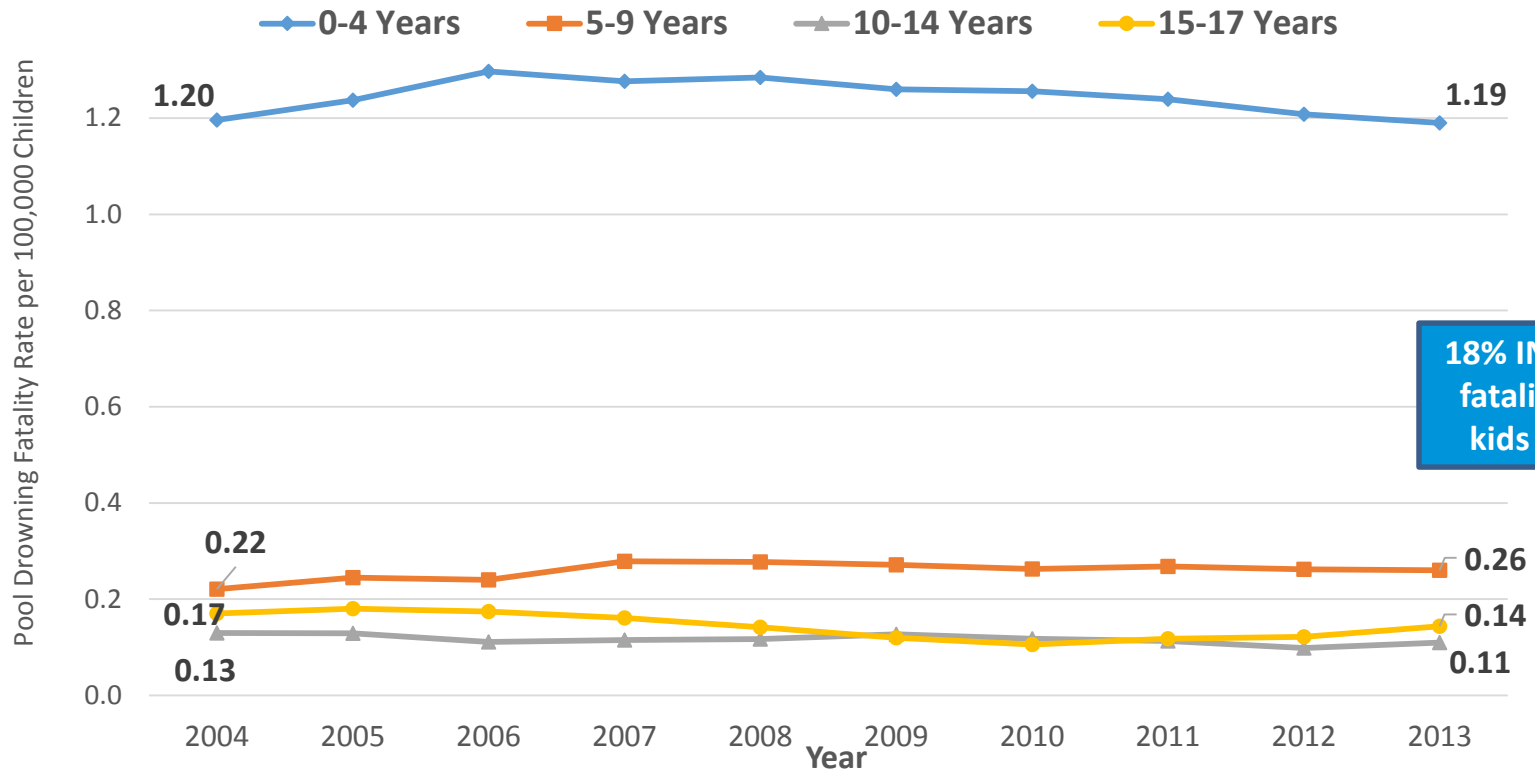


- Number of deaths over time: 54% *reduction* for infants, 26% *increase* for children 1-14 years.
- Children under 2 years drown at **13 times** the rate of those over 2 years.
- 85% occurred in child's own home
- Inadequate supervisions a factor in 75% of deaths.
- CPR initiated in 83% of cases and 911 called in 88% of cases.

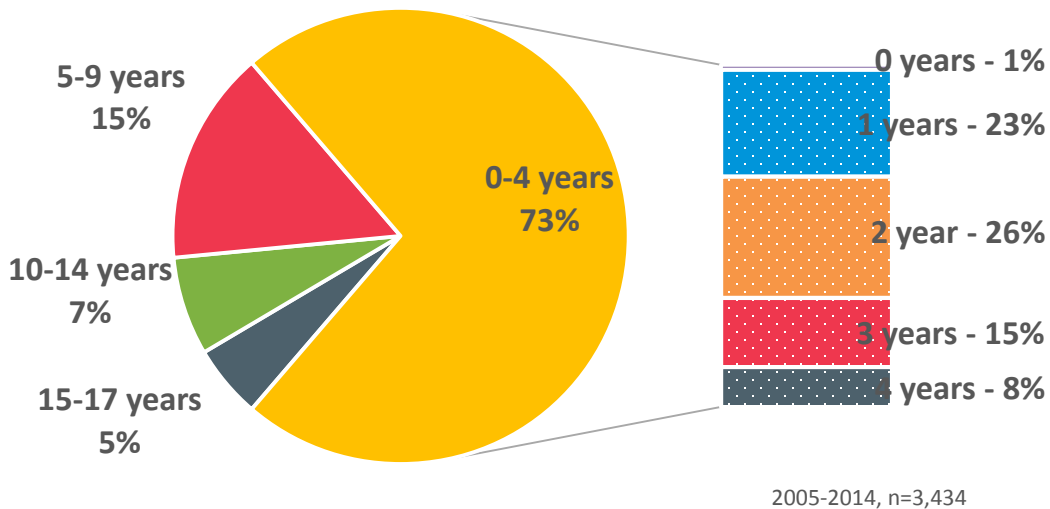
DROWNINGS IN POOLS



Fatal Drowning Rate Among Children In Pools From 2004 to 2013¹

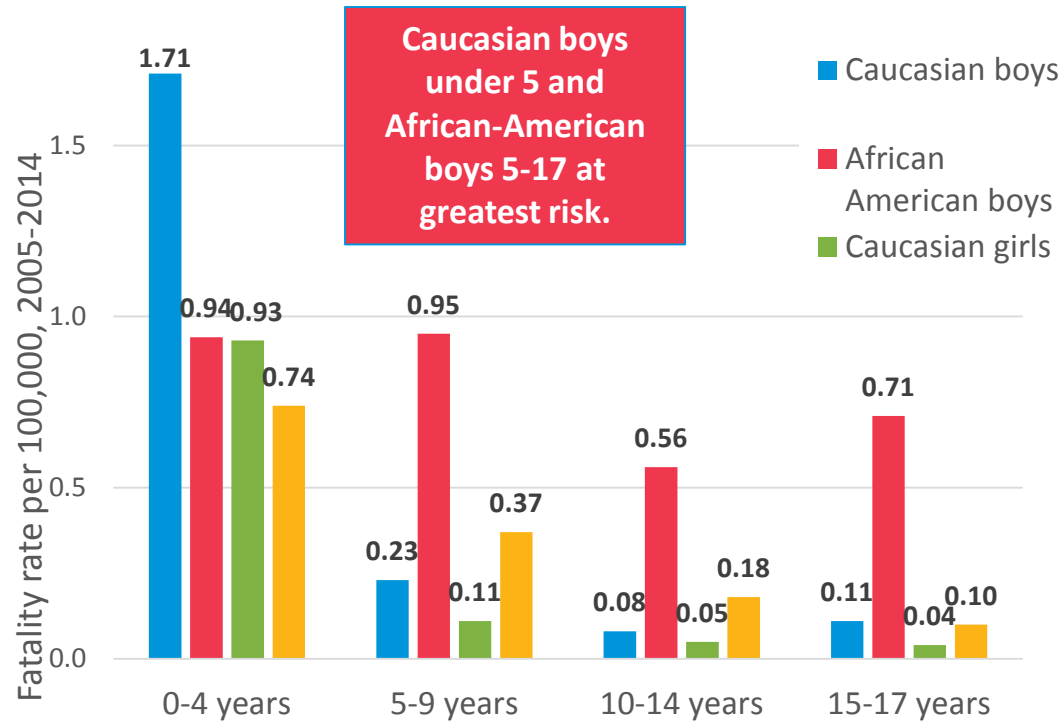


Age and Gender Affect Risk in Pools¹



- Fatality rate for children **1-2 years**:
 - **8** times higher than 5-9 years
 - **15** times higher than 15-17 years
 - **23** times higher than infants
- **Boys** more likely to drown than girls and gender gap widens with age:
 - Boys **under 10** years have **twice** the risk of girls the same age.
 - Boys **10-17** years have **three** times the risk of girls the same age.

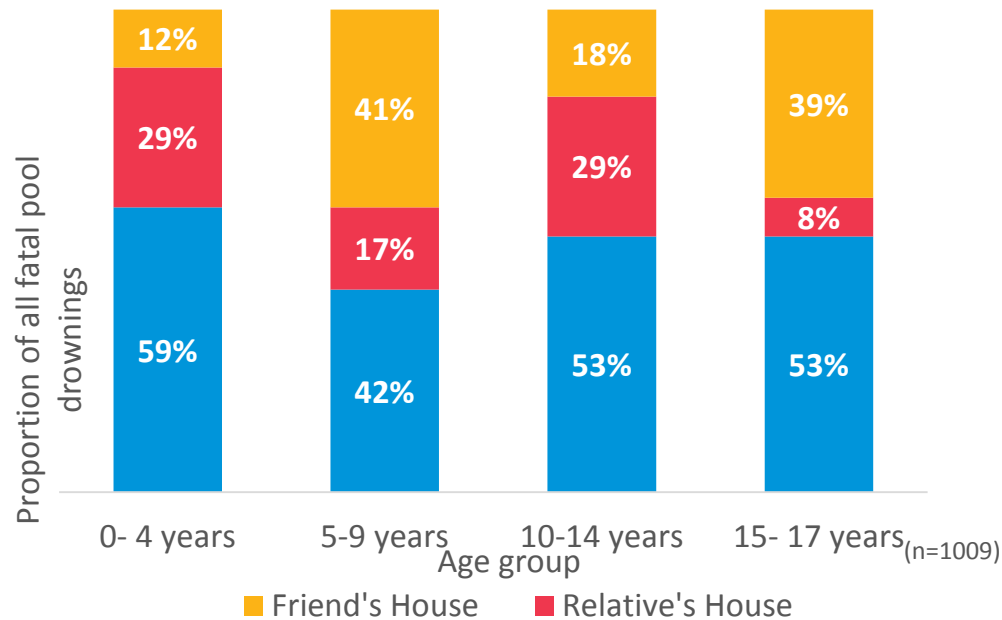
Racial Disparities in Pool Drownings¹



- Among those **under 5**, Caucasian children drown at higher rates.
- Among those **5-17 years**, African-American children drown at **4.5** times higher rates.
- Among African-Americans, the fatality rate is **2.6** times higher for **boys** than girls.
- Among Caucasians, the fatality rate is only **1.9** times higher for **boys** than girls.

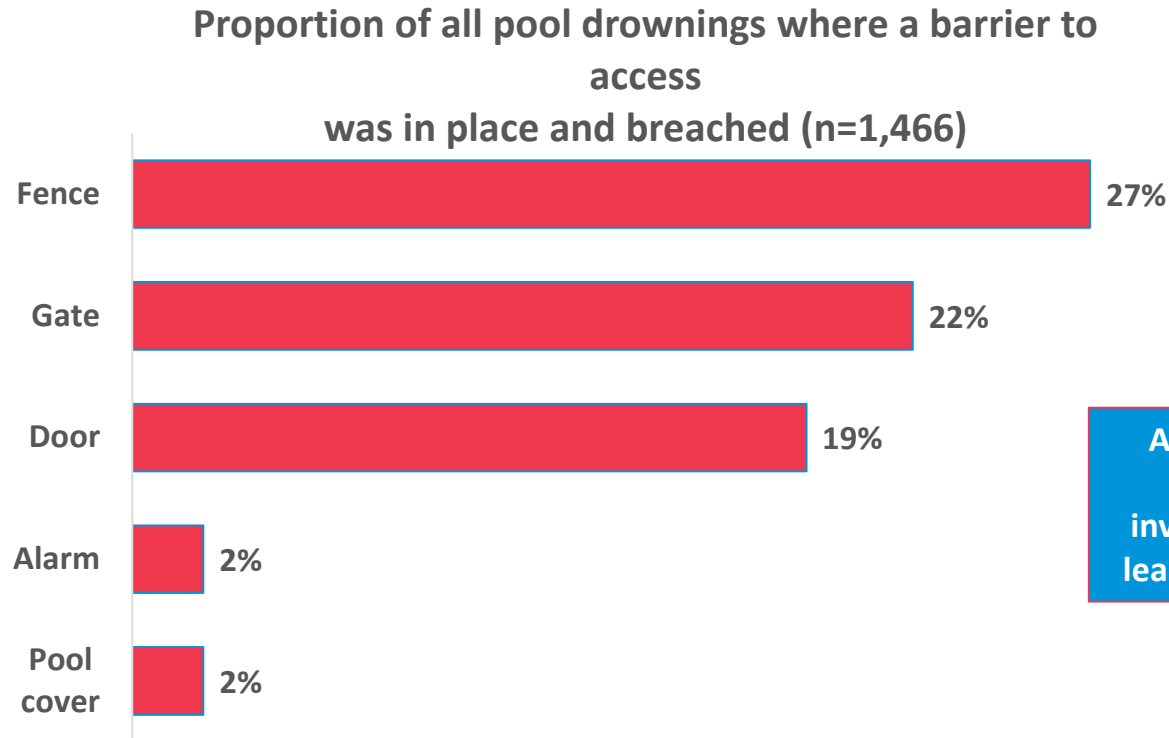
Circumstances Surrounding Pool Drownings¹

Location of Fatal Drowning by Age Group From 2005 to 2014



Children ages 5-9 years were equally likely to drown at a friend's home as their own.

Barriers Around Pools¹



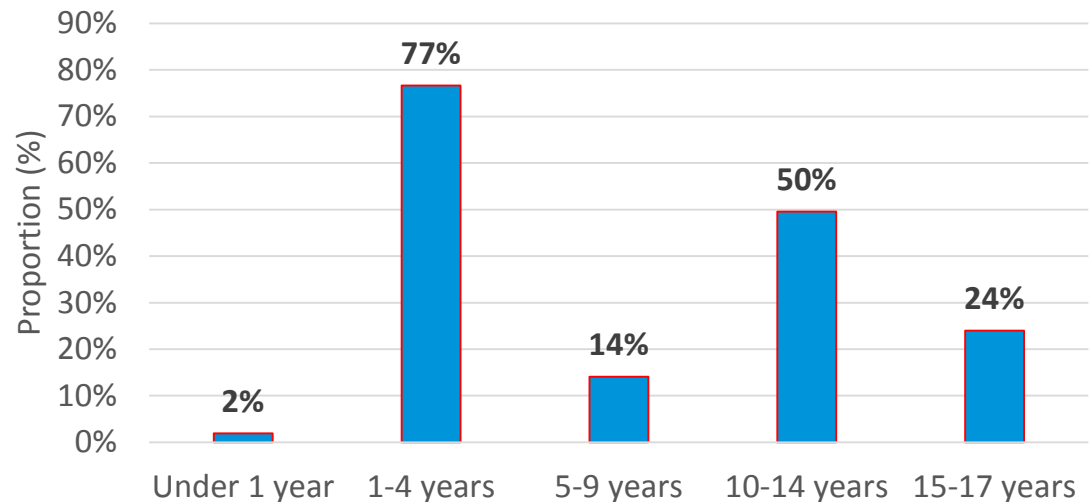
Almost half of all pool drowning fatalities involved the failure of at least one physical barrier.

Supervision¹

- Almost HALF of the time, they were not supervised by an adult.
- If they were supervised, in HALF of these cases the supervision was not adequate due to drugs, alcohol or other distractions.

Children 1-4 years of age were least likely to be supervised at time of pool drowning death.

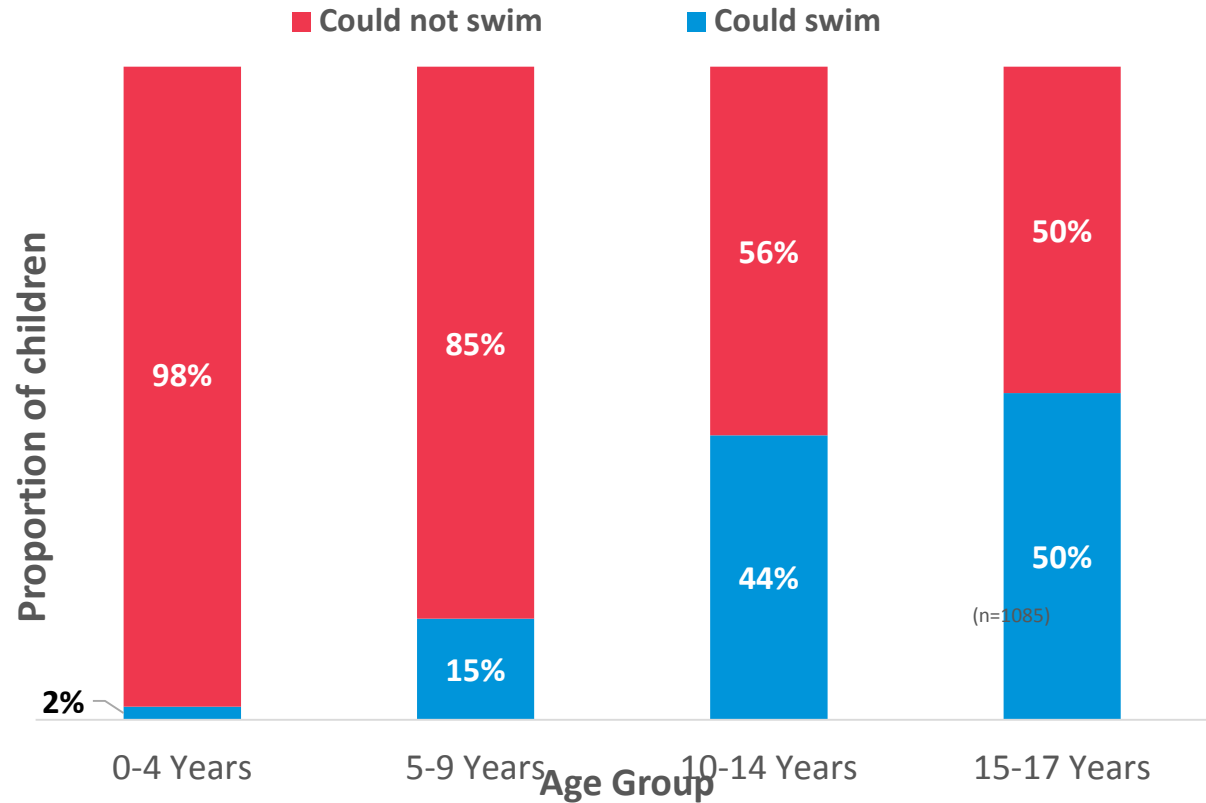
**Proportion of Fatalities With No Supervision
By Age Group**



Swimming ability¹

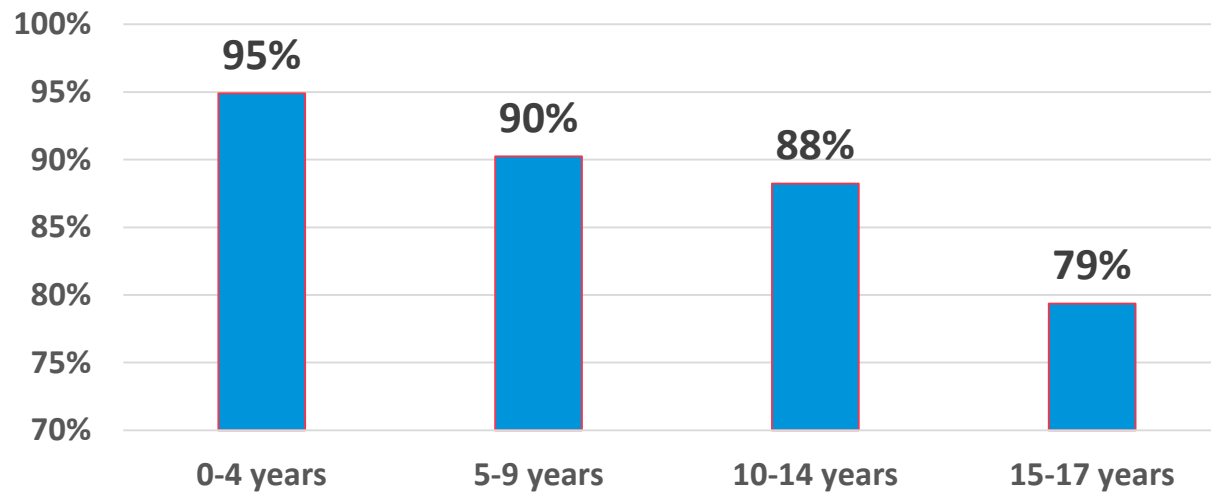


Almost half of kids 10-17 years who drown in pools reportedly could swim.



Rescue and Resuscitation Around Pools¹

Proportion of Drowning Deaths When CPR
Initiated
By Age Group



With increasing age, decreasing likelihood that CPR was attempted during a pool drowning.

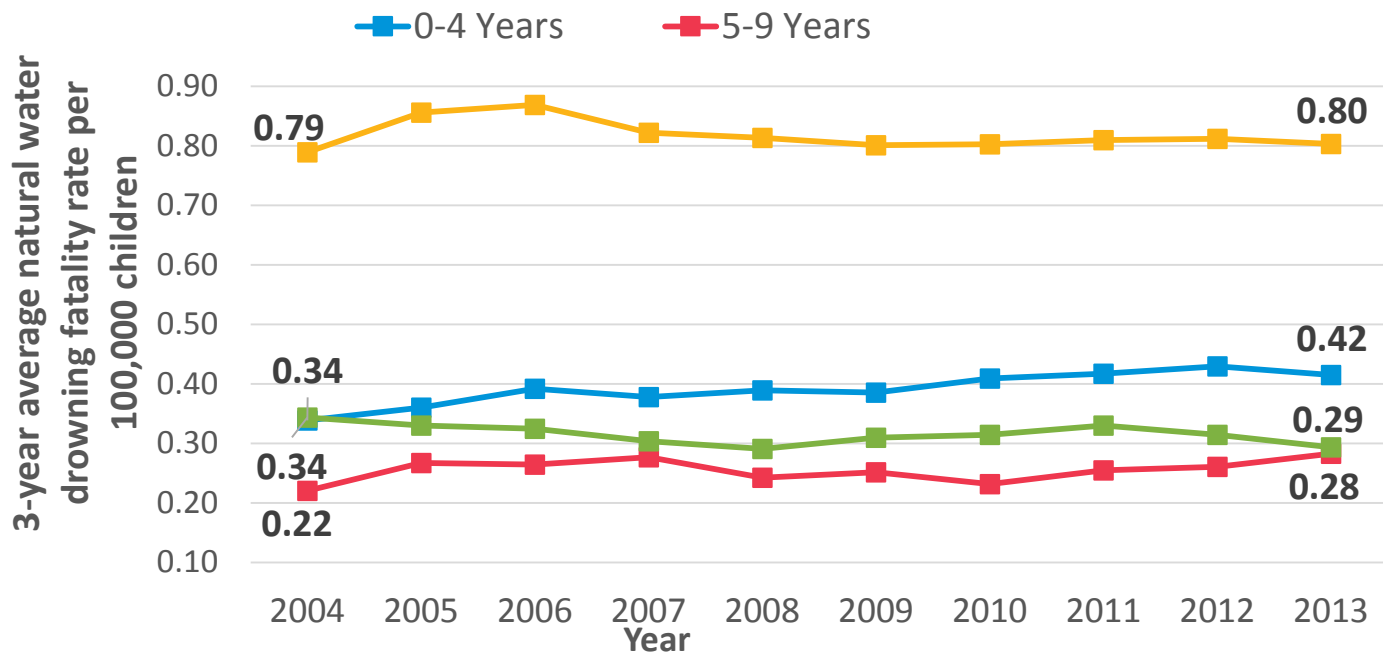
DROWNINGS IN NATURAL WATER



Natural Water Drowning Fatalities Over Time¹



Drowning Fatality Rates Among Children From 2004 to 2015



24% increase for children 0-4 years and 27% increase for 5-9 years.

Natural Water Drownings¹

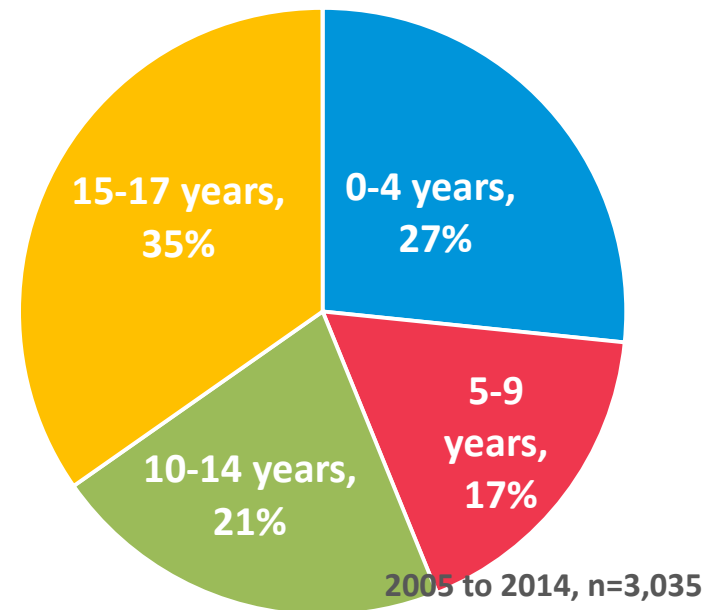


More than **HALF** of deaths were 10 years of age or older, but children under 5 still account for **27%** of these deaths.

Boys account for **82%** of deaths in natural bodies of water and drown at **4 times** the rate of girls.

Only **7%** of drownings in natural water between 2005 and 2014 involved watercraft.

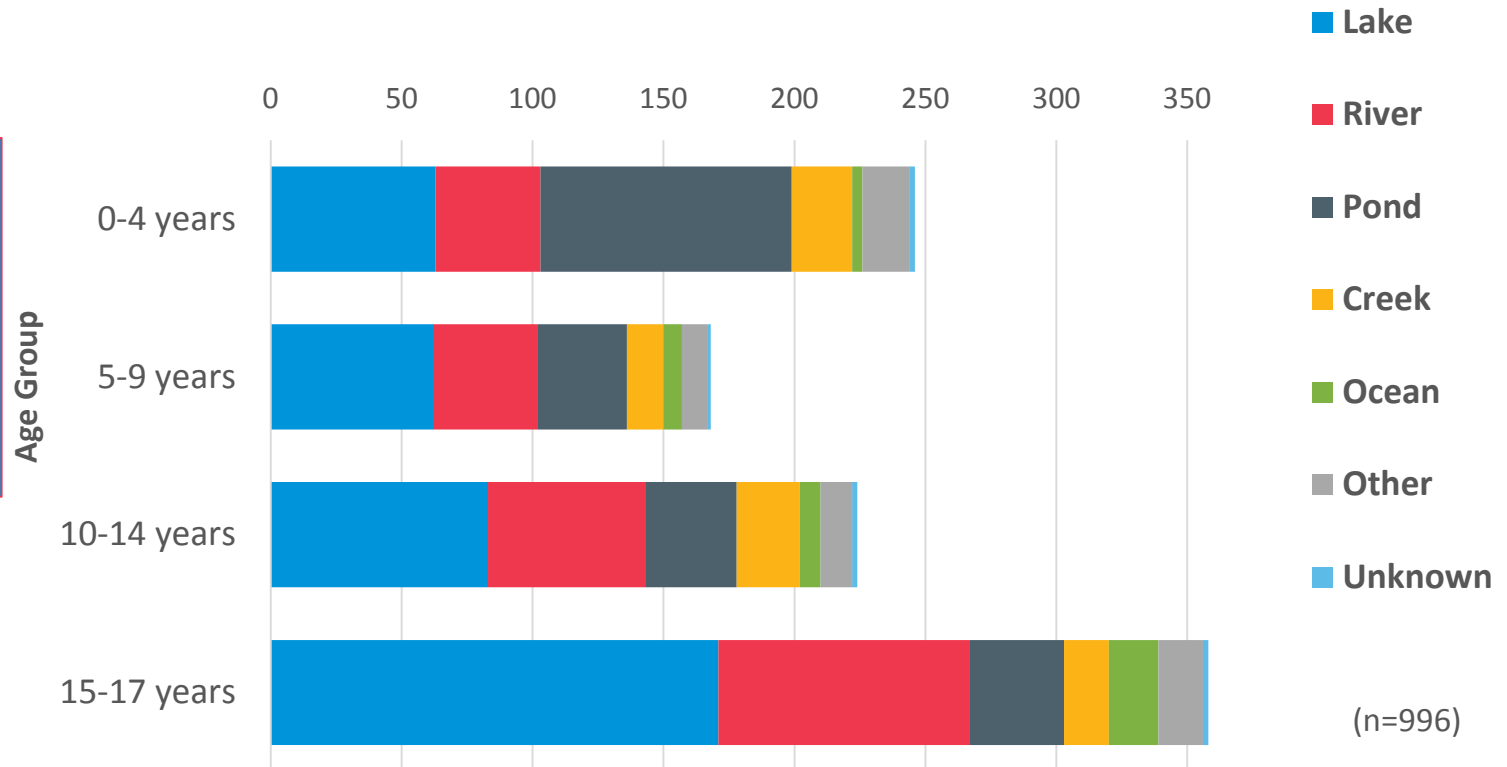
Proportion of Natural Water Drowning Fatalities
By Age Group From 2005 to 2014



Natural Water Drownings¹



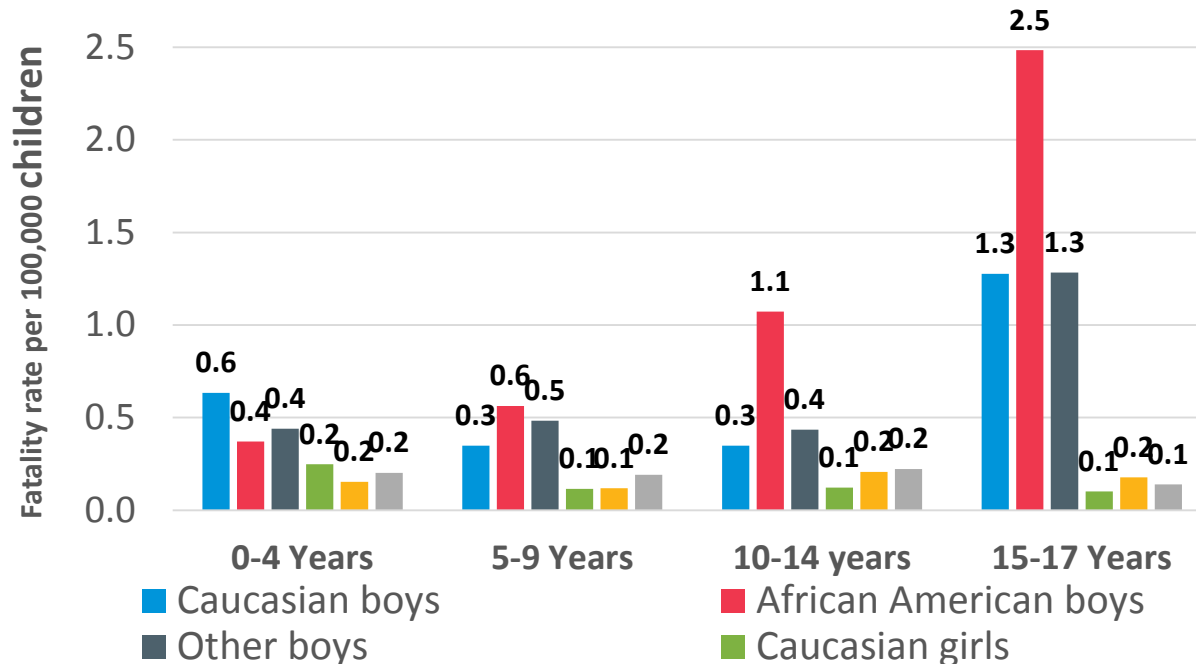
Number of Fatal Drownings by Age Group and Location
From 2005 to 2014



Older kids are more likely to drown in **lakes and rivers**, while younger children more likely to drown in **ponds**.

Racial Disparities in Natural Water Drownings¹

Natural Water Drowning Fatality Rates by Age Group and Race
From 2005 to 2014



Among teens, the fatality rate for African American boys is **2 times** the rate of Caucasian boys, **14 times** the rate of African-American girls, and **24 times** the rate of Caucasian girls.

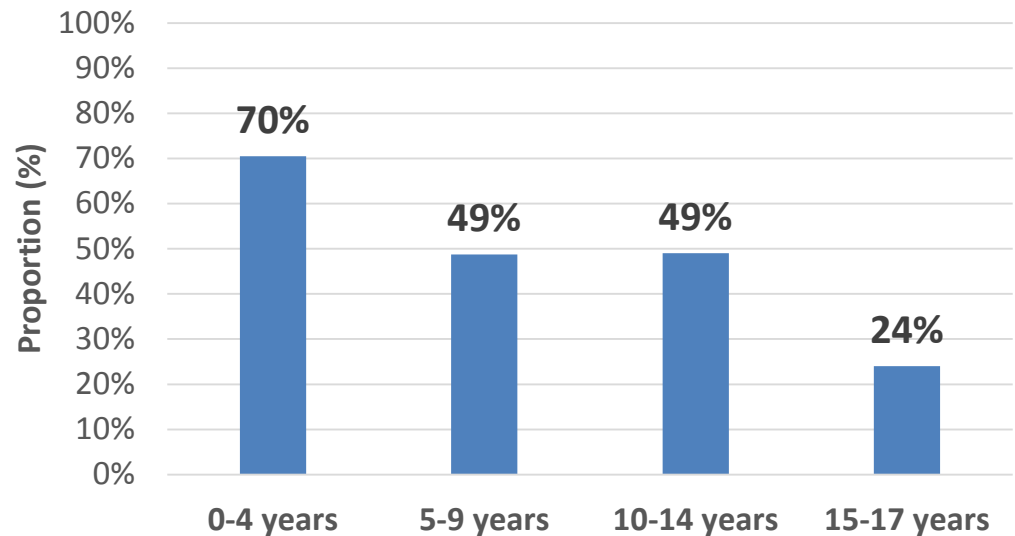
Circumstances Surrounding Natural Water Drownings¹



62% of natural water drowning deaths occurred in the presence of an adult, but in **25%** of cases supervision was compromised by drugs or alcohol, distraction, sleepiness, injury or illness.

Drugs or alcohol were detected in the system of **11%** of the children who drowned in natural bodies of water between 2005 and 2014.

Proportion of Natural Water Drownings When CPR
Initiated
By Age Category From 2005 to 2014



Evidence Based Prevention: How can we protect our children?

Layers of Protection



- Barriers
- Supervision
- Water Safety Education
- Rescue and Resuscitation

In and Around the Home

- Top Tips:
 - Keep young children within arm's reach when around water.
 - Avoid distraction.
 - Empty all tubs, buckets, containers and kiddie pools IMMEDIATELY after use and store them upside down.
 - Know what to do in an emergency.
 - Learn CPR and basic water rescue skills.

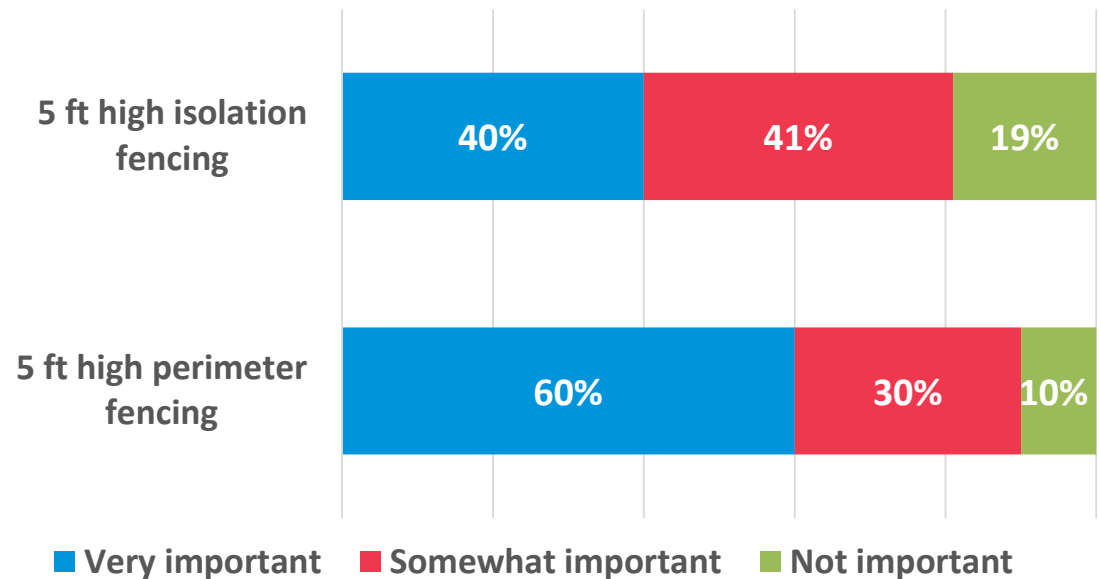


Barriers Around Pools²



- Components of effective barr
 - Completely separate the pool the house and yard
 - 4-sided fencing
 - At least 4 feet high
 - Self-closing and self-latching g
 - Door alarms

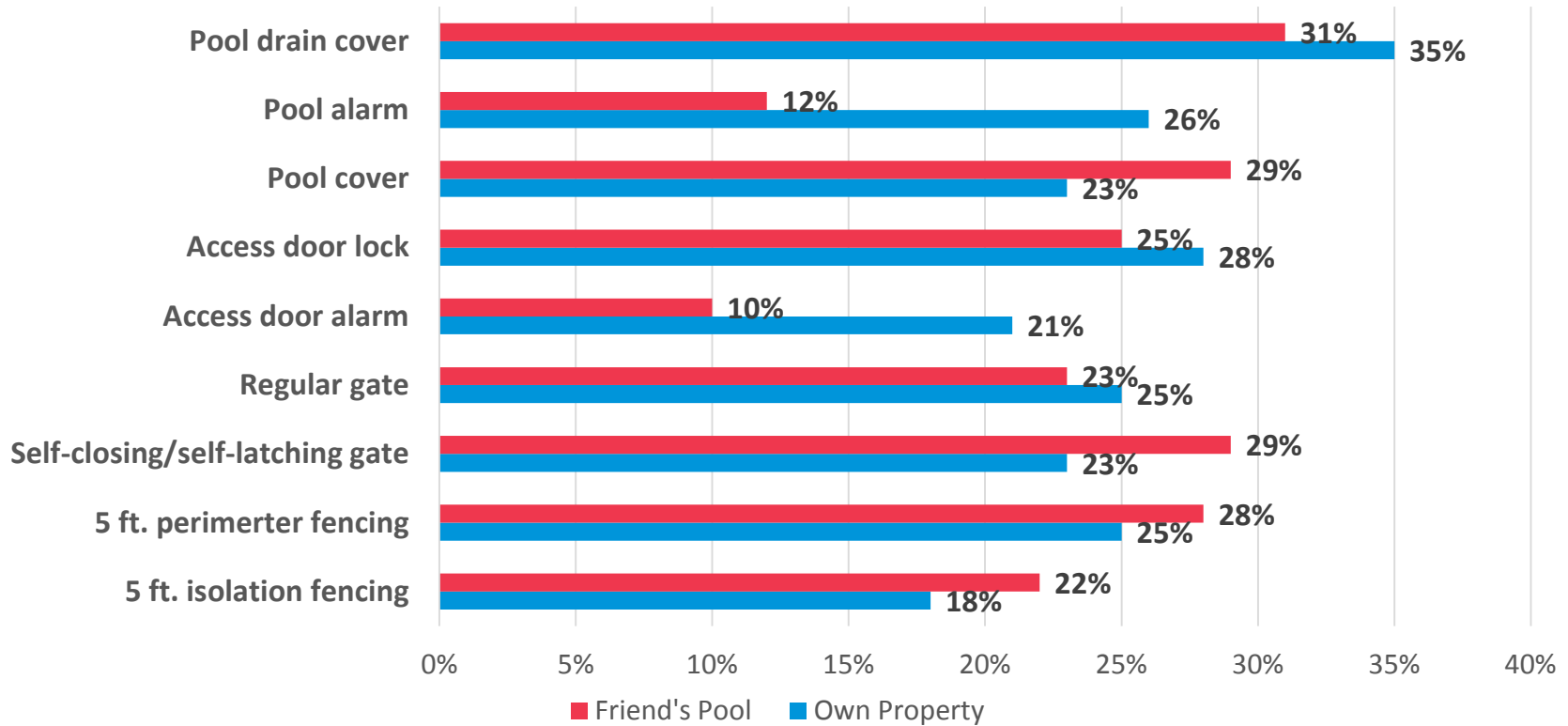
Pool Owners' Perceived Importance of Barrier Fencing



Barriers Around Pools²



Presence of Pool Barriers Reported by Parents



Supervision Around Pools²

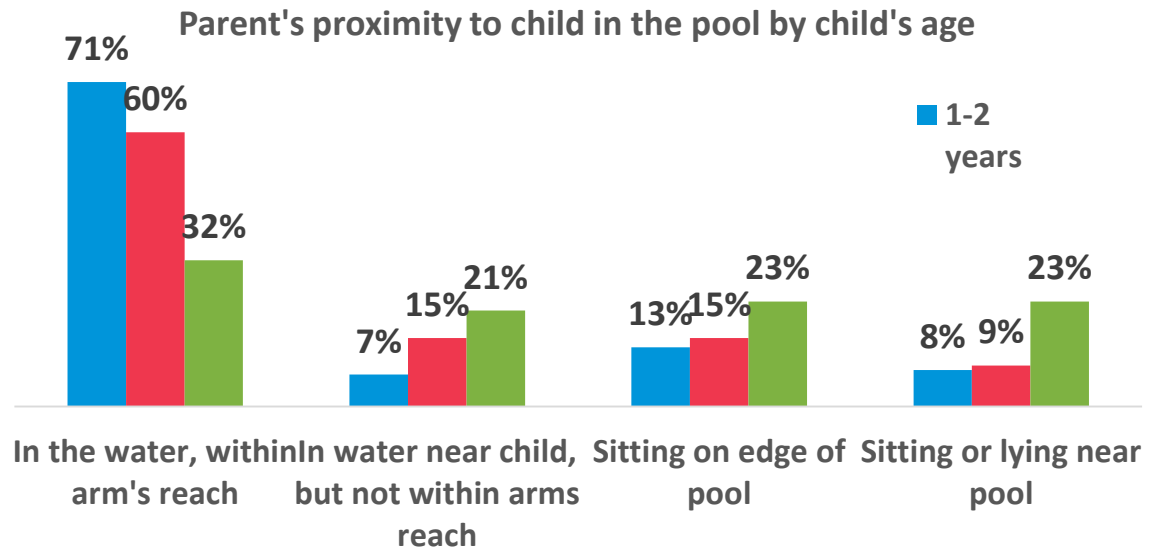


- Appropriate supervision means:

- Within arms' reach for young children
- Constant visual supervision for all children

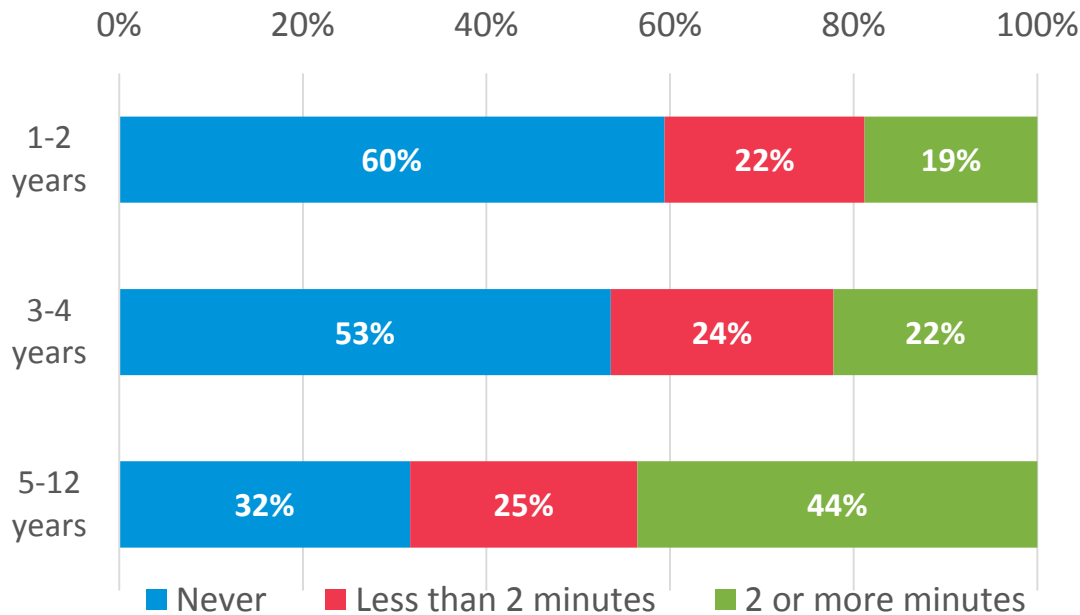
48% of parents surveyed think that if their child was drowning nearby, they would hear him or her splashing, crying or screaming.

56% of parents surveyed think that a lifeguard is the primary person responsible for supervising their children at the pool.



Supervision Around Pools²

Proportion of parents who have left their child without supervision at a pool by age



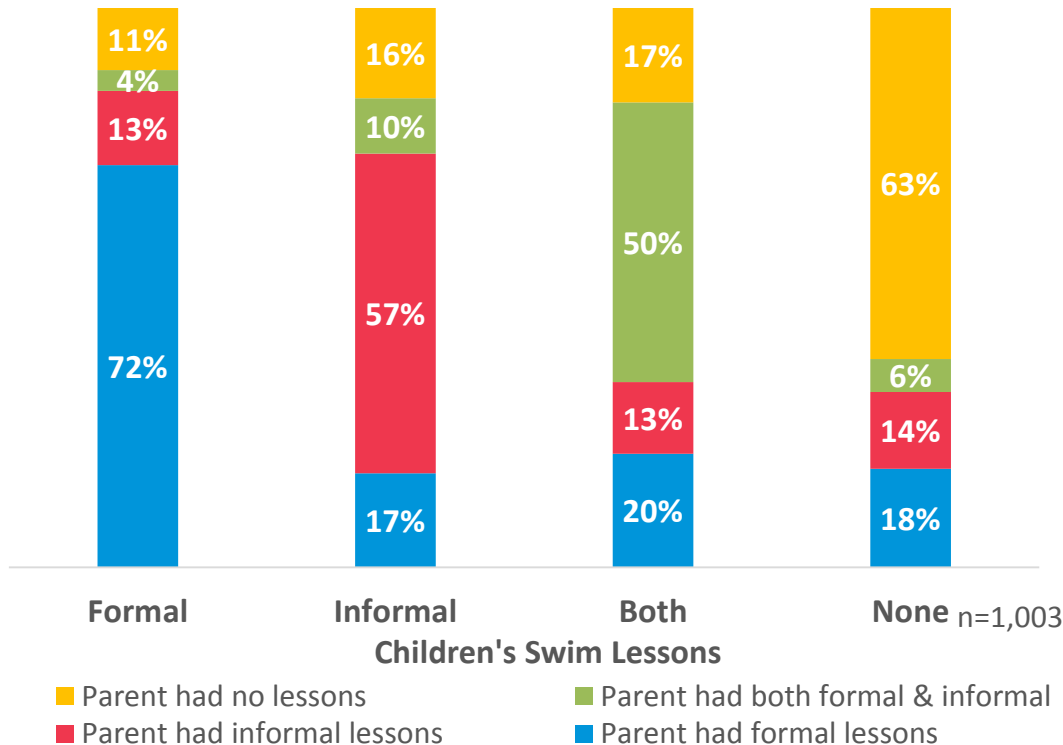
Parents are more likely to leave children unsupervised if they are older, have taken swim lessons, or parents perceive them as strong or adequate swimmers

Supervision Around Pools²

- **What is a Water Watcher?**
 - An adult who commits to watching children in and around water, so that while they are in the role, their eyes and attention are only on that task
 - This only ends when the children leave the water and/or they turn over the responsibility to another Water Watcher.
- Using the Water Watcher system for a certain amount of time (such as 15-minute periods) prevents fatigue and lapses in supervision.
- The Water Watcher card is a tool that helps underscore the importance of the role and identifies who has undertaken the responsibility for active supervision.

Water Safety Education Around Pools: Swim Lessons²

Proportion of Children Who Have Had Swim Lessons
By Parent Swim Lesson Status

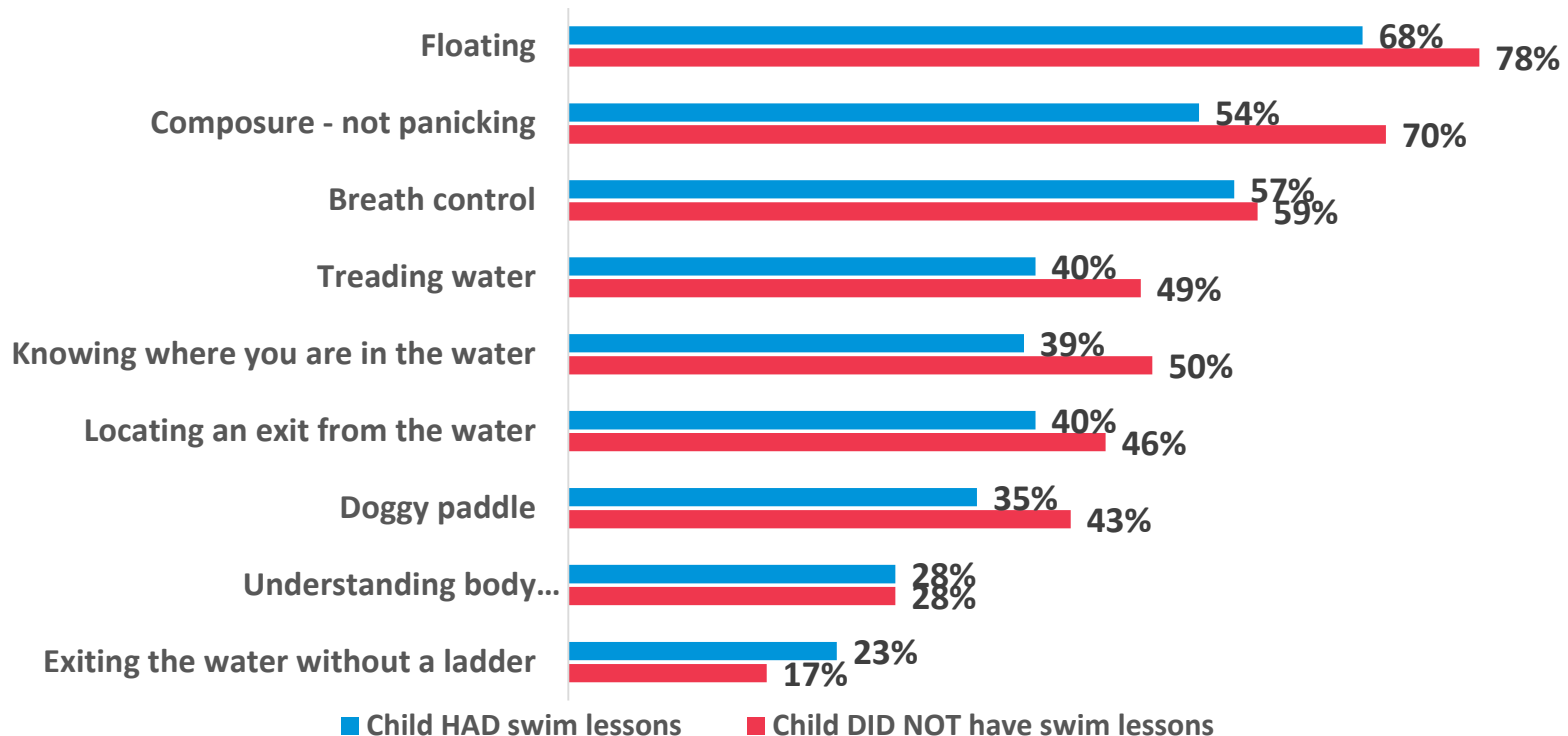


Children were **more likely** to have had swim lessons if:

- Their parents had swim lessons
- They were older
- They had a pool on their home property
- They had a higher household income
- They lived in an urban or suburban setting (versus rural).

Water Competency Around Pools²

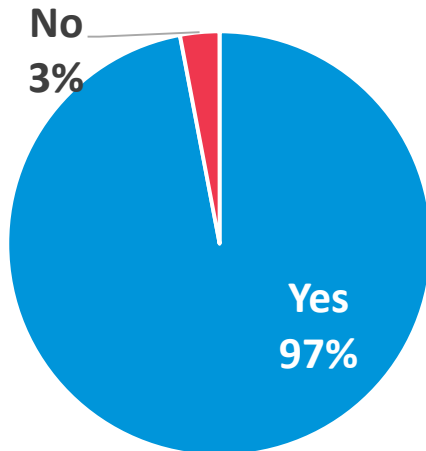
Most Important Skills Children Should Know in a Pool as Selected by Parents



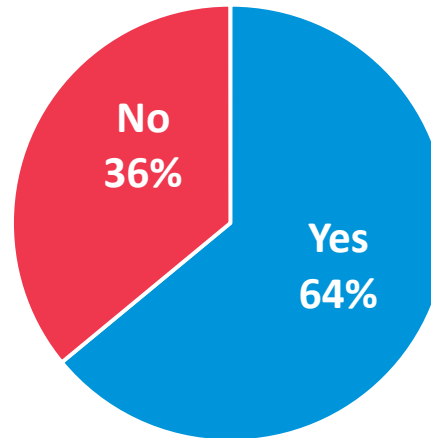
Rescue and Resuscitation Around Pools²



Proportion of Parents Who Think it is Important to be Trained in CPR



Proportion of Parents who are Actually Trained in CPR



Most common reasons parents had not been trained:

- Lack of time or opportunity (29%)
- Not seen as necessary (22%)
- No reason (22%)
- Cost (3%)


Questions??

- For more information:

Safe Kids Worldwide Research page:
<https://www.safekids.org/research>

Contact information:
Angela Steel
asteel@safekids.org
Phone # 202-662-0611

References

- 
1. MacKay JM, Steel A, Dykstra H. Dangerous Waters: Profiles of Fatal Child Drowning in the U.S. 2005-2014. Washington, D.C: Safe Kids Worldwide, June 2016.
 2. MacKay JM, Steel A, Dykstra H, Wheeler T, Samuel E, Green A. Keeping Kids Safe In and Around Water: Exploring Misconceptions That Lead to Drowning. Washington, D.C.: Safe Kids Worldwide, June 2016.



Open Water Drowning Prevention Evidence-Based Best Practices

Elizabeth Bennett MPH, MCHES
Linda Quan, MD

Data Driven Strategies for Drowning Prevention
4.12.17

What Works: Circle of Drowning Prevention

Drowning Prevention



American Red Cross

Focus On The Site: Safer Water Recreation Sites

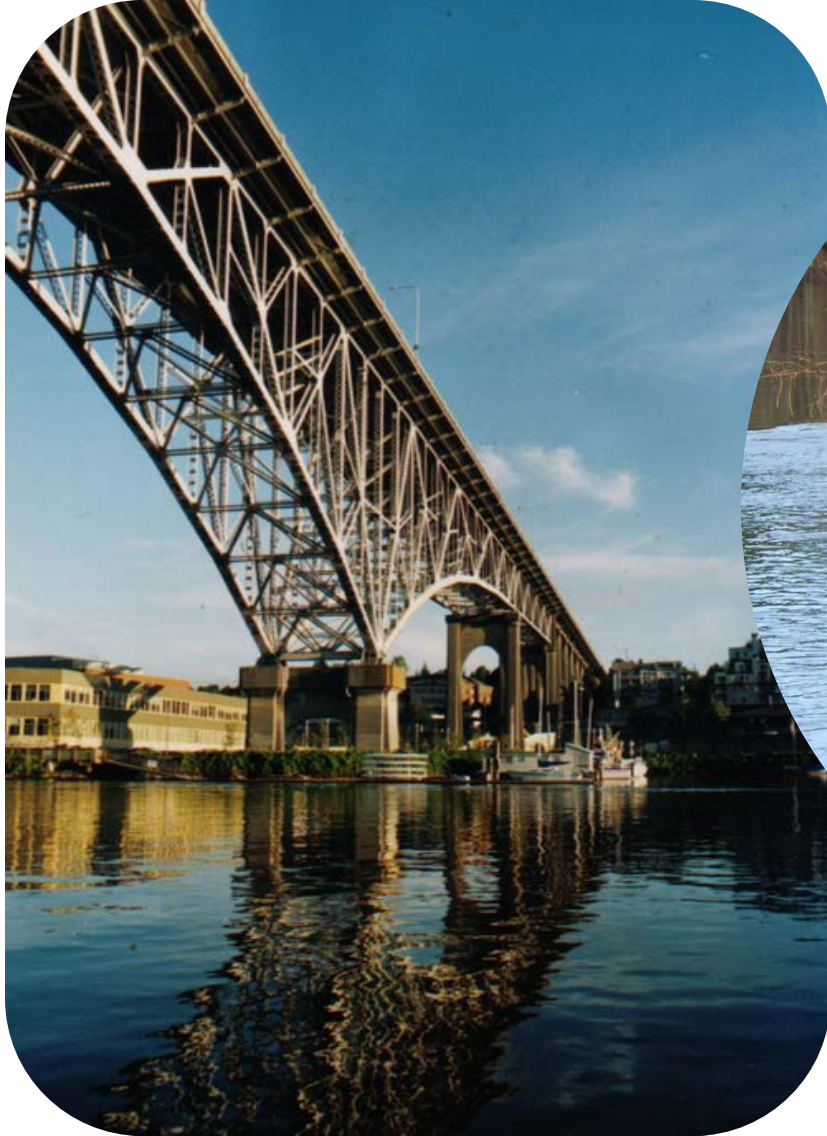
- A new study shows better rate of survival
- Assess swim area sites
- Identify unsafe waters used for recreation
 - Prohibit or limit swimming, boating in them
- Improve safety at sites:
 - Designate swim sites you want swimmers to go
 - Work with local agencies

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

Washington State Designated Swim Area Guidelines



Manage Natural Bodies of Water



Close, dangerous bodies of water:
-Ship Canal, Seattle
-Rivers with fallen trees

Swim Area Checklist Example

	Yes	No	Notes
Designated Swim Area (Bathing Beach Only)			
Marked by rope or other marker			
Clear, visible maximum depth marker			
Depth marker provided in shallow swimming area			
Float line separates shallow from deep swimming area			
Clear of rocks, weeds, lily pads, or other potential hazards			
Beach is glass free			
Other:			



Lifeguards

Control patrons' behaviors; prevent risk taking

Recognize a drowning in progress

Perform rescue

Start CPR

Efficacy:

USLA estimates risk of drowning death is 1/18 million visits

Seattle lifeguarded beaches: No drowning deaths for 10 years



Increase Life Jackets Worn On and Near Water



Life Jackets

- Must be USCG approved (also called personal flotation device/PFD)
- Must be worn
- Must fit
- Must be secured
- Efficacy: Decrease drowning death risk in boats by 50% (*Cummings 2009*)
- Decrease drowning death risk in boating accidents by 40% (*Stempski et al. 2014*)
- Decrease drowning death risk in children playing near water (*Yang et al. 2007*)



Policy

Observed PFD Use by Mandated PFD use

<u>Life Jacket Use Required by Law</u>	<u>#</u>	<u>% life jacket use</u>
• Personal Water Craft (PWC)	333	97
• Water Ski/Being Pulled by Boat	125	94
• Age 0-12	525	82
<u>Life Jacket Use Not Required by Law</u>	<u>#</u>	<u>% life jacket use</u>
• Kayak	208	80
Canoe	147	60
Inflatable	60	43
• Motorized Boat	877	21
• Age 13-17	446	50
Age 18-64	3919	22

Association of Life Jacket Use by Adult and Child and Adolescent in a Boat

Adult wore lifejacket

	<u>No</u>	<u>Yes</u>	<u>RR (95% CI)</u>
<6 yo	87%	100%	6.6 (1.2, 36.5)
6-12 yo	77%	93%	6.2 (3.0, 12.9)
13-17 yo	36%	82%	20 (7.1, 12.8)

Chung C et al. Life jacket observation study in WA State, 2010

Increase Access to Life Jackets: Life Jacket Loaner Programs

Borrow a Life Jacket

Toma prestado un chaleco salvavidas



Check the label to choose the right size.

Revisa la etiqueta para escoger la talla correcta.



Fasten all buckles and zippers.

Abrocha las hebillas y los cierres.



Check for correct fit: snug but not tight.

Verificar que el tamaño sea correcto: ajustado sin apretar.



Wear it here. Leave it here.

Úsalo aquí. Déjalo aquí.

Provide adult supervision at all times.
Proporcionar supervisión adulta en todo momento.

Life jackets save lives.
Los chalecos salvavidas salvan vidas.

Borrow and use a life jacket at your own risk.

Toma prestado un chaleco salvavidas y úsalo bajo tu propio riesgo.

In Partnership With:
Washington State
Drowning Prevention
Network



Google Maps:

Washington State Life Jacket Loaner Program Locations

Washington State Life Jacket Loaner Program Locations

Wearing life jackets when playing, swimming, or boating in lakes, rivers, and the ocean can help keep you and your loved ones safe. Bring your own lifejackets or plan your visit to parks and beaches that have life jacket loaner programs. Use this map to visit a place with a Free Life Jacket Loaner Program.

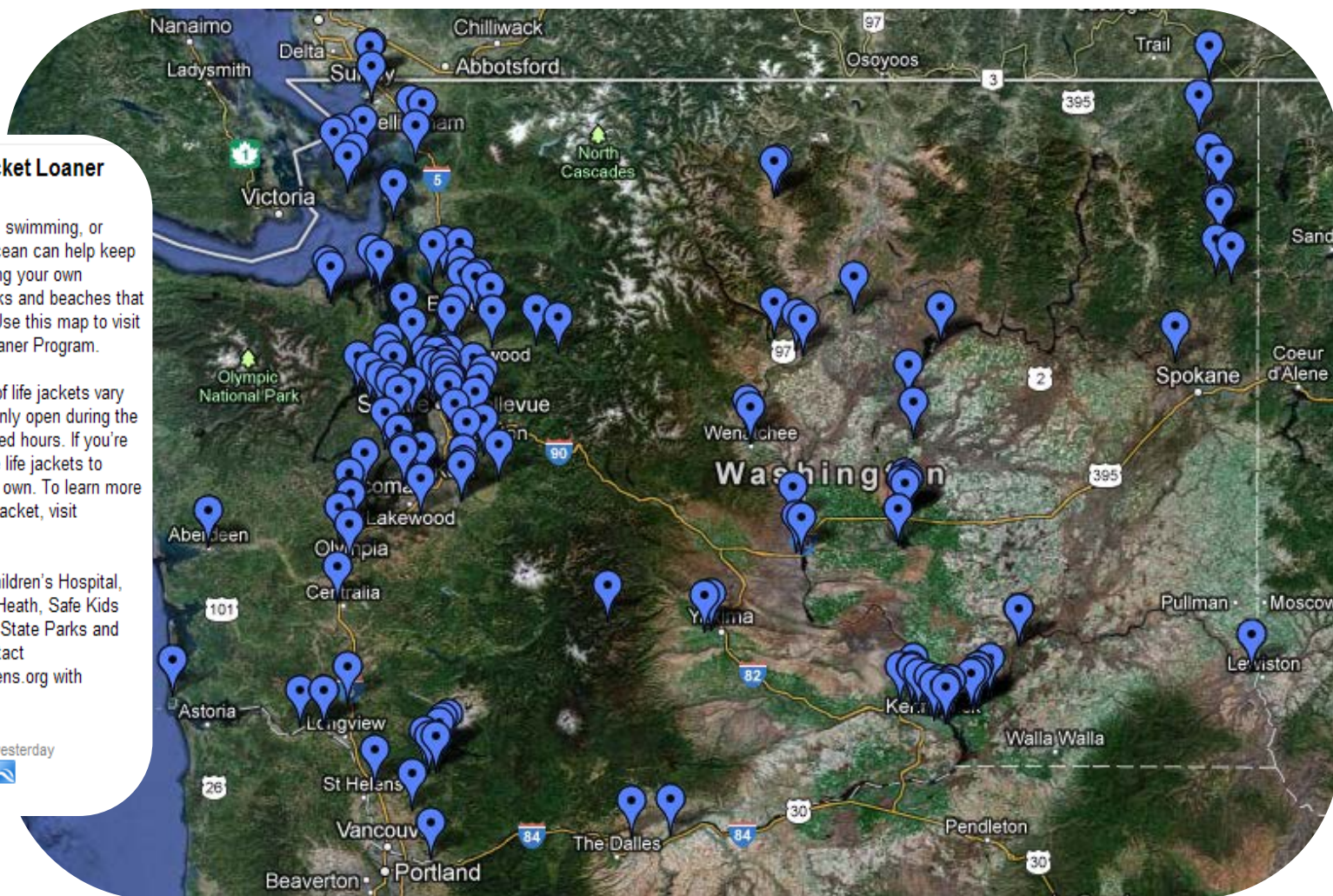
Life jacket sizes and the number of life jackets vary by location. Some programs are only open during the summer and some may have limited hours. If you're unsure about whether there will be life jackets to borrow, please bring and use your own. To learn more about when and how to use a life jacket, visit www.seattlechildrens.org/dp.

This list is compiled by Seattle Children's Hospital, Washington State Department of Health, Safe Kids Washington, and the Washington State Parks and Recreation Boating Program. Contact drowningprevention@seattlechildrens.org with changes and additions.

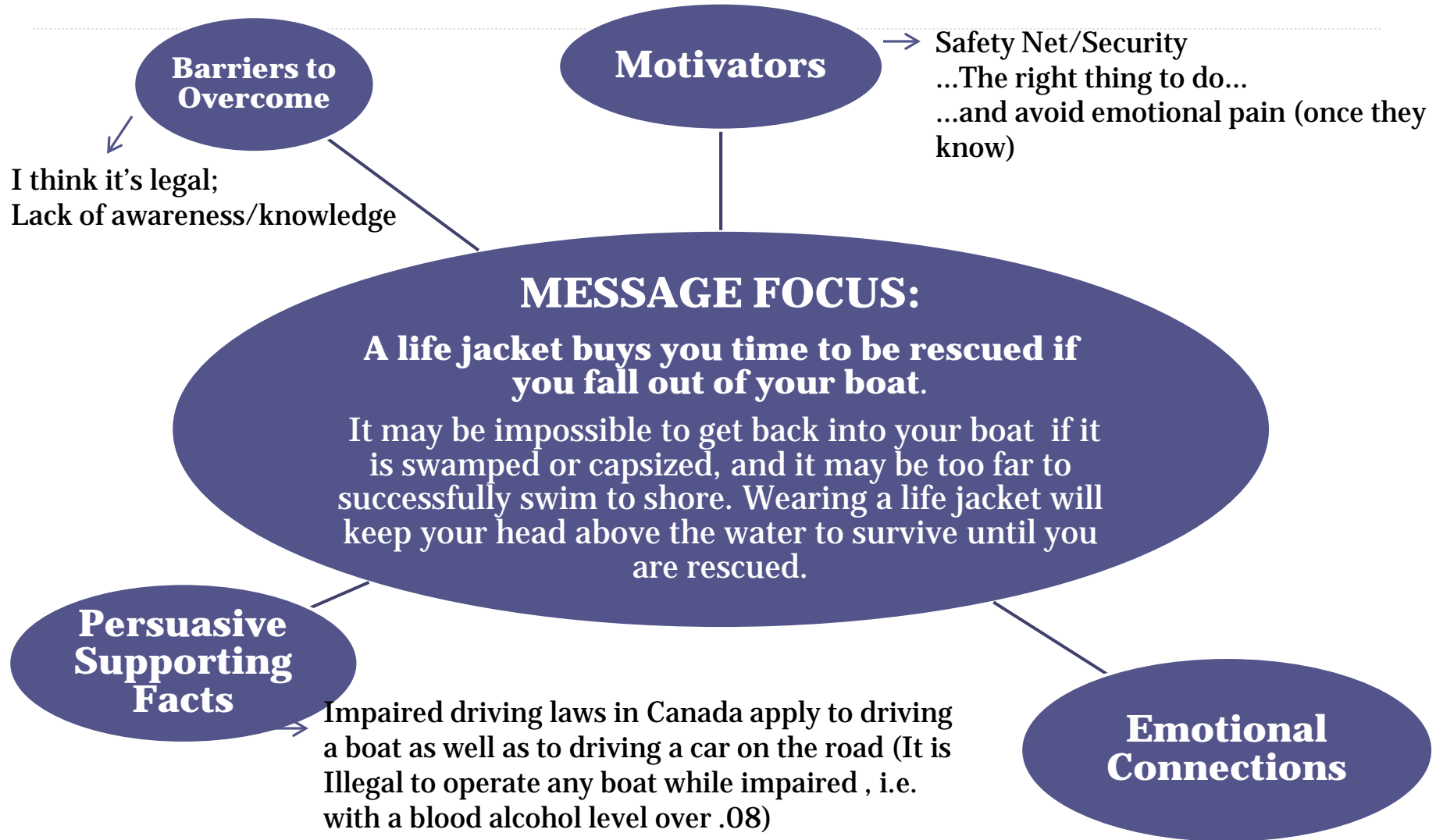
Public · 4 Collaborators · 1,025 views

Created on Jul 25, 2012 · By · Updated yesterday

[Rate this map](#) · [Write a comment](#) · [KML](#)



High Potential Life Jacket Communications



International Task Force on Open Water Drowning Prevention Guidelines

Learn swimming and water safety survival skills.



Swimming Lessons

Decreased drowning deaths in < 5 yo children

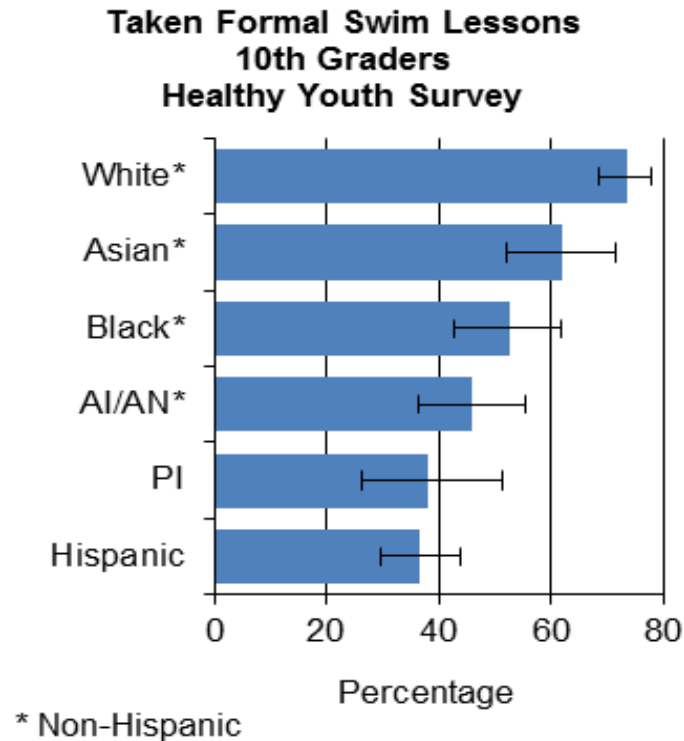
- No swim lessons increased likelihood of death
RR=2.3 (1.4 to 4.5) *Yang et al. 2007- China*
- Any swim lessons decreased likelihood by
50% *Brenner 2010- USA*

Decreased drowning deaths in
older children:

- SwimSafe
Rahmen et al. 2012 Bangladesh

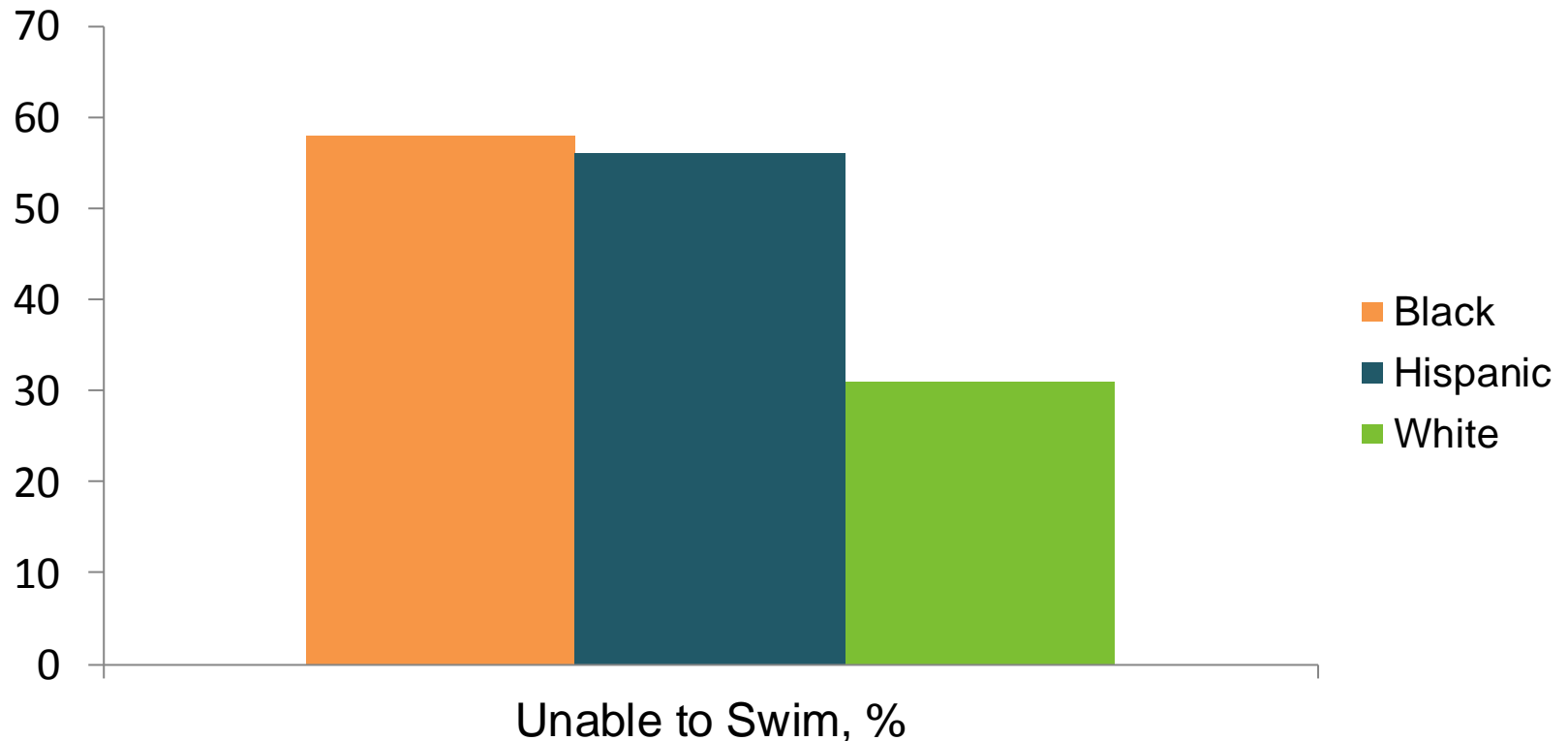


Formal Swim Lessons by Race/Ethnicity



AI/AN=American Indian/Alaska Native
PI=Pacific Islander

Goal: Health Equity



1. Irwin, C.C., et al. Urban minority youth swimming (in)ability in the United States and associated demographic characteristics: Toward a drowning prevention plan., 2009

Swim Lessons - Old Focus:

- Lessons should be developmentally appropriate
- Should be positive experience
- Ideally should include parental learning
- Skill acquisition achieved age 4 y (average)
- The real question is when can swim lessons stop?

New Focus: What is Water Competency?

Research evidence supports inclusion of the following:

1. Entry into deep water
2. Surface and level off
3. Integrated and effective breathing
4. Swim on the front
5. Swim on the back
6. Roll from front to back and back to front
7. Turn, L & R, on Front & Back
8. Surface dive & swim underwater
9. Survival float, front and back
10. Tread water
11. Use of life jacket
12. Exit safely
13. All of the above with clothes
14. All of the above in open water
15. Knowledge of local hazards
16. Recognize and avoid risk
17. Assess ones own competency
18. Recognize a drowning person and lay rescue skills
19. Judgment of risk and action
20. Attitudes & values

A culturally competent approach to drowning prevention



Vietnamese-American Focus Groups: What they wanted

Beliefs:

- Fate

Skills:

- Skills to evaluate water
- Water safety combined with swimming lessons

Infrastructure:

- Age/language specific classes
- Free swim classes (incentive)
- Safe and free places to swim

How to reach them?

- Schools
- Media

Quan et al. Beliefs and practices to prevent drowning among Vietnamese-American adolescents and parents. 2006

A Drowning prevention education campaign tailored to Vietnamese-American community

How: Church leaders, community health workers, Vietnamese newspapers, language schools, Tet festival

Objectives:

- Increase swim lessons: Held pool sessions
- Increase life jacket use: Education sessions and low cost life jacket sales/fitting at Head Start
- Increase use of lifeguarded sites:
 - Created/translated brochures of sites/bus routes
 - Parks dept worked to increase Asian lifeguards

Message: Need to be prepared for American lifestyle/challenges

Muslim-American Communities: What they wanted

Women or men only swims

- Socializing: Swimming was a recreational activity in Somalia
- Obesity control

Skills:

- Water safety and learn to swim

Infrastructure:

- Privacy

How to reach?

- Community leaders



Everyone Swims: a policy and system change approach

Women or men only swim sessions

- Now held county wide at YMCA and public pools
- Men-only sessions added after males request
- Continues through various funding sources

Permanent infrastructure changes made to several public swimming pools

Challenges to exclusive usage of public pools

Stempski et al. Everyone Swims: a community partnership and policy approach to address health disparities in drowning and obesity. 2015

Thank you!

Elizabeth 'Tizzy' Bennett

Elizabeth.bennett@seattlechildrens.org

www.seattlechildrens.org/dp



QUESTIONS

**Recording of webinar and slides will be posted within
a week on National Center website: www.ncfrp.org**



Save the Date!

May 10, 2017, 2:00 pm – 3:00 pm EDT

State Level Fatality Review Advisory Boards in Action: Best Practices for Establishing and Managing

Registration details to follow

Facebook and Twitter



Thank you!

Additional questions can be directed to info@ncfrp.org

