
Childhood Drowning as a Model for Injury Prevention and Product Safety

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Mark A. Nichter, MD
Chief, Division of Critical Care Medicine
Vice-Chief of Staff
All Children's Hospital, St. Petersburg, FL

What the heck is a Pediatric Intensivist? (and why is he talking to us now?)

- Pediatrician
 - Intensive Care Fellowship
 - ~250 Pediatric ICUs in US
 - Exclusively hospital-based, ICU practice
 - ~1000 Intensivists in US
 - Patients range from birth to young adulthood
 - Any illness / injury warranting ICU care
 - Major trauma, Seizures, Pneumonia, Asthma, Diabetes, Heart failure, Heart Surgery, Poisoning, **Drowning and Near Drowning**
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Stuff done by Intensivists

- See children after nearly drowning
 - Talk to parents / witnesses (What happened?)
 - Predict Life, Death and Brain Damage
 - Coordinate care for the Child
 - Comfort the Parents
 - Draw conclusions
 - Facts, Trends, Opinions
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Facts, Trends, Opinions

Childhood (0-19) Deaths in Florida, 2003

*FL Dept of Health

Vehicle Occupants	198
<i>Accidental Drownings</i>	<i>134</i>
Malignancies	132
SIDS	92
Poisoning	73
Pedestrian v. Motor Vehicle	50
Fire Related	19
Bicyclists	11
Adverse Effects of Medical Care	4
HIV	3
Accidental Firearm	3

Introduction to Injury Prevention

- 1985
 - Suncoast Drowning Prevention Coalition
 - A pediatric emergency medicine physician
 - A pediatric intensivist
 - A firefighter/paramedic
 - 2 Nice ladies who taught children to swim
 - A guy who taught infants to swim
 - No manufacturers
 - The hospital PR guy
 - Me
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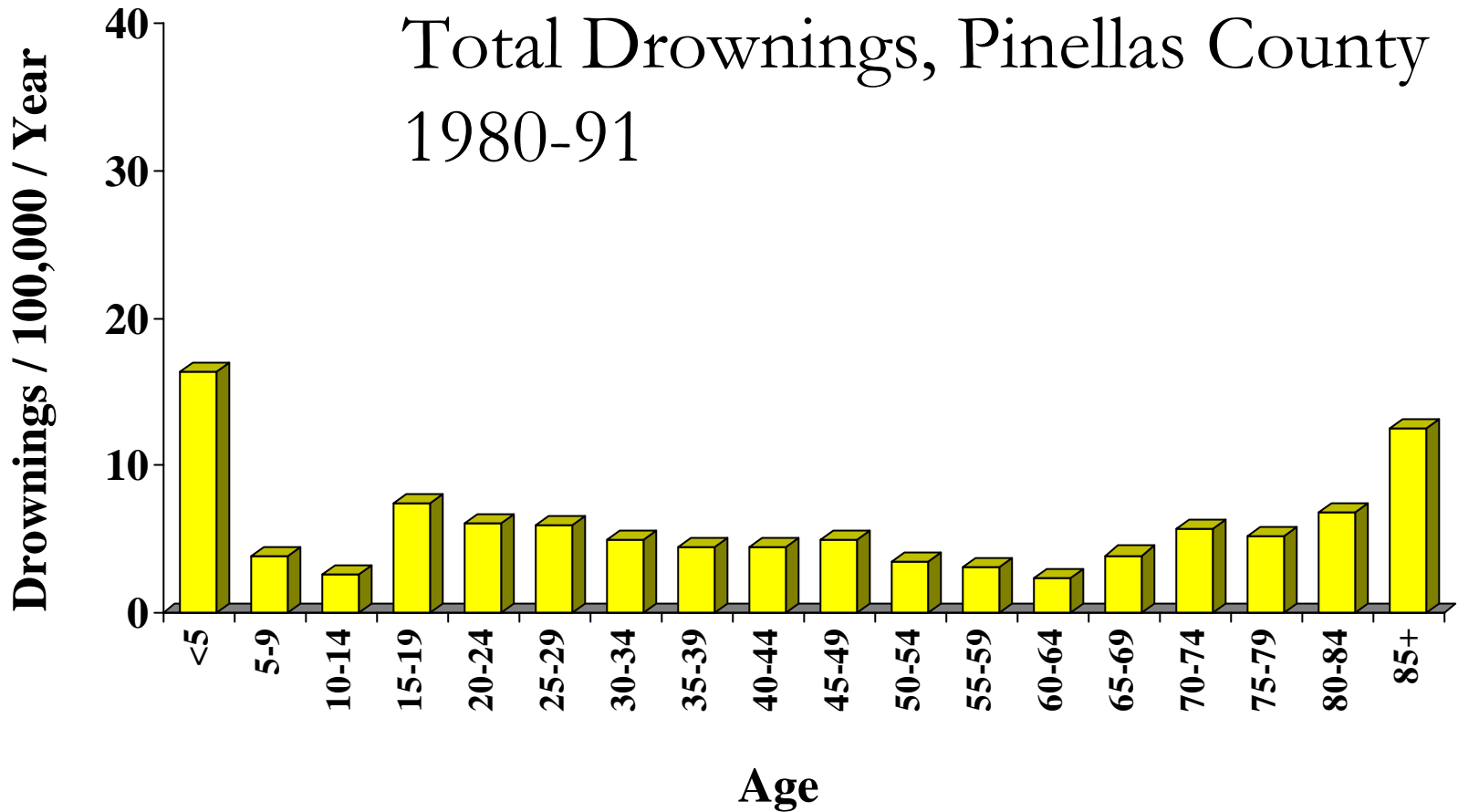
Introduction to Injury Prevention

Facts, Trends & Educated Opinions

VS.

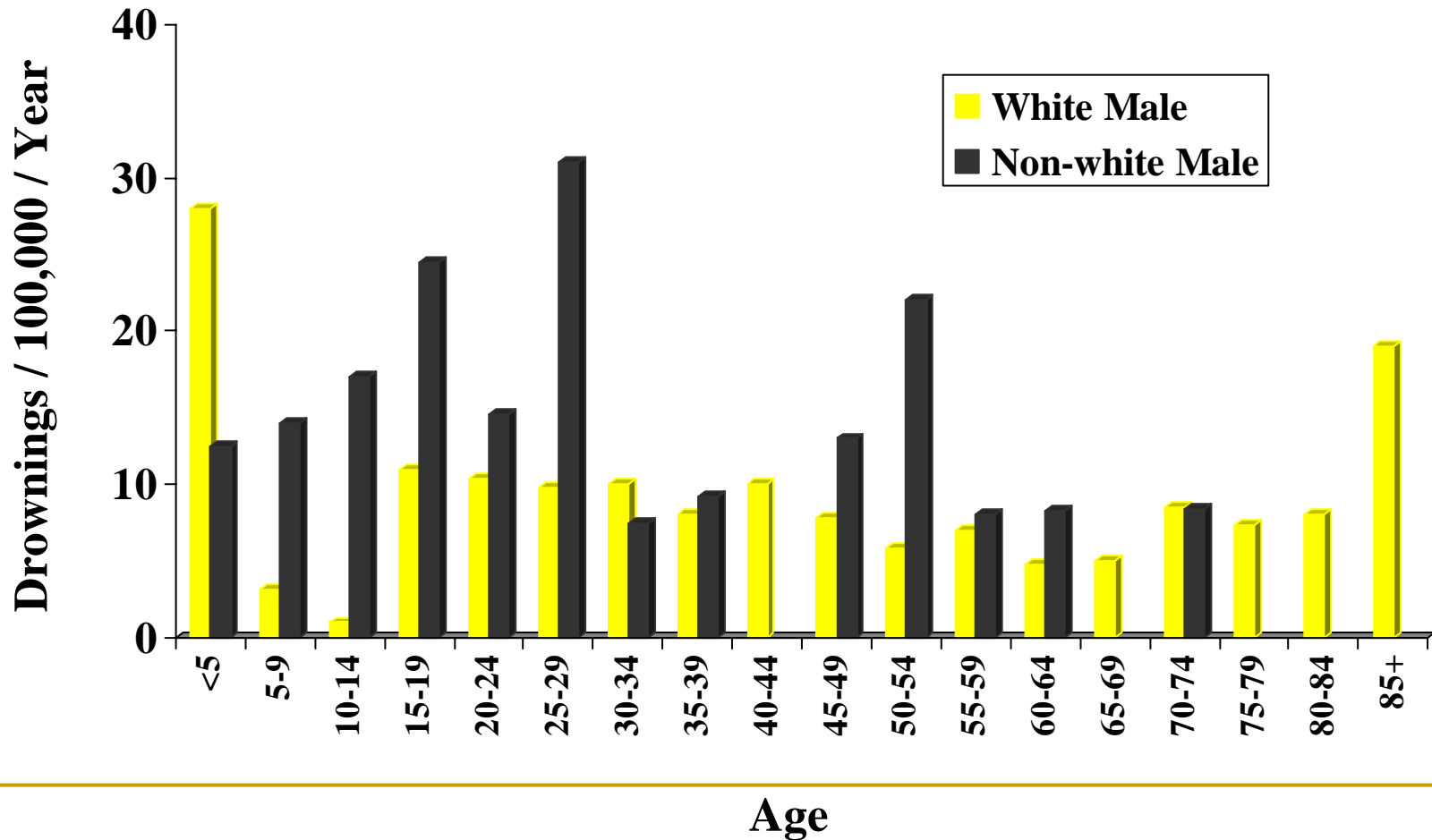
Myths, Good Intentions & Self Interest

Facts, Trends, Opinions



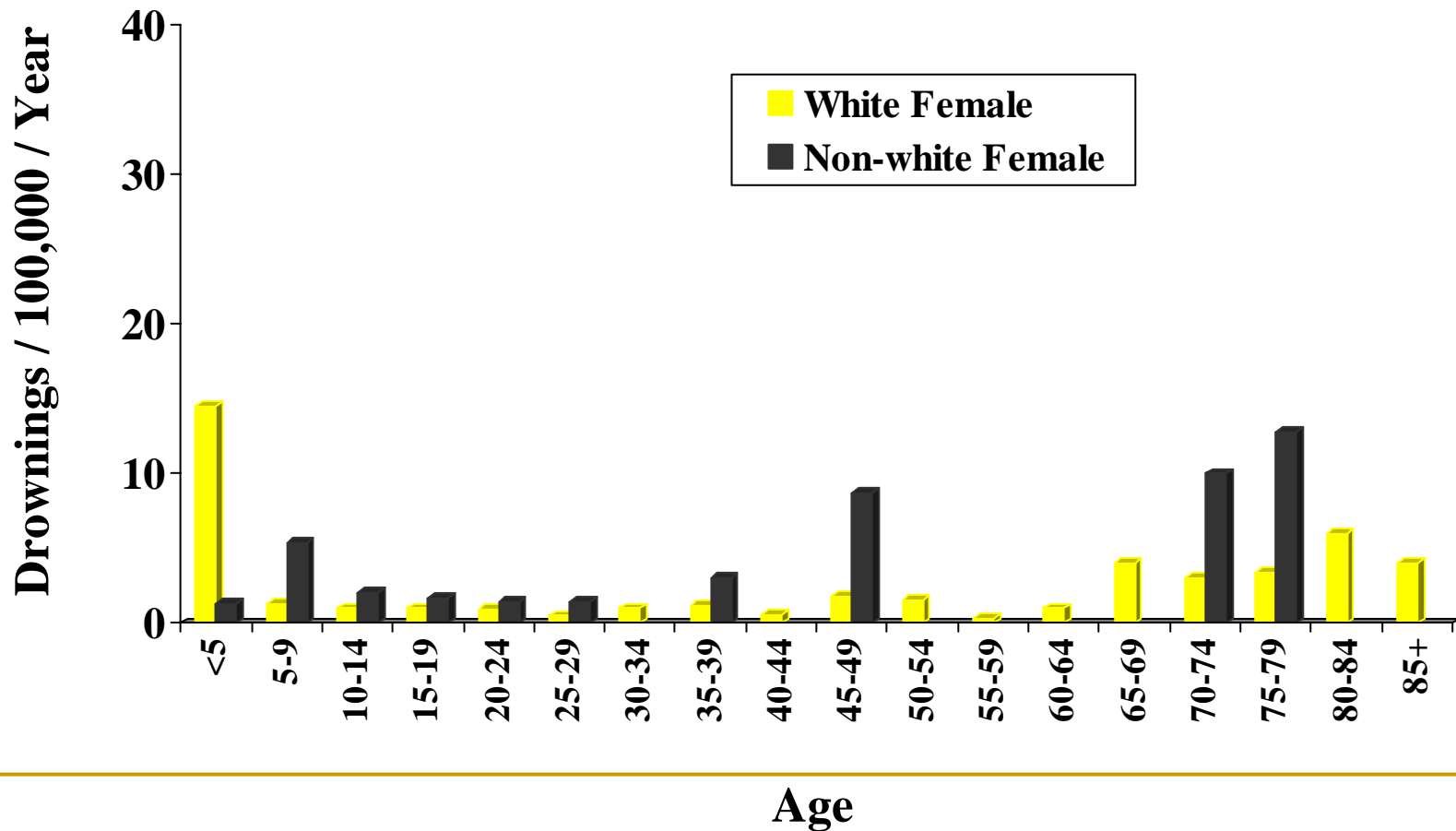
Male Drowning Rates, Pinellas Co.

1980-91

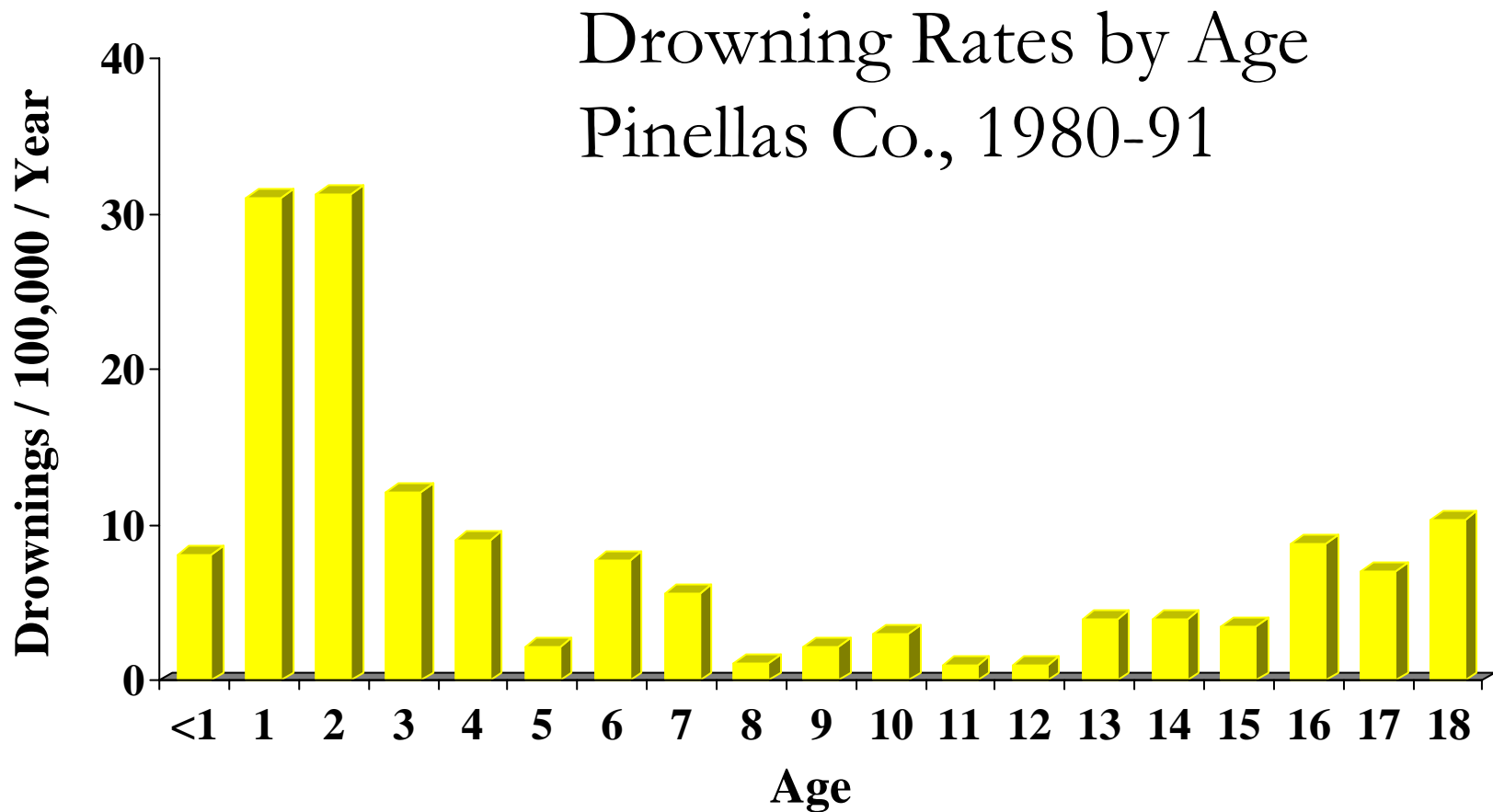


Female Drowning Rates, Pinellas Co.

1980-91

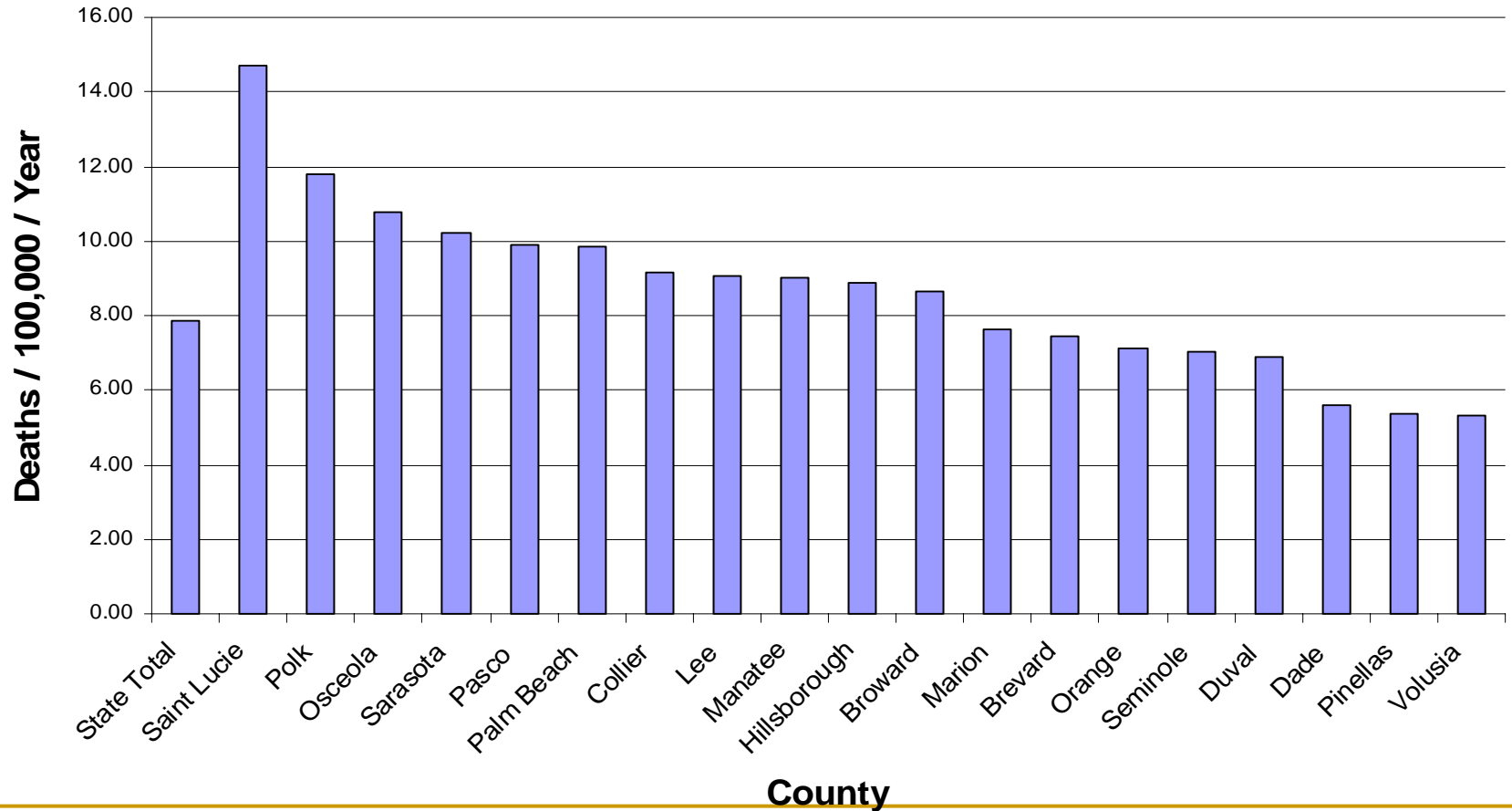


Facts, Trends, Opinions



Facts, Trends, Opinions

Drowning Death Rates 0 - 4 Years 1993-2002



Facts, Trends, Opinions

ACH Experience

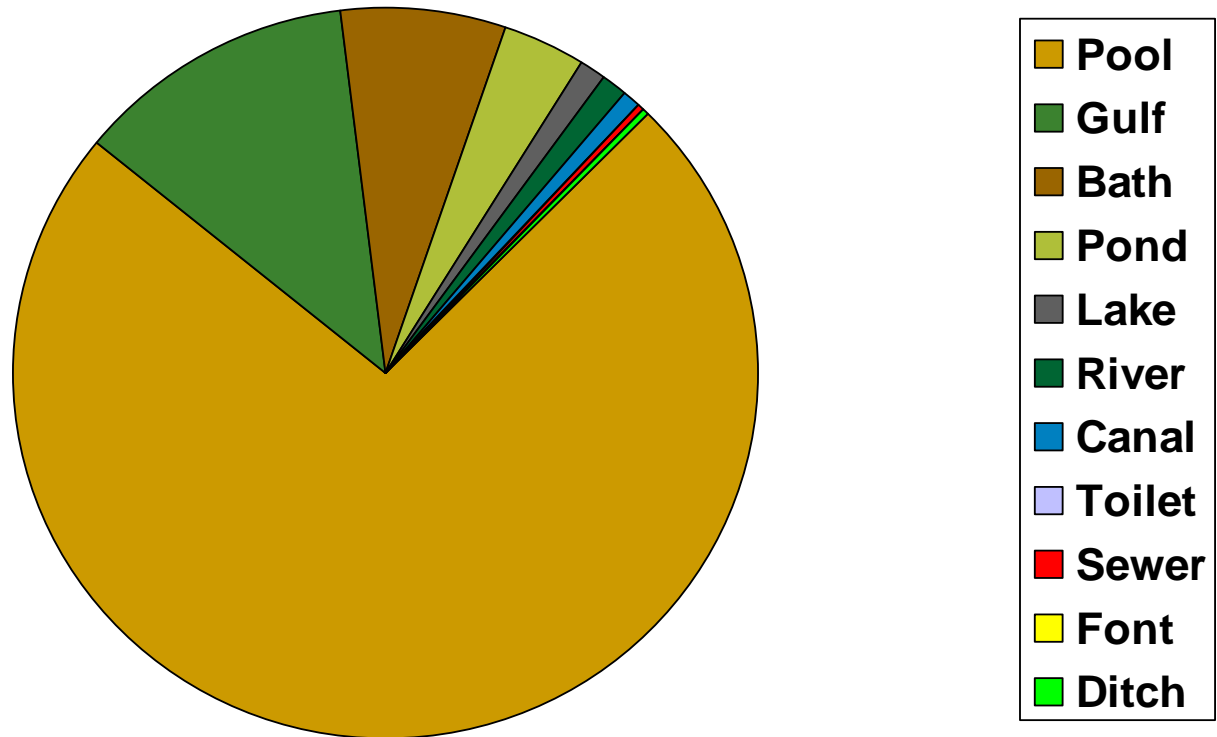
1983-2002

- 576 Children

- Age Range 4 mos – 18 yrs, 10 mos
 - Mean Age 41.98 months
 - Median Age 27 months
 - Mode Age 14 months (n=24)
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Facts, Trends, Opinions

ACH Experience
1983-2002



Facts, Trends, Opinions

ACH Experience

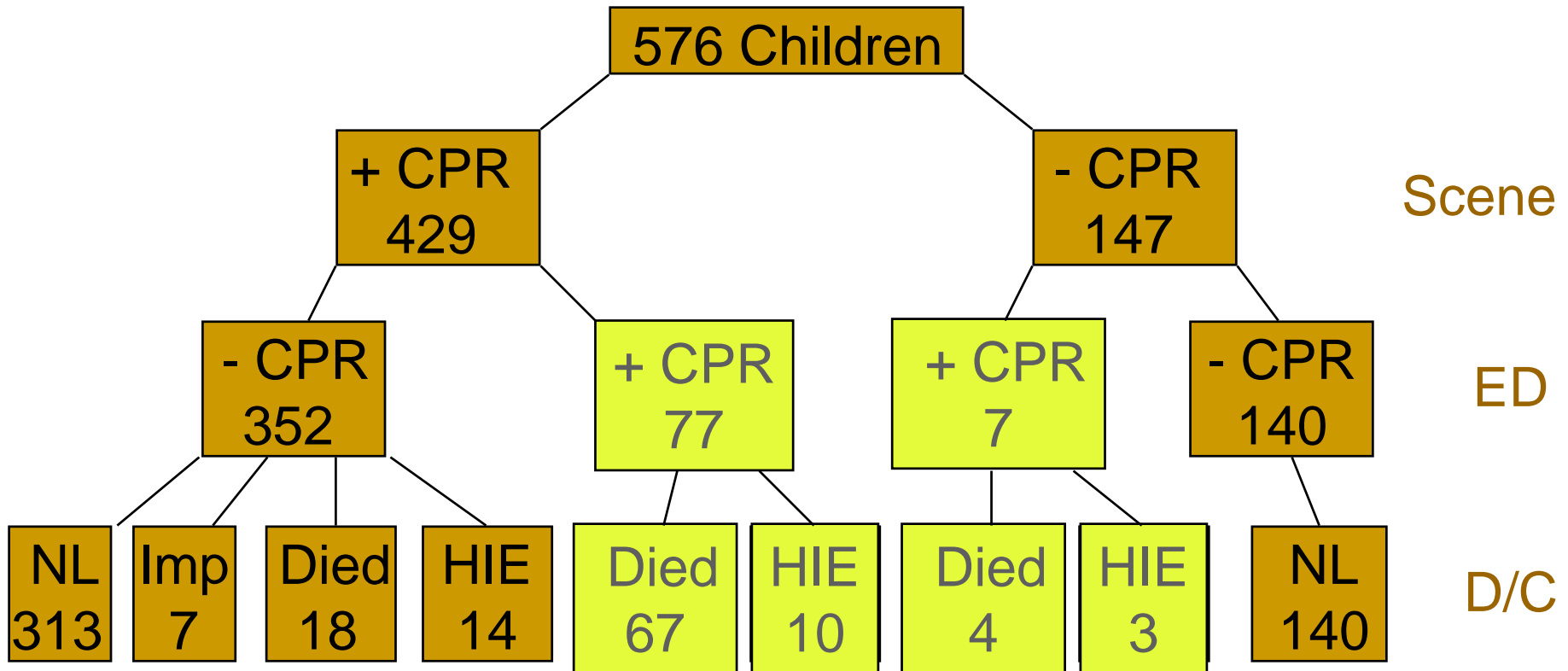
1983-2002

■ Outcomes

- 487 (84.5%) Alive at Hospital Discharge
- 453 (78.6%) Normal at Discharge
- 7 (1.2%) Impaired with Rehab Potential
- 27 (4.7%) Brain Damage no rehab potential
- 89 (15.5%) Died in Hospital

ACH Experience

1983-2002



CPR = Rescue Breaths (Scene) +/- Chest Compressions (Scene or ED)

Facts, Trends, **Opinions**

Childhood Submersion

Sequence of Events

- Submersion
 - Breathholding
 - Automatic Paddling Movements
 - Increased CO₂, Decreased O₂
 - Gaspings, Swallowing
 - Vomiting, Aspiration
 - Loss of Consciousness
 - Continued Gaspings leading to Apnea
 - Arrhythmias
-

Facts, Trends, Opinions

Drowning Scenarios

Age	Scenario
< 1y	Infants left unattended or with sibs in bathtubs, sinks & sometimes pools.
1-4y	Undersupervised, predominantly white children in backyard pools, lakes & ponds. Boys at higher risk.
5-15y	Undersupervised males frequently overestimating or disregarding their swimming skills in open bodies of water. Drugs / alcohol are rare. AA at increased risk.
16-65y	Mostly men in open bodies of water. Drugs / Alcohol implicated in 40+% of all episodes and ~ 75% of boating episodes. AA at increased risk.
66+y	Falls in pools, canals or bathtubs. Drugs / Alcohol in 20%. Suicide an important cofactor.

Facts, Trends, Opinions

- Perspective:

- While we have cared for 418 children who have drowned or nearly drowned in pools and spas
 - Not one has successfully defeated a 4 foot high, properly installed and maintained, isolation fence
 - 20 (est) have drowned on top of or under pool covers
 - No pool alarms alerted parents
 - 3 (est) have become entrapped in drains / vacuums
 - None has suffered significant head or neck injury
 - Many have opened or walked through open sliding doors
 - Many were described as “knowing how to swim”
 - Nearly all have occurred in the home of residence / play
 - Nearly all have merely toddled into the pool
 - Florida’s Swimming Pool safety legislation has not noticeably affected drowning rates
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Facts, Trends, Opinions

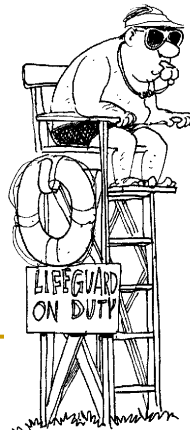
Drowning Prevention Strategies

■ Parental Vigilance

- ❑ The large majority of parents are vigilant
- ❑ Nobody can keep their eyes on a toddler constantly
- ❑ Simply reminding parents to “watch their children” isn’t enough

■ Pool Fencing

- ❑ 4-sided pool fences
- ❑ 4 feet high
- ❑ Self closing, self latching gate
- ❑ 4-sided pool fencing legislation has decreased preschool drownings by 50%



Facts, Trends, Opinions

Drowning Prevention Strategies

■ Pool alarms

- ❑ Cheap
- ❑ Too effective or not effective enough
- ❑ Rarely used continuously
- ❑ Not an effective drowning prevention tool

■ Pool covers

- ❑ Frequently not used during the drowning “season”
 - ❑ Children can drown on top of or underneath pool covers
 - ❑ Not currently recommended by the AAP
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Facts, Trends, Opinions

Swimming Instruction

- Less than 1 year old
 - Numerous reports of
 - Water intoxication
 - Seizure
 - Salmonella
 - Probably not effective
 - Probably not needed
 - Infants don't like it
 - Water play is OK
 - More than 3 years old
 - Organized swimming instruction advocated by the AAP for children > 4 years old
 - Children are highly “teachable”
 - Low risk of infection
 - Limit sessions to 15-30 minutes
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Facts, Trends, Opinions

Swimming Instruction

- Children 1-3 years old
 - ❑ Are variably “teachable”
 - ❑ Are at risk for infectious diseases in group classes
 - ❑ Don’t need to swim as a drowning prevention method if pools are properly fenced
 - ❑ Personally, I would wait till the child (and everyone else) is out of diapers



Facts, Trends, Opinions

Drowning Prevention Strategy

■ What works

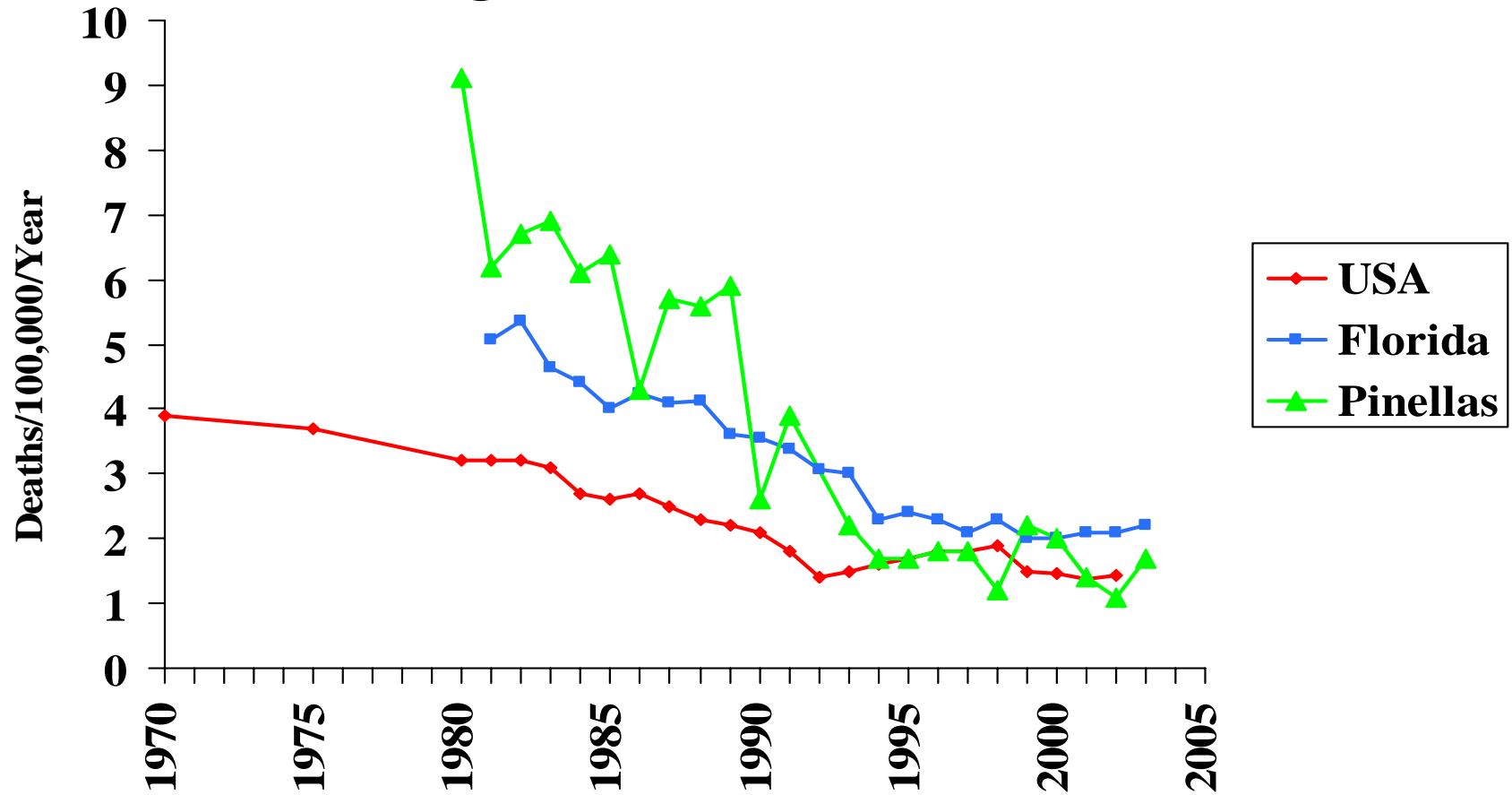
- Raising awareness
- Media
 - TV > Print > Radio
- Isolation pool fencing
 - 4-sided
 - 4 feet
 - Self-closing gate
 - Locked
- Legislation + media attention

■ What doesn't

- Preaching
 - Programs done in isolation
 - Anything else
 - Alarms
 - Covers*
 - Locks
 - Swimming*
 - Legislation alone
-

Facts, Trends, Opinions

Drowning Rates, USA, Florida & Pinellas Co.



Injury Prevention – Lessons Learned

Facts, Trends and Educated Opinions

always beat out

Myths, Good Intentions and Self Interest

Injury Prevention - Lessons Learned

■ 1985

- Eight Individuals
 - No facts
 - Good Intentions
 - Self Interest

■ 2005

- Hundreds of individuals
 - Leaders
- Scores of Organizations
 - Leaders
- Armed
 - Facts, Trends, Opinions
- Positioned
 - Leadership

Injury Prevention – Lessons Learned

Lead!

Be Unafraid

Our Challenge

■ Pool and Spa Safety

- Take and inherently unsafe, hole in the ground filled with liquid, manufactured by hundreds, installed by tens of thousands, maintained by millions, with a product life of decades and increase its safety profile while minimizing effects on its enjoyability and usefulness.

Loaded Gun
Bengal Tiger
Grand Canyon

Our Challenge

- Pool and Spa Safety
 - Target safety measures to what we know about the frequency and lethality of submersion injuries
 - Appropriately counsel parents about the lethality of the home pool and spa
 - Encourage/mandate limited access
 - Use our product safety knowledge to minimize risk where applicable
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Our Challenge

- Pool and Spa Safety

- Vision and Leadership

- Establish the risk of death of the home pool/spa and efficacy of various proposed safety measures
 - Arm homeowners/parents with risk/efficacy assessments
 - Establish guidelines for design, manufacture, placement and safety features
 - Establish community standards for frequency, timing and content of media campaigns
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Our Challenge

- Whatever Consumer Product
 - Avoid the natural tendency to rely on myth, good intention or self interest
 - Do the hard work to gather fact, follow trends and develop educated opinions
 - Once armed, be unafraid to advocate and lead
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