

# Drowning and Water-Incidents

-- Arizona and Maricopa County --

Data from Arizona Vital Statistics  
and Fire Departments in Maricopa  
County

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# Epidemiology

- Epi (upon) + demos (people)
- The study of disease as it affects groups of people, as opposed to individuals
- The study of the distribution and determinants of health-related states or events in specific populations, and the application of this study to control of health problems.
- Infectious, chronic, injury, mental health, ...

# Surveillance

- **Public health surveillance** is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health

# Data from a public health surveillance system can be used to

- guide immediate action for cases of public health importance;
- measure the burden of a disease (or other health-related event), including changes in related factors, the identification of populations at high risk, and the identification of new or emerging health concerns;
- monitor trends in the burden of a disease (or other health-related event), including the detection of epidemics (outbreaks) and pandemics;
- guide the planning, implementation, and evaluation of programs to prevent and control disease, injury, or adverse exposure;
- evaluate public policy;
- detect changes in health practices and the effects of these changes;
- prioritize the allocation of health resources;
- describe the clinical course of disease; and
- provide a basis for epidemiologic research.

# Purpose of drowning surveillance

1. Is there a problem?
2. Characterize the problem
3. Guide corrective action
  1. legislation
  2. education
  3. product design
4. Monitor for signs of success

# CHILD DROWNING & WATER-RELATED DATA

- Death data (ADHS)
  - Rank with other injuries
  - Count and rates
  - Risk factors
- Incidence data (DPCCA)
  - Counts and rates
  - Risk factors
- Knowledge gaps

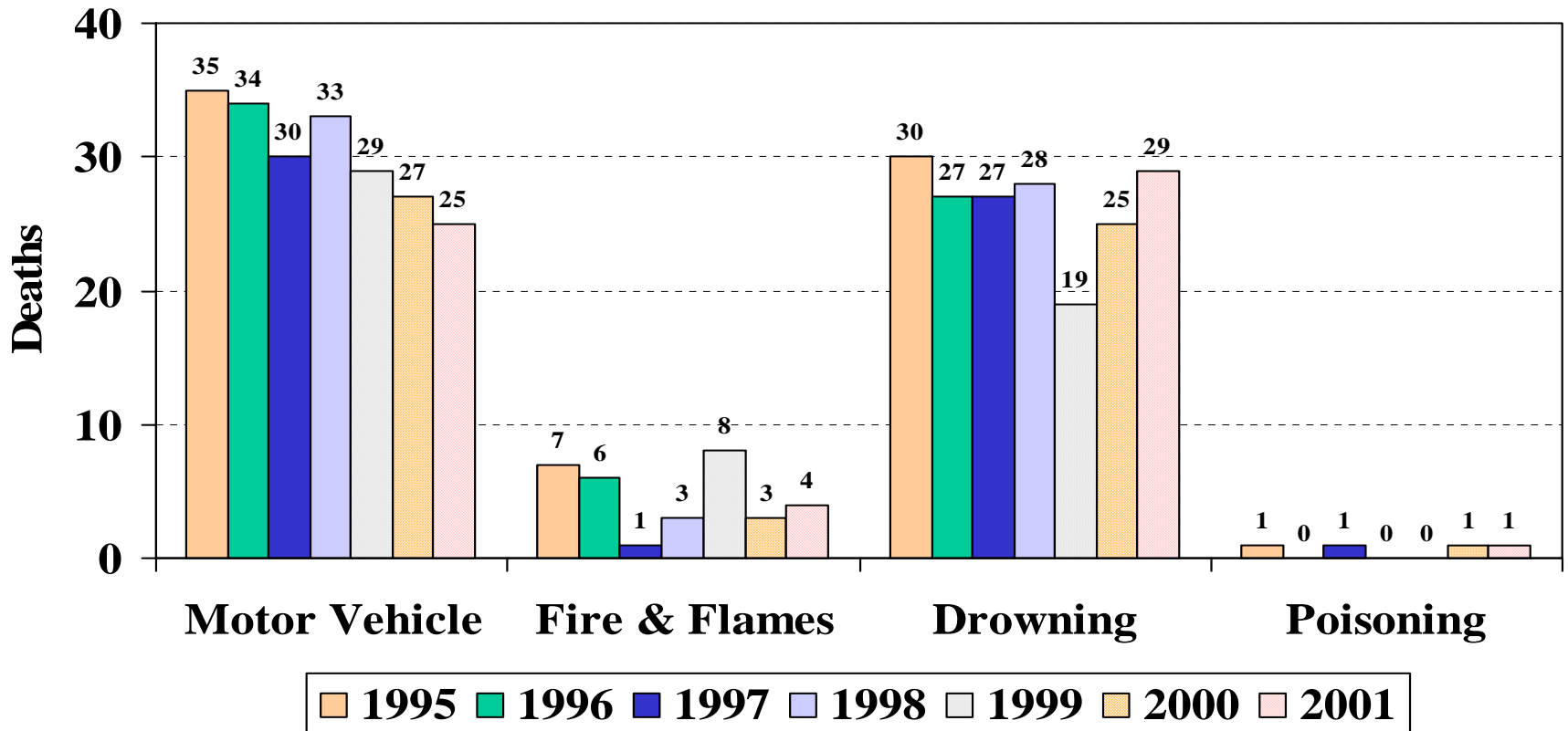
Tim Flood; ADHS; 9-12-2003

Drowning Prevention Coalition of Central Arizona

CPSC Safety Workshop

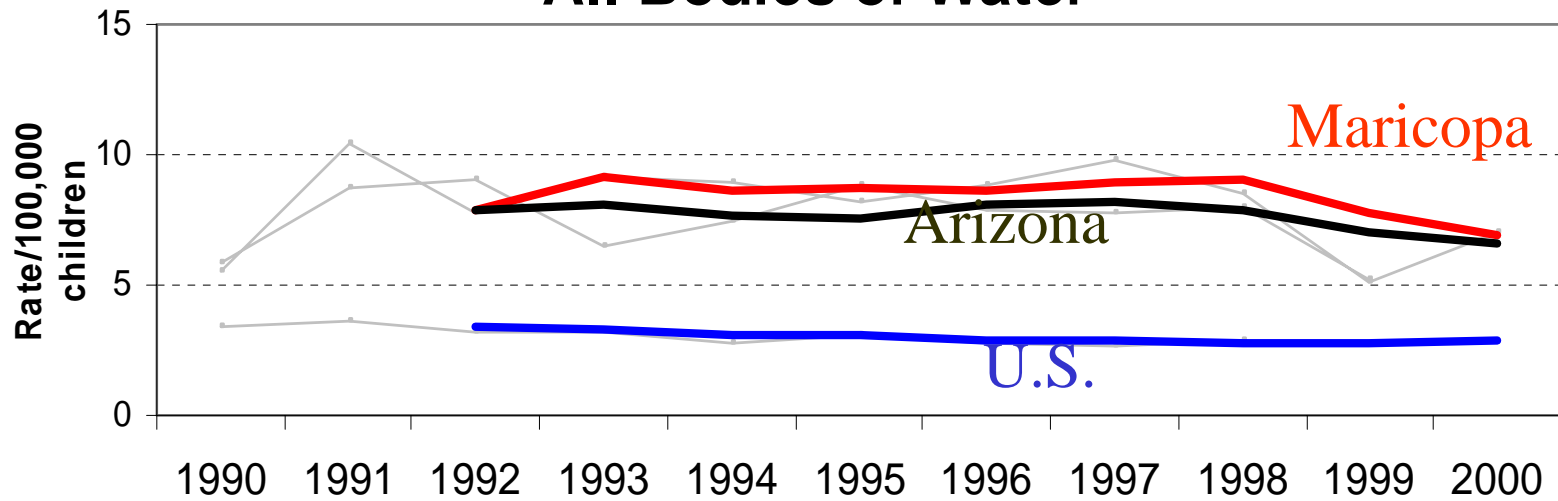
# Causes of Unintentional Injury Death

Arizona, 0-4 year olds

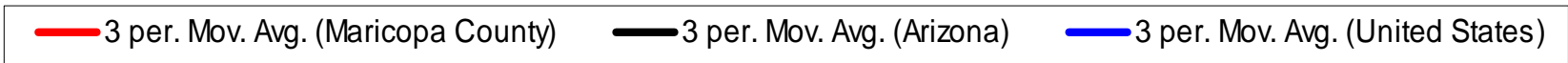


Source: Arizona death certificates

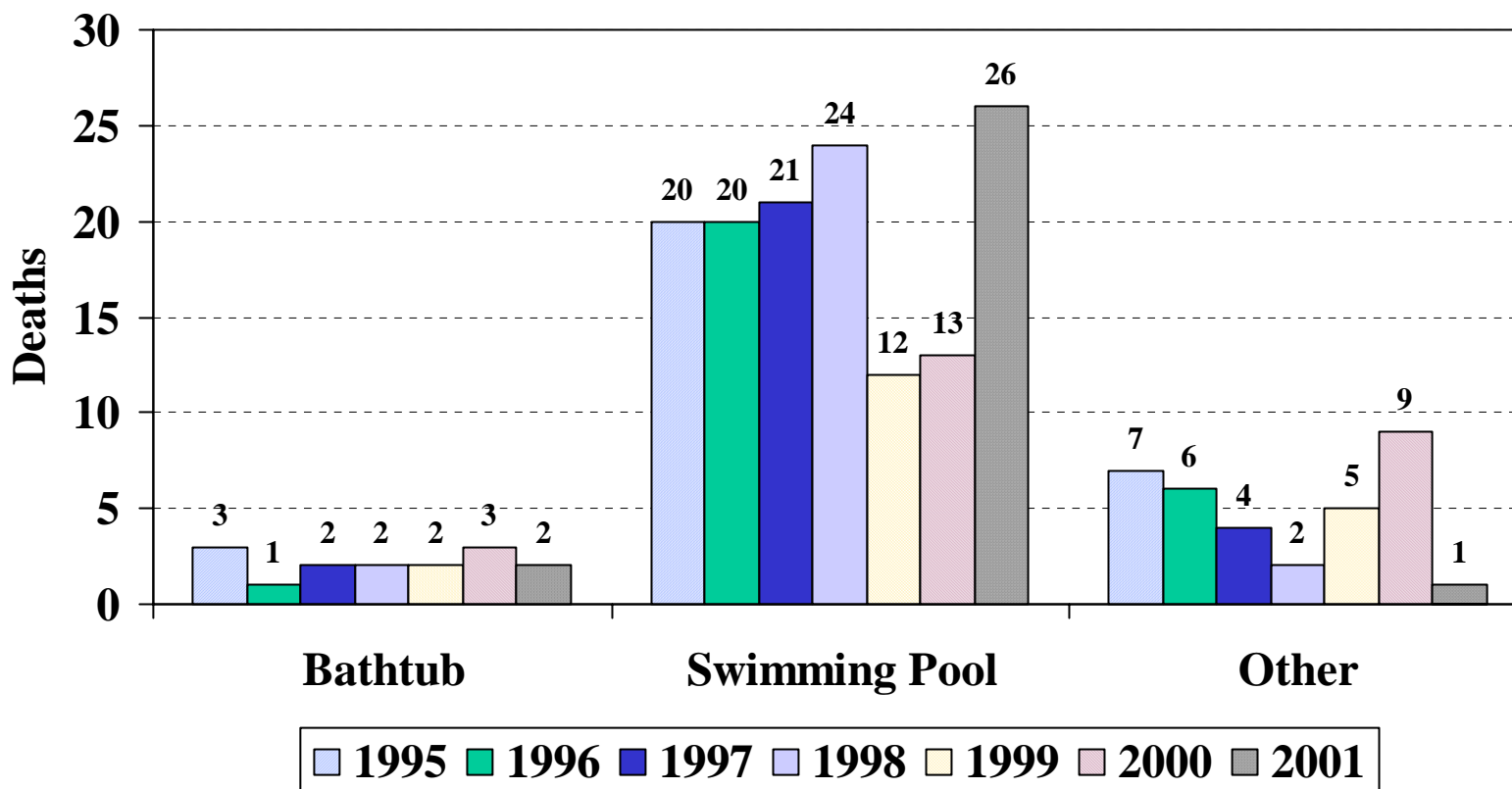
# Drowning Death Rate 0-4 Year Olds All Bodies of Water



Source: ADHS, Vital Statistics

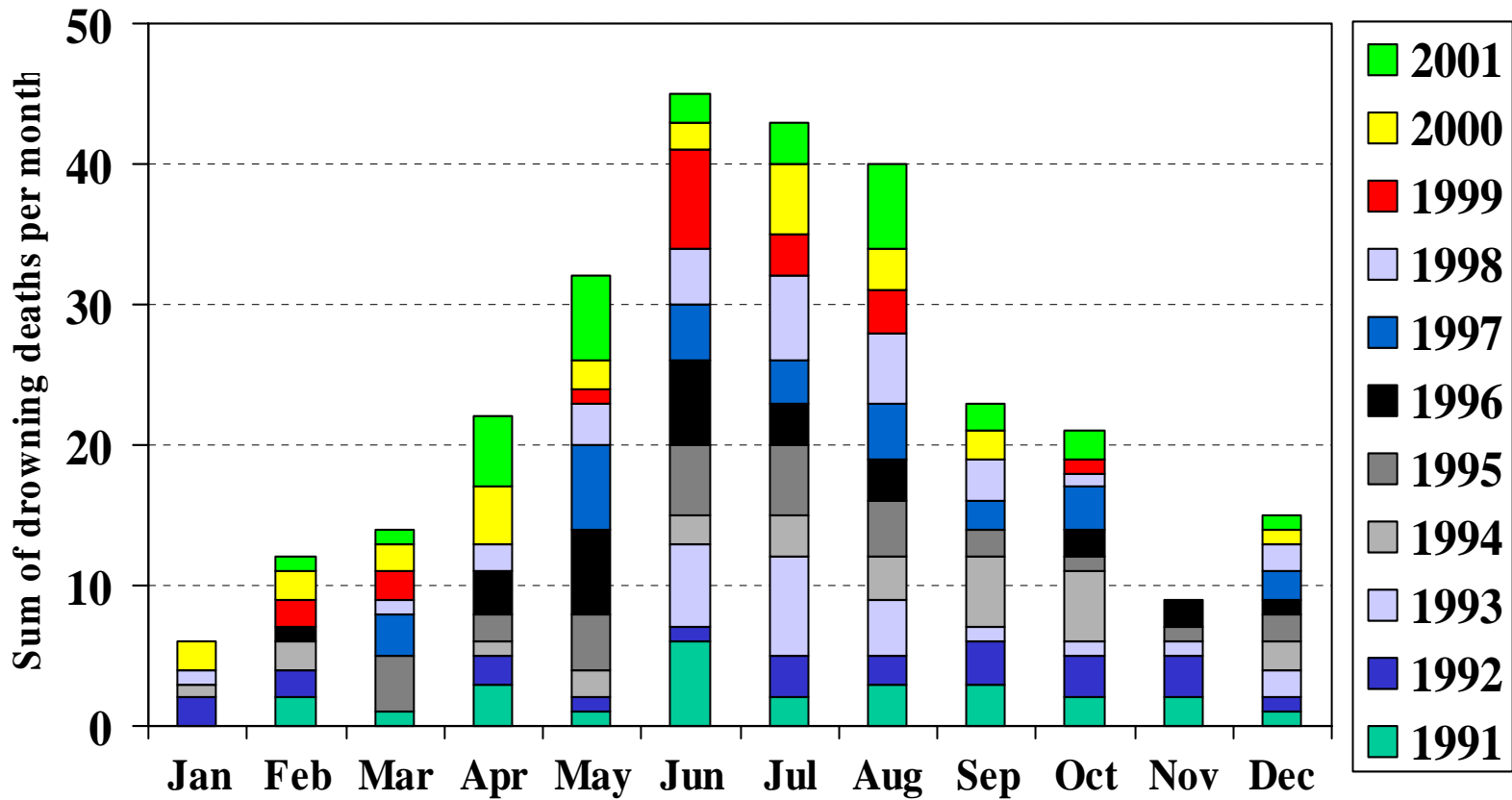


# Location of Drowning Death, Arizona Children 0-4 years of age



# Drowning deaths per month

## Arizona residents, age 0-4



Source: Arizona Vital Statistics

# Water-related incidence surveillance in Maricopa County

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- **Source:** Reports from fire departments participating in the Drowning Prevention Coalition of Central Arizona
- **Case definition:** A life-threatening water-related incident that triggers a 9-1-1 call; child not breathing or struggling; usually given CPR
- **Exclusions:** “dunkings; close calls; brief submersion” (child struggling, breathing, not given CPR, rescued just in time).

**REPORT OF DROWNING OR  
NEAR-DROWNING IN ARIZONA -- 2003**

\_\_\_\_\_  
**DATE OF INCIDENT**  
(MM/DD/YR)

\_\_\_\_\_  
**HOUR**  
(24:00)

\_\_\_\_\_  
**AGE**  
(yrs)

\_\_\_\_\_  
**SEX**

\_\_\_\_\_  
**INCIDENT #**

\_\_\_\_\_  
PLAT # or ZIP CODE

\_\_\_\_\_  
**Fire Dept.**

(Reporting agency)

**CITY OF INCIDENT:**

- Chandler  Mesa  Rural area  
 Gilbert  Peoria  Scottsdale  
 Glendale  Phoenix  Tempe  
 Other: \_\_\_\_\_

**HISPANIC:**  Yes  No  Unk.

**RACE:**  White  Amer. Indian  
 Black  Unknown  
 Other: \_\_\_\_\_

**WATER TYPE:**

- Pool--in ground  Spa  
 Pool--above ground  Bathtub  
 Canal or Irrig. Ditch  Toilet  
 Other: \_\_\_\_\_

**SITE OF INCIDENT:** (at whose home?)

- Victim's Home  Neighbor's "  
 Relative's "  Friend's "  
 Other: \_\_\_\_\_

**TYPE OF DWELLING OR FACILITY:**

- Single Home  Apt/Condo  
 Hotel/Motel  Other: \_\_\_\_\_

**ATTIRE OF VICTIM:**

- Swimwear  Other Clothes  
 None

**ACTIVITY AND LOCATION OF VICTIM  
IMMEDIATELY PRIOR TO INCIDENT:**

\_\_\_\_\_  
**SUPERVISOR(S) AT TIME OF INCIDENT:**

- Mother  Father  N/A  
 Other (Specify) \_\_\_\_\_  
Age of this person \_\_\_\_\_

**ACTIVITY AND LOCATION OF SUPERVISOR  
IMMEDIATELY PRIOR TO INCIDENT:**

\_\_\_\_\_  
**STATUS OF VICTIM WHEN FOUND IN WATER:**

- Submerged  Floating  
 Struggling  Unknown  
 Other: \_\_\_\_\_

**RESPIRATORY EFFORT WHEN PULLED  
FROM WATER:**

- Present  Absent

**ESTIM. DURATION OF ANOXIA:** \_\_\_\_\_

**DID RESCUER/ BYSTANDER(S) PERFORM  
CPR?**

- Yes  No  Unknown  
Done right? Comment: \_\_\_\_\_

**LENGTH OF RESIDENCE AT THIS HOUSE (if  
applicable)?** \_\_\_\_\_

**IS THERE A FENCE OR BARRIER?**

- Yes  No  Unknown  
Describe: \_\_\_\_\_

**METHOD OF ACCESS TO POOL OR SPA:**

- Supervisor allowed child into pool or deck area  
 No barrier -- child wandered in  
 Climbed (specify): \_\_\_\_\_  
 Child entered unsecured gate  
 Child entered secured gate  
 Other: \_\_\_\_\_

**WOULD AN INNER FENCE AROUND THE POOL  
HAVE PREVENTED THIS INCIDENT?**

- Yes  No  
 Unknown  N/A

**DISPOSITION:**

- DOA  Died in E.R.  
 Treated As Outpatient  
 Admit to: \_\_\_\_\_

**FOLLOW-UP: (Date pt was last seen)**

- Died \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 No Impairment \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Impairment \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

**DESCRIBE THE APPARENT CIRCUMSTANCES** (how/why it happened; how child was found & revived): \_\_\_\_\_

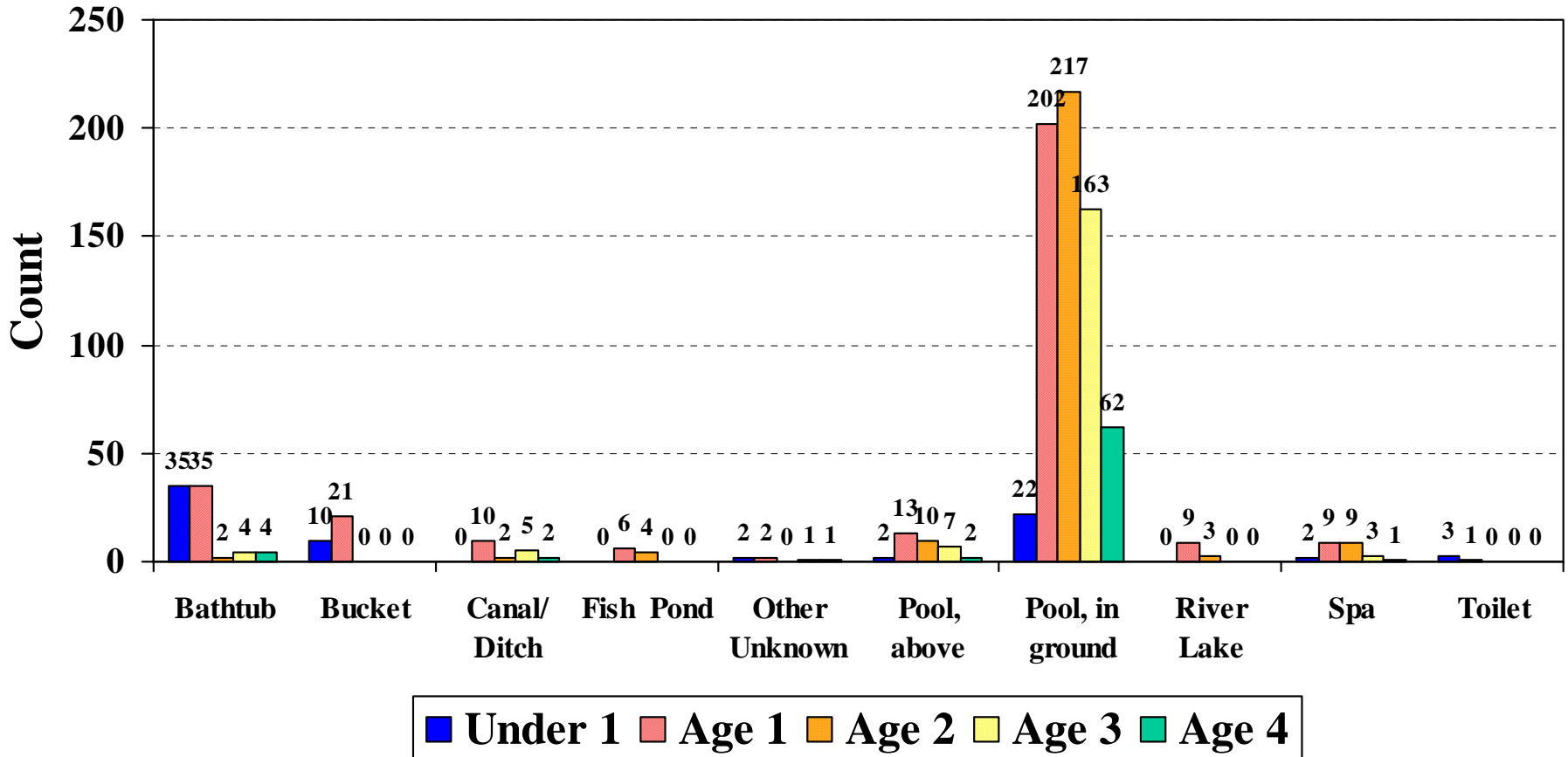
\_\_\_\_\_  
(Initials)

\_\_\_\_\_  
12  
(Today's Date)

# Body of Water of Incident

Maricopa County, 1990-2002

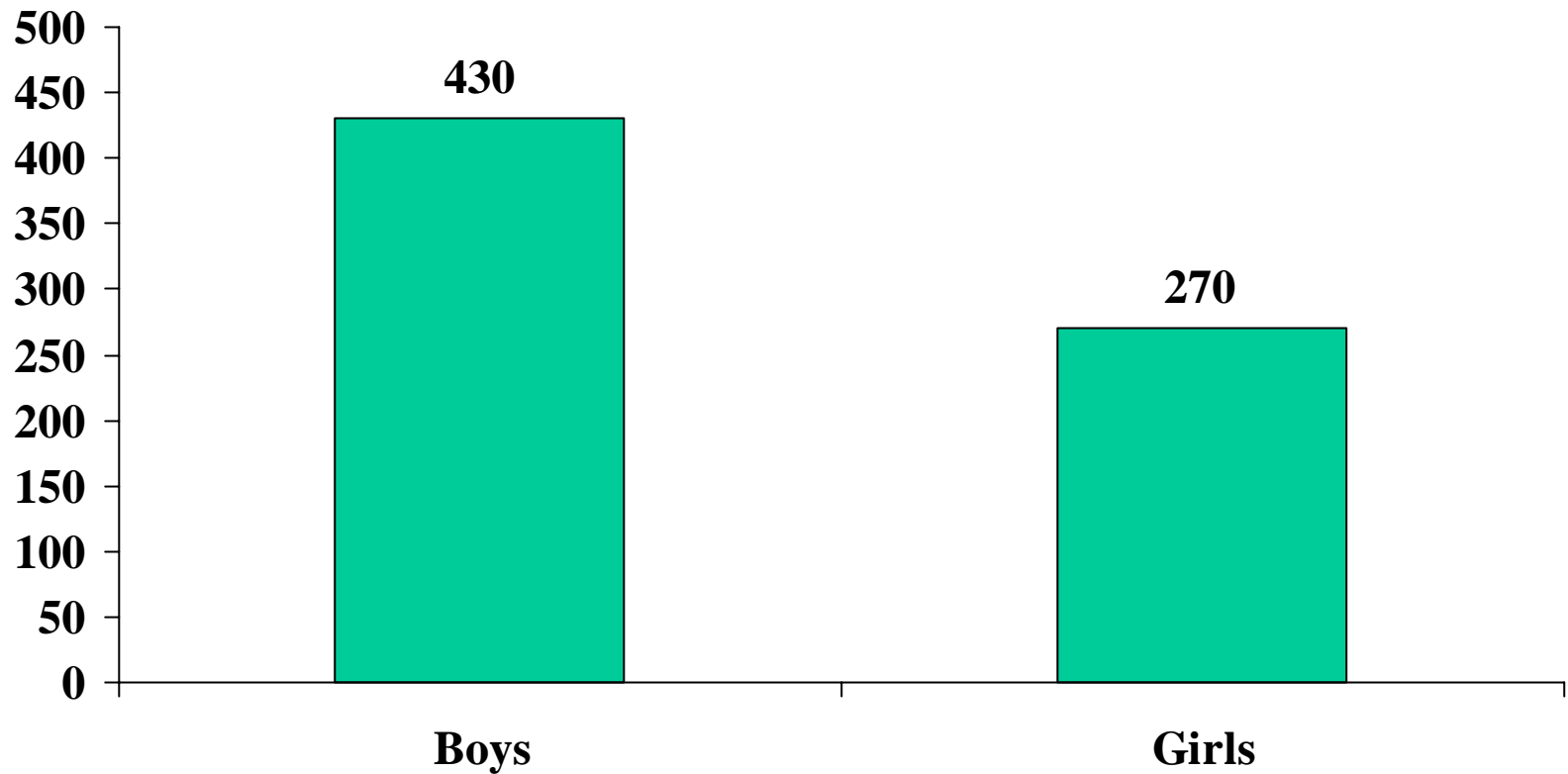
Outcome = Alive or dead



Source: Incidence reports from fire departments

# Pool incidents: Boys vs Girls

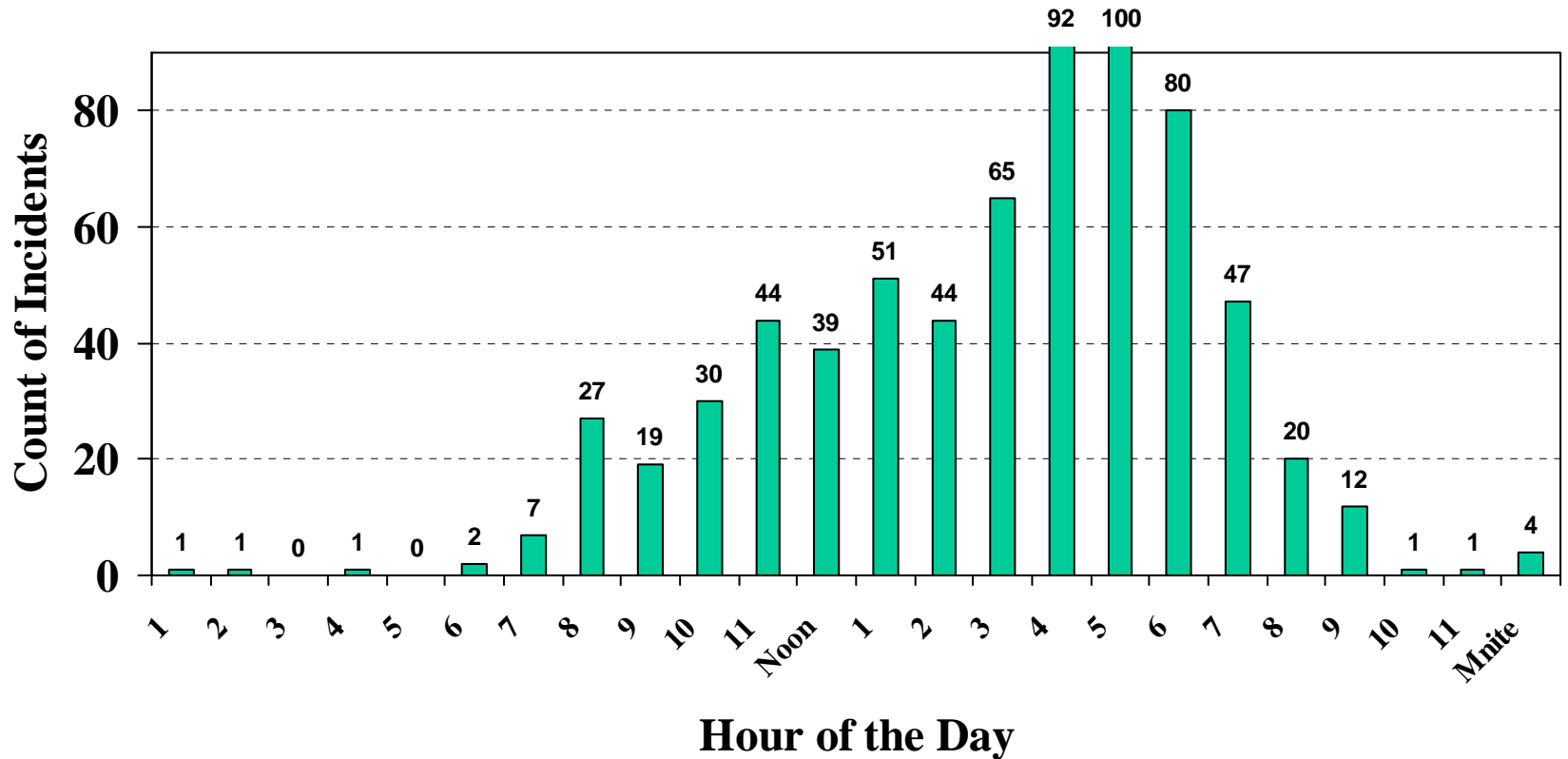
1990 – 2002; Age 0-4



Source: Incidence reports from fire departments

# Pool Incidents, Age 0-4: Hour of the Day

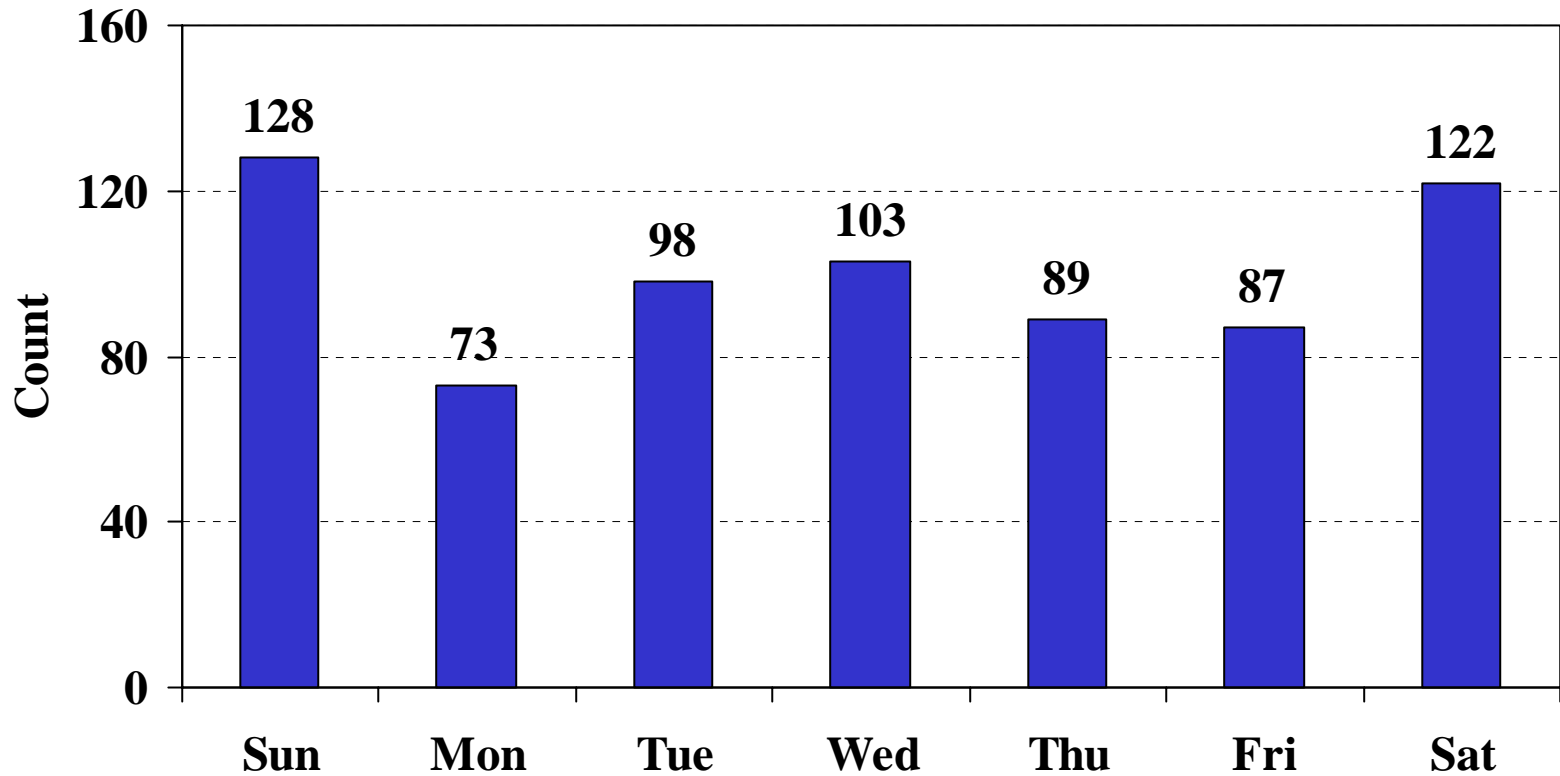
1990 - 2002



Source: Incidence reports from fire departments

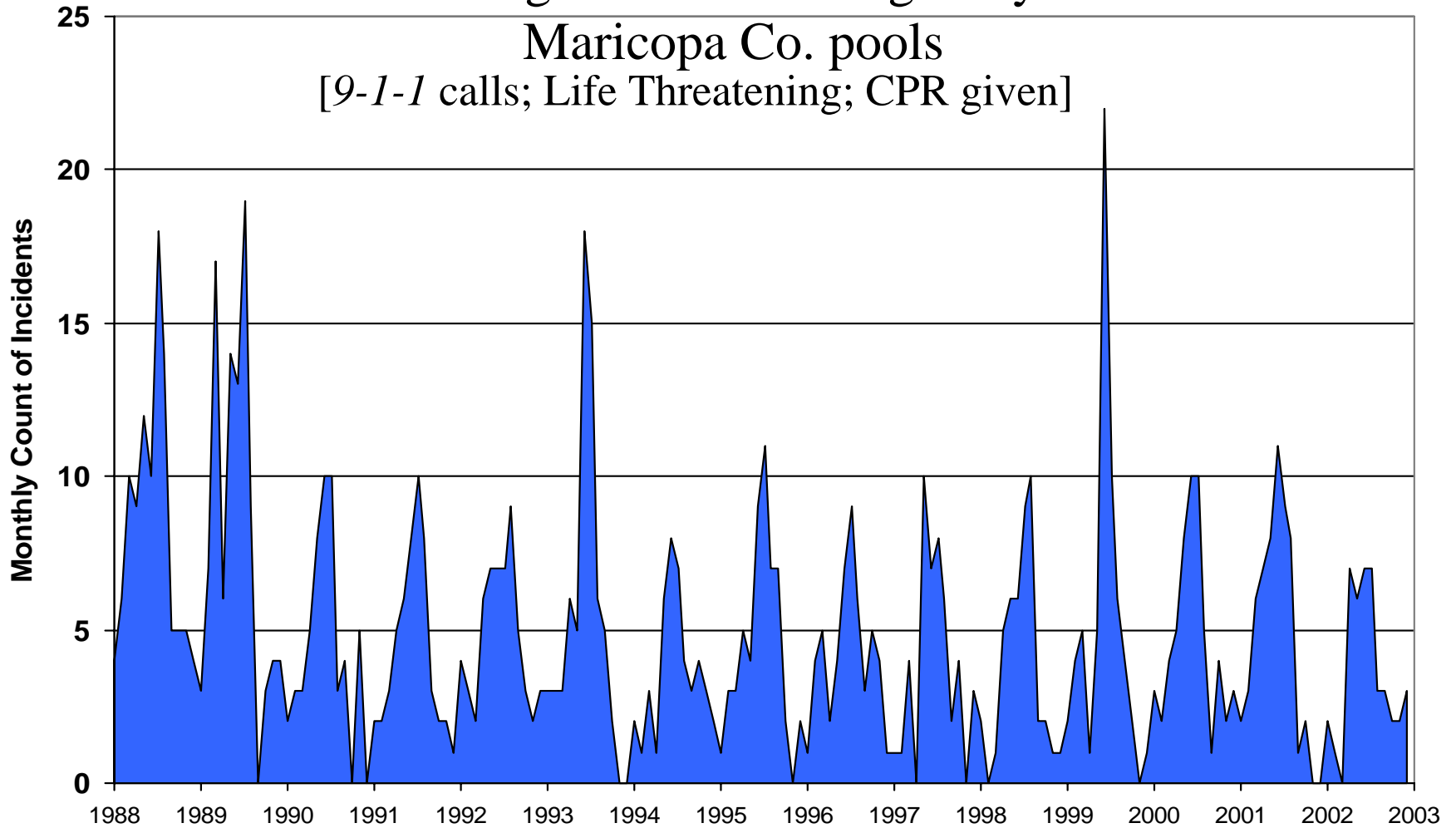
# Pool Incidents: Day of Week

1990 - 2002



Source: Incidence reports from fire departments

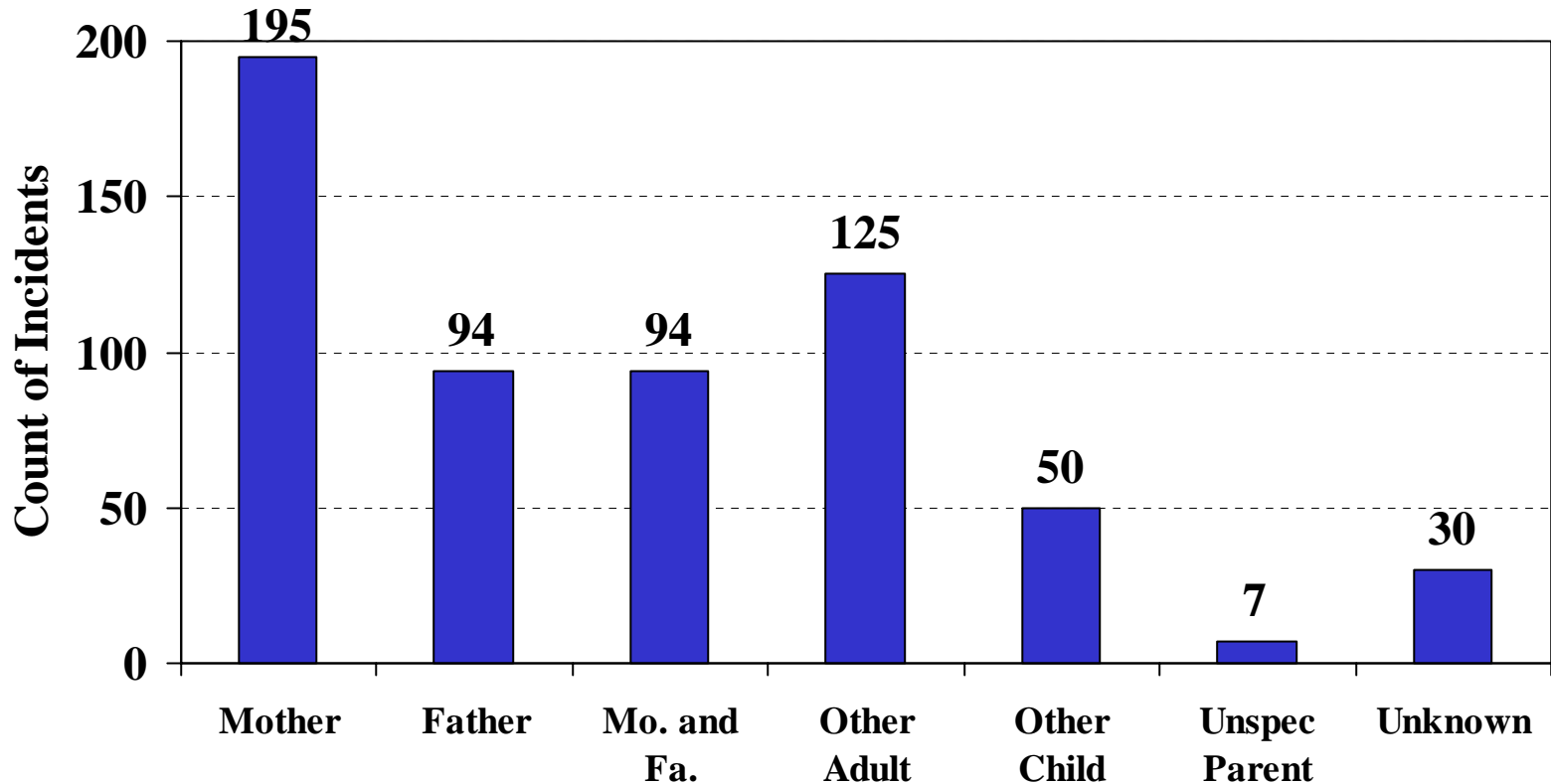
# Life-threatening incidents among 0-4 year olds in Maricopa Co. pools [9-1-1 calls; Life Threatening; CPR given]



Source: Incidence reports from fire departments

# Pool Incidents: Presumed Supervisor

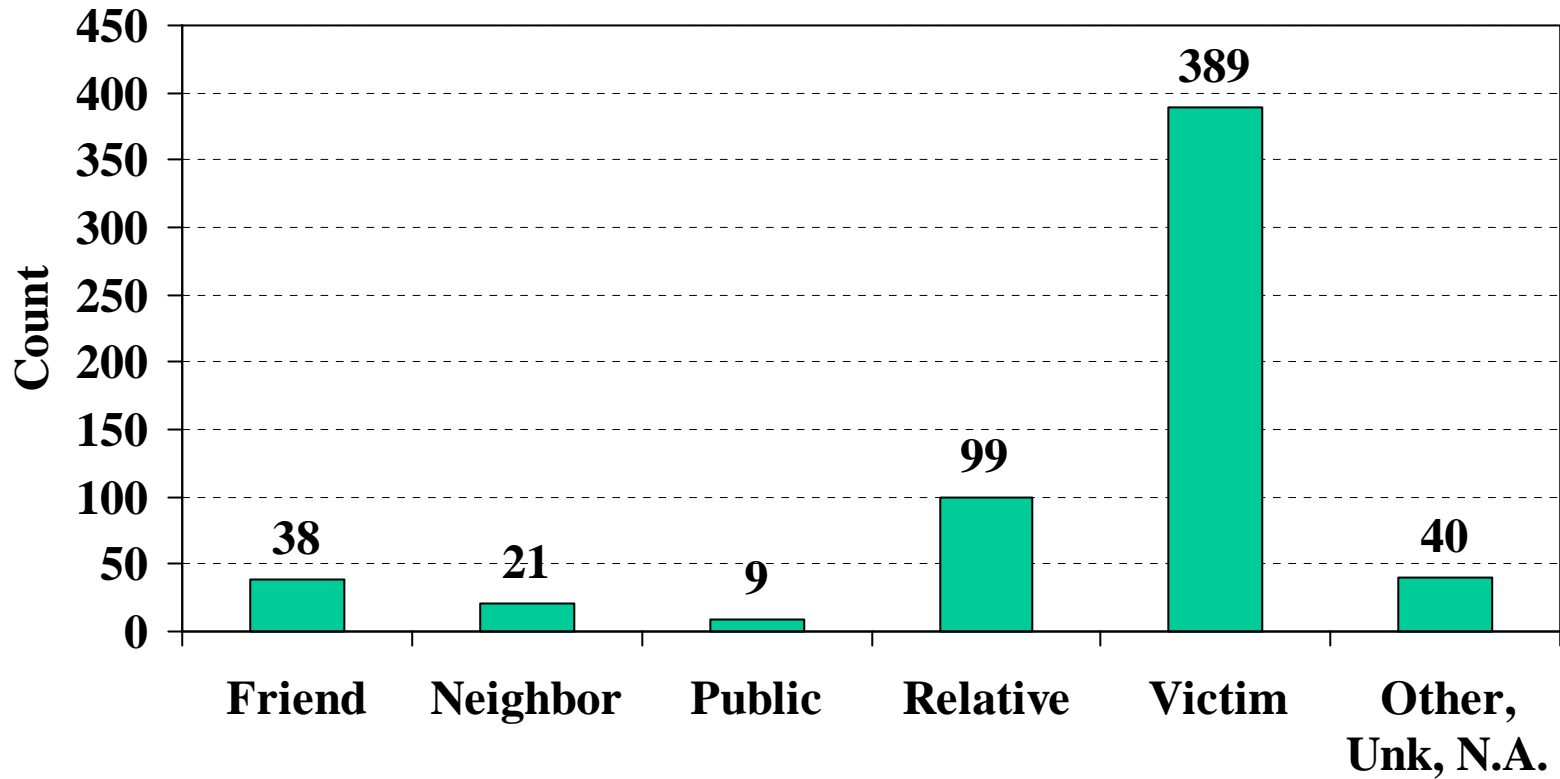
1992 - 2002



Source: Incidence reports from fire departments

# Pool Incidents: At Home of ...

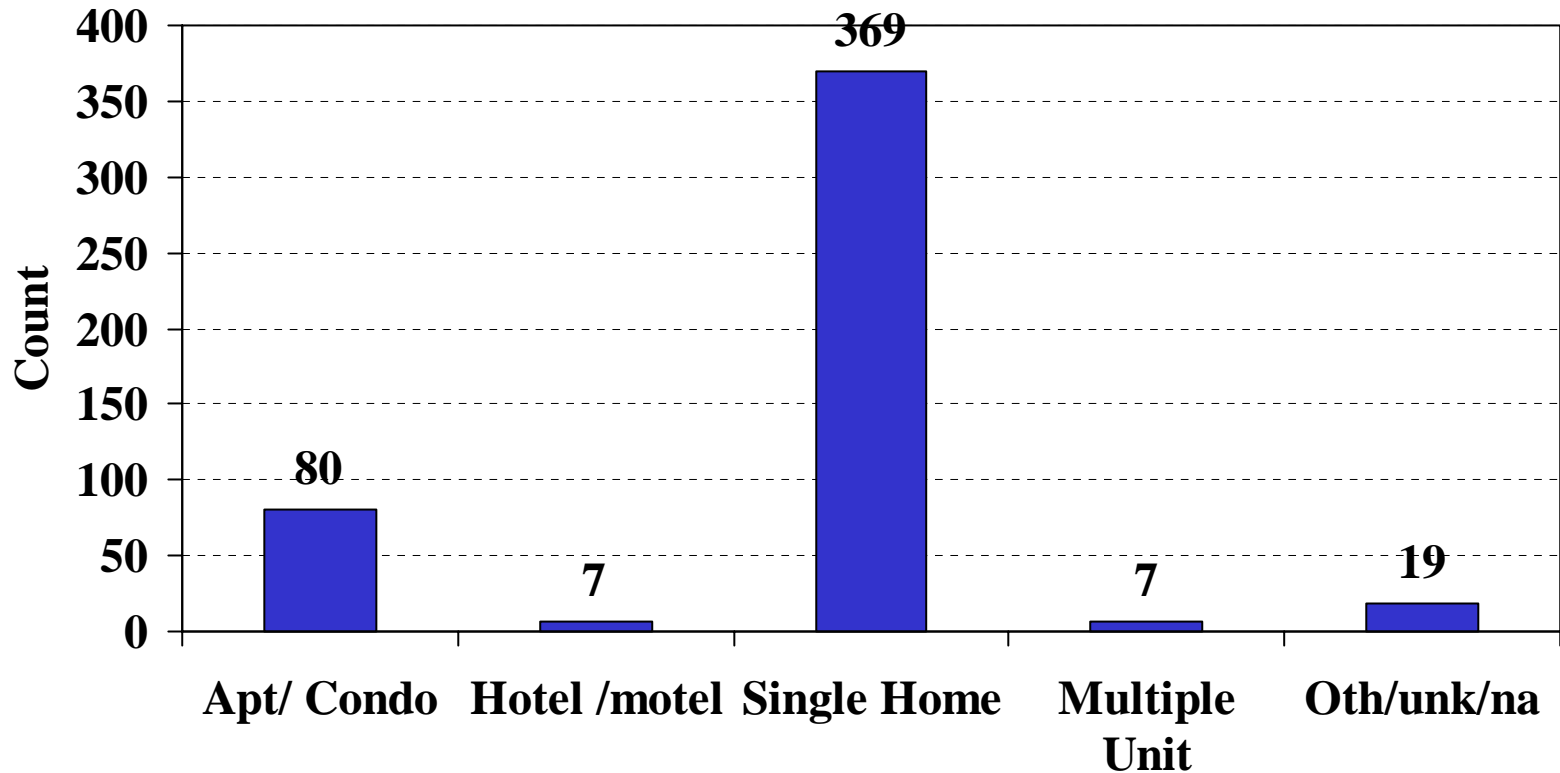
1992-2002



Source: Incidence reports from fire departments

# Pool Incidents: Dwelling Type

1992 - 2002

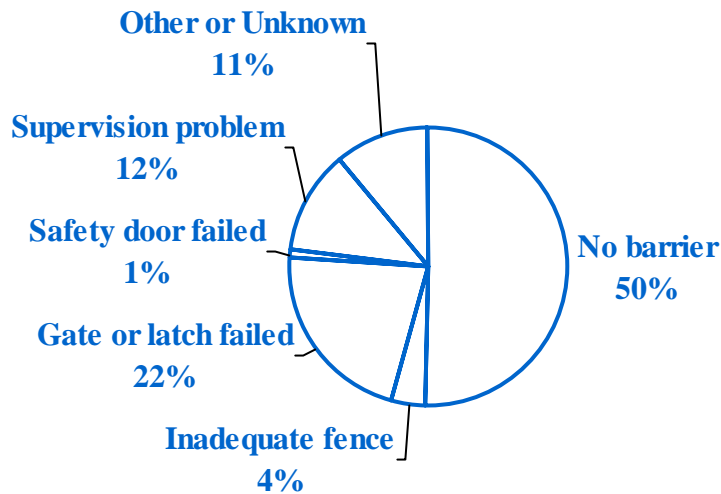


Source: Incidence reports from fire departments

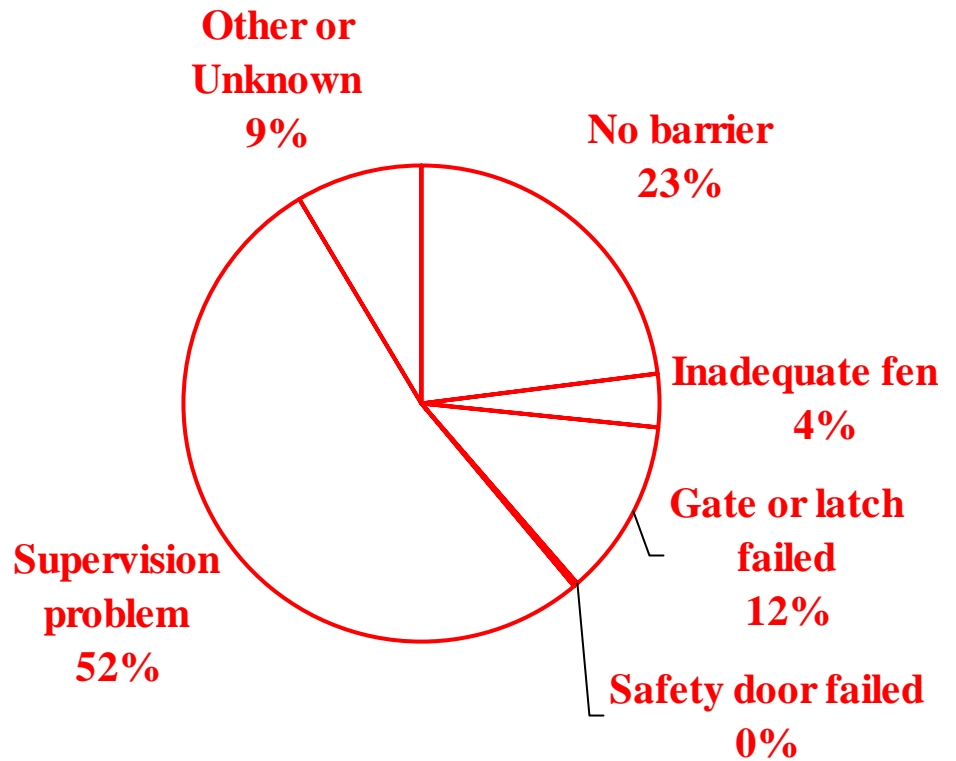
# Attributed Cause of Pool Incidents, 1998-2002

all outcomes

**Oct - April**  
N=282

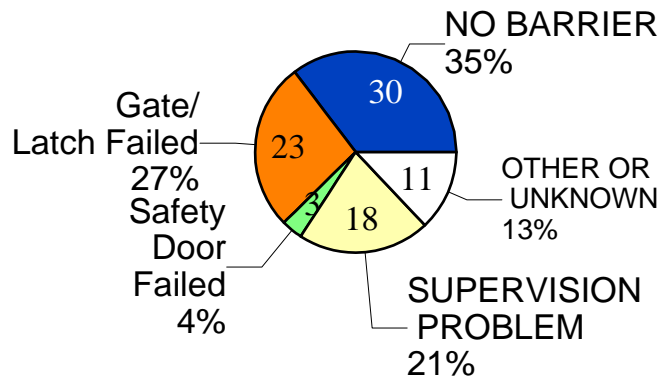


**May - Sept**  
N=555

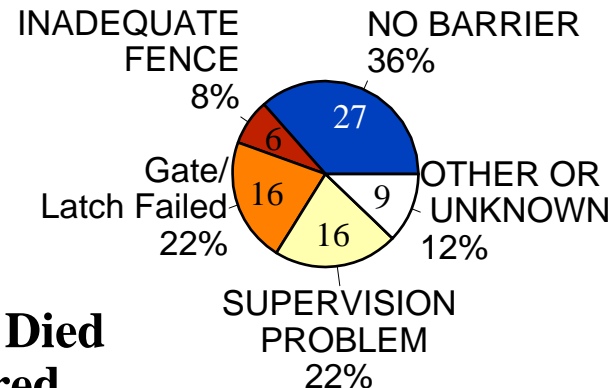
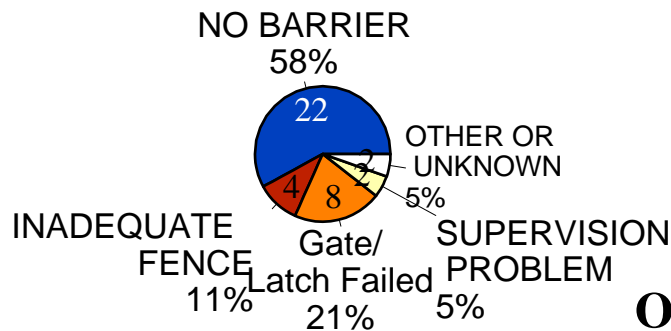
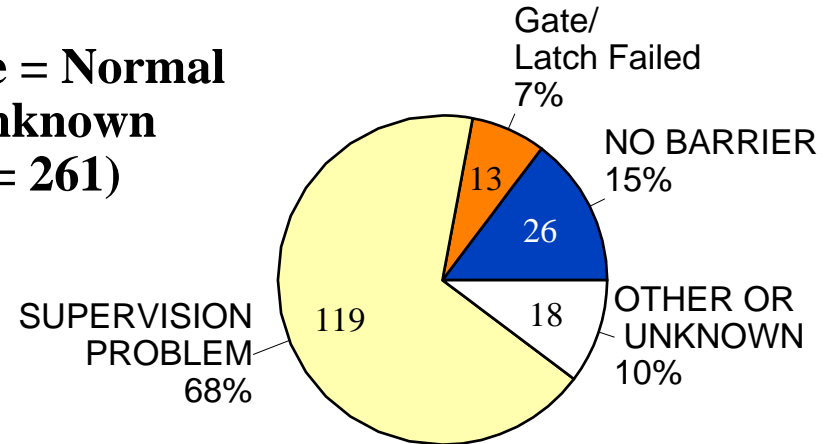


# Attributed cause in pools, children under 5 years of age, Maricopa County, 1996-2002

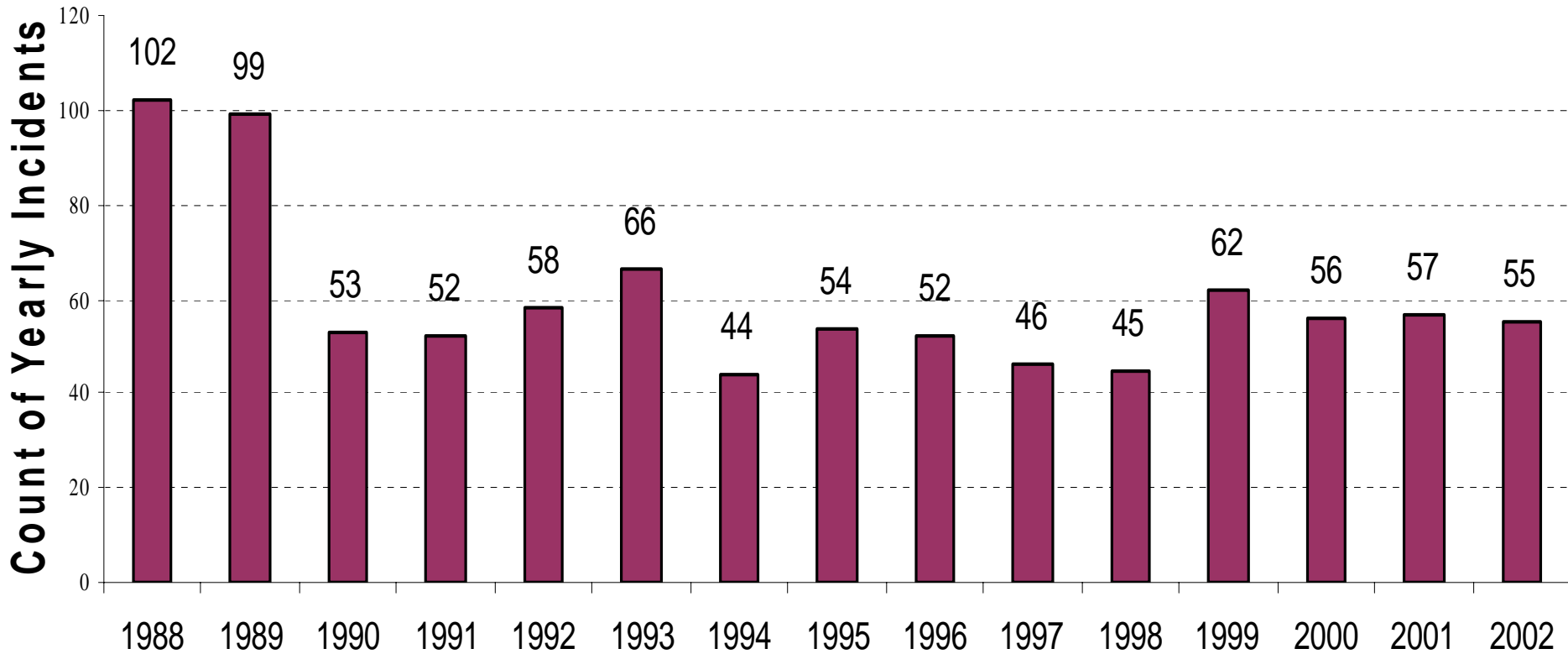
**COLD MONTHS  
(OCT-APR)**



**WARM MONTHS  
(MAY-SEPT)**



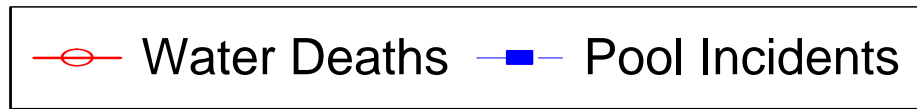
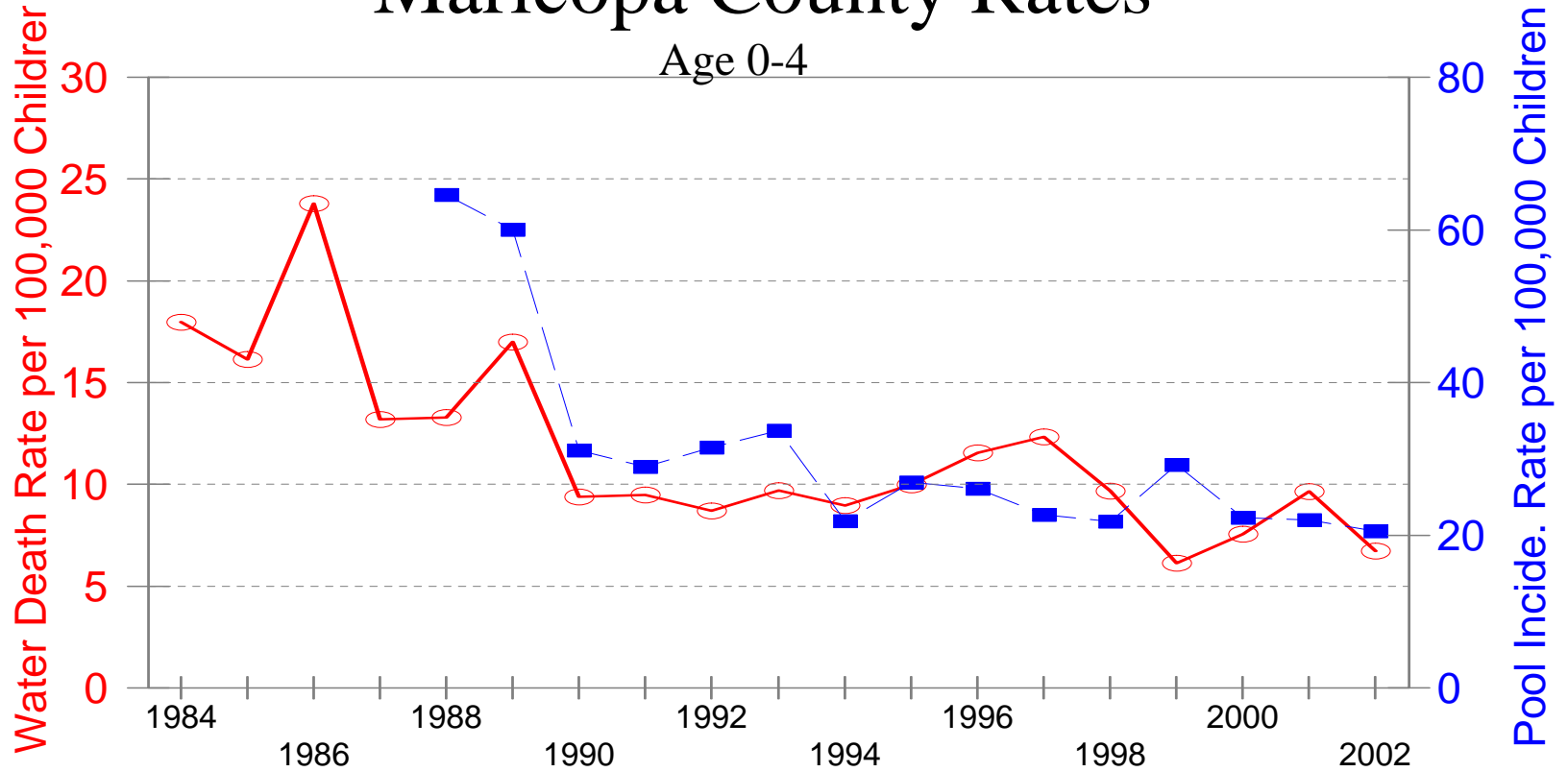
# Life-threatening incidents, 0-4 year olds, Maricopa Co. pools



Source: Incidence reports from fire departments

# Maricopa County Rates

Age 0-4



# Knowledge Gaps

- How many pools
  - Frequency of visits by children
  - How many have a barrier; what kinds
- Swim lessons
  - Teaching “water skills” to young children
  - Age to start swim lessons
- Risk to newcomers
- Rates in cities with differing laws
- Maintenance of barriers
- CPR skills of the rescuers
- Other bodies of water; other age groups

# Haddon's Matrix

	Host (victim)	Environment (setting)	Vector (water)
Pre-event			
Event			
Post-event			

# Haddon's Countermeasures for Injury Control

1. Prevent creation of the hazard (stop producing poisons)
2. Reduce the amount of the hazard (package drugs in smaller/safer amounts)
3. Prevent release of hazard (make bathtubs less slippery)
4. Modify rate or spacial distribution of hazard (air bags)
5. Separate the hazard in time or space (pedestrian walkway vs street)
6. Separate the hazard with physical barriers (guard rails)
7. Modify the basic qualities of the hazard (narrow the crib slats)
8. Make people more hazard resistant (stronger bones in old people)
9. Counter the damage once done (EMS)
10. Stabilize, repair, or rehabilitate

# Further Information

- ADHS websites
  - [www.hs.state.az.us](http://www.hs.state.az.us)
  - <http://www.hs.state.az.us/plan/ohpes.htm>
  - <http://www.hs.state.az.us/phs/phstats/meddir>
- Drowning Prevention Coalition website
  - <http://www.preventdrowning.com/>
- Tim Flood
  - 602-542-7331
  - [tflood@hs.state.az.us](mailto:tflood@hs.state.az.us)