

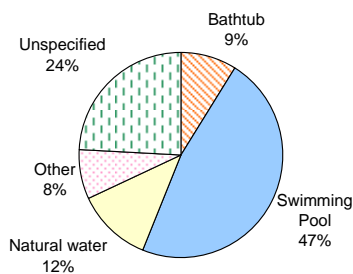
MEASURING THE DECREASE IN CHILD DROWNING

The National Drowning Prevention Alliance (NDPA) participates in activities to reduce drownings nationwide. As a part of those activities the Research and Data committee tracks statistics about drowning deaths. The NDPA Strategic Plan, Objective #3, states that the Alliance will work “**to reduce the incidence of toddler drowning in swimming pools and spas.**” Statistics from death certificates provide the most direct method of measuring this progress.

Why has the Alliance targeted pools and spas for prevention efforts?

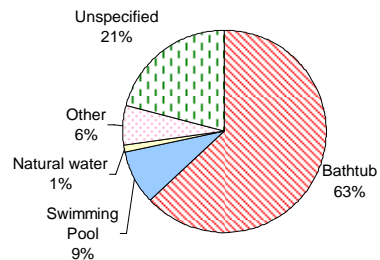
The pie figures below show that a swimming pool is the most common site for drowning deaths of young children, age 1-4 years. The Alliance believes that targeting the swimming pool deaths will most rapidly reduce the child drowning rate. Also, we believe that a variety of effective interventions can be applied to reduce the deaths in swimming pools.

Site of Drowning Deaths, 1999-2003,
U.S., Age 1-4 years (N=2351)



Source: CDC WONDER

Site of Drowning Deaths, 1999-2003,
US, Age 0 (<1) years (N= 332)



Source: CDC WONDER

In the remainder of this report we provide information about the counts and rates of drowning of children one year of age through 4 years of age (that is, age 1-4 years, inclusive). We exclude the deaths of children less than one year of age here because only a relative small proportion those drowning deaths occurs in swimming pools, and excluding the infants allows for a more robust and focused assessment of progress toward Objective 3.

What is our source of data?

The Alliance relies upon the National Center for Health Statistics (NCHS), a unit of the federal Centers for Disease Control and Prevention (CDC) as our source of data about deaths from drowning. The NCHS hosts useful websites that allow users to query their datasets and produce data at a state and the national level. In some circumstances, data at the county level also are available from the websites. The NCHS is able to post a complete year of data about 3 years after the fact (i.e., data for year 2004 was posted in 2007).

Where do national data come from?

The NCHS obtains its data from state vital records offices. When a person dies (of whatever cause) all states require that a death certificate be prepared. For unnatural deaths (for example, those caused by injury) usually a medical examiner investigates the death, certifies the cause of

the death, and files the death certificate with the state registrar. The states forward demographic and medical information from the death certificates to NCHS so that NCHS can compile national mortality statistics.

How are drownings classified?

The NCHS requires states to code a decedent’s underlying cause of death according to the International Classification of Diseases (ICD-10). The 10th edition of this classification scheme has been using to classify deaths since 1999. Drownings and immersions are classified according to the water type in which the incident occurred: bath-tub, swimming pool, natural water, other specific place of drowning; and unspecified drowning. These codes range from W65 – W74, and are specific for accidental drownings.

ICD-10 code	Description
W65	Drowning and submersion while in bath-tub
W66	Drowning and submersion following fall into bath-tub
W67	Drowning and submersion while in swimming-pool
W68	Drowning and submersion following fall into swimming-pool
W69	Drowning and submersion while in natural water
W70	Drowning and submersion following fall into natural water
W73	Other specified drowning and submersion
W74	Unspecified drowning and submersion

How do we measure this problem?

We look at two measures: overall counts of yearly deaths (Figure 1); and the mortality rate (Figure 2) expressed as the count of deaths divided by the census population of children in that age group.

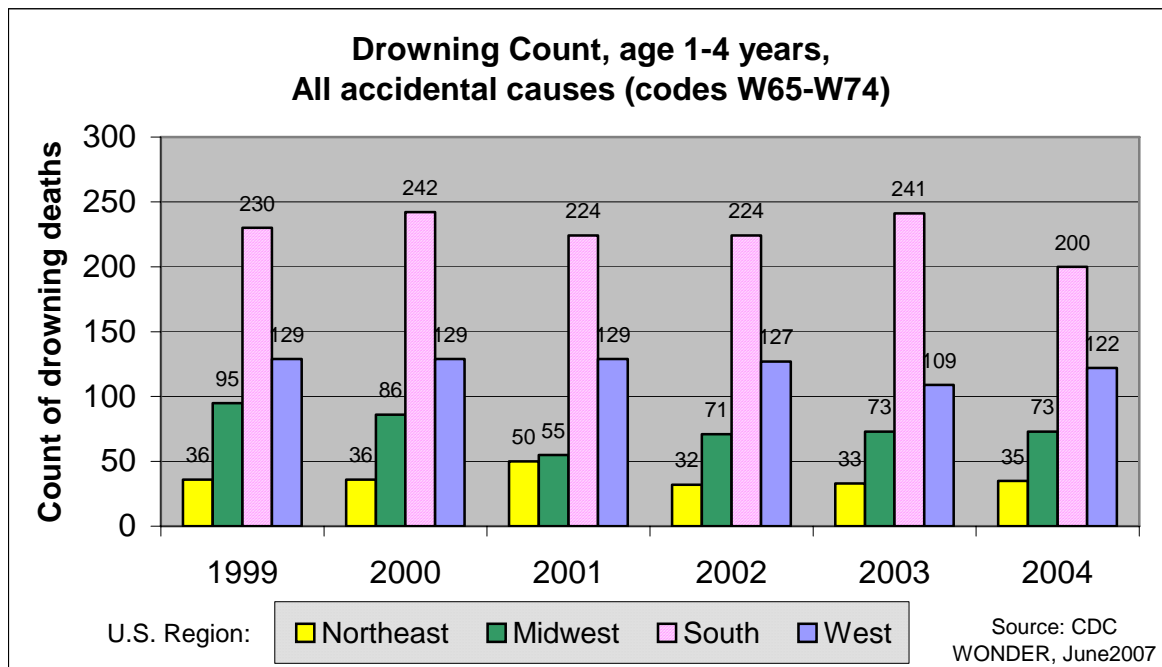


Figure 1. Yearly counts of drowning deaths reported to the National Center for Health Statistics. The data are shown according to the four census regions of the United States.

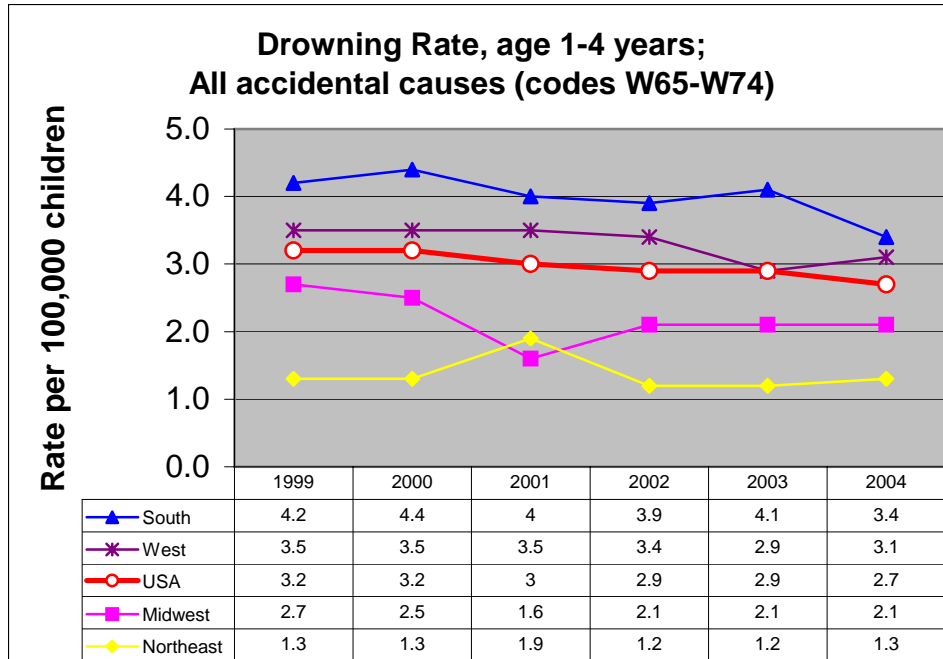


Figure 2. Drowning mortality rate in the US and the four census regions.

Tracking progress in reducing deaths in pools and spas

NDPA Objective 3 specifies that the Alliance works to reduce the toddler drowning mortality rate for incidents occurring in pools and spas. Our target rate for the year 2010 is no more than 1.5 drownings per 100,000 children. However, our committee has identified technical issues in monitoring progress specific to these bodies of water.

Pools: Drowning codes W67 and W68 are specific for identifying swimming pool related deaths (see legend in Figure 3). However, from 1999 through 2003 the coding software that identified the water body did not consider a “pool” to mean “swimming pool.” Rather, pool drownings were categorized as W74: “other specified drownings” – a category that includes other types of “pools” that were not swimming pools. For deaths occurring from 2004 forward, the software was reprogrammed to classify a drowning in a “pool” as drowning in a “swimming pool.” Therefore, for the period 1999 through 2003, some swimming pool related deaths may be included in categories W73 and W74.

We are not aware of any validation studies that have confirmed the accuracy of distinguishing W67 from W68. Until such a study is conducted we prefer to track progress by combining these two codes to indicate that the submersion location was a swimming pool.

Spas: A spa-related death can be coded to a range of sites. An incident occurring in a “spa” might be categorized as an incident in a bathtub, a swimming pool, or a place of invigoration. Unfortunately, no single death code accurately reflects the term “spa.”

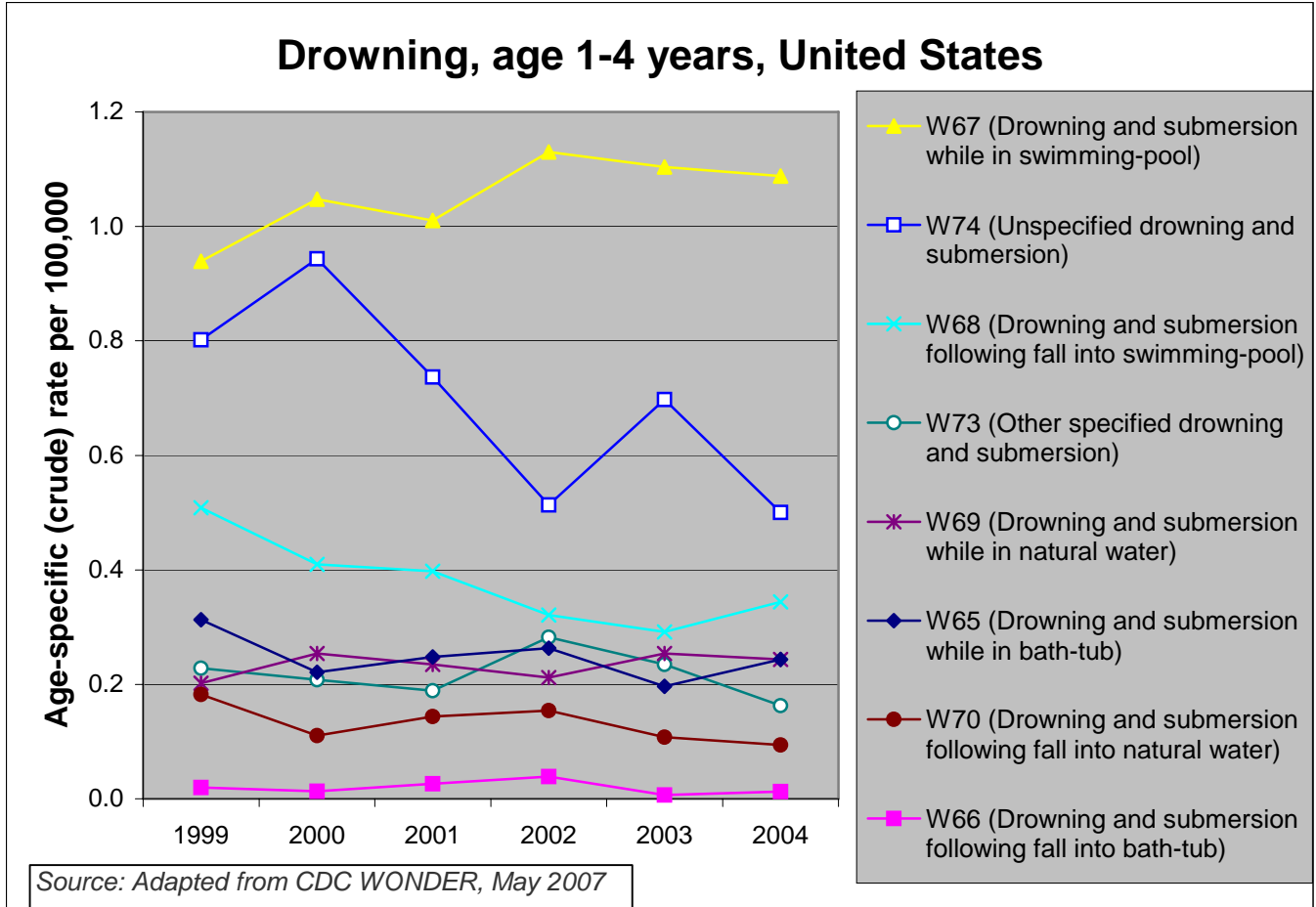


Figure 3. Unintentional drowning rate according to detailed underlying cause, United States.

Combining a few categories gives a simpler graph. The annual counts of deaths are shown in Figure 4; the rates (per 100,000 children) are shown in Figure 5.

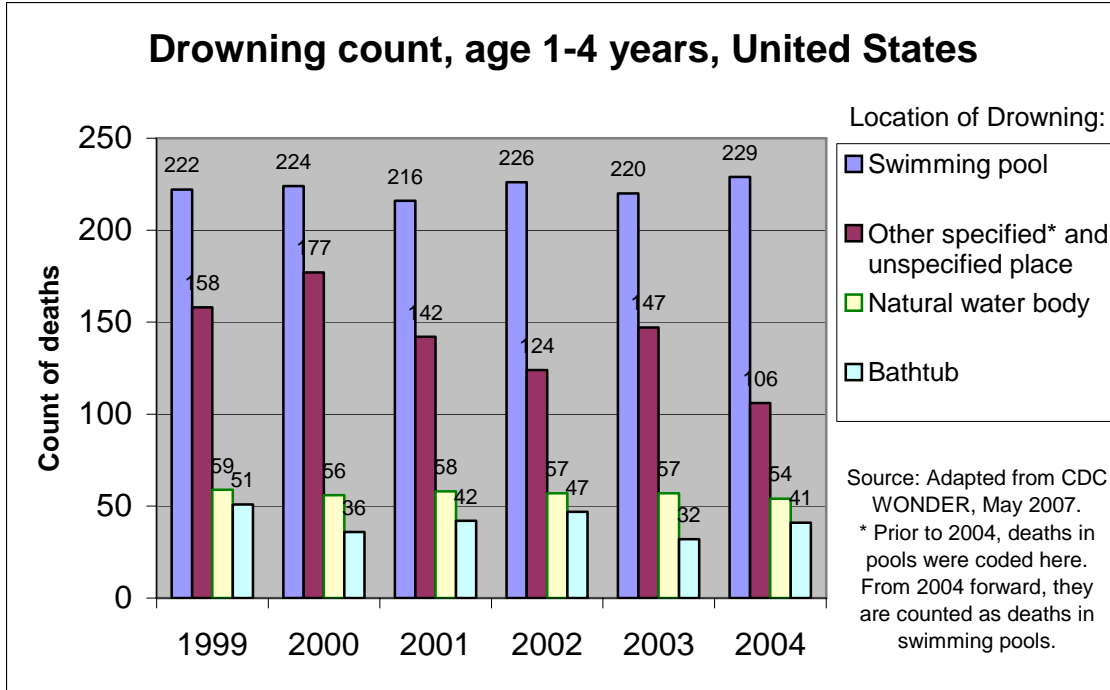


Figure 4. Count of drowning deaths in the United States according to the water type. Between 1999-2003 incidents in “pools” may have been coded as occurring in “Other specified place.”

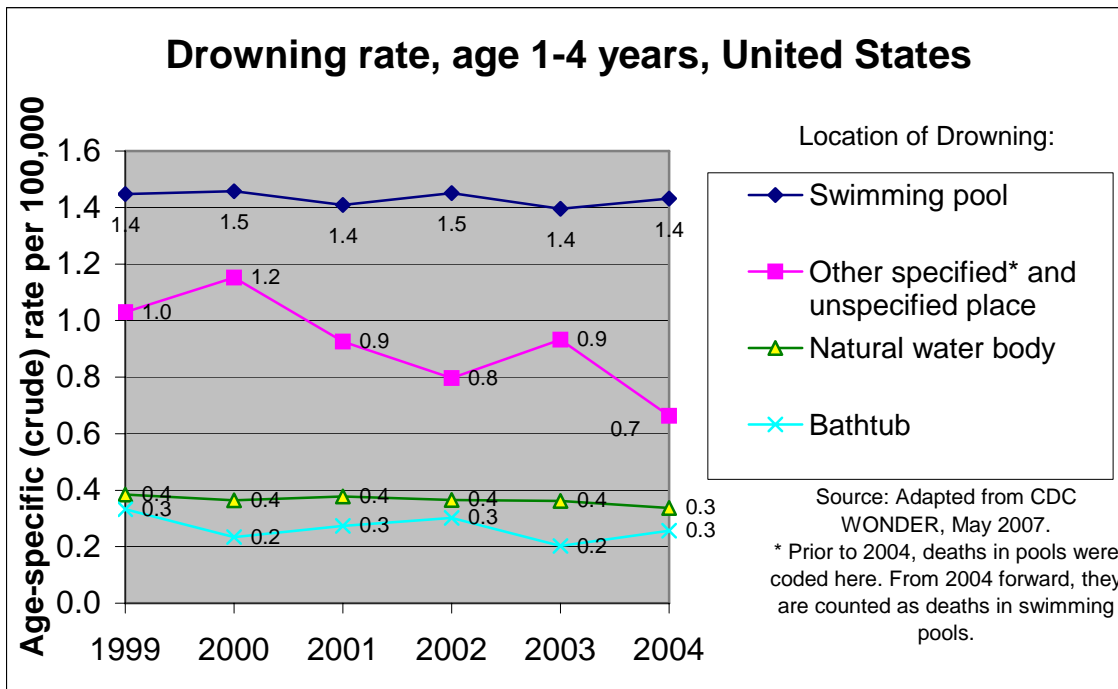
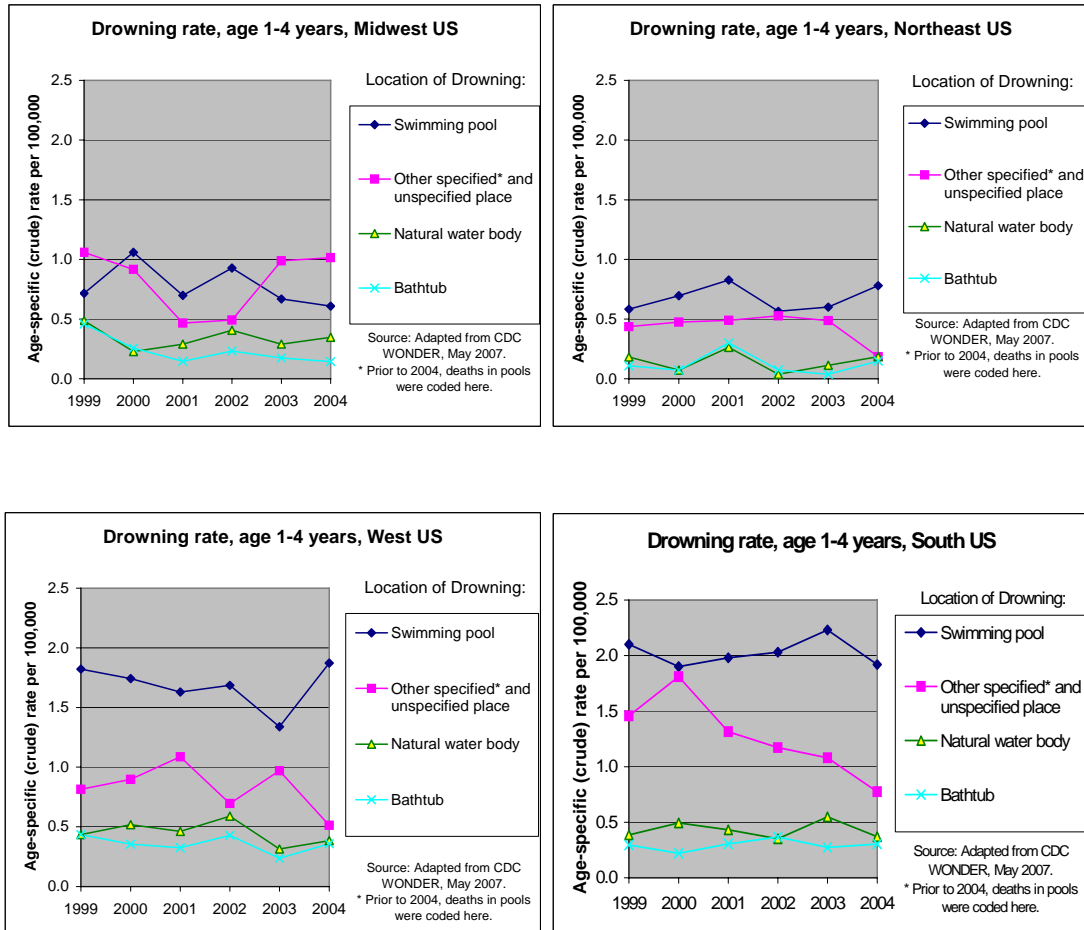


Figure 5. Rate of drowning deaths in United States according to the water type. Between 1999-2003 incidents in “pools” may have been coded as occurring in “Other specified place.”

Do the drowning rates vary according to region of the United States?

Rates vary somewhat according to region, with the states in the South and West experiencing the highest rates. Of note, due to the relatively low count of drownings in natural bodies of water and in bathtubs the rates for those locations are statistically unstable. A comparison of just the rates in swimming pools is shown in Figure 6.



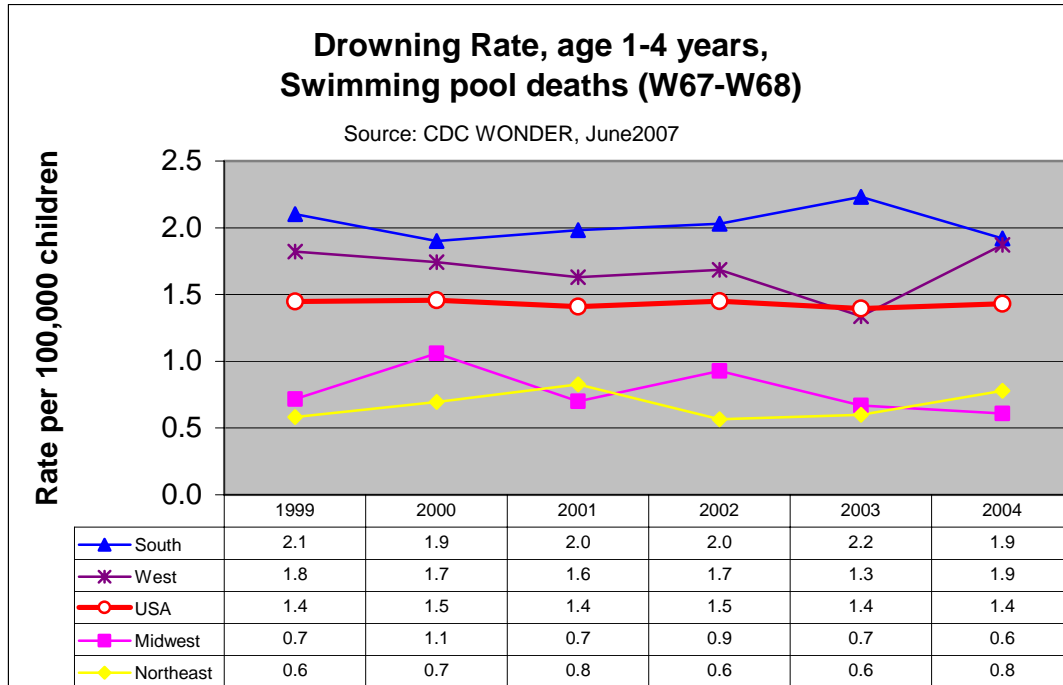


Figure 6. Comparison of regional and U.S.A. drowning rates of children age 1-4 years for the combined codes W67 and W68. Codes W73 or W74 are not shown. Data from 2004 forward will be comparable.

Conclusion and Recommendation:

The best way for the Alliance to track progress in the prevention of drowning of young children in swimming pools is to track the death rates using ICD-10 codes W67 and W68 combined – “deaths due to drowning or submersion while in, or following fall into swimming pool.” However, readers should recognize that data covering the years 1999-2003 coded some pool-related deaths into W74 (the “other specified” category). The apparently flat rate of swimming pool drownings prior to 2004 may reflect this coding artifact. Given the uncertainty about the rates prior to 2004, it is difficult to determine a reference rate, but future rates (from 2004 forward) should not have this problem.

We recommend Figure 4 and Figure 5 for tracking yearly progress of NDPA Objective 3.