



Special Report from the CDC

Racial and ethnic disparities in fatal unintentional drowning among persons less than 30 years of age – United States, 1999–2010[☆]

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ABSTRACT

Background: In the U.S., almost 4,000 persons die from drowning annually. Among those 0–29 years, drowning is in the top three causes of unintentional injury death. **Methods:** To describe racial/ethnic differences in drowning rates by age of decedent and drowning setting, CDC analyzed 12 years of mortality data from 1999 through 2010 for those ≤ 29 years. **Results:** Compared to whites, American Indians/Alaska Natives were twice, and blacks were 1.4 times, as likely to drown. Disparities were greatest in swimming pool settings, with drowning rates among blacks aged 5–19 years 5.5 times higher than those among whites. **Conclusions:** Drowning rates for black children and teens are higher than those of other race/ethnicities, especially in swimming pools. **Practical application:** The practicality and effectiveness of current drowning prevention strategies varies by setting; however, basic swimming skills can be beneficial across all settings and may help reduce racial disparities.

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1. Introduction

In the United States, almost 4,000 persons die from drowning each year (Xu, 2014). Drowning is responsible for more deaths among children aged 1–4 years than any other cause except birth defects (CDC, 2014). For persons aged ≤ 29 years, drowning is one of the top three causes of unintentional injury death (CDC, 2014). Previous research has identified racial/ethnic disparities in drowning rates (CDC, 2012; Saluja et al., 2006). To describe racial/ethnic differences in drowning rates by age of decedent and drowning setting (e.g., bathtub, swimming pool, natural water, boating), CDC analyzed 12 years of combined mortality data from 1999 through 2010 for those aged ≤ 29 years.

2. Methods

Death certificate data for persons aged ≤ 29 years for 1999 through 2010 were obtained from the National Vital Statistics System¹ to identify persons who had died from unintentional drowning. Fatal unintentional drowning was defined as any death for which the underlying cause included any of the following codes from the *International Classification of Diseases, 10th Revision*: W65–W74, V90, or V92. By international standards, boating-related drowning (V90 and V92) is classified as a transportation-related death. However, most boating in the United States is not for the purpose of transportation; therefore, drowning while boating is included in this report. Drowning was examined by setting (e.g., bathtub, swimming pool, natural water), age, and race/ethnicity. Race/ethnicity was coded into five mutually exclusive categories: Hispanic (of any race), and four non-Hispanic racial groups (white, black, American Indian/Alaska Native (AI/AN), and Asian/Pacific Islander (A/PI)). Age was divided into 5-year age groups for overall drowning deaths among each racial/ethnic category and for setting-specific drowning. Among blacks, whites, and Hispanics, overall drowning was presented by the year of age, and drowning in swimming pools and natural water were categorized by 2-year age groups to provide stable rates after infancy. Rates of drowning death for infants aged < 1 year were dissimilar from other ages and were not combined. Death rates per 100,000 population were calculated using 1999–2010 U.S. Census bridged-race population estimates. Differences between rates

[☆] The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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¹ Additional information available at <http://wonder.cdc.gov/ucd-icd10.html>.

representing at least 100 deaths were determined using z-tests; rates based on fewer than 100 deaths were compared using 95% confidence intervals from a gamma distribution.

3. Results

Among all settings combined, AI/AN aged ≤ 29 years had the highest rates of drowning, with blacks having the second highest rates (Table 1). Overall, the rate for AI/AN was twice the rate for whites (2.57 per 100,000 population versus 1.32, respectively) and the rate for blacks was 1.4 times the rate for whites (1.90 versus 1.32, respectively). When considering drowning rates by age group, AI/AN were not statistically different from other races for some age groups (whites at ages 1–4 years, blacks at ages 5–9, 10–14, and 15–19 years). By setting, disparities in drowning rates were greatest for swimming pool deaths, where the drowning death rate for blacks aged 5–19 years was 5.5 times the rate for whites (0.55 per 100,000 population versus 0.10, respectively) (data not shown).

Among each racial/ethnic group, drowning settings varied similarly by age group (data not shown). Infants aged < 1 year most commonly drowned in bathtubs, accounting for 62.5% of drowning at this age. Children aged 1–4 and 5–9 years most commonly drowned in swimming pools, accounting for 51.4% and 33.9%, respectively. The older age groups most commonly drowned in natural water settings.

Racial/ethnic differences in overall drowning rates varied by each year of age (Fig. 1). The highest rates for all three groups presented were among children aged 1 year, with rates for whites (5.22 per 100,000 population) higher than those for Hispanics (4.14), and rates for Hispanics higher than those for black children (2.98). Between the ages of 1 year and 5 years, drowning rates decreased significantly for each racial/ethnic group (83% for whites, 85% for Hispanics, and 43% for blacks). However, the drowning rates for black children were significantly higher than those for whites and Hispanics at every age from 5 years through 18 years. The greatest disparity for blacks compared with whites and Hispanics was at age 10 years (rate ratios of 4.2 and 5.3, respectively).

For drowning in swimming pool settings, the rates for black, white, and Hispanic children aged 1–2 years were highest; pool drowning rates among whites (2.53 per 100,000 population) were significantly higher than those for Hispanics (1.85) and blacks (1.59) in this age group. Rates of pool drowning among blacks were significantly higher than those for whites for ages 5–6 through 27–28 years and higher than those for Hispanics for ages 3–4 through 19–20 years; rate ratio was highest at ages 11–12 years for blacks compared to whites (10.4) (Fig. 2).

For drowning in natural water settings, the rates for blacks were significantly higher than those for whites for ages 7–8 through 17–18 years and higher than those for Hispanics for ages 5–6 through 15–16 years; rate ratios were highest at 13–14 years for both comparisons (3.5 and 2.6, respectively) (Fig. 2). Rates of drowning in natural water settings among Hispanics were similar to those among whites from 5–6 years through 15–16 years, when rates among Hispanics increased, peaking at 1.35 per 100,000 population among Hispanics aged 19–20 years.

4. Discussion

Identifying racial/ethnic drowning disparities by setting can help focus prevention efforts. For instance, swimming pools are generally considered safer than natural water venues for aquatic activities because their depth is known and bottom often visible, they lack currents and underwater hazards, and the side can be reached a relatively short distance away. However, in the United States, drowning in a swimming pool continues to be a major threat to the health of toddlers and preschool children (CDC, 2012; Xu, 2014). Moreover, swimming pool drowning rates for black children, adolescents, and young adults were elevated compared with those for other racial/ethnic groups. Research suggests that learning basic swimming skills (e.g., controlled breathing, floating, and traversing a distance) can reduce drowning risks (Brenner, Taneja, Haynie, et al., 2009; Rahman, Bose, Linnan, et al., 2012); however, many children and adults, especially blacks, report limited swimming skills (Gilchrist, Sacks, & Branche, 2000; Irwin, Irwin, Ryan, & Drayer, 2011).

Among all racial/ethnic groups, rates of drowning in natural water settings increase among teens and young adults. Alcohol use and increased independence, with resulting reduced supervision, might play a role in these deaths (Howland, Hingson, Mangione, Bell, & Bak, 1996). In these

Table 1
Rates^a and numbers of fatal unintentional drowning among persons aged ≤ 29 years for race/ethnicity and setting by age group – United States, 1999–2010.

	Age group (years)							Total
	<1	1–4	5–9	10–14	15–19	20–24	25–29	
	Rate (no.)	Rate (no.)	Rate (no.)	Rate (no.)	Rate (no.)	Rate (no.)	Rate (no.)	Rate (no.)
<i>Race/ethnicity</i>								
AI/AN	^b (11)	3.83 (73)	1.50 (37)	1.22 (33)	2.63 (73)	3.25 (77)	3.68 (75)	2.57 (379)
A/PI	– (–)	1.42 (127)	0.84 (91)	0.67 (72)	1.80 (206)	1.38 (179)	1.10 (162)	1.18 (846)
Black	2.03 (145)	2.30 (654)	1.54 (569)	1.75 (690)	2.44 (956)	1.78 (620)	1.58 (496)	1.90 (4,130)
Hispanic ^c	1.38 (156)	2.40 (1,013)	0.51 (246)	0.48 (224)	1.57 (709)	2.02 (932)	1.34 (619)	1.37 (3,899)
White	1.39 (371)	3.40 (3,665)	0.61 (865)	0.47 (712)	1.35 (2,108)	1.45 (2,166)	1.18 (1,694)	1.32 (11,581)
<i>Setting</i>								
Swimming pool	0.13 (61)	1.51 (2,852)	0.26 (616)	0.14 (356)	0.15 (383)	0.12 (295)	0.11 (268)	0.33 (4,831)
Natural water	– (–)	0.42 (800)	0.23 (539)	0.28 (700)	0.82 (2,083)	0.82 (2,031)	0.60 (1,433)	0.52 (7,594)
Boating	– (–)	0.01 (28)	0.03 (65)	0.04 (101)	0.12 (302)	0.17 (423)	0.15 (367)	0.09 (1,291)
Bathtub	0.91 (435)	0.26 (500)	0.04 (87)	0.04 (99)	0.04 (113)	0.08 (190)	0.08 (191)	0.11 (1,615)
Other/unspecified	0.39 (187)	0.72 (1,367)	0.21 (511)	0.19 (481)	0.46 (1,183)	0.43 (1,049)	0.34 (803)	0.38 (5,581)
Total ^d	1.46 (696)	2.93 (5,547)	0.76 (1,818)	0.69 (1,737)	1.59 (4,064)	1.62 (3,988)	1.29 (3,062)	1.43 (20,912)

Abbreviation: AI/AN = American Indian/Alaska Native, A/PI = Asian/Pacific Islander.

^a Per 100,000 population.

^b Death counts based on < 10 deaths suppressed for confidentiality. Death rates based on < 20 deaths suppressed for unreliability.

^c Persons identified as Hispanic might be of any race. Persons identified in the categories of white, black, AI/AN, or Asian/Pacific Islander are all non-Hispanic.

^d Total rates include “not stated” race/ethnicity.

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