



RESEARCH BRIEF

# Drowning in Disparities: Health Equity in Ohio Childhood Drowning Rates

Leah Hite<sup>1</sup>

<sup>1</sup>The Ohio State University, Columbus, OH

Corresponding Author: Leah Hite, 1645 Neil Avenue, Columbus, OH 43210, [leah.hite@osumc.edu](mailto:leah.hite@osumc.edu)

Submitted September 10, 2024 Accepted January 28, 2025 Published April 8, 2025 <https://doi.org/10.18061/ojph.v7i1.10116>

## ABSTRACT

**Background:** Drowning, a common unintentional injury, is a leading cause of death among children in the United States. The morbidity and mortality of childhood drowning are not uniform across American society but, rather, subject to profound racial disparities. These inequities are reflected in Ohio's pediatric drowning rates.

**Methods:** Data from the 2015–2020 Franklin County Child Fatality Report and the Centers for Disease Control and Prevention Web-based Injury Statistics Query and Reporting System (WISQARS) database were synthesized with information from the 2020 US Census to calculate standardized mortality ratios (SMRs) comparing observed drowning deaths among Black children in the state of Ohio to expected deaths based on national data. The SMRs were additionally calculated for Franklin County, Ohio, and compared to state and national rates.

**Results:** Standardized mortality ratios show that Black children in Franklin County were 21% more likely to drown than expected based on Ohio state rates and 41% more likely to drown than expected based on national rates between 2015 and 2020. Black children in the state of Ohio were 16% more likely to drown than expected based on national data during this time frame.

**Conclusion:** Existing inequalities in childhood drowning rates are rooted in historical racism. This legacy has resulted in significantly higher drowning rates among Black American children and, alarmingly, higher-than-expected rates in Ohio specifically. Understanding these disparities is crucial to protecting vulnerable members of our communities from these avoidable tragedies. Interventions should account for social determinants of health, including race and ethnicity, when attempting to decrease pediatric drowning rates.

**Keywords:** Drowning; Health equity; Social determinants of health; Standardized mortality ratios

## INTRODUCTION

Drowning is a common cause of death among American children, with approximately 11 fatal drownings occurring every single day in the United States.<sup>1</sup> These unintentional injury deaths are largely preventable, yet they continue to occur, making pediatric drowning a critical public health concern.<sup>2</sup> Moreover, these drowning rates are subject to profound racial disparities.<sup>1,2</sup> Childhood drowning is therefore a matter of equity and social justice.

While drowning rates among American White and Hispanic children have declined in recent years, rates among Black children

have been consistent for the past 2 decades. Today, Black Americans remain 1.5 times as likely to drown as White Americans—a disparity that has not improved since 1999.<sup>3</sup> This inequality has primarily been attributed to racial differences in access to swimming education and safe swimming facilities, an issue with historical roots in American racism.<sup>4</sup>

Historically, Black Americans have struggled to access the facilities and education needed to learn to swim because of racist legislation and structural violence. During racial segregation, few pools or beaches allowed Black families to swim, and desegregation coincided with a shift toward privatization of these





facilities. Public pools deteriorated and closed or were torn down and replaced by private establishments, eliminating the possibility of gaining swimming competence via free communal facilities. The economic and social legacy of racial discrimination prevented many Black families from joining private clubs, perpetuating a lack of swim education among African American families.<sup>5</sup> As a result, 64% of Black American children cannot swim.<sup>6</sup> This trend is reflected in Ohio's childhood drowning rates, as well as in rates specific to Franklin County.<sup>7</sup>

## METHODS

Data were extracted from the 2015-2020 Franklin County Child Fatality Report<sup>7</sup> and the Centers for Disease Control and Prevention Web-based Injury Statistics Query and Reporting System (WISQARS)<sup>8</sup> database. The proportional racial breakdown of pediatric drowning deaths was calculated for the United States, the state of Ohio, and Franklin County, Ohio (Figure 1).

This data was then synthesized with information on the racial makeup of the overall pediatric population from the 2020 US Census<sup>9</sup> to calculate standardized mortality ratios (SMRs) accounting for different racial demographics. These SMRs compare the true number of events within a population to expected events based on the mortality rate of a standard population (in this case, that of the United States). Calculated SMRs show geographic disparities between observed and expected drowning deaths among Black children during the 2015-2020 period. These inequalities are analyzed in the context of social determinants of health.

## RESULTS

Childhood drowning rates in Ohio reflect a broader national pattern wherein Black children are significantly more likely to drown than White children.<sup>1,5,7,10,11</sup> From 2015-2020, Black children accounted for 55% of childhood drowning victims in Franklin County, compared to 29% in Ohio as a whole and 25% nationally during this period.<sup>7,8</sup> Accounting for differences in racial demographics reveals a Franklin County drowning rate of approximately 15.88 per 100 000 Black children during this period, compared to 13.08 per 100 000 for the state of Ohio, and 11.28 per 100 000 nationally. The SMR calculations for the 2015-2020 time frame, provided (Table 1), show that observed child drowning

deaths among Black children in Franklin County were 21% higher than expected based on Ohio state rates (SMR=121.08) and 41% higher than expected based on national rates (SMR=140.99). Observed child drowning deaths among Black children in Ohio as a whole were also 16% higher than expected based on national rates during this period (SMR=115.97).

## DISCUSSION

Ohio faces a heavy burden of racial disparities in drowning. These standardized mortality rates illustrate higher-than-expected pediatric drowning deaths among Black children in Ohio compared to the United States, as well as higher-than-expected rates in Franklin County compared to the entirety of Ohio. Additionally, in Franklin County, specifically, immigrant children accounted for half of all childhood drowning victims between 2015 and 2020. This adds another layer of vulnerability for certain minority children.<sup>7</sup>

Numerous factors might be proposed to account for these inequalities. Among these are the material conditions in which individuals live and work, psychosocial factors, behavioral and biological factors, and the health system itself.<sup>12</sup> The economic impacts of decades of discrimination have resulted in a poverty rate among Black Americans that is 1.8 times that of the general population, preventing access to formal swimming lessons which have been shown to reduce the risk of drowning in children by as much as 88%.<sup>13,14</sup> Lack of safe swimming facilities is an additional issue—many US cities, including Columbus, Ohio, legally require pools to be surrounded by a fence or barrier; however, studies show that most cities do not routinely inspect pool barriers or enforce safety regulations.<sup>4,15</sup> These lapses in safety inspections are more likely to affect lower-income communities.<sup>4</sup>

Psychosocial determinants of drowning include an absence of attentive, effective supervision which is associated with a 3-fold increase in drownings.<sup>4</sup> Numerous stressors may compromise caregiver attention including health concerns, working long hours, and performing shift work. These determinants disproportionately affect marginalized individuals, particularly racial minorities and individuals with lower socioeconomic status.<sup>16</sup> Additionally, if a caregiver cannot swim, they are limited in their ability to provide proximity during water supervision. This perpetuates

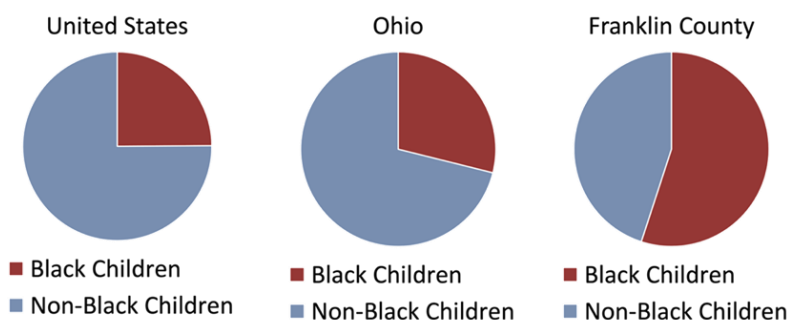


Figure 1. Racial Makeup of Pediatric Drowning Deaths<sup>7,8</sup>


**Table 1. Standardized Mortality Ratios (SMRs) for Black Pediatric Drowning Victims in Franklin County, Ohio and the State of Ohio, 2015-2020**

Data: 2015-2020	United States	Ohio	Franklin County, Ohio
Black children as a percentage of pediatric drowning victims	24.9%	28.9%	54.5%
Drowning rate among Black children ( <i>drownings per 100 000 Black children</i> )	11.28	13.08	15.88
Standardized mortality ratio (SMR) versus the state of Ohio	--	--	121.08
Standardized mortality ratio (SMR) versus national data	--	115.97	140.99

drowning risk among families belonging to marginalized groups, where parents may have faced their own challenges in accessing swim education.<sup>4</sup>

Health infrastructure also has significant impacts on drowning prevention and resuscitation. Previous studies that have examined the relationship between emergency medical services (EMS) response time and demographic factors in the United States have consistently reported that racial minorities, rural residents, and individuals living in low-income areas experience longer wait times for EMS arrival.<sup>17,18</sup> Before EMS arrival, racial and ethnic minorities are additionally less likely to receive bystander support, including cardiopulmonary resuscitation (CPR).<sup>17</sup> These systemic issues augment elevated risks of experiencing drowning among these communities, creating further susceptibility to poor outcomes.

Understanding these root causes may pave the way for better, more comprehensive policies and practices to combat preventable childhood drownings. Given that swim lessons are highly effective at preventing drowning, increasing access to swim education among vulnerable populations is essential.<sup>14</sup> Mandatory water safety education in elementary schools has been proposed as one possible intervention that has been successfully implemented in other countries, such as the United Kingdom.<sup>19</sup> Subsidizing school-based programs in low-income neighborhoods in the United States could enhance equity in swim education, tackling socioeconomic disparities in drowning. Subsidy of adult swim education in high-risk areas should also be a key policy goal, knowing that parental swimming ability prevents childhood drowning.<sup>4</sup> These programs would also benefit from incorporating inclusive water safety outreach campaigns to educate families about effective swim supervision, drowning risks, and the importance of swim education.<sup>4</sup>

Culturally competent swim education should be a priority to ensure the accessibility of swim lessons among at-risk populations. Barriers to swimming competency in higher-risk groups should be defined and addressed using input and leadership from within these communities, ensuring adequate understanding of needs and values. Considerations for better, more inclusive swim education and outreach may include accommodations for ethnic hairstyles and hair protection, religious clothing and headwear, and cultural beliefs about mixed-gender physical activity.<sup>20,21</sup> In addition to designing programs with inclusivity in mind, ensuring that staff are knowledgeable about cultural needs and differences can

facilitate more comprehensive swim education. These actions address social determinants of drowning, creating a more just and inclusive approach to drowning prevention.

### PUBLIC HEALTH IMPLICATIONS

An analysis of Ohio-specific childhood drowning data compared to national trends reveals important disparities and challenges within the state. While systemic racism and the historic legacy of racial segregation may partially explain discrepancies in drowning rates among different racial groups, these issues are not specific to Ohio. More research is needed to understand the factors contributing to disproportionately high rates of pediatric drowning deaths among Black and immigrant children in Ohio and Franklin County. Knowledge of these disparities should also guide drowning prevention. To address these challenges, interventions will need to be tailored to the most vulnerable children and their communities. Policy recommendations include increasing equity in swim education by requiring and sponsoring mandatory water safety education in elementary schools;<sup>19</sup> subsidizing adult swim education programs through community centers, gyms, and schools, recognizing that parental swimming ability prevents childhood drowning;<sup>4</sup> and utilizing culturally competent, inclusive water safety outreach campaigns in multiple languages to educate families about effective swim supervision, drowning risks, and the importance of swim education.<sup>4</sup>

By acknowledging and acting upon the social determinants of childhood drowning, we can create better, more comprehensive prevention practices and systems. This approach safeguards the well-being of all children, regardless of their social circumstances.

### CONFLICTS OF INTEREST

None declared.

### ACKNOWLEDGMENTS

Funding. None declared.

### REFERENCES

1. Drowning Facts. Centers for Disease Control and Prevention. 2022. Accessed April 20, 2024. [https://www.cdc.gov/drowning/data-research/facts/?CDC\\_AAref\\_Val=https://www.cdc.gov/drowning/facts/index.html](https://www.cdc.gov/drowning/data-research/facts/?CDC_AAref_Val=https://www.cdc.gov/drowning/facts/index.html)
2. Sultana S, Mahtab M, Selim F. Each drowning death is preventable. WHO and UNICEF. Unicef. July 25, 2022. Accessed April 20, 2024. <https://www.unicef.org/bangladesh/en/press-releases/each-drowning-death-preventable-who-and-unicef>



3. Vestal C. Drowning prevention could get a boost in federal budget. Stateline. July 15, 2021. Accessed April 20, 2024. <https://stateline.org/2021/07/15/drowning-prevention-could-get-a-boost-in-federal-budget/>
4. Denny SA, Quan L, Gilchrist J, et al; Council on Injury, Violence and Poison Prevention. Prevention of drowning. *Pediatrics*. 2021;148(2):e2021052227. <https://doi.org/10.1542/peds.2021-052227>
5. Miller NS. Racial disparities in drowning deaths persist, research shows. The Journalist's Resource. 2022. Accessed April 20, 2024. <https://journalistsresource.org/health/racial-disparities-in-drowning-deaths-persist-research-shows/>
6. Mondick L. Why are black youth at highest risk for drowning? YMCA. March 25, 2021. Accessed April 20, 2024. <https://www.ymca.org/blog/why-are-black-youth-highest-risk-drowning>
7. Columbus Public Health. Franklin County Child Fatality Review. Columbus Public Health. 2021. Accessed April 20, 2024. [https://www.columbus.gov/files/sharedassets/city/v/1/public-health/data-and-reports/2017-20\\_cfr\\_report\\_1.3.2022.pdf](https://www.columbus.gov/files/sharedassets/city/v/1/public-health/data-and-reports/2017-20_cfr_report_1.3.2022.pdf)
8. CDC WISQARS (web-based injury statistics query and reporting system). Centers for Disease Control and Prevention. 2023. Accessed April 20, 2024. <https://www.cdc.gov/injury/wisqars/index.html>
9. United States Census Bureau. United States Census QuickFacts. 2024. Accessed April 20, 2024. <https://www.census.gov/quickfacts/>
10. Drowning. World Health Organization. 2023. Accessed April 20, 2024. <https://www.who.int/news-room/fact-sheets/detail/drowning>
11. Mahboob A, Richmond SA, Harkins JP, Macpherson AK. Childhood unintentional injury: the impact of family income, education level, occupation status, and other measures of socioeconomic status. A systematic review. *Paediatr Child Health*. 2019;26(1):e39-45. <https://doi.org/10.1093/pch/pxz145>
12. Solar O, Irwin A. A conceptual framework for action on the social determinants of health. World Health Organization. 2010. Accessed April 20, 2024. <https://www.who.int/publications/i/item/9789241500852>
13. Creamer J. Poverty rates for Blacks and Hispanics reached historic lows in 2019. US Census Bureau. 2020. Accessed April 20, 2024. <https://www.census.gov/library/stories/2020/09/poverty-rates-for-blacks-and-hispanics-reached-historic-lows-in-2019.html#:~:text=In%202019%2C%20the%20share%20of.share%20in%20the%20general%20population>
14. Sprecher MH. Could learn-to-swim laws go nationwide? how could they affect events? Sports Destination Management. 2022. Accessed April 20, 2024. <https://www.sportsdestinations.com/sports/swimming-diving/could-learn-swim-laws-go-nationwide-how-could-they-30494>
15. City of Columbus. Building and zoning services frequently asked questions. City of Columbus Building and Zoning Services. 2024. Accessed April 20, 2024. <https://new.columbus.gov/Business-Development/Building-Zoning-Services/Frequently-Asked-Questions#:~:text=Fencing%20and%20Gate%20Requirements%20%2D%20No.height%2C%20measured%20from%20the%20ground>
16. Virtanen M, Singh-Manoux A, Ferrie JE, et al. Long working hours and cognitive function: the Whitehall II Study. *Am J Epidemiol*. 2009;169(5):596-605. <https://doi.org/10.1093/aje/kwn382>
17. Farcas AM, Joiner AP, Rudman JS, et al. Disparities in emergency medical services care delivery in the United States: a scoping review. *Prehosp Emerg Care*. 2022;27(8):1058-1071. <https://doi.org/10.1080/10903127.2022.2142344>
18. Friedson AI. Income and ambulance response time inequality. No simple explanation, no simple fix. *JAMA Netw Open*. 2018;1(7):e185201. <https://doi.org/10.1001/jamanetworkopen.2018.5201>
19. Brenner RA, Saluja G, Smith GS. Swimming lessons, swimming ability, and the risk of drowning. *Inj Control Saf Promot*. 2003;10(4):211-5. <https://doi.org/10.1076/jcsp.10.4.211.16775>
20. Huebschmann AG, Campbell LJ, Brown CS, Dunn AL. "My hair or my health:" overcoming barriers to physical activity in African American women with a focus on hairstyle-related factors. *Women Health*. 2016;56(4):428-447. <https://doi.org/10.1080/03630242.2015.1101743>
21. Rubio-Rico L, de Molina-Fernández I, Font-Jiménez I, Roca-Biosca A. Meanings and practices of the physical activity engaged in by Moroccan women in an Islamic urban environment: a quasi-ethnography. *Nurs Open*. 2021;8(5):2801-2812. <https://doi.org/10.1002/nop2.857>