

New York State Drowning Prevention Report

CDC Foundation



New York State Drowning Prevention Report

November 2026

Funding provided by *Bloomberg Philanthropies Initiative to Prevent Drowning*. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the CDC Foundation or the New York State Department of Health.

Table of Contents

Acknowledgements **4**
Introduction **5**
State background 6
Drowning prevention landscape 6
Project details 8
Situational assessment of drowning data in New York **9**
Data sources assessed 11
Data sources considered but not assessed 14
Case study: Drowning Prevention and Investigation (at regulated bathing facilities) Program 15
Opportunities for improvement 19
Burden and circumstances **21**
Time trends 26
Demographics 28
Types of drowning by region, sex, and race/ethnicity 29
Key circumstances of drowning 38
Highlights from the Drowning Prevention and Investigation Program 20
Lessons and considerations **47**
Lessons and considerations for strengthening drowning data systems 48
Lessons and considerations for strengthening drowning prevention 49
Conclusions **50**
References **53**

Acknowledgements

This report is the result of a collaboration between the CDC Foundation and the New York State Department of Health.

The New York State Drowning Prevention Report benefited from the contributions of various collaborators and staff from the New York State Department of Health.

Special thanks are extended to those partners who provided valuable insight through completion of the drowning prevention scoping questionnaire or responded to separate scoping inquiries: the New York State Department of Health; New York State Parks, Recreation & Historic Preservation; New York State Department of Environmental Conservation; and New York City Department of Health and Mental Hygiene's Office of Public Health Engineering.

New York State Department of Health staff (Michael Bauer, Leah Hines, and Amanda Tarrier) provided invaluable support to this report, connecting partners to facilitate access to the data included and carefully reviewing the report to ensure accuracy and impact. The CDC Foundation project leadership team (Tessa Clemens, Danielle Fernandez, Briana Moreland, and William Koon) provided essential strategic direction, editing, and statistical expertise that significantly enhanced the quality of the report. Additionally, through a multi-state initiative, valuable connections were established with CDC Foundation field employees and collaborators in Alaska, Arizona, California, Georgia, Louisiana, New York, and Oklahoma.

Lastly, a special thank you is extended to Robert Lennex, who worked directly with the New York State Department of Health as a CDC Foundation field employee and led the report writing, completion of the scoping questionnaire, and data analysis.



Introduction

State background

Nestled in the northeastern United States, the state of New York offers a diverse geography. Mountain ranges like the Adirondacks and Catskills (an Appalachian subregion) stretch across the state. Major natural bodies of water, such as Lake Erie, Lake Ontario, and the Atlantic Ocean, contribute to over 2,625 miles of coastline.[1] Within New York's interior, the Hudson River, the Finger Lakes, and Oneida Lake are part of a vast freshwater network, which includes over 7,600 other lakes, ponds, and reservoirs and over 70,000 miles of rivers and streams.[2] The prevalence of water and the state's varied landscapes have contributed to its unique economic development and a wide assortment of recreational opportunities for its residents and visitors.

Home to over 19 million people, New York State is the fourth largest state by population, and 42.7% of the populace resides in New York City.[3] The city is a global cultural and financial capital, while the upstate regions possess more rural and suburban counties with cities like Albany, Buffalo, and Rochester sprinkled among them. Whether people live in urban or rural settings across the state, there is a connection with water, as evidenced by the over 7,400 public swimming pools and approximately 1,300 public bathing beaches spread across the state.[4]

Residents and visitors in New York State have ample recreational swimming opportunities with the state's 51 Department of Environmental Conservation Parks and 180 State Parks.[5,6] These parks offer natural sources of water for boating, fishing, kayaking, and other water-related activities. However, these outdoor locations and swimming pools have limited accessibility that differ regionally throughout the year due to variations in climate across the state.

In the southern parts of the state—especially New York City and Long Island—summers are typically warm and humid, and residents flock to outdoor swimming pools and beaches from Memorial Day to Labor Day. Beach and outdoor pool operations are generally limited to this period due to cooler temperatures in late spring and early fall. The northern regions in upstate New York experience shorter summers and harsher winters, resulting in a shorter outdoor swimming pool and beach season. Despite the limitations in outdoor water access during the year, drowning remains a prevalent public health concern in New York State.

Drowning prevention landscape

New York State has had a recent surge of legislation and initiatives focused on drowning prevention and improvements in public swimming infrastructure. At the end of 2021, legislation was signed by New York State Governor Kathy Hochul to create the Temporary Commission to Prevent Childhood Drowning.[7] This commission included professionals from various sectors—including aquatic education, youth development, public health, and community outreach—seeking to address childhood drowning prevention through a comprehensive approach. In 2025, the commission submitted their executive summary and final report on recommendations for developing and evaluating programs to educate children on water safety and swimming skills.[8]

A few years after the passage of the commission legislation, between 2023 and 2025, the New York State government passed three additional laws related to drowning education and outreach. The first mandated that hospitals provide new parents with a state-approved informational video on drowning risks for infants and young children before discharge, a first-of-its-kind law in the United States.[9] This was modeled after a similar requirement for a video on Shaken Baby Syndrome for new parents.[10] The second law authorized the New York State Department of Health to conduct education and outreach programs to promote public awareness of the dangers of fatal and non-fatal drowning.[11] The third law required school districts, by the start of the 2026–2027 school year, to provide information on drowning prevention, water safety, and safe and healthy swimming upon the enrollment of each student.[12] Additional information around all three of these laws can be found on the New York State Department of Health website alongside guidance on

Drowning Prevention & Water Safety for Children and Teens[13] and Safe and Healthy Swimming.[14]

The legislation and initiatives focused on drowning prevention continued in 2024 with the New York Statewide Investment in More Swimming program, announced by the New York Governor's Office.[15] The New York Statewide Investment in More Swimming program is designed to expand access to swimming facilities and instruction, especially in high-need areas—achieved in part by covering the cost of swim lessons for children through contracts with YMCAs and the State University of New York system. This program provides the largest statewide investment in swimming and related infrastructure in decades and in 2026, expanded access to free learn-to-swim lessons for children aged 0–12 years. The New York Statewide Investment in More Swimming program, combined with the recent drowning prevention legislation, reflects New York State's comprehensive, forward-thinking approach to address drowning within the state.

Interest in understanding and preventing drowning in New York State is not a recent phenomenon. Since 1987, the New York State Sanitary Code has required the tracking and documentation of drowning at regulated bathing facilities (i.e., swimming pools and beaches) as part of efforts to ensure bather health and safety. The New York State Department of Health's Bureau of Community Environmental Health and Food Protection's Drowning Prevention and Investigation Program is responsible for coordinating and managing investigations related to the State Sanitary Code.

In 2003, the New York State Department of Health published a series of public health reports that reviewed unintentional drowning deaths between 1988 and 1994. One report investigated and reviewed 883 non-bathtub drowning fatalities among New York State residents[16], while the second report investigated 216 watercraft-related drowning fatalities among the same population.[17] The first report highlighted the importance of adequate pool fencing and other prevention strategies for limiting access during non-swim times (e.g., locking gates, storing ladders properly) to prevent fatal drowning among children aged 0–4 years. The second report highlighted the use of personal flotation devices as an effective drowning prevention method, while recognizing that swift currents, injury, and hypothermia can reduce their effectiveness. Among both watercraft-related and non-watercraft-related drowning deaths, most people who drowned were not wearing a personal flotation device at the time of the drowning.

The New York State Department of Health's Drowning Prevention and Investigation Program published its most recent report of New York State bathing facility fatal drowning statistics in 2026, covering the time period from 1987 to 2024.[18] This report and its previous iterations present data on the burden and circumstances of fatal drowning at regulated bathing facilities, including factors such as facility type, pool enclosure status, water depth at the location of submersion, and swimming ability.



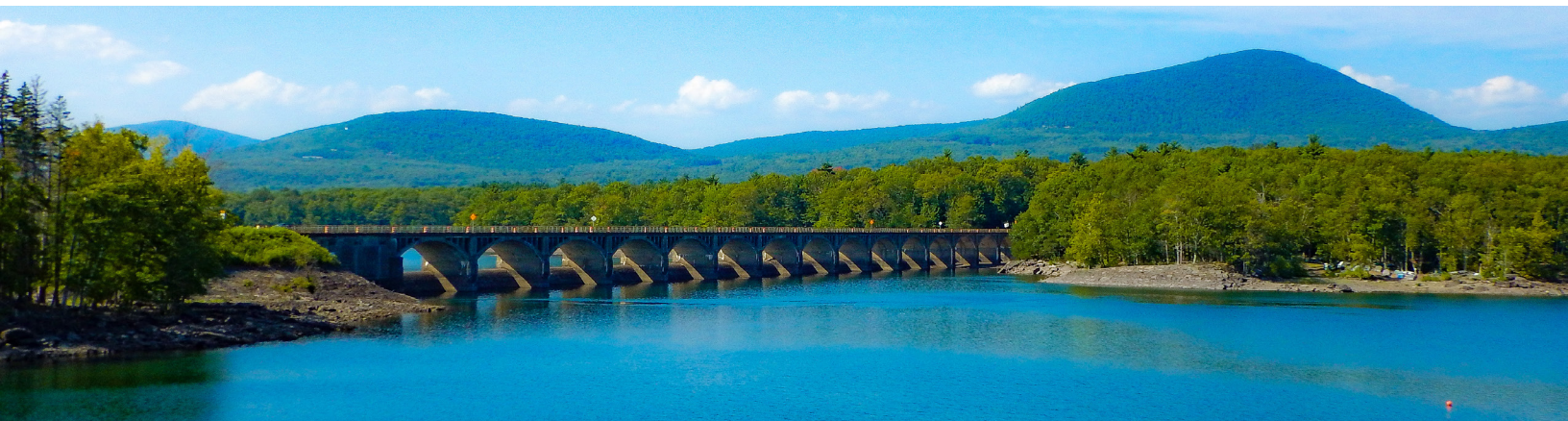
Washington Square Park, Manhattan, New York City.

Project details

Although New York State has routinely reported on drowning fatalities across the state, important gaps in drowning data remain. Drowning is not always fatal and, when non-fatal, can result in long-term health consequences. Additionally, information about fatal and non-fatal drowning circumstances and risk factors is limited. Addressing these data gaps is essential for informing existing drowning prevention initiatives in New York State, such as the New York Statewide Investment in More Swimming and the education and outreach activities at the New York State Department of Health. Through this project, the New York State Department of Health partnered with the CDC Foundation to enhance drowning data collection and reporting in New York State by:

- Surveying divisions of the New York State Department of Health and state agencies to identify the types of drowning event data currently collected
- Examining how these data are being used
- Assessing capacity for improving drowning surveillance efforts and
- Describing the burden and circumstances of drowning in the state by collating, analyzing, and reporting on existing drowning data

This report summarizes the findings of this project and provides recommendations for preventing drowning and strengthening drowning data in New York State.





Situational assessment of drowning data in New York State

The CDC Foundation, in collaboration with the Centers for Disease Control and Prevention, developed the *Scoping Questionnaire: Types, Availability, and Gaps in Drowning Data in the United States* (hereinafter "the questionnaire"). The intent of the questionnaire was to identify the types of data collected on drowning events, examine how these data are being used, and assess capacity for improving drowning surveillance efforts. The questionnaire was administered to select individuals at the New York State Department of Health to understand drowning-related data and work being completed in New York State. Responses were received for information regarding Civil Registration and Vital Statistics, hospitalization data, emergency department data, emergency medical services data, the New York State Department of Health's Bureau of Community Environmental Health and Food Protection's Drowning Prevention and Investigation Program, and the Bureau of Occupational Health and Injury Prevention of the New York State Department of Health. Inquiries were made by email as a substitute for the questionnaire to the New York State Office of Parks, Recreation and Historic Preservation; the New York State Department of Environmental Conservation; and the New York City Department of Health and Mental Hygiene's Office of Public Health Engineering. The responses from these inquiries described each agency's role in drowning investigations and tracking in their jurisdictions. These agencies often collaborate with the Drowning Prevention and Investigation Program.

Table 1 describes data sources that possess any drowning-related data. This table is not an exhaustive list of drowning data sources in New York State, as additional data sources may be examined in the future. The Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research is a well-documented data source, so no additional information about this system was gathered. Administrators of the Recreational Boating Report[19] were not contacted with a questionnaire due to time limitations of this project. Data sources were reviewed and then selected for use in an assessment of the burden and circumstance of drowning in New York State.

Table 1. New York State drowning-related data sources assessed during the study period.

Sources	Outcome type	Still collecting data	Analyzed in this report	Years analyzed for this report*
Civil Registration and Vital Statistics†	Fatal	Yes	No	None
Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research	Fatal	Yes	Yes	1999–2023
Hospitalizations‡	Fatal and non-fatal	Yes	Yes	2016–2023
Emergency department visits‡	Fatal and non-fatal	Yes	Yes	2016–2023
Emergency medical services†	Fatal and non-fatal	Yes	No	None
Drowning Prevention and Investigation Program	Fatal and non-fatal§ (at regulated facilities)	Yes	Yes	2001–2022
Recreational Boating Report	Fatal and non-fatal	Yes	No	None

* Some sources have archived/stored data in addition to the data years included for analysis in the table.
† New York City hosts several of its own data systems, including those for, but not limited to, Civil Registration and Vital Statistics, emergency medical services, law enforcement, and syndromic surveillance. Both Civil Registration and Vital Statistics and emergency medical services data are shared with the New York State Department of Health. Due to time constraints, data from most New York City data sources could not be accessed during the study period.
‡ Hospitalization and emergency department visit data are sourced from the same data source: Statewide Planning and Research Cooperative System database.
§ Only line-level data for drowning fatalities are accessible.

Data sources assessed

Civil Registration and Vital Statistics

The Civil Registration and Vital Statistics data of New York State are overseen by two separate health departments.[20] The New York City Department of Health and Mental Hygiene oversees registration of death certificates and other vital records in the five counties of New York City: Bronx, Kings (Brooklyn), New York (Manhattan), Queens, and Richmond (Staten Island). The New York State Department of Health oversees the registration of the remaining 57 counties in the state. Each city or town is responsible for collecting and processing records locally and sharing the data with their respective registration office. Historically, it has been through a cooperative agreement that the New York State Department of Health receives death certificates and other vital records from New York City. Once all the death certificates have been collected, the New York State Department of Health standardizes and stores all the death certificates in a central statewide database.

Challenges and limitations: Civil Registration and Vital Statistics

Since 2019, the cooperative agreement between the New York City Department of Health and Mental Hygiene and the New York State Department of Health's Bureau of Occupational Health and Injury Prevention has not been in effect. As a result, at the time of the creation of this report, death certificates of New York City residents were not available for analysis for years after 2019. To remedy this, data from the Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research was used in place of the Civil Registration and Vital Statistics system of New York State to report on fatal drowning deaths.

Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research

Multiple-cause mortality data for drowning (including water transport) can be obtained from the Centers for Disease Control and Prevention. This publicly available dataset comprises death counts at the county level that can be queried and aggregated by geographic and demographic characteristics from 1999–2020 and 2018–2023, depending on the datasets selected.[21]

Challenges and limitations: Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research

The Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research dataset provides easy access to county-level mortality data for New York State. There are, however, important limitations to consider when using these data:

1. Discrepancies with the state database

   Drowning death counts from the Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research do not match with data published by the New York State Department of Health's Bureau of Community Environmental Health and Food Protection in their report, which includes state-level drowning death totals from the vital statistics data. These discrepancies may be explained by differences in data processing timelines, case inclusion criteria, or state-specific coding practices. For example, state data may be updated or revised after the Centers for Disease Control and Prevention's national files are finalized.

2. Residence-based reporting

   County-level mortality data in the Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research are tabulated by the residence of the decedent, not

the location where the death occurred. If a fatal drowning occurs at a family member's house, a distant public pool or lake, or on a vacation out of New York State, the death is still assigned to the decedent's home county. This could result in an improper assessment of the geographical burden of drowning. There are selectable options for place of death in the Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research, but they are limited to medical facilities (i.e., inpatient, outpatient or emergency department, dead on arrival, or unknown status), decedent's home, hospice or long-term care facilities, and other or unknown locations.

3. Limited contextual detail related to death

   The Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research mortality data are derived from death certificates. The cause of death data extracted from death certificates are limited to the International Classification of Diseases, 10th Revision coding that are found on the certificate. The lack of circumstantial or contextual detail that can be pulled from this database limits the ability to perform circumstance and context-based analyses. Such analyses would enable more comprehensive guidance for drowning prevention.

4. Potential coding errors or misclassification

   Death certificates are dependent on accurate and complete reporting by certifiers, which can include physicians, coroners, and medical examiners. Qualifications can vary from certifier to certifier. Legislation intended to address this was passed in New York State in 2017, requiring certain training for coroners and coroners' deputies.[22] Recognizing differences among certifiers remains an area to understand when processing reported data.

Statewide Planning and Research Cooperative System Database (emergency department visits and hospitalizations)

Since 1979, the Statewide Planning and Research Cooperative System has provided comprehensive reporting on patients with private insurance, Medicaid, Medicare, and those uninsured or who self-pay.[23] Initially created to collect information on discharges from hospitals, the system has since expanded to include patient-level detail on patient characteristics, diagnoses and treatments, services, and charges for:

- Each hospital inpatient stay
- Each outpatient discharge (i.e., ambulatory surgery, emergency department, and outpatient services)
- Each ambulatory surgery and outpatient services visit to a hospital extension clinic and diagnostic and treatment center licensed to provide ambulatory surgery services

The Statewide Planning and Research Cooperative System has a mandate of reporting external cause of injury codes from the International Classification of Diseases, 10th Revision, Clinical Modification (codes V00–Y99) whenever a diagnosis in the Statewide Planning and Research Cooperative System Injury, Cause, and Place Code Set requires it. This Statewide Planning and Research Cooperative System Injury, Cause, and Place Code Set is updated annually by the New York State Department of Health to reflect current International Classification of Diseases, 10th Revision, Clinical Modification coding and reporting requirements. New York City data are included in the Statewide Planning and Research Cooperative System, so hospital and emergency department discharges for all counties in New York State can be analyzed.

Challenges and limitations: Statewide Planning and Research Cooperative System Database

The Statewide Planning and Research Cooperative System dataset captures an expansive amount of data on hospitalizations and emergency department visits in New York State. However, there are important limitations to consider when using these data:

1. Limited capture of total drowning-related healthcare utilization

   The Statewide Planning and Research Cooperative System dataset does not capture outpatient clinic visits (when outside a hospital network), urgent care visits (unless affiliated with a hospital), physician office visits, or telehealth encounters. Some non-fatal drowning incidents may result in a visit to one of these healthcare service locations, which would not be captured within the Statewide Planning and Research Cooperative System data. Moreover, the Statewide Planning and Research Cooperative System does not capture visits to facilities managed by Veterans Affairs.

2. Out-of-jurisdiction emergency medical services and hospital care

   New York State shares borders with Pennsylvania, New Jersey, Connecticut, Massachusetts, and Vermont. In addition to neighboring states, New York State shares international waters with Canada. A drowning incident near these borders may lead to emergency medical services transport or another method of transportation to an out-of-state hospital. The hospitalizations and emergency department visits associated with these drowning incidents would not be captured in the Statewide Planning and Research Cooperative System. It is unknown how many New York State residents are involved in drowning not captured by the Statewide Planning and Research Cooperative System due to such situations.

3. Limited contextual detail related to hospitalizations and emergency department visits

   The Statewide Planning and Research Cooperative System data are limited to the International Classification of Diseases, 10th Revision, Clinical Modification codes assigned at the time of discharge of the patient. The International Classification of Diseases, 10th Revision, Clinical Modification codes do not include information about the circumstances of the drowning. Information about the circumstances of non-fatal drowning would enable more comprehensive guidance for drowning prevention.

Emergency medical services

The New York State Emergency Medical Services Patient Care Report Database is a statewide repository of prehospital emergency medical services records submitted electronically by emergency medical services agencies.[24] This data source was not fully explored, described, or reviewed due to the data being inaccessible during the creation of this report.

Drowning Prevention and Investigation (at regulated bathing facilities) Program

The Drowning Prevention and Investigation Program was used to develop a case study highlighting drowning prevention and investigation activities across regulated bathing facilities within New York State. A more detailed description of this data source and how it is implemented is provided in the case study subsection of this report.

Boat Incident Report Database

The New York State Office of Parks, Recreation and Historic Preservation, through the Marine Services Bureau, tracks recreational boating incidents. These incidents are required to be reported to the Marine

Services Bureau by boaters and law enforcement if there is loss of life or disappearance, injury involving more than basic first aid, or total property damage to any one party more than $1,000.[25] Reporting is required within 48 hours for incidents involving injury or death, while all other incident reports are required within 5 days of the incident. These incidents are documented within the Boat Incident Report Database. Data are routinely synthesized each year to produce a Recreational Boating Report, which includes descriptions of drowning incidents. Due to time constraints, this data source could not be fully explored, described, or reviewed before finalizing this report.

Data sources considered but not assessed

Syndromic surveillance

The New York State Department of Health conducts syndromic surveillance using emergency department visit data submitted by participating hospitals and analyzes these data through the Electronic Syndromic Surveillance System.[26] The New York City syndromic surveillance system exists separately, containing similar data elements.[27] Drowning is mandated at the state level to be reported if it occurs at a regulated bathing facility or if it is the recorded external cause of injury at a hospital or an emergency department, but it is not a notifiable condition at the state level for public health surveillance. A drowning syndrome is reported to be used in the New York City syndromic surveillance system. However, neither data source could be fully explored, described, or reviewed due to time constraints associated with the completion of this report.

Decentralized data systems: medical examiner and coroner reports and law enforcement

New York State consists of 62 counties, including the five counties of New York City and 57 counties upstate. The New York City counties have a centralized medical examiner and one law enforcement agency, which differs from that of the remainder of the state.

The rest of the state is made up of decentralized coroner/medical examiner and decentralized law enforcement agencies. The 57 counties are a mix of coroners and medical examiner systems, and each county has their practices for collecting information on scene and reporting on the deaths. Certain New York State Department of Health staff are designees of the Commissioner of the State Department of Health, which under public health law requires coroners and medical examiners to respond to their requests for data. However, that does not mean these requests are always answered.

Challenges and limitations: medical examiner and coroner reports and law enforcement

There are some caveats to these systems' coverage. Some county coroner and medical examiners offices are responsible for the investigation of deaths in surrounding counties through contractual agreements. However, there can be nuances to these contracts. For example, the contracted county (the lead county) may be responsible for the autopsy and toxicology of the deaths that occur, but they are not responsible for scene investigation. Thus, this "collaborative" effort can lead to incomplete and at times convoluted reports.

The law enforcement agencies are even more disparate. While New York State has its statewide New York State Police (often called the New York State Troopers), there are over 500 law enforcement agencies in the 57 counties outside of New York City. Unlike the coroner and medical examiner agencies, law enforcement agencies are not required to report drowning-related information to the New York State Department of Health, except in limited instances related to specific funding requirements.

Due to the decentralized nature of these entities, the drowning data that they may contain could not be fully explored, described, or reviewed by the time this report was finalized.

Case study: Drowning Prevention and Investigation (at regulated bathing facilities) Program

New York State has more than 7,400 public swimming pools and 1,300 public bathing beaches. City/county health departments (i.e., local health departments) and State District Offices conduct inspections at public bathing facilities to protect bathers from death, injury, and illness.

The Bureau of Community Environmental Health and Food Protection of the New York State Department of Health oversees implementation of New York State Sanitary Code regulations for swimming pools and bathing beaches by local health departments. This includes the Drowning Prevention and Investigation Program, which seeks to determine the factors contributing to death, injury, or illness at public bathing facilities and determine how future events can be prevented. As part of this program, since 1987, local health departments and the Regional and Central Offices of the New York State Department of Health collaboratively conduct investigations of all fatal and non-fatal drowning incidents at regulated bathing facilities.

Regulated facilities are responsible for reporting all incidents, including fatal and non-fatal drowning incidents, to the New York State Department of Health within 24 hours in cases that[31]:

- Result in death
- Require resuscitation
- Require referral to a hospital or other facility for medical attention
- Include a bather illness associated with bathing water quality

What is a bathing facility?

Within the New York State Sanitary Code, bathing facilities include pools, beaches, and recreational aquatic spray grounds.[28,29,30] Pools and beaches are further classified into the following types:

Pools
- Swimming pools
- Wading pools
- Activity pools
- Spa pools
- White-water slides
- Wave pools

Beaches
- Pond beaches
- Lake beaches
- Stream beaches
- Ocean beaches (marine beaches)
- Other freshwater or saltwater beaches

Venues with pools or beaches include those owned and operated by state agencies, municipalities, hotels, motels, campgrounds, apartment complexes, health clubs, spas, or children's camps. Pools and beaches that are operated by the New York State Office of Parks, Recreation and Historic Preservation and/or the New York State Department of Environmental Conservation are overseen by their respective agencies, which report drowning incidents that occur at their facilities to the New York State Department of Health. Recreational aquatic spray grounds differ from pools and beaches in that there is no immersion in water during use. Sprayed water is continuously drained from the spray pad surface, so there is no standing water that would pose a drowning risk.

Once a report is received, the local health department, in collaboration with Regional and Central Offices of the New York State Department of Health—or in cases where the drowning incident occurs at a state-operated facility, the Central Office—conducts an investigation into the drowning incident. This includes an inspection of regulated bathing facilities for compliance with the State Sanitary Code and a complete review of the incident details and characteristics pertaining to the victim, environment, supervision, and emergency response.

Data collected include:

- Age
- Sex
- Race/ethnicity
- Date of drowning
- Time of drowning
- Activity at time of drowning
- Location of drowning
- Type of bathing facility
- Comorbidities
- Bather supervision by lifeguards or other aquatic supervisory staff
- Rescue or attempted rescue
- Swimming ability
- Environmental conditions (e.g., wind, water temperature, water clarity)
- Proper enclosures at swimming pools
- Signage and depth markings
- Supervision of minors
- Alcohol/drug use

Sources of data will vary from investigation to investigation but may be collected from:

- Statements or interviews from witnesses, lifeguards and facility staff, the victim (if non-fatal), or their friends, family, or acquaintances
- Incident records, including hospital records, emergency medical services records, medical examiner or coroner reports, and police reports
- Video recordings
- Facility records
- On-site investigation findings

Once the investigation report is submitted, the Central Office reviews and enters data into the statewide database and analyzes trends. A notable limitation is that program staff do not have direct access to health, other private records, or any databases or systems that host and maintain them. Requests must be made for every incident-specific record from the corresponding entity that holds them, which results in a time- and personnel-intensive process. Despite this limitation, the Drowning Prevention and Investigation Program has successfully tracked and analyzed over 200 drowning fatalities that have occurred at regulated bathing facilities since 1987. The findings from this work can be found in the published report, "Historical Drowning Data New York State Bathing Facility Fatal Drowning Statistics 1987-2024."

Table 2 summarizes the strengths and challenges of the data sources assessed and analyzed in this report.

Table 2. Strengths and challenges of data sources assessed and analyzed in New York State.

Data source	Strengths	Challenges
Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research	• Allows public access to New York State aggregate county-level mortality data, including New York City	• May include discrepancies with the state database • Is based on residence-based reporting • Has limited circumstance detail related to death • May include potential coding errors or misclassification
Statewide Planning and Research Cooperative System	• Allows access to New York State hospital and emergency department discharge data—including New York City—in a centralized database	• Does not include every case of drowning-related healthcare utilization • May not capture out-of-jurisdiction emergency medical services and hospital care • Has limited circumstance detail related to hospitalizations and emergency department visits
Drowning Prevention and Investigation Program Database	• Provides a wide breadth of unique variables pertaining to the supervision, environmental conditions, victim characteristics, and other circumstances of fatal drowning incidents	• Only captures drowning incidents at regulated bathing facilities • Involves some incomplete abstraction of non-fatal drowning incidents • Depends on separate incident-specific record requests to each data-holding entity, which can be time- and personnel-intensive • May include incident-specific records that have conflicting information

Table 3 summarizes variables included and used to describe drowning by the data sources assessed and analyzed in this report.

Table 3. Variables of interest available in data sources assessed and analyzed in New York State.

Variable	Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research	Statewide Planning and Research Cooperative System	Drowning Prevention and Investigation Program
Age	X	X	X
Sex	X	X	X
Race/ethnicity	X	X	X
Date of drowning		X	X
Time of drowning		X	X
Activity at time of drowning		X	X
Location of drowning	X	X	X
Comorbidities		X	X
Rescue or attempted rescue			X
Swimming ability			X
Lifejacket use (when applicable)			
Environmental conditions (e.g., wind, water temperature)			X
Presence of structural barriers (e.g., pool fencing)			X
Alcohol/drug use	X*	X*	X
Other variables relevant to drowning†	X	X	X

* Alcohol- and drug-related variables can be derived from International Classification of Diseases, 10th Revision and International Classification of Diseases, 10th Revision, Clinical Modification codes in the corresponding data source; however, the presence of alcohol and drugs is not always documented in emergency department and hospital records or on death certificates.

† Other variables relevant to drowning may include the intent of drowning (unintentional, intentional, or undetermined), mechanism of drowning, place of death, or contributing causes of death.

Opportunities for improvement

The situational assessment enabled the comparison of the current and desired scopes of drowning data and prevention. As part of the questionnaire, respondents were asked to describe opportunities to improve drowning data quality, storage, and processing. Data challenges as identified from the questionnaire and examples summarized from interviews with responders (in parenthesis) include:

- Availability of data (e.g., narratives describing drowning incidents often are not stored with abstracted line-level data or in an accessible database; coroner/medical examiner and law enforcement systems are decentralized)
- Reporting (e.g., drowning is mandated to be reported if it occurs at a regulated bathing facility or if it is the recorded external cause of injury at a hospital or an emergency department, but it is not a notifiable condition in all New York State Department of Health jurisdictions for public health surveillance)
- Completeness of records (e.g., drowning investigations at regulated bathing facilities compile information from multiple sources with varying levels of completeness and consistency)
- Data on non-fatal drowning (e.g., syndromic surveillance of drowning is not performed at the state level; the Drowning Prevention and Investigation Program has not had staff hours to abstract non-fatal drowning data into a database)
- Funding (e.g., drowning prevention is grant-funded so there is no consistent funding stream)
- Availability of staff support (e.g., most staff are not assigned to solely drowning prevention work; the current scope of injury prevention work already maximizes available staffing hours)
- Other data-related challenges

While acknowledging and sharing these challenges, questionnaire respondents provided information on the support that would be most helpful to initiate, continue, or expand their drowning prevention work (Table 4).

Table 4. Types of desired support for drowning prevention work in New York State.

Support needed	Ranked position by New York State Department of Health's Bureau of Occupational Health and Injury Prevention	Ranked position by New York State Department of Health's Drowning Prevention and Investigation Program
Support the implementation of state/national drowning prevention strategies	#1	-
Compile and report detailed drowning data	#2	#3
Provide capacity development and training for surveillance and/or programs	#3	#1
Improve data collection and strengthen data systems in the state/county	-	#2

To further support the programmatic work of the New York State Department of Health, respondents provided suggestions on what data would be most helpful for their needs. The top five data sources of interest, in ranked order, were:

1. Syndromic surveillance
2. Child death reviews
3. Lifesaving/drowning prevention organizations
4. Maritime/boating safety
5. Media

Respondents provided further opinions on what variables would be most helpful for their work, not only from the data sources of interest but also the available drowning data. These variables, in ranked order, were:

1. Activity at the time of drowning
2. Alcohol use
3. Drug use
4. Supervision
5. Lifejacket use (when applicable)



Battery Park, New York City.



Burden and circumstances

International Classification of Diseases, 10th Revision codes were used to identify drowning deaths and International Classification of Diseases, 10th Revision, Clinical Modification codes were used to identify drowning-related emergency department visits and hospitalizations; Table 5 shows the specific International Classification of Diseases, 10th Revision and International Classification of Diseases, 10th Revision, Clinical Modification codes used. To better understand the full burden of drowning, expanded inclusion criteria for drowning deaths and hospitalizations were developed and used throughout this report. Deaths from the Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research between 2009–2023 were identified as unintentional drowning if there was an unintentional drowning International Classification of Diseases, 10th Revision code in either the underlying cause of death or multiple causes of death fields. This differs from the approach typically used for identifying fatal drowning, which only utilizes the underlying cause of death field. The expanded criteria captured 5.7% more unintentional drowning deaths compared with the traditional approach from 2009–2023. Intentional drowning and drowning deaths of undetermined intent were also identified.

Emergency department visit and hospitalization data were analyzed from New York's Statewide Planning and Research Cooperative System between 2016–2023. Emergency department visits were limited to those that did not result in hospitalization within the same hospital system or death, and hospitalizations were limited to those that did not result in death. Patients discharged from the emergency department and transferred to another hospital system may appear in the data more than once. Traditionally, hospitalizations are only considered drowning-related if the primary diagnosis is an injury and there is a drowning International Classification of Diseases, 10th Revision, Clinical Modification code in a subsequent field while emergency department visits are considered drowning-related if there is a drowning International Classification of Diseases, 10th Revision, Clinical Modification code anywhere in the record.[32] For this report, both emergency department visits and hospitalizations were identified as unintentional drowning if there was an International Classification of Diseases, 10th Revision, Clinical Modification code related to unintentional drowning anywhere in the record. The expanded hospitalization inclusion criteria captured 57.1% more unintentional drowning hospitalization cases than would have been identified had hospitalizations been limited to a primary diagnosis of injury only. Emergency department and hospital discharge data were limited to 2016–2023 due to coding changes starting on October 1, 2015, with the change from the 9th to 10th revision of International Classification of Diseases, Clinical Modification codes. Intentional and undetermined intent drowning-related emergency department visits and hospitalizations were also identified in the same manner as unintentional drowning.

Rates were calculated as the number of drowning deaths, emergency department visits, or hospitalizations per 100,000 state residents overall and by year, sex, age group, race/ethnicity, and region using population estimates from the United States Census Bureau (vintage 2023 estimates for 2020 to 2023, vintage 2020 estimates for 2010 to 2019, and intercensal 2010 estimates for 2009 from: https://www2.census.gov/programs-surveys/popest/datasets/. Rates were age-adjusted to the 2000 U.S. standard population using the direct method.[33] The number of drowning-related emergency department visits and hospitalizations were also calculated for incidents that occurred in New York State among non-residents of New York State. Unless otherwise noted, the focus of this report is on unintentional drowning among state residents.

Drowning occurs when a person experiences respiratory impairment from submersion or immersion in a liquid.[34] Drowning can be fatal or non-fatal and may result from intentional acts (such as suicide or assault), unintentional causes (such as loss of balance leading to submersion or being caught in a rip current), or where the intent is unknown. Traditional analyses of drowning often focus on fatalities which can underestimate the true

Table 5. International Classification of Diseases, 10th revision and International Classification of Diseases, 10th revision, Clinical Modification codes used to identify drowning deaths (International Classification of Diseases, 10th revision) and emergency department visits and hospitalizations (International Classification of Diseases, 10th Revision, Clinical Modification).

Fatal

Unintentional drowning: Underlying cause of death = V90, V92, W65-W74 OR multiple cause of death = V90, V92, W65-W74 and the underlying cause of death ≠ X60-X99, Y00-Y34, Y87, U01-U03.

Intentional drowning: Underlying cause of death = X71, X92 OR underlying cause of death = X60-X99, Y00-Y09, Y87.0, Y87.1, U01-U03 and multiple cause of death = V90, V92, W65-W74, Y21, OR multiple cause of death = X71, X92 and underlying cause of death ≠ V90, V92, W65-W74, Y21.

Undetermined intent drowning: Underlying cause of death = Y21 OR underlying cause of death = Y10-Y34, Y87.2 and multiple cause of death = V90, V92, W65-W74, X71, X92 OR multiple cause of death = Y21 and underlying cause of death ≠ V90, V92, W65-W74, X71, X92.

T75.1: In the multiple cause of death field T75.1 is considered unintentional drowning if there are no intentional or undetermined injury codes present in the record: X60-X99, Y00-Y38, Y87, U01-U03. If intentional or undetermined injury codes are present in the record, T75.1 is coded as intentional or undetermined intent.

Non-fatal (ED visits and hospitalizations): All codes have a 7th character of A or missing.

Unintentional drowning: V90, V92, W16 with 6th character=1, W16.41, W16.91, W22.041, W65-W74 anywhere in the record.

Intentional drowning: X71, X92 and no other drowning codes present.

Undetermined intent drowning: Y21 and no other drowning codes present.

Primary diagnosis of injury (only traditional hospitalizations): S00-S99, T07-T34, T36-T50 with a 6th character of 1, 2, 3, or 4 except T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9 with fifth character of 1, 2, 3, or 4, T51-T76, T79, O9A.2-O9A.5, T84.04, M97.

T75.1: Considered unintentional drowning if there are no intentional or undetermined intent injuries anywhere in the record: X71-X83, X92-X99, Y00-Y09, Y21-Y33, Y38, R45.88, T14.191, T36–T50 with 6th character=2,3,4 except T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9 where fifth character=2,3,4, T51–T65 with 6th character=2,3,4 except T51.9, T52.9, T53.9, T54.9, T56.9, T57.9, T58.0, T58.1, T58.9, T59.9, T60.9, T61.0, T61.1, T61.9, T62.9, T63.9, T64, and T65.9 where the fifth character=2,3,4, T71 with sixth character=2,3,4, T74, T76. If there are intentional or undetermined intent injuries in the record drowning was coded as intentional or undetermined intent.

burden of drowning, thus limiting opportunities for intervention and prevention of non-fatal drowning. By understanding the full spectrum of drowning, New York State can better track trends, allocate resources, and implement targeted interventions that protect all populations.

During the 2009–2023 study period, 3,201 fatal drowning records among New York State residents were captured (Table 6). Of these records, 2,236 (69.9%) were classified as unintentional, 660 (20.6%) as intentional, and 305 (9.5%) as undetermined intent. Non-fatal drowning was separated into hospitalizations and emergency department discharges between 2016–2023. During this period, 890 hospitalizations and 2,689 emergency department discharges among New York State residents were captured. Of these, 735 (82.6%) hospitalizations and 2,447 (91.0%) emergency department discharges were labeled as unintentional.

Data on drowning fatalities among non-New York State residents were not available for review for this report due to limitations of the Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research. However, the Statewide Planning and Research Cooperative System database (hospitalization and emergency department discharge) captures data on non-fatal drowning among non-state residents. From 2016–2023, most drowning-related emergency department visits and hospitalizations were among state residents. The number of non-state resident hospitalizations and emergency department visits was substantially fewer compared with New York State residents (Table 6).

In New York State, a substantial proportion of drowning incidents are intentional. For example, intentional drowning accounts for approximately 20% of fatalities and hospitalizations among New York State residents. The prevalence of intentional drowning, primarily from self-harm, highlights an important area for future investigation and prevention work. Notably, between 2018–2023, New York State has a higher proportion of intentional fatal drowning (20.4%) compared with the entire United States (9.4%). Although intentional drowning and drowning among non-state residents contribute to the overall burden of drowning, the primary focus of the rest of this report will be unintentional drowning among residents of New York State (Table 7). State residents who experience unintentional drowning are more substantial in number and are most directly affected by New York State regulations, policies, and outreach from stakeholders across the state.

Table 6. Fatal and non-fatal drowning outcomes by intent and residency in New York State.

	Fatalities (2009–2023)		Hospitalizations (2016–2023)		Emergency department visits (2016–2023)	
Intent	**State residents**	**Non-state residents**	**State residents**	**Non-state residents**	**State residents**	**Non-state residents**
Unintentional	2,236	*	735	47	2,447	180
Intentional	660	*	155	†	242‡	16
Undetermined	305	*	0	0	†	†

* Data were only available for New York State residents through the Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research platform.
† Values were suppressed due to a low case count (10 or less).
‡ The number of 2016 emergency department visits among state residents labeled as assault by drowning (X92) exceeded expected levels based on frequency trends within the review period.

Table 7. Annual average counts and rates of fatal and non-fatal unintentional drowning by demographic characteristics, New York State residents.

Variable		Fatalities (2009–2023)		Hospitalizations (2016–2023)		Emergency department visits (2016–2023)	
		Annual Average Count	Rate per 100,000 Residents*	Annual Average Count	Rate per 100,000 Residents*	Annual Average Count	Rate per 100,000 Residents*
Sex	Male	114	1.18	63	0.70	193	2.18
	Female	35	0.34	29	0.32	113	1.33
Age group (in years)	<1	1	0.46	4	1.97	15	6.85
	1-4	10	1.10	20	2.26	87	9.71
	5-9	4	0.37	8	0.73	33	2.94
	10-14	5	0.42	7	0.65	25	2.20
	15-19	9	0.76	6	0.49	28	2.36
	20-24	13	0.98	4	0.30	20	1.52
	25-34	21	0.74	9	0.32	30	1.04
	35-44	16	0.64	8	0.30	21	0.84
	45-54	20	0.73	6	0.24	16	0.64
	55-64	18	0.70	7	0.26	18	0.67
	65-74	16	0.93	6	0.31	8	0.44
	75+	16	1.19	6	0.44	5	0.36
Race/ ethnicity[†]	American Indian or Alaska Native	‡	‡	‡	‡	‡	‡
	Asian[§]	8	0.47	5	0.29	11	0.70
	Black or African American	23	0.80	13	0.53	34	1.33
	Native Hawaiian or other Pacific Islander[‖]	0	0.00	‡	‡	‡	‡
	White	95	0.81	46	0.46	180	2.06
	Hispanic or Latino	23	0.61	12	0.30	40	1.02
	Multiracial	‡	‡	‡	‡	2	0.44
	Unknown	0	0.00	0	0.00	0	0.00
	Other	0	0.00	15	0.00	39	0.00
Residence region	New York State, excluding New York City	108	0.93	63	0.61	221	2.25
	New York City	41	0.50	29	0.37	85	1.14

* Rates per 100,000 residents for sex, race/ethnicity, and residency region are adjusted for age; rates for age groups are age-specific.
[†] Ethnicity is non-Hispanic for each race/ethnicity category unless stated otherwise. Records with unknown ethnicity were included in the reported race category and as non-Hispanic for this report.
[‡] Suppressed because the underlying count is fewer than 10 fatalities or 10 or fewer hospitalizations or emergency department visits. Means and rates calculated from these suppressed counts are also suppressed.
[§] Fatality data from CDC WONDER are reported as "Asian or Pacific Islander"; however, other data sources report "Asian" only.
[‖] Fatality data from CDC WONDER on non-Hispanic Native Hawaiian or other Pacific Islander populations were available only for 2018–2023.

Time trends

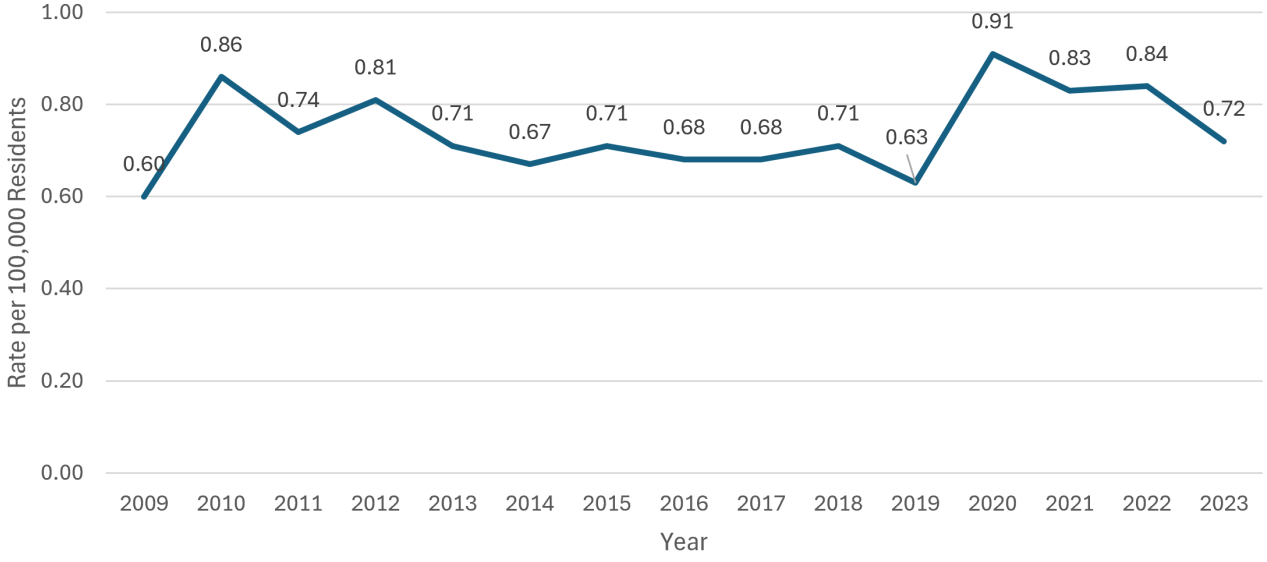
Fatalities

During the 2009–2023 study period, age-adjusted drowning death rates ranged from a low of 0.60 per 100,000 in 2009 to a high of 0.91 per 100,000 in 2020 (Figure 1). During the period for which both fatal and non-fatal drowning data were available (2016–2023), 1,223 fatalities occurred in the state (Figure 2). From 2009–2010, there was a large (43.3%) increase in the age-adjusted rate of drowning deaths. From 2011–2018, drowning mortality remained relatively stable, with age-adjusted rates averaging approximately 0.70 deaths per 100,000 population. Similar to 2009 and 2010, a relatively low death rate in 2019 was followed by a substantial (44.4%) increase in 2020, coinciding with the onset of the coronavirus disease 2019 (COVID-19) pandemic. Drowning-related fatalities remained elevated in 2021 and 2022, then returned to pre-COVID-19 counts and age-adjusted rates in 2023.



Lake Placid, New York.

Figure 1. Age-adjusted drowning-related fatality rates (per 100,000), New York State residents, 2009–2023.



Hospitalizations

During the 2016–2023 study period, 735 hospitalizations among New York State residents were identified, corresponding to an average annual rate of 0.50 per 100,000 residents. The number of drowning-related hospitalizations was lowest in 2018 (77 hospitalizations – Figure 2). The highest number occurred in 2020 (110 hospitalizations). Rates of drowning-related hospitalizations were relatively stable prior to the COVID-19 pandemic (Figure 3). In 2020, the first full year of the pandemic, the age-adjusted rate of drowning-related hospitalizations increased by 26.4% to 0.60 per 100,000 residents, rising from 0.47 per 100,000 residents in 2019. The age-adjusted rate for 2021 (0.54 per 100,000 residents) was closer to the rates prior to 2020 but remained slightly elevated.

Emergency department visits

During the 2016–2023 study period, 2,447 drowning-related emergency department visits among state residents occurred, corresponding to an average annual rate of 1.75 per 100,000 residents (Figures 2 and 3). The lowest recorded number of drowning-related emergency department visits occurred in 2020 and 2021 (276 and 266 visits, respectively). The highest recorded number occurred in 2019 (345 emergency department visits). Drowning-related emergency department rates were relatively stable prior to the COVID-19 pandemic. In the first full year of the COVID-19 pandemic (2020), there was a 23.7% decrease in the age-adjusted rate of drowning-related emergency department visits (1.51 per 100,000 residents) compared with 1.98 per 100,000 residents in 2019 (Figure 3). The age-adjusted drowning emergency department rate for 2021 (1.52 per 100,000) remained below the rates found prior to 2020; however, the rate increased to 1.71 per 100,000 in 2022 and 1.92 per 100,000 in 2023.

Figure 2. Drowning-related fatalities, hospitalizations, and emergency department visits, New York State residents, 2016–2023.

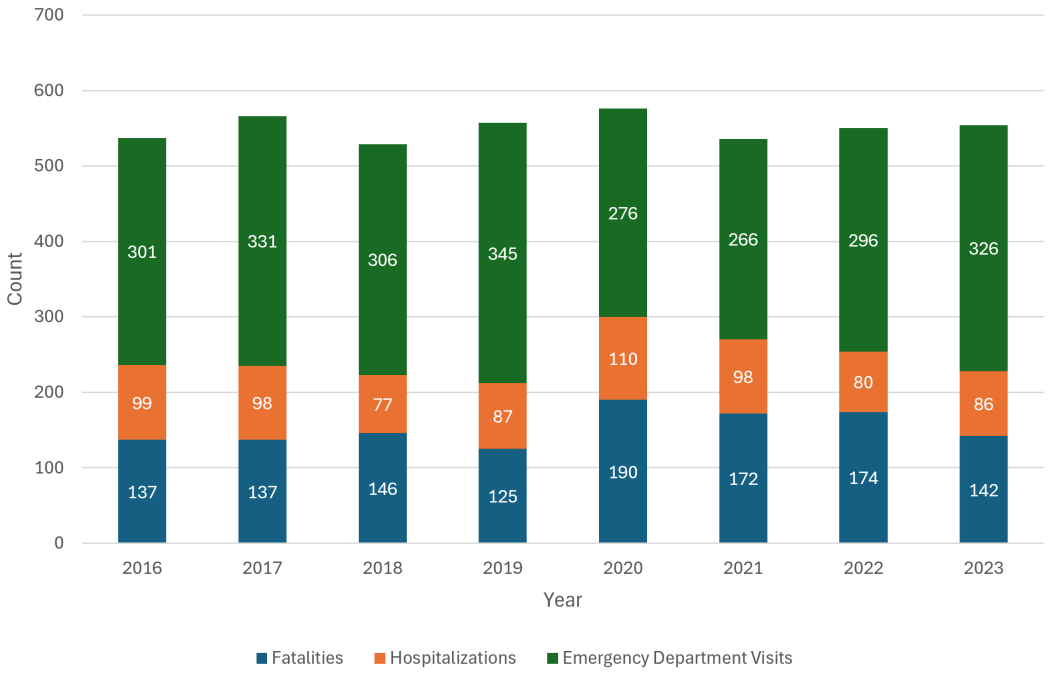
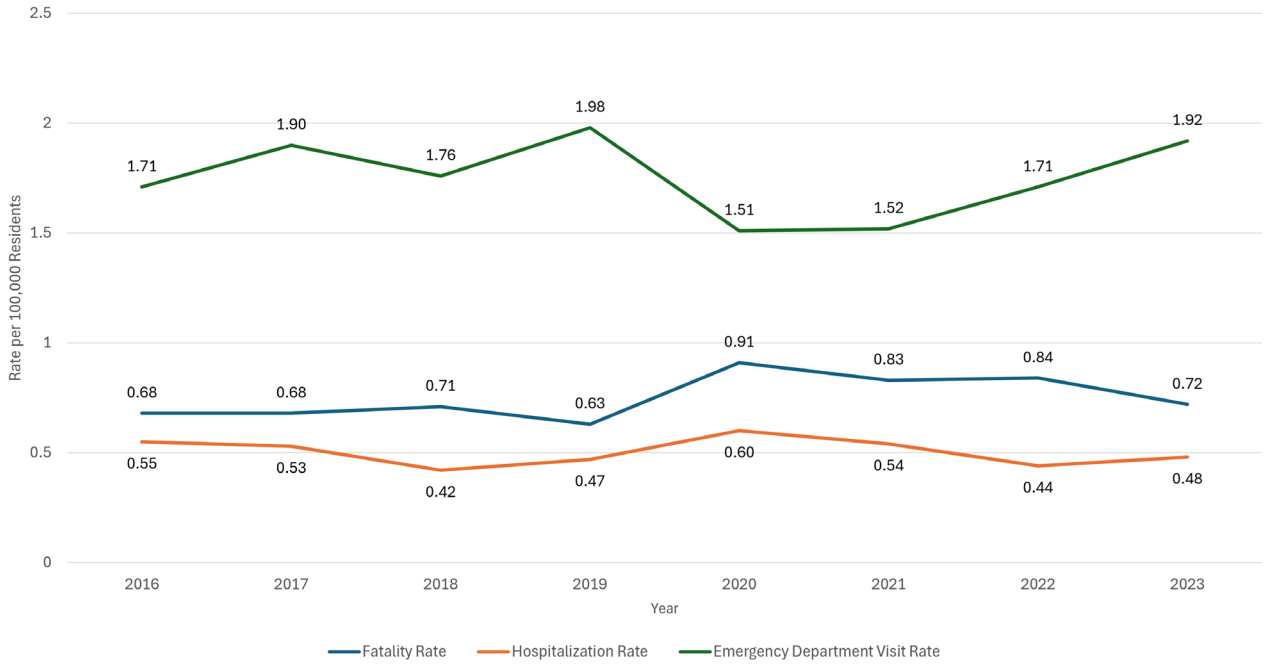


Figure 3. Age-adjusted rates (per 100,000 residents) for drowning-related fatalities, hospitalizations, and emergency department visits, New York State residents, 2016–2023.



Demographics

Age

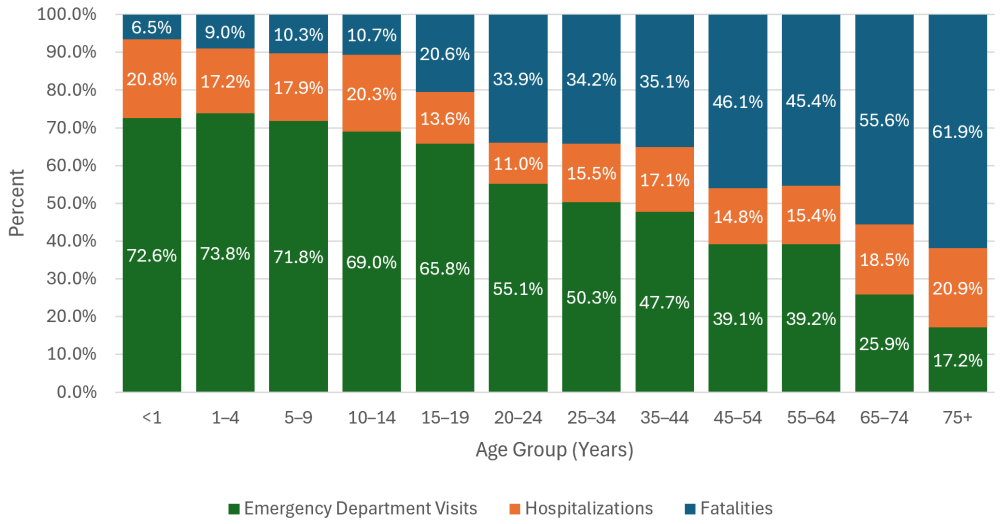
During the 2016–2023 study period, the burden of both fatal and non-fatal drowning differed by age. For example, 72.6% of drowning incidents reported among infants aged less than 1 year resulted in emergency department visits compared with only 17.2% among older adults aged 75 years and older (Figure 4). Drowning-related hospitalizations displayed a different trend in burden across age groups. A larger proportion of drowning incidents were hospitalizations among infants aged less than 1 year (20.8%), children aged 10–14 years (20.3%), and older adults aged 75 years and older (20.9%). Less than 10 fatal drowning records were missing age.

Drowning among young children and older adults

- **Young Children:** During the 2016–2023 study period, drowning-related emergency department visit and hospitalization rates among those aged less than 1 year and aged 1–4 years were higher than other age groups. In addition, during the 2009–2023 study period, the second highest drowning-related fatality rate was observed among those aged 1–4 years.
- **Older Adults:** Over the 2009–2023 study period, persons aged 55 years and older represented an increasing proportion of total drowning fatalities. In 2009, adults in this age group represented 24.8% of all drowning fatalities. By the latter end of the study period, between 2018 and 2022, those aged 55 years and older represented between 38.4%–39.9% of all drowning fatalities.



Figure 4. Percent distribution of drowning-related fatalities, hospitalizations, and emergency department visits by age group, New York State residents, 2016–2023.



Types of drowning by region, sex, and race/ethnicity*

*Note: Elevated drowning rates were observed among the non-Hispanic American Indian and Alaska Native populations. However, these values were not included because they did not meet reliability standards (i.e., small sample size) and were excluded to improve visual clarity.

Fatalities (2009–2023)

- Region: The unintentional fatal drowning rate was lower among New York City residents (0.50 per 100,000 residents) compared with the rest of New York State (0.93 per 100,000 New York State residents, excluding New York City) (Figure 5).
- Sex: The unintentional drowning-related fatality rate among male New York State residents (1.18 per 100,000) was over three times the rate among female residents (0.34 per 100,000) (Figure 5).
- Race/Ethnicity: Non-Hispanic White residents (0.81 per 100,000) and non-Hispanic Black residents (0.80 per 100,000) had the highest drowning-related fatality rates, followed by Hispanic residents (0.61 per 100,000) and non-Hispanic Asian or Pacific Islander residents (0.47 per 100,000) (Figure 5).
- Race/Ethinicity by Region: Age-adjusted fatal drowning rates for all race/ethnicity groups were lower in New York City compared with the rest of New York State (New York State, excluding New York City) (Figures 6a, 6b, and 6c). Within New York City, non-Hispanic Black residents had the highest unintentional drowning fatality rate (0.66 per 100,000 New York City residents) (Figure 6b), followed by Hispanic residents (0.47 per 100,000), non-Hispanic White residents (0.45 per 100,000), and non-Hispanic Asian or Pacific Islander residents (0.40 per 100,000). In New York State, excluding New York City, non-Hispanic Black residents had the highest unintentional drowning-related fatality rate (1.10 per 100,000 residents) (Figure 6c), followed by non-Hispanic White residents (0.93 per 100,000), Hispanic residents (0.88 per 100,000), and non-Hispanic Asian or Pacific Islander residents (0.70 per 100,000). When the state is stratified by these two regions, the highest rate by race and ethnicity was among non-Hispanic Black residents for both regions (Figure 6b and 6c).

Figure 5. Age-adjusted drowning-related fatality rates by region, sex, and race/ethnicity, New York State residents, 2009–2023.

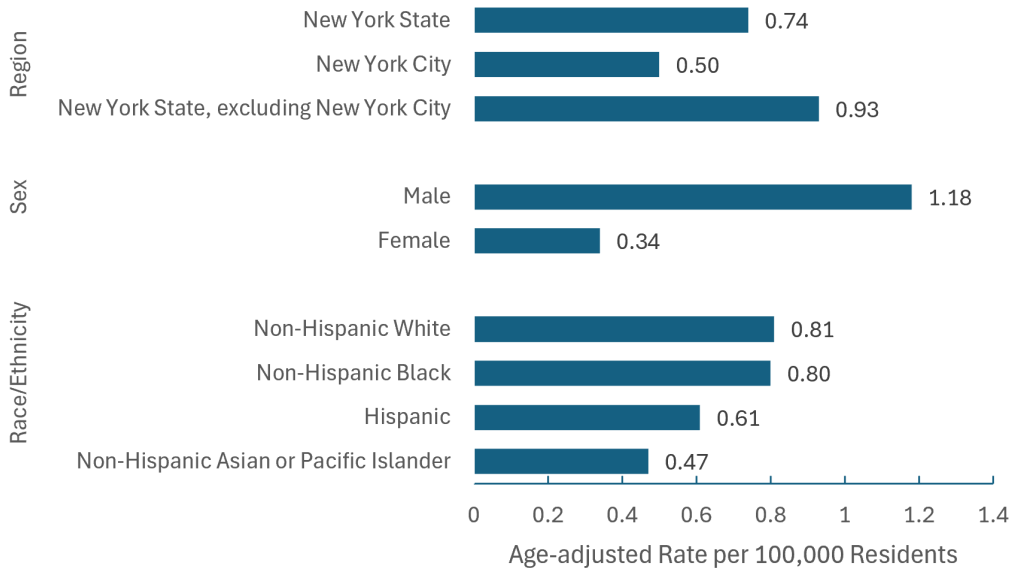
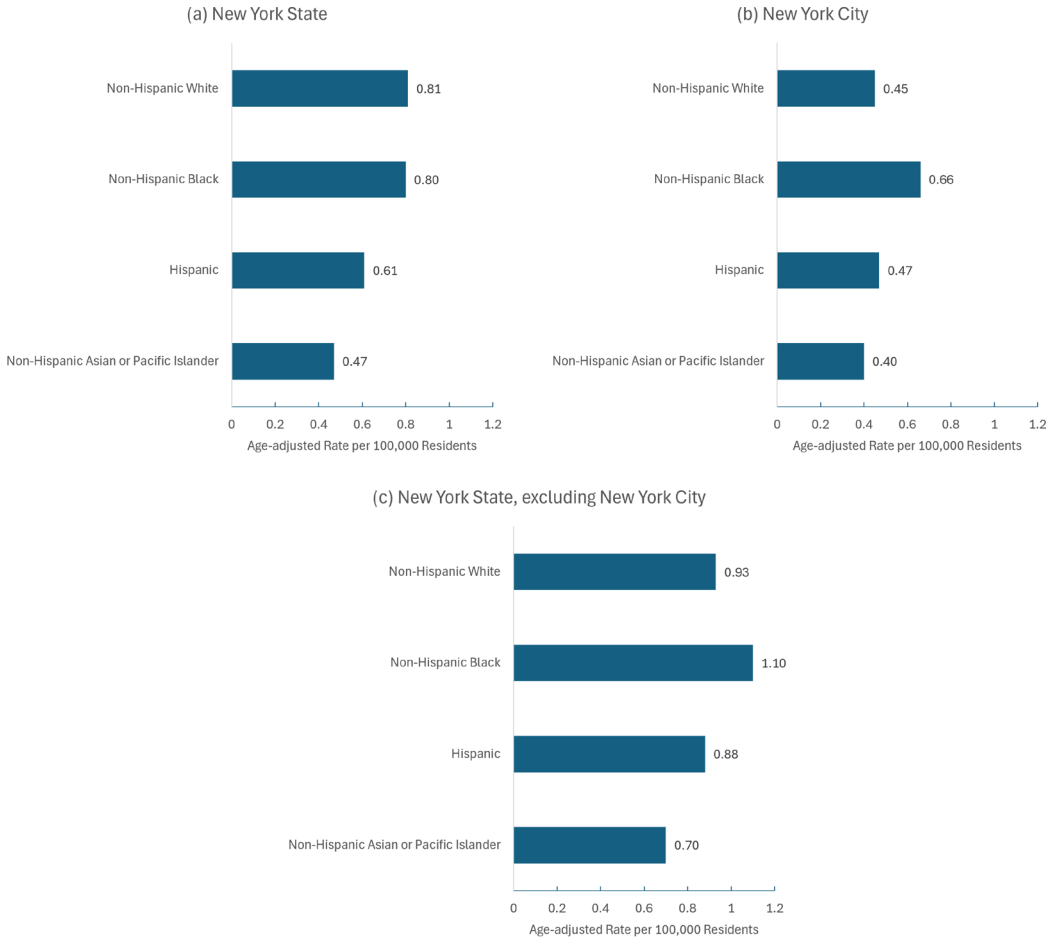


Figure 6. Age-adjusted drowning-related fatality rates by region and race/ethnicity, New York State residents, 2009–2023.



Hospitalizations (2016–2023)

- Region: The rate of unintentional drowning-related hospitalizations among New York City residents (0.37 per 100,000 residents) was lower compared with the rate of the rest of New York State (0.61 per 100,000 New York State residents, excluding New York City) (Figure 7).
- Sex: The unintentional drowning-related hospitalization rate among male New York State residents (0.70 per 100,000) was more than twice the rate among female residents (0.33 per 100,000) (Figure 7).
- Race/Ethnicity: Among New York State residents, non-Hispanic Black residents had the highest unintentional drowning-related hospitalization rate (0.53 per 100,000), followed by non-Hispanic White residents (0.46 per 100,000), non-Hispanic Asian or Pacific Islander residents (0.30 per 100,000), and Hispanic residents (0.30 per 100,000) (Figure 7).
- Race/Ethnicity by Region: Unintentional drowning-related hospitalization rates are lower in New York City than in New York State, excluding New York City, across race and ethnicity (Figures 8a, 8b, and 8c). Among New York City residents, non-Hispanic Black residents (0.37 per 100,000) and non-Hispanic White residents (0.33 per 100,000) had the highest unintentional drowning-related hospitalization rates (Figure 8b). Within New York State, excluding New York City, non-Hispanic Black residents (0.81 per 100,000) had the highest unintentional drowning-related hospitalization rates (Figure 8c).

Figure 7. Age-adjusted drowning-related hospitalization rates by region, sex, and race/ethnicity, New York State residents, 2016–2023.

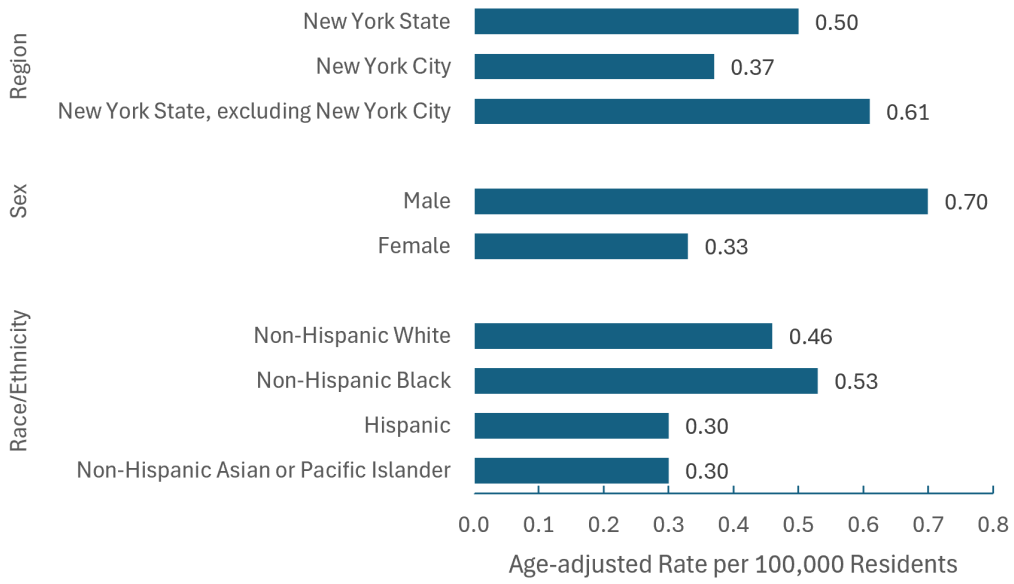
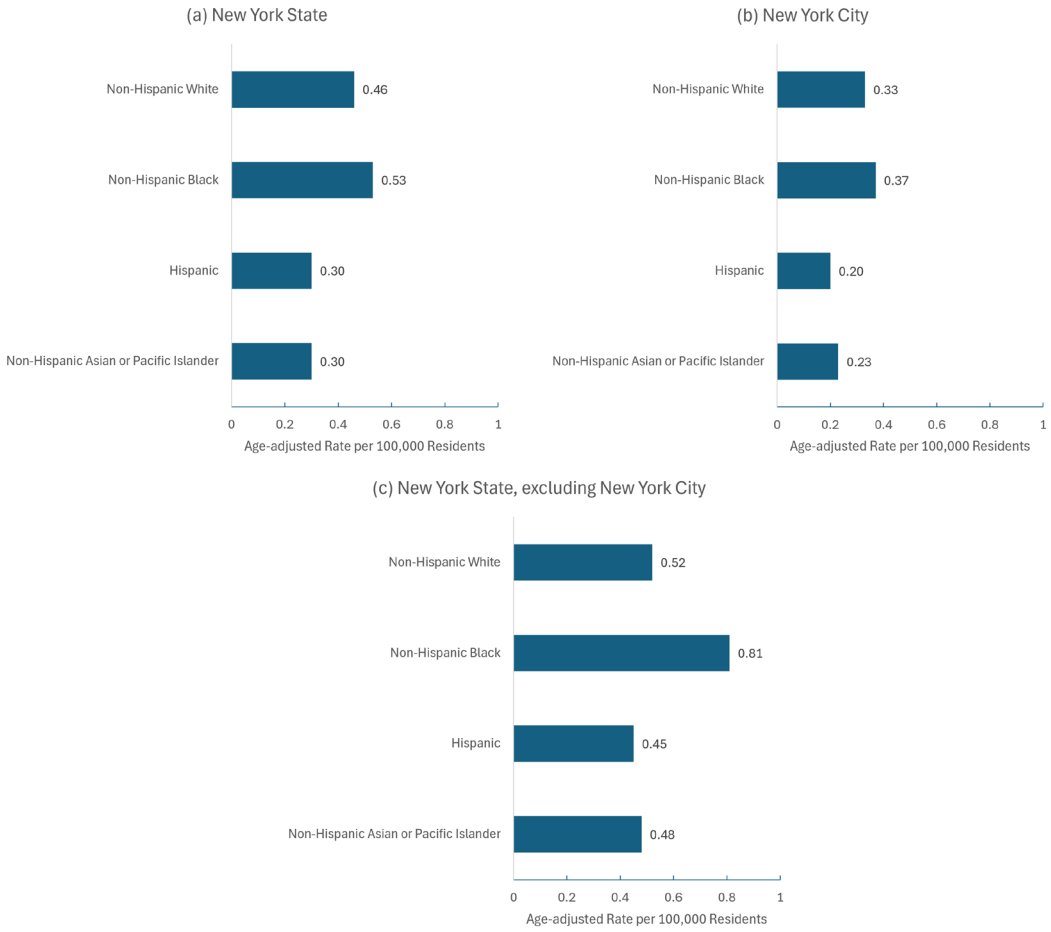


Figure 8. Age-adjusted drowning-related hospitalization rates by region and race/ethnicity, New York State residents, 2016–2023.



Emergency department visits (2016–2023)

- Region: The rate of unintentional drowning-related emergency department visits among New York City residents (1.14 per 100,000 residents) was lower than the rest of New York State (2.25 per 100,000 New York State residents, excluding New York City) (Figure 9).
- Sex: The rate of unintentional drowning-related emergency department visits among male New York State residents (2.18 per 100,000) was higher than the rate among female residents (1.33 per 100,000) (Figure 9).
- Race/Ethnicity: The highest unintentional drowning-related emergency department visit rate by race/ethnicity was among non-Hispanic White New York State residents (2.06 per 100,000) (Figure 9), followed by non-Hispanic Black residents (1.33 per 100,000), Hispanic residents (1.02 per 100,000), and non-Hispanic Asian or Pacific Islander residents (0.72 per 100,000).
- Race/Ethnicity by Region: Unintentional drowning-related emergency department visit rates were persistently lower in New York City than New York State, excluding New York City, regardless of race and ethnicity (Figures 10a, 10b, and 10c). Within New York City and the rest of the state, the highest unintentional drowning-related emergency department visit rates were among non-Hispanic White New York State residents (New York City: 1.29 per 100,000; New York State, excluding New York City: 2.35 per 100,000) (Figures 10b and 10c).

Among all race/ethnicity groups, similar trends were observed across the state. Full rate comparisons across the entire state can be found in Figure 11.

Figure 9. Age-adjusted drowning-related emergency department visit rates by region, sex, and race/ethnicity, New York State residents, 2016–2023.

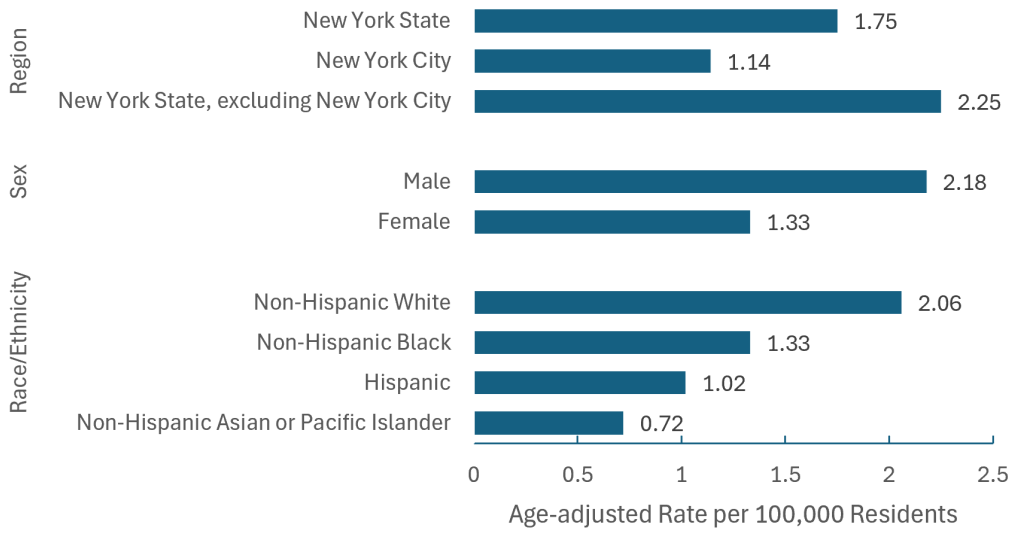


Figure 10. Age-adjusted drowning-related emergency department rates by region and race/ethnicity, New York State residents, 2016–2023.

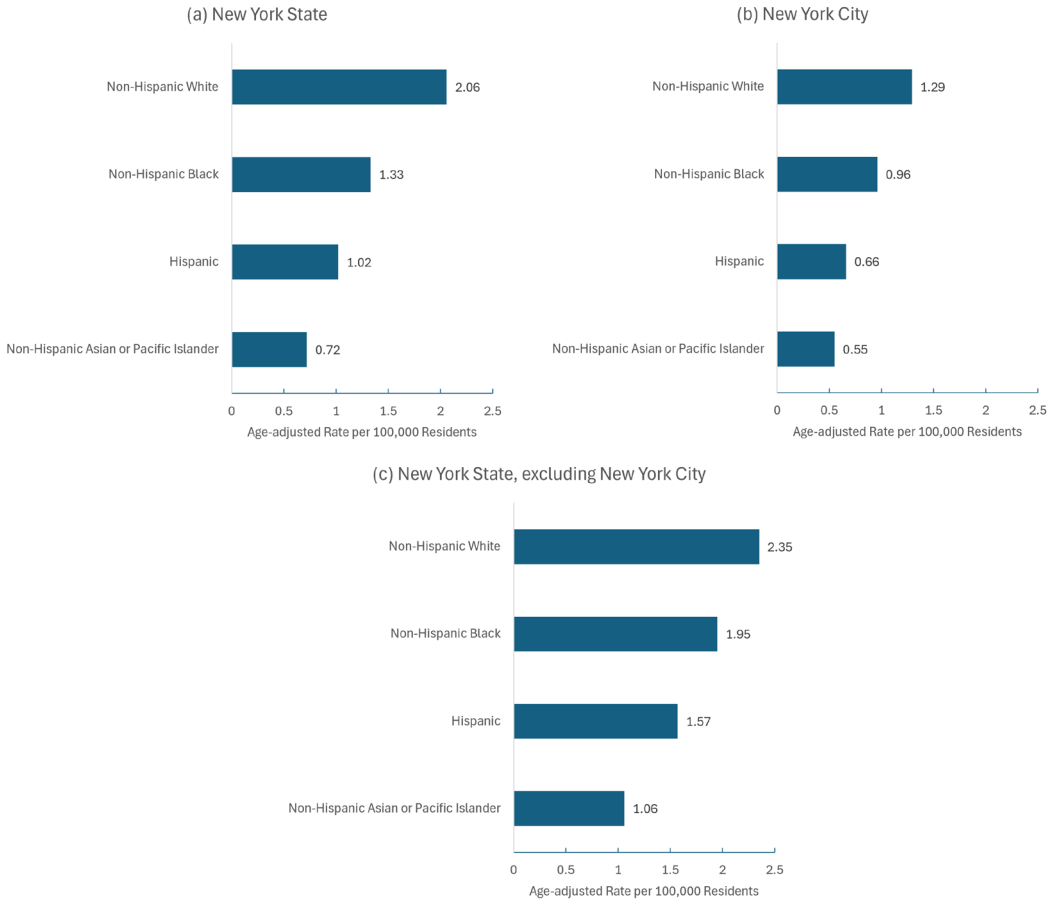
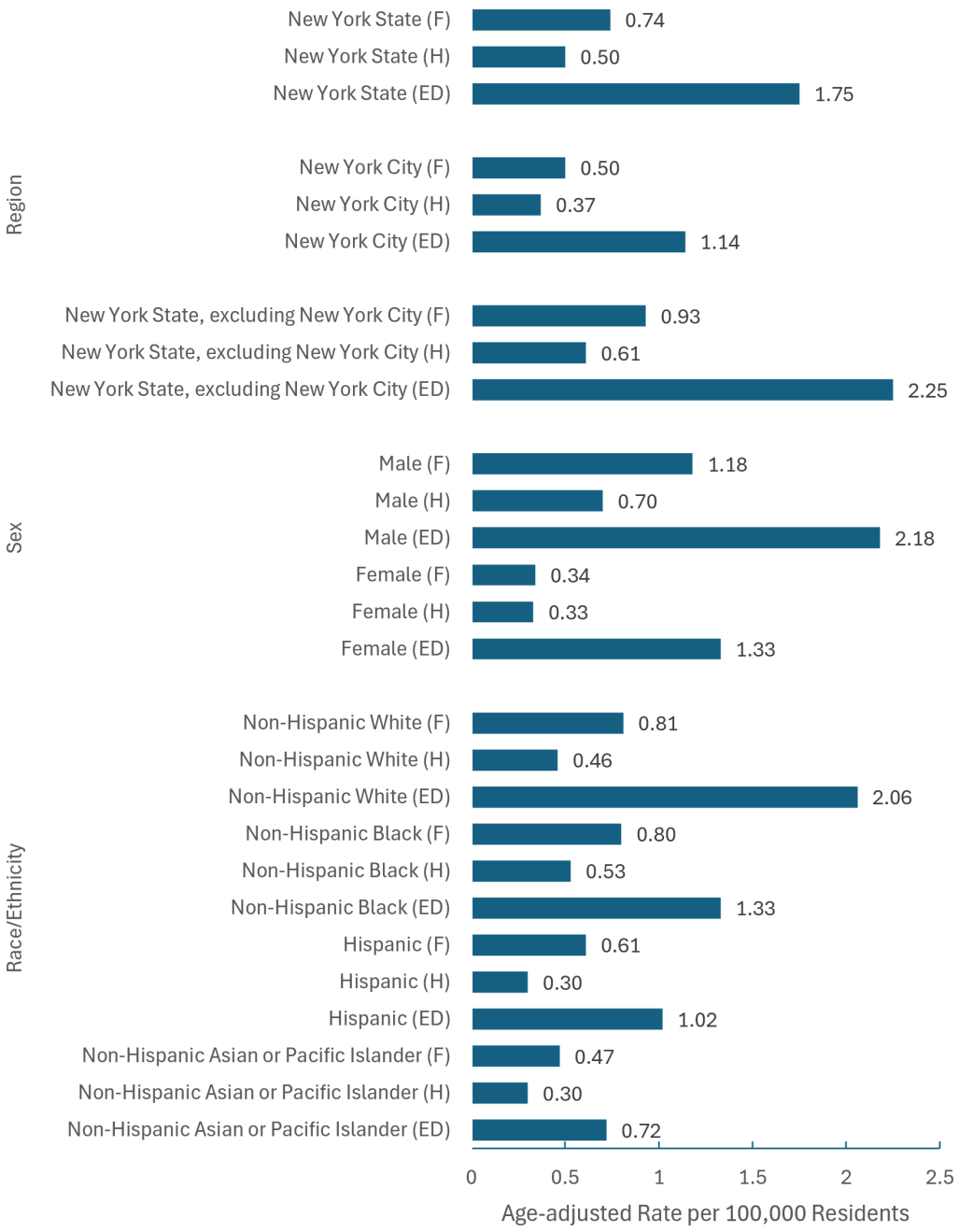


Figure 11. Age-adjusted drowning-related rates* by region and race/ethnicity, New York State residents.



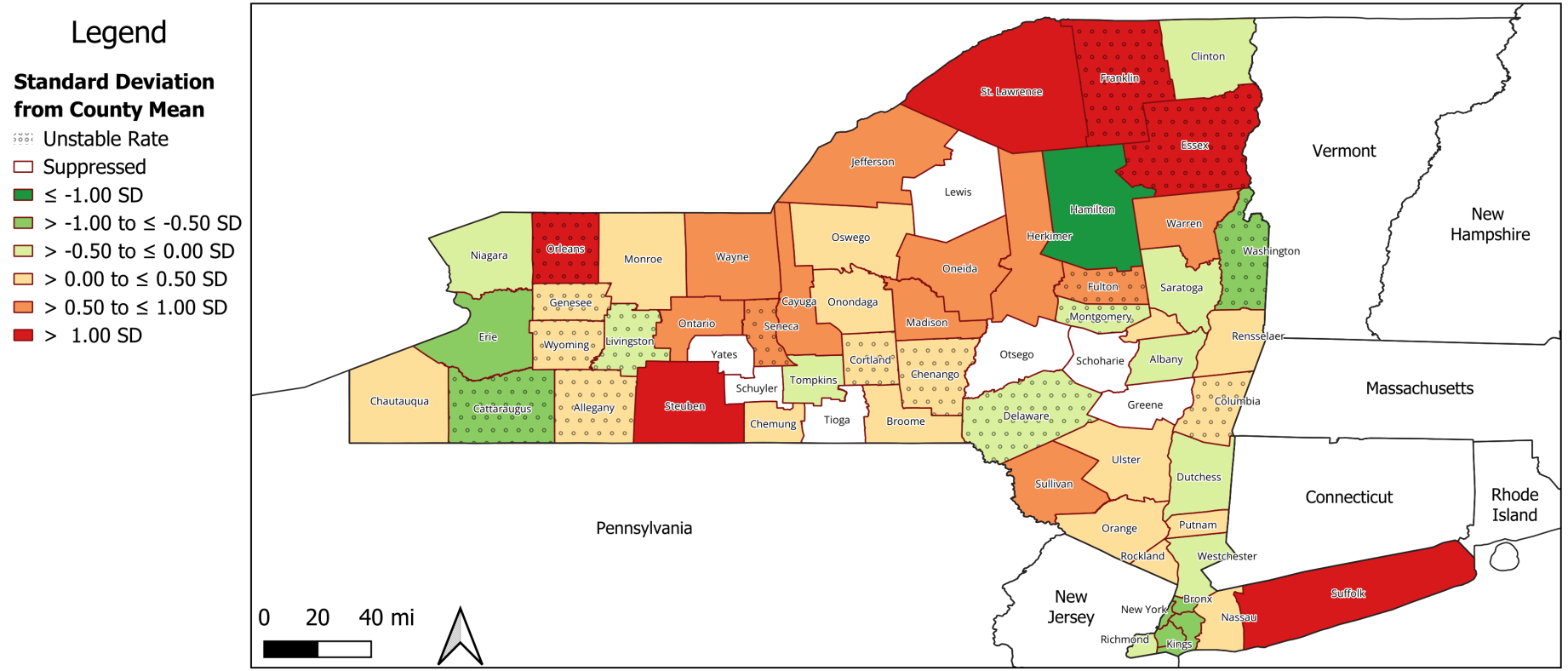
* Fatality (F) rate includes data from 2009–2023. Hospitalization (H) and emergency department (ED) visit rates include data from 2016–2023.

Fatalities, hospitalizations, and emergency department visits (2016–2023)

- Region (counties): New York State counties were categorized based upon their standard deviation (SD) from the county mean, defined as the mean of county-level crude rates (per 100,000 New York State residents) across all counties statewide with unsuppressed rates (Figure 12). Counties that were not suppressed were assigned to one of six SD categories, labeled as very low (≤ -1.00 SD), below average (> -1.00 to ≤ -0.50 SD), slightly below average (> -0.50 to ≤ 0.00 SD), slightly above average (> 0.00 to ≤ 0.50 SD), above average (> 0.50 to ≤ 1.00 SD), and high (> 1.00 SD). Many of the counties within New York City possessed below average crude drowning rates relative to the rest of New York State. Counties with high crude drowning rates included Essex, Franklin, Orleans, St. Lawrence, Steuben, and Suffolk counties. Detailed drowning burden by frequency of fatal and non-fatal drowning and crude drowning rates for the review period can be found in Table 8. County-level population data for Figure 12 and Table 8 were obtained from census data acquired by the New York State Department of Health. These data differ from the population data sourcing methods used in other portions of this report.



Figure 12. County-level variation in combined crude rate of drowning-related fatalities, hospitalizations, and emergency department visits by New York State county, New York State residents, 2016–2023.*



* This map displays county-level variation in drowning rates (fatal and non-fatal) among New York State residents within each county in the given time period by standard deviation from the county mean. Data are suppressed if underlying count is less than 11. Data as of October 2025 from Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research (International Classification of Diseases, 10th Revision codes V90, V92, and W65–W74) and Statewide Planning and Research Cooperative System (International Classification of Diseases, 10th Revision, Clinical Modification codes V90; V92; W16 with 6th character=1; W16.41; W22.041; and W65–W74).

Table 8. Combined burden (count and rate) of drowning-related fatalities, hospitalizations, and emergency department visits by county, New York State residents, 2016–2023.

County	Number	Crude rate per 100,000 residents
Albany	63	2.57
Allegany	12	3.24*
Bronx	219	1.96
Broome	57	3.72
Cattaraugus	13	2.14*
Cayuga	27	4.47
Chautauqua	39	3.88
Chemung	23	3.49
Chenango	14	3.74*
Clinton	20	3.15
Columbia	17	3.54*
Cortland	13	3.48*
Delaware	11	3.10*
Dutchess	65	2.78
Erie	161	2.18
Essex	17	5.74*
Franklin	19	4.88*
Fulton	17	4.03*
Genesee	17	3.72*
Greene	†	†
Hamilton	0	0.00
Herkimer	22	4.54
Jefferson	38	4.25
Kings	350	1.71
Lewis	†	†
Livingston	15	3.02*
Madison	24	4.35
Monroe	224	3.79
Montgomery	11	2.81*
Nassau	376	3.46
New York	239	1.87
Niagara	51	3.06
Oneida	83	4.57
Onondaga	130	3.54
Ontario	36	4.09
Orange	111	3.59
Orleans	17	5.34*
Oswego	30	3.20
Otsego	†	†
Putnam	25	3.20
Queens	339	1.87
Rensselaer	49	3.88
Richmond	95	2.48
Rockland	97	3.69
St. Lawrence	50	5.82
Saratoga	57	3.09
Schenectady	39	3.16
Schoharie	†	†
Schuyler	†	†
Seneca	11	4.10*
Steuben	41	5.45
Suffolk	582	4.89
Sullivan	27	4.44
Tioga	†	†
Tompkins	22	2.69
Ulster	55	3.86
Warren	33	6.42
Washington	11	2.27*
Wayne	33	4.60
Westchester	196	2.53
Wyoming	12	3.77*
Yates	†	†
New York City‡	1,242	1.87
Rest of state	3,163	3.56
Statewide	4,405	2.84

* Caution: Rates calculated using frequencies of less than 20 are unstable.
† Data based on 10 or fewer drowning incidents are suppressed.
‡ New York City consists of five counties: Bronx, Kings (Brooklyn), New York (Manhattan), Queens, and Richmond (Staten Island).

Key circumstances of drowning

Body of water: fatalities

Differences exist in locations of fatal drowning across different age groups (Table 9). New York State residents aged less than 1 year are most likely to drown while in or after falling into a bathtub (63.3%), while children aged 1–9 years are most likely to drown in a swimming pool (ages 1–4: 54.9%; ages 5–9: 41.3%). The most prevalent location of drowning shifts in the 10–14 year age group. Among those aged 10 years and older the most prevalent location of drowning is in natural water (ages 10–14: 41.7%; ages 15–19: 45.8%; ages 20–24: 47.7%; ages 25–34: 46.1%; ages 35–44: 42.6%; ages 45–54: 40.4%; ages 55–64: 38.6%; ages 65–74: 36.6%; ages 75+: 29.1%). Additional analysis indicates that for those aged 85 years and older, bathtubs become the most prevalent location of drowning (24.1%), followed by swimming pools (23.1%) and natural water (23.1%). Drowning deaths with an unknown body of water or other circumstances (Limited detail: Unknown) ranged from 16.8% to 29.6% across age groups.

Differences were also observed by sex (Table 10). Between 2009–2023, nearly half of fatal drowning deaths among males occurred in natural water (49.9%), while location was unknown for 13.8%. During the same time period, 30.2% of fatal drowning deaths among females occurred in a bathtub, followed by natural water (26.0%), and swimming pools (22.9%); location was unknown for 14.8% female deaths. Differences between sexes are less apparent in drowning-related hospitalizations and emergency department visits compared with drowning fatalities (Tables 11 and 12).

Table 9. Fatal drowning percentages by age group, water source or circumstance, New York State residents, 1999–2023.*

	Unspecified water source	Known water source			Limited detail	
Age group	**Watercraft-related**	**Bathtub**	**Swimming pool**	**Natural water**	**Other specified**	**Unknown**
<1	0.00%	63.3%	†	0.0%	†	†
1–4	†	6.6%	54.9%	16.0%	†	17.9%
5–9	†	†	41.3%	29.4%	†	17.4%
10–14	†	†	28.1%	41.7%	†	20.1%
15–19	5.1%	4.0%	11.1%	45.8%	4.4%	29.6%
20–24	11.4%	4.3%	10.5%	47.7%	4.0%	22.2%
25–34	10.3%	6.5%	12.6%	46.1%	4.4%	20.1%
35–44	12.3%	12.1%	7.6%	42.6%	2.6%	22.9%
45–54	14.3%	11.6%	9.2%	40.4%	2.4%	22.1%
55–64	12.9%	13.1%	11.5%	38.6%	3.7%	20.2%
65–74	9.1%	19.8%	14.0%	36.6%	3.7%	16.8%
75+	5.9%	21.0%	19.9%	29.1%	2.7%	21.3%

* A larger period was reviewed for the analysis of unintentional drowning mortality by water source and circumstance across age groups to allow for less suppression.
† Percentages were suppressed due to low underlying case counts (less than 10).

Table 10. Sex-specific fatal drowning percentages by water source or circumstance, New York State residents, 2009–2023.

	Unspecified water source	Known water source			Limited detail	
Sex	**Watercraft-related**	**Bathtub**	**Swimming pool**	**Natural water**	**Other specified**	**Unknown**
Male	10.5%	7.3%	15.0%	49.9%	3.3%	13.8%
Female	3.7%	30.2%	22.9%	26.0%	2.5%	14.8%

Table 11. Sex-specific percentages of drowning-related hospitalizations by water source or circumstance, New York State residents, 2016–2023.

	Unspecified water source			Known water source			Limited detail	
Sex	**Unspecified effects**	**Watercraft-related**	**After fall, jump, or dive**	**Bathtub**	**Swimming pool**	**Natural water**	**Other specified**	**Unknown**
Male	15.2%	13.2%	17.6%	4.9%	19.0%	8.1%	3.2%	19.0%
Female	15.7%	13.1%	13.1%	9.6%	21.4%	5.2%	*	21.0%

* Female other specified hospitalizations were suppressed due to a low case count (less than 11).

Table 12. Sex-specific percentages of drowning-related emergency department visits by water source or circumstance, New York State residents, 2016–2023.

	Unspecified water source			Known water source			Limited detail	
Sex	**Unspecified effects**	**Watercraft-related**	**After fall, jump, or dive**	**Bathtub**	**Swimming pool**	**Natural water**	**Other specified**	**Unknown**
Male	24.2%	24.5%	15.7%	1.7%	10.8%	4.8%	1.6%	16.8%
Female	25.0%	21.0%	15.9%	3.5%	10.3%	4.6%	*	18.5%

* Female other specified emergency department visits were suppressed due to a low case count (less than 11).

Body of water: hospitalizations and emergency department visits by region

Ranking types of non-fatal drowning by frequency revealed distinct patterns between hospitalizations and emergency department visits (Table 13). Among drowning-related hospitalizations in New York State, pools were the most frequently documented location of the drowning event (19.7%) (data not shown). Among drowning-related emergency department visits in New York State, watercraft-related incidents were the most frequently documented (23.2%) (data not shown). Patterns differed slightly across regions, indicating that drowning that results in a hospitalization or an emergency department visit vary by type of drowning and geographic area.

Table 13. Ranking of the frequency of drowning location and activities of drowning-related hospitalizations and emergency department visits, New York State residents, 2016–2023.

	Region—Hospitalizations			Region—Emergency department visits		
Rank*	**New York State**	**New York City**	**New York State, excluding New York City**	**New York State**	**New York City**	**New York State, excluding New York City**
1	Pool	Unknown	Pool	Watercraft-related	Unknown	Watercraft-related
2	Unknown	Pool	Unknown	Unknown	Watercraft-related	Unknown
3	After fall, jump, or dive (any source)	After fall, jump, or dive (any source)†	After fall, jump, or dive (any source)	After fall, jump, or dive (any source)	After fall, jump, or dive (any source)	After fall, jump, or dive (any source)
4	Watercraft-related	Natural water†	Watercraft-related	Pool	Pool	Pool
5	Natural water	Watercraft-related	Bathtub	Natural water	Natural water	Natural water
6	Bathtub	Bathtub	Natural water	Bathtub	Bathtub	Bathtub
7	Other specified	Other specified	Other specified	Other specified	Other specified	Other specified

* These categories are based on International Classification of Diseases, 10th Revision, Clinical Modification codes. The most common International Classification of Diseases, 10th Revision, Clinical Modification code was for unspecified effects of drowning and nonfatal submersion (T75.1), but this category was excluded from this table for readability. The codes for watercraft (V90 and V92) and the code for jumping or diving into any source of water (W16) do not specify the body of water of drowning. The remainder of the codes specify only the body of water and not the activity at the time of drowning.
† New York City has the same number of drowning-related hospitalizations labeled as having occurred after a fall, jump, or dive (any source) and having occurred in natural water.

Alcohol: hospitalizations and emergency department visits by region

Alcohol intoxication can be documented on a hospitalization or emergency department visit record using International Classification of Diseases, 10th Revision, Clinical Modification codes F10.12, F10.22, and F10.92. These denote alcohol abuse with intoxication, alcohol dependence with intoxication, and unspecified alcohol use with intoxication, respectively. However, these codes do not denote the results of a blood alcohol test of the patient and may therefore underestimate the role of alcohol in drowning hospitalizations and emergency department visits.

- New York State: Of the 361 drowning-related hospitalizations among New York State residents aged 21 years and older, 53 (14.7%) were found to have alcohol intoxication. Of the 901 drowning-related emergency department visits among New York State residents aged 21 years and older, 34 (3.8%) were found to have alcohol intoxication. Underage alcohol intoxication was not found in a reportable number of cases (greater than 10).
- New York City: Of the 119 drowning-related hospitalizations among New York City residents aged 21 years and older, 16 (13.4%) were found to have alcohol intoxication. Of the 253 drowning-related emergency department visits among New York City residents aged 21 years and older, 11 (4.3%) were found to have alcohol intoxication.
- New York State, excluding New York City: Of the 242 drowning-related hospitalizations among New York State residents, excluding New York City, aged 21 years and older, 37 (15.3%) were found to have alcohol intoxication. Of the 648 drowning-related emergency department visits among New York State residents, excluding New York City, aged 21 years and older, 23 (3.5%) drowning-related emergency department visits were found to have alcohol intoxication.

Outcomes of hospitalizations and emergency department visits: fatalities

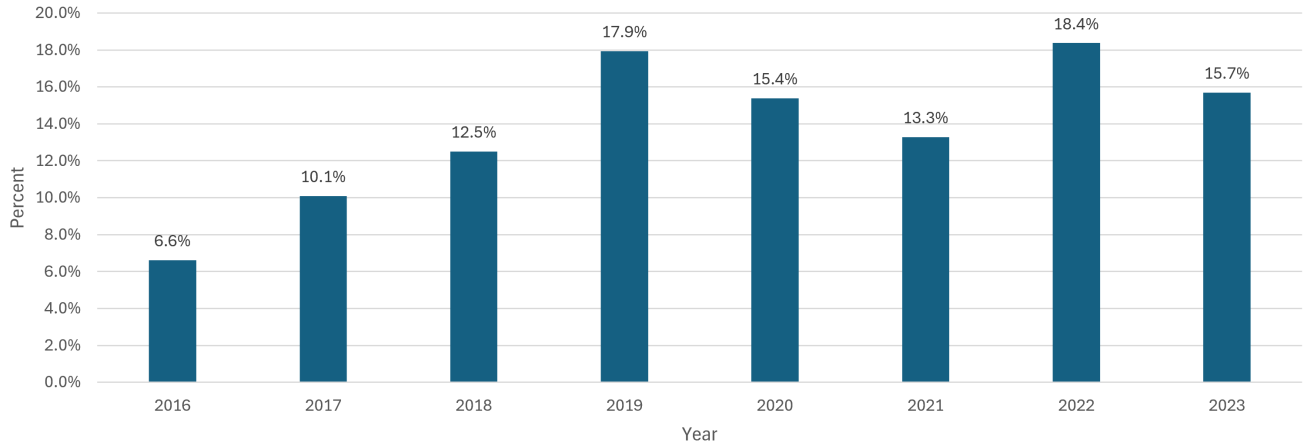
Throughout the bulk of this report, emergency department visits were limited to those that did not result in hospitalization within the same hospital system or death, and hospitalizations were limited to those that did not result in death. However, drowning-related hospitalizations and emergency department visits can result in death. These fatal outcomes can be identified through discharge disposition codes, which indicate that the patient died during the encounter. Of note, these data could fail to capture people who were discharged and subsequently died later. Such cases are not expected to be a significant portion of the records. In this section, emergency department visits and hospitalizations that resulted in known death are examined.

Between 2016–2023, 13.7% of drowning-related hospitalizations among New York State residents resulted in a fatality during the hospitalization. Annual proportions ranged from 6.6% (2016) to 18.4% (2022) over the study period (Figure 13). Following 2016, this proportion generally increased until settling between 12.5% and 18.4% between 2018 and 2023.



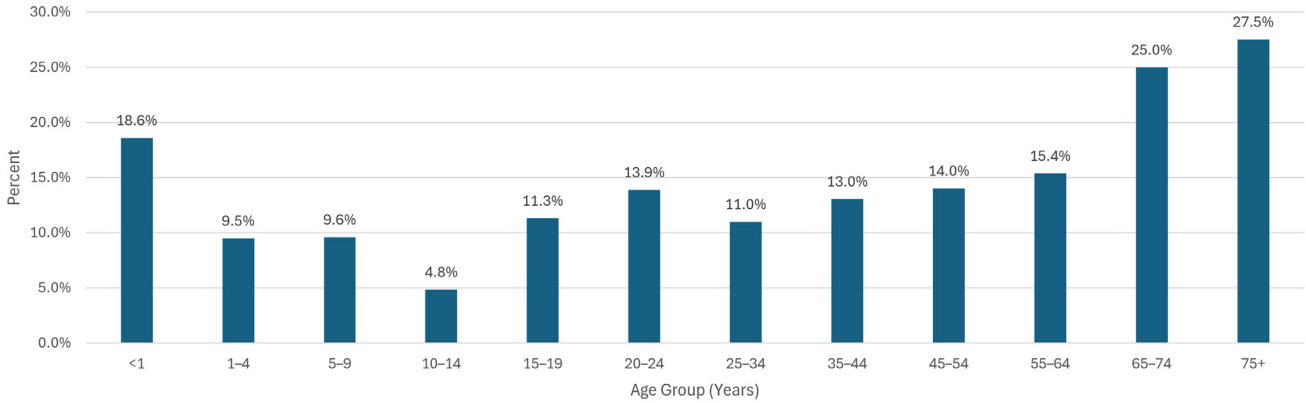
"Stay Cool Harlem" sign at the Sheltering Arms pool, New York City.

Figure 13. Percentages of drowning-related hospitalizations resulting in a fatality during the hospitalization, New York State residents, 2016–2023.



Stratified by age group, the proportion of drowning-related hospitalizations among New York State residents that resulted in a fatality during the hospitalization ranged from 4.8% (aged 10–14 years) to 27.5% (aged 75 years and older) (Figure 14). The highest proportions of drowning-related hospitalizations resulting in a fatality during the hospitalization occurred among New York State residents aged less than 1 year and aged 65 years and older.

Figure 14. Percentages of drowning-related hospitalizations resulting in a fatality during the hospitalization by age group, New York State residents, 2016–2023.





Between 2016–2023, 6.0% of drowning-related emergency department visits among New York State residents resulted in a fatality. Annual proportions ranged from 4.3% (2017) to 8.4% (2022) over the study period (Figure 15).

Stratified by age group, the proportion of drowning-related emergency department visits among New York State residents that resulted in a fatality during the emergency department visit ranged from 2.0% (aged 10–14 years) to 38.8% (aged 75 years and older) (Figure 16). The proportion of drowning-related emergency department visits resulting in death generally increased beginning among adults aged 25–34 years, with a surge in fatal outcomes appearing in adults aged 75 years and older.

Figure 15. Percentages of drowning-related emergency department visits resulting in a fatality during the emergency department visit, New York State residents, 2016–2023.

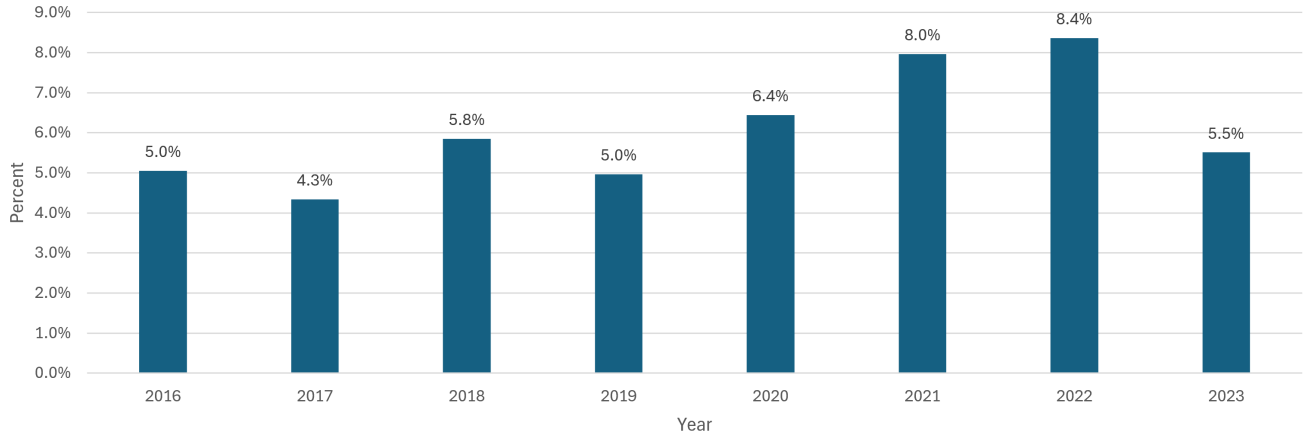
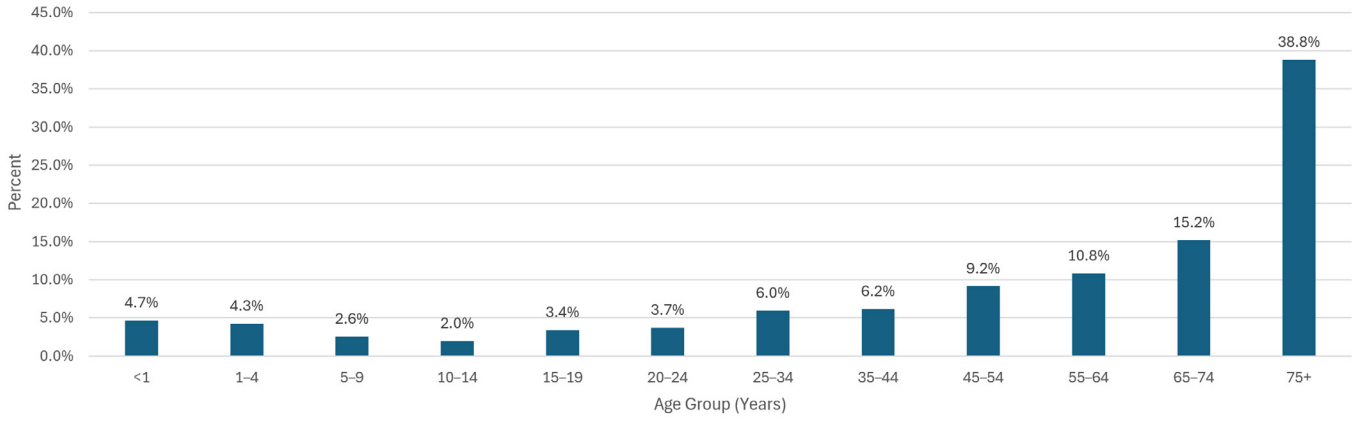


Figure 16. Percentages of drowning-related emergency department visits resulting in a fatality during the emergency department visit by age group, New York State residents, 2016–2023.



Highlights from the Drowning Prevention and Investigation Program (2001–2022)

Select findings from the Drowning Prevention and Investigation Program's investigations can be found below.

Swimming ability and young children

Among those aged 1–9 years where swimming ability was known (n=13), 92.3% had a reported swimming ability of non-swimmer or beginner/poor (Table 14).

Table 14. Swimming ability of children aged 1–9 years who drowned at regulated facilities in New York state, 2001–2022.

Swimming ability	Frequency	Percent*
Non-swimmer	11	61.1%
Beginner/poor	1	5.6%
Swimmer	1	5.6%
Unknown	5	27.8%

* Sum of percentages not equal to 100% due to rounding.

Age of persons who drowned over time

There was an increase in the average age of persons who drowned at regulated bathing facilities across the study period (Figure 17). The average age of persons who drowned at regulated bathing facilities in 2001 was close to 30 years. By 2014 and 2015, the average age had risen to above 50 years. The average age varied from 2016–2022. However, during the same period, the 3-year rolling average age generally held between 40–50 years. This increase in the observed average of age mirrors what is seen for all fatal drowning incidents across New York State. The influence of the variability in the number of fatal drowning incidents from year to year may influence these trends (Figure 18).



Toddler and her grandfather enjoying the river.

Figure 17. Annual and 3-year rolling average age of persons who drowned at regulated bathing facilities in New York State, 2001–2022.

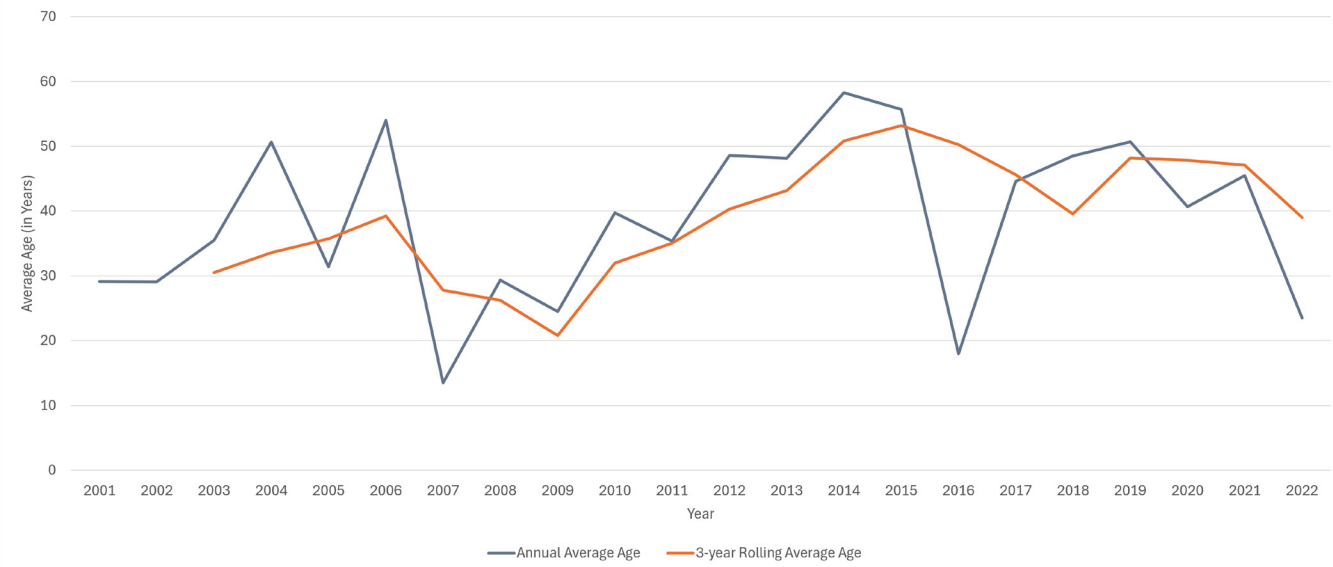
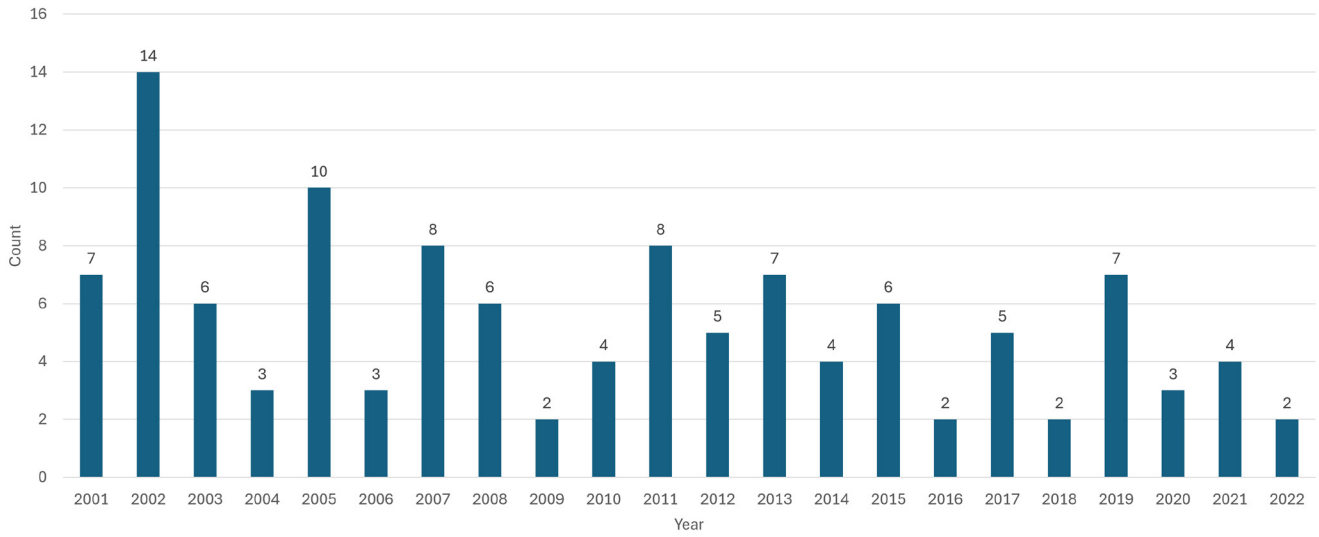


Figure 18. Number of fatal drowning incidents at regulated bathing facilities in New York State, 2001–2022.



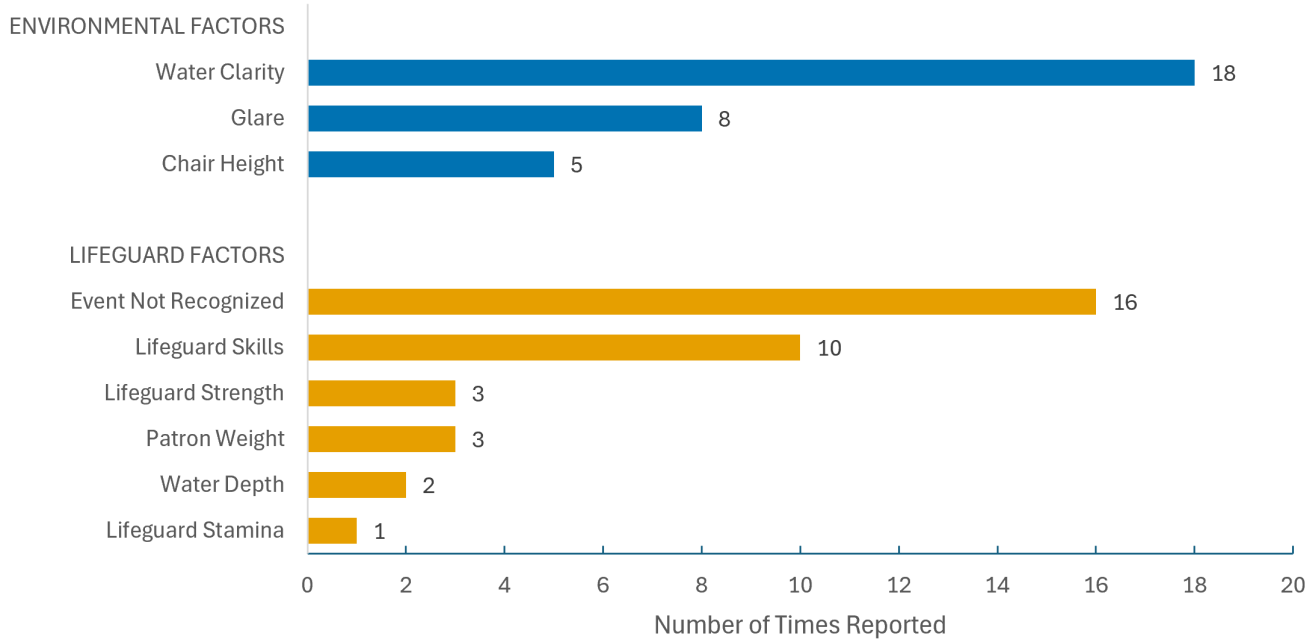
Characteristics of lifeguards: Contributing factors to delayed recognition and response

From 2001–2022, 76 drowning incidents occurred at lifeguarded pools and beaches. Investigation of these incidents included 134 individual lifeguard interviews, as multiple lifeguards may have been present for any particular drowning incident. Forty-three lifeguards (32.1%) reported environmental or lifeguard factors that contributed to a delayed response or recognition of the drowning incident. Of the environmental factors, water clarity was most frequently reported as a contributing factor to delayed response (Figure 19). Of the lifeguard factors, the drowning event not being recognized was most frequently reported as a contributing factor to a delayed response.



Lifeguard stand at Gilgo Beach, New York.

Figure 19. Contributing environmental and lifeguard factors to delayed recognition and response to drowning incidents at regulated bathing facilities in New York State as reported by lifeguards (2001–2022)*†



* Data from the New York State Drowning Prevention and Investigation (at regulated bathing facilities) Program
† Environmental and lifeguard factors are not mutually exclusive.



Lessons and considerations

Lessons and considerations for strengthening drowning data systems

Lesson 1. It is difficult for drowning prevention stakeholders to find drowning data that are timely and enable drowning prevention work.

The Temporary Commission to Prevent Childhood Drowning and the Suffolk County Drowning Prevention Alliance both found it difficult to find data that could guide targeted drowning prevention. Following a rise in drowning in their jurisdiction, the Suffolk County Drowning Prevention Alliance could not find data from the previous or current year as they were either provisional or not available.

Consideration 1. An annual drowning report developed and published in a timely manner by the New York State Department of Health could enable drowning prevention work. This report could mirror the recently mandated annual drowning statistics published by New York City.[36,37]

Lesson 2. There is no centralized repository for medical examiner and coroner reports.

Currently, separate requests must be made to each county's medical examiner or coroner to obtain reports on deaths due to specific causes. Increased accessibility to medical examiner and coroner reports through a centralized database would enable more efficient investigation into all fatalities, not just drowning. Narratives attached to these reports are not stored alongside the line-level death certificate data of the New York State Department of Health.

Consideration 2. The development of a centralized repository for medical examiner and coroner reports would be beneficial for New York State.

Lesson 3. New York City hosts its own databases containing drowning-related data that are separate from the rest of the state.

Currently, data hosted by New York City are inconsistently shared with the New York State Department of Health; Civil Registration and Vital Statistics and emergency medical services data may be shared, while other sources, such as law enforcement and syndromic surveillance, are seldomly shared. The New York State Department of Health must continually maintain a data use agreement to perform analyses of death certificates that include New York City residents. At the time of this report, there was a lapse in coverage of this data use agreement for the New York State Department of Health's Bureau of Occupational Health and Injury Prevention.

Consideration 3. Implementing policies and procedures that more readily enable data use and sharing between New York City and the rest of the state's agencies would better support broader drowning prevention efforts.

Lesson 4. There are more data sources, other than Statewide Planning and Research Cooperative System and mortality data, that provide information on circumstances surrounding drowning in New York State.

Some drowning data sources in New York State were not explored due to difficulty in obtaining access, including data from emergency medical services, trauma centers, and recreational boating reports. These data sources may provide information on circumstances that are not included within Statewide Planning and Research Cooperative System and mortality data. Moreover, emergency

medical services data may provide more timely and comprehensive circumstantial information, which would enable drowning surveillance.

Consideration 4. Future work could focus on developing working relationships with broader partners to enable drowning surveillance and facilitate more analyses of drowning circumstances.

Lessons and considerations for strengthening drowning prevention

Lesson 5. Young children are at higher risk of drowning than other age groups.

Compared with all other age groups, children aged 0–4 years showed elevated rates of drowning-related hospitalizations and emergency department visits. Those aged 0–4 years also had the second highest drowning-related fatality rate. Moreover, when swimming ability was known, more than 90% of deaths among children aged 1–9 years captured by the Drowning Prevention and Investigation Program between 2001–2022 reported a swimming ability of non-swimmer or beginner/poor.

Consideration 5. To address drowning among young children, expanding access to swim and water competency lessons for young children and ensuring consistent adult supervision when children are in or around the water are key.

Lesson 6. Non-Hispanic Black populations are at higher risk of drowning than other racial/ethnic groups.

The non-Hispanic Black population in the counties outside New York City had higher rates of fatal drowning and non-fatal drowning-related hospitalizations than those of other races and ethnicities. Persistent disparities in access to swim instruction, water safety education, and safe aquatic environments are likely factors contributing to these disproportionately elevated drowning rates.

Consideration 6. Targeted outreach to improve access to swim and water competency lessons for non-Hispanic Black populations may help to reduce the disparities between populations.

Lesson 7. Drowning among older adults accounts for an increasing proportion of drowning fatalities as New York State's population ages.

New York State residents aged 55 years and older have increased from 25% to 35% of the population from 1999–2022. Moreover, during this same period, their proportion of drowning in the state increased from 20% to 40%, outpacing the growth of the older adult population.

Consideration 7. Targeted drowning prevention strategies are needed for the older adult population. For example, New York State Drowning Prevention and Investigation Program data also showed an increase of the average age of those who drown at regulated bathing facilities from 2001–2022. These findings need to be further investigated to inform tailored drowning prevention strategies in these settings.



Conclusions

Drowning continues to be a serious public health concern in New York State. Between 2009–2023, available data systems recorded over 7,000 drowning-related deaths, hospitalizations, and emergency department visits. In 2020, drowning-related fatality and hospitalization rates rose sharply, while the drowning-related emergency department visit rate declined. All three rates were relatively stable in the years prior to 2020, and it took several years after 2020 for rates to return closer to pre-2020 levels. These trends illustrate how drowning risk can change in response to shifts in environmental conditions and population-level behavior.

Drowning affects New York State residents across every age, sex, race/ethnicity group, and geographic region. Clear disparities exist that suggest that some populations face higher risk than others, particularly children aged 0–4 years and adults aged 55 years and older. Males contributed to a majority of drowning fatalities. Among females, a higher percentage of drowning fatalities (regardless of if fatal or non-fatal) occurred in bathtubs compared with males. Non-Hispanic Black populations experienced higher drowning rates than other racial and ethnic groups. Some coastal regions, such as Suffolk County, experienced disproportionately high fatal and non-fatal drowning rates. These highlighted disparities provide opportunities for developing and implementing tailored drowning prevention strategies for these groups.

A majority of drowning fatalities among children aged 1–9 years documented at regulated bathing facilities reported the child as a non-swimmer or beginner/poor swimmer, suggesting the need for broader access to swimming and water competency lessons for young children and consistent adult supervision when children are in or around the water. About 1 in 7 drowning-related hospitalizations among those aged 21 years and older noted alcohol intoxication, reinforcing the need to avoid consuming alcohol near sources of water.

Circumstantial information provided by the Drowning Prevention and Investigation Program highlighted how many drowning incidents at regulated facilities occur despite supervision being present. Lifeguards report most frequently that water clarity and a glare on the surface of the water contributed to the inability to recognize a drowning incident at the time of occurrence. In follow-up interviews, some lifeguards reported their skills, strength, and stamina influenced their ability to perform a successful rescue. Other less frequently listed factors were the water depth and the weight of the patron they were attempting to rescue.

New York State's wide range of drowning data allowed for descriptions of the drowning burden and circumstances across the state. However, these data are siloed across a multitude of data systems (e.g., Civil Registration and Vital Statistics death certificates, Statewide Planning and Research Cooperative System, Drowning Prevention and Investigation Program database, Recreational Boating dataset), are hosted by separate entities, provide varying levels of patient and circumstantial data, and are not readily accessible to stakeholders seeking to use data to guide their drowning prevention work. Moreover, the lack of centralized repositories for medical examiner and coroner reports, law enforcement reports, or other similar data delays timeliness in investigations and surveillance.

Despite these challenges, staff that work with drowning data are still able to conduct meaningful analyses, investigations, and prevention activities—as seen by New York State having one of the lowest drowning rates in the United States. These same staff have described how more data (e.g., syndromic surveillance, Child Death Review, lifesaving/drowning prevention organization, maritime/boating safety, media reports) could enable a better understanding of drowning in New York State. Any new data would ideally include more variables than what are currently available in existing drowning datasets.

New York State has a great foundation of past, present, and ongoing initiatives and legislation focused on drowning prevention. The Drowning Prevention and Investigation Program has existed for decades and continues to perform impactful work. Together, the New York Statewide Investment in More Swimming program and complimentary legislation solidify a further expansion of New York State's efforts in addressing drowning. The New York Statewide Investment in More Swimming program expands physical access to pools, aquatic infrastructure, and swim instruction. Separate legislative measures strengthen statewide education and prevention efforts by requiring hospitals to provide new parents with a state-approved drowning risk video, authorizing the New York State Department of Health to conduct drowning prevention education and outreach programs, and requiring school districts to distribute water safety information to families beginning in the 2026–2027 school year. If the current efforts are combined with updates to data workflows, use agreements, collaboration, and sharing, a comprehensive push across all stakeholders could take place that maximizes the efforts of all interested parties.

Future work should expand upon the data sources and analyses included in this report. Emergency medical services and Recreational Boating Reports are examples of additional data sources that may provide more detailed—and in the case of emergency medical services data, more timely—circumstance information not included within the Statewide Planning and Research Cooperative System and mortality data. Findings from this report warrant additional investigation. For example, New York State exhibited a higher proportion of intentional drowning deaths compared with the United States overall. Finally, the Drowning Prevention and Investigation Program has a plethora of additional variables that could be analyzed to provide insights into drowning beyond what was examined in this report.



Beach at Coney Island.

References

1. National Oceanic and Atmospheric Administration, Office for Coastal Management. *Shoreline Mileage of the United States* [Internet]. Silver Spring (MD): NOAA Office for Coastal Management; [cited 2025 Oct 15]. Available from: https://coast.noaa.gov/data/docs/states/shorelines.pdf
2. U.S. Geological Survey. *New York and Landsat* (ver. 1.1, January 2023): U.S. Geological Survey Fact Sheet 2021–3020 [Internet]. Reston (VA): U.S. Geological Survey; 2021 [cited 2025 Oct 15]. Available from: https://pubs.usgs.gov/publication/fs20213020. doi:10.3133/fs20213020
3. U.S. Census Bureau. *County population totals and components of change: 2020–2024* [Internet]. Washington (DC): U.S. Census Bureau; [cited 2025 Oct 15]. Available from: https://www2.census.gov/programs-surveys/popest/datasets/2020-2024/counties/totals/
4. New York State Department of Health. *Drowning statistics* [Internet]. Albany (NY): New York State Department of Health; [cited 2025 Oct 15]. Available from: https://www.health.ny.gov/environmental/outdoors/swimming/drowning_statistics.htm
5. New York State Department of Environmental Conservation. *Camping* [Internet]. Albany (NY): New York State Department of Environmental Conservation; [cited 2025 Oct 15]. Available from: https://dec.ny.gov/things-to-do/camping
6. New York State Office of Parks, Recreation and Historic Preservation. *State parks* [Internet]. Albany (NY): NYS Office of Parks, Recreation and Historic Preservation; [cited 2025 Oct 15]. Available from: https://parks.ny.gov/parks/
7. New York State Senate. *An Act to create a temporary "commission to prevent childhood drowning" (S 7129, 2021-2022 legislative session)* [Internet]. Albany (NY): New York State Senate; 2021 [cited 2025 Oct 15]. Available from: https://www.nysenate.gov/legislation/bills/2021/S7129
8. New York State. *Temporary Commission to Prevent Childhood Drowning* [Internet]. New York: The State of New York; [cited 2026 Feb 1]. Available from: https://www.ny.gov/programs/temporary-commission-prevent-childhood-drowning
9. NY State Senate. *Senate Bill S3608A (2023) — Amendment A*. [Internet]. Albany (NY): New York State Senate; [cited 2025 Oct 15]. Available from: https://www.nysenate.gov/legislation/bills/2023/S3608/amendment/A
10. New York State Assembly. *Bill A10889 (2003) summary*. New York State Assembly [Internet]. [cited 2025 Oct 15]. Available from: https://www.assembly.ny.gov/leg/?Summary=Y&bn=A10889&default_fld=&leg_video=&term=2003
11. New York State Senate. *Senate Bill S5815 — Amendment A*. [Internet]. Albany (NY): New York State Senate; [cited 2025 Oct 16]. Available from: https://www.nysenate.gov/legislation/bills/2023/S5815/amendment/A
12. New York State Senate. *Senate Bill S1349C – 2025-2026 Legislative Session*. [Internet]. Albany (NY): New York State Senate; [cited 2026 Feb 1]. Available from: https://www.nysenate.gov/legislation/bills/2025/S1349/amendment/C
13. New York State Department of Health. *Drowning prevention and water safety for children and teens* [Internet]. Albany (NY): New York State Department of Health; 2026 May [cited 2026 Jun 1]. Available from: https://www.health.ny.gov/prevention/injury_prevention/drowning prevention.htm
14. New York State Department of Health. *Safe and healthy swimming* [Internet]. Albany (NY): New York State Department of Health; 2026 May [cited 2026 Jun 1]. Available from: https://www.health.ny.gov/prevention/environmental/outdoors/swimming/
15. Office of the Governor of New York. *Governor Hochul Unveils Fourth Proposal of 2024 State of the State: 'NY SWIMS' — the New York Statewide Investment in More Swimming* [Internet]. Albany (NY): Office of the Governor; 2024 Jan 5 [cited 2025 Oct 16]. Available from: https://www.governor.ny.gov/news/governor-hochul-unveils-fourth-proposal-2024-state-state-ny-swims-new-york-statewide

16. Browne ML, Lewis-Michl EL, Stark AD. *Unintentional drownings among New York State residents, 1988-1994*. Public Health Rep. 2003 Sep-Oct;118(5):448-458. doi: 10.1093/phr/118.5.448. PMID: 12941857. PMCID: PMC1497570
17. Browne ML, Lewis Michl EL, Stark AD. *Watercraft related drownings among New York State residents, 1988-1994*. Public Health Rep. 2003 Sep Oct;118(5):459 463. doi: 10.1093/phr/118.5.459
18. New York State Department of Health. *Historical Drowning Data New York State Bathing Facility Fatal Drowning Statistics 1987-2024* [Internet]. Albany (NY): New York State Department of Health; [cited 2026 Jun 1]. Available from: https://www.health.ny.gov/environmental/outdoors/swimming/docs/drowning_statistics.pdf
19. New York State Office of Parks, Recreation and Historic Preservation. *2024 recreational boating report* [Internet]. Albany (NY): New York State Office of Parks, Recreation and Historic Preservation; 2025 [cited 2026 Jun 1]. Available from: https://parks.ny.gov/sites/default/files/RecreationalBoatingReport2024.pdf
20. New York State Department of Health. *Vital Statistics of New York State* [Internet]. Albany (NY): NY State DOH; [cited 2025 Oct 15]. Available from: https://www.health.ny.gov/statistics/vital_statistics/Vital Statistics of New York State
21. Centers for Disease Control and Prevention, National Center for Health Statistics. *Multiple Cause of Death, 1999–2023 on CDC WONDER Online Database* [Internet]. Atlanta (GA): CDC; 2025 [cited 2025 Oct 15]. Available from: https://wonder.cdc.gov/mcd.html
22. New York State Senate. *Bill S875 (2017) – An Act to amend the county law, in relation to requiring coroner and coroner's deputy training; original amendment*. [Internet]. [cited 2025 Oct 15]. Available from: https://www.nysenate.gov/legislation/bills/2017/S875/amendment/original
23. New York State Department of Health. *Statewide Planning and Research Cooperative System (SPARCS)* [Internet]. Albany (NY): NY State DOH; [cited 2025 Oct 15]. Available from: https://www.health.ny.gov/statistics/sparcs/
24. New York State Department of Health, Bureau of Emergency Medical Services. *Policy Statement 12-03: Electronic PCR Data Submission* [Internet]. Albany (NY): New York State Department of Health; 2012 Jan 23 [cited 2026 Jun 1]. Available from: https://www.health.ny.gov/professionals/ems/pdf/12-03.pdf
25. New York State Office of Parks, Recreation and Historic Preservation. *Boating* [Internet]. Albany (NY): NYS Office of Parks, Recreation and Historic Preservation; [cited 2026 Jun 1]. Available from: https://parks.ny.gov/activities/boating
26. New York State Department of Health. *Electronic Syndromic Surveillance System (ESSS)* [Internet]. Albany (NY): New York State Department of Health; [cited 2026 Jun 1]. Available from: https://www.health.ny.gov/professionals/reportable_diseases/esss/
27. New York City Department of Health and Mental Hygiene. *EpiQuery: Disease Reporting* [Internet]. New York (NY): New York City Department of Health and Mental Hygiene; [cited 2026 Jun 1]. Available from: https://a816-health.nyc.gov/hdi/epiquery/disease-reporting/
28. New York State Department of Health. *10 NYCRR § 6-12 Definitions* [Internet]. Albany (NY): New York State Department of Health; [cited 2025 Oct 15]. Available from: https://regs.health.ny.gov/content/section-6-12-definitions
29. New York State Department of Health. *10 NYCRR § 6-22 Definitions* [Internet]. Albany (NY): New York State Department of Health; [cited 2025 Oct 15]. Available from: https://regs.health.ny.gov/content/section-6-22-definitions
30. New York State Department of Health. *10 NYCRR § 6-32 Definitions* [Internet]. Albany (NY): New York State Department of Health; [cited 2026 Sep 2]. Available from: https://regs.health.ny.gov/content/section-6-32-definitions
31. New York State Department of Health. *Drowning Statistics* [Internet]. Albany (NY): New York State Department of Health; [cited 2025 Oct 15]. Available from: https://www.health.ny.gov/environmental/outdoors/swimming/drowning_statistics.htm

32. Thomas KE, Johnson RL. *State Injury Indicators: Instructions for Preparing 2022 Data*. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2024
33. Anderson RN, Rosenberg HM. *Age Standardization of Death Rates: Implementation of the Year 2000 Standard*. National vital statistics reports; vol 47 no 3. Hyattsville, Maryland: National Center for Health Statistics,1998
34. World Health Organization. *Drowning: key facts* [Internet]. Geneva: World Health Organization; 2024 [cited 2025 Oct 15]. Available from: https://www.who.int/news-room/fact-sheets/detail/
35. Centers for Disease Control and Prevention. *WISQARS ("Web-based Injury Statistics Query and Reporting System") Fatal Injury Reports, United States, 2018-2023* [Internet]. Atlanta (GA): CDC; [cited 2025 Oct 15] Available from: https://wisqars.cdc.gov/
36. New York City. *Local Law No. 159 of 2023. A local Law to amend the administrative code of the city of New York, in relation to a report by the department of health and mental hygiene on drowning deaths that occur in the city* [Internet]. New York (NY): New York City Council; 2023 [cited 2026 Jun 1]. Available from: https://legistar.council.nyc.gov/View.ashx?GUID=0761ABB0-1245-4DD9-97B5-7B716476C452&ID=12547046&M=F
37. New York City Department of Health and Mental Hygiene. *Annual Report on Drowning Deaths in New York City* [Internet]. New York (NY): New York City Department of Health and Mental Hygiene; 2024 [cited 2026 Jun 1]. Available from: https://a860-gpp.nyc.gov/concern/nyc_government_publications/pg15bj49x?locale=en

New York State Drowning Prevention Report

CDC Foundation