CDPH
California Department of Public Health

Injury Data Brief

California Drowning Trends Between 2016-2023

California's warm climate and numerous beaches, lakes, pools, rivers and other waterways provide ample opportunities for fun in the water. However, with exposure to water comes the risk of drowning. Each year, more Californians fatally drown than residents of any other state in the nation.[1] This report describes drowning incidents in California from 2016 to 2023, quantifying the burden of drowning in the state and highlighting at-risk populations.

Drowning Incidents Included in This Report

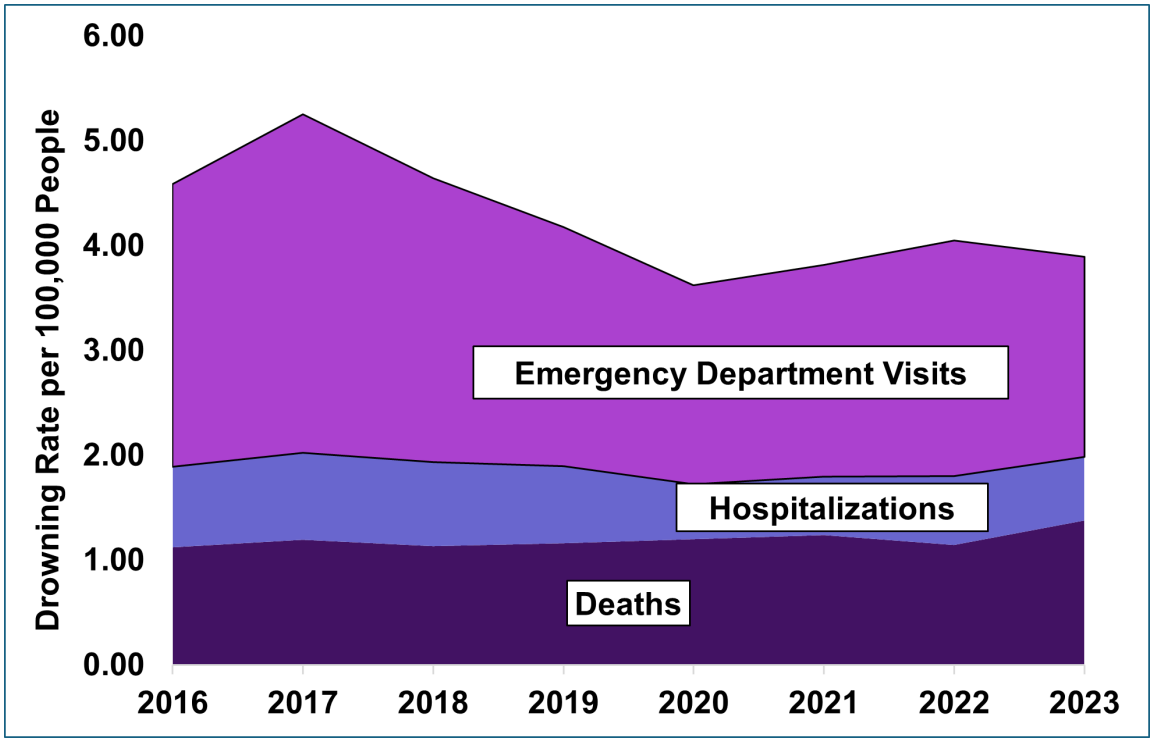
This report focuses on unintentional fatal and non-fatal drowning incidents using standard injury surveillance data and case definitions[2]. Fatal drowning incidents were identified from death certificate data and include California residents where unintentional drowning was listed as the underlying cause of death. There were 3,631 fatal unintentional drowning cases in California over the eight-year period from 2016 to 2023. However, this figure excludes 350 fatal drowning incidents that occurred in California among non-state residents; 814 fatal drowning cases that were either a suicide, homicide, or undetermined intent; and 347 cases where drowning was listed as a contributing cause of death but not the underlying cause of death. Of the 3,631 cases included in this report, 300 (8.3%) involved a California resident who drowned out of state.

Unintentional non-fatal drowning incidents were identified from Emergency Department (ED) encounter and hospital patient discharge records from state-licensed facilities. Cases that result in hospitalization are usually more severe than an ED visit. Patients initially treated at the ED then hospitalized at the same facility only appear as a hospitalization record. Cases were included if unintentional drowning was listed as a diagnosis or external cause of injury anywhere in the hospital or ED record. During the eight-year period from 2016 to 2023, there were 7,477 ED visits and 2,160 hospitalizations for unintentional drowning. Drowning incidents treated at the scene by first responders or lifeguards that were not transported to an ED or hospital, are not included in these figures.

Statewide Fatal and Nonfatal Drowning Between 2016-2023

- For every fatal drowning incident in California there are three nonfatal drowning incidents [3].
- Between 2022 and 2023, nonfatal drowning rates decreased while the rate of fatal drowning increased.

Figure 1: Combined Unintentional Fatal and Nonfatal Drowning Rate (Per 100,000 People) Among CA Residents, 2016-2023

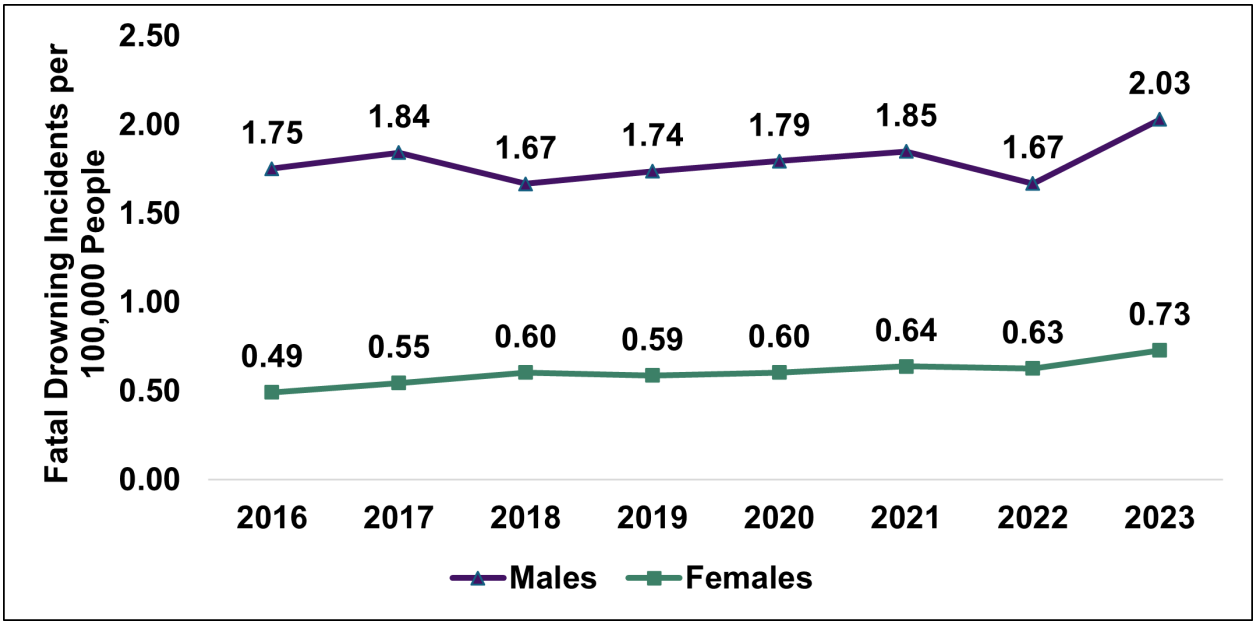


Statewide Fatal Drowning Between 2016-2023 by Demographics

Sex

- The fatal drowning rate is greater for males than it is for females (Figure 2) (Appendix Table 2).
- The fatal drowning rate increased sharply in 2023 for males and just slightly for females.
- 2023 had the highest fatal drowning rate for males and females over the eight-year period.

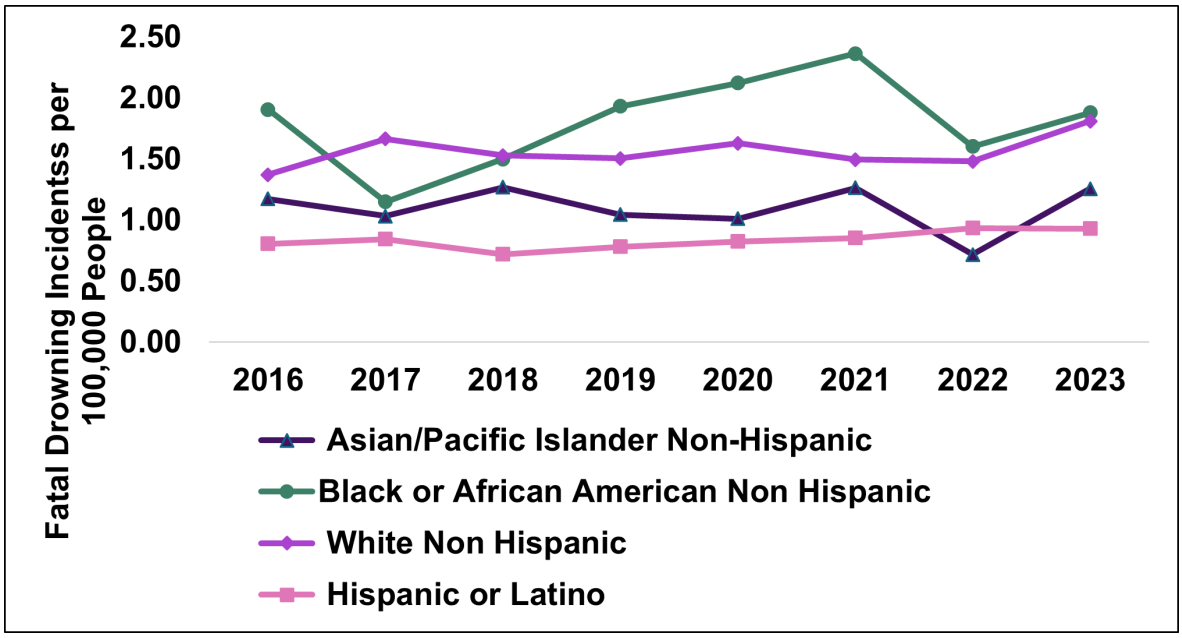
Figure 2: Unintentional Fatal Drowning Rate by Sex, 2016-2023



Race/Ethnicity

- Hispanic and Latino California residents have had the lowest drowning rate over the 8-year period, apart from 2022, where Asian/Pacific Islander Non-Hispanic residents had the lowest fatal drowning rate (Figure 3) (Appendix Table 3).
- Conversely, Black Non-Hispanic residents have had the highest rate of drowning over the eight-year period, apart from 2017, where White Non-Hispanic residents had the highest rate of fatal drowning. In 2023 and 2018, both groups had similar rates of fatal drowning incidents.
- All groups, apart from Hispanic residents, have seen an increase in fatal drowning incidents from 2022 to 2023.

Figure 3: Unintentional Fatal Drowning Rate by Race and Ethnicity, 2016-2023



American Indian/Alaskan Native were excluded from the above figure due to low yearly counts. Using the total counts available between 2016-2023, the rate of fatal drowning over an 8-year period for American Indian/Alaskan Native is 2.26 deaths per 100,000 people. This is the highest rate compared to the other four groups with Black Non-Hispanic having the second highest rate at 1.79 deaths per 100,000 people, followed by White Non-Hispanic at 1.55 deaths per 100,000 people, then Asian/Pacific Islander Non-Hispanic at 1.09 deaths per 100,000 people, and lastly Hispanic/Latino at 0.89 deaths per 100,000 people.

Age

- Fatal drowning occurred at higher rates for residents that were between 1-4 years of age and then decreased later in childhood. Rates begin to increase again once children reach adulthood (Figure 4) (Appendix Table 1).
- Conversely, the rate of nonfatal drowning was the highest for the youngest residents and then decreased over a resident's lifetime (Figure 5) (Appendix Table 1).

Figure 4: Unintentional Fatal Drowning Rates by Age Categories, 2016-2023

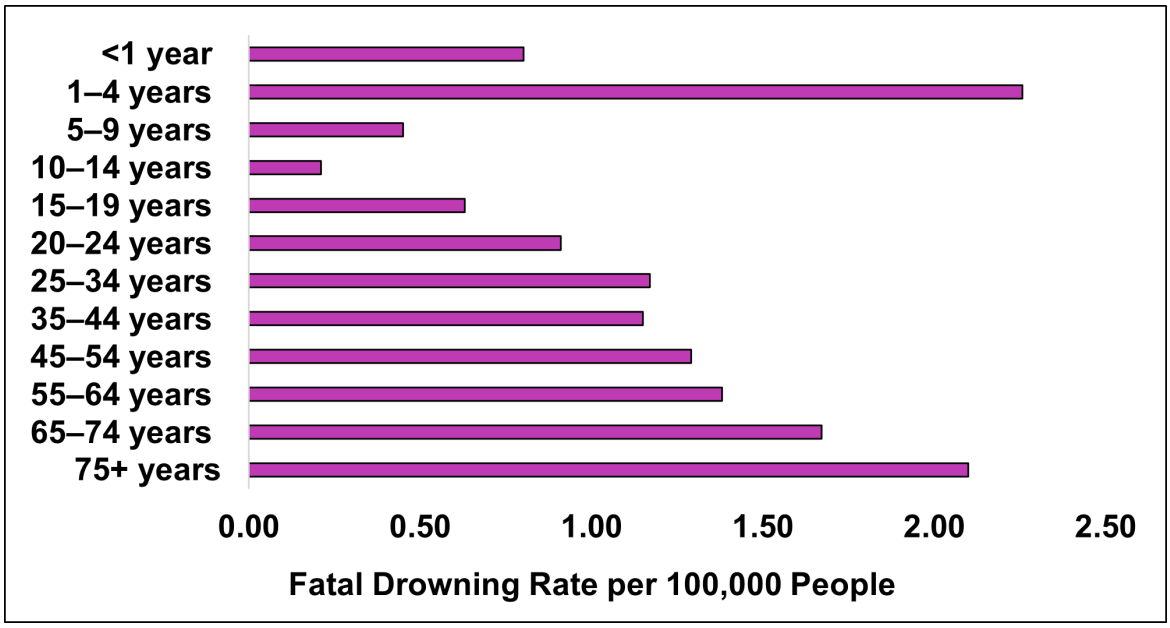
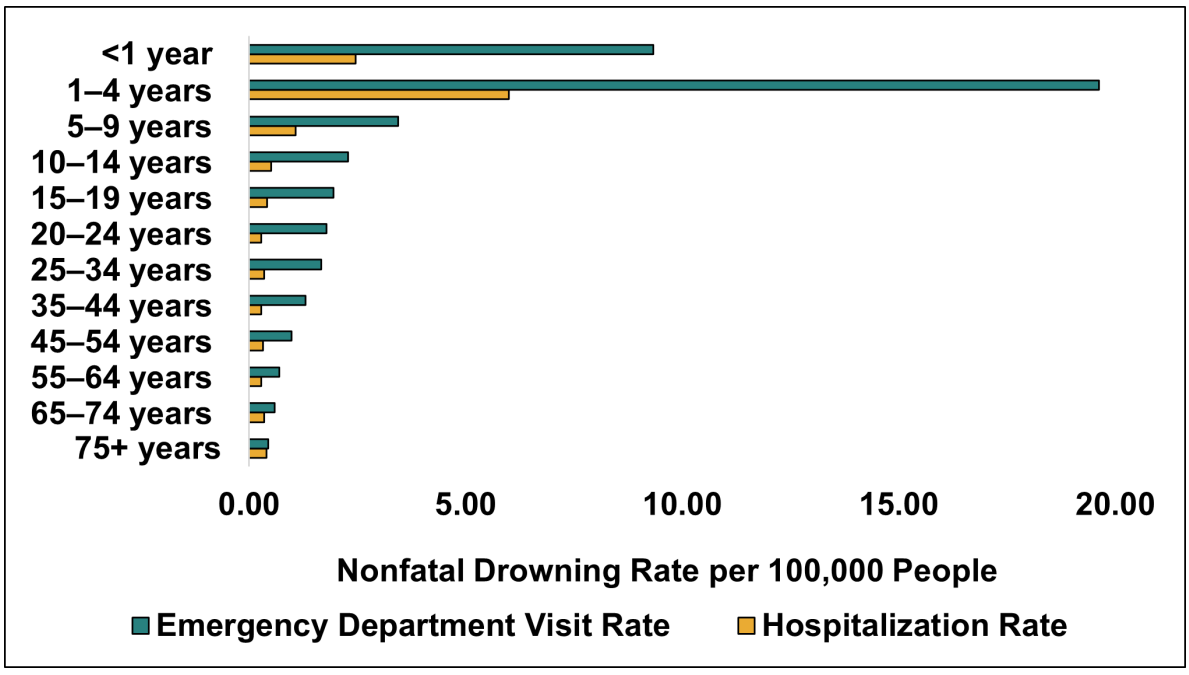


Figure 5: Unintentional Nonfatal Drowning Rates by Age Categories, 2016-2023



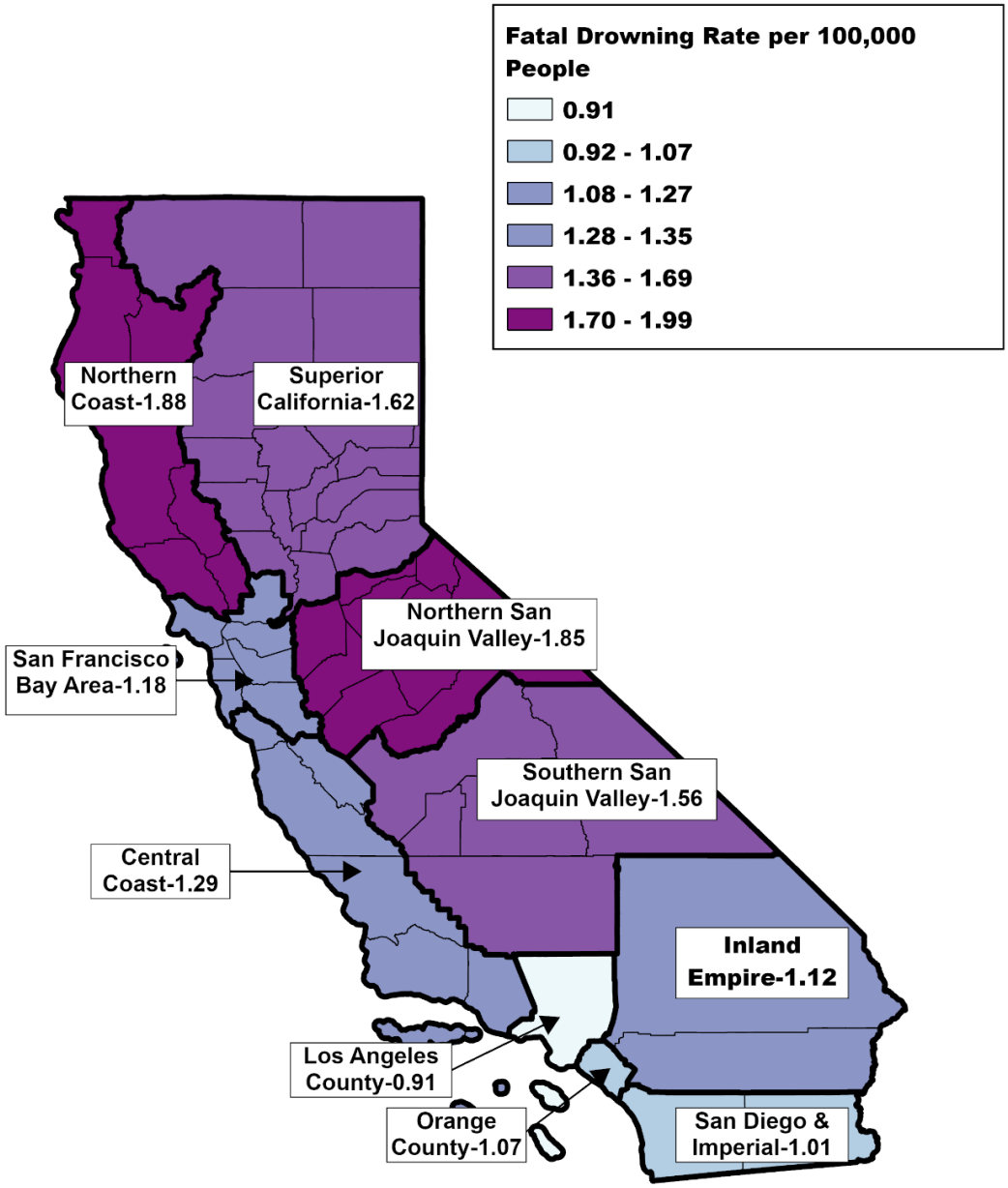
California Census Region of Residence

- Fatal drowning rates by residence in California census regions[4] reached the highest level in Superior California, The Northern Coast, Inland Empire, and Orange County Regions in 2023.
- Overall, unintentional fatal drowning rates were highest for the Northern Coast, Northern San Joaquin Valley, and Superior California regions between 2016-2023 (Figure 6) (Appendix Table 4).

Age by Location of Drowning

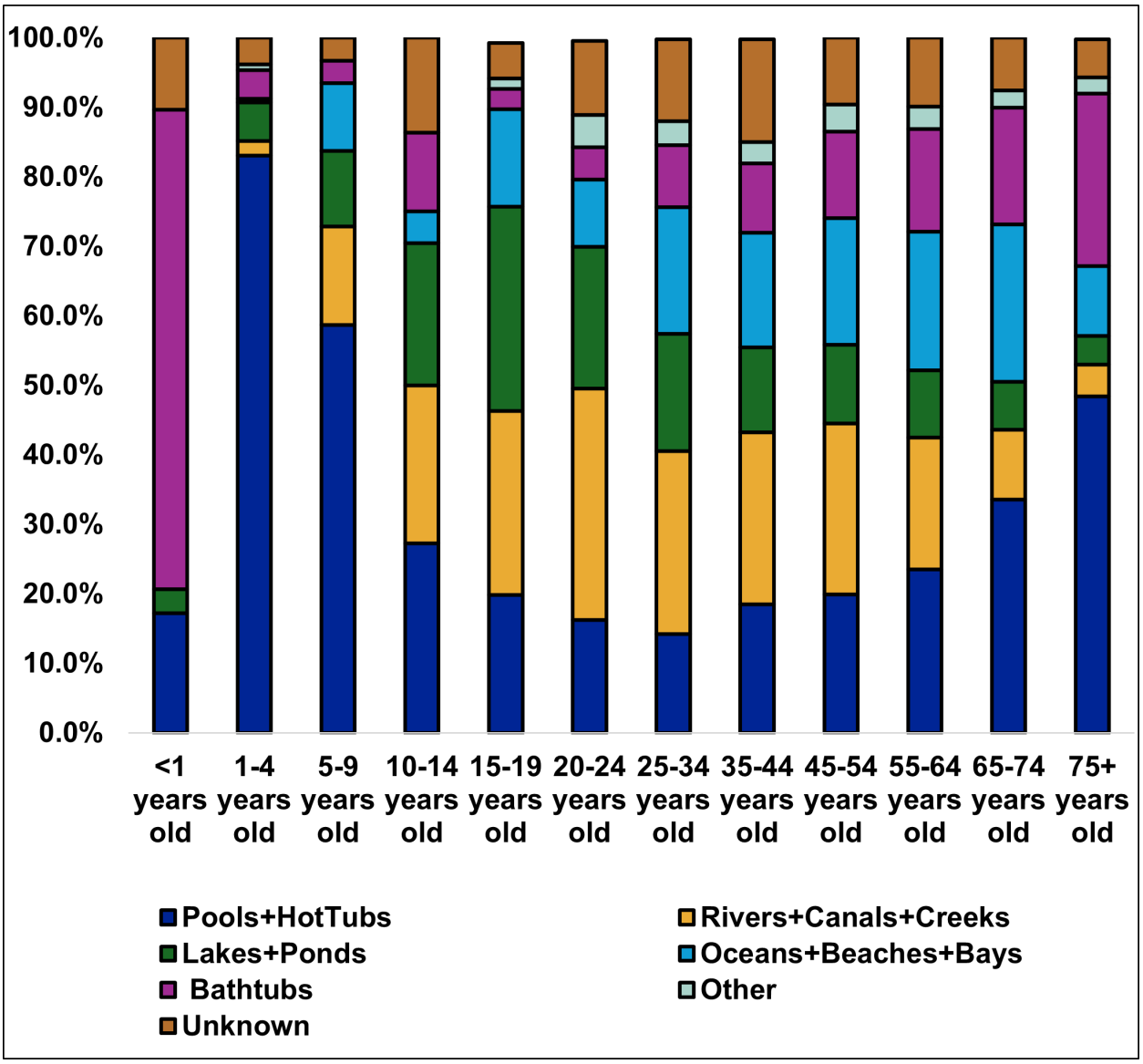
- For infants less than a year old the most common fatal drowning location is bathtubs while children between 1-4 and 5-9 years old are most likely to drown in swimming pools or hot tubs (Figure 7) (Appendix Table 5).
- As children grow into adulthood the percentage of natural water fatal drowning incidents in places such as lakes, rivers, and oceans increase.
- Around mid-adulthood the percentage of fatal drowning incidents taking place in swimming pools and bathtubs increase with age.

Figure 6: Unintentional Fatal Drowning Rates (Deaths per 100,000 People) by California Census Region of Residence, 2016-2023



Data Source: California Comprehensive Master Death File 2016-2023

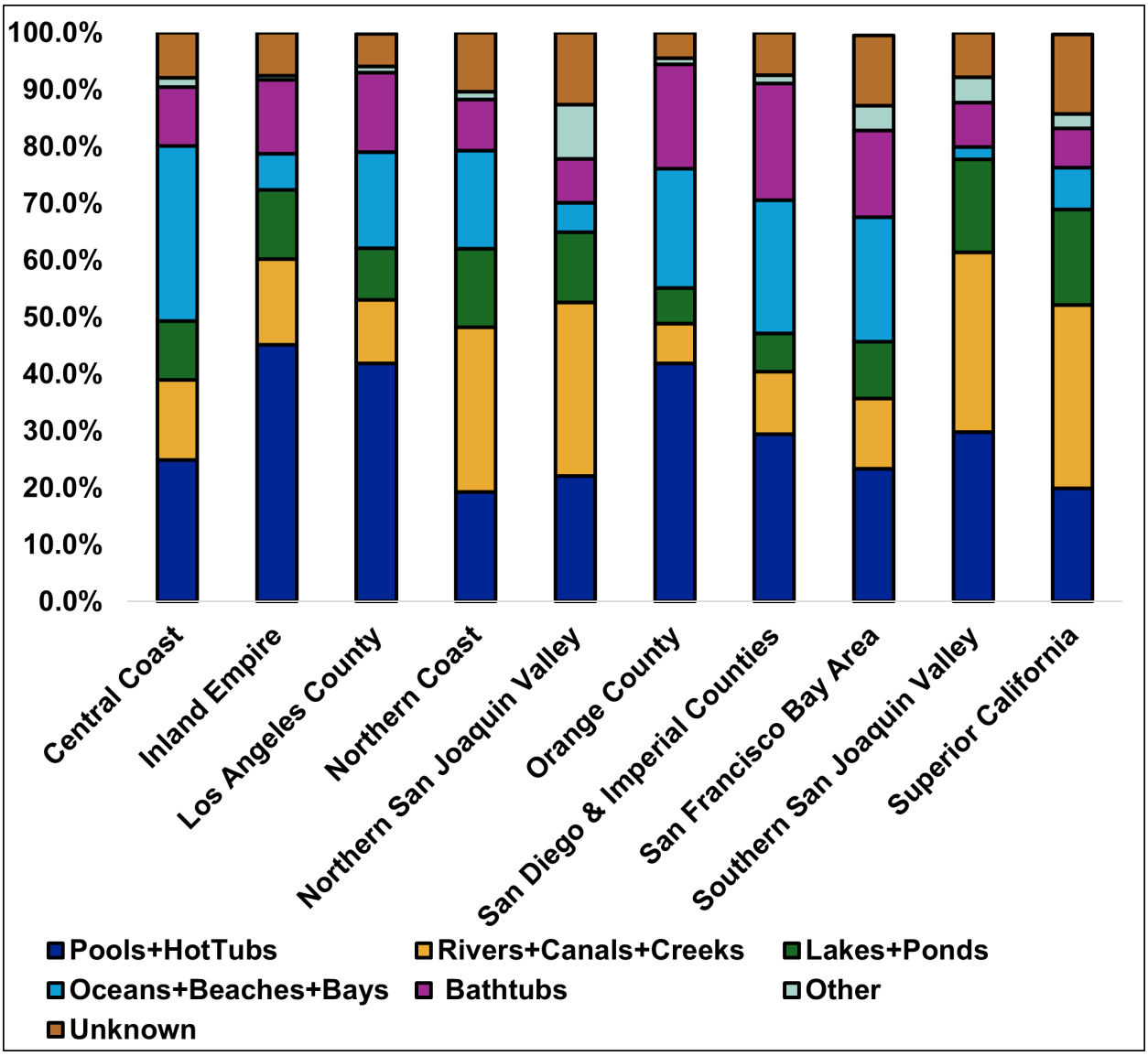
Figure 7: Percent of Unintentional Fatal Drowning Incidents by Age Categories and Drowning Location, 2016-2023



California Census Region of Residence by Location of Drowning

- Location of drowning also varies by region, with Southern California regions having a higher percentage of swimming pool drowning incidents and Coastal regions having a higher percentage of ocean drowning incidents (Figure 8) (Appendix Table 6).
- The percentage of bathtub drowning incidents tends to be high in regions with greater population densities.

Figure 8: Percent of Unintentional Fatal Drowning Incidents by California Census Region of Residence and Drowning Location, 2016-2023



Drowning Prevention Resources

- The Injury and Violence Prevention Branch at the California Department of Public Health (CDPH) has a drowning prevention resource webpage that provides information on water and pool safety.
- The U.S. National Water Safety Action Plan is a national framework that can be used to help prevent drowning. This includes guidelines for pool barriers, enhancing water safety, advocating for life jacket use, teaching CPR, and developing national drowning surveillance to help make data informed decisions.
- The Childhood Drowning Data Collection Pilot Program is a California state program that will help improve collection of drowning data and create a childhood water safety action plan.

Data Limitations

- Emergency Department Visits and Hospitalization data do not contain the location of the nonfatal drowning. For fatal drowning incidents many locations are unknown due to the lack of specificity of information found in the death certificates of certain residents.
- Data on California Census Regions is by location of residence and does not reflect where the Census Region the drowning incidents occurred.
- Per Assembly Bill (AB) 1726, The Accounting of Health and Education in Asian and Pacific Islander (API) Demographics Act, CDPH is mandated to expand the number of API groups for which information is collected and reported. Data for detailed API groups are not presented in this brief because detailed race/ethnicity data only became available for death data starting in 2023. See the CDPH Asian and Pacific Islander Data Disaggregation page for more details.
- California law requires that individuals completing death certificates accurately record a decedent's sex to reflect the decedent's gender identity ("Respect After Death Act" AB 1577, 2014). In 2021, the law was expanded to provide a nonbinary option for gender identity on California death certificates (AB 439, 2021). The California Department of Health Care Access and Information Patient Discharge Data and ED data used in this analysis reports only the biological sex of the patient, so it was not possible to explore nonfatal drowning variation based on gender identity. Due to small cell sizes and data de-identification guidelines the nonbinary category is suppressed.

Technical Notes

[1] Data obtained from the Web Based Injury Statistics Query and Reporting System (WISQARS); https://wisqars.cdc.gov/.

[2] California Department of Public Health Injury and Violence Prevention Branch-EpiCenter California Injury Data Online; https://skylab4.cdph.ca.gov/epicenter/_w_993eca5d/?Home-welcome.

[3] Emergency Department Visit and Hospitalization data collected by the California Department of Health Care Access and information (HCAI). https://hcai.ca.gov/data/request-data/data-documentation/

[4] Click Here for Information on California Census Regions. Regions are classified by County with the following 10 divisions: (Superior California: Butte, Colusa, El Dorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Siskiyou, Sutter, Tehama, Yolo, Yuba), (Northern Coast: Del Norte, Humboldt, Lake, Mendocino, Napa, Sonoma, Trinity), (San Francisco Bay Area: Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, Solano), (Northern San Joaquin Valley: Alpine, Amador, Calaveras, Madera, Mariposa, Merced, Mono, San Joaquin, Stanislaus, Tuolumne), (Central Coast: Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz, Ventura), (Southern San Joaquin Valley: Fresno, Inyo, Kern, Kings, Tulare), (Inland Empire: Riverside, San Bernardino), (Los Angeles County), (Orange County), (San Diego and Imperial Counties).

Drowning incidents were classified using the following ICD-10 codes found in multiple causes of death codes in death certificates and injury codes for emergency department visits and hospitalization data: (unintentional: V90, V92, W64-W74), (intentional suicide: X71), (intentional homicide: X92), (undetermined: Y21).

Appendix

Appendix Table 1: Fatal and Nonfatal Drowning Incidents and Rate per 100,000 People by Year, 2016-2023

Fatal and Nonfatal Drowning Incidents by Age Groups 2016-2023	Deaths (Rate)	Emergency Department Visits (Rate)	Hospitalizations (Rate)
<1 year	29 (0.80)	338 (9.33)	89 (2.46)
1–4 years	343 (2.26)	2982 (19.63)	912 (6.00)
5–9 years	92 (0.45)	700 (3.44)	218 (1.07)
10–14 years	44 (0.21)	475 (2.28)	107 (0.51)
15–19 years	136 (0.63)	422 (1.95)	91 (0.42)
20–24 years	216 (0.91)	424 (1.79)	66 (0.28)
25–34 years	493 (1.17)	700 (1.66)	146 (0.35)
35–44 years	460 (1.15)	523 (1.30)	111 (0.28)
45–54 years	512 (1.29)	386 (0.97)	129 (0.33)
55–64 years	527 (1.38)	265 (0.69)	109 (0.28)
65–74 years	477 (1.67)	169 (0.59)	98 (0.34)
75+ years	438 (2.10)	93 (0.45)	84 (0.40)

Appendix Table 2: Fatal Drowning Incidents and Rate per 100,000 People by Sex and Year

Sex	2016	2017	2018	2019	2020	2021	2022	2023
Male (Rate)	343 (1.75)	363 (1.84)	330 (1.67)	345 (1.74)	353 (1.79)	361 (1.85)	324 (1.67)	394 (2.03)
Female (Rate)	97 (0.49)	108 (0.55)	120 (0.60)	117 (0.59)	120 (0.60)	126 (0.64)	123 (0.63)	143 (0.73)

Appendix Table 3: Fatal Drowning Incidents and Rate per 100,000 People by Race and Ethnicity by Year

Race and Ethnicity	2016	2017	2018	2019	2020	2021	2022	2023
Asian/ Pacific Islander Non-Hispanic (Rate)	62 (1.17)	55 (1.03)	68 (1.27)	56 (1.04)	63 (1.01)	78 (1.26)	44 (0.72)	77 (1.26)
Black or African American Non-Hispanic (Rate)	43 (1.91)	26 (1.15)	34 (1.50)	44 (1.93)	47 (2.12)	52 (2.36)	35 (1.60)	41 (1.88)
White Non-Hispanic (Rate)	209 (1.37)	254 (1.66)	233 (1.53)	229 (1.53)	227 (1.63)	207 (1.50)	204 (1.48)	249 (1.81)
Hispanic or Latino (Rate)	123 (0.81)	130 (0.84)	112 (0.72)	122 (0.78)	130 (0.82)	134 (0.85)	146 (0.94)	145 (0.93)

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Appendix Table 4: Fatal Drowning Incidents and Rate per 100,000 People by California Census Region of Residence

California Census Regions	2016	2017	2018	2019	2020	2021	2022	2023
Superior California (Rate)	51 (1.61)	49 (1.53)	49 (1.52)	58 (1.79)	61 (1.85)	46 (1.40)	41 (1.25)	67 (2.04)
Northern Coast (Rate)	21 (2.16)	18 (1.85)	12 (1.24)	17 (1.77)	21 (2.18)	14 (1.46)	17 (1.79)	25 (2.64)
San Francisco Bay Area (Rate)	92 (1.30)	84 (1.18)	73 (1.02)	76 (1.06)	77 (1.08)	96 (1.37)	74 (1.07)	91 (1.32)
Northern San Joaquin Valley (Rate)	31 (1.66)	42 (2.22)	33 (1.73)	34 (1.76)	35 (1.80)	44 (2.26)	29 (1.49)	37 (1.89)
Central Coast (Rate)	26 (1.11)	38 (1.62)	30 (1.28)	30 (1.28)	31 (1.32)	21 (0.90)	30 (1.29)	35 (1.51)
Southern San Joaquin Valley (Rate)	45 (1.80)	48 (1.90)	29 (1.13)	45 (1.75)	35 (1.37)	32 (1.25)	45 (1.75)	40 (1.55)
Inland Empire (Rate)	38 (0.85)	45 (0.99)	47 (1.03)	52 (1.13)	55 (1.19)	56 (1.21)	51 (1.10)	66 (1.42)
Los Angeles County (Rate)	77 (0.76)	86 (0.84)	83 (0.81)	83 (0.81)	98 (0.98)	101 (1.03)	102 (1.04)	96 (0.98)
Orange County (Rate)	32 (1.01)	31 (0.97)	39 (1.22)	32 (1.00)	25 (0.78)	37 (1.17)	33 (1.05)	43 (1.37)

California Census Regions	2016	2017	2018	2019	2020	2021	2022	2023
San Diego & Imperial Counties (Rate)	27 (0.78)	30 (0.86)	54 (1.53)	35 (0.99)	35 (1.01)	39 (1.13)	25 (0.72)	37 (1.07)

Appendix Table 5: Drowning Deaths and Percents by Age Groups and Drowning Location, 2016-2023

Age Groups	Pools + Hot Tubs	Rivers + Canals + Creeks	Lakes+ Ponds	Oceans + Beaches + Bays	Bathtub	Other	Unknown
<1 year (%)	5 (17%)	0 (0%)	1 (3%)	0 (0%)	20 (69%)	0 (0%)	3 (10%)
1–4 years (%)	285 (83%)	7 (2%)	19 (6%)	2 (1%)	14 (4%)	3 (1%)	13 (4%)
5–9 years (%)	54 (59%)	13 (14%)	10 (11%)	9 (10%)	3 (3%)	0 (0%)	3 (3%)
10–14 years (%)	12 (27%)	10 (23%)	9 (20%)	2 (5%)	5 (11%)	0 (0%)	6 (14%)
15–19 years (%)	27 (20%)	36 (26%)	40 (29%)	19 (14%)	4 (3%)	2 (1%)	7 (5%)
20–24 years (%)	35 (16%)	72 (33%)	44 (20%)	21 (10%)	10 (5%)	10 (5%)	23 (11%)
25–34 years (%)	70 (14%)	130 (26%)	83 (17%)	90 (18%)	44 (9%)	17 (3%)	58 (12%)
35–44 years (%)	85 (18%)	114 (25%)	56 (12%)	76 (17%)	46 (10%)	14 (3%)	68 (15%)
45–54 years (%)	102 (20%)	126 (25%)	58 (11%)	93 (18%)	64 (13%)	20 (4%)	49 (10%)
55–64 years (%)	124 (24%)	100 (19%)	51 (10%)	105 (20%)	78 (15%)	17 (3%)	52 (10%)
65–74 years (%)	160 (34%)	48 (10%)	33 (7%)	108 (23%)	80 (17%)	12 (3%)	36 (8%)
75+ years (%)	212 (48%)	20 (5%)	18 (4%)	44 (10%)	109 (25%)	10 (2%)	24 (5%)

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Appendix Table 6: Drowning Deaths and Percents by California Census Region of Residence and Drowning Location, 2016-2023

California Census Regions	Pools + Hot Tubs	Rivers + Canals + Creeks	Lakes + Ponds	Oceans + Beaches + Bays	Bathtubs	Other	Unknown
Superior California (%)	84 (20%)	136 (32%)	71 (17%)	31 (7%)	29 (7%)	11 (3%)	59 (14%)
Northern Coast (%)	28 (19%)	42 (29%)	20 (14%)	25 (17%)	13 (9%)	2 (1%)	15 (10%)
San Francisco Bay Area (%)	155 (23%)	82 (12%)	66 (10%)	145 (22%)	101 (15%)	29 (4%)	82 (12%)
Northern San Joaquin Valley (%)	63 (22%)	87 (31%)	35 (12%)	15 (5%)	22 (8%)	27 (9%)	36 (13%)
Central Coast (%)	60 (25%)	34 (14%)	25 (10%)	74 (31%)	25 (10%)	4 (2%)	19 (8%)
Southern San Joaquin Valley (%)	95 (30%)	101 (32%)	52 (16%)	7 (2%)	25 (8%)	14 (4%)	25 (8%)
Inland Empire (%)	185 (45%)	62 (15%)	50 (12%)	26 (6%)	53 (13%)	3 (1%)	31 (8%)
Los Angeles County (%)	304 (42%)	81 (11%)	66 (9%)	123 (17%)	101 (14%)	8 (1%)	42 (6%)
Orange County (%)	114 (42%)	19 (7%)	17 (6%)	57 (21%)	50 (18%)	3 (1%)	12 (4%)
San Diego & Imperial Counties (%)	83 (29%)	31 (11%)	19 (7%)	66 (23%)	58 (21%)	4 (1%)	21 (7%)