Immersion Incidents & Drowning Deaths

In Orange County (2011-2013)

Based on Emergency Department,

Hospitalization & Death Records

Orange County Health Care Agency
Health Policy – Research & Planning
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Background

Drowning is one of the top five causes of unintentional injury death across all age groups in Orange County.[1] Each year over 100 immersion incidents involve children and adults who are injured seriously enough to require medical care in an emergency department, while roughly 35 die. Between 2011 and 2013, 105 Orange County (OC) residents drowned – including 15 children and 90 adults. As part of a 2001 Orange County Grand Jury recommendation, the OC Fire Authority and OC Health Care Agency were asked to track and report immersion-related incidents and drowning deaths to children in the county.[2] A previous report using 2005-2007 data, examined immersion-related incidents only involving children between the ages of 0 and 17 years.[3] In the present report, data for all ages were included to highlight the ongoing risk to not only children, but also to younger and older adults in order to help reduce and prevent immersion-related incidents and deaths in Orange County.

Overview

This report utilizes data from emergency department visits and hospitalizations, to provide a comprehensive overview of immersion-related incidents among Orange County residents, and the impact these events have on the community. The report examines both the demographic and geographic characteristics, as well as the mechanism of injury for incidents over a three-year period (2011-2013). Similarly, this report will examine the characteristics of immersion-related deaths among Orange County residents.

Data for this report were obtained from the Office of Statewide Planning and Development (OSHPD), which collects patient-level data from all health care facilities in California. The 2011-2013 Emergency Department (ED) and Patient Discharge (PD) datasets for Orange County residents were used for this report. Incidents that resulted in a drowning death were captured in the Orange County statistical master death file for the same time period. Whenever incidence rates were determined, 2012 population estimates were acquired from the California Department of Finance: Population Projections. Overall, in the three-year period, there were 309 immersion-related incidents that required medical attention at an ED. Of these cases, 113 (37%) required further hospitalization. The first section of the report covers ED trends, followed by hospitalization trends, and concluding with immersion-related deaths.

Emergency Department Visits

These statistics include all emergency department (ED) records, as well as hospitalization (PD) records where the patient was admitted to the same hospital. This was done because the ED records for patients who are admitted are converted into PD records, upon being transferred. Therefore, to get the comprehensive picture of immersion-related incidents and drowning deaths among Orange County residents, it was necessary to identify those PD cases that originated from the same hospital's ED.

Both the ED and PD datasets utilize the *International Classification of Diseases* (ICD-9 CM). The following codes were used to categorize the various types of immersion-related incidents (**Table 1**).

Table 1: ICD-9 CM Code Interpretation

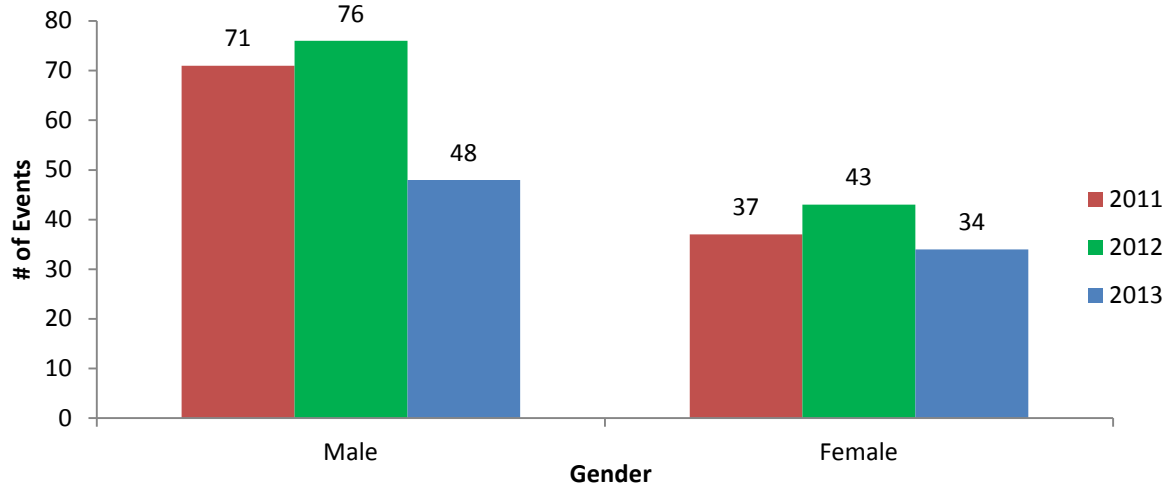
Code	Base Description: Accidental Drowning & Submersion
E910	Accidental drowning and submersion (immersion, swimmer's cramp)
Other	
E910.0	Accident while Waterskiing
Natural Body of Water	
E910.1	Accident while Scuba Diving/Skin Diving
E910.2	Accident while Swimming (recreational, fishing, surfing, playing in water, ice skating)
E910.3	Accident while Swimming/Diving (non-recreational, marine salvage, rescue of another person)
Bath Tub	
E910.4	Accident in Bathtub
Pool	
E910.8	Other Accidents: including swimming pools & quenching tanks
Unspecified	
E910.9	Unspecified Immersion-Related Circumstances (accidental fall into the water NOS or Drowning NOS)

Demographics of ED Patients

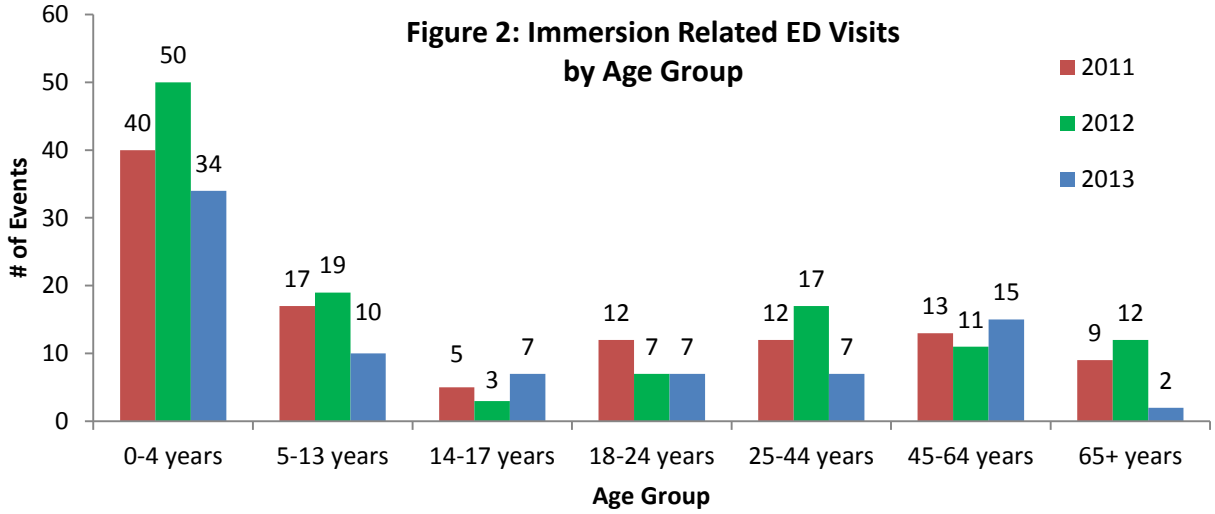
Over the three-year period, there was an annual average of 103 immersion-related ED visits and an average of ten deaths in the ED per year. Approximately 10% of all immersion-related ED cases resulted in death while being treated in the ED.

Gender: Similar to what is reported at the state level, among the 309 immersion-related incidents that resulted in an ED visit, the majority were males (63%; *n* = 195) and the remaining 37% (*n* = 114) were females (**Figure 1**).

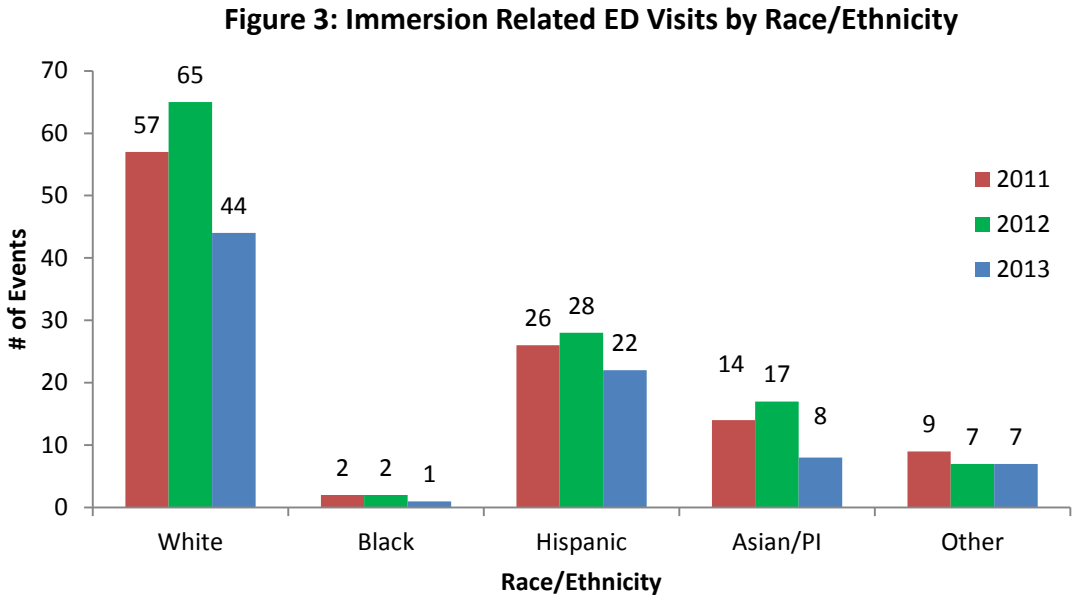
Figure 1: Immersion Related ED Visits by Gender



Age: The majority of all ED visits (60%, *n* = 185) occurred among minors under 18 years of age. More specifically, the groups with the greatest number of immersion-related visits to the ED included children under age five (*n* = 124, 40%), followed by children ages 5-13 (*n* = 46, 15%; **Figure 2**).



Race/Ethnicity: Whites accounted for 54% (*n* = 166) of all immersion-related ED visits between 2011 and 2013. Hispanics made up the second highest group, with 25% (*n* = 76). Asians & Pacific Islanders were the third highest group, with 13% (*n* = 39). African Americans (*n* = 5) and other/unknown (*n* = 23) together made up the remaining 9% of all immersion-related cases that resulted in an ED visit (**Figure 3**).



Residence: **Table 2** on the following page summarizes the number and crude rate of immersion-related incidents, by the victim's city of residence. More than half of all Orange County cities were above the county-wide rate of 3.3 per 100,000. The cities with the highest rate of incidents that resulted in an ED visit were Villa Park, Laguna Woods, Los Alamitos, and San Juan Capistrano. Because of the relatively small population and the small number of cases in some of these cities, their respective rates should be interpreted with caution. A map depicting the geographic distribution of immersion incident rates can be found on page 17 of this report.

Table 2: Immersion Related ED Visits by City of Residence (2011-2013)

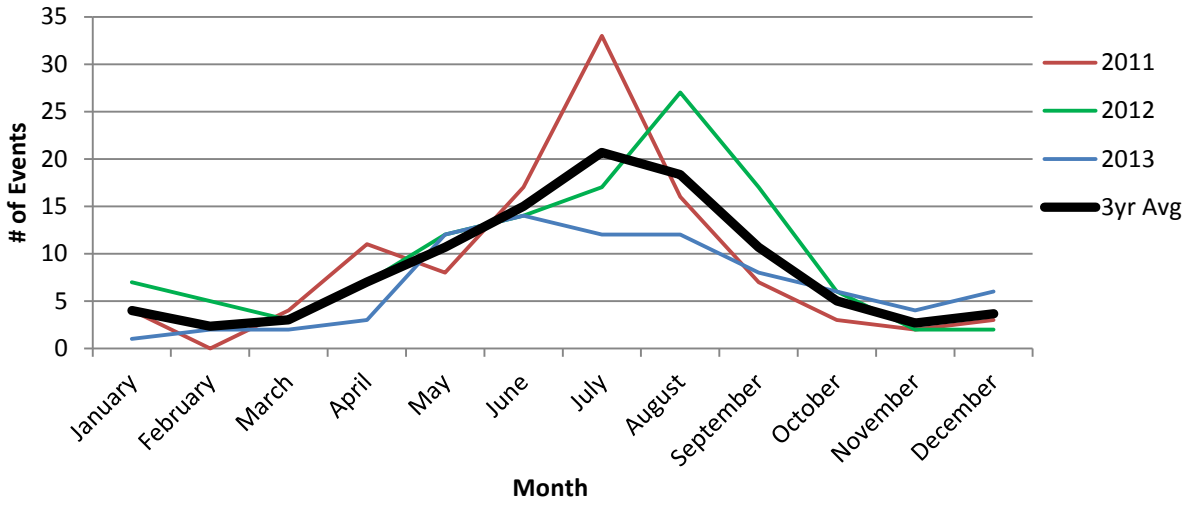
Residence	Year			Total	Population[1]	3yr Avg. Rate per 100,000
	2011	2012	2013			
Aliso Viejo	2	3	2	**7**	49,533	4.7
Anaheim	8	11	8	**27**	346,553	2.6
Brea	0	1	1	**2**	41,341	1.6
Buena Park	0	4	1	**5**	82,035	2.0
Costa Mesa	1	2	3	**6**	111,482	1.8
Cypress	0	2	0	**2**	48,602	1.4
Dana Point	1	1	1	**3**	33,902	2.9
Fountain Valley	2	1	3	**6**	56,244	3.6
Fullerton	7	1	1	**9**	138,466	2.2
Garden Grove	7	4	3	**14**	173,182	2.7
Huntington Beach	10	6	4	**20**	193,836	3.4
Irvine	9	10	4	**23**	231,363	3.3
La Habra	2	0	2	**4**	61,255	2.2
La Palma	0	0	0	**0**	15,836	0.0
Laguna Beach	1	1	1	**3**	23,131	4.3
Laguna Hills	0	2	0	**2**	30,737	2.2
Laguna Niguel	2	5	3	**10**	64,138	5.2
Laguna Woods	2	3	0	**5**	16,519	10.1
Lake Forest	1	1	4	**6**	78,723	2.5
Los Alamitos	0	1	1	**2**	11,639	5.7
Mission Viejo	6	6	4	**16**	94,799	5.6
Newport Beach	1	6	2	**9**	86,534	3.5
Orange	3	0	4	**7**	138,913	1.7
Placentia	2	0	1	**3**	51,900	1.9
Rancho Santa Margarita	2	1	2	**5**	48,606	3.4
San Clemente	3	4	2	**9**	64,615	4.6
San Juan Capistrano	2	2	2	**6**	35,361	5.7
Santa Ana	15	11	9	**35**	330,407	3.5
Seal Beach	1	1	0	**2**	24,514	2.7
Stanton	2	2	2	**6**	38,808	5.2
Tustin	4	5	3	**12**	78,071	5.1
Unincorporated/Unknown	4	5	5	**14**	120,533	3.9
Villa Park	3	4	1	**8**	5,907	45.1*
Westminster	4	5	3	**12**	91,272	4.4
Yorba Linda	1	8	0	**9**	66,512	4.5
Orange County	**108**	**119**	**82**	**309**	**3,085,269**	**3.3**

[1]California Department of Finance Population Estimates (Jan 1, 2013)

*Cities with small populations (below 10,000) can have unstable/unreliable rates

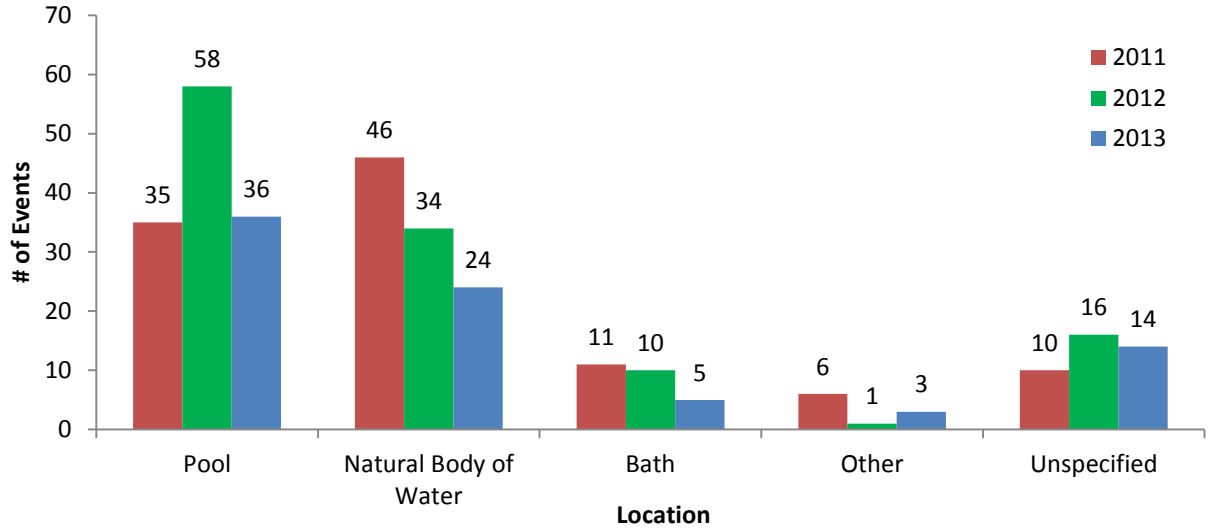
Month of Encounter: **Figure 4** summarizes the month of the year the immersion-related incident occurred. Between 2011 and 2013, half (52%) of all immersion-related ED visits occurred during the summer months of June, July, and August (*n* = 168). Additionally, two out of every five incidents occurred during the weekend.

Figure 4: Immersion Related ED Visits by Month of Admission



Location of Immersion-Related Incidents: Overall, the single most common location for immersion-related incidents was residential or commercial pools (42%, *n* = 129; **Figure 5**). An additional 34% (*n* = 104) of all incidents occurred in a natural body of water, such as a lake or the ocean. Immersion-related incidents in bath tubs accounted for 8% (*n* = 26) of all cases, while the remaining 13% (*n* = 40) of incidents occurred in other, undetermined, or unidentified locations.

Figure 5: Immersion Related ED Visits by Incident Location



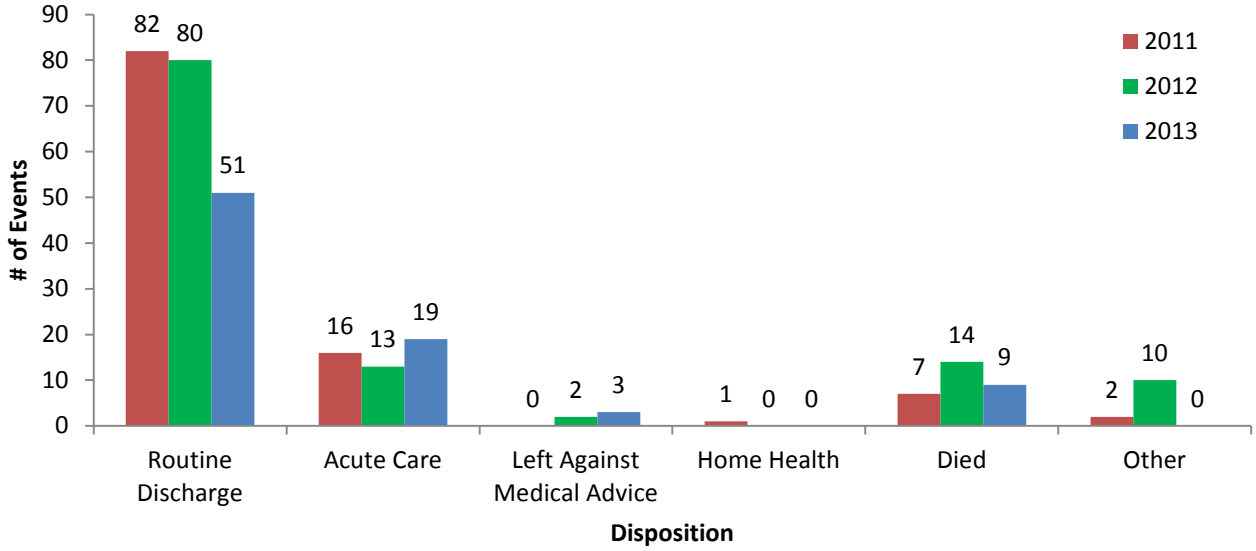
As shown in **Table 3**, the majority of immersion-related incidents for children under age five took place in swimming pools or spas (*n* = 70, 57%), followed by bath tubs (*n* = 21, 17%), and natural bodies of water (*n* = 20, 16%). For children 5-13 years of age, most incidents took place in either natural bodies of water (*n* = 20, 44%) or pools (*n* = 18, 39%). With the exception of 25-44 year olds, most immersion-related incidents for age-groups 14 years and older occurred in natural bodies of water such as the ocean or a lake.

Table 3: Immersion Related ED Visits: Incident Location Type by Age Group

Age Group	Incident Location (2011-2013)					Total
	Pool	Natural Body of Water	Bath	Other	Unspecified	
0-4 years	70	20	21	0	13	**124**
5-13 years	18	20	1	2	5	**46**
14-17 years	2	10	0	2	1	**15**
18-24 years	8	14	0	3	1	**26**
25-44 years	17	11	0	2	6	**36**
45-64 years	10	18	3	1	6	**38**
65+ years	4	11	1	0	8	**24**
Total	**129**	**104**	**26**	**10**	**40**	**309**

Patient Disposition: Among all immersion-related incidents, 10% (*n* = 30) resulted in the death of the patient in the ED, for an average of ten drowning deaths per year between 2011 and 2013 (**Figure 6**). The remaining 90% of these events were considered non-fatal drowning injuries, with 69% (*n* = 213) of these patients being discharged to their homes. Additionally, more than one in seven patients were admitted or transferred to an acute care facility (*n* = 48; 16%).

Figure 6: Immersion Related ED Visits by Patient Disposition



As summarized in **Table 4**, persons under 14 years of age accounted for the majority of the immersion-related ED visits (*n* = 170, 55%). Among these children, 66% (*n* = 112) were discharged home, 22% (*n* = 37) were transferred to another acute care facility, and 3.5% (*n* = 6) expired in the ED (**Table 4**). Four out of five individuals 14 years of age and older were either discharged home (*n* = 101, 73%) or transferred to another acute care facility (*n* = 8, 6%). While those over 14 years of age accounted for less than one half of all cases (*n* = 139; 45%), this group accounted for the majority all of the immersion-related deaths (*n* = 24, 80%), compared to six deaths reported for those under the age of 14 years.

Table 4: Immersion Related ED Visits: Disposition of Patient by Age Group

Age Group	Disposition of Patient						Total
	Routine Discharge	Acute Care Facility	Left Against Medical Advice	Home Health Service	Died	Other	
0-4 years	73	35	2	0	5	9	**124**
5-13 years	39	5	0	0	1	1	**46**
14-17 years	14	1	0	0	0	0	**15**
18-24 years	22	0	0	1	3	0	**26**
25-44 years	29	1	2	0	3	1	**36**
45-64 years	28	4	1	0	6	0	**39**
65+ years	8	2	0	0	12	1	**23**
Total	**213**	**48**	**5**	**1**	**30**	**12**	**309**

The majority of victims (58%) had private insurance, 32% had government insurance (e.g., Medi-Cal or Medicare), and ten percent were uninsured.

Emergency Department Incident Rates: The three-year rate for immersion-related ED visits among Orange County residents was 3.3 per 100,000 population as summarized in **Table 5**.

The three-year average mortality (i.e. drowning) rate for immersion-related ED visits was 0.3 per 100,000, compared to an incident rate of 3.0 for non-fatal drowning injuries (**Table 5**). The age-specific incident rate for children 0-4 years of age was 21.6 of this population, which was more than five times higher than any other age group. The immersion-related incident rate for males was 3.9, compared to that of females at 2.3. Whites had a rate of 4.2 per 100,000, followed by Hispanics (2.4), and Asian/Pacific Islanders (2.3).

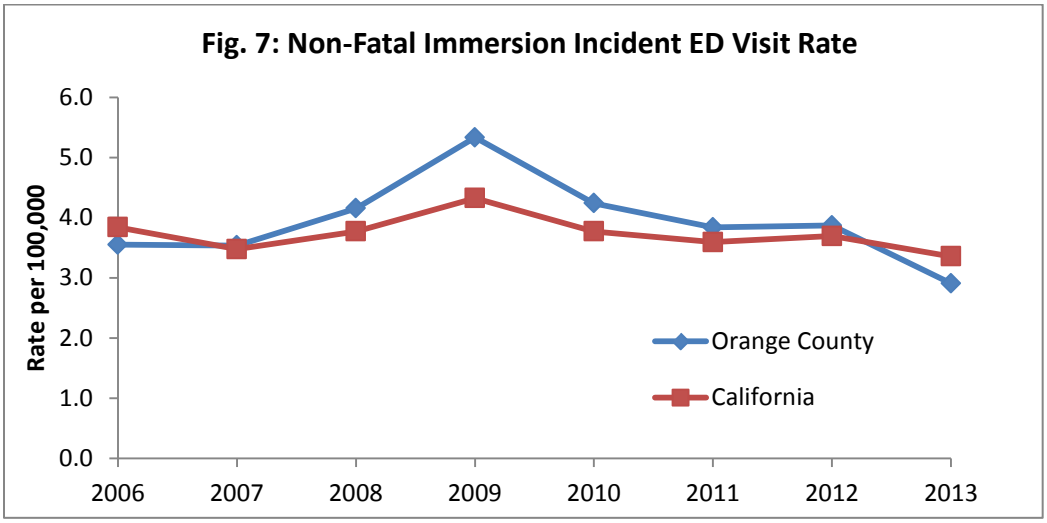
Table 5: Age-Specific-ED Visit Rates (2011-2013)

Incidents	Year			Total	Population[1]	3yr Avg. Rate per 100,000
	2011	2012	2013			
Drowning	7	14	9	**30**	3,071,933	0.3
Drowning Non-Fatal	101	105	73	**279**	3,071,933	3.0
Sex						
Male	71	76	33	**180**	1,520,205	3.9
Female	37	43	29	**109**	1,551,728	2.3
Age Group						
0-4 years	40	50	34	**124**	191,523	21.6
5-13 years	17	19	10	**46**	359,882	4.3
14-17 years	5	3	7	**15**	173,521	2.9
18-24 years	12	7	7	**26**	317,819	2.7
25-44 years	12	17	7	**36**	852,664	1.4
45-64 years	13	11	15	**39**	799,344	1.6
65+ years	9	12	2	**23**	377,180	2.0
Race/Ethnicity						
White	57	65	44	**166**	1,331,095	4.2
Black	2	2	1	**5**	48,659	3.4*
Hispanic	26	28	22	**76**	1,052,849	2.4
Asian/PI	14	17	8	**39**	560,714	2.3
Other	9	7	7	**23**	78,616	9.8
Total	**108**	**119**	**82**	**309**	**3,085,269**	**3.3**

[1]California Department of Finance Population Projections (2010-2060)

* Because of the small number of cases for Black residents, the rate should be interpreted with caution.

Non-Fatal Immersion Incident Trends: The rate of immersion-related incidents that resulted in an ED visit in Orange County and, for comparison, the State of California is presented in **Figure 7**. Data for these trends were retrieved from the State's EpiCenter – California Injury Data Online (1). During the past several years, the rate of such incidents in Orange County and the State of California have remained relatively level. However, in 2013 Orange County dipped below the state for the first time in several years to a rate of 2.9 per 100,000 non-fatal immersion incidents compared to 3.4 per 100,000 for the state.



Hospitalizations

Patient Disposition: Among the 113 immersion-related incidents that resulted in hospitalization, 20% of patients died (*n* = 22; **Figure 8** and **Table 6**). Non-fatal drowning injuries accounted for the remaining 80% of these events, and of those 91 patients, 87% (*n* = 79) were sent home after being treated. Six (5%) were admitted to an acute care facility and two (1.8%) were provided intermediate skilled nursing care.

Figure 8: Immersion Related Hospitalizations by Patient Disposition

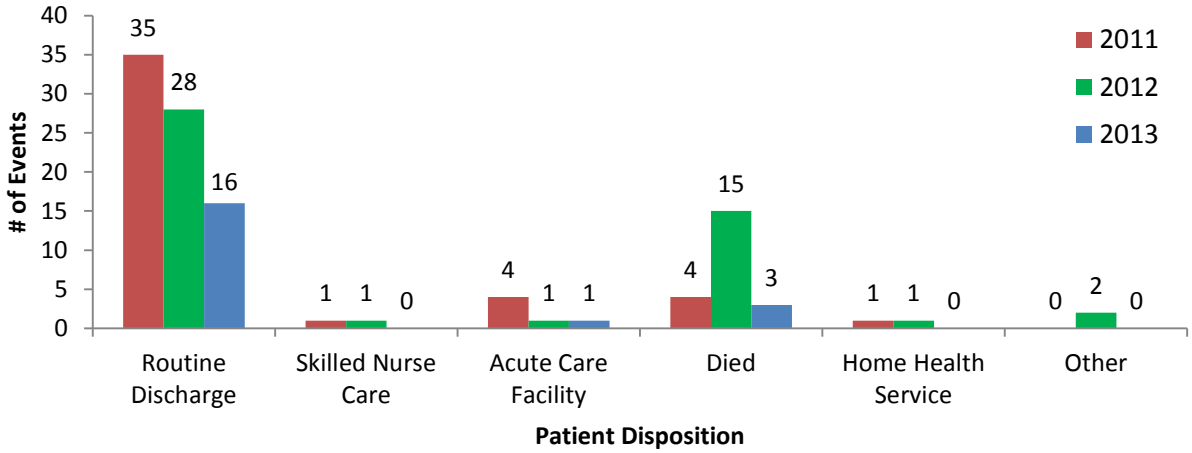


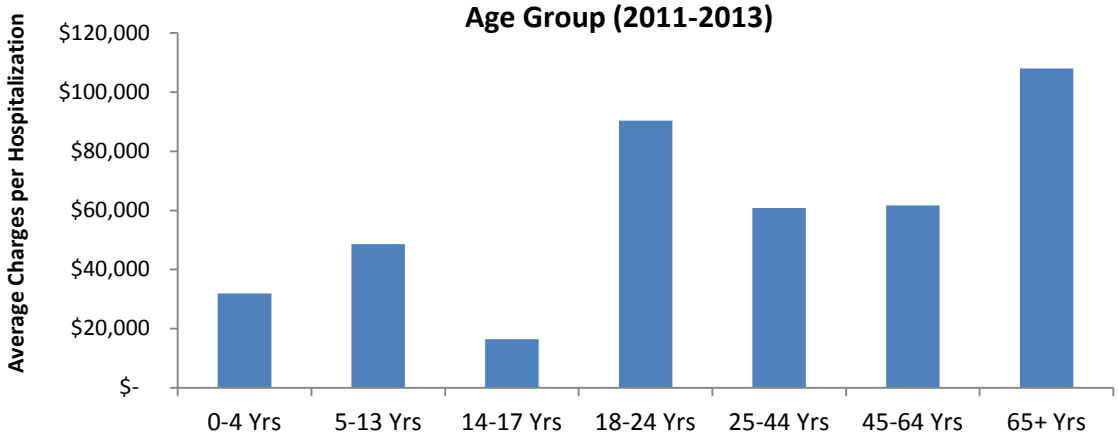
Table 6: Immersion Related Hospitalizations: Disposition of Patient by Age Group

Age Group	Disposition of Patient						Total
	Routine Discharge	Skilled Nurse Care	Acute Care Facility	Died	Home Health Service	Other	
0-4 years	31	0	2	6	0	0	**39**
5-13 years	7	0	0	0	0	1	**8**
14-17 years	2	0	0	0	0	0	**2**
18-24 years	5	1	0	0	1	0	**7**
25-44 years	11	1	0	3	0	0	**15**
45-64 years	19	0	2	4	0	0	**25**
65+ years	4	0	2	9	1	1	**17**
Total	**79**	**2**	**6**	**22**	**2**	**2**	**113**

Length of Stay: The average length of stay over the three-year period (2011-2013) for all immersion-related hospitalizations was 2.95 days. The majority of these hospitalizations lasted between zero and two days (*n* = 70, 66%). For two cases, long-term skilled nursing care was required, ranging from 200 to 300+ days of inpatient care.

Cost of Care: The average cost of an immersion-related hospitalization was $55,000 per admission. As shown in **Figure 9**, the average hospitalization charges tended to increased with the age of the patient – from $33,610 per admission for children 0 to 17 years old, increasing to $74,902 per admission for adults 18+ years and older.

Figure 9: Average Charges per Immersion-Related Hospitalization by Age Group (2011-2013)



The higher costs of care associated with adult victims was often the result of significant conditions (e.g., heart disease, pneumonitis, acute respiratory failure) or injuries (e.g., fractures, spinal cord injuries) that may have contributed to or were a result of the immersion incident. In two cases, extensive injuries resulted in long term care totaling between $860,000 and over $2.1 million.

Drowning Deaths

Patients who died in the field were transferred to the Orange County Sheriff-Coroner's office. As a result, these cases are not accounted for in the emergency department or hospitalization data. Therefore, to account for these cases, the 2011-2013 State Master Death File for Orange County was utilized. This dataset is different in that it utilizes the 10th edition of the *International Classification of Diseases* (ICD-10). **Table 7** provides a detailed grouping of the codes that were used to categorize the various types of immersion-related drowning deaths.

Table 7: ICD-10 Code Interpretation

Code	Base Description: Accidental Drowning & Submersion
Bath Tub	
W65	Drowning & Submersion while in bath tub
W66	Drowning & Submersion following fall into bath tub
Pool	
W67	Drowning & Submersion while in swimming pool
W68	Drowning & Submersion following fall into swimming pool
Natural Body of Water	
W69	Drowning & Submersion while in natural water
W70	Drowning & Submersion following fall into natural water
Other	
W73	Other Specified Drowning & Submersion
Unspecified	
W74	Unspecified Immersion-Related Circumstance

Drowning Death Demographics

Drowning Deaths by Gender: The drowning death rate for males (1.6 per 100,000) was over two times higher than that of the females (0.7 per 100,000) as shown in **Table 8**.

Drowning Deaths by Age: Older adults (65+ years) were the most at risk for drowning in comparison to all other age-groups, with a drowning death rate of 3.4 (**Table 8**). This group was about four times more likely to drown compared the other adult age groups. The next age-group most at risk for drowning were children under the age of five, with a drowning rate of 1.6 per 100,000. Importantly, in 2012 there was a large number of drowning deaths among all age-groups compared to other two years, representing almost half (n = 46, 44%) of all drowning deaths over this three-year period.

Other risk factors may have contributed to the drowning deaths of several adult victims. For example, diseases of the heart (e.g., atherosclerosis, cardiomegaly) were listed as significant conditions for some adult cases. Similarly, alcohol and/or drugs may have been a contributing factor for some adult cases.

Drowning Rates by Race/Ethnicity: The three-year average drowning death rate for OC residents by race/ethnicity is summarized in **Table 8**. Excluding those without a known race/ethnicity, Blacks had the highest drowning rate at 2.7 per 100,000, followed by Whites with a rate of 1.5. However, given the very small sample number of cases and population for Black residents, the three-year average rate for that population should be interpreted with caution. Asian/Pacific Islanders had a drowning rate of 1.1 per 100,000 and Hispanics had the lowest rate at 0.6 per 100,000 during this three-year period.

Table 8: Drowning Death Demographics

Incidents	Year			Total[1]	Population[2]	3yr Avg. Rate per 100,000
	2011	2012	2013			
Sex						
Male	18	32	23	**73**	1,520,205	**1.6**
Female	8	14	10	**32**	1,551,728	**0.7**
Age Group						
0-4 years	1	5	5	**11**	191,523	**1.9**
5-13 years	0	3	0	**3**	359,882	**0.3**
14-17 years	0	0	1	**1**	173,521	**0.2**
18-24 years	3	4	3	**10**	317,819	**1.0**
25-44 years	8	9	3	**20**	852,664	**0.8**
45-64 years	6	11	5	**22**	799,344	**0.9**
65+ years	8	14	16	**38**	377,180	**3.4**
Race/Ethnicity						
White	16	27	17	**60**	1,331,095	**1.5**
Black	1	2	1	**4**	48,659	**2.7***
Hispanic	3	7	8	**18**	1,052,849	**0.6**
Asian/PI	5	7	7	**19**	560,714	**1.1**
Other	1	3	0	**4**	78,616	**1.7**
Total	**26**	**46**	**33**	**105**	**3,071,933**	**1.1**

[1]Master Death File (2011-2013)

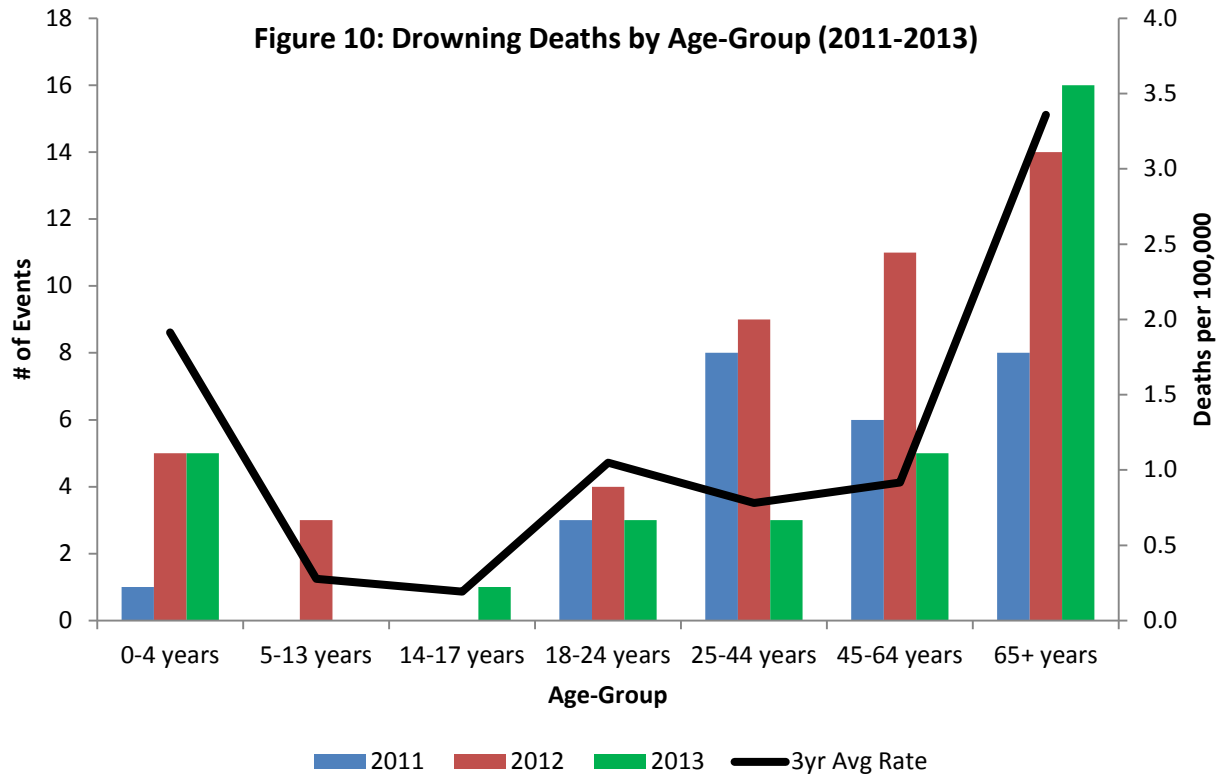
[2]California Department of Finance Population Projections (2012)

* Because of the small number of cases for Black residents, the rate should be interpreted with caution.

Drowning Deaths by Gender and Age: With the exception of young children less than five years, males were at a substantially greater risk for drowning compared to females across all age groups (**Table 9 & Figure 10** on the following page). For all but the youngest, male death rates were two to eight times higher than females in the same age-groups. The exception to this were toddlers (ages 0-4) who experienced the about same number and rate of fatalities for both genders.

Table 9: Drowning Deaths: Age Group and Gender (2011-2013)

Age Group	Gender		Total	Male Deaths per 100,000	Female Deaths per 100,000	3-Year Avg. Rate per 100,000
	Male	Female				
0-4 years	6	5	**11**	2.0	1.8	1.9
5-13 years	2	1	**3**	0.4	0.2	0.3
14-17 years	1	0	**1**	0.4	0.0	0.2
18-24 years	9	1	**10**	1.8	0.2	1.0
25-44 years	16	4	**20**	1.2	0.3	0.8
45-64 years	16	6	**22**	1.4	0.5	0.9
65+ years	23	15	**38**	4.7	2.4	3.4
Total	**73**	**32**	**105**	**1.6**	**0.7**	**1.1**



Drowning Death Location Types: Natural bodies of water (*n = 38*) and pools (*n = 32*) served as the most common location for drowning deaths, accounting for 67% of such deaths between 2011 and 2013 (**Table 10**). Bath tubs accounted for 13% (*n* = 14) and note that for 20% (*n* = 21) the location was not specified in the death certificate.

Table 10: Drowning Deaths: Age-Group by Incident Location Type (2011-2013)

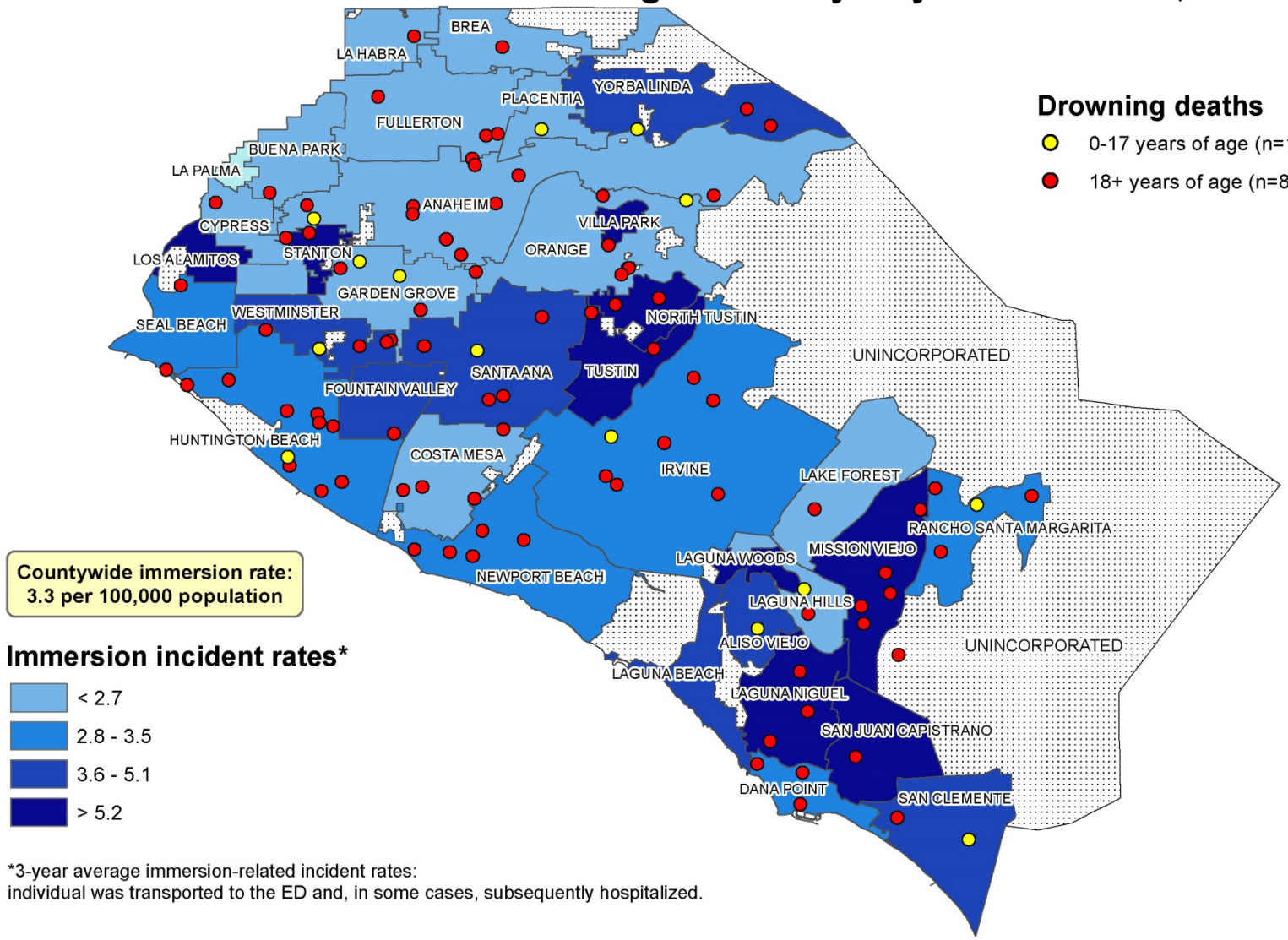
Age Groups	Bath Tub	Pool	Natural Water	Other/Unspecified	Total
0-4 years	2	3	2	4	11
5-13 years	0	2	1	0	3
14-17 years	0	1	0	0	1
18-24 years	1	3	3	3	10
25-44 years	2	3	11	4	20
45-64 years	1	5	12	4	22
65+ years	8	15	9	6	38
Total	14	32	38	21	105

As mentioned previously, other factors may have contributed to the drowning deaths of several adult victims such as diseases of the heart and the fact that alcohol and/or drugs may have been a contributing factor in some adult drowning deaths.

Geographic Distribution of Drowning Deaths and Immersion Incidents: The geographic distribution of drowning deaths and immersion incidents (non-fatal and fatal) victims are presented in the map on the following page for 2011 through 2013. The colored dots on the map correspond to the approximate location of the drowning victim's residential location (not necessarily where the incident occurred).

The map also shows the rate of immersion incidents for this same time period for each city (reference **Table 2**). The nineteen cities with immersion incident rates higher than the countywide rate of 3.3 per 100,000 are colored in the two darker shades of blue. The 15 cities with immersion incident rates lower than the countywide rate are in shown in lighter shades of blue.

Immersion Incidents & Drowning Deaths by City of Residence, 2011-2013

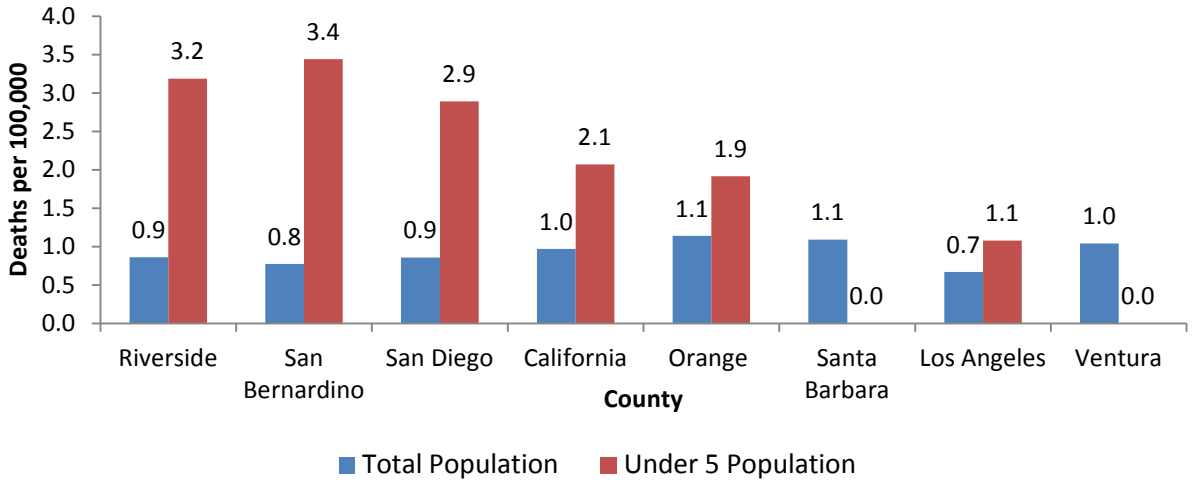


*3-year average immersion-related incident rates:
individual was transported to the ED and, in some cases, subsequently hospitalized.

Source: Emergency Department (ED), Patient Discharge (PD), and Death Statistical Master File (SMF) (2011-2013)

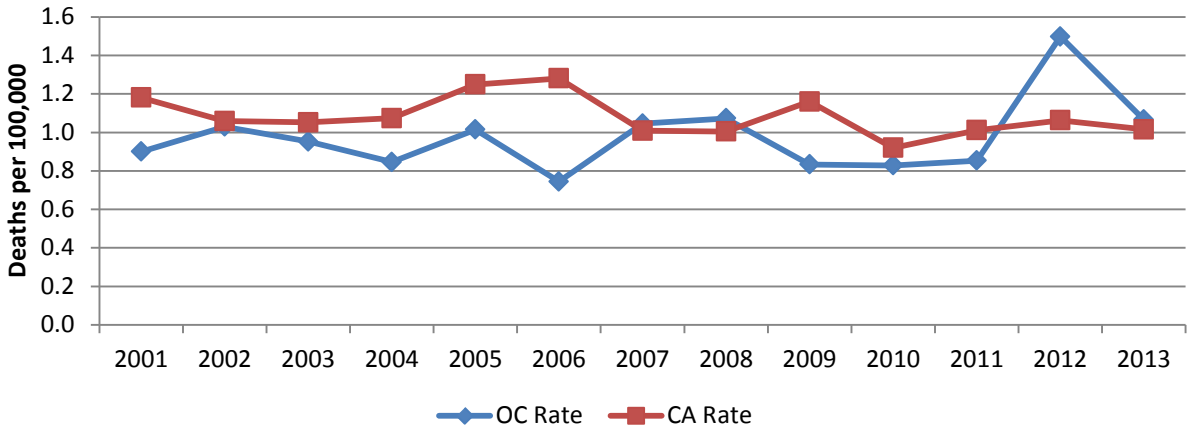
Drowning Deaths – California and Select Counties (2011-2013) – A cross-county comparison of drowning death rates for both children under the age of five (0-4 yrs) and for the entire population are shown in **Figure 10**. Orange County's overall drowning death rate was comparable to other counties and the state during this three-year period (1.1 per 100,000). At 1.4 per 100,000 children 0-4 years, Orange County's three-year average drowning rate for young children was lower than the statewide rate of 2.1 per 100,000 and markedly lower than some neighboring counties such as San Bernardino, Riverside and San Diego.

Figure 10: Immersion-Related Death Rates of Select CA Counties (2011-2013)



Drowning Death Trends – California & Orange County (13-year period): With the exception of 2012 for Orange County where the rate spiked to 1.5, the death rate for both California and Orange County have been relatively stable (**Figure 11**). Orange County's death rate has historically been around 1.0, compared to California.

Figure 11: Immerison-Related Death Rate Trends for California & OC (2001-2013)



Summary

Drowning and non-fatal drowning injuries continued to be a leading cause of unintentional injury and death in Orange County between 2011 and 2013. Of the 309 immersion incidents that resulted in a visit to the emergency department, nearly four in ten occurred to young infants and children less than five years of age. At a rate of 21.6 per 100,000, the immersion incident rate for this age group was five times higher than the next highest age group (5.1 for 5-13 year olds) and over six times higher than the county-wide rate of 3.3 per 100,000. As in past years, the number of immersion incidents peaked during the summer swimming season (June to August) making up more than half of the total number of incidents each year.

Swimming pools and spas continue to be the most common location for immersion incidents among infants and young children 0-4 years; 56% of all incidents for this age group. Similar to what has been reported at the national level, natural bodies of water such as the ocean and lakes become more common incident locations for non-fatal drowning injuries with increasing age.[(4)] For example, 67% of immersion incidents involving teenagers (14-17 years) and 54% for young adults 18-24 years occurred in natural bodies of water.

The drowning death rate in Orange County has remained relatively level during the past decade (approx. 1.1 drowning deaths per 100,000 per year) with one-year spike in fatal events for the 2012 calendar year across nearly all age groups.

The drowning death rate varied by a number of factors, including age, gender, and incident location. Older adults (65+ years) were the most at-risk age group for drowning deaths at 3.4 per 100,000. Medical conditions such as diseases of the heart or the use of alcohol/drugs may have contributed to the drowning deaths of some adults. Young children (0-4 years) had the second highest drowning rate at 1.9 per 100,000. Males ages 18 years and older had a drowning rate nearly triple that of females of the same age. For drowning victims 18 to 64 years of age, natural bodies of water served as the location for over half of such incidents (54%).

The results of this report illustrate the magnitude and severity of immersion incidents and drowning deaths in Orange County. It is our hope that these findings might be used to raise awareness and help guide efforts aimed at reducing the occurrence of such preventable tragedies.

HCA is collaborating with other stakeholders to coordinate a variety of activities to help prevent drowning, especially among young children. For example:

- Orange County Fire Authority has educational material, a video on the "ABC's of Pool Safety" and offers Childhood Drowning Prevention & Water Safety Classes at http://www.ocfa.org/Content/SafetyEducation/WaterSafetyTip.aspx.
- Orange County Health Care Agency, Environmental Health Services regularly inspects public pools to ensure that they are free of safety hazards and risk of communicable

diseases. For example, inspectors check for appropriate safety barrier fencing and self-closing gates, ensure that pools/spas are sanitized and that the water is clear such that the bottom of the pool is visible for the purpose of a quick and effective rescue should one be necessary. Staff also respond to and help in the investigation of any immersion incident or drowning death that occurs at any public pool facility. For more information please visit us on the web at: http://ochealthinfo.com/eh/water/pool.

- Orange County Health Care Agency continues to monitor and analyze drowning (immersion) related data and help plan and coordinate prevention efforts with our community partners. This includes partnering with the Safe Kids Orange County Coalition, led by Children's Hospital Orange County, to provide community education as well as partnering with the Orange County Fire Authority, and the American Academy of Pediatrics.

References

1. California Department of Public Health, EpiCenter – California Injury Data Online retrieved on July 22, 2014. Available from: http://epicenter.cdph.ca.gov.

2. Orange County Grand Jury Report (2001) "Only a Few Seconds – Young Children Drown Without a Sound." Available from: http://www.ocgrandjury.org/pdfs/poolsafety.pdf

3. Childhood Immersion Incidents & Deaths In Orange County: Based on Emergency Department and Hospitalization Data (2005 – 2007). OC Health Care Agency, Santa Ana, California. June 2009. Available from: http://ochealthinfo.com/childhood_drowning2005-7.

4. Xu, J. (2014) Unintentional Drowning Deaths in the United States, 1999-2010. National Center for Health Statistics Data Brief, No. 149, April 2014. Available from: http://www.cdc.gov/nchs/data/databriefs/DB149.pdf.

Protect the Ones You Love: Drowning (CDC)

Keeping our children safe is a priority both inside and outside. Whether children are swimming at a home pool or in natural bodies of water, with friends or with family, water safety is always important. Two children 14 years and under die every day in the U.S. from drowning and it is the third leading cause of all deaths for children ages 1 to 4 years of age in the nation.

Use these parent prevention tips to ensure your child's safety in and around the water:

- **Learn to swim**. Swimming lessons, even among toddlers and young children, can help protect them from drowning.
- **Learn CPR.** CPR can help you save a child's life. Learn CPR and get recertified every two years.
- **Use the buddy system.** Always swim with a buddy. Look for swimming sites that have lifeguards on duty whenever possible.
- **Do not use air-filled or foam toys as safety devices**. Do not use toys, such as "water wings," "noodles," or inner-tubes, instead of life jackets (or personal flotation devices). While these toys are fun, they are not designed to keep swimmers safe.
- **Supervise your children.** Supervise young children at all times around bathtubs, swimming pools, spas, and natural bodies of water. When supervising kids near water, avoid distracting activities such as playing cards, reading books, or talking on the phone and always stay close enough to reach out and touch young children at all times.
- **Don't drink alcohol**. Avoid alcohol before or during swimming, boating, or water skiing. Do not drink alcohol while supervising children.

If you have a pool at home:

- **Install four-sided fencing**. Install a four-sided pool fence, at least four-feet high, that separates the house and play area from the pool area. Use self-closing and self-latching gates that open outward with latches that are out of the reach of children.
- **Clear the pool deck of toys**. Immediately remove floats, balls, and other toys from the pool and surrounding area after use. These toys may encourage children to enter the pool area unsupervised and potentially fall into the pool.

Around natural bodies of water:

- **Wear life jackets.** Even if they know how to swim, make sure kids wear life jackets in and around natural bodies of water. Use U.S. Coast Guard approved life jackets when boating, regardless of travel distance, boat size, or boater's swimming ability.
- **Before swimming or boating, know the local weather conditions and forecast**. Avoid swimming and or boating whenever there are strong winds and thunder or lightning.
- **Watch for dangerous waves and signs of rip currents** (for example, water that is discolored and choppy, foamy, or filled with debris and moving away from shore). If you are caught in a rip current, swim parallel to shore; once free, swim diagonally away from the current toward the shore.

For more information on CDC's work in water-related injury prevention, please visit: http://www.cdc.gov/safechild/Drowning/index.html or 1-800-CDC-INFO.

To learn more about CDC's Protect the Ones You Love initiative to prevent child injuries, including drowning, please visit www.cdc.gov/safechild.

Swimming Programs for Infants and Toddlers

The American Academy of Pediatrics (AAP) wants parents to know that swimming lessons for infants and toddlers do not protect children from drowning. Children are not ready for formal swimming lessons until after their fourth birthday. That's because they cannot voluntarily hold their breath for significant amounts of time until that age. Drowning is a leading cause of unintentional injury and death among children. While millions of infants and preschool children take part in swimming programs, parents should not feel secure that their infant or toddler is safe from drowning after participating in swimming lessons. Whenever infants and toddlers are in or around water, an adult should be within an arm's length. You can teach your baby or toddler to love the water. But your child always needs an adult present at all times to prevent drowning.

Please see more at: https://www.aap.org/en-us/about-the-aap/aap-press-room/aap-press-room-media-center/Pages/Swimming-Programs-for-Infants-and-Toddlers.aspx#sthash.jJjFra2p.dpuf.