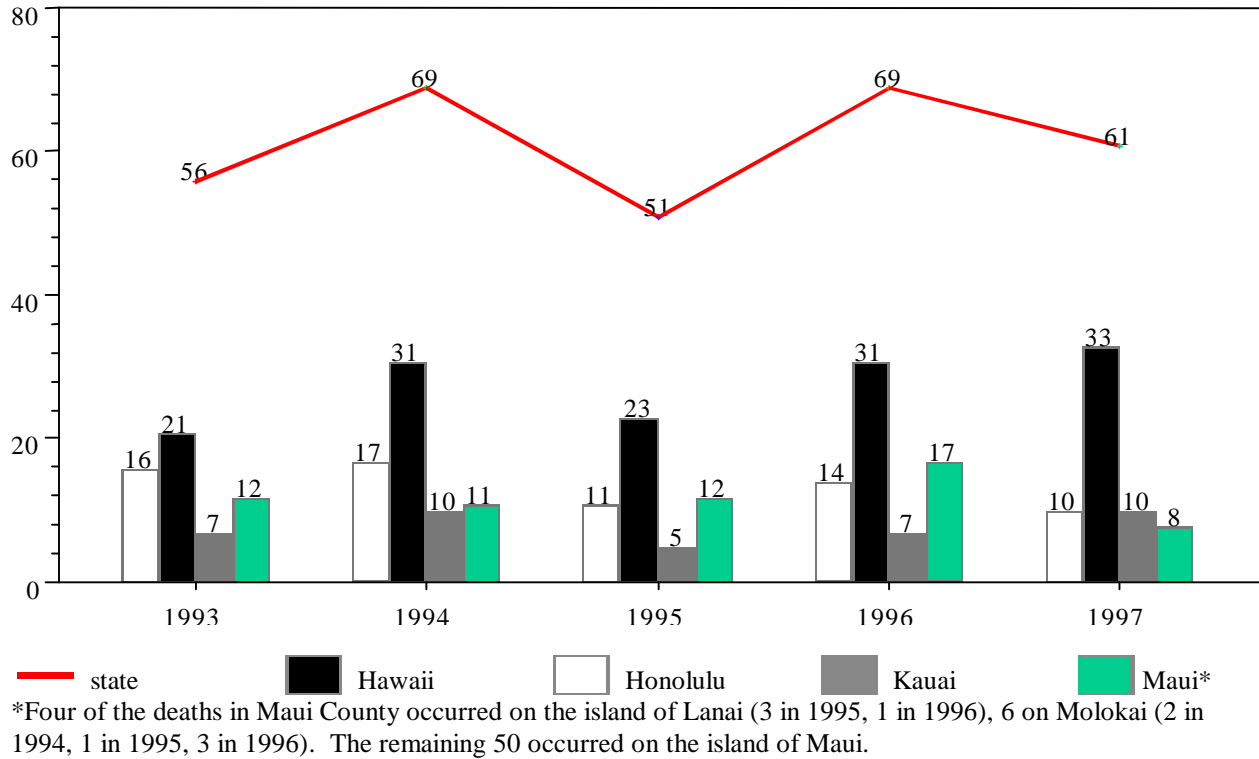


Drownings in Hawaii, 1993-97.

A review of death certificates by the Injury Prevention and Control Program, Hawaii DOH

There were 306 drownings in the state over the 5-year period, with no apparent trend over time in any of the individual counties (Figure 1). Nearly half (139) occurred on the island of Oahu.

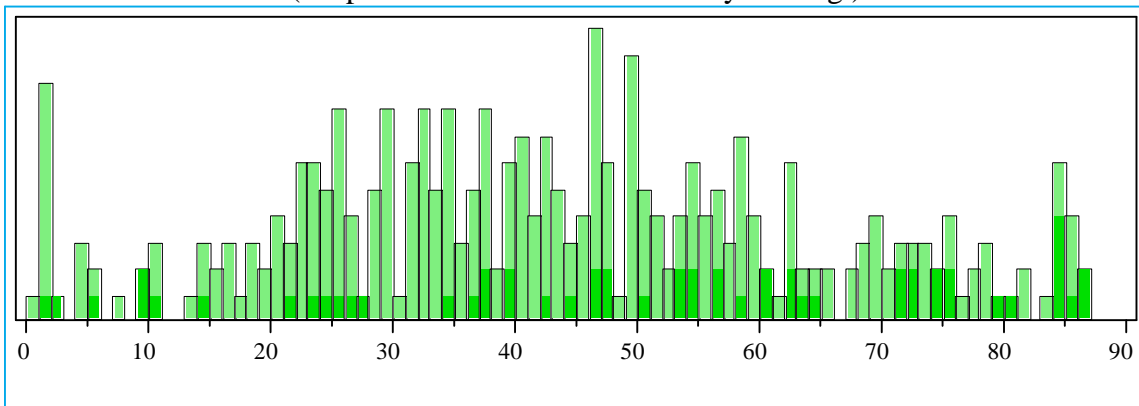
Figure 1. Annual number of drownings in Hawaii, by county, 1993-97.



More than 80% (250) of the victims were males. Figure 2 below shows that the age of the victims was very broadly distributed, for both genders.

Age distribution of drowning victims in Hawaii, 1993-97.

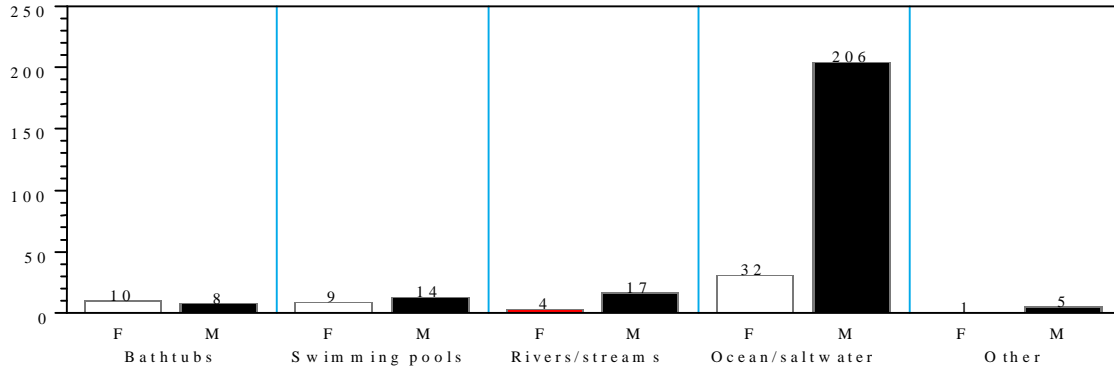
(Proportion of females indicated by shading.)



Age and gender differed somewhat by the type of drowning, however, as shown in the following two figures. Figure 3 shows that there were a significant proportion of females only for drownings occurring in bathtubs (56% of those drownings) and swimming pools (39%). In contrast, there were relatively few females among victims who drowned in the ocean (14%) or rivers and streams (19%).

The figure also shows that more than three-quarters (238) of all drownings in Hawaii occurred in the ocean or other saltwater environments. Of this total, 147 were noted to occur near the shore (128 near beaches, 13 in harbors, and 6 in canals), and 39 occurred offshore. (This information was not specified for the remaining 52 cases.) Of the 23 drownings in swimming pools, only one was noted to have occurred in a public pool.

Figure 3. Place of drowning in Hawaii, by gender, 1993-97.



A higher proportion of the drownings on Oahu occurred in swimming pools, compared to Neighbor Islands (13% vs. 3%). Conversely, there were proportionally fewer ocean drownings on Oahu than Neighbor Islands (73% vs. 81%).

Bathtub and swimming pool drownings included proportionally more young and old victims (Figure 4). Twenty-nine percent (12) of these victims were aged 5 years or younger, and 41% (17) were over age 60. Age was more evenly distributed among victims who drowned in rivers or saltwater environments, and only 2% (6) were younger than 14 years of age.

Figure 4. Age distribution of drowning victims, by place of drowning, 1993-97.

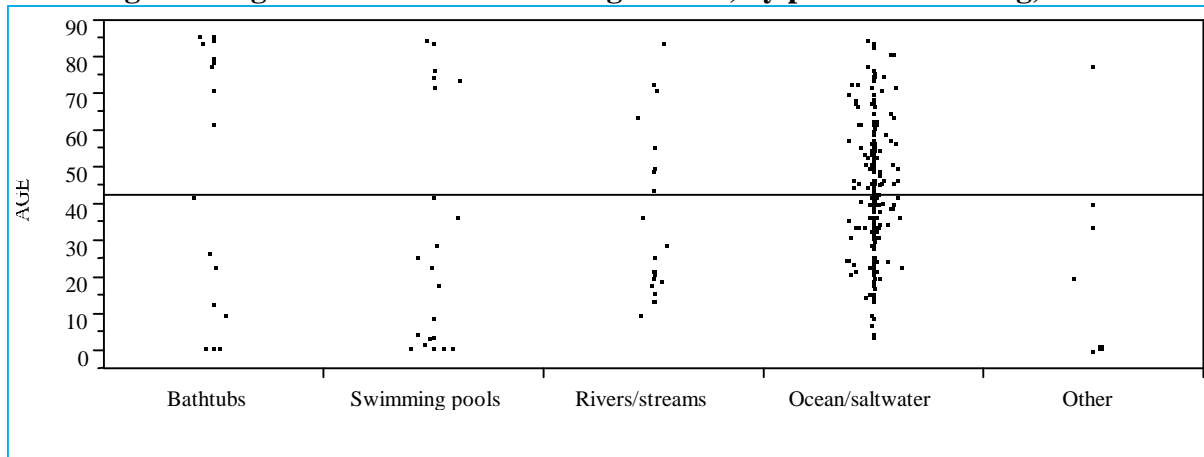
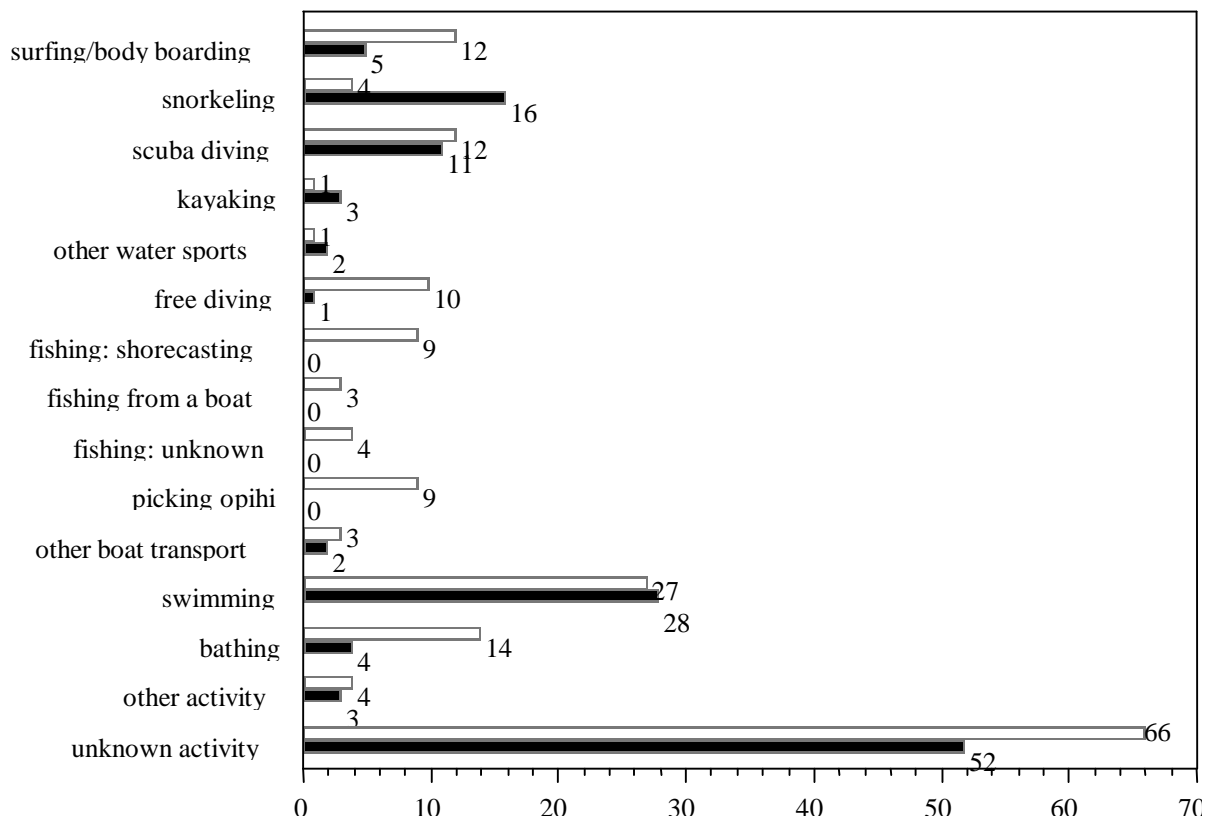


Figure 5 summarizes the activity for the remaining 188 incidents. (Note: all of the 23 victims who drowned in swimming pools were assumed to be swimming. This assumption was not made for those who drowned in the ocean, so most of the incidents classified under “unknown activity” (102/118) include ocean drownings for which no activity was listed.)

Not surprisingly, swimming was the most common activity associated with drowning (18% of all incidents). Thirty six of the victims were fishing at the time of drowning, including at least 9 of whom were fishing from the shore and were swept out to sea. Another 9 victims were gathering opihi at the time of drowning. Other common activities were scuba diving (23 victims), snorkeling (20) and surfing or body boarding (17).

Figure 5. Drownings in Hawaii, by activity and resident status, 1993-97.
(White bars indicate drowning totals among state residents, black among non-residents.)



Forty-one percent (127) of the drowning victims were not residents of Hawaii. Figure 5 shows that residence status differed somewhat by the type of activity the victims were engaged in at the time of drowning. All of the victims who were fishing or picking opihi were residents, and only one of the 11 who were free diving was a non-resident. Residence status was equally divided among the victims who were swimming or scuba diving, while non-residents constituted the majority (80%) of victims who drowned while snorkeling.

Proportionally fewer of the Oahu (29%) and Hawaii (26%) victims were non-residents, compared to those who drowned on Maui (65%) and Kauai (74%).

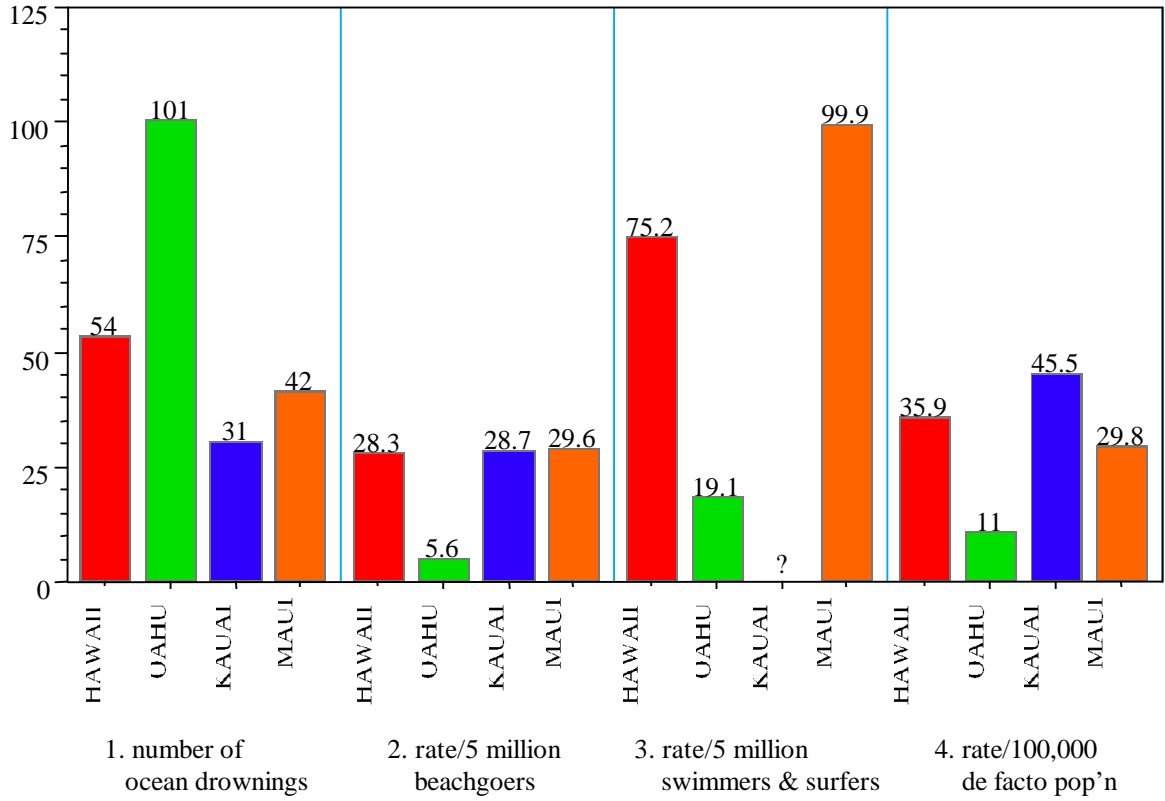
Comparison of ocean/saltwater drowning rates among Hawaiian islands, 1993-97.

Although Oahu had the greatest number of ocean or saltwater drownings over the 5-year period, the rates were by far the lowest on Oahu, when calculated by any of three methods (described below).

Rates were calculated using two sources for the denominator: estimated attendance at lifeguarded beaches, and 1995 de facto population estimates. Each of these methods has pros and cons. Population estimates include all parts of each island and are relatively accurate. The obvious problem, however, is that not all those who are included in the denominator are really “at risk” of drowning, since not everyone goes to or swims in the ocean.

This problem is somewhat alleviated by using lifeguard estimations of both the number of beachgoers and (with the exception of Kauai) the number of people either swimming or surfing in the water. Lifeguards estimated the number of sunbathers, swimmers and surfers at 5 different times during the day. Estimates were available for 7 lifeguarded beaches on Kauai in 1995, 7 on Maui in 1997, 10 on Hawaii in 1997, and 19 on Oahu in 1998. The problems with this source as a rate denominator are that not all beaches on each island are lifeguarded, and the attendance estimations may not be accurate or completely consistent among all lifeguards. Therefore, although this drowning rate estimation may be conceptually better than one based on population alone, the following comparisons should be interpreted with caution.

The number and rate of ocean drownings in Hawaii, by island, 1993-97.

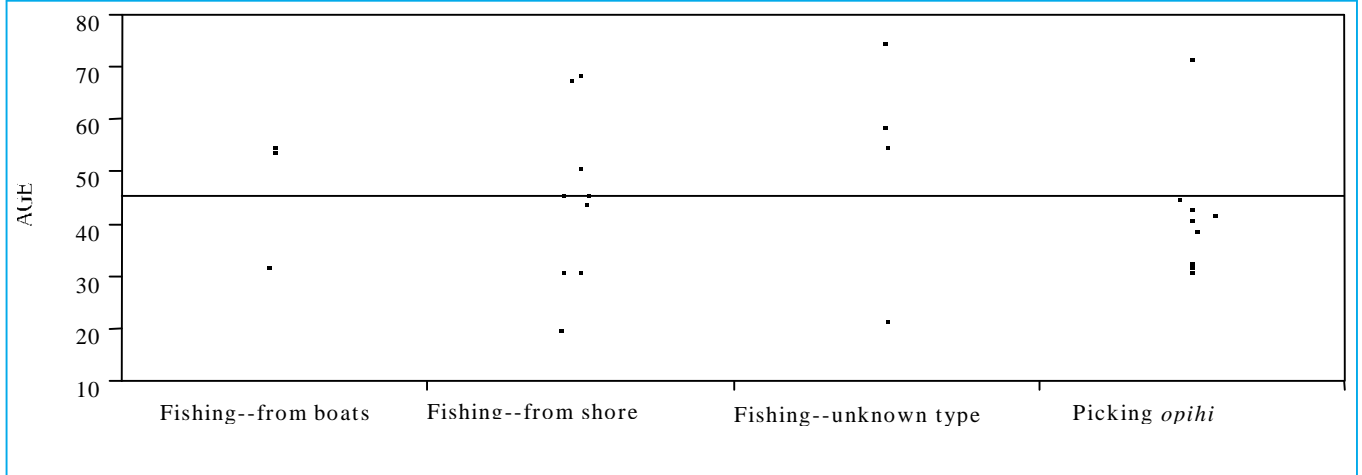


1. Number of drownings (leftmost graph): There were 238 drownings that occurred in the ocean or saltwater environments. Not included in the above chart are 6 that happened on Molokai and 4 others on Lanai. Of the remaining 228 drownings, 44% occurred on Oahu.
2. Rate of drownings/5,000,000 beachgoers: The denominators for these calculations comes from lifeguard logsheets (1995 for Kauai, 1997 for Maui and Hawaii, and 1998 for Oahu). The graph above (second from left) shows that Oahu had by far the lowest estimated rate, less than $\frac{1}{4}$ that computed for Neighbor Islands. Also, the rates for Hawaii, Kauai and Maui are remarkably similar.
3. Rate of drownings/5,000,000 swimmers and surfers: The denominators here are the same as those used for #2 above, minus the number of sunbathers. (This breakdown was not available from Kauai lifeguard reports, so no rate was calculated.) Again, the rate for Oahu is much lower than that for Hawaii or Maui, which had the highest rate.
4. Rate of drownings/100,000 de facto population (rightmost graph): Rates on Oahu are 3- to 4-times lower than those for Neighbor Islands. Kauai had the highest rate.

Statistics on victims who drowned while fishing or harvesting in Hawaii, 1993-97.

*All 25 of these victims were male, and all were Hawaii residents.

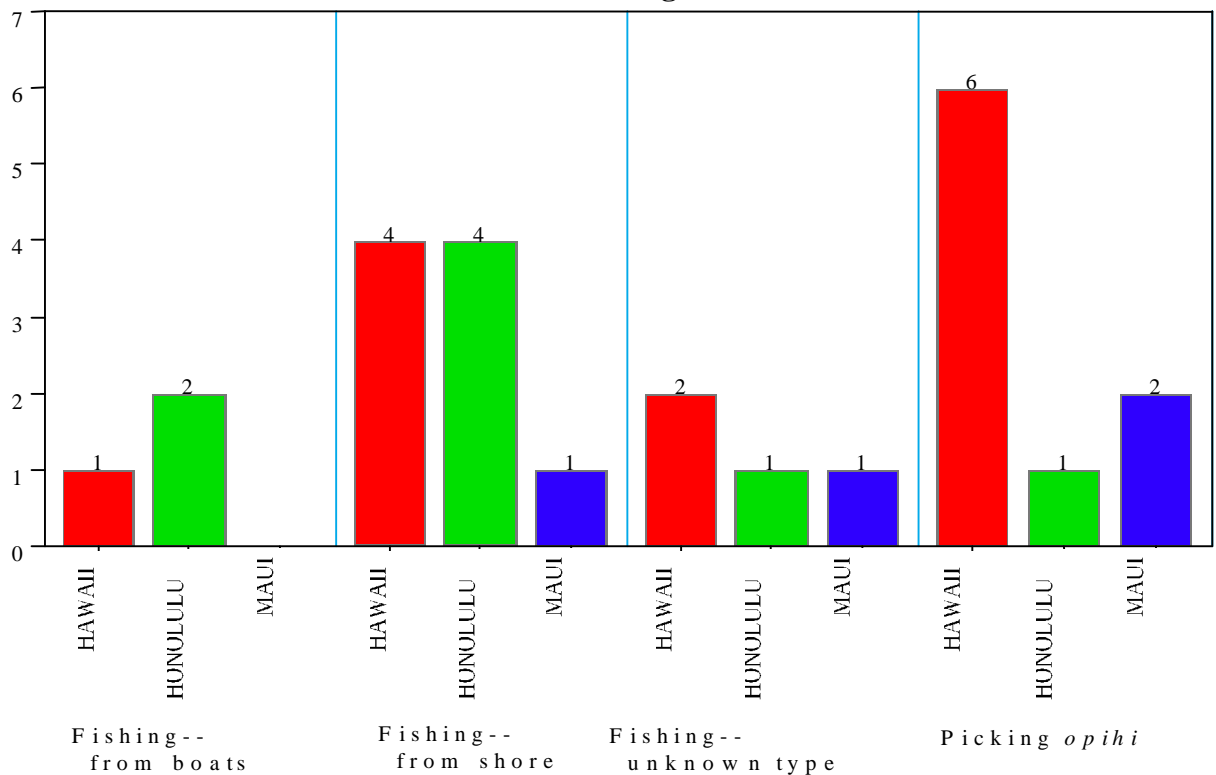
Age distribution, by type of fishing.



*The ages of those fishing from shore were broadly distributed over the 20-69 year range.

*Among the 9 victims who were picking opihi, all but 1 were between 32 and 45 years of age.

Island of drowning



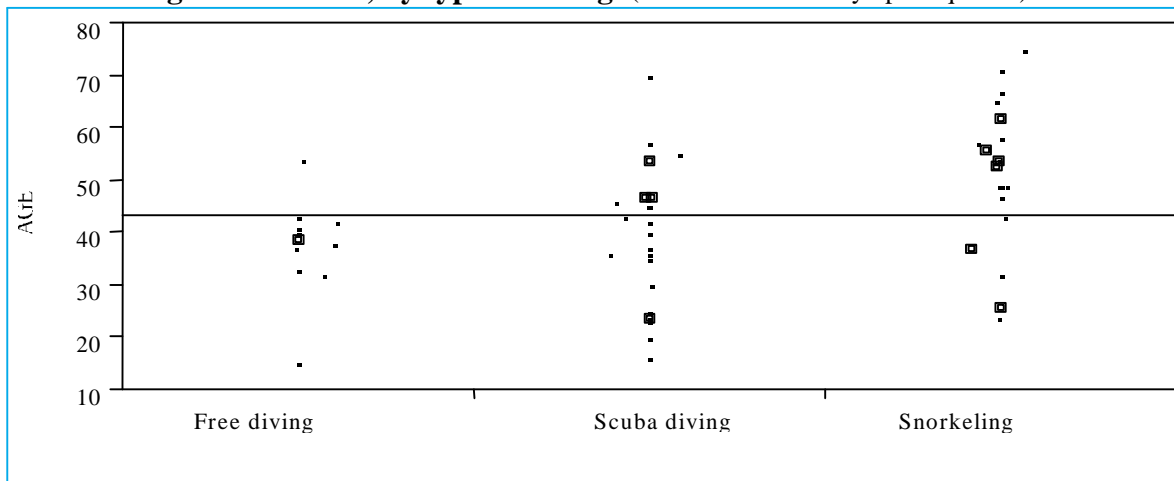
*Eight of the nine victims who were fishing from shore drowned on Hawaii or Oahu.

*Six of the nine victims who were picking opihi drowned on Hawaii, 4 in the Puna district.

Statistics on victims who drowned while diving or snorkeling in Hawaii, 1993-97.

*Eleven of the 54 victims were females. Only 1 of the 11 victims who were free diving was a female, and 4 of the 23 victims who were scuba diving. The gender distribution of the snorkeling victims was more equal (6 female, 8 male).

Age distribution, by type of diving. (Females indicated by open squares.)

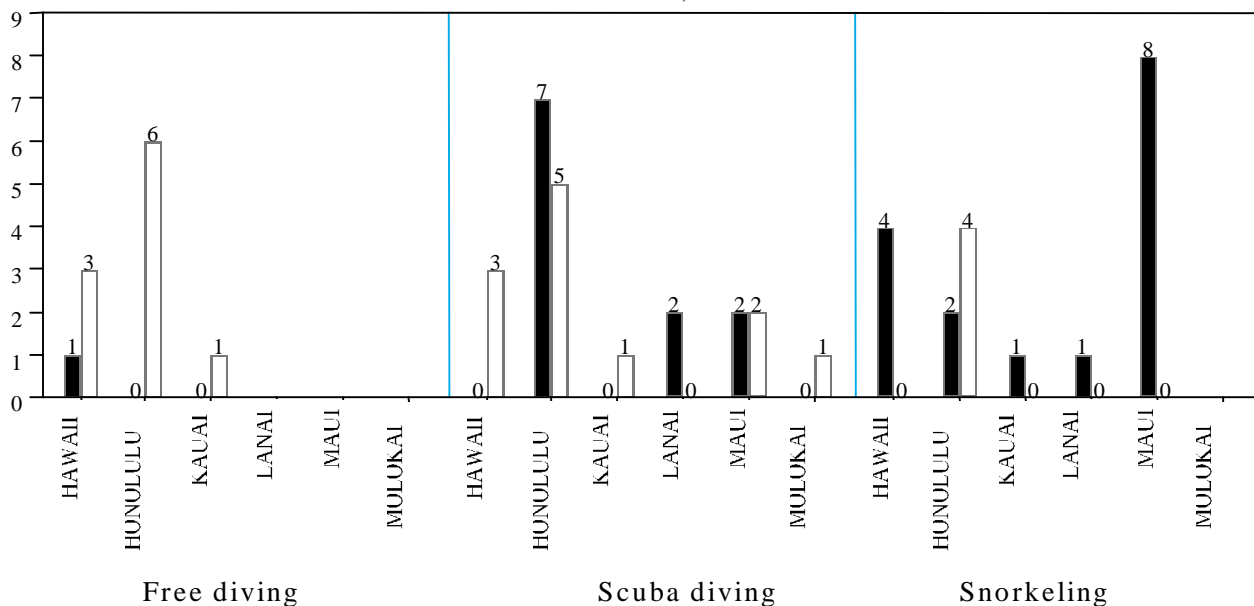


*All but 2 of the 11 free divers were between 32 and 43 years of age.

*Eighteen of 23 victims who drowned while scuba diving were between 20 and 47 years old.

*Victims who drowned while snorkeling tended to be older; 15 of 20 were 49 years or older.

Island of death, by residence status. (White bars represent Hawaii residents, black bars non-residents.)



*Free divers: 10 of 11 victims drowned on Hawaii or Oahu, on various parts of both islands.

*Scuba divers: About half (12/23) drowned on Oahu: 3 in Waikiki area, 2 on the Eastside, 3 on North Shore, and 3 along the Windward coast.

*Snorkelers: 40% drowned on Maui: 3 on the Kihei coast, 2 off Molokini and 2 near Lahaina.

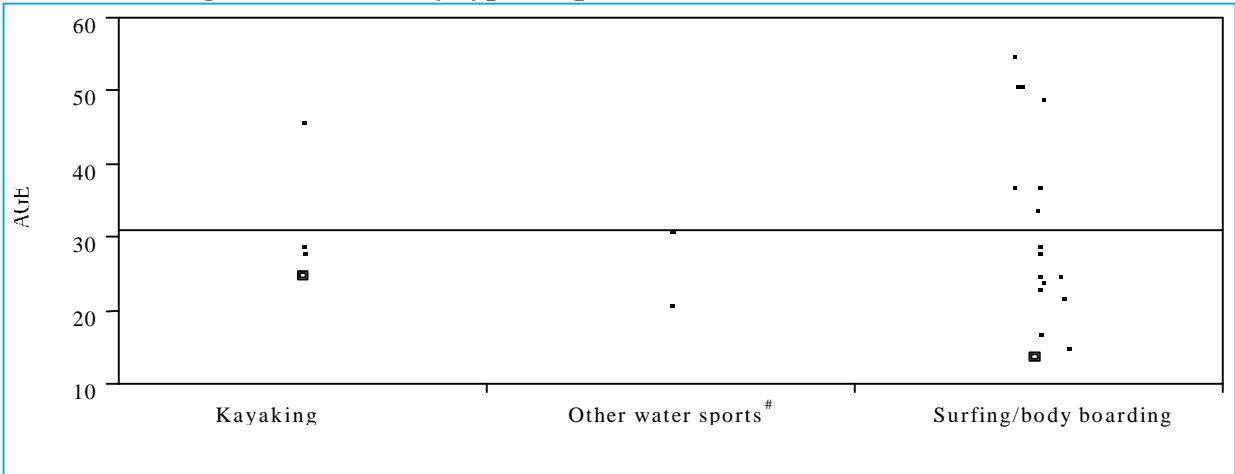
Statistics on victims who drowned during miscellaneous ocean sports on Hawaii, 1993-97.

*Most (17/24) of these victims were surfing or body boarding at the time of the drowning.

*All but 2 were males.

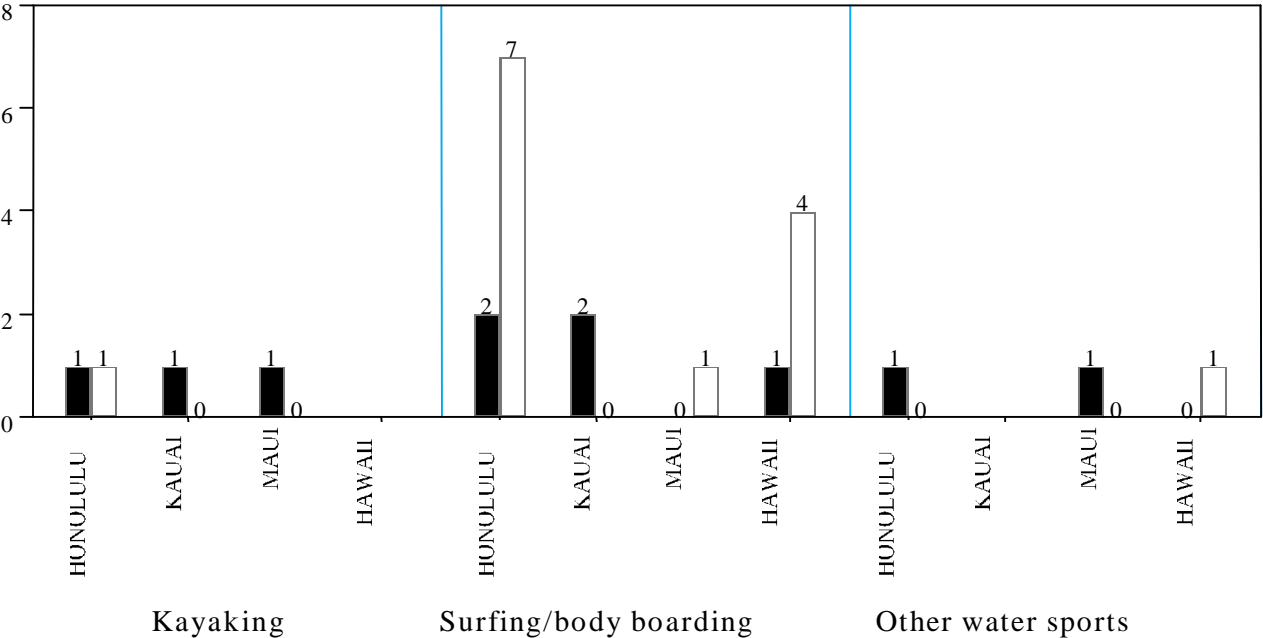
*The “other water sports” category includes 1 windsurfer and 2 victims who drowned after jumping off rocks into the ocean.

Age distribution, by type of sport. (Females indicated by open squares.)



*10 of the 17 surfers/body boarders were between 22 and 37 years of age.

Island of death, by residence status. (White bars represent Hawaii residents, black bars non-residents.)



*Five of the 9 surfers/body boarders who drowned on Oahu drowned in the North Shore area.

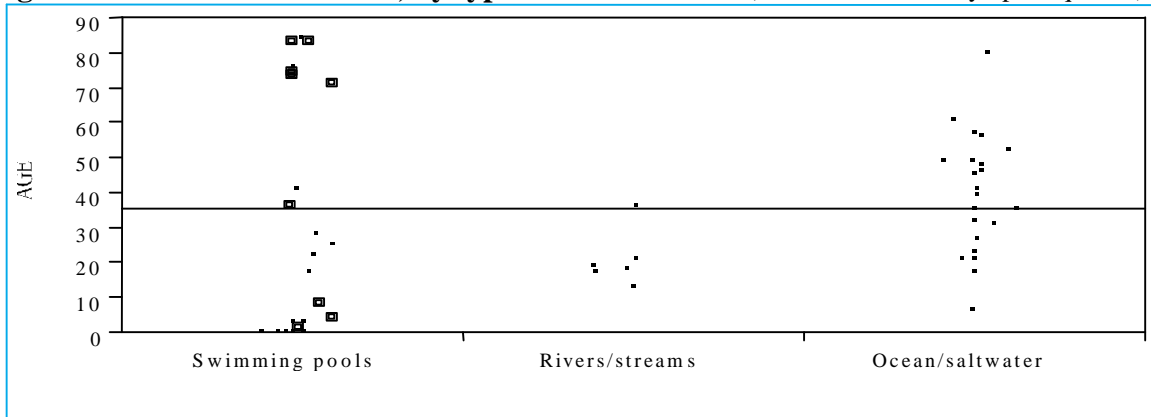
*Among the 5 surfers/body boarders who drowned on Hawaii, 4 drowned in the Hilo area.

Statistics on victims who drowned while swimming in Hawaii, 1993-97.

*Included in this grouping are all victims who drowned in swimming pools and those who were specifically noted to be "swimming" at the time of drowning. Not included are the 12 victims who drowned in rivers or streams or the 102 victims who drowned in saltwater environments for whom no activity was specified. These statistics should therefore be interpreted with caution until the activity of those 114 victims can be accurately determined.

*Only 9 of the 53 victims were female, and all of those drowned in swimming pools.

Age distribution of swimmers, by type of environment. (Females indicated by open squares.)

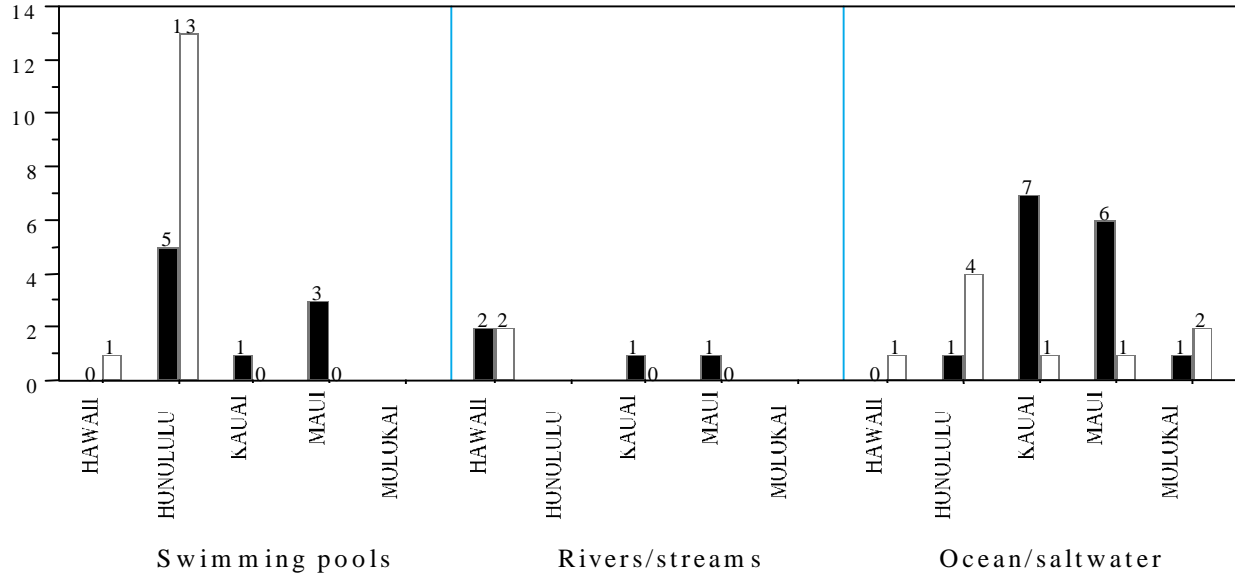


*Again, swimming pool victims included the very young and the very old: There were five 1 year-olds and one 2 year-old; all were Hawaii residents and all drowned in home pools. Five of the 7 victim who were older than 70 were residents; all 7 drowned in home pools. Eight of the remaining 10 victims drowned in hotel pools.

*All but 1 of the 6 victims who drowned in rivers were between 14 and 22 years of age.

*The age range of saltwater drowning victims was wider, although all but 1 were 18 or older.

Island of death, by residence status. (White bars represent Hawaii residents, black bars non-residents.)



*Hawaii river victims: 3 in Wailuku river, 2 in a single 1995 incident.