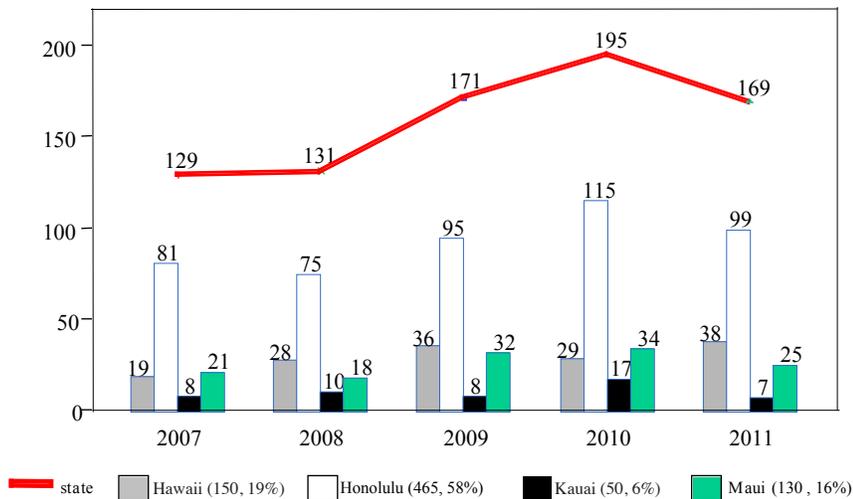


Suicides

Fatal injuries

Suicide was the single leading cause of fatal injuries among state residents, accounting for 24% of the total number of victims. There were 795 suicides among state residents over the 5-year period, with an increasing trend in the annual number (Figure 144). The 195 deaths in 2010 was by far the highest total in the 19-year period (1991-2009) for which data was available. Most (58%, or 465) of the suicides occurred among residents of Oahu. Increasing trends were evident for residents of all counties, although the total decreased from 2010 to 2011 for all but Hawaii County. The interpretation of annual trends for both the state and individual counties requires consideration of trends in the number of fatal injuries of undetermined intent (i.e. possible suicides, or less commonly, possible homicides), although those did not change much over the 5-year period (Figure 168).

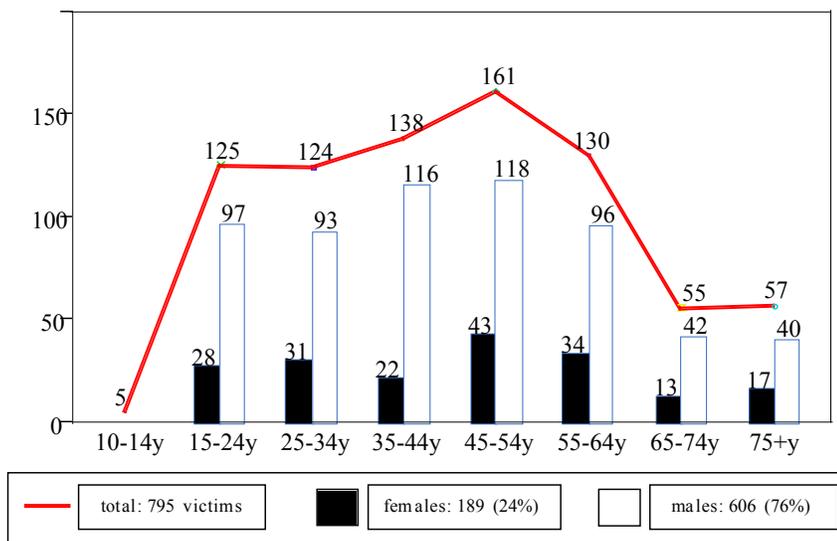
Figure 144. Annual number of suicides among Hawaii residents, by county of residence, 2007-2011.



The youngest aged victims were 10 years old, but almost all (95%, or 758) were 19 years or older (Figure 145). Victim age was widely distributed, with 74% (592) in the wide range of 20 to 60 years of age. The increasing trend (Figure 144, above) was evident in all age groups in the 15 to 74 year age range.

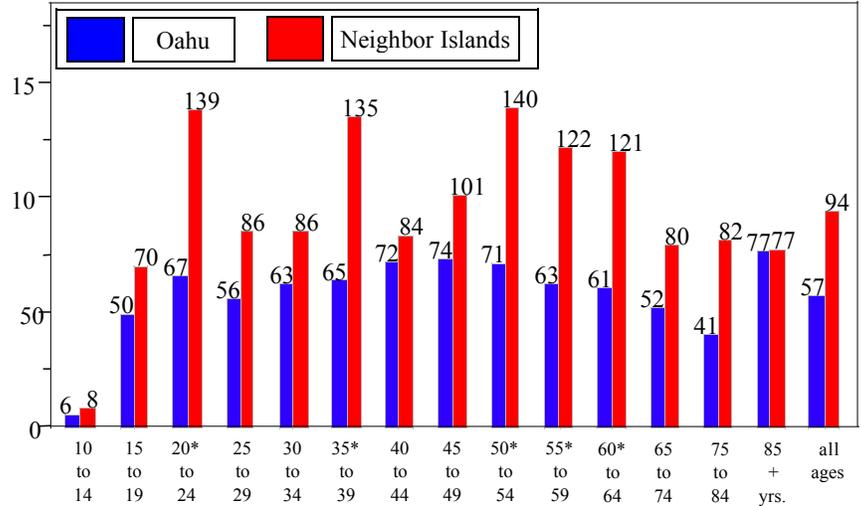
The figure also shows that male victims (606) outnumbered females (189) by a 3-to-1 ratio. That ratio was fairly constant across the age ranges, although smaller among the 37 victims who were 18 years or younger (25 males and 12 females). There was an increasing trend in annual number of both male and female victims, with the 2010 totals being the highest since at least 1991 for either gender (46 females, 159 males). Fatality rates were highest for 45 to 54 year olds and residents aged 85 years and older (see Figure 20).

Figure 145. Age and gender distribution of victims of suicides in Hawaii, 2007-2011.



Although 58% of the victims were residents of Oahu, the overall age adjusted rate (57.5 suicides/100,000) was 39% lower compared to that for residents of the Neighbor Islands (94.5). The rates for each of the other 3 counties were statistically comparable, ranging only from 85.5/100,000 (Kauai County) to 98.6 (Hawaii County). (The rate for Maui County was 94.9/100,000 residents.) Figure 146 shows that suicide rates for Neighbor Island residents were higher than those for Oahu residents for most age groups, particularly for those 50 to 64 years of age.

Figure 146. Five-year rates (/100,000) of suicide among residents of Oahu, and Neighbor Islands, by age group, 2007-2011.

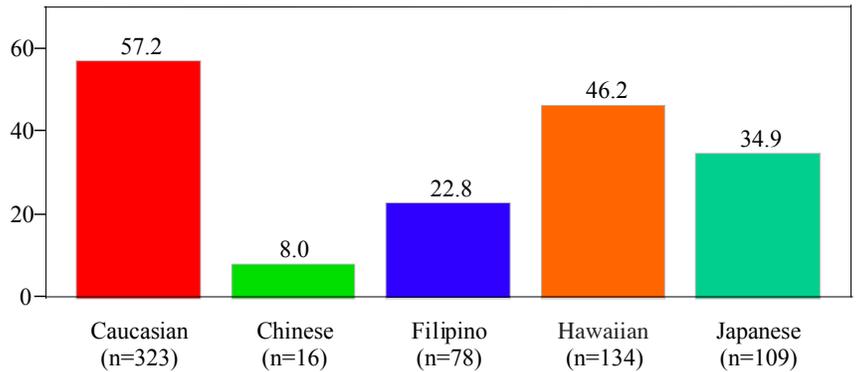


*Indicates significant difference in rates between residents of Oahu and Neighbor Islands.

Chinese residents had significantly lower suicide fatality rates than any of the other ethnic groups, although the rate was based on only 16 deaths (Figure 147). The rate was also low for Filipino residents, significantly lower than all but the rate for Chinese residents. The highest rate was computed for Caucasian residents, significantly higher than any group, other than Hawaiians.

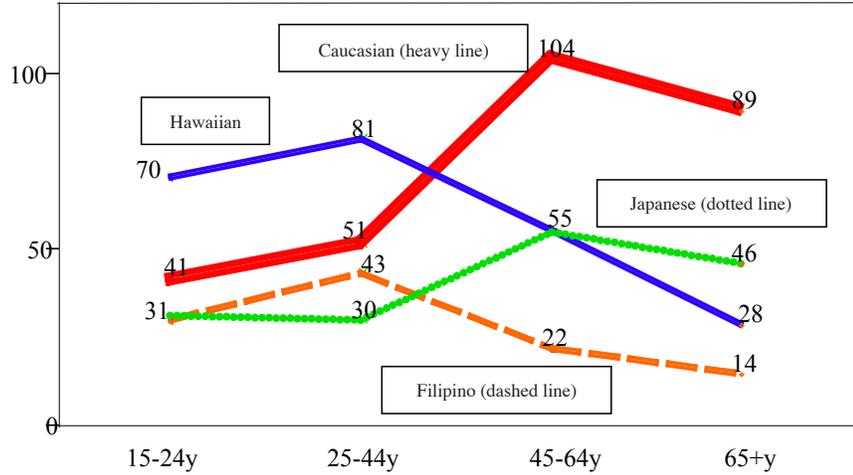
Figure 147: Unadjusted rates (per 100,000) of suicides, by ethnicity, 2007-2011.

(Number of suicides given in parentheses in bottom labels.)



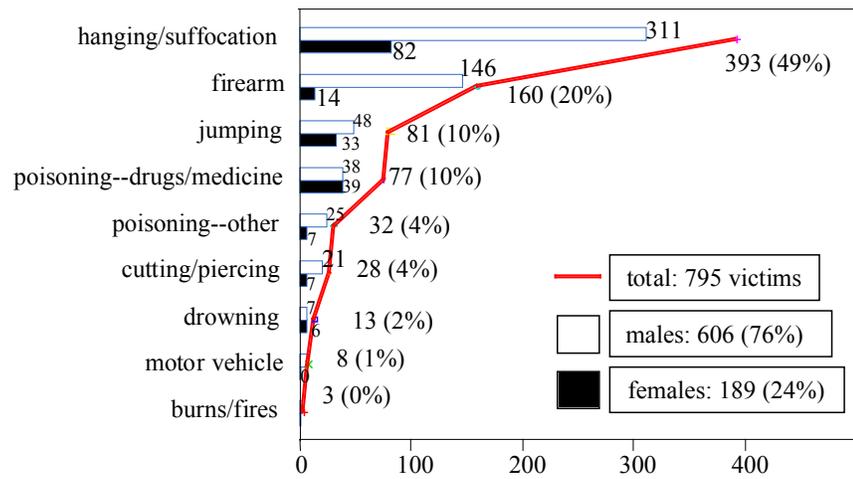
Suicide rates were computed for different age groups within the 4 ethnicities with at least 75 deaths (Figure 148). Hawaiians had the highest rates for 15 to 24 year-old and 25 to 44 year-old residents, significantly higher than any other ethnic group, but a relatively rate for senior-aged residents. The rates for 45 to 64 year-old residents and those aged 65 and older were significantly higher for Caucasians than any other ethnic group. The rates for Caucasians in these latter two age groups were approximately 2 to 5 times higher than the rates for the other 3 ethnicities. Hawaiians and Filipinos had generally similar patterns with peak rates in the 25 to 44 year age group, and lower rates for older age groups, although rates were higher among Hawaiian residents at every age group. Suicide rates were computed for different age groups within the 4 ethnicities with at least 75 deaths (Figure 148). Hawaiians had the highest rates for 15 to 24 year-old and 25 to 44 year-old residents, significantly higher than any other ethnic group, but a relatively rate for senior-aged residents. The rates for 45 to 64 year-old residents and those aged 65 and older were significantly higher for Caucasians than any other ethnic group. The rates for Caucasians in these latter two age groups were approximately 2 to 5 times higher than the rates for the other 3 ethnicities. Hawaiians and Filipinos had generally similar patterns with peak rates in the 25 to 44 year age group, and lower rates for older age groups, although rates were higher among Hawaiian residents at every age group.

Figure 148: Suicide rates (per 100,000) among residents of Hawaii, by age group and ethnicity, 2007-2011.



The most common mechanism of suicide was by hanging or suffocation, which accounted for about half (49%) of the deaths (Figure 149). Use of firearms was the second most common method, although it accounted for a much higher proportion of the suicides among males (24%), than among females (7%). Other major mechanisms included jumps from high places (10%), and poisoning from medicinal substances (10%). Besides firearms, male victims were more likely to die by hangings/suffocations (51%), compared to female victims (43%), while females were more likely than males to use medicinal substances (21% vs. 6%, respectively). Firearms were more commonly used among Neighbor Island victims (26%) than those on Oahu (16%), while the latter were more likely to have jumped from a high place (15% vs. 3% for Neighbor Island victims). Victims of hangings or suffocations (mean age 40 years) were significantly younger than other victims (50 years of age).

Figure 149. Suicides among male and female residents of Hawaii, by mechanism, 2007-2011.

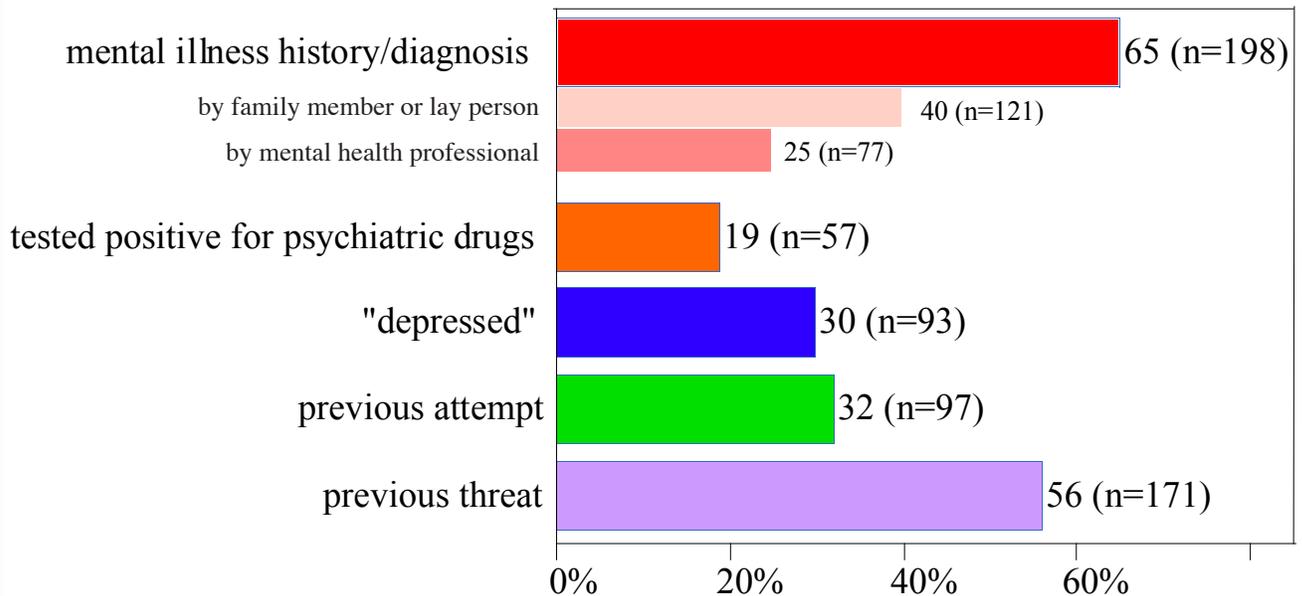


Efforts were made to review all Honolulu County autopsy records for suicide victims for years 2008 through 2010, and a random selection of 2007. Almost all (97%, or 306) of the 314 eligible records were reviewed. Manifestations of mental illness were commonly documented in these records. Figure 150 shows that almost two-thirds (65%, or 198) of the victims had a documented history of mental illness, most commonly mood disorders (178 victims, 58%), psychoses (31, 10%), or anxiety disorders (27, 9%). (These percentages add to more than 65% because 39 victims had more than 1 type of mental illness.) A mental illness diagnosis was provided by a psychiatrist, psychologist or mental health case worker for 25% (77) of the victims. Mental illness was described by a surviving spouse or intimate partner for 10% (32), by another family member for 23% (70%), by other lay person for 4% (13), and by an unknown source for the remaining 2% (6 victims). Only about one-third (32%, or 63) of the victims described as mentally ill were in treatment near the time of the suicide. Another 11 victims (6%) had been in treatment

at earlier points in their lives. Barriers to mental health treatment were described for 24 of the victims, most commonly their non-compliance with medications (10) and/or refusal of treatment or therapy (15). Concerns over insurance were noted for only 2 of the mentally ill victims.

About one-fifth (19%, or 57) of the victim tested positive for psychiatric drugs, including benzodiazepines (42 victims), anti-depressants (17), anti-psychotics (6), and anxiolytics (5). (Note: it is possible that the drugs labeled for “psychiatric” uses in this report, were actually prescribed for other purposes, e.g. as anti-convulsants, or muscle relaxants.) The proportion who tested positive for these substances was higher among those described as mentally ill (25%), particularly those diagnosed by a mental health professional (31%). Thirty-percent (93) of the victims were described by survivors as “depressed” before the suicide, 56% had verbally threatened suicide, and nearly one-third (32%) had made a previous attempt.

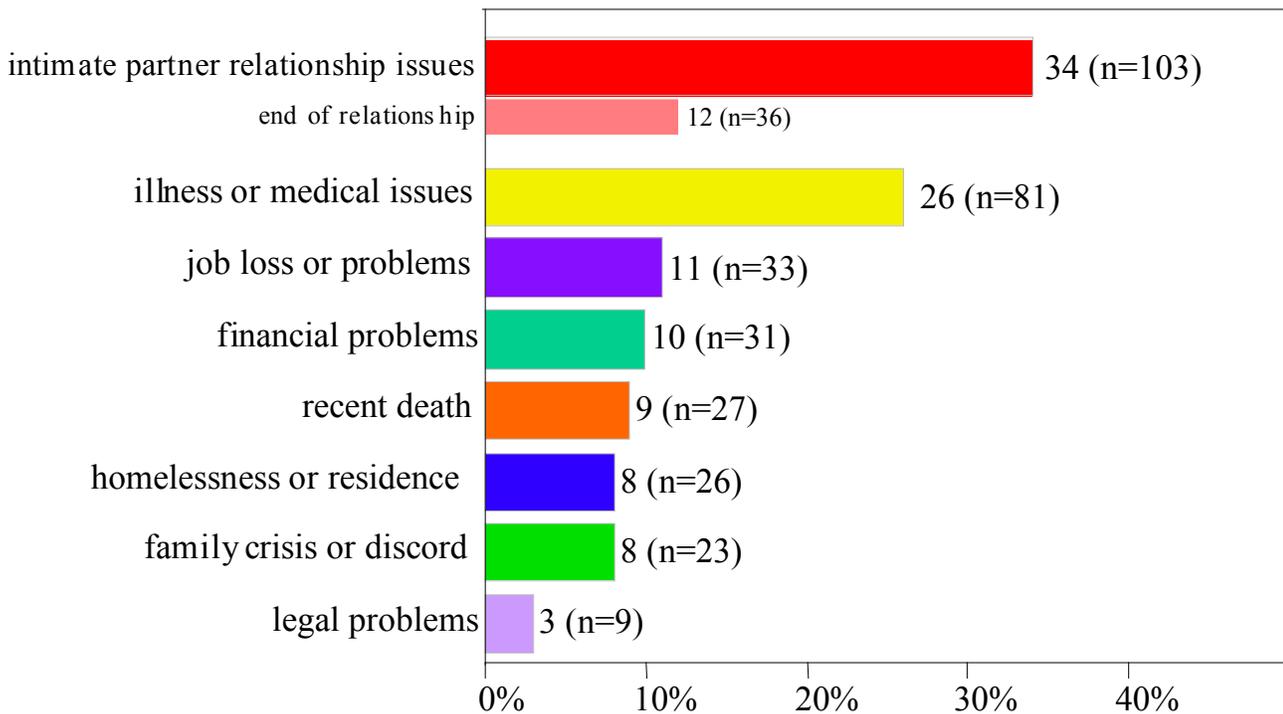
Figure 150. Documentation of “mental illness” among suicide victims in Honolulu County, 2007-2010.



At least one negative life event was documented in the autopsy records of more than two-thirds (72%, or 219) of the 306 victims (Figure 151). The most common negative events were intimate partner relationship problems (34%, or 103 victims). About one-third (36) of these victims specifically had issues with the endings of relationships. Relationship issues were most common among victims under 50 years of age (44%, or 87 of 197 victims). Serious illness was documented for about one-quarter (26%) of the victims overall, and one-half (60%, or 29 of 48 victims) of senior-aged victims. Problems at work (including loss of job), financial problems, bereavement, homelessness or residence issues, and family crises or discord were documented for 11% to 8% of the victims. Among the 24 victims under the age of 21, the most prevalent negative life events were intimate relationship issues (11 victims, or 46%), family problems (4), and bereavement (4). Only 1 of these victims had documented issues related to school. There was no significant difference in

the overall proportion of male victims with a documented negative event, compared to female victims (71% vs. 72%). There were also few gender differences in the type of negative life events, other than male victims were significantly more likely to have had end of relationship issues (14% vs. 5% for females) or the loss of a job (10% vs. 5%) as negative events, while females were somewhat more likely to have had a serious illness or medical issues (31% vs. 25% for males).

Figure 151. Negative life events documented in the autopsy records of suicide victims in Honolulu County, 2007-2010.

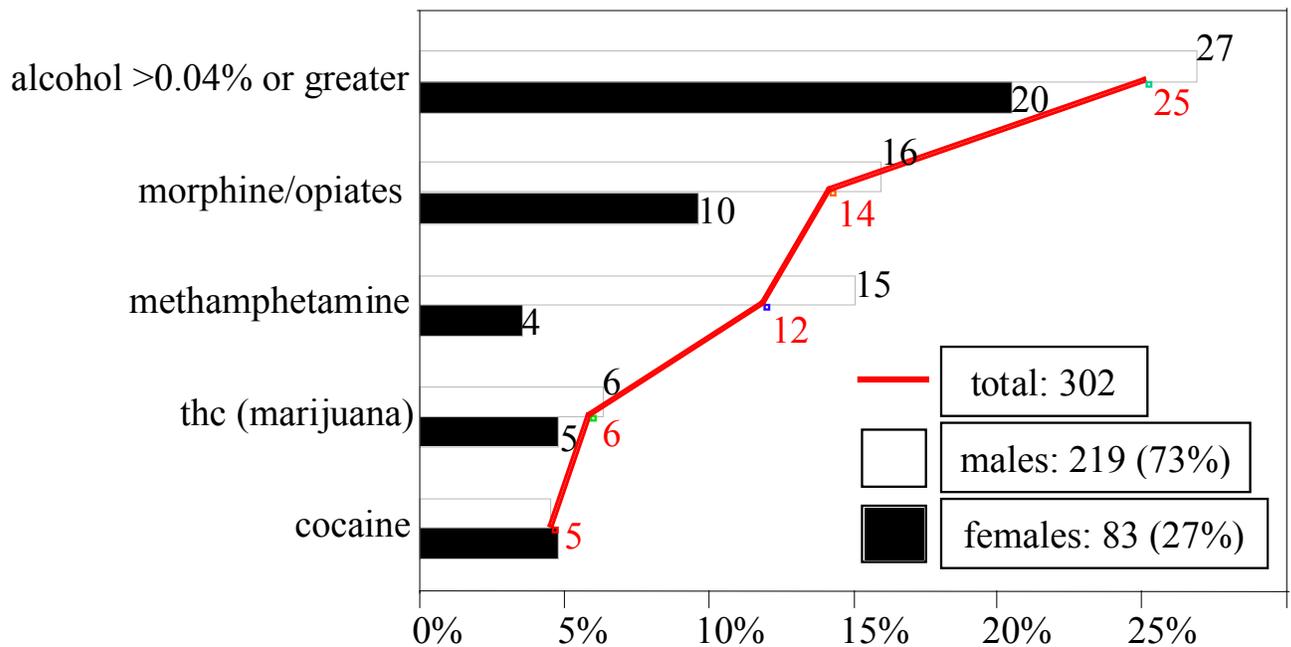


The toxicology results from autopsy records from 2007-2010 are summarized in Figure 152. (These percentages exclude 4 (1% of 306) victims who were not tested or for whom test results were not available.) One-quarter (25%, or 75) of the victims had BAC of 0.04% or greater, including 57 (19%) with BAC of 0.08% or greater, the level used to indicate inebriation among drivers in Hawaii. (These proportions were similar if only victims aged 21 years and older are considered: 26% and 20%, respectively.) About 11% (32) of the victims had BAC levels of 0.16% or greater (i.e. twice the legal limit). Males and females were statistically comparable in the proportion of victims with BAC levels of 0.04% or greater, and the proportion who were legally intoxicated. Victims who were legally intoxicated were significantly younger, on average, than victims who tested negative for alcohol (39 vs. 47 years of age, respectively).

Toxicologic exams identified illicit drugs in the blood of about one-third (34%, or 103) of the victims.

(The term “illicit” here includes thc, cocaine, methamphetamine, as well as morphine and opiates, which also have medicinal uses.) This proportion was significantly higher among male victims (39%) compared to female victims (22%). The most commonly identified drugs were opiates, present in 14% (43) of the victims, followed by methamphetamine (12%), cocaine (5%), and marijuana (6%). Male victims were significantly more likely to test positive for methamphetamine (15%), compared to female victims (4%). Eleven (4%) of the victims tested positive for more than one of the drug groups at the time of autopsy. The average age of victims who had used drugs was significantly younger than that of those who had not (42 vs. 47 years, respectively), although there was a wide age distribution (standard deviation 15 years) among the drug users. There were no significant associations between alcohol use and the prevalence of illicit drugs, which was 33% for victims who were negative for alcohol, and 37% for those with a BAC of 0.04% or higher. (This proportion was 28% for the 18 victims with a BAC between 0.01% and 0.03%.)

Figure 152. Presence of alcohol or illicit drugs in the blood of suicide victims in Honolulu County, by gender, 2007-2010.



Apart from the toxicology results, over one-third (37%, or 112) of the 306 victims had a documented history of substance abuse. The most commonly abused substances were alcohol (24%, or 73 victims), methamphetamine (13%, or 40 victims), cocaine (4%, or 12 victims), and prescription drugs (4%, or 13 victims). Substance abusers were significantly younger than the other victims (mean age: 41 vs. 47 years).

Nonfatal injuries

There was an increasing trend in the annual number of nonfatal suicide attempts overall, although this was evident only for ED visits (Table 34). (There were 5 patients under 10 years of age with E-codes indicating self-inflicted injuries. These 5 records were assumed to be erroneously coded and excluded from these analyses.) The number of injuries that required hospitalization were not much lower than the number treated in EDs, unlike most any other category of injury. The gender distribution of patients was similar for both settings, with females comprising a slight majority of patients. Slightly more than half (56%) of the patients were under 15 to 34 years of age, compared to only 31% of those who died from suicide over the 2007 to 2011 period. Proportionally more of the patients treated in EDs were in the 15 to 24 year age group (40%, compared to 27% of hospitalized patients), while there were more patients aged 45 years and older among those who were hospitalized (35%, vs. 18% of ED patients). About two-thirds (64%) of the patients were residents of Honolulu County. Among Maui County residents, patients who were hospitalized outnumbered those who were treated in EDs.

Table 34. Demographic characteristics* of Hawaii residents with nonfatal injuries from suicide attempts.

	ED visits	hospitalizations	total
Year of admission			
2007	424	352	776
2008	411	370	781
2009	448	392	840
2010	459	366	825
2011	585	323	908
average annual total	465	361	826
Patient gender			
Female	272 (58%)	198 (55%)	470 (57%)
Male	194 (42%)	162 (45%)	356 (43%)
Patient age			
10-14 y	22 (5%)	6 (2%)	28 (3%)
15-24 y	187 (40%)	96 (27%)	283 (34%)
25-34 y	108 (23%)	68 (19%)	177 (21%)
35-44 y	64 (14%)	64 (18%)	128 (15%)
45-54 y	55 (12%)	70 (19%)	125 (15%)
55-64 y	20 (4%)	35 (10%)	55 (7%)
65-74 y	7 (1%)	12 (3%)	18 (2%)
75-84 y	2 (0%)	6 (2%)	8 (1%)
85+ y	1 (0%)	3 (1%)	4 (0%)
County of residence of patient			
Hawaii	104 (22%)	61 (17%)	166 (20%)
Honolulu	285 (61%)	240 (67%)	525 (64%)
Kauai	47 (10%)	15 (4%)	61 (7%)
Maui	29 (6%)	45 (12%)	74 (9%)

*Statistics are annual averages over the 2007-2011 period.

Residents aged 15 to 19 years had the highest rates of hospitalizations and especially ED visits (Figure 153). Injury rates generally declined gradually from age 20, although the rate of hospitalizations changed little between 30 and 54 years of age. Residents aged 50 years and older were more likely to be hospitalized for nonfatal attempts than to be treated in ED settings.

Female residents had significantly higher rates of both ED visits (53/100,000 residents) and hospitalizations (37/100,000) than male residents (34 and 28/100,000, respectively). However, these gender differences were only significant for the 10 to 14 and 15 to 19 year age groups for ED visits, and the 15 to 19 year age group for hospitalizations; male and female resident rate estimates were statistically comparable for all other age groups. If all nonfatal injuries (ED visits and hospitalizations combined) were considered, rates for females were also significantly higher in the in the 25 to 29 year age group.

Figure 153. Average annual rates (per 100,000 residents) of hospitalizations and ED visits for nonfatal injuries from suicide attempts in Hawaii, by age of patient, 2007-2011.

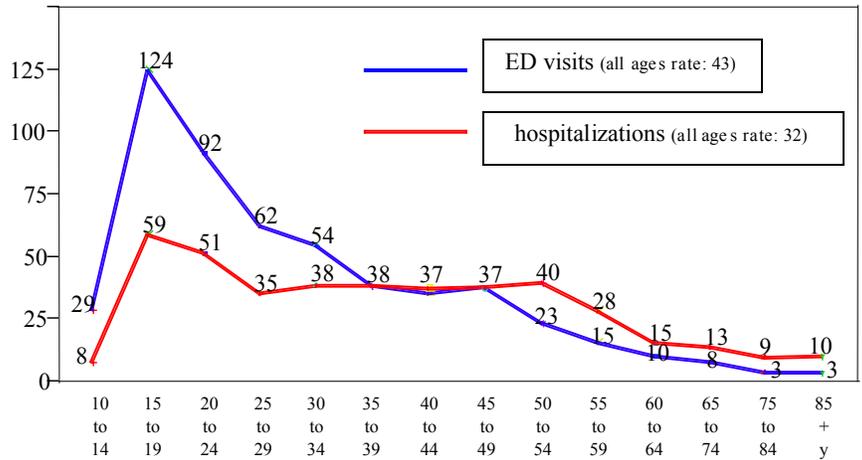
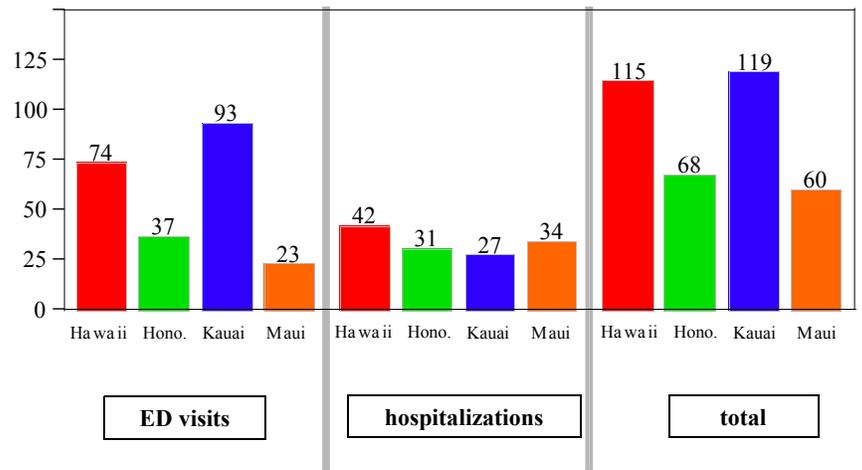


Figure 154. Age adjusted annual rates (per 100,000 residents) of nonfatal injuries from suicide attempts, by level of care and county of residence of patient, 2007-2011.

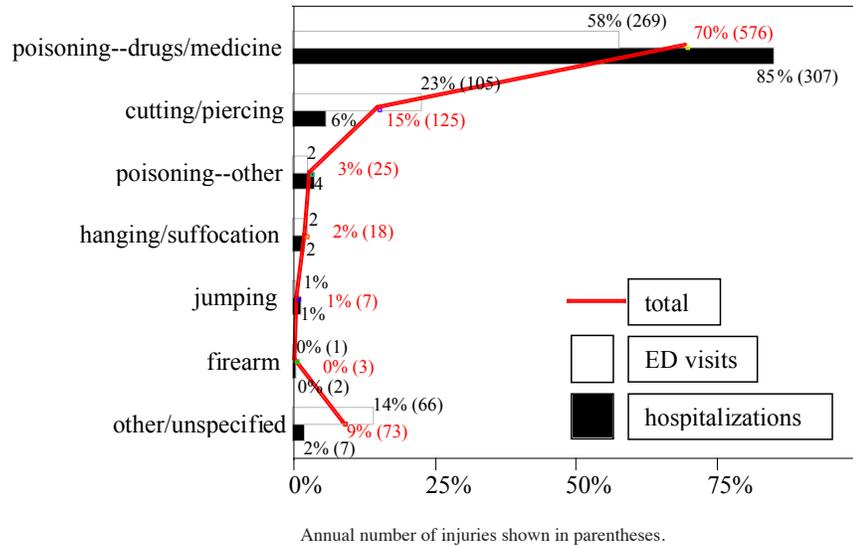


*Includes only residents aged 10 years and older.

Residents of Kauai and Hawaii counties had significantly higher rates of ED visits for nonfatal suicide attempts, compared to residents of Honolulu and Maui counties (Figure 154). The hospitalization rates were statistically comparable across counties, except for a significantly higher rate among Hawaii County residents compared to Honolulu County residents. The total rate (ED visits and hospitalizations combined) for residents of Kauai County was 75% higher than that for Oahu residents, and nearly double that for residents of Maui County. The total rate for Hawaii County residents was also significantly higher than the rates for residents of Honolulu and Maui counties, but comparable to the rate for Kauai County. These rate comparisons were complicated by injuries coded as undetermined intent, or possibly self-inflicted (see figure 172).

Fifty-eight percent of the ED visits and most (85%) of the hospitalizations were caused by poisonings from drugs or medicinal substances (Figure 155). The most common poisonings were from the “analgesics, antipyretics, and anti-rheumatics” class (22% of ED visits, 33% of hospitalizations), which includes both narcotics (heroin, and other opiates), as well as aspirin and acetaminophen. Poisonings from “tranquilizers and other psychotropic agents” were also common, accounting for 16% of the ED visits and 29% of the hospital admissions. Injuries from cutting or piercing instruments comprised 15% of the attempts overall, including 23% of those treated in EDs. Very few of these nonfatal attempts were from hangings or use of firearms, reflecting the lethality of these mechanisms. Female patients were more likely to attempt by drug or medicinal poisonings (76%, vs. 62% for male patients. There were few differences in mechanism across the county of residence of the patients.

Figure 155. Mechanism of nonfatal suicide attempts among Hawaii residents, by level of care, 2007-2011.



Patients were hospitalized for an average of nearly 5 days, so admissions constituted the bulk of days of patient care and total medical charges (Table 35). As described by mechanism, the majority (73%) of injuries were from poisonings, particularly for hospital admissions (89%). (These proportions do not exactly match those shown in Figure 124 because the former are based on E-codes, while these values are derived from diagnosis codes.) Open wounds and contusions or superficial injuries constituted most of the remaining ED visits.

Table 35. Clinical characteristics* of Hawaii residents with nonfatal injuries from suicide attempts.

	ED visits	hospitalizations	total
Length of care and financial charges			
Ave. length of stay (days)	1.0	4.6	2.6
Total number of days	466	1,661	2,127
Average charge	\$2,727	\$22,330	\$10,771
Total charges	\$1.3 million	\$8.1 million	\$9.3 million
Primary injury diagnosis			
fractures	20 (4%)	6 (2%)	27 (3%)
open wounds	99 (21%)	14 (4%)	113 (14%)
contusion/superficial	46 (10%)	0 (0%)	46 (6%)
poisonings	279 (60%)	321 (89%)	600 (73%)
other/unspecified	21 (5%)	19 (5%)	40 (5%)

*Statistics are annual averages over the 2007-2011 period.