



Department of the Navy Suicide Incident Report (DONSIR): Summary of 1999–2003 Findings

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SUMMARY

Problem: The Department of the Navy Suicide Incident Report (DONSIR) collects data on completed suicides in the Navy (USN) and Marine Corps (USMC). It provides the Department of the Navy (DON) with consistent data that can be compared across both services, and establishes baselines for suicide rates and suicide event characteristics that can be used to track trends over time. It also evaluates military-specific correlates of suicide that are not addressed in the civilian academic literature.

Objective: This is the fifth annual report on the DONSIR. The objectives are to present findings for data collection from 1999 through 2003 and to summarize the conclusions and recommendations that can be drawn based on the results.

Approach: Completion of the DONSIR is a DON requirement for every completed suicide by an active-duty member (Navy Personnel Command, 2002; U.S. Marine Corps, 2001). The Suicide Prevention Program Manager for each service forwards service-specific instructions and an electronic copy of the DONSIR to each decedent's command. Commands are to assign a point of contact to complete the report and return it within 4 weeks of receipt.

Results: Between 1999 and 2003, there were 216 completed suicides among active-duty USN personnel and 125 among active-duty USMC personnel.

Decedent Demographic Profile

- Suicide rates were significantly higher among men than among women within the USN, but not within the USMC.
- There were no significant differences in suicide rates based on age.
- For the USN, there was a trend for Native Americans to have a particularly high suicide rate. For the USMC, there were no significant differences in rates as a function of race.
- Suicide rates were lower for the DON than for the U.S. civilian population after adjusting for demographic differences. USN and USMC rates were also significantly lower ($p < .01$) than U.S. rates for men, those aged 20-24, and for White, Black, and Hispanic personnel.

Decedent Career Profile

- The suicide rate was significantly lower for officers than for enlisted personnel in the DON overall, but not in the USN and USMC considered separately ($p < .01$).

- There were no differences in suicide rates by length of service or enlisted paygrade.

Suicide Event Characteristics

- USN decedents were more likely than USMC decedents to be assigned to a ship or submarine at time of death. This difference is not surprising because ships and submarines are not typically permanent duty stations for USMC personnel.
- The modal group committed suicide at a private residence while the individual was on liberty.
- There was a marginal trend for duty status, with USMC decedents more likely than USN decedents to have been on duty at time of death.
- The most common method of suicide was the use of a firearm; USMC personnel were significantly more likely than USN personnel to have used a firearm to commit suicide.
- Decedents who were on government property at the time of suicide were more likely than were persons who died on civilian property to choose hanging as a suicide method.

Risk Factors for Suicide

- There were no significant ($p < .01$) differences by service in the total number of key suicide risk factors or recent associated stressors reported for decedents.
- The key risk factors most commonly noted were recent depression, psychiatric treatment history, recent anxiety, alcohol abuse in the previous year, and feelings of guilt or shame.
- The five most commonly noted associated stressors were problems in a primary romantic relationship, physical health problems, work issues such as poor performance, job dissatisfaction, and pending military legal or administrative action.
- Multiple key risk factors and associated stressors were common among decedents. Among nearly one third of decedents, there was evidence of 10 or more risks factors/stressors.

Recent Service Use

- USMC and USN decedents did not differ in the number of support services accessed.
- For most decedents (69%) there was no evidence of support service use in the 30 days prior to suicide.
- The most common type of service used in the 30 days prior to suicide was outpatient medical care, followed by mental health counseling and the chaplain service.

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INTRODUCTION

The Department of the Navy Suicide Incident Report (DONSIR) collects data on completed suicides in the Navy (USN) and Marine Corps (USMC) (Hourani & Hilton, 1999; Hourani, Hilton, Kennedy, & Jones, 2000; Hourani, Hilton, Kennedy, & Robbins, 2001; Jones et al., 2001; Valerie A. Stander, Hilton, Kennedy, & Gaskin, 2004; Valerie Ann Stander, Hilton, Kennedy, & Robbins, 2004). The long-term goals of this program are (1) to provide military leadership and public affairs personnel with accurate and detailed information regarding suicide trends within the Department of the Navy (DON), and (2) to improve suicide prevention by identifying and modifying military-specific risk factors for suicide. The DONSIR provides the DON with consistent data that can be compared across both the USN and the USMC. It establishes baselines for suicide rates and suicide event characteristics that can be used to track trends over time. It also evaluates military-specific correlates of suicide that are not addressed in the civilian academic literature. The DONSIR's focus on military-specific risk factors is important because military personnel are not representative of the U.S. population. Differences in gender, race, age, health, and employment may result in unique correlates of suicide among active-duty personnel. The structure of the military may also facilitate initiating policies and procedures to address risk factors that are difficult to influence among civilians.

METHODS

Instrument

The DONSIR is divided into sections covering information about the (1) point of contact (POC) assigned to complete the report, (2) demographic characteristics of the decedent and the circumstances of the suicide event, (3) military service history of the decedent, (4) health and medical history of the decedent, (5) risk factors for suicide evident within the year prior to the suicide event, and (6) recent use of support services by the decedent. It also includes sections for (7) narrative accounts of interviews with the decedent's military associates, (8) a narrative summary by the POC regarding the circumstances surrounding the suicide event, and (9) POC feedback regarding the process of completing the DONSIR (Hourani & Hilton, 1999; Hourani et al., 2000; Hourani et al., 2001). The questions in the first six sections are primarily quantitative. The final three sections are more open-ended, so that relevant stressors and chronological events preceding the suicide can be summarized in narrative form. Information from these narratives are used to clarify responses to quantitative items and to inform revisions of the DONSIR.

Procedure

Completion of the DONSIR is both a USN and a USMC requirement in the event of any completed suicide by an active-duty member (Navy Personnel Command, 2002; U.S. Marine Corps, 2001). This includes activated reservists and reservists on weekend training. It includes persons who are on unauthorized absence, but not personnel who have been declared deserters. In our last report, although DONSIRs were collected for personnel on appellate leave, those persons were not included in the active-duty suicide counts (Valerie A. Stander et al., 2004). By contrast, suicide counts in the present report do include suicides among personnel on appellate leave. Appellate leave is a period of automatic appeal and review following a court martial. Personnel on appellate leave are officially on active duty, although they are in a final leave status and are being processed out by the Navy and Marine Corps Appellate Leave Activity. Because they have been convicted through court-martial and are in the process of separating from the service, these personnel are likely to be at heightened risk for suicide.

In the event of a suicide, the Suicide Prevention Program Manager for each service forwards service-specific instructions and an electronic copy of the DONSIR to each decedent's command. The command is to assign a POC within 3 days of the Report of Casualty (USMC) or within 3 days of receipt of the DONSIR (USN). POCs are directed to complete the report within 4 weeks. Program Managers are available to answer questions throughout the process of filling out the DONSIR. POCs return the completed form to their Program Manager and are instructed to forward a copy to the Naval Health Research Center at the same time.

The primary sources for completing the DONSIR are decedents' military service and medical records (Hourani & Hilton, 1999; Hourani et al., 2000; Hourani et al., 2001; Valerie A. Stander et al., 2004). Recommended additional sources that are sometimes available include counseling records, autopsy reports, toxicology reports, investigative reports, and interviews with military personnel who were the decedents' recent associates or who participated in the casualty management process (e.g., Casualty Assistance Calls Officers). POCs are instructed not to contact decedents' civilian family members or friends. They are instructed to complete the DONSIR using the best sources available within the 4-week time frame.

Decedents

Between 1999 and 2003, 341 active-duty personnel within the DON (USN, 216; USMC, 125) committed suicide. Twelve of these (USN, 4; USMC, 8) were on appellate leave at time of death (see Table 1). DONSIRs were not received for 16 cases, for an overall data receipt rate of 95%. The Report of Casualty DD1300 required in the event of all active-duty deaths was available for all suicide decedents. Data from this form were used to supplement the DONSIR database so that information regarding demographics, military status, and the nature of the suicide act was complete for all decedents.

Table 1. Suicides in the Navy and the Marine Corps, 1999–2003

Year	Navy		Marine Corps	
	Men	Women	Men	Women
1999				
Active duty	38	2	23	2
Appellate leave	-	-	1	-
Total	38	2	24	2
2000				
Active duty	41	2	20	2
Appellate leave	-	-	2	-
Total	41	2	22	2
2001				
Active duty	39	-	27	-
Appellate leave	1	-	1	-
Total	40	-	28	-
2002				
Active duty	41	2	22	-
Appellate leave	2	1	-	-
Total	43	3	22	-
2003				
Active duty	44	3	20	1
Appellate leave	-	-	4	-
Total	44	3	24	1
Grand total	206	10	120	5

Computation of Rates and Analytic Strategy

SPSS statistical software (rel. 12.0.2) was primarily used in the data management and analyses for this report. Analyses not supported by this software package were programmed using Microsoft Excel (rel. 11.6355.6408). Because of the large number of analyses conducted, associations were considered statistically significant only if they attained significance at $p < .01$. Associations significant at $p < .05$ are reported as nonsignificant trends.

We conducted t tests for independent means and chi-square tests of association in order to compare the characteristics of DON suicide decedents across the USN and USMC and to compare DON decedents by calendar year. We used a Poisson process model to test differences in suicide rates among different demographic subgroups within services. In cases where there were only two groups to be compared, (i.e., gender) a binomial test was conducted (Fleiss, Levin, & Paik, 2003). Significance was based on the binomial likelihood of observing the number of suicides that occurred in the smaller subgroup (e.g., women) out of the total number of suicides, given the proportion of the total population constituted by that smaller subgroup. In instances where there were more than two subgroups to be compared (i.e., race), the multinomial model applies and a goodness-of-fit test was used to determine significant differences among rates (Larsen & Marx, 2001). Goodness-of-fit tests were calculated as:

Total population size: N

Total suicide deaths: D

Number of subgroups: M

Suicide deaths for i^{th} subgroup: o_i

Population count for i^{th} subgroup: n_i

Proportion parameter for i^{th} subgroup: $p_i = n_i/N$

Expected count for i^{th} subgroup: $e_i = Dp_i$

Chi-square statistic: $\chi^2 = \sum (o_i - e_i)^2 / e_i$

Degrees of freedom for χ^2 : $df = M - 1$

Crude suicide rates are expressed as number of suicides per 100,000 people per year in the relevant population (USN, USMC, DON, or U.S. civilian). Comparing rates across different populations is problematic if they differ markedly in demographic composition. For example, the DON population includes a much higher proportion of men than does the U.S. civilian population, and men are more likely than women to commit suicide. To address this issue, we

directly standardized U.S. civilian suicide rates for DON demographics. These standardized rates estimate the suicide rate among civilians if they had the same demographics as the total DON (or the USN or USMC) in terms of age, sex, and race/ethnicity (White, Black, Asian/Pacific Islander, American Indian/Alaskan Native, Hispanic).

To directly compare suicide rates across demographically disparate groups, we also used standardized mortality ratios (SMRs). SMRs are calculated as the total observed number of suicides (d) in study population A divided by the expected number of suicides if A had the same suicide rates (R_i) observed in standard population B for all demographic subpopulations. Alternatively, an SMR can be conceptualized as the crude suicide rate for population A divided by the directly standardized rate for population B, adjusted using the subpopulation counts (n_i) from study population A. For this report, the following formulas were used to calculate crude and standardized suicide rates, SMRs, and the upper and lower 99% confidence interval limits (CI_U - CI_L) for SMRs (Julious, Nicholl, & George, 2001; Ulm, 1990):

$$\text{Crude rate: } \frac{d}{\sum n_i}$$

$$\text{Standardized rate: } \frac{\sum n_i R_i}{\sum n_i}$$

$$\text{SMR: } \frac{d}{\sum n_i R_i}$$

$$CI_L: \frac{\chi^2}{2 \sum n_i R_i} \text{ where } P(\chi^2_{df=2d}) = .995$$

$$CI_U: \frac{\chi^2}{2 \sum n_i R_i} \text{ where } P(\chi^2_{df=2[d+1]}) = .005$$

An SMR greater than 1.00 indicates that the observed rate for study population A (in the numerator) is larger than would be expected based on the rates for standard population B (in the denominator). Conversely, an SMR less than 1.00 shows that the observed rate for population A is smaller than expected, given the rates for B. If the confidence interval for an SMR does not include 1.00, one can conclude that after taking demographics into consideration, rates for populations A and B are significantly different. Finally, an SMR multiplied by 100 can be interpreted as a percentage. It is the percentage of the suicides expected in the study population that were actually observed.

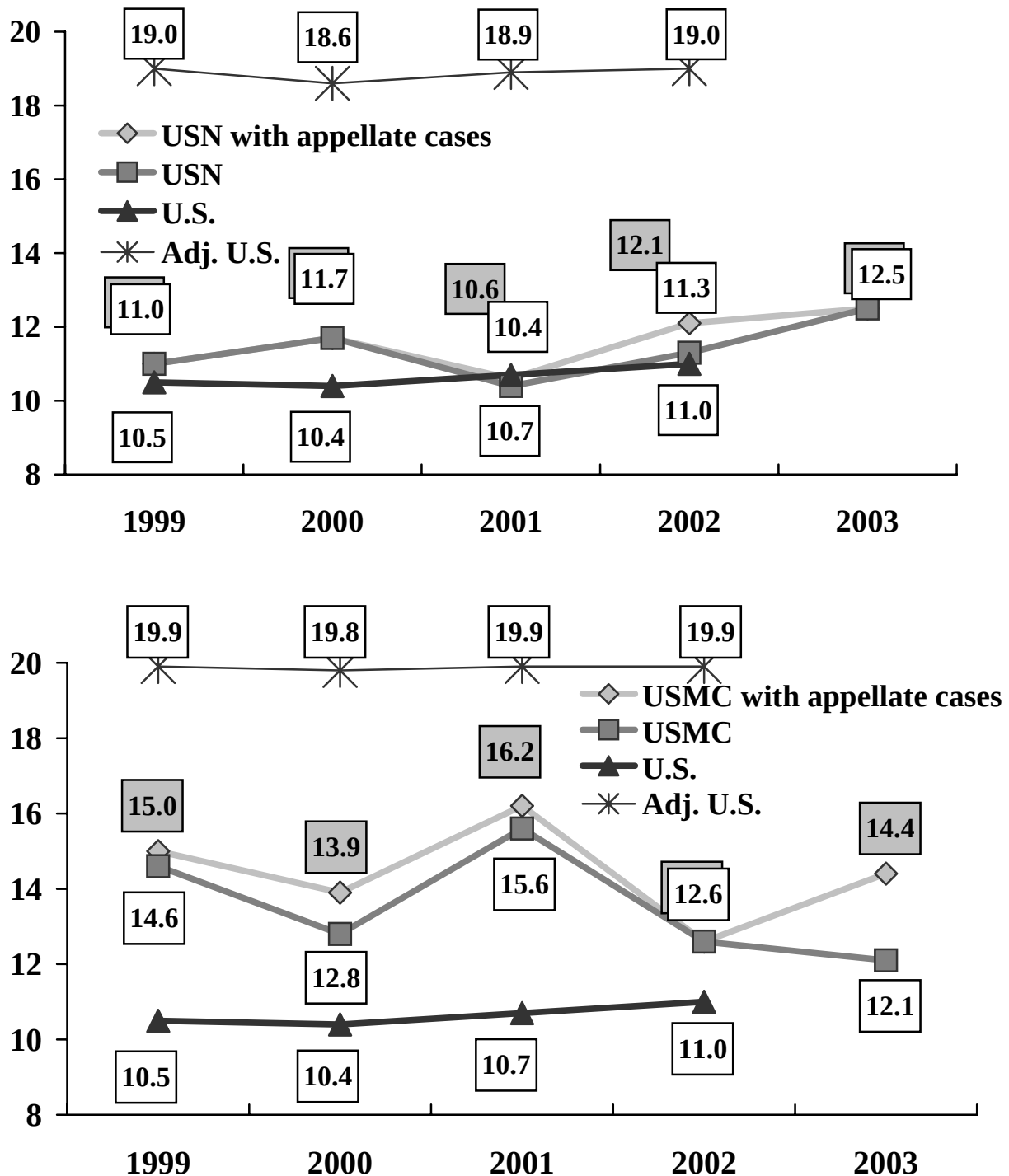
RESULTS

Suicide Rates

Across the 5-year data collection period (1999–2003), the overall suicide rate for the DON was 12.0 per 100,000 if suicides during appellate leave were included and 11.5 if they were excluded (for USN, 11.2 with appellate leave and 11.0 without appellate leave; for USMC, 13.6 with appellate leave and 12.8 without appellate leave). The suicide rate for the U.S. civilian population from 1999 to 2002 was 10.7 (no information was available for 2003 at the time of this report's preparation). As noted previously, however, the civilian and DON rates are not directly comparable because of differences in demographic composition. The 1999-2002 adjusted suicide rate for the U.S. civilian population, assuming that it had the same demographic characteristics as the total DON, was 19.2 per 100,000 (U.S. rate adjusted for USMC demographics: 19.9; U.S. rate adjusted for USN demographics: 18.8). In Appendix Table A, SMRs comparing the U.S. with the DON suicide rates (including appellate cases) suggest that the USN rate was 40% below the standardized U.S. rate and the USMC rate was 32% lower than the civilian rate. These differences were statistically significant for both services, $p < .01$. Thus, the DON suicide rate is lower than the suicide rate among demographically comparable U.S. civilians.

More USMC than USN decedents committed suicide while on appellate leave. However, there are regularly more personnel on appellate leave from the USMC than from the USN. The suicide rate among individuals on appellate leave (using total personnel on appellate leave at the end of each calendar year as a denominator) is estimated to be an extremely high 119.7 per 100,000 (USN, 122.4; USMC, 118.4). However, because the total number of personnel on appellate leave is quite small, these rates are difficult to accurately estimate. There were no significant differences between the rates for the two services.

Figure 1 shows USN and USMC suicide rates by year, both including and excluding personnel on appellate leave. The figure also includes crude suicide rates for the U.S. civilian population, as well as U.S. civilian rates adjusted for DON demographics.

Figure 1. Navy^a, Marine Corps^b, and U.S. Population^c Suicides Rates, 1999–2003

Note. ^aBehavioral Health Section, Navy Personnel Command, PERS 601. ^bPrevention and Intervention Section, Marine Corps Community Services, Headquarters, USMC. ^cNational Center for Injury Prevention & Control (2004). Standardized U.S. suicide rates are adjusted for DON demographics (race, sex, and age).

Decedent Demographic Profile

Table 2 lists suicide rates in the USN and USMC as a function of the gender, age, and race of decedents. For comparison, suicide rates are also shown for the U.S. civilian population. Appendix Figures A1 to A3 compare the demographic characteristics of decedents with those of the USN and USMC populations as a whole.

The crude rate of suicide across the 5-year study period (1999–2003) has been significantly higher among men than among women for USN decedents, $p < .001$. This finding is consistent with civilian suicide characteristics. Gender differences in rates for USMC decedents did not reach significance. The USMC suicide rate for women is lower than the rate for men, but the observed count for women is too low to provide sufficient statistical power to reliably evaluate the difference. Alternatively, gender differences in the USMC may not be as profound as in the Navy or in the U.S. civilian population. Continued data collection will help to discriminate between these two possibilities.

There were no significant differences in crude suicide rates by age group. Results for race were more complex. In previous annual DONSIR reports, only three race groups (White, Black, Other) have been specified and there have been no significant differences in suicide rates as a function of race. The present report includes five race/ethnic groups (White, Black, Asian/Pacific Islander, Native American, Other/Unknown). Considering all of these groups, within the USN there was a trend toward a difference in crude suicide rates by race, $p < .05$. This was largely due to the fairly high suicide rate among Native Americans. There was no significant difference by race for the USMC. In the USN, the pattern of racial differences in suicide rates was similar to the pattern in the U.S. civilian population. In the USMC, the pattern of rates by race was less similar to the pattern among civilians.

In addition to crude suicide rates, Table 2 shows standardized figures for all rates using the total DON as the standard population. These figures facilitate comparison across demographic subgroup as well as the USN versus USMC and military versus civilian populations. They estimate what the suicide rates would be for all subgroups if they had the same gender, age, and race/ethnic composition. However, it should be noted that standardized rates are hypothetical and do not provide an indication of the real size of the problem of suicide within a population. Furthermore, particularly within the two military populations, they are susceptible to unstable fluctuations in rates due to small counts in population subgroups. Despite this, the

standardized rates for USN and USMC are generally similar to the crude rates. Additionally, standardized rates for the U.S. are generally higher than either crude or standardized rates for each of the services. The few exceptions where military rates exceed standardized U.S. rates occur for USMC women, USN and USMC Asian/Pacific Islanders, and USN Native American personnel.

In order to more formally test for significant subgroup differences, we computed SMRs for each subgroup. Appendix Table A lists these ratios, which compare USN and USMC crude suicide rates (numerator) with U.S. subgroup rates standardized for the demographics of each service (denominator). As can be seen in the table, almost all of the ratios are fractional, indicating that military rates are lower than U.S. rates. Bolded figures indicate where the U.S. and military rates significantly differ, as evidenced by confidence intervals that do not include 1.00. We noted earlier that the overall rates for the USN and USMC were lower than would be expected given the U.S. population rates. Furthermore, rates in the USN were significantly lower than rates among U.S. civilians for the following subgroups: men, personnel aged 20–44 years, and White, Black, Asian/Pacific Islander, and Hispanic personnel. Rates in the USMC were significantly lower than rates in the U.S. civilian population for men, personnel aged 20–24 years, and White, Black, and Hispanic personnel.

There were only three instances in which the SMR exceeded 1.00, indicating higher subgroup rates in the military than among U.S. civilians. This occurred for USN Native American personnel, for women in the USMC, and for Asian/Pacific Islander personnel in the USMC. In none of these cases was the SMR statistically significant. Moreover, these are very small groups in the DON; rates are consequently likely to be unstable because they are estimated based on very few suicides.

In addition to comparing DON and civilian suicide rates, we computed SMRs to compare the USMC with the USN. In this case we computed ratios with USMC observed suicides as the numerator and the expected deaths given USN rates and USMC population proportions in the denominator. In 10 out of 14 subgroup comparisons, and for the services as a whole, the SMR was larger than 1.00. This pattern suggests that rates may generally be higher in the USMC than in the USN. However, none of the SMRs were statistically significant, indicating there were no reliable differences between the two services in subgroup suicide rates. This was the case

whether the analyses were done including or excluding personnel on appellate leave. Continued data collection will help to determine whether the observed group differences are reliable.

Table 2. USN, USMC, and U.S. 5-Year Suicide Rates (1999–2003) by Demographic Group

	^a USN		^a USMC		^b U.S. Population	
Demographic Group	Crude	Std ^c	Crude	Std ^c	Crude	Std ^c
Total	11.2	11.5	13.6	14.1	10.7	19.2
Gender						
Male	12.4	12.5	13.9	14.4	17.5	21.1
Female	3.6	4.2	9.0	12.9	4.1	4.3
Age in years						
17-19	11.9	12.1	12.1	10.0	9.6	14.6
20-24	11.4	11.8	13.8	13.9	12.3	19.6
25-34	9.8	10.3	14.1	14.2	12.6	19.2
35-44	12.3	14.0	15.7	19.7	14.7	20.4
45-54	13.4	16.9	0.0	0.0	14.8	19.5
Race/Ethnicity						
White	12.4	12.7	14.7	15.3	12.9	22.0
Black	8.7	8.8	12.0	10.6	5.4	14.8
Asian/Pac Island	8.7	10.2	26.4	29.7	5.4	9.5
Native American	25.5	38.1	12.0	7.9	12.5	32.8
Hispanic	7.9	7.8	6.7	4.7	5.0	10.3
Other/Unknown	0.0	0.0	19.0	16.0	NA	NA
Military status						
Officer	7.2	7.6	9.3	7.6	NA	NA
Enlisted	11.8	12.2	14.1	15.2	NA	NA

Note. ^aMilitary figures are calculated using endstrengths from personnel data (Gunderson, Miller, & Garland, 2002). ^bU.S. data are for 1999 to 2002 (National Center for Injury Prevention and Control, 2004); 2003 U.S. rates by subpopulation were not available at the time this report was prepared. ^cRates are standardized using total DON population proportions for gender, age, and race/ethnicity; USN and USMC rates are also standardized for military officer/enlisted status. NA = not applicable.

Decedent Career Profile

The 1999–2003 DON suicide rate for officers (7.7) was lower ($p < .01$) than the rate for enlisted personnel (12.6; USN, officer = 7.2, enlisted = 11.8; USMC, officer = 9.3, enlisted = 14.1). Separately by service, significance tests only reached $p < .05$ for the USN and were not significant for the USMC. However, the pattern was consistent across services and has been stable over time. Continued data collection will help to verify whether this effect is stable and significant. There were no differences in suicide rates by length of service or enlisted paygrade.

Figure 2. Officer/Enlisted Status of DON Suicide Decedents, 1999–2003

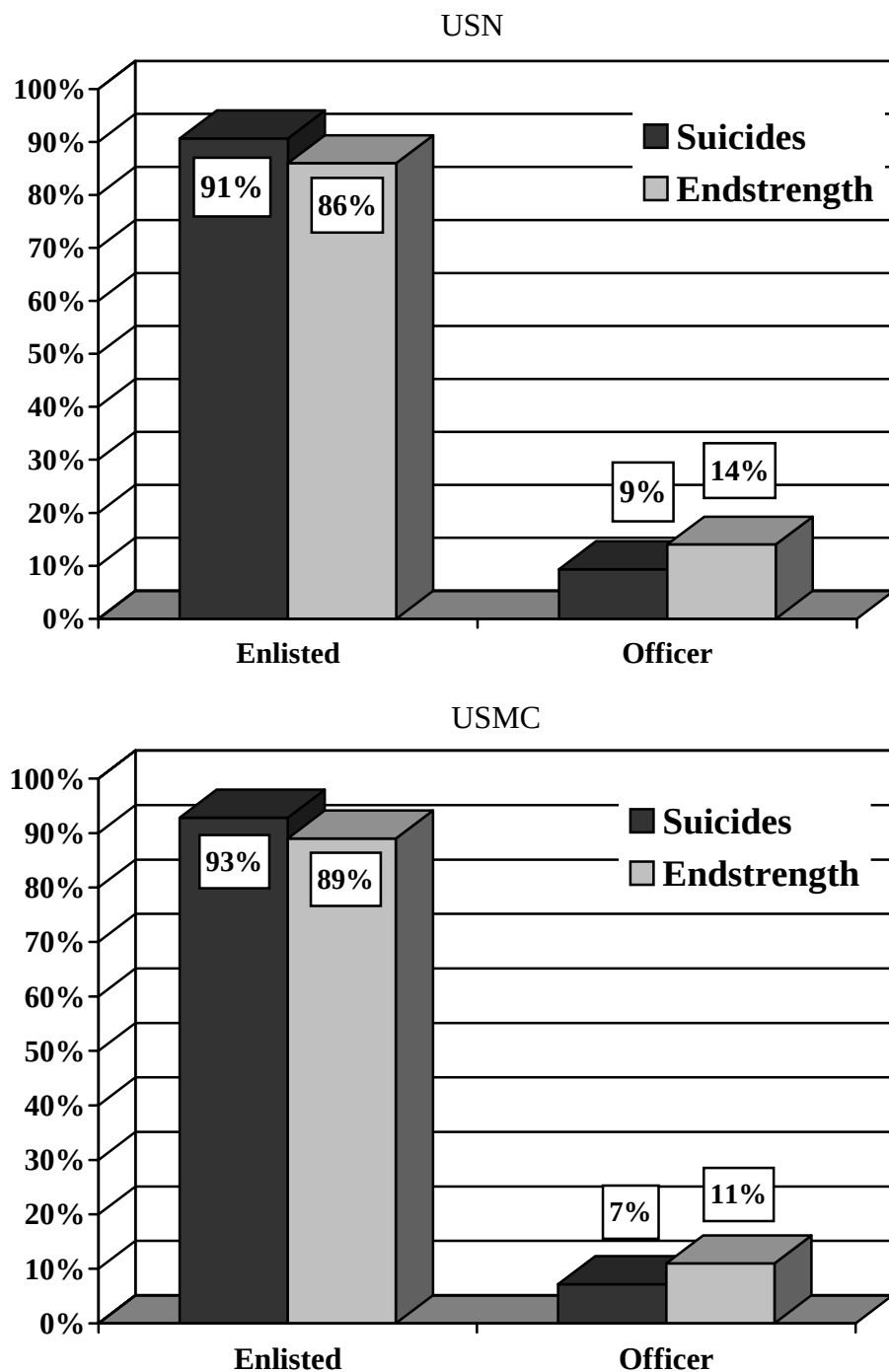


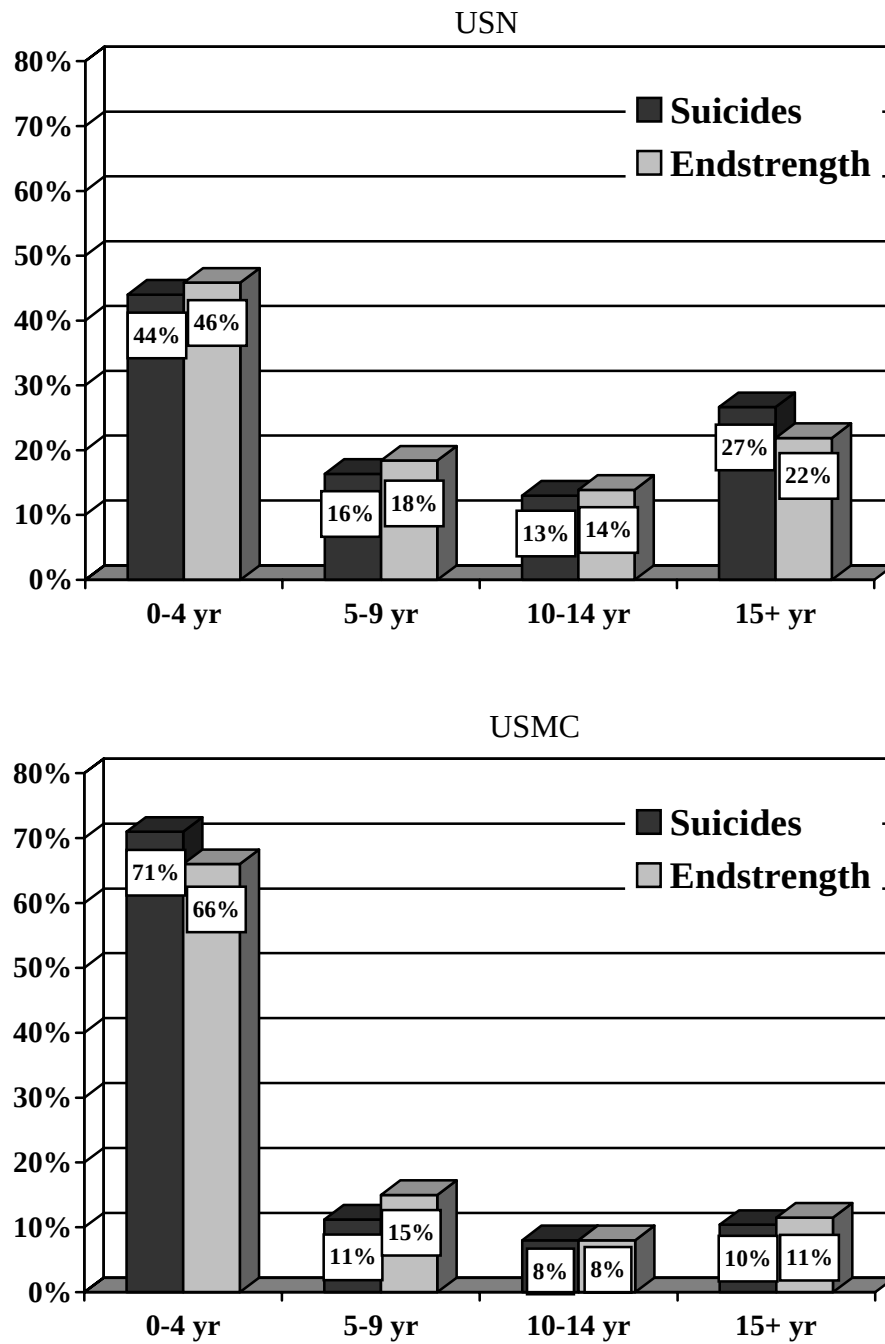
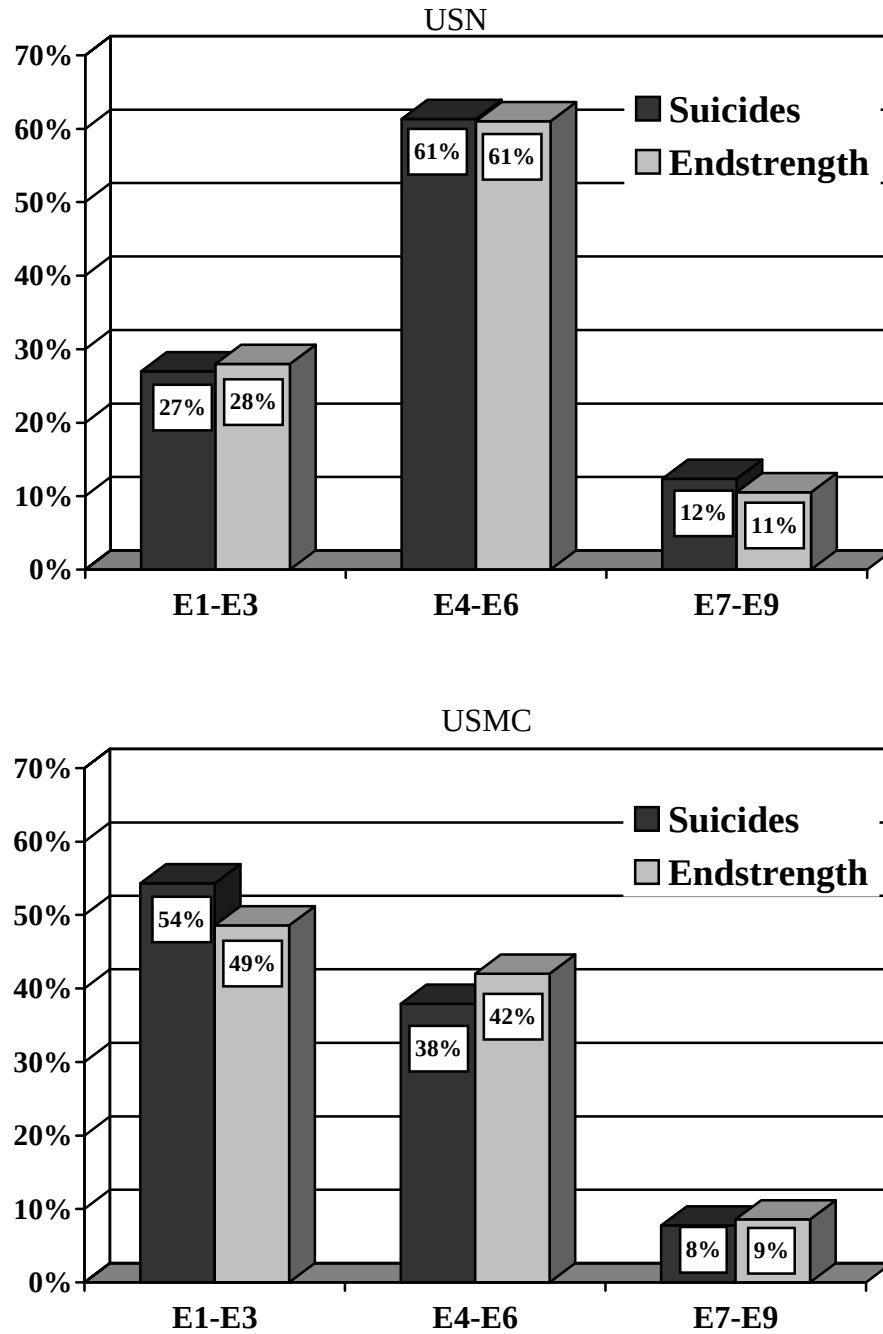
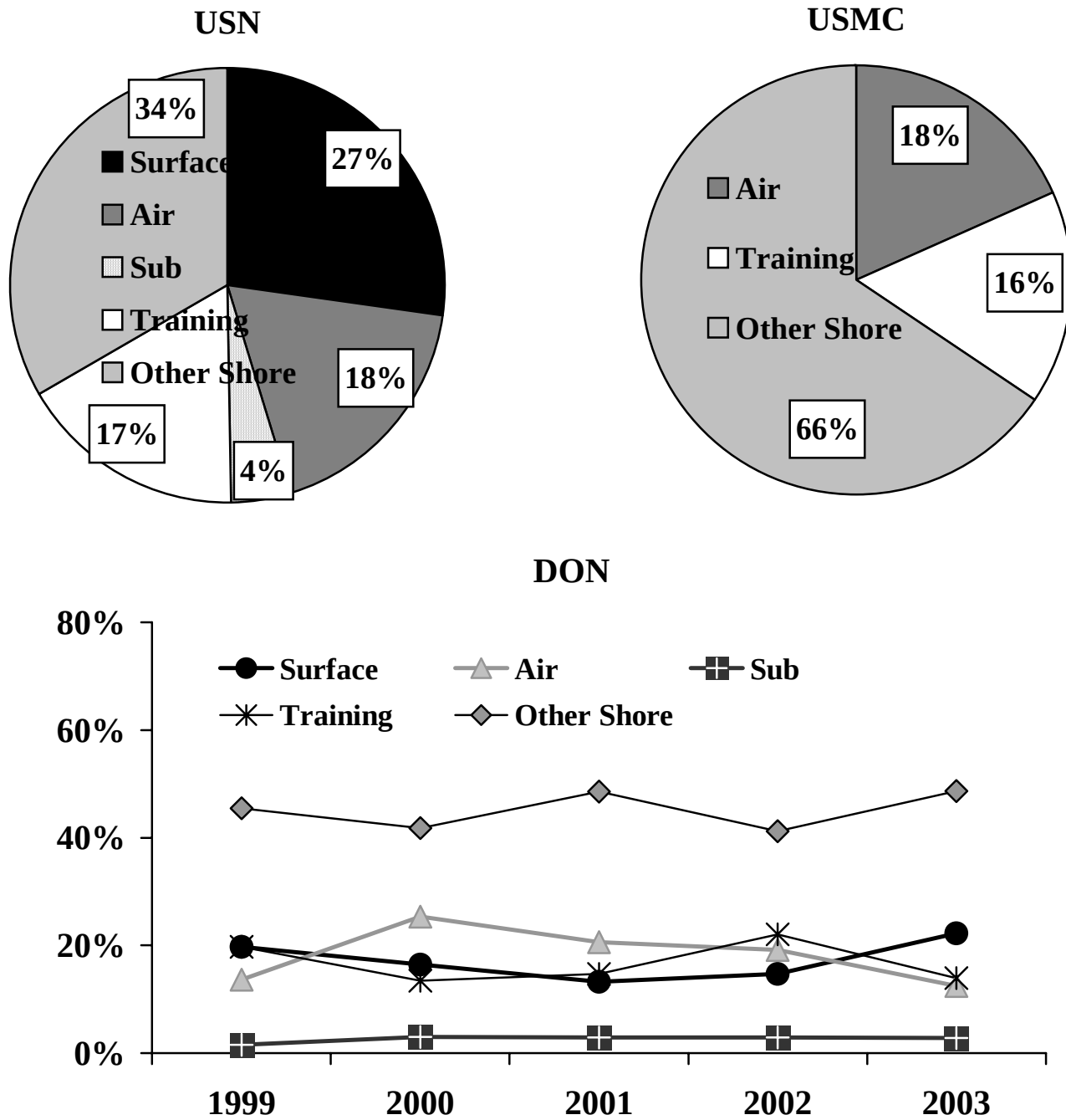
Figure 3. Years of Service at Time of Suicide, 1999–2003

Figure 4. Paygrade of Enlisted DON Suicide Decedents, 1999–2003



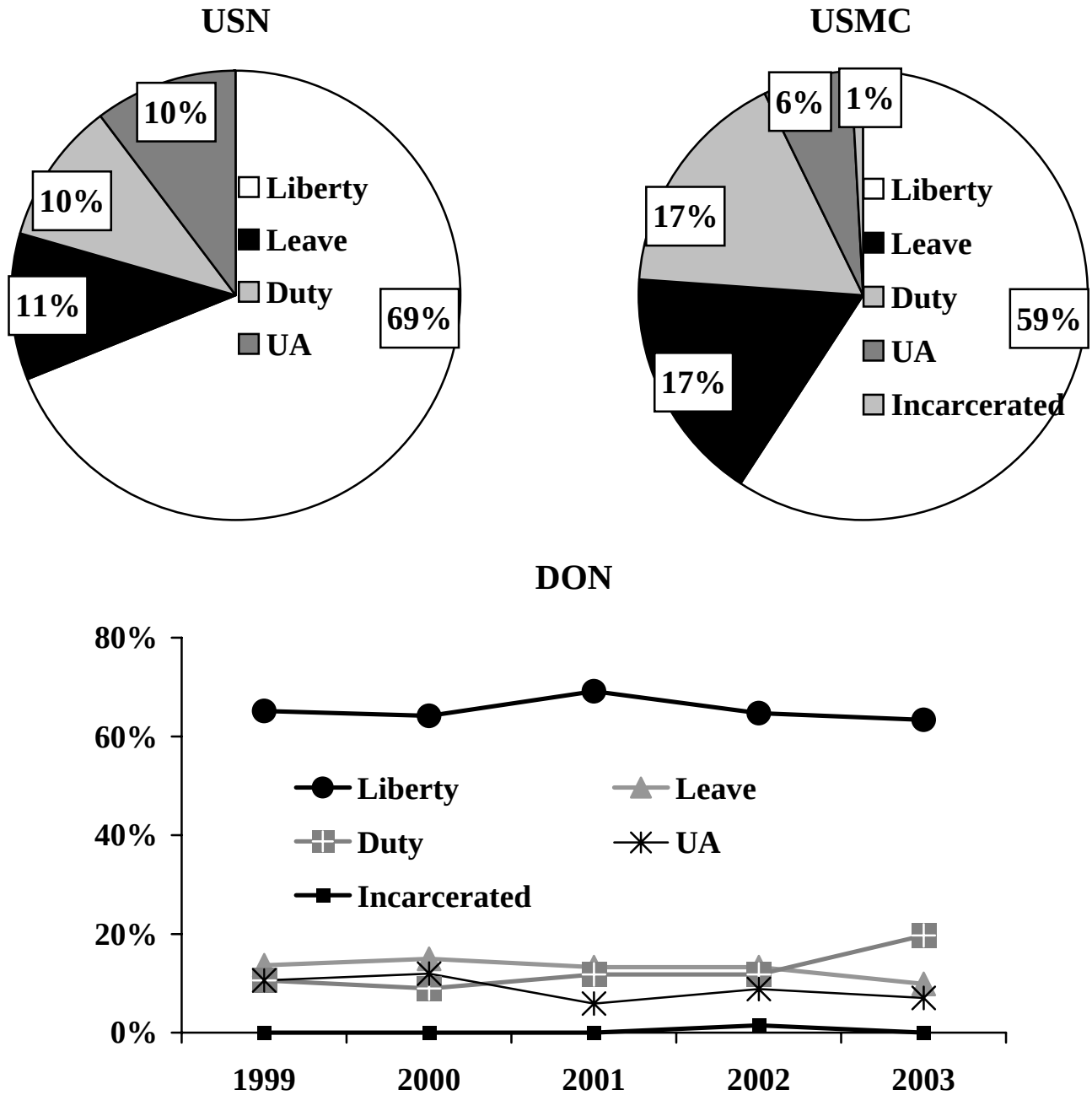
Suicide Event Characteristics

Figures 5 through 9 describe characteristics of completed suicides within the DON from 1999–2003. Sample size varies due to missing data, as indicated for each figure.

Figure 5. Decedents' Command Type at Time of Suicide, 1999–2003 ($N = 341$)

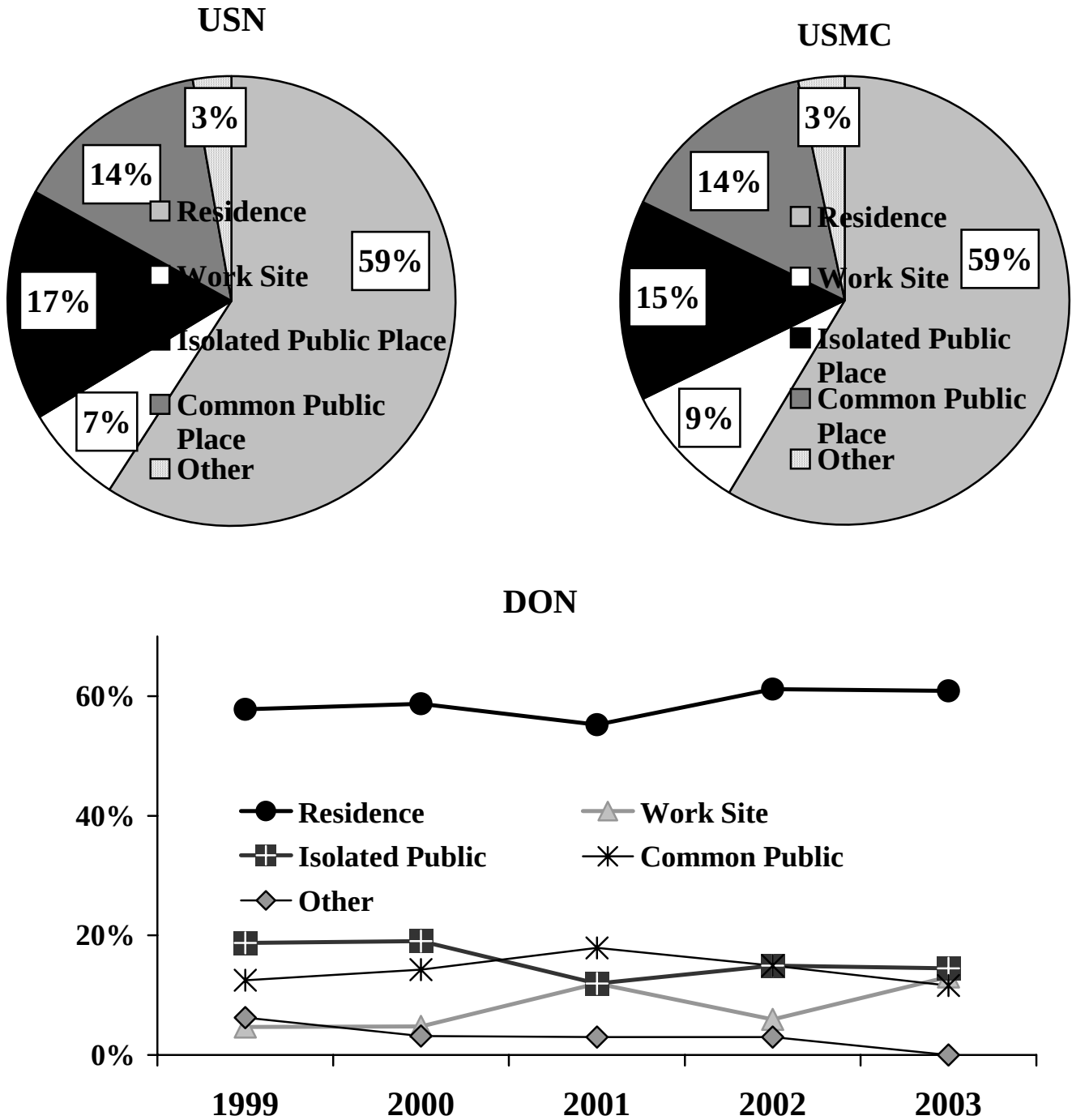
Shore commands were most common among decedents. There was a significant service difference ($p < .001$) in the type of command to which decedents were assigned. However, this was due to the fact that ships and submarines are not a permanent duty assignment for USMC personnel as they are in the USN. Decedents' command types did not vary by calendar year.

Figure 6. Decedents' Duty Status at Time of Suicide, 1999–2003 ($N = 340$)



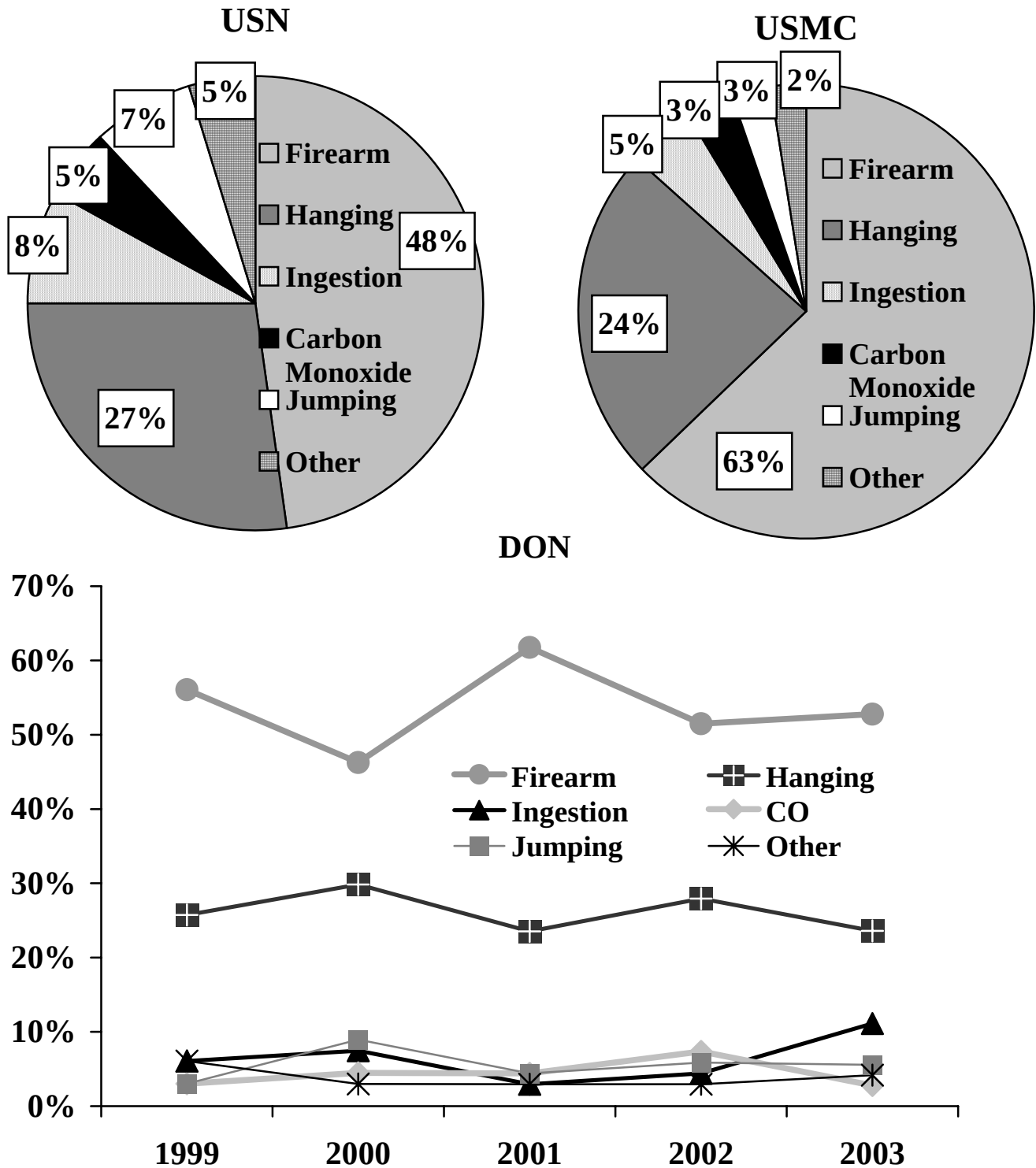
At the time of suicide, most DON decedents were on liberty (see Figure 6). There were no significant differences by year in duty status at time of death. However, there was a trend ($p = .058$) for a difference in duty status by service. USMC decedents were somewhat more often on duty at time of death. However, this is the only DONSIR report in which this pattern has been noted and the trend is weak.

Figure 7. Location of Suicide Event, 1999–2003 ($N = 330$)



Most often, decedents chose to commit suicide in their own or someone else's private residence (see Figure 7). There were no significant differences in decedents' choice of suicide site by service or calendar year.

Figure 8. Method of Suicide, 1999–2003 (*N* = 341)



The most common method of suicide was the use of a firearm, followed by hanging. Together, these two methods accounted for 87% of USMC suicides and 75% of USN suicides

(see Figure 8). Fewer USN decedents than USMC decedents used a firearm to commit suicide ($p < .01$). Decedents who were aboard ships or on other government property at the time of their suicide were less likely to have used a firearm and more likely to have chosen hanging (see Table 3, $p < .001$), perhaps because access to firearms is restricted on military property. But even among those who chose to commit suicide on government property, there was a trend for USMC personnel to be more likely than USN personnel to use a gun ($p < .05$). There were also marginal associations between using a gun to commit suicide and both military firearm training and access ($p < .05$; see Table 4). Those who chose to use a firearm were more likely to have had some training with weapons and to have access to a military weapon. This relationship was probably weakened by the fact that data on firearm access and training were not available for 1999. Despite this pattern, only 10.4% of the guns used by DON personnel to commit suicide were military weapons.

Firearm use was not significantly related to gender, age, race, officer/enlisted status, education level, or marital status. There was a marginal relationship between enlisted paygrade and firearm use ($p < .05$); a smaller percentage of junior enlisted (E1 to E3; 43%) than more-senior enlisted personnel (58%) used a firearm.

Table 3. Method of Suicide by Military vs. Nonmilitary Location of Suicide

Location	Method		
	Firearm	Hanging	Other
Nonmilitary	63%	17%	20%
Military	35%	45%	20%

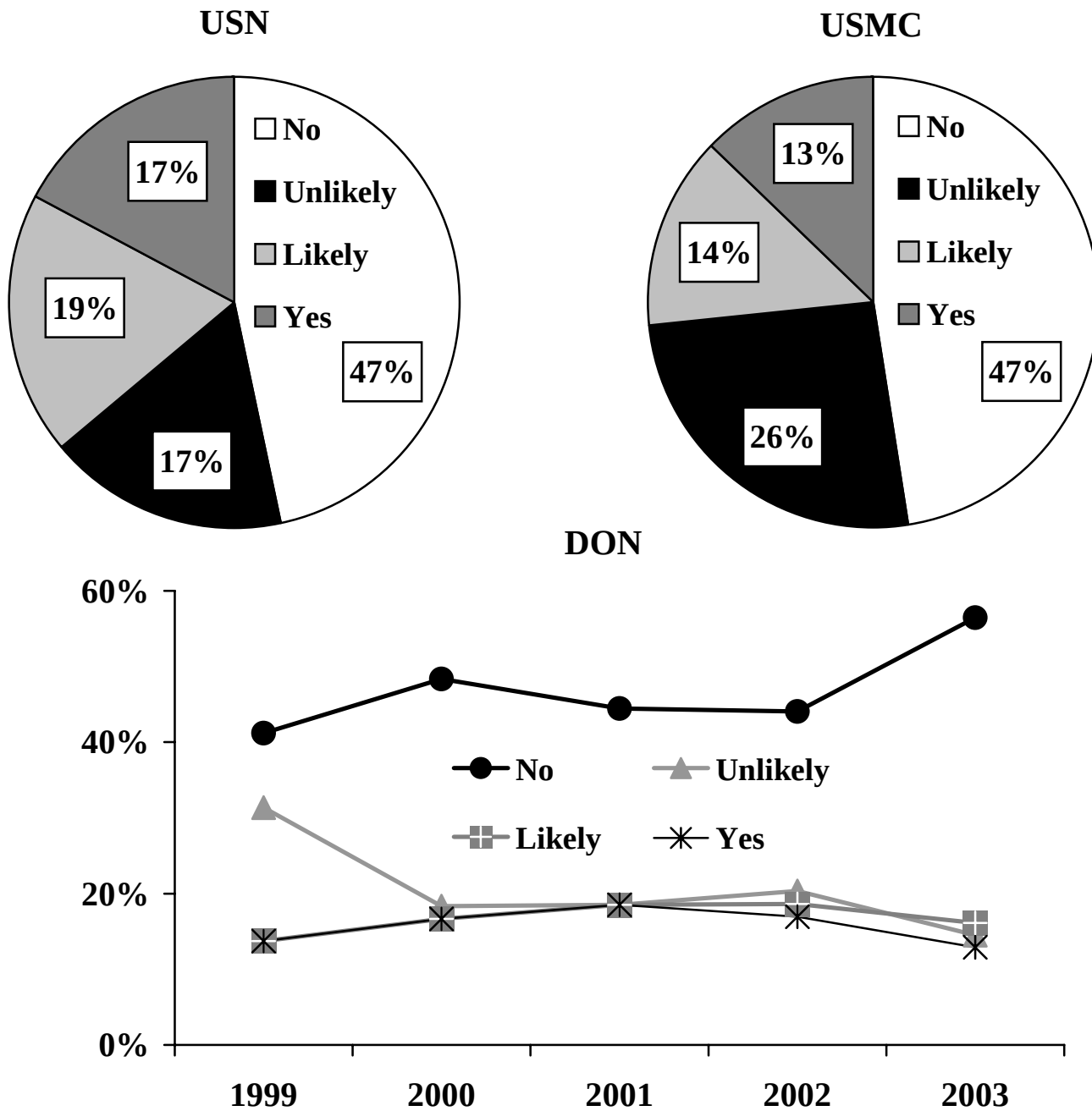
Note. $N = 341$.

Table 4. Method of Suicide by Access to and Training With Military Weapons

Method	Access		Training	
	Yes	No	Yes	No
Gun	66%	52%	66%	50%
Other	34%	48%	34%	50%

Note. $N = 224$ –229.

Figure 9. Use of Alcohol at Time of Suicide, 1999–2003 ($n = 286$)



In general, POCs reported that decedents were not drinking alcohol at the time of suicide or that it was unlikely alcohol was involved (USN, 64%; USMC, 73%). There were no differences in reports of alcohol use at time of suicide by service or calendar year (see Figure 9).

Risk Factors for Suicide

The DONSIR asks POCs if there is any evidence that decedents had experienced a number of specific problems that might have precipitated their choice to commit suicide. These include 26 key risk factors and 14 possible associated stressors.

Key Risk Factors. The 26 key risk factors for suicide assessed by the DONSIR can be summarized in four categories: (a) mental health history, (b) recent emotional state, (c) recent change in affect or behavior, and (d) self-destructive or aggressive behavior (see Appendix Table B). On average, POCs found evidence of 4 to 5 ($M = 4.42$) key risk factors. The key risks most commonly noted were recent depression, a history of psychiatric treatment, recent anxiety, alcohol abuse within the previous year, and recent feelings of guilt or shame (see Figure 10). The average number of key risk factors reported did not significantly differ by service (USN, $M = 4.53$; USMC, $M = 4.17$). There was only one significant service difference in key risk factors, $p < .01$. POCs reported more alcohol problems for USN than for USMC decedents. They also tended to report more feelings of loneliness for USN than USMC decedents, $p < .05$.

Associated Stressors. The 14 associated stressors explored by the DONSIR are contextual problems that may have led to suicide, such as relationship problems, legal or disciplinary difficulties, and work-related problems (see Appendix Table C). On average, POCs noted about three contextual stressors for each decedent ($M = 3.10$). The five most commonly reported associated stressors were problems in a primary romantic relationship, physical health problems, work issues such as poor performance, job dissatisfaction, and recent military legal or administrative action (see Figure 11). The number of associated stressors indicated per decedent did not differ by service (USN, $M = 3.19$; USMC, $M = 2.95$) nor did the prevalence of any specific stressor differ by service at $p < .01$. However, there was a trend for POCs to report more problems with domestic violence for Navy (10%) than for USMC (4%) decedents ($p < .05$).

The number of key risk factors and the number of associated stressors reported were significantly correlated ($r = .44$, $p < .001$). Those with the most key risks tended to have the most associated stressors. Table 5 and Figure 12 illustrate this relationship and also highlight the level of skewness in the distribution. It is possible that this relationship is spurious, due to the fact that POCs who were conscientious found both more key risk factors and associated stressors, while those who spent little time found few of either. Considering both types of factors together, POCs noted 10 or more indicators for suicide among almost one third (31%) of decedents.

Figure 10. Most Common Key Risk Factors for Suicide Reported for DON Decedents, 1999–2003

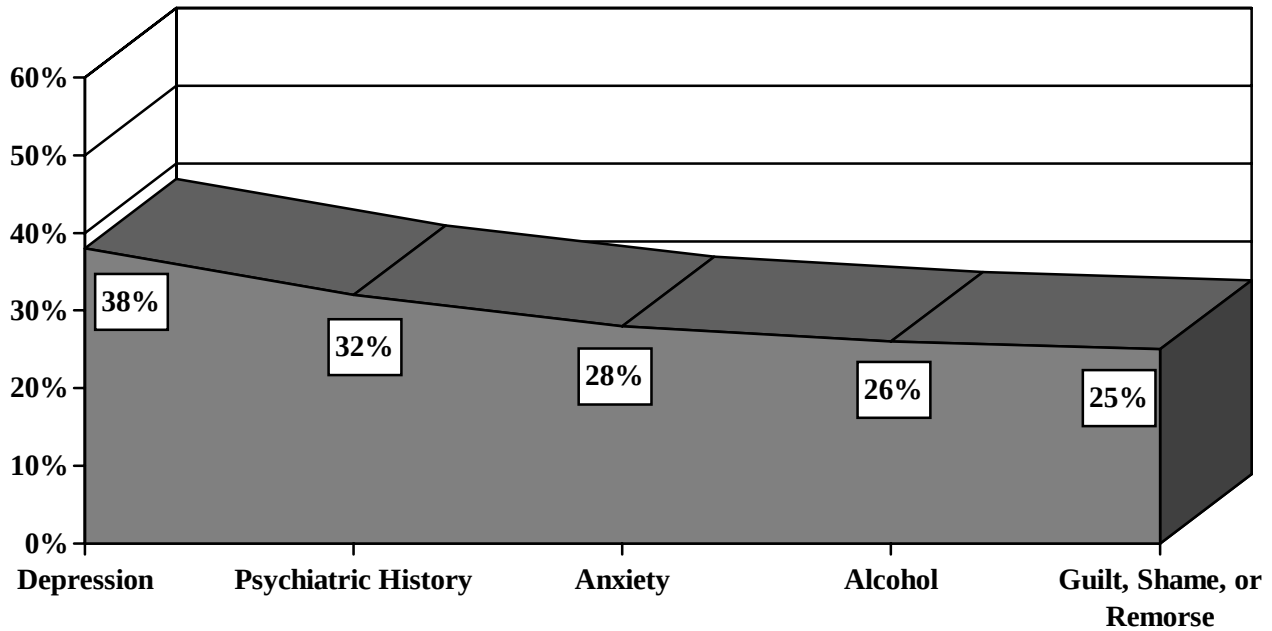


Figure 11. Most Common Associated Stressors Reported for DON Decedents, 1999–2003

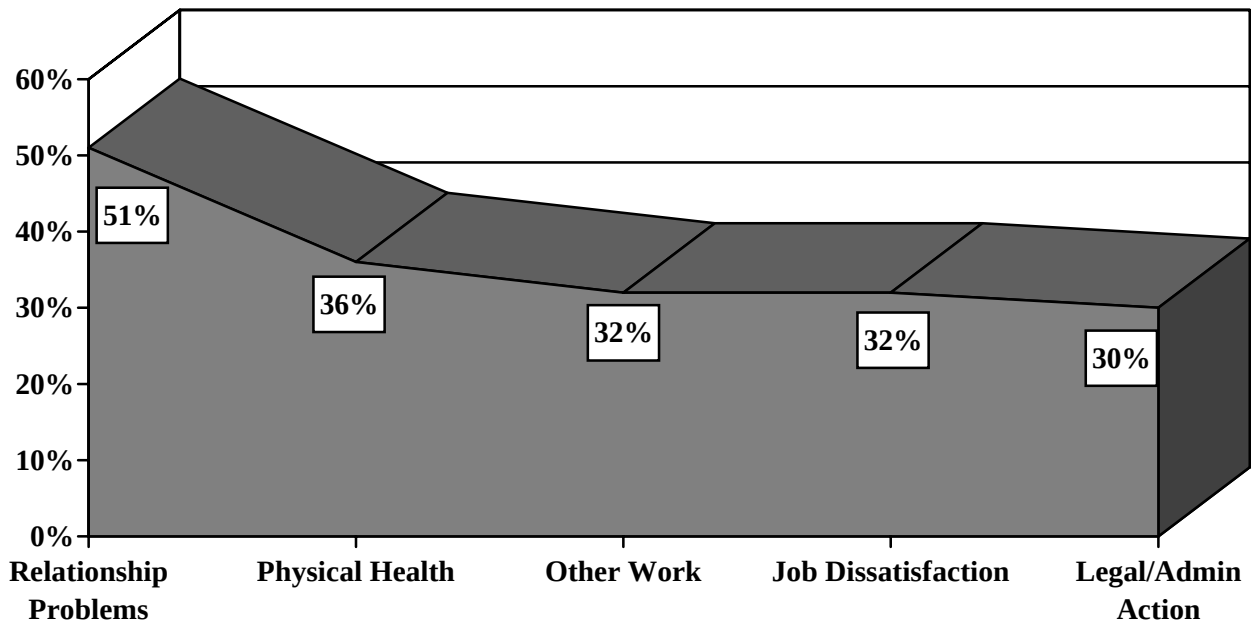
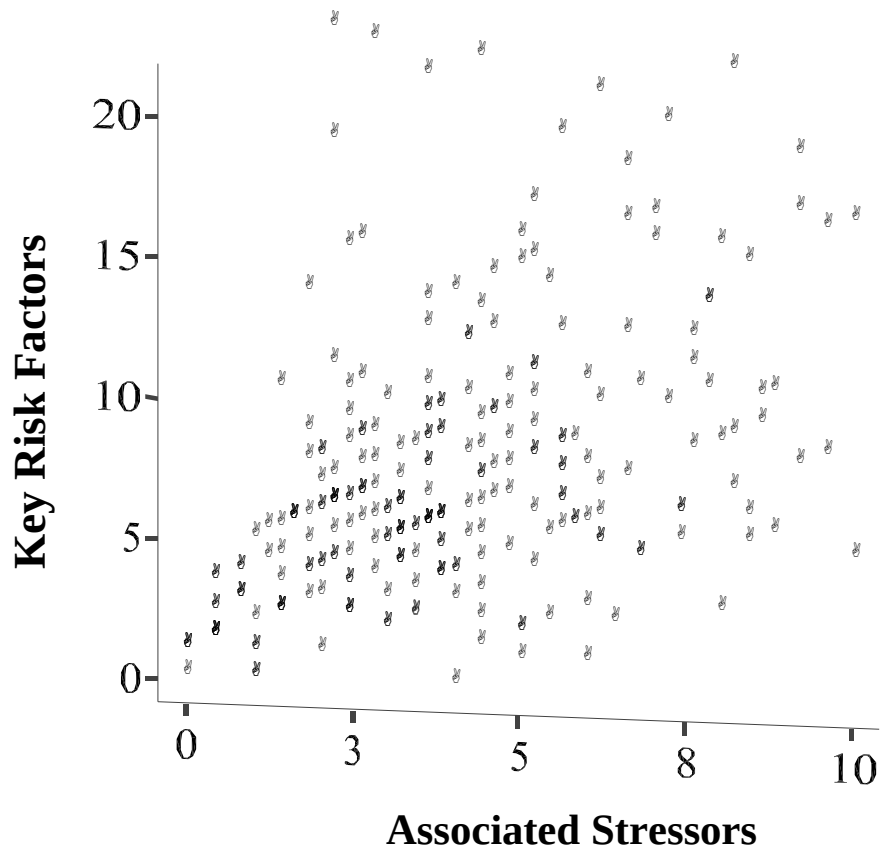


Table 5. Most Common Key Risk Factors for Suicide Reported for DON Decedents, 1999–2003

Stressors	Key Risk Factors				
	None	1 to 2	3 to 4	5 to 6	7 plus
None	15 (5%)	10 (4%)	0 (0%)	0 (0%)	0 (0%)
1 to 2	19 (7%)	44 (16%)	18 (6%)	10 (4%)	18 (6%)
3 to 4	7 (2%)	20 (7%)	23 (8%)	10 (4%)	24 (8%)
5 to 6	0 (0%)	14 (5%)	3 (1%)	3 (1%)	15 (5%)
7 plus	0 (0%)	1 (<1%)	8 (3%)	5 (2%)	16 (6%)

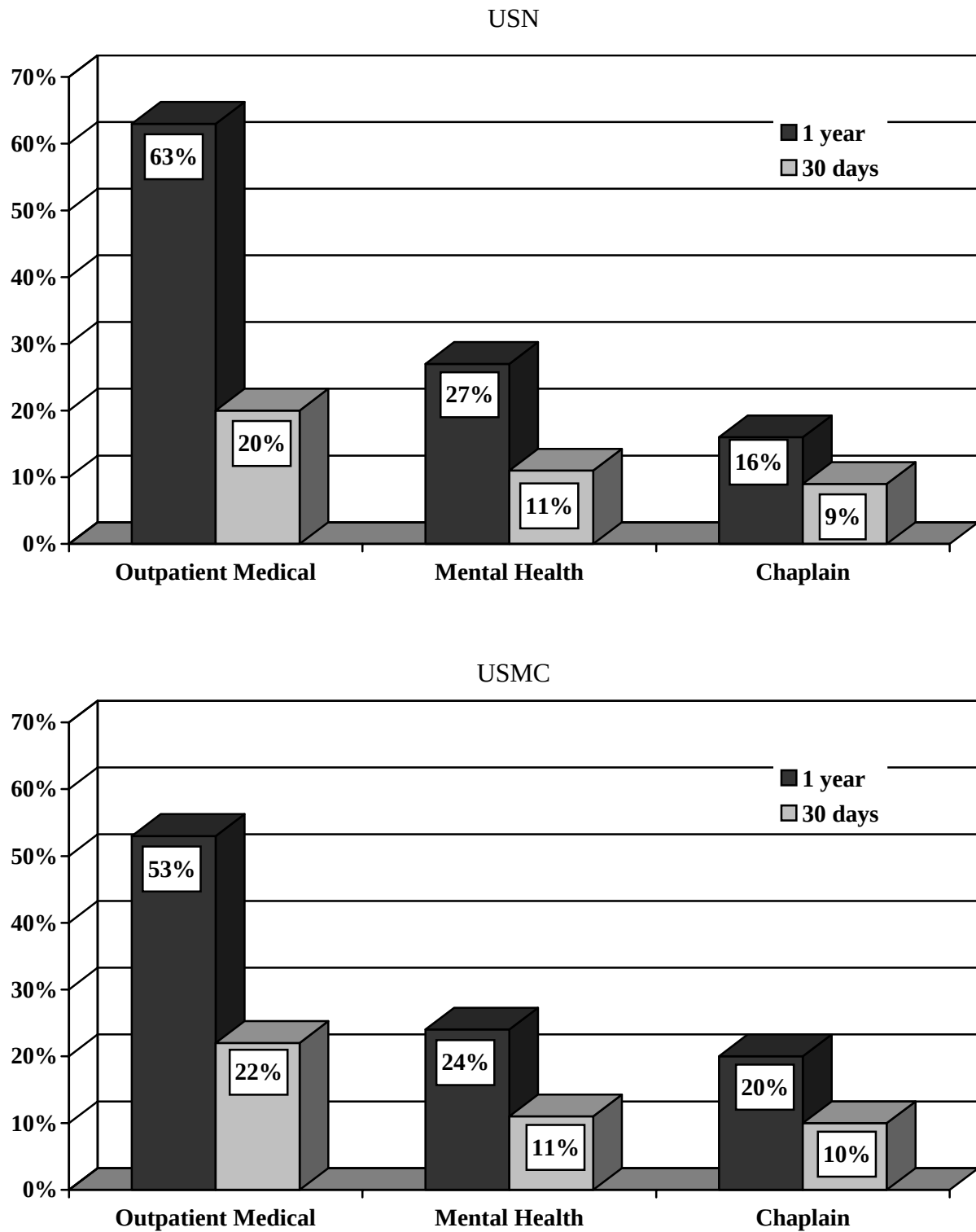
Note. Due to missing data, $N = 283$.

Figure 12. Association Between Key Risk Factors and Associated Stressors for DON Decedents, 1999–2003

Recent Service Use

POCs were asked to report whether there was evidence that decedents had accessed any of 11 different types of professional support services within the month or the year prior to suicide. The percentage of decedents for whom POCs noted evidence of specific support service use is shown in Appendix Table D. For 69% of the decedents, POCs reported no evidence of any service use in the last 30 days before suicide (USN, 68%; USMC, 72%). Within the previous year, decedents had used an average of 1.71 of these services (USN, $M = 1.72$; USMC, $M = 1.71$). There were no significant differences between USN and USMC decedents in the number of support services accessed in the last 30 days or the last year, nor in the percentage using any specific type of service. The most common type of service used in the 30 days prior to suicide was outpatient medical care followed by mental health counseling and chaplain service use (see Figure 13). Twenty-one percent of DON decedents had been seen at outpatient medical facilities within 30 days of suicide.

Figure 13. Most Common Support Services Used by DON Decedents in the Year Prior to Suicide, 1999–2003



DISCUSSION

This report summarizes 5 years of suicide surveillance using the DON Suicide Incident Report. As would be expected based on demographic patterns established in the US civilian population, most decedents were male, and suicide rates were significantly higher among men than among women in the DON overall. In addition, the suicide rate was significantly lower for officers than for enlisted DON personnel. In contrast, suicide rates did not significantly differ as a function of age, race, length of service, or enlisted paygrade.

Suicides generally occurred while the decedent was on liberty and at a private residence. A firearm was the most commonly used method of committing suicide. USMC personnel were significantly more likely than USN personnel to have used a firearm. Although the vast majority of deaths by firearm involved a private weapon, persons who had some military training with or access to a firearm were more likely than those who did not to use a gun to commit suicide. Finally, decedents who were on government property at the time of suicide, compared to those who were on civilian property, were more likely to choose hanging.

There was only one significant difference ($p < .01$) by service in key suicide risk factors, associated stressors, or in support service use prior to suicide. USN decedents may have been experiencing more problems with alcohol than USMC decedents. Although there were a few additional trends ($p < .05$), these should be regarded tentatively since these comparisons did not control for the total number of tests conducted. The key risk factors most commonly noted were depression, feelings of anxiety, alcohol abuse within the previous year, feelings of guilt, and recent change in mood. The five most commonly noted associated stressors were problems in a primary romantic relationship, physical health problems, work issues such as poor performance, job dissatisfaction, and recent military legal or administrative action. Multiple key risk factors and associated stressors were common, with evidence of 10 or more being reported for 31% of decedents. Despite this, the evidence suggests that few decedents sought help; no support service use in the month prior to death was reported by POCs for 69% of decedents.

In general, these findings are consistent with those of previous annual DONSIR reports. The prevalence of risk factors for suicide and use of support services by decedents were very similar when comparing the USN and USMC. The demographic and military career correlates of suicide also remain basically unchanged. The only exception to this is a possible race effect within the USN. However, this effect is marginally significant and is dependent on the high rate

of suicide among Native Americans. Native Americans are a small subgroup and suicide rates are likely to be unstable given their low numbers. This tentative result for race and the fact that gender and officer/enlisted status are consistently related to suicide only for the entire DON population (i.e., not when the USN and USMC are examined separately) reinforce the importance of ongoing data collection in order to reliably define these relationships.

There are some new results in this report. We have not previously estimated suicide rates for personnel on appellate leave. Marines and Sailors who have been through court-martial and are awaiting discharge from the service on their own recognizance are logically a high-risk group. It would be important for the services to consider how they might target this group for suicide prevention. In particular, it might be better to continue to provide some sort of surveillance or mental health counseling to these personnel while they are attempting to make the transition out of the service under such disadvantageous circumstances. Furthermore, in tracking suicide rates over time and in comparing rates across services, it is important to be particularly aware of how high-risk groups are included or excluded from data counts.

This is also the first time we have computed standardized mortality ratios or SMRs to compare suicide rates across different populations. Results based on SMRs confirm that suicide rates are generally significantly lower in the USN and USMC than they are in the U.S. civilian population once demographics are taken into account. At the same time, they show no reliable differences between the USN and the USMC at the present time.

There are limitations in the DONSIR process that should be considered in reviewing these results. In particular, POCs completing the report rarely have access to all requested information. Demographic data, the circumstances of the suicide, and military information available in the decedents' personnel records are most accessible. Information regarding family history, key risk factors, associated stressors, and support service use are most incomplete. It is important to remember these data represent information available to POCs posthumously, not self-report data. POCs are limited in that they are instructed not to contact civilians or relatives for information. Broader access to informants would improve the quality of the data, but it would potentially burden grieving friends and family (Institute of Medicine, 2002).

In our last report, we summarized six directions for future prevention and research. These were (1) continuing to target prevention toward persons experiencing multiple risk factors for suicide; (2) encouraging the use of support services; (3) improving support for persons with

serious relationship problems; (4) evaluating the specific aspects of military work stress that might be risk factors for suicide; (5) researching the effects of limiting access to methods of suicide, particularly firearms, on suicide rates; and (6) studying suicide attempts both as a risk factor for completed suicide and as a threat to military readiness in their own right (Valerie A. Stander et al., 2004). These issues remain a priority. Below, we identify some other issues that deserve focused attention.

Future research should begin to examine the relative impact of different types of military environmental stress on suicide risk. For instance, what is the relative importance of factors such as disciplinary action (court-martial, nonjudicial punishment, administrative action), failure to succeed in training, failure to meet physical readiness or other performance standards, failure to be selected for a promotion or a lateral change in rate, and failure to receive opportunities for specific assignments? Are some of these factors stronger predictors of suicide risk than others? Answering these questions will obviously have critical implications for prevention efforts. However, in order to evaluate the relative impact of specific key risk factors and associated stressors on suicidality, it is crucial to collect comparison data. Moreover, for comparison data to truly be comparable, it will need to be collected using comparable procedures. One possible approach would be to collect data on accidental-death decedents who have been matched with suicide decedents on key demographic characteristics (Institute of Medicine, 2002). In this manner, it would be possible to determine which risk factors uniquely predict manner of death.

Additionally, there is concern among military leaders regarding the impact of deployment and military mobility on suicide risk. Current research on this subject is inconclusive. Studies of deployment factors have reported conflicting results. For example, a seminal study conducted by the Centers for Disease Control and Prevention found a small increase in suicides among Vietnam veterans in the first 5 years after returning home (Centers for Disease Control and Prevention, 1987). By comparison, a national study of Australian Vietnam veterans found no evidence for an increase in suicide rates (O'Toole & Cantor, 1995). Studies of peacekeeping missions also have found weak and inconsistent evidence for any relationship between deployment and suicide (Hall, 1996; Hansen-Schwartz, Jessen, Andersen, & Jørgensen, 2002; Thoresen, Mehlum, & Moller, 2003; Wong et al., 2001).

There are a number of possible reasons that there may be no clear relationship between suicide and military operational stress, particularly deployment. First, deploying and transferring

from one permanent station to another are normative within the military (Rothberg, 1991). It is likely that persons who have an unusually low level of individual operational tempo have problems that are preventing them from participating in these normative behaviors that also put them at risk for suicide (Wong et al., 2001). This might increase the suicide rate among persons who remain behind and decrease the problem among personnel who are deploying. The very fact of being left behind from deployment may exacerbate existing personal difficulties. For such personnel, a deployment accentuates the fact that they are not ready to support the military mission. Conversely, suicide rates in the military may be affected during a time of conflict if the military retains and deploys persons who might otherwise be discharged. Persons at higher risk for suicide may be disproportionately retained under these conditions.

It is possible is that military screening and self-selection play a role in preventing significant increases in suicide during deployment (Thoresen et al., 2003). Many persons at high risk for suicide in the general population will not be accepted into the service. Because personnel volunteer to serve, it may be easier for them to maintain a sense of personal agency and control over the fact that they are deploying and they may actually want to deploy. Both of these factors may be protective against suicide.

Finally, there are several respects in which the context of deployment itself may be somewhat protective. First, social isolation – a risk factor for suicide – is likely to be structurally limited by close living quarters and high operational tempo during deployment. By removing personnel from home, deployment may temporarily reduce the impact of some personal problems (e.g., relationship difficulties). An external threat of injury or death may make it less likely that personnel will focus on self-destructive behaviors. Alternatively, it is possible that active combat obscures suicidal behavior in the form of risky choices during engagements. Lastly, it could be difficult to identify any consistent relationship between deployment and suicide risk because of delayed effects. The full impact of deployment may not be noticeable until long after personnel have returned (Wong et al., 2001). At that time they have more opportunities for social isolation, and they are faced with the difficulty of reintegrating into their normal lives. Multiple deployments for long periods of time involving exposure to severe combat may be particularly disruptive to long-term personal mental health and interpersonal relationships, again manifesting as a delayed effect. In the future it would be helpful to design

longitudinal studies, using existing data available for the full military population to test some of these competing hypotheses.

In conclusion, the DONSIR facilitates the analysis of patterns in completed suicides over time (Hourani & Hilton, 1999; Hourani et al., 2000; Hourani et al., 2001) It provides the DON with consistent data that can be compared across both the USN and the USMC, and allows for the evaluation of military-specific correlates of suicide, which are not addressed in the civilian academic literature. The DONSIR's focus on military-specific risk factors is important because military personnel are not representative of the U.S. population. The organizational structure of the military could potentially facilitate initiating policies and procedures to address risk factors that cannot be addressed among civilians.

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APPENDIX

Figure A1. Gender of DON Suicide Decedents, 1999–2003

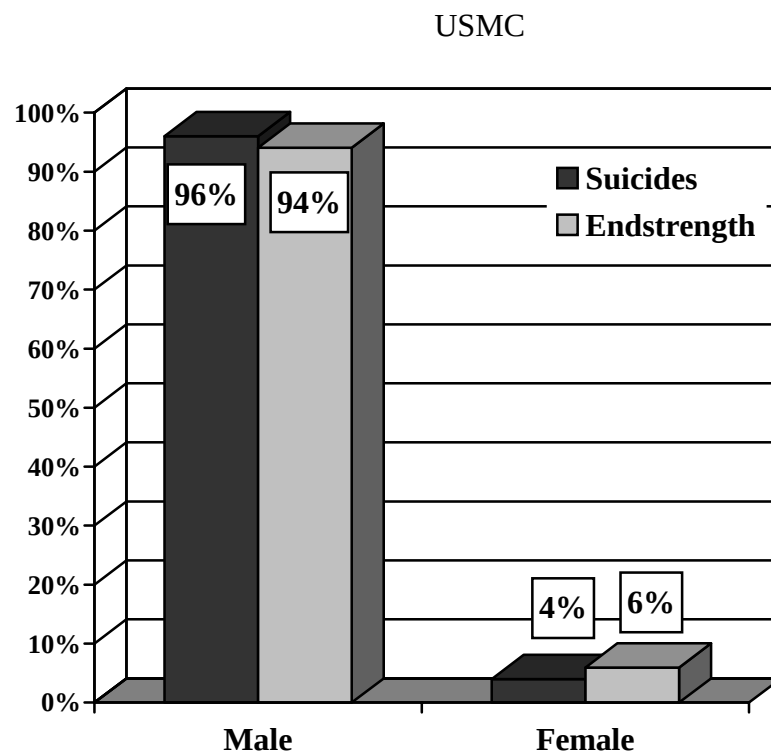
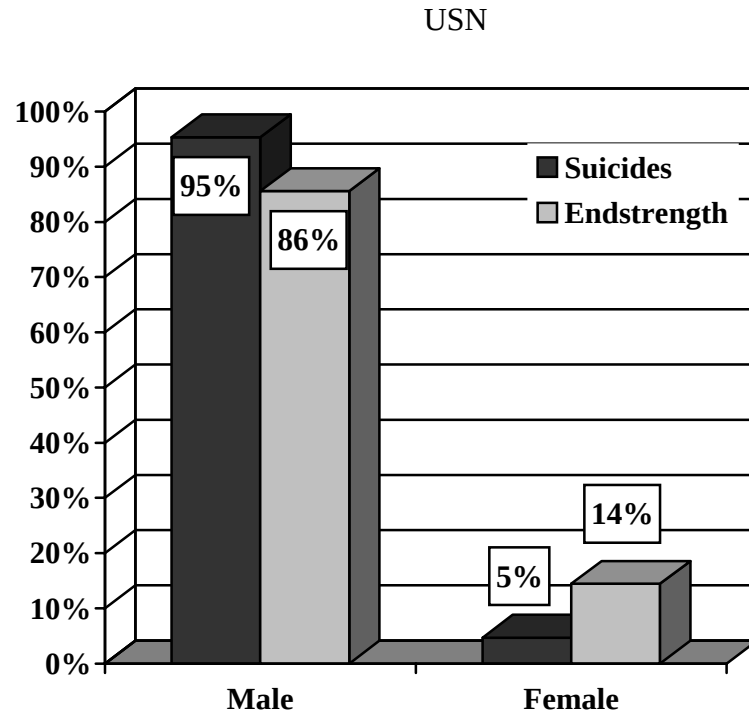


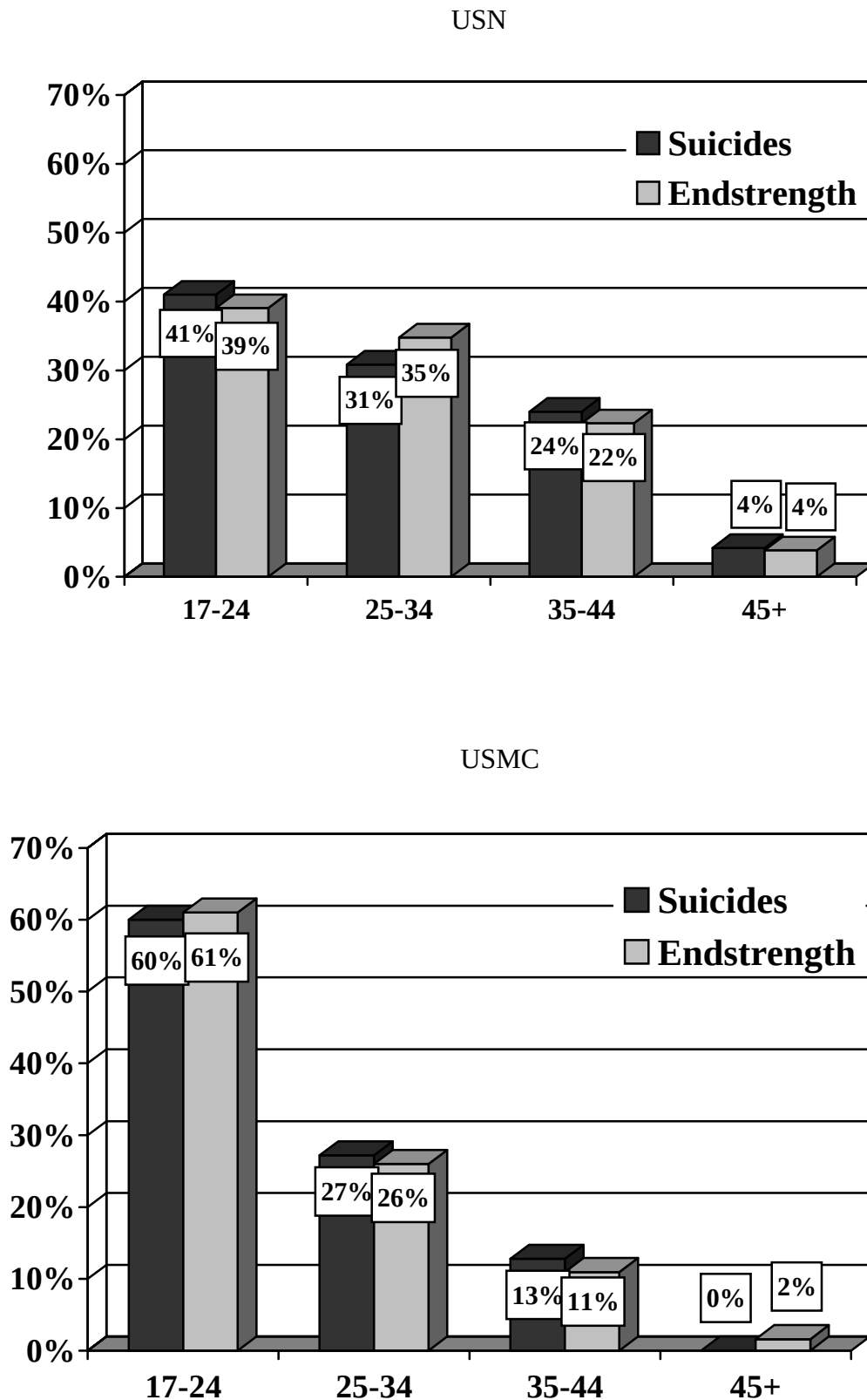
Figure A2. Age in Years of DON Suicide Decedents, 1999–2003

Figure A3. Race of DON Suicide Decedents, 1999–2003

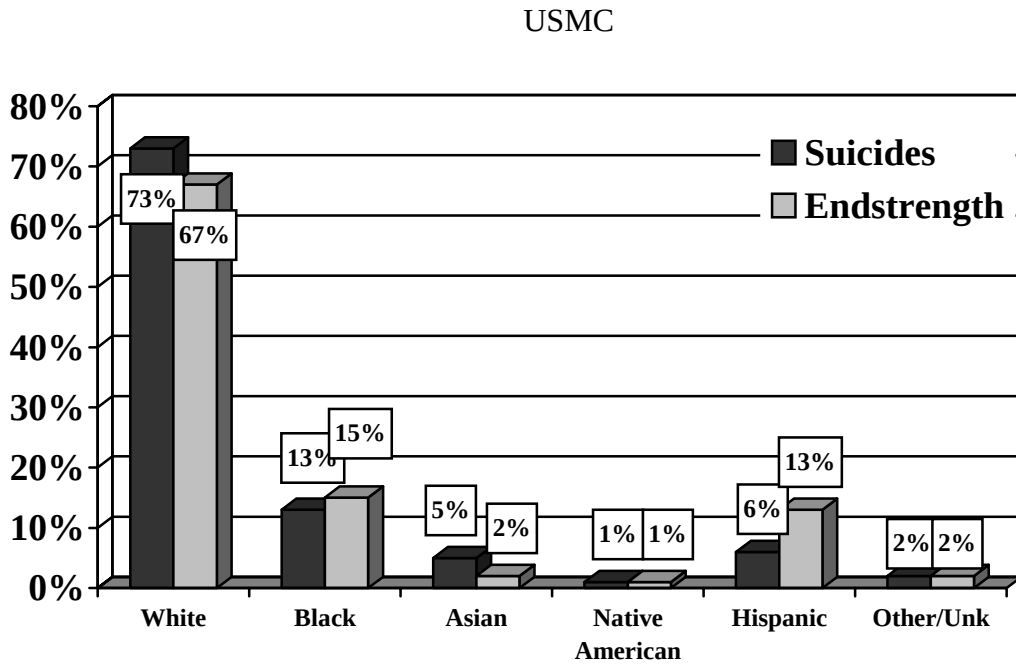
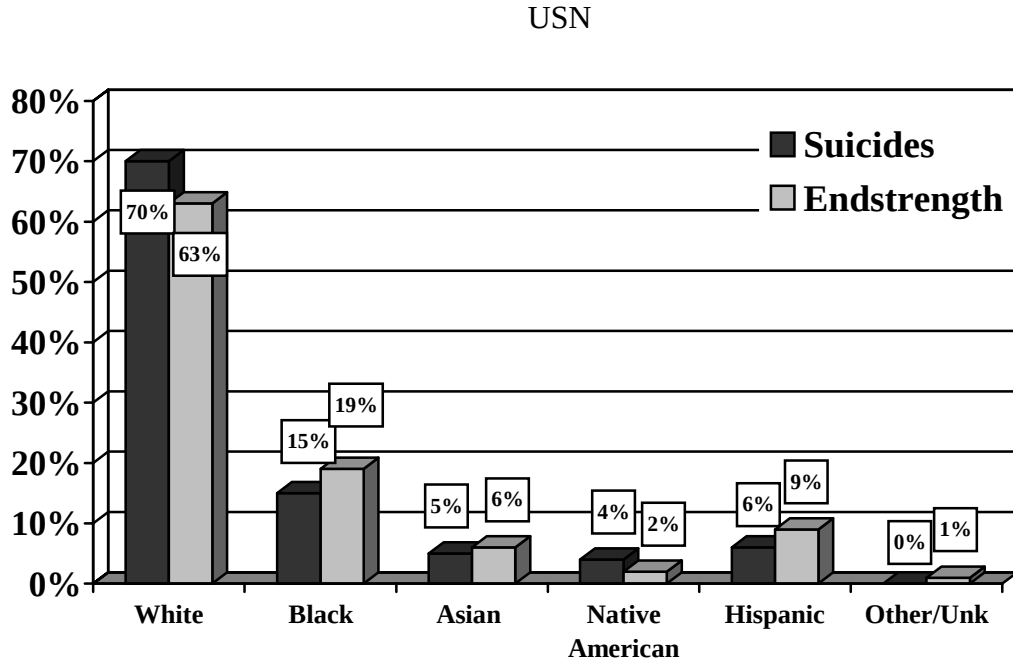


Table A. Standardized Mortality Ratios (SMRs) Comparing Suicide Rates for the U.S. Civilian Population With Rates for the USN and USMC

Subpopulation	USN		USMC	
	SMR	99% CI	SMR	99% CI
Overall	0.60	0.50–0.71	0.68	0.53–0.86
Gender				
Male	0.59	0.49–0.70	0.66	0.51–0.84
Female	0.91	0.34–1.94	2.54	0.55–7.20
Age in years				
17–19	0.88	0.44–1.54	0.80	0.39–1.45
20–24	0.63	0.45–0.85	0.66	0.45–0.92
25–34	0.53	0.38–0.72	0.69	0.42–1.07
35–44	0.60	0.41–0.84	0.73	0.34–1.34
45–54	0.67	0.23–1.48	0.00	0.00–1.81
Race/Ethnicity				
White	0.56	0.45–0.68	0.65	0.49–0.84
Black	0.43	0.26–0.67	0.53	0.25–0.98
Asian/Pacific Islander	0.39	0.14–0.82	1.20	0.31–3.13
Native American	1.29	0.45–2.87	0.56	0.00–4.13
Hispanic	0.37	0.17–0.71	0.30	0.10–0.70

Note. SMRs are computed as the ratio of USN or USMC crude rates over U.S. rates standardized for the respective service demographics. CI = confidence interval. Bolded figures indicate significant ratios, $p < .01$. All figures are calculated excluding persons of “other” or unknown race from USN and USMC data in order to facilitate compatibility with U.S. data.

Table B. Key Risk Factors Reported on the DONSIR for Suicide Decedents, 1999–2003

Indicator	USN	USMC	DON
Mental Health History			
1. Psychiatric history	31%	33%	32%
2. Alcohol misuse in the last year	31%	17%	26%
3. Suicide attempts or gestures	20%	19%	20%
4. Drug use/abuse in last year ^a	6%	11%	8%
<i>Total mental health history</i>	53%	46%	51%
Recent Emotional State			
5. Depression	38%	39%	38%
6. Anxiety	29%	27%	28%
7. Guilt, shame, remorse	26%	21%	25%
8. Sense of failure	21%	27%	23%
9. A desire to be free of problems	23%	16%	21%
10. Hopelessness or uselessness	17%	21%	19%
11. A desire to die	18%	16%	18%
12. Isolation	18%	11%	16%
13. Loneliness	19%	8%	15%
14. Powerlessness	14%	16%	14%
15. Feeling burdensome to others	11%	12%	12%
16. Lack of interest in usual activities	10%	15%	11%
<i>Total recent emotional state</i>	66%	58%	64%

Table B Cont.

Key Risk Factors Reported on the DONSIR for Suicide Decedents, 1999–2003

Indicator	Navy	Marine Corps	DON
Recent Change in Affect or Behavior			
17. Change in usual mood	26%	20%	24%
18. Change in sleep patterns	17%	15%	16%
19. Poorer work performance	13%	12%	13%
20. Change in weight	10%	15%	11%
21. Change in eating patterns	10%	9%	10%
<i>Total recent changes</i>	42%	35%	40%
Self-Destructive or Aggressive Behavior			
22. Arranging affairs	15%	12%	14%
23. Impulsivity	12%	10%	12%
24. Self-deprecation	9%	9%	9%
25. Aggressive behavior	7%	9%	8%
26. Self-mutilation	5%	4%	5%
<i>Total destructive behavior</i>	36%	27%	33%

Note. ^aDrug use includes (a) amphetamines, (b) tranquilizers/depressants, (c) marijuana, (d) cocaine/opiates, (e) inhalants, and (d) designer drugs (ecstasy). Due to missing data, *N*'s vary from 277–317 (USN, 182–204; USMC, 89–113).

Table C. Associated Stressors Reported on the DONSIR for Suicide Decedents, 1999–2003

Stressor	Navy	USMC	DON
Relationship Problems			
1. Recent romantic relationship problem	53%	46%	51%
2. Recent death of family/friend	10%	6%	9%
3. Domestic violence/sexual abuse	10%	4%	8%
<i>Total relationship problems</i>	59%	50%	56%
Disciplinary/Legal Problems			
4. Military legal/admin action	28%	34%	30%
5. Discipline/conflict with authority	24%	29%	26%
6. Civil legal difficulties	17%	17%	17%
7. Under criminal investigation	13%	10%	12%
<i>Total disciplinary/legal problems</i>	44%	49%	45%
Work-Related Problems			
8. Other work	29%	36%	32%
9. Job dissatisfaction	32%	30%	32%
10. Job stress	22%	17%	20%
11. Job loss	17%	13%	16%
<i>Total work-related problems</i>	52%	53%	52%
Other			
12. Physical health	36%	36%	36%
13. Financial	20%	16%	18%
14. School	10%	5%	9%
<i>Total other problems</i>	55%	50%	53%

Note. Due to missing data, N's vary (292–317) (USN, N = 192–204; USMC, N = 100–113).

Table D. Evidence of Service Use Prior to Suicide Reported on the DONSIR for Decedents, 1999–2003

	Navy		Marine Corps	
Support Service	1 Year	30 Days	1 Year	30 Days
1. Outpatient, military facility	63%	20%	53%	22%
2. Civilian facility	10%	3%	12%	5%
3. Inpatient, military facility	19%	5%	17%	3%
<i>Total medical service use</i>	65%	22%	59%	25%
4. Mental health counseling	27%	11%	24%	11%
5. Substance abuse counseling	11%	3%	8%	3%
6. Stress management	5%	2%	7%	2%
7. Anger management	3%	0%	5%	0%
<i>Total mental health service use</i>	32%	12%	25%	12%
8. Chaplain service	16%	9%	20%	11%
9. Family advocacy	6%	4%	6%	2%
10. Exceptional family member	5%	3%	5%	1%
11. Financial counseling	6%	2%	13%	1%
<i>Total other service use</i>	28%	15%	27%	11%

Note. Due to missing data, $N = 297$ (USN = 194, USMC = 103).

REPORT DOCUMENTATION PAGE

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13. SUPPLEMENTARY NOTES					
14. ABSTRACT (maximum 200 words) The Department of the Navy Suicide Incident Report (DONSIR) collects data on completed suicides in the Navy (USN) and Marine Corps (USMC). It provides the Department of the Navy (DON) with consistent data that can be compared across both services, and establishes baselines for suicide rates and suicide event characteristics that can be used to track trends over time. It also evaluates military-specific correlates of suicide that are not addressed in the civilian academic literature. This is the fifth annual report on the DONSIR. As would be expected based on demographic patterns established in the U.S. civilian population, most decedents were male, and suicide rates were significantly higher among men than among women in the DON overall. In addition, the suicide rate was significantly lower for officers than for enlisted DON personnel. In contrast, suicide rates did not significantly differ as a function of age, race, length of service, or enlisted paygrade. Suicides generally occurred while the decedent was on liberty and at a private residence. A firearm was the most commonly used method of committing suicide. USMC personnel were significantly more likely than USN personnel to have used a firearm. Although the vast majority of deaths by firearm involved a private weapon, persons who had some military training with or access to a firearm were more likely than those who did not to use a gun to commit suicide. Finally, decedents who were on government property at the time of suicide, compared with those who were on civilian property, were more likely to choose hanging.					
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