



Department of the Navy Suicide Incident Report (DONSIR): Summary of Findings, 1999–2007

*S. M. Hilton
D. B. Service
V. A. Stander
A. D. Werbel
B. R. Chavez*



Naval Health Research Center

Report No. 09-15

. Approved for public release: distribution is unlimited.

*Naval Health Research Center
140 Sylvester Road
San Diego, California 92106*

**Department of the Navy Suicide Incident Report (DONSIR):
Summary of Findings, 1999–2007**

Susan M. Hilton

David B. Service, CAPT, MSC, USN

Valerie A. Stander

Behavioral Science and Epidemiology Program

Naval Health Research Center

San Diego, CA

Aaron D. Werbel, CDR, MSC, USN

Suicide Prevention Program Manager

Headquarters, U.S. Marine Corps

Quantico, VA

Bonnie R. Chavez, LCDR, MSC, USN

Suicide Prevention Program Manager

Office of the Chief of Naval Operations

Millington, TN

Report No. 09-15 was supported by the Behavioral Health Branch, Office of the Chief of Naval Operations and by the Office of Prevention and Intervention, Headquarters, United States Marine Corps, under research work unit 6821. The views expressed in this report are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, the Department of Defense, nor the U.S. Government. Approved for public release; distribution is unlimited. This research has been conducted in compliance with all applicable federal regulations governing the protection of human subjects in research.

SUMMARY

Problem: Before the development and implementation of the Department of the Navy Suicide Incident Report (DONSIR), the Department of the Navy (DON) lacked an adequate instrument for the collection and analysis of data on completed suicides in the U.S. Navy (USN) and Marine Corps (USMC). The DONSIR was conceived to address three primary needs: (1) provide the DON with longitudinal data that could be compared across both services, (2) establish baselines for suicide rates and suicide event characteristics that could be used to track trends over time, and (3) evaluate military-specific correlates of suicide that were not addressed in the civilian academic literature.

Objective: This is the final report for the DON suicide surveillance program using the DONSIR. The goal of this report is to summarize results and conclusions based on the DONSIR data covering the period of DONSIR use, 1999 through 2007.

Approach: In recent years, completion of the DONSIR was 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 would forward service-specific instructions and an electronic copy of the DONSIR to each new decedent's command. Commands would then assign a point of contact to complete the report and return it within 4 weeks of receipt.

Results: In the results assessment, the requisite level for statistical significance was set as .01, rather than .05. Data for all years were adjusted to comply with the 2006 Department of Defense-wide suicide reporting guidelines.

Population Suicide Rates

- Between 1999 and 2007, 365 completed suicides occurred among active-duty USN personnel and 250 among active-duty USMC personnel. The USN crude suicide rate was significantly lower than the USMC crude rate ($p < .001$), and both standardized rates were significantly lower than the U.S. civilian suicide rate ($p < .01$).

Decedent Demographic Profile

- Suicide rates were significantly higher among men than among women within both the USN ($p < .001$) and USMC ($p < .01$), consistent with the U.S. civilian population ($p < .001$).

- No significant differences in crude suicide rates were found in either service for age group.
- No significant differences in crude suicide rates were found in the USMC for race/ethnic group. The disproportionately high suicide rate among Native Americans in the USN was based on a small count, and is likely to continue to be unstable.

Decedent Career Profile

- The crude suicide rate was significantly lower ($p < .001$) for officers than for enlisted personnel in the DON overall and in the USN, but not in the USMC.
- No differences in crude suicide rates were found by length of service or enlisted paygrade in either service.

Suicide Event Characteristics

- USN decedents were more likely than USMC decedents to be assigned to a ship or submarine at time of death. However, this difference is because ships and submarines are not permanent duty stations for USMC personnel.
- The modal group committed suicide at a private residence while the individual was on liberty.
- The most common method of suicide was the use of a firearm. Self-inflicted gunshot and hanging accounted for over three quarters of DON suicides.
- Decedents who were on government property at the time of their suicide were more likely than those on civilian property to have chosen hanging as the suicide method; this difference between location (government vs. civilian property) regarding method choice (firearm, hanging, other) was significant ($p < .001$).

Risk Factors for Suicide

- No significant differences were found by service in the average number of key suicide risk factors or of recent associated stressors reported for decedents ($p < .01$).
- The key risk factors most commonly noted were recent depression, psychiatric treatment history, recent anxiety, alcohol abuse in the previous year, and recent feelings of guilt or shame.
- The most commonly noted associated stressors were problems in a primary romantic relationship, physical health problems, work issues (such as poor performance), recent military legal or administrative action, and job dissatisfaction.

- Multiple key risk factors and associated stressors were common among decedents. As much as 27% of decedents had evidence of 10 or more risks factors or stressors.
- Supplemental analyses to assess the association between deployments to a war zone and each of the key risk factors and associated stressors found only one significant result. The count of suicide victims who were or ever had been war-deployed in the Global War on Terrorism was higher than statistically expected among sailors and Marines who showed a recent change in body weight ($p < .01$). Whether the weight change was directly or spuriously related to suicide (or war) is unclear.

Recent Service Use

- The most common types of services used in the 30 days prior to suicide were outpatient medical care, mental health counseling, and the chaplain service.
- For most decedents (73%), however, no evidence was indicated of support service use in the 30 days prior to suicide.
- USMC and USN decedents did not differ in the number of support services accessed.

TABLE OF CONTENTS

SUMMARY	2
TABLE OF CONTENTS.....	5
INTRODUCTION	6
METHODS	7
Instrument	7
Procedure	7
Computation of Rates and Analytic Strategy.....	9
RESULTS	11
Suicide Rates.....	12
Decedent Demographic Profile.....	14
Decedent Career Profile.....	16
Suicide Event Characteristics	20
Risk Factors for Suicide.....	26
Recent Use of Support Services.....	29
DISCUSSION	32
CONCLUSION.....	35
ACKNOWLEDGMENTS	36
REFERENCES	37
APPENDIX.....	40

INTRODUCTION

The Department of the Navy Suicide Incident Report (DONSIR) was collaboratively devised at the Naval Health Research Center (NHRC) to support the first official suicide surveillance program within the Department of the Navy (DON). Between 1999 and 2007 inclusive, data on all completed suicides in the U.S. Navy (USN) and Marine Corps (USMC) were systematically collected, analyzed, and archived (Hourani & Hilton, 1999; Hourani, Hilton, Kennedy, & Jones, 2000; Hourani, Hilton, Kennedy, & Robbins, 2001; Jones, Kennedy, Hawkes, Hourani, Long, & Robbins, 2001; Stander, Hilton, Doran, Gaskin, & Thomsen, 2005; Stander, Hilton, Doran, Werbel, & Thomsen, 2006; Stander, Hilton, Kennedy, & Gaskin, 2004; Stander, Hilton, Kennedy, & Robbins, 2004). The long-term goals of this program were to provide military leadership and public affairs personnel with accurate and detailed information regarding suicide trends within the DON, and to improve suicide prevention by identifying and modifying military-specific risk factors for suicide. Moreover, the DONSIR has provided the DON with longitudinal data that can be compared across the USN and the USMC. Of note, this report conforms to 2006 guidelines established by the Department of Defense (DoD) Office of Health Affairs regarding how active duty suicides should be counted and how suicide rates should be calculated so that statistics can also be compared more meaningfully across all of the U.S. military services.

The DONSIR established baselines for suicide rates and suicide event characteristics that could be used to track trends over time. It evaluated military-specific correlates of suicide that were not addressed in the civilian academic literature. The DONSIR's focus on military-specific risk factors was important because military personnel are not representative of the U.S. population. For example, differences in gender, race, age, health, and employment might reveal unique correlates of suicide for active-duty personnel. Also, U.S. military governance, compared with civilian, might better facilitate the implementation and monitoring of policies and procedures to address risk factors and suicide prevention.

In addition to serving the needs of the Navy and Marine Corps, the DONSIR was used extensively to inform the development of the Department of Defense Suicide Event Report (DoDSER) that replaced the DONSIR in January 2008. In addition to suicide deaths, the DoDSER collects data on suicide attempts and other suicide-related behaviors. The new

DoDSER applies to U.S. Army and Air Force service members, sailors, and Marines, and the Coast Guard is considering adopting it as well. The DoDSER represents the first attempt to standardize an all-service suicide data registry, and, as a capability that grew from the DONSIR project developed at NHRC, owes much to DONSIR development and use over the decade preceding the DoDSER's 2008 launch.

METHODS

Instrument

The DONSIR started as a paper-and-pencil instrument divided into nine main sections. The DONSIR collected information about (1) the command point of contact (POC) assigned to complete the report, (2) demographic characteristics about the decedent and the circumstances of the suicide event, (3) the military service history of the decedent, (4) the 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 included sections for narrative accounts of interviews with the decedent's military associates, a narrative summary by the POC regarding the circumstances surrounding the suicide event, and feedback from the POC 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 was used to clarify responses to quantitative items and to inform revisions to the DONSIR.

Procedure

From 2002 through 2008, completion of the DONSIR was a requirement in both the Navy and Marine Corps whenever there was a completed suicide by an active-duty member (Navy Personnel Command, 2002; U.S. Marine Corps, 2001). In the event of a suicide, the Suicide Prevention Program Manager for each service would forward service-specific instructions and an electronic copy of the DONSIR to each decedent's command. The affected command would then assign a POC within 3 days of the Report of Casualty (USMC), or within 3 days of receipt of the DONSIR (USN). The POCs were directed to complete the report within 4 weeks, and encouraged to consult the cognizant service Program Manager with any questions or

concerns during the process of filling out the report. Finally, the POCs would return the completed DONSIR to NHRC, often via their Program Manager.

The primary documentation sources for completing the DONSIR were the decedent's military service and medical records (Hourani & Hilton, 1999; Hourani et al., 2000; Hourani et al., 2001; Stander et al., 2004; Stander et al., 2005; Stander et al., 2006). Other resources that were sometimes available included counseling records, autopsy reports, toxicology reports, investigative reports, and interviews with military personnel who were the decedent's recent associates or who participated in the casualty management process (e.g., Casualty Assistance Calls Officers). The only sources the POCs were restricted from contacting were the decedent's civilian friends or family members. Other than those prohibitions, POCs were encouraged to use the best military sources available within the 4-week time frame.

In 2006, a DoD working group under the direction of Health Affairs instituted suicide reporting guidelines that all of the services agreed to follow. Among them was guidance regarding what military status categories should be included as "active duty" and what methods should be used to calculate annual suicide rates (Winkenwerder, Ireland, Tornberg, & Smith, 2006). Under these guidelines, total active-duty suicide counts would include the following regular and reserve component personnel with a cause of death officially confirmed as suicide by the Armed Forces Medical Examiner (AFME):

1. All regular component service members except deserters. (This included personnel on appellate leave.)
2. Reserve commissioned officers and cadets/midshipmen at service academies.
3. Regular component personnel whose suicide-related death occurs while on the temporary or permanent disability retired list (TDRL/PDRL) for 120 days or less. (This would include those placed on the TDRL while comatose from the suicide act.)
4. All active National Guard reserve (full-time support personnel) and activated Guard and reservists.
5. All Guard and reserve members who commit suicide en route to or during (a) Initial Active-Duty Training (boot camp and entry-level training), (b) 2-week Annual Training, or (c) weekend Inactive Duty Training.

These guidelines only minimally affected the way the Navy and Marine Corps were already tracking suicide deaths with the DONSIR. Most of the categories of active-duty sailors and Marines listed above were already included in DON rates. However, service members on appellate leave and personnel attending the United States Naval Academy were not counted previous to 2004 data. Furthermore, some cases were previously included that were equivocal or undetermined but strongly suspected to be suicide deaths by civilian or local authorities. Cases that did not have an official ruling of suicide from the AFME were no longer included. This report's figures and numbers reflect 2006 Health Affairs guidelines, and therefore may not match suicide numbers presented in previous reports. Because some cases are now counted as active-duty suicides that were not previously counted, the percentage of decedents for whom DONSIRs are available is somewhat lower than in earlier reports. Logistical difficulties in coordinating with war-deployed POCs further reduced case capture, especially after the escalation in the Global War on Terrorism (GWOT) in 2002. DONSIRs were captured for 534 of the 615 cases, for an overall data receipt rate of 87%. The Report of Casualty DD1300 required in the event of all active-duty deaths was available for all but two 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 would be complete for all decedents.

Computation of Rates and Analytic Strategy

SPSS statistical software, Rel. 16.0.2 (SPSS Inc., Chicago, IL) was the primary software application used in the data management and analyses for this report. Other analyses were programmed using Microsoft Office Excel (release 11.8237.8221). Because of the large number of analyses conducted, associations were considered statistically significant only if they attained significance at $p < .01$ rather than .05.

We conducted t tests for independent means and chi-square tests of association in order to compare the characteristics of USN and USMC suicide decedents, 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 only two groups were compared (e.g., 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 of more than two subgroups to be compared (e.g., race), the multinomial model applies, and a goodness-of-fit test was used to determine significant differences among rates (Larson & 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, gender, and race/ethnicity (White, Black, Asian/Pacific Islander, American Indian/Alaskan Native, Hispanic, Other/Unknown).

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 and 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; that product is the percentage of the suicides expected in the study population that were actually observed.

RESULTS

Between 1999 and 2007, 615 active-duty personnel within the Department of the Navy committed suicide. The suicide counts by service and calendar year are listed in Table 1. Note that these counts reflect the 2006 DOD guidelines regarding which military status categories are included in active-duty counts, and therefore may differ slightly from previous reports. About 7% of the decedents were reservists on active duty, and the percentages of reservists among decedents were similar between the USN (6%) and the USMC (8%).

Table 1. Suicides in the Navy and the Marine Corps, 1999–2007

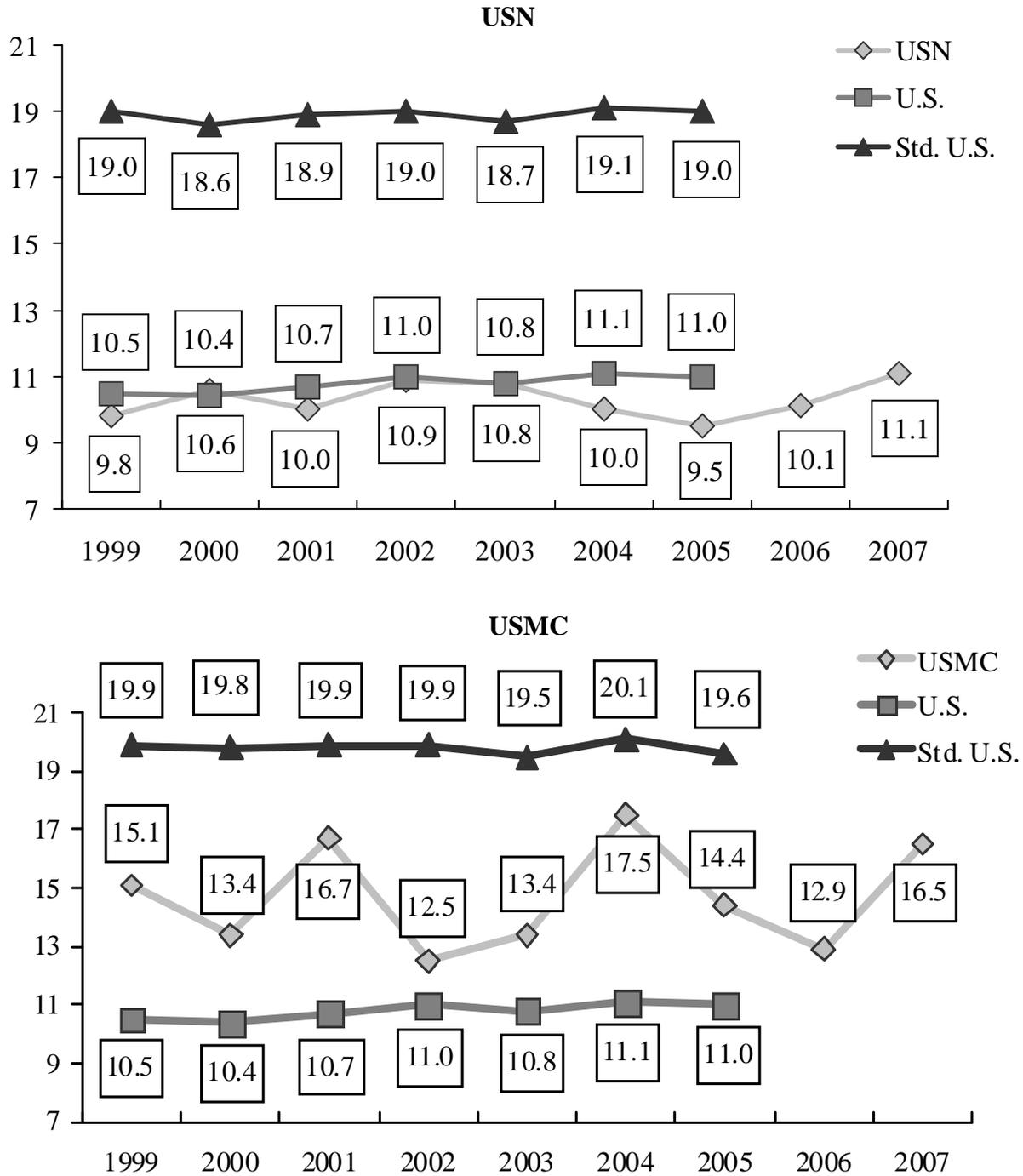
Year	Navy			Marine Corps			DON
	Regular	Reserve	Total	Regular	Reserve	Total	Total
1999	38	1	39	24	3	27	66
2000	40	2	42	22	2	24	66
2001	36	4	40	29	1	30	70
2002	43	2	45	22	1	23	68
2003	42	2	44	18	8	26	70
2004	38	2	40	33	1	34	74
2005	36	1	37	25	3	28	65
2006	32	6	38	25	0	25	63
2007	37	3	40	33	0	33	73
Total	342	23	365	231	19	250	615

Suicide Rates

Across the 9-year data collection period (1999–2007), the overall suicide rate for the DON was 12.0 per 100,000 (USN, 10.7; USMC, 14.6). The difference between these crude suicide rates of the two services was statistically significant ($p < .001$). Crude rate differences by year, however, were not significant within either service. The overall suicide rate for the U.S. civilian population from 1999 through 2005 was 10.8 per 100,000 (National Center for Injury Prevention and Control, 2008). U.S. data beyond 2005 were not available at the time of this report's preparation.

Civilian and DON rates are not directly comparable because of differences in demographic composition. Figure 1 illustrates the differences between the DON and U.S. suicide rates, comparing USN and USMC suicide rates by year along with the corresponding crude and standardized U.S. civilian rates. When the 1999–2005 suicide rate for the U.S. civilian population was adjusted to assume that it had the same demographic characteristics as the corresponding service, it was 18.8 per 100,000 for USN and 19.8 per 100,000 for the USMC. SMRs comparing the U.S. population with the DON suicide rates suggest that the USN rate was 43% below the standardized U.S. rate and the USMC rate was 28% lower than the civilian rate (see Appendix Table A). These differences were statistically significant for both services ($p < .01$).

Figure 1. Navy^a, Marine Corps^a, and U.S. Population^b Suicide Rates, 1999–2007



Note. ^aArmed Forces Medical Examiner (Pearse & White, 2008); ^bNational Center for Injury Prevention and Control (2008); data for the U.S. population were not available beyond 2005. Standardized U.S. suicide rates are adjusted for DON demographics (race, gender, and age).

Decedent Demographic Profile

Table 2 (at end of this section) lists suicide rates in the USN and USMC by gender, age, race, and military status (officer/enlisted). For comparison, suicide rates are also shown for the corresponding U.S. civilian population. Appendix Figures A1 to A3 display the proportionate demographic characteristics of decedents with those of the USN and USMC populations.

Gender differences in military suicide rates were consistent with those in the U.S. civilian population. The crude rate of suicide across the 9-year study period (1999–2007) was significantly higher among men than among women for both USN ($p < .001$) and USMC ($p < .01$) decedents. No significant differences in crude suicide rates were found by age group within either the USN or the USMC (see Appendix Figure A2).

Results were less simple for race (White, Black, Asian/Pacific Islander, Native American, Hispanic, Other/Unknown). As in our last report, a trend was indicated for Native Americans to have a disproportionately high rate within the Navy; for this report's 9-year study period, the USN crude-rate difference for race attained significance ($p < .005$), with Native Americans, Whites, and Others showing higher than statistically expected counts (see Appendix Figure A3). The observed count for Other was insufficient for statistical reliability, and when that category was dropped from the analysis or combined with Native American (the smallest subgroup), results were still significant. As with the USMC, the USN Native American suicide count is small, implicating results likely to be unstable across time.

In addition to crude suicide rates, Table 2 shows standardized rates using the total DON as the standard population. These standardized rates accommodate both within- and between-population comparisons in that they estimate what 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, standardized rates are susceptible to unstable fluctuations due to small counts in population subgroups. Despite this, standardized rates for USN and USMC subgroups were generally similar to the crude rates. Additionally, standardized rates for the U.S. population were generally higher than either crude or standardized rates for each of the services. The few

exceptions where military standardized rates exceeded those of the U.S. population occurred for USMC women, and USN and USMC Asians/Pacific Islanders.

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, only 2 of the 26 ratios exceed 1.00, indicating that military rates were consistently lower than U.S. rates. Bolded figures indicate where the U.S. and military rates significantly differed, 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 and Black personnel. Rates in the USMC were significantly lower than rates in the U.S. civilian population for men, personnel aged 20–34 and 45–54 years, and White personnel.

The two instances in which the SMR exceeded 1.00 indicate higher subgroup rates in the military than among U.S. civilians. This occurred for women in the USMC, and for Asian/Pacific Islander personnel in the USMC. In neither of these cases was the SMR statistically significant. Moreover, women and Asian/Pacific Islanders are small groups in the DON; such 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 Marine Corps with the Navy. For these SMRs, we computed ratios with USMC observed suicides as the numerator and the expected deaths given USN rates and USMC population proportions in the denominator. For the overall between-service comparison, and in 11 out of 14 subgroup comparisons, 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 no reliable differences between the two services in subgroup suicide rates.

Table 2. USN, USMC, and U.S. 9-Year Suicide Rates (1999–2007) by Demographic Group

Demographic Group	USN ^a		USMC ^a		U.S. Population ^b	
	Crude	Std ^c	Crude	Std ^c	Crude	Std ^c
Total	10.7	11.0	14.6	14.4	10.7	19.2
Gender						
Men	11.9	11.9	15.2	15.4	17.5	21.1
Women	3.6	4.1	4.8	6.9	4.1	4.5
Age, years						
17–19	10.0	9.8	15.5	11.9	9.4	14.5
20–24	11.2	11.4	15.1	14.5	12.2	19.4
25–34	10.0	10.5	13.5	13.6	12.6	19.4
35–44	10.8	12.0	15.9	19.3	14.8	20.7
45–54	13.7	12.2	0.0	0.0	15.1	20.3
Race/Ethnicity						
White	11.9	12.2	16.2	15.9	12.9	22.0
Black	7.8	7.9	10.7	10.0	5.4	14.4
Asian/Pac Island	9.0	9.5	15.2	21.2	5.4	9.3
Native American	19.3	23.9	6.1	4.3	12.6	35.0
Hispanic	7.7	8.0	8.5	6.3	5.0	10.6
Other/Unknown	8.0	10.2	25.0	23.6	NA	NA
Military status						
Officer	7.1	6.6	7.8	9.9	NA	NA
Enlisted	11.3	11.7	15.4	15.6	NA	NA

Note. ^aMilitary figures are calculated using endstrengths from personnel data (Gunderson, Miller, & Garland, 2002). ^bU.S. data are for 1999–2005 (National Center for Injury Prevention and Control, 2008); U.S. numbers for 2006 and later 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

Table 2 also lists suicide rates in the Navy and Marine Corps separately for military officer and enlisted personnel. The 1999–2007 crude suicide rate for DON officers (7.2) was lower ($p < .001$) than the rate for enlisted personnel (12.7; USN, officer = 7.1, enlisted = 11.3; USMC, officer = 7.8, enlisted = 15.4). Separately by service, the differences were significant for USN ($p < .01$) and marginal ($p < .05$) for USMC. No differences were found in crude suicide rates for personnel grouped by length of service (0–4, 5–9, 10–14, 15+ years) or enlisted paygrade (E1–E3, E4–E6, E7–E9) within either service. Figures 2 through 4 depict these profiles.

Figure 2. Officer/Enlisted Status of DON Suicide Decedents, 1999–2007

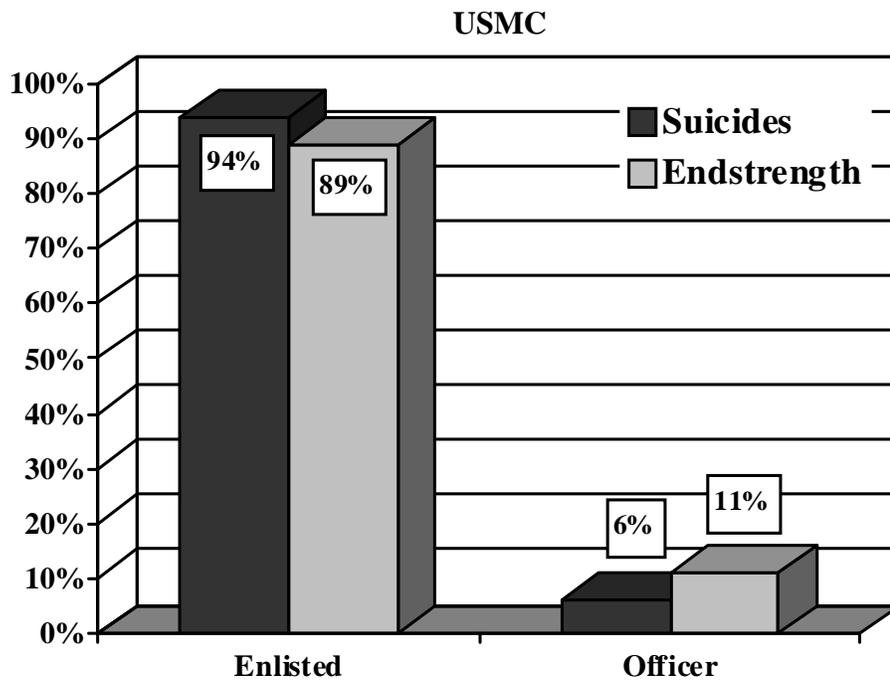
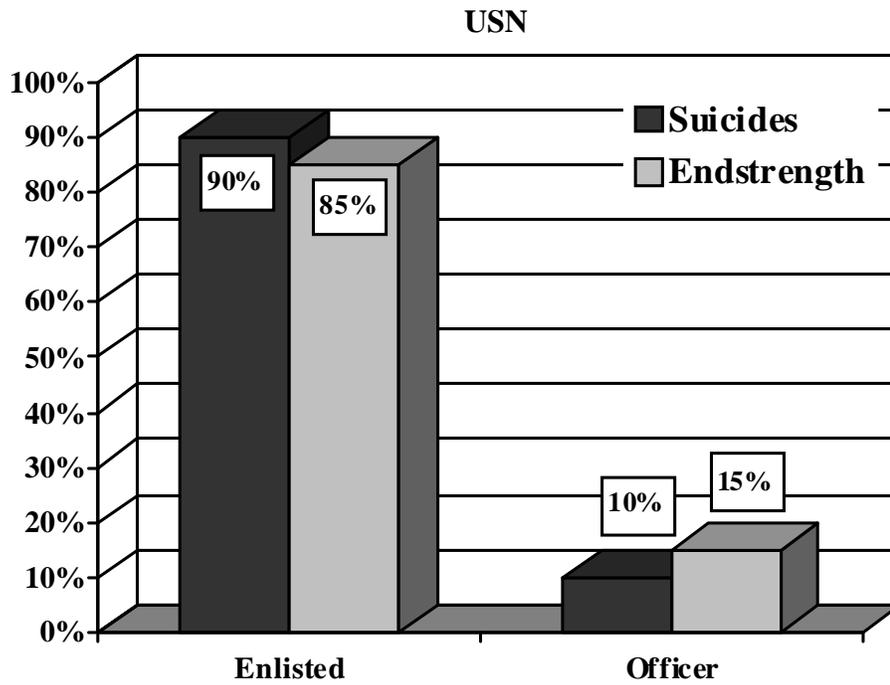


Figure 3. Years of Service at Time of Suicide, 1999–2007

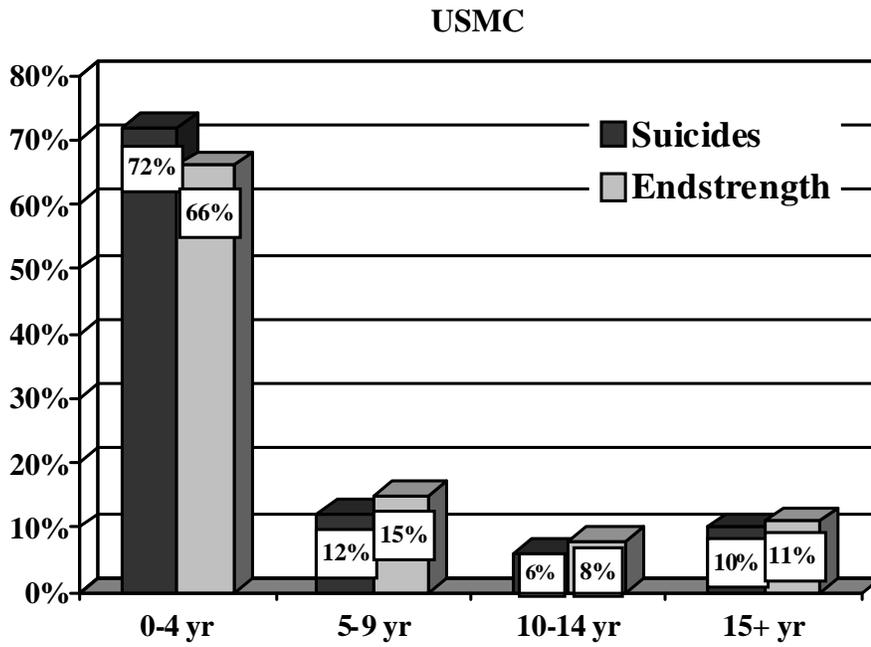
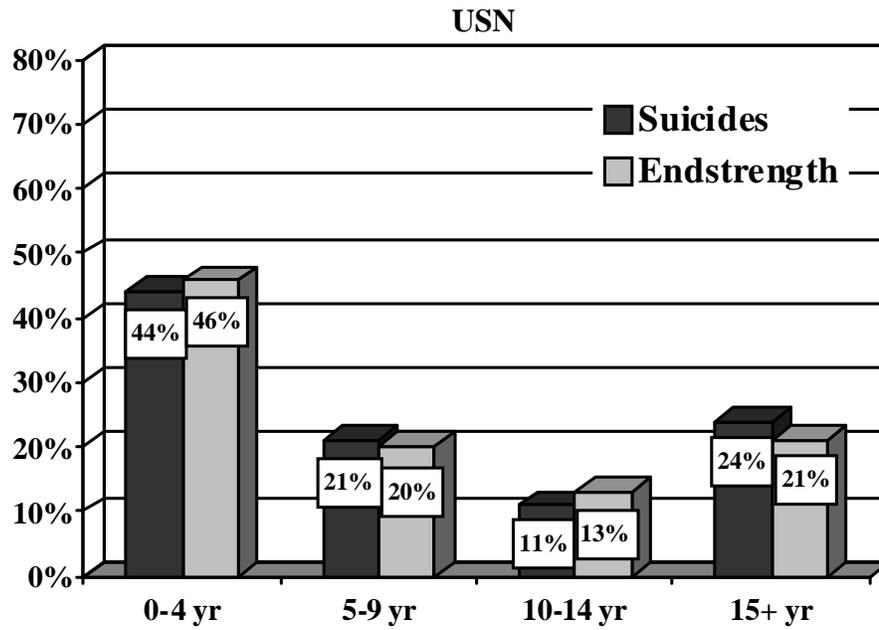
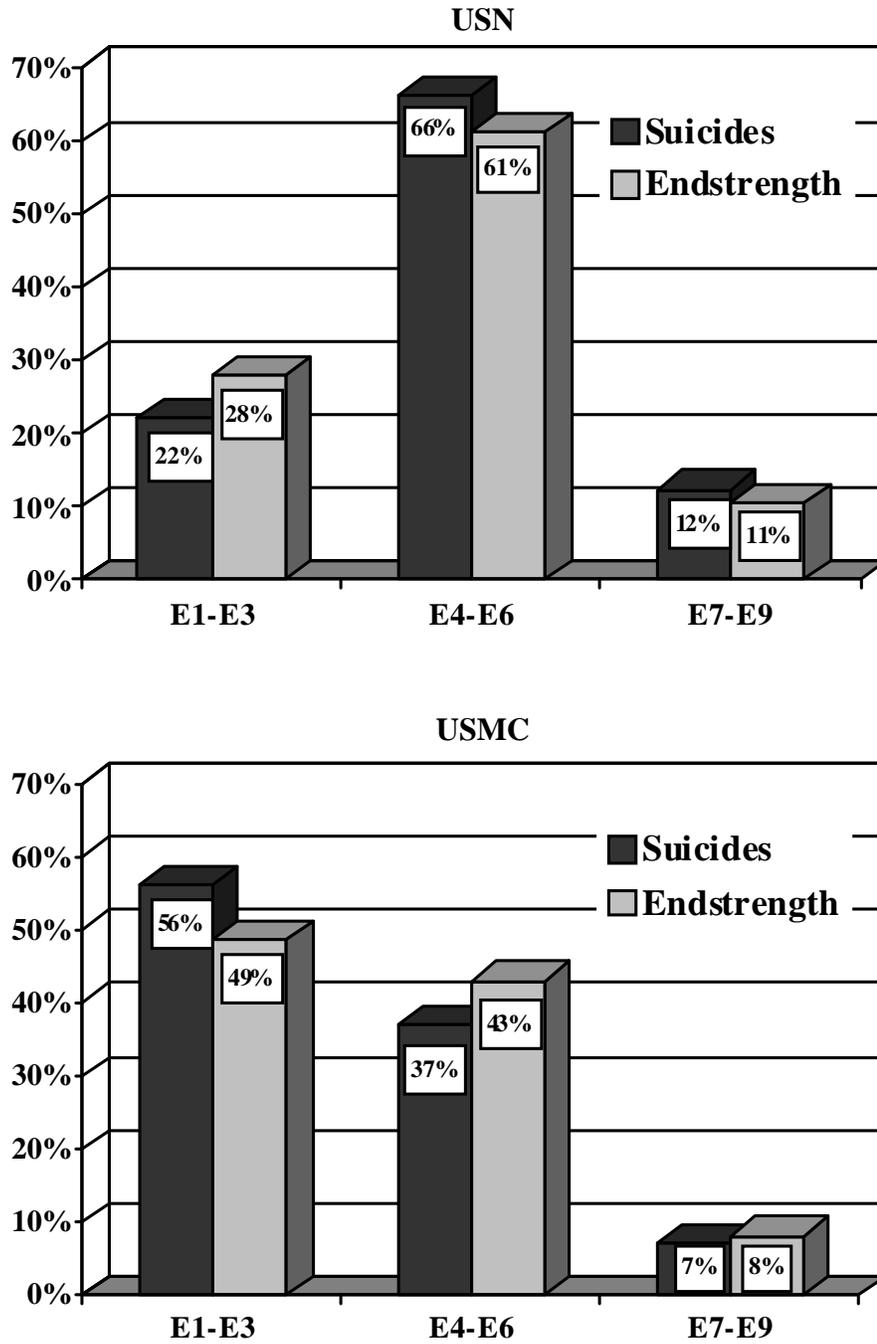


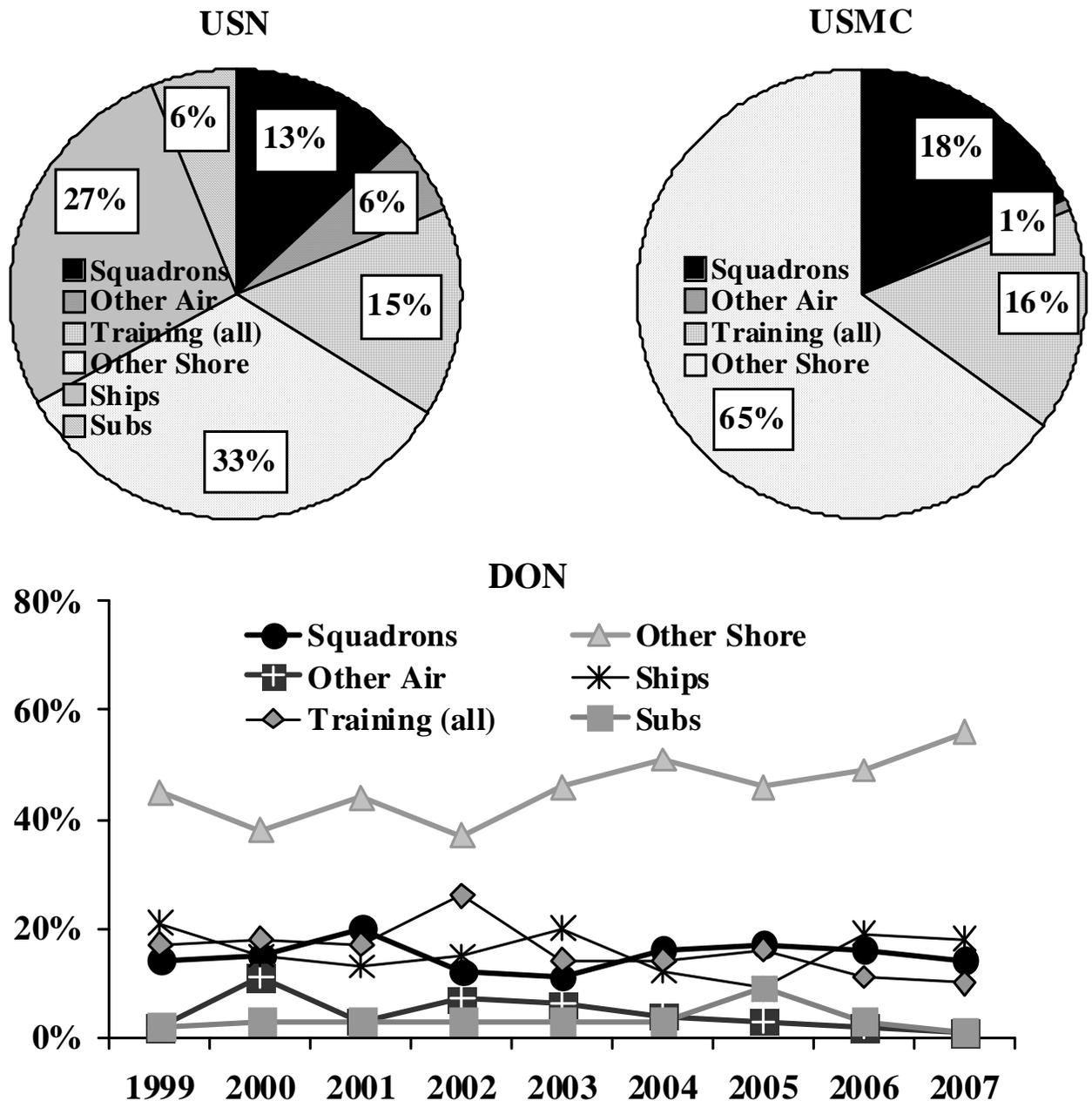
Figure 4. Paygrade of Enlisted DON Suicide Decedents, 1999–2007



Suicide Event Characteristics

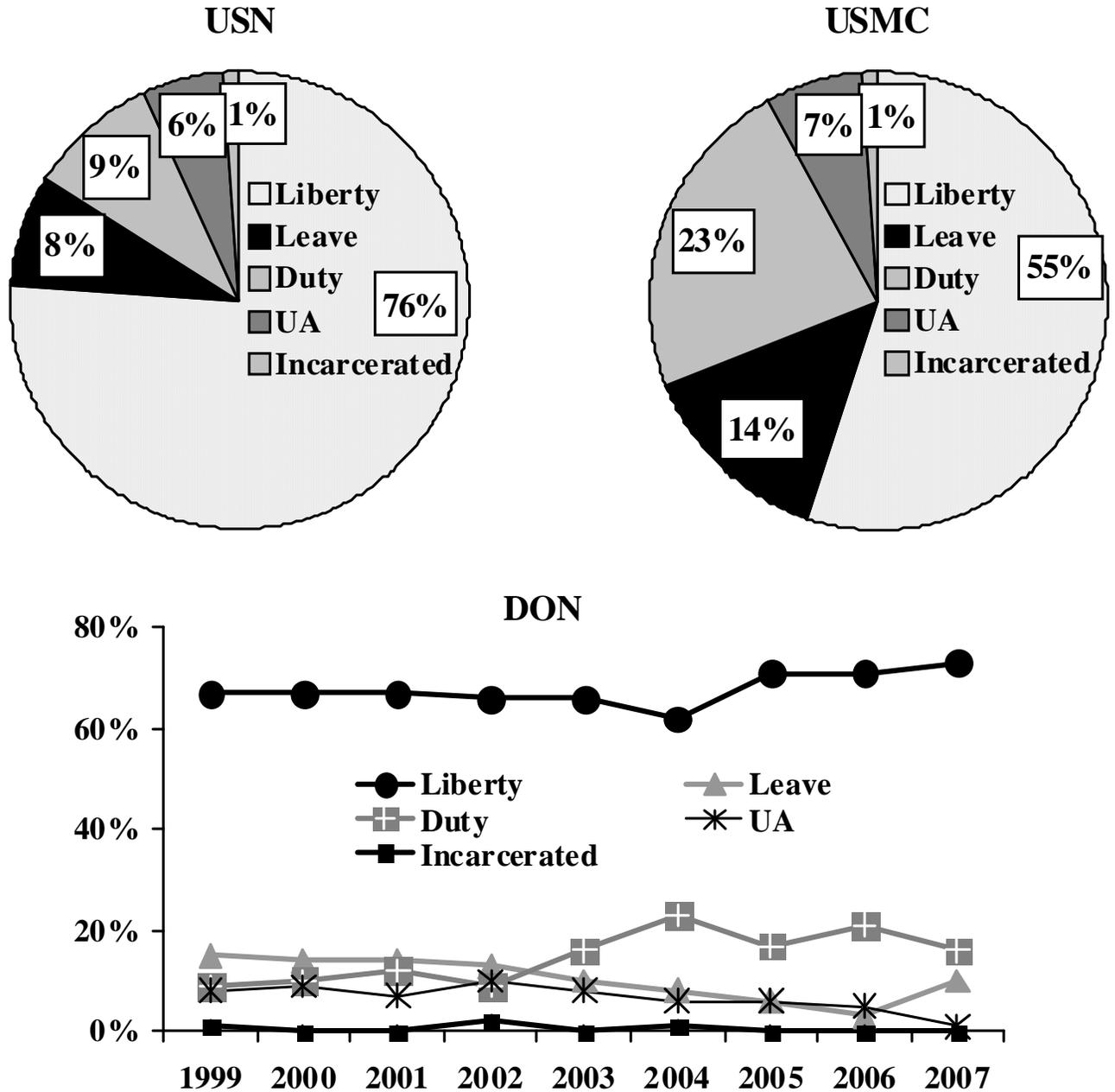
Figures 5 through 9 describe characteristics of completed suicides within the DON from 1999–2007. Sample size varies due to missing data, as indicated for each figure. Figure 5 shows shore commands were the most common type of command to which decedents were assigned. A significant service difference ($p < .001$) was found in command type. However, this was due to the fact that ships and submarines are not permanent duty assignments for USMC personnel as they are for USN personnel. Differences in command type were not significant by year.

Figure 5. Decedents' Command Type at Time of Suicide, 1999–2007 ($N = 615$)



At the time of suicide, most DON decedents were on liberty (see Figure 6). No significant differences were found in duty status at time of death by year of death. By service, USMC decedents were more often on duty at time of death ($p < .001$) than were USN decedents. However, this pattern has not been stable over time.

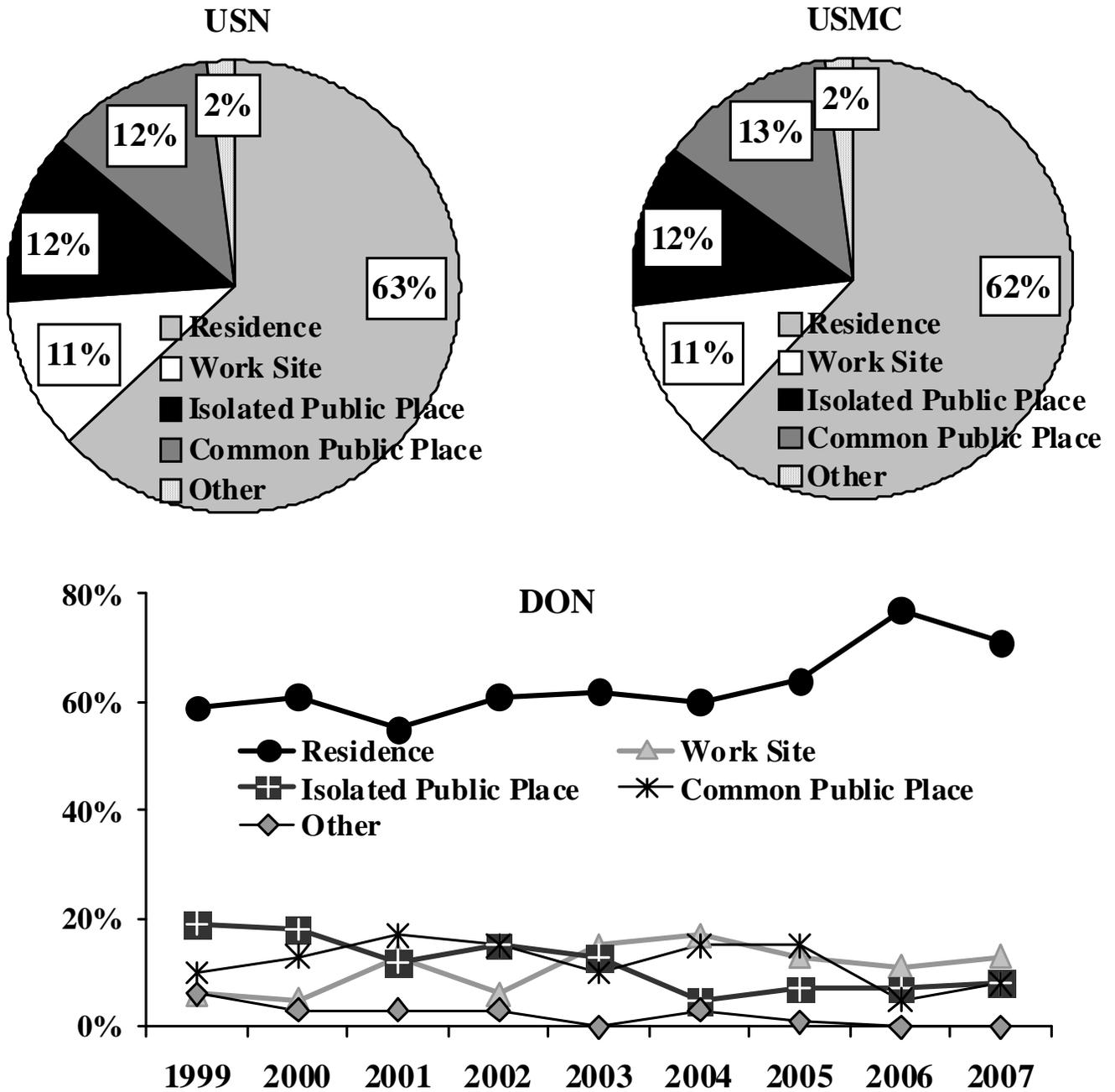
Figure 6. Decedents’ Duty Status at Time of Suicide, 1999–2007 ($N = 615$)



Note. UA = unauthorized absence.

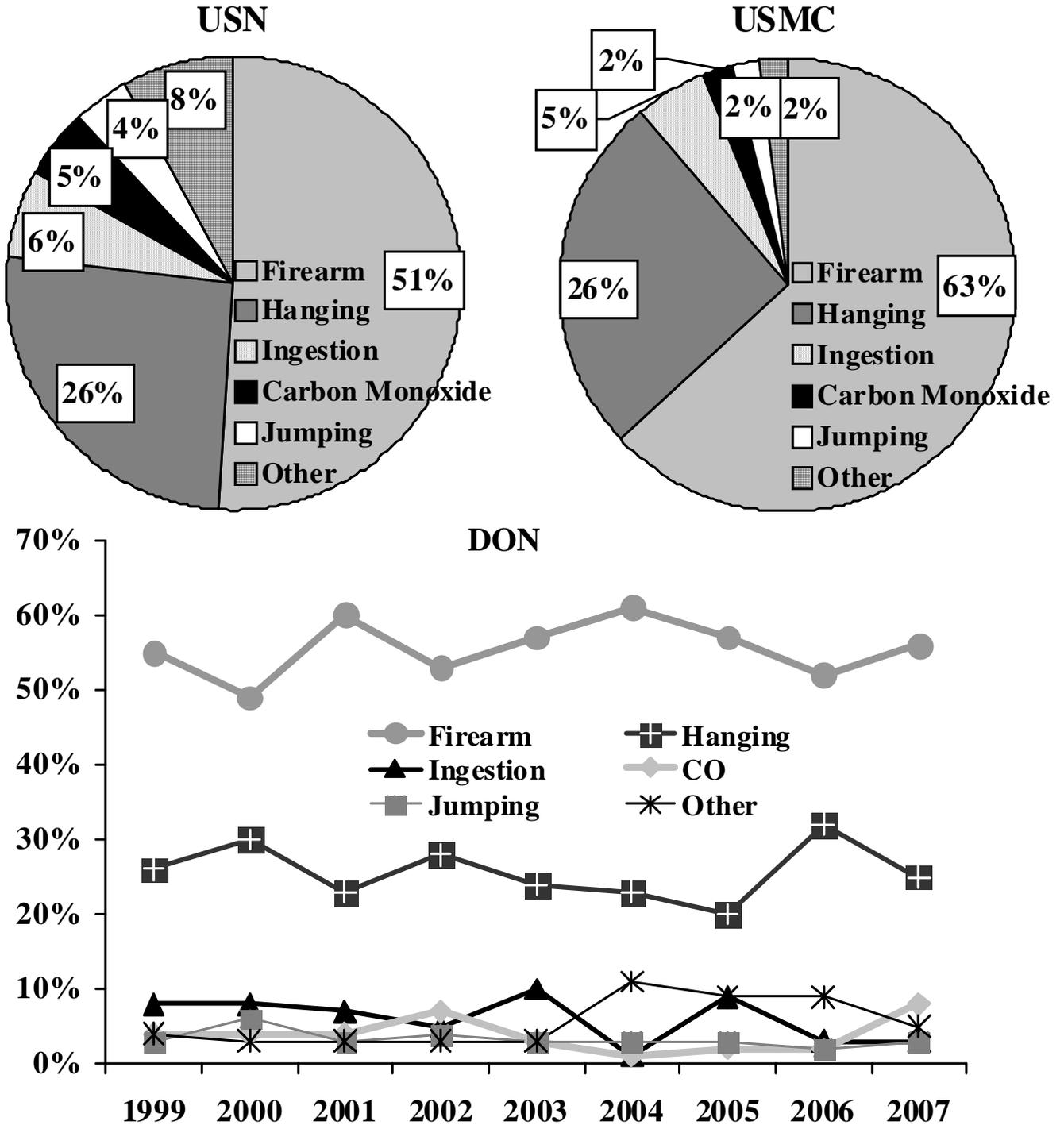
Most often, decedents chose to commit suicide in a residence (see Figure 7). The pattern by service is nearly identical. No significant differences were found in decedents’ choice of suicide site by service or calendar year of suicide. Shifting the relatively few cases in command quarters (e.g., barracks) from Residence to Work Site did not affect results.

Figure 7. Location of Suicide Event, 1999–2007 (*N* = 570)



The most common method of suicide involved the use of a firearm, followed by hanging. Together, these two methods accounted for 77% of USN suicides and 89% of USMC suicides (see Figure 8). Fewer USN than USMC decedents used a firearm to commit suicide ($p < .01$).

Figure 8. Method of Suicide, 1999–2007 ($N = 615$)



Decedents who were aboard ships or on other government property at the time of their suicide were significantly more likely than those on civilian property to have chosen hanging as the suicide method ($p < .001$; see Table 3). This result held whether decedents who were in government housing at the time of suicide were reclassified with civilian housing decedents. Among only those who committed suicide on government property, USMC decedents were again more likely to have used firearms than USN decedents, but the service difference was not significant.

The marginal associations we reported previously between using a gun to commit suicide and both military firearm training and access have attained statistical significance with this report's data expansion ($p < .001$; see Table 4). Those who chose to use a firearm were more likely to have had some training with weapons and to have had access to a military weapon. Despite this pattern, only 16% of the guns used by DON personnel to commit suicide were military weapons. We should note that data on firearm access and training were not available for 1999 cases.

Firearm use was not significantly related to gender, age, race, officer/enlisted status, educational level, or marital status. The marginal relationship between enlisted paygrade and firearm use reported previously on the smaller data set is much weaker in the expanded data set; while a smaller percentage of junior enlisted (E1 to E3; 51%) than more-senior enlisted personnel (E4 to E9; 58%) used a firearm, the difference is nonsignificant.

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

Location	Method		
	Firearm	Hanging	Other
Nonmilitary	62%	16%	22%
Military	44%	44%	12%

Note. $N = 614$.

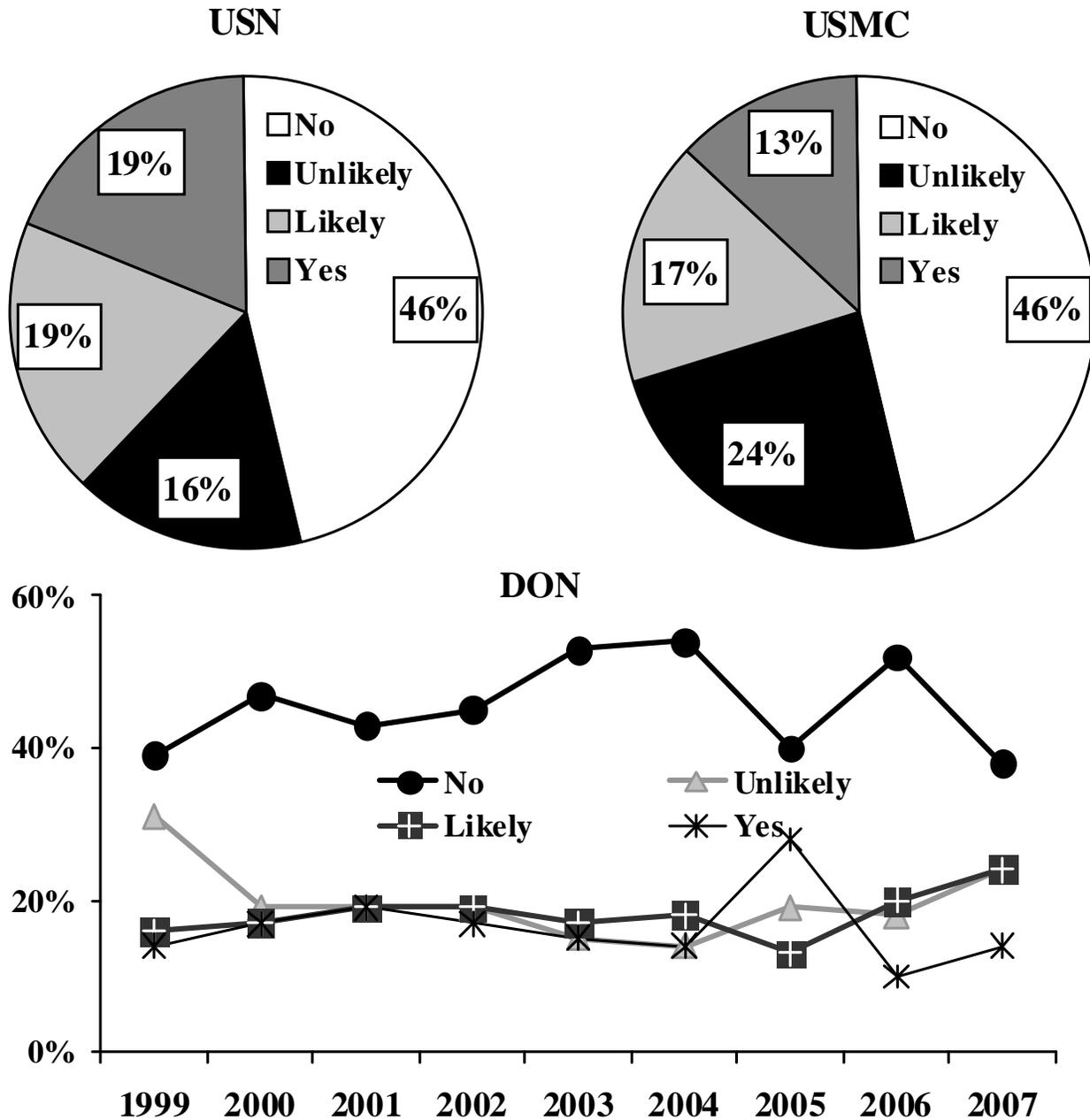
Table 4. Method of Suicide by Access to and Training With Military Weapons

Method	Access		Training	
	Yes	No	Yes	No
Gun	69%	52%	69%	49%
Other	31%	48%	31%	51%

Note. $N = 433-439$.

Though alcohol was likely involved in 35% of DON suicides, in general POCs reported that decedents were not drinking alcohol at the time of suicide or that it was unlikely alcohol was involved (USN, 62%; USMC, 70%). No differences were found in alcohol use at time of suicide by service or calendar year (see Figure 9).

Figure 9. Use of Alcohol at Time of Suicide, 1999–2007 (N = 486)

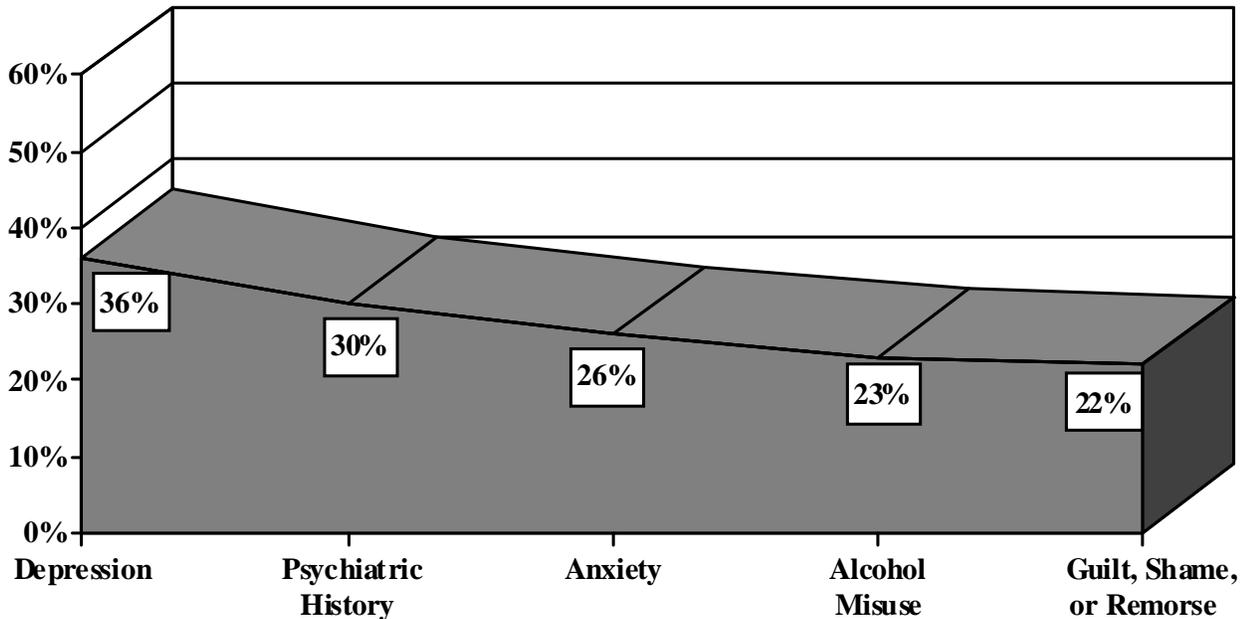


Risk Factors for Suicide

The DONSIR instructs POCs to report finding evidence that decedents had experienced a number of specific problems that might have precipitated their choice to commit suicide. These included 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 four ($M = 3.9$) key risk factors. The key risks most commonly noted were recent depression, a history of psychiatric treatment, recent anxiety, alcohol abuse in 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, $M = 4.20$; USMC, $M = 3.68$). Only one significant service difference in key risk factors was found; POCs reported more alcohol problems for USN than for USMC decedents ($p < .001$). They also tended to report more feelings of loneliness for USN than USMC decedents ($p < .05$).

Figure 10. Most Common Key Risk Factors for Suicide Reported for DON Decedents, 1999–2007



Because of media depictions of an elevated suicide rate among Army personnel deployed in support of the GWOT (Alvarez, 2008; Associated Press, 2004; Associated Press, 2008), supplemental analyses were conducted on DON cases occurring inclusively between 2002 and 2007. Assessment of the association of having been war-deployed, dichotomized as Never/Ever, with each of the 26 key risk factors found only one factor significant at the .01 level: the count of those who were or ever had been war-deployed for GWOT was higher than statistically expected for a change in body weight ($p < .01$), with 25 out of 330 decedents evidencing recent change. This is possibly a spurious result based on over- or under-eating related to noncombat stresses or food-access issues.

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 approximately three contextual stressors for each decedent ($M = 2.87$). The five most commonly reported associated stressors were problems in a primary romantic relationship, physical health problems, work issues (such as poor performance), recent military legal or administrative action, and job dissatisfaction (see Figure 11). The number of associated stressors indicated per decedent did not differ by service (USN, $M = 2.94$; USMC, $M = 2.78$) nor did the prevalence of any specific stressor differ by service ($p < .01$).

Supplemental analyses to assess the association of having been war-deployed with each of the 14 associated stressors found only one stressor significant at the .01 level (school problems); however, the result is not meaningful because it involves zero USMC cases reporting school problems among those ever-war-deployed.

The number of key risk factors and the number of associated stressors reported were significantly correlated ($r = .48$; $p < .01$). 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. This relationship is possibly spurious, due to the fact that POCs who were conscientious found both more key risk factors and associated stressors, while those who spent less time investigating suicides found few of either. Considering both types of factors together, POCs noted 10 or more indicators for suicide among 27% of the decedents.

Figure 11. Most Common Associated Stressors Reported for DON Decedents, 1999–2007

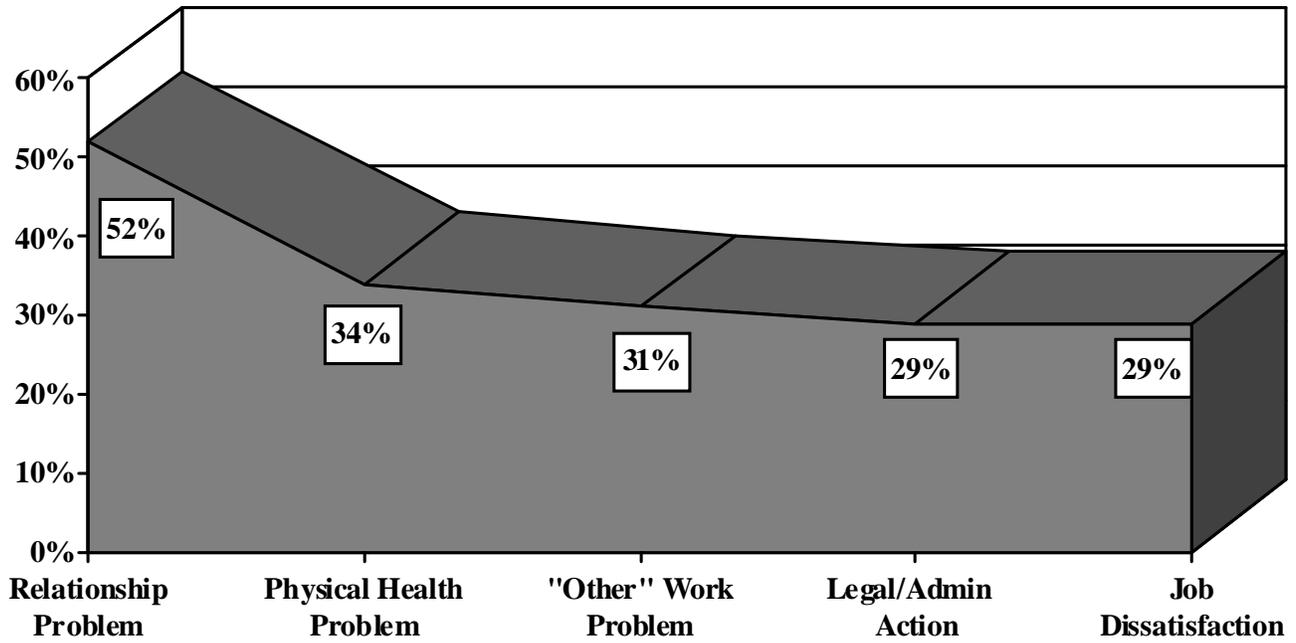
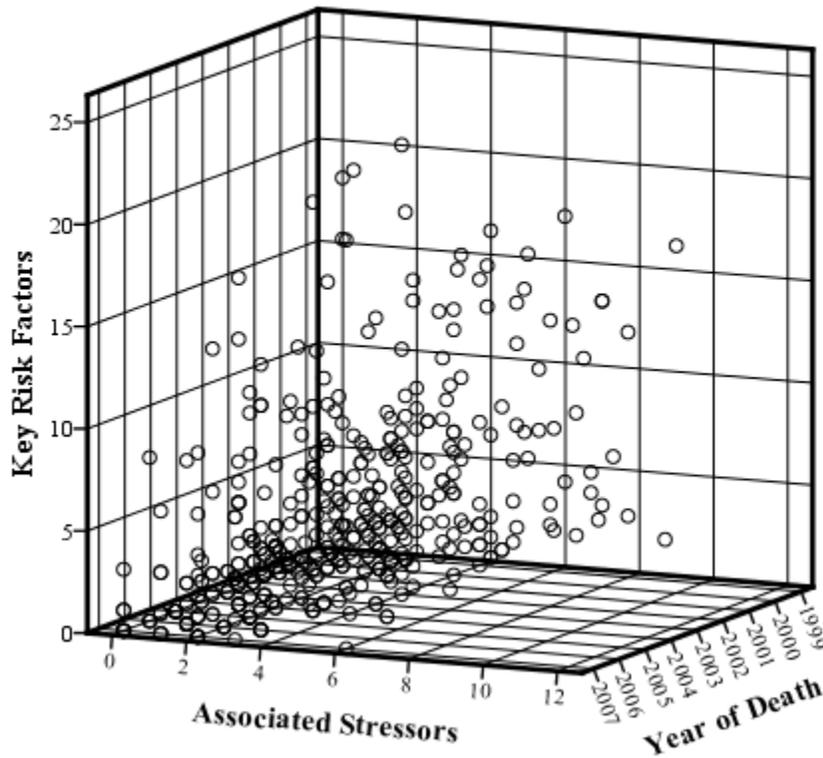


Table 5. Co-occurrence of Key Risk Factors and Associated Stressors for DON Decedents, 1999–2007

Stressors	Key Risk Factors				
	None	1–2	3–4	5–6	7+
None	32 (7%)	15 (3%)	1 (<1%)	0 (0%)	1 (<1%)
1–2	59 (12%)	69 (14%)	32 (7%)	17 (4%)	27 (6%)
3–4	16 (3%)	33 (7%)	35 (7%)	15 (3%)	35 (7%)
5–6	3 (1%)	16 (3%)	8 (2%)	11 (2%)	27 (5%)
7+	0 (0%)	1 (<1%)	6 (1%)	6 (1%)	22 (5%)

Note. Due to missing data, $N = 487$.

Figure 12. Association Between Key Risk Factors and Associated Stressors for DON Decedents, 1999–2007



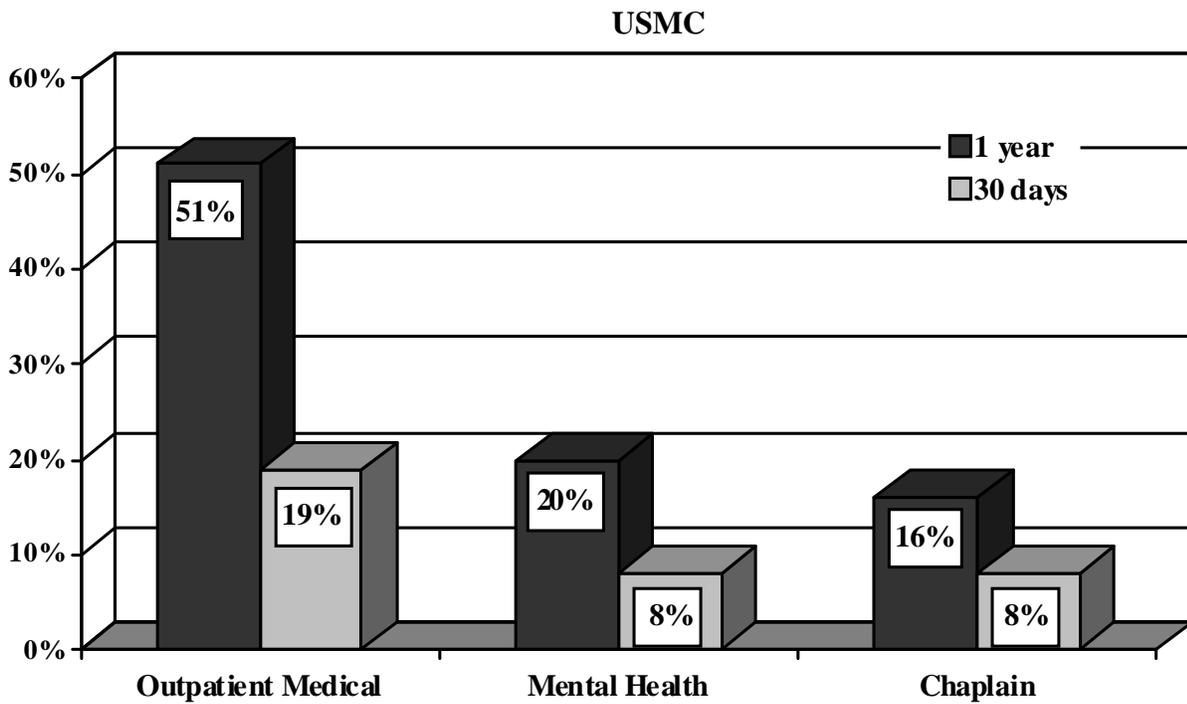
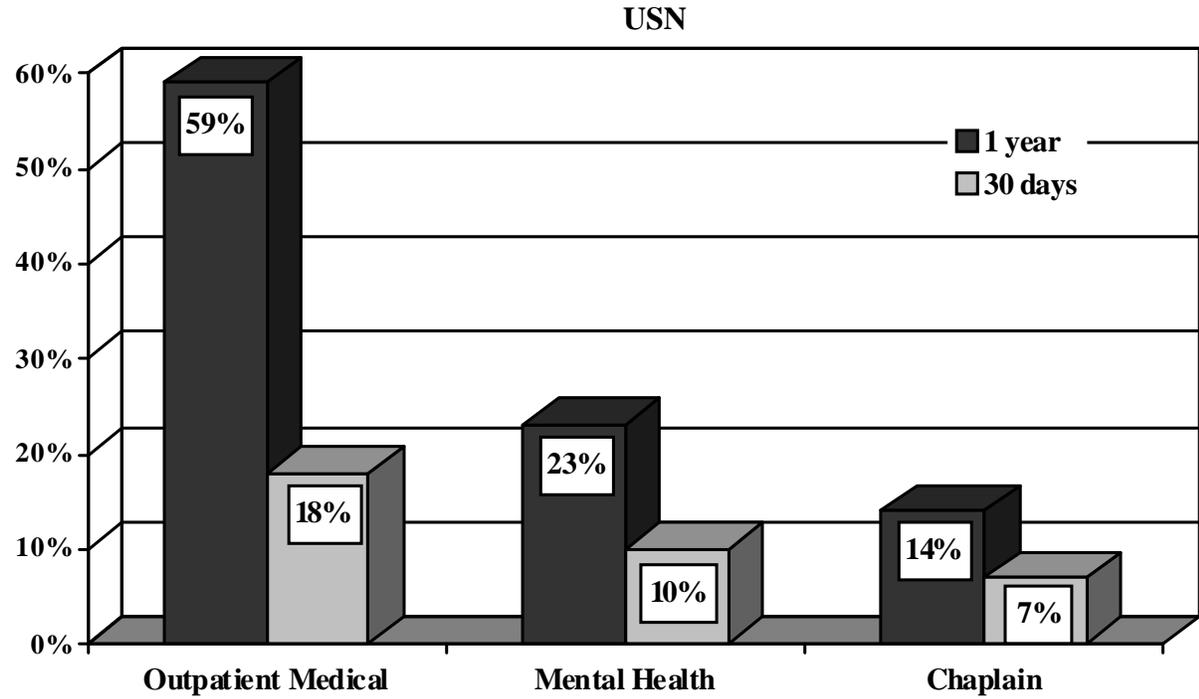
Recent Use of Support Services

POCs were asked to report finding 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 73% of the decedents, POCs reported no evidence of any service use in the last 30 days before suicide (USN, 72%; USMC, 74%). Within the previous year, decedents had used an average of 1.49 of these services (USN, $M = 1.55$; USMC, $M = 1.41$). No significant differences were found 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 in the last 30 days. 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). Eighteen percent of DON decedents had been seen at outpatient medical facilities within 30 days of suicide.

Supplemental analyses to assess the association of having been war-deployed with each of the 11 support service-use variables found that none were significant at the .01 level. Count patterns were riddled with zeroes and ones among those ever deployed to war, possibly reflecting war-front access issues and rendering results unreliable.

Figure 13. Most Common Support Services Used by DON Decedents in the Year Prior to Suicide, 1999–2007



DISCUSSION

The Department of the Navy Suicide Incident Report project conducted by the Naval Health Research Center from 1999 to 2007 represents a focused effort to assess the factors contributing to suicides among active-duty sailor and Marines. However, limitations in the DONSIR process should be considered in evaluating results. In particular, POCs completing the report rarely had access to all the information requested on the DONSIR form. Typically the most accessible information, as reflected by missing-data patterns, were demographic data, the circumstances of the suicide, and career and performance information available in the decedents' military personnel records. Information regarding family history, psychological risk factors, personal-life stressors, and support service use was less consistently reported. A substantial amount of personal information was available to some POCs in military investigative reports, from the decedents' military colleagues, and through the Casualty Assistance Calls Officers who act as military liaisons for decedents' families. However, it is important to remember that the DONSIR data include information available posthumously to the POCs, and are not self-report data. POCs were instructed not to contact the decedent's family members directly. Though broader direct access to civilian informants would have improved the quality of the data, such an approach posed the risk of burdening grieving friends and families (Institute of Medicine, 2002).

The general findings described herein are consistent with those previously reported for the initial years of the cumulative database. The descriptions hold true, despite adjustments initiated in 2005 to ensure compliance with the then-pending DoD-wide guidelines regarding what suicide deaths should be included in active-duty suicide rates and how those rates should be calculated. Overall, patterns of suicide characteristics have become more stable as more data have accumulated. As in our last report, results confirmed that suicide rates have been significantly lower in the Navy and Marine Corps than in the U.S. civilian population, after taking demographics into account. Most suicide decedents have been men, and suicide rates have been significantly higher among men than among women. The suicide rate has been also significantly lower for officers than for enlisted personnel. The significant race/ethnicity difference found among USN decedents seems to hinge on fluctuation of a small count of Native American sailors who committed suicide, and that count could be expected to continue to

fluctuate across time. We did not find significant differences in suicide rates based on groupings of age, length of service, or enlisted paygrade.

Suicides generally occurred while the decedent was on liberty and at a private residence. A firearm has been the most common method of suicide overall; however, those decedents who were USMC personnel, had military training in or access to firearms, or were on private property at time of death, appear somewhat more likely than others to have chosen this method.

The key risk factors for suicide most commonly noted were recent depression, a history of psychiatric treatment, recent anxiety, alcohol abuse in the previous year, and recent feelings of guilt or shame. The five most commonly noted associated stressors were problems in a primary romantic relationship, physical health problems, work issues (e.g., poor performance), recent military legal or administrative action, and job dissatisfaction. Multiple key risk factors and associated stressors were common, with evidence of 10 or more for well over a quarter of the decedents. Despite this, it appears that few decedents sought help; for 73% of the decedents, POCs reported no use of military support services in the month prior to their suicide acts.

No associations were found between being or having ever been deployed in support of the Global War on Terrorism and any of the key risk factors or associated stressors or support-service use variables. A recent change in body weight among decedents who had been deployed to Operation Iraqi Freedom or Operation Enduring Freedom was observed; however, it is unclear whether the weight change was related directly to either suicide or war. The currently discussed issue regarding whether combat or other war-related stress contributes to the DON suicide rate cannot be addressed directly by the DONSIR. However, the rate fluctuations between 1999 and 2007 fail to suggest strong evidence of war-related suicides in the Navy or even, with its wider rate fluctuations, the Marine Corps.

Many findings regarding suicide rates for military personnel in other branches of the U.S. armed and abroad have been similar to those noted here for the Department of the Navy. In particular, rates of suicide among military personnel have been lower than rates among comparable civilian populations (Defense Analytical Services Agency, 2005, 2006; Fear & Williamson, 2003; Flach, 1988; Helmkamp, 1995; Hytten & Weisaeth, 1989; Mancinelli, Lazanio, Comparelli, Ceciarelli, Marzo, Pompili, et al., 2003; Mancinelli, Tommaselli, Comparelli, Lazanio, Ceciarelli, Girardi, et al., 2001; Ponteva, 1983; Schroderus, Lonnqvist, &

Aro, 1992). Low rates of suicide in different military services have been attributed to entrance screening practices in modern military organizations, social cohesion among military troops, and multiple support services available to military personnel (Bodner, Ben-Artzi, & Kaplan, 2006; Schroderus et al., 1992).

As we found in this report, lower rates of suicide among officers than enlisted personnel have been reported by other countries, including the United Kingdom and Italy (Blatchley, Ward, & Fear, 2004; Mancinelli et al., 2001). This difference has not been noted as commonly or consistently in international studies as has the finding that military suicide rates overall are somewhat lower than civilian rates. For example, a study in Germany found no consistent pattern in relation to officer/enlisted status (Flach, 1988). However, lower rates of suicide among officers have been noted within all of the U.S. armed services for some time (Helmkamp, 1995; Rothberg & Jones, 1987).

The most common methods of suicide appear somewhat disparate across international military populations, largely due to differences in availability of different methods. Most notably, countries where personal firearms are not legal have very low rates of suicide or parasuicide by firearm (Lim & Ang, 1992; Ward & Fear, 2004). In contrast, when firearms are available, their use is the most common method, implicated in 30% to 60% of cases (Flach, 1988; Mancinelli et al., 2003; Mancinelli et al., 2001; Marttunen, Schroderus, Henriksson, Lonnqvist, & Pelkonen, 1997; Ponteva, 1983). Reports of U.S. and foreign armed services have suggested that the use of firearms in suicide may be elevated in military populations, at least those where a weapon is a primary occupational tool (Helmkamp, 1996; Hytten & Weisaeth, 1989; Ponteva, 1983; Ward & Fear, 2004). However, where military weapons are carefully controlled, the specific use of a military weapon appears less common, and careful control over access to military weapons is probably an important factor in reducing suicides with military firearms (Marttunen et al., 1997; Ward & Fear, 2004).

Beyond demographic characteristics, comparative studies of suicide and suicide attempts in military populations have reported that social or relationship problems, depression, and history of psychiatric care seem to be risk factors for suicide (Angst & Clayton, 1998; Apter et al., 1993; Gaines & Richmond, 1980; Hytten & Weisaeth, 1989; Marttunen et al., 1997). However, these problems may be more acute than chronic, with major psychological disorders and physical

illnesses less prevalent in comparison with civilian suicide decedents (Apter et al., 1993; Hytten & Weisaeth, 1989; Marttunen et al., 1997; Mehlum, 1990). Ponteva (1983) noted that, over time in the modern Finnish military, the proportion of psychiatric versus social problems as precipitating factors had shifted to include a greater proportion of social and relationship issues. Furthermore, some studies suggest that military suicide decedents may actually have better performance histories than other personnel, and that perfectionism may distinguish certain types of suicidal behavior such as completed versus attempted suicide, or suicides among deployed versus nondeployed personnel (Apter et al., 1993; Bodner et al., 2006; Dycian, Fishman, & Bleich, 1994; Mancinelli et al., 2003; Mancinelli et al., 2001).

DONSIR data were not collected for any comparison groups in order to assess the extent to which specific key risks and associated stressors might be more prevalent among DON suicide decedents than they are among the general DON population or among civilian suicide decedents. Furthermore, international studies of risk factors for suicide among military personnel have not consistently included comparison groups, have not evaluated the same subsets of risk factors, and frequently have been based on small numbers of suicide cases (Angst & Clayton, 1998; Apter et al., 1993; Hytten & Weisaeth, 1989; Marttunen et al., 1997; Mehlum, 1990). Given the challenges, the importance of specific risk factors for suicide within military populations should be a focus for future research.

It is possible that different risk factors coincide with different types of suicidal behavior or with suicides among persons in different military subpopulations, and for that reason population-specific research in this area would be helpful. Furthermore, although there appear to be many similarities in patterns of suicide across international military populations, the dynamics of an all-volunteer force versus mandatory military service may uniquely affect some risk factors, such as the timing of suicide (Flach, 1988; Mancinelli et al., 2003; Partonen, Aro, Schroderus, Lonnqvist, & Henriksson, 1994). Future studies of U.S. military populations that include comparison groups and large numbers of cases across multiple types of suicidal behavior would contribute greatly to understanding this problem.

CONCLUSION

This report summarizes data regarding all completed suicides in the Navy and Marine Corps across 9 years of surveillance using the Department of the Navy Suicide Incident Report.

The DONSIR is useful to the study of completed suicide among active duty sailor and Marines (Hourani & Hilton, 1999; Hourani et al., 2000; Hourani et al., 2001; Jones et al., 2001; Stander et al., 2005; Stander et al., 2006; Stander, Hilton, Kennedy, & Gaskin, 2004; Stander, Hilton, Kennedy, & Robbins, 2004). In particular, the DONSIR has contributed to the evaluation of military-specific correlates of suicide not addressed in the civilian academic literature. Focus on military-specific risk factors is important because military personnel are not representative of the U.S. population. Also, the organizational structure of the military can potentially support suicide prevention policies and procedures that cannot be implemented among civilian populations.

One of the goals of the DONSIR program has been to facilitate comparability of patterns in completed suicides over time and across services (Hourani & Hilton, 1999; Hourani et al., 2000; Hourani et al., 2001; Jones et al., 2001; Stander et al., 2005; Stander et al., 2006; Stander, Hilton, Kennedy, & Gaskin, 2004; Stander, Hilton, Kennedy, & Robbins, 2004). This goal has been shared and pursued by working groups under the direction of the Office of Health Affairs during the same time period as the DONSIR program. Their efforts have honed definitions of suicide terms under military use, and standardized methods for both data collection and rate calculation. The launch in January 2008 of the Department of Defense Suicide Event Report (DoDSER), the DONSIR's replacement, established a core registry for suicide surveillance at the DoD level. A frustration of suicide research in the military is the time lapse required to accumulate data sufficient for conclusive analysis of this statistically rare event. Because the DONSIR database was compliant with Health Affairs DoD-wide guidelines, it is positioned to backfill the DoDSER with nearly a decade of preceding cases. This will undoubtedly expedite and strengthen the DoDSER's usefulness in understanding this force-diminishing action and improve the military's suicide prevention program efforts.

ACKNOWLEDGMENTS

The authors thank, alphabetically, the following collaborators for their invaluable contributions in support of this research over the years: Lisa M. Boyd, Christina M. Bruce, Anthony P. Doren, Lauren Farmer, Thomas A. Gaskin, Catherine J. Grainger, Tom Hennessy, Laurel L. Hourani, Tristan N. Johnson, David E. Jones, Kevin R. Kennedy, Daniel Rahilly, Danisha L. Robbins, Cynthia J. Thomsen, Michelle J. White.

REFERENCES

- Alvarez, L. (2008, October 30). Army and agency will study rising suicide rate among soldiers. [Electronic version]. The New York Times. Retrieved October 30, 2008, from http://www.nytimes.com/2008/10/30/us/30soldiers.html?_r=2&th=&oref=slogin&emc=th&page=1&th&emc=th&oref.
- Angst, J., & Clayton, P. J. (1998). Personality, smoking and suicide: A prospective study. *Journal of Affective Disorders, 51*, 55-62.
- Apter, A., Bleich, A., King, R. A., Kron, S., Fluch, A., Kotler, M., et al. (1993). Death without warning? A clinical postmortem study of suicide in 43 Israeli adolescent males. *Archives of General Psychiatry, 50*, 138-142
- Associated Press. (2004, January 14). Suicide rate among soldiers up in Iraq. Retrieved January 14, 2004, from <http://www.msnbc.msn.com/id/3956787/>
- Associated Press. (2008, January 31). Army suicides up 20 percent in 2007, report says. Retrieved January 31, 2008, from http://www.cnn.com/2008/HEALTH/01/31/army.suicides.ap/index.html?efef=rss_topstories
- Blatchley, N. F., Ward, V. R., & Fear, N. T. (2004). *Suicide and open verdict deaths among males in the UK Regular Armed Forces, 1984-2003*. London, UK: Defense Analytical Services Agency for UK Defense Statistics.
- Bodner, E., Ben-Artzi, E., & Kaplan, Z. (2006). Soldiers who kill themselves: The contribution of dispositional and situational factors. *Archives of Suicide Research, 10*, 29-43.
- Defense Analytical Services Agency. (2005, July 14). Suicide and open verdict deaths in the UK regular Armed Forces 1984-2004. Retrieved June 19, 2006, from <http://www.dasa.mod.uk/publications/pdfs/suicide/suicideJul05.pdf>
- Defense Analytical Services Agency. (2006, July 14). Suicide and open verdict deaths in the UK regular Armed Forces, 1984-2005. Retrieved June 19, 2006, from <http://www.dasa.mod.uk/publications/pdfs/suicide/suicideMar06.pdf>
- Dycian, A., Fishman, G., & Bleich, A. (1994). Suicide and self-inflicted injuries. *Aggressive Behavior, 20*(1), 9-16.
- Fear, N. T., & Williamson, S. (2003). *Suicide and open verdict deaths among males in the UK regular Armed Forces. Comparison with the UK civilian population and the US military*. London, UK: Defense Analytical Services Agency for UK Defense Statistics.
- Flach, H. (1988). A social-psychological investigation on suicide attempts in a military population. *Crisis, 4*(1), 16-32.
- Fleiss, J. L., Levin, B., & Paik, M. C. (2003). *Statistical methods for rates and proportions* (3rd ed.). Hoboken, NJ: John Wiley & Sons.
- Gaines, T., & Richmond, L. H. (1980). Assessing suicidal behavior in basic military trainees. *Military Medicine, 145*, 263-266.

- Gunderson, E. K. E., Miller, M. R., & Garland, C. F. (2002). Career History Archival Medical and Personnel System (CHAMPS): Data resource for cancer, chronic disease, and other epidemiological research (NHRC Tech. Rep. No. 02-06). San Diego, CA: Naval Health Research Center.
- Helmkamp, J. C. (1995). Suicides in the military: 1980-1992. *Military Medicine*, 160(2), 45-50.
- Helmkamp, J. C. (1996). Occupation and suicide among males in the US armed forces. *Annals of Epidemiology*, 6, 83-88.
- Hourani, L. L., & Hilton, S. (1999). *Department of the Navy Suicide Incident Report (DONSIR): Preliminary findings January-June 1999* (NHRC Tech. Rep. No. 99-5E). San Diego, CA: Naval Health Research Center.
- Hourani, L. L., Hilton, S. M., Kennedy, K., & Jones, D. (2000). *Department of the Navy Suicide Incident Report (DONSIR): Summary of 1999 findings* (NHRC Tech. Rep. No. 00-22). San Diego, CA: Naval Health Research Center.
- Hourani, L. L., Hilton, S. M., Kennedy, K., & Robbins, D. (2001). *Department of the Navy Suicide Incident Report (DONSIR): Summary of 1999-2000 findings* (NHRC Tech. Rep. No. 01-22). San Diego, CA: Naval Health Research Center.
- Hyttén, K., & Weisaeth, L. (1989). Suicide among soldiers and young men in Nordic countries 1977-1984. *Acta Psychiatrica Scandinavica*, 79(3), 224-228.
- Institute of Medicine (2002). *Reducing suicide: A national imperative*. Washington, DC: National Academies Press.
- Jones, D. E., Kennedy, K. R., Hawkes, C., Hourani, L. L., Long, M. A., & Robbins, N. L. (2001). Suicide prevention in the Navy and Marine Corps: Applying the public health model. *Navy Medicine*, 92(6), 31-36.
- Julious, S. A., Nicholl, J., & George, S. (2001). Why do we continue to use standardized mortality ratios for small area comparisons? *Journal of Public Health Medicine*, 23(1), 40-46.
- Larsen, R. J., & Marx, M. L. (2001). *An introduction to mathematical statistics and its applications* (3rd ed.). Upper Saddle River, NJ: Prentice-Hall.
- Lim, L. C.-C., & Ang, Y.-G. (1992). Parasuicide in male conscripts: A Singapore experience. *Military Medicine*, 157(8), 401-404.
- Mancinelli, I., Lazanio, S., Comparelli, A., Ceciarelli, L., Marzo, S. D., Pompili, M., et al. (2003). Suicide in the Italian military environment (1986-1998). *Military Medicine*, 168(2), 146-152.
- Mancinelli, I., Tommaselli, P., Comparelli, A., Lazanio, S., Ceciarelli, L., Girardi, P., et al. (2001). Suicide in military circles in Italy (1986-1998). *European Psychiatry*, 16, 432-433.
- Marttunen, M., Schroderus, M., Henriksson, M., Lonnqvist, J., & Pelkonen, S. (1997). Suicide among military conscripts in Finland: A psychological autopsy study. *Military Medicine*, 162(1), 14-18.

- Mehlum, L. (1990). Attempted suicide in the armed forces: A retrospective study of Norwegian conscripts. *Military Medicine*, 155(12), 596-600.
- National Center for Injury Prevention and Control. (2008, July 6). Web-based injury statistics query and reporting system. Retrieved July 6, 2008, from http://webappa.cdc.gov/sasweb/ncipc/mortrate10_sy.html
- Navy Personnel Command (2002). Naval Military Personnel Manual. In PERS-621 (Ed.), *Reporting requirements for suicides, suicide attempts and suicide gestures*. Millington, TN: Navy Personnel Command.
- Partonen, T., Aro, H., Schroderus, M., Lonqvist, J., & Henriksson, M. (1994). Suicides among draftees: Biphasic occurrence of suicide during military service. *Military Medicine*, 159(4), 299-301.
- Pearse, L., & White, M. (2008). Unpublished data, Mortality Surveillance Division, Armed Forces Medical Examiner System, Armed Forces Institute of Pathology.
- Ponteva, M. (1983). Aspects on the suicides of conscripts in the Finnish Defense Forces. *Psychiatria Fennica*, 14(Suppl.), 97-103.
- Rothberg, J. M., & Jones, F. D. (1987). Suicide in the U.S. Army: Epidemiological and periodic aspects. *Suicide and Life-Threatening Behavior*, 17(2), 119-132.
- Schroderus, M., Lonqvist, J. K., & Aro, H. M. (1992). Trends in suicide rates among military conscripts. *Acta Psychiatrica Scandinavica*, 86, 233-235.
- Stander, V. A., Hilton, S. M., Doran, A., Gaskin, T. A., & Thomsen, C. J. (2005). *Department of the Navy Suicide Incident Report (DONSIR): Summary of 1999-2003 findings* (NHRC Tech. Rep. No. 04-22). San Diego, CA: Naval Health Research Center.
- Stander, V. A., Hilton, S. M., Doran, A. P., Werbel, A. D., & Thomsen, C. J. (2006). *Department of the Navy Suicide Incident Report (DONSIR): Summary of 1999-2004 findings* (NHRC Tech. Rep. No. 07-05). San Diego, CA: Naval Health Research Center.
- Stander, V. A., Hilton, S. M., Kennedy, K. R., & Gaskin, T. A. (2004). *Department of the Navy Suicide Incident Report (DONSIR): Summary of 1999-2002 findings* (NHRC Tech. Rep. No. 04-19). San Diego, CA: Naval Health Research Center.
- Stander, V. A., Hilton, S. M., Kennedy, K. R., & Robbins, D. L. (2004). Surveillance of completed suicide in the Department of the Navy. *Military Medicine*, 169(4), 301-306.
- U.S. Marine Corps (2001). *Marine Corps personal services manual*. Quantico, VA: Headquarters USMC: Author.
- Ulm, K. (1990). A simple method to calculate the confidence interval of a standardized mortality ratio (SMR). *American Journal of Epidemiology*, 131(2), 373-375.
- Ward, V. R., & Fear, N. T. (2004, July 28). Suicide and open verdict deaths among males in the UK regular Armed Forces, 1984-2002: Methods used to commit suicide. Retrieved June 19, 2006, from <http://www.dasa.mod.uk/publications/pdfs/suicide/suicidemethodrep.pdf>
- Winkenwerder, W., Ireland, B., Tornberg, D., & Smith, J. (2006). *Request for standardized suicide data and reporting* (Action Memo No. 107677,108297). Washington, DC: Assistant Secretary of Defense for Health Affairs.

APPENDIX

Figure A1. Gender of DON Suicide Decedents, 1999–2007

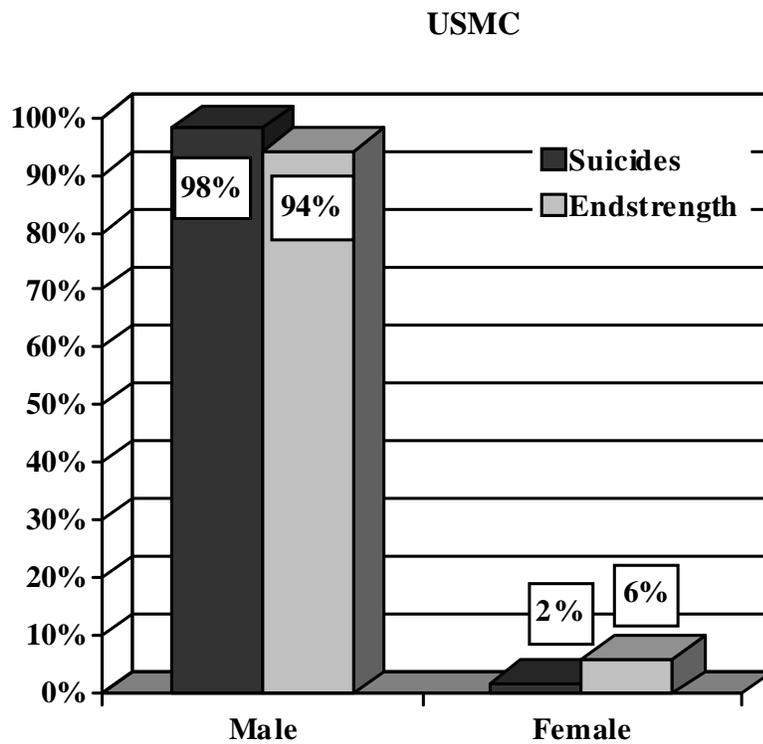
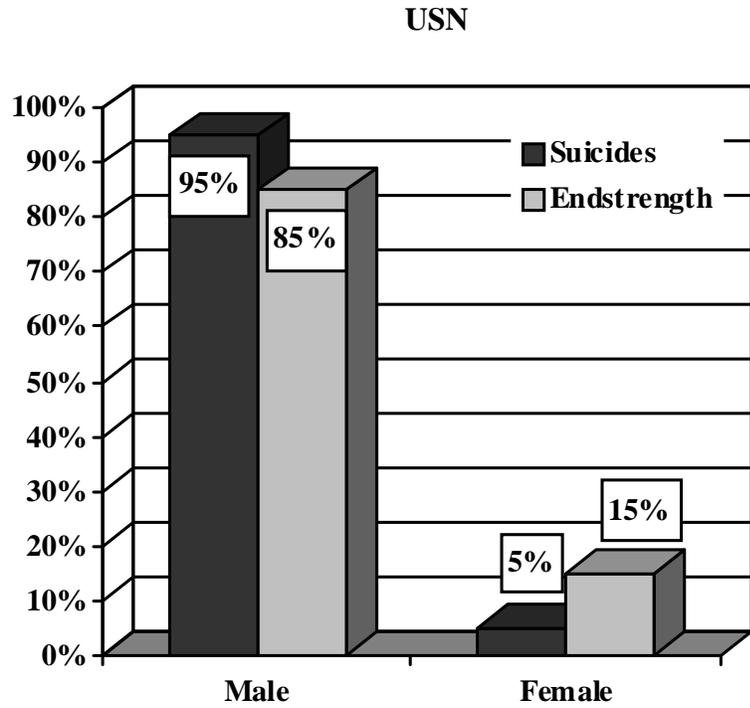


Figure A2. Age in Years of DON Suicide Decedents, 1999–2007

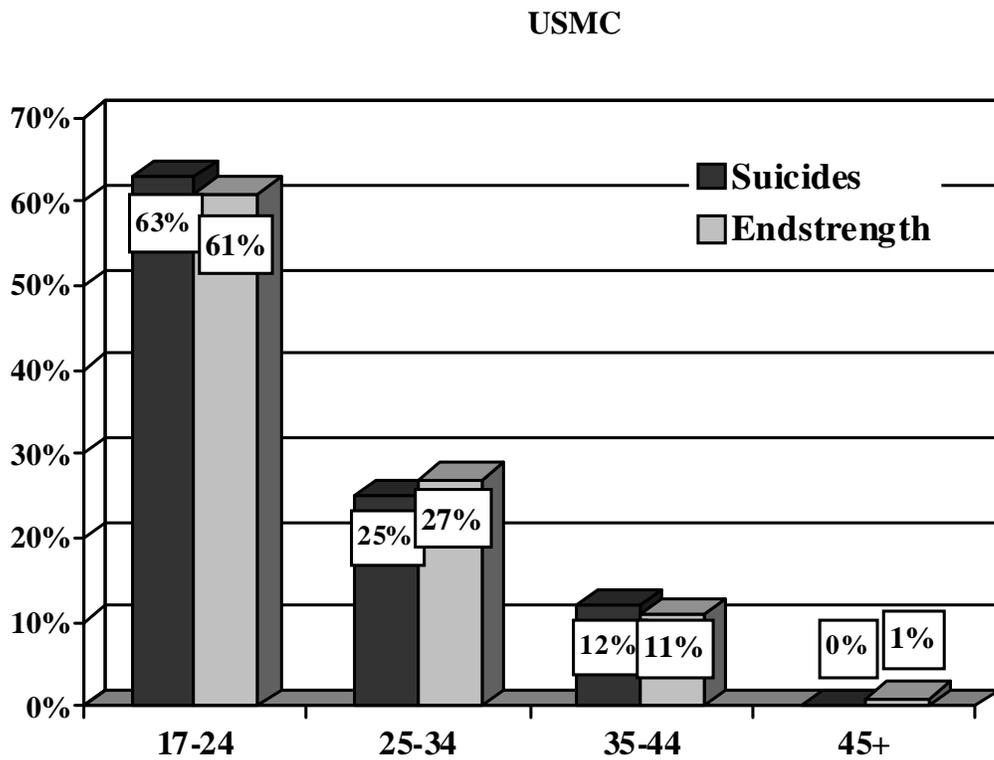
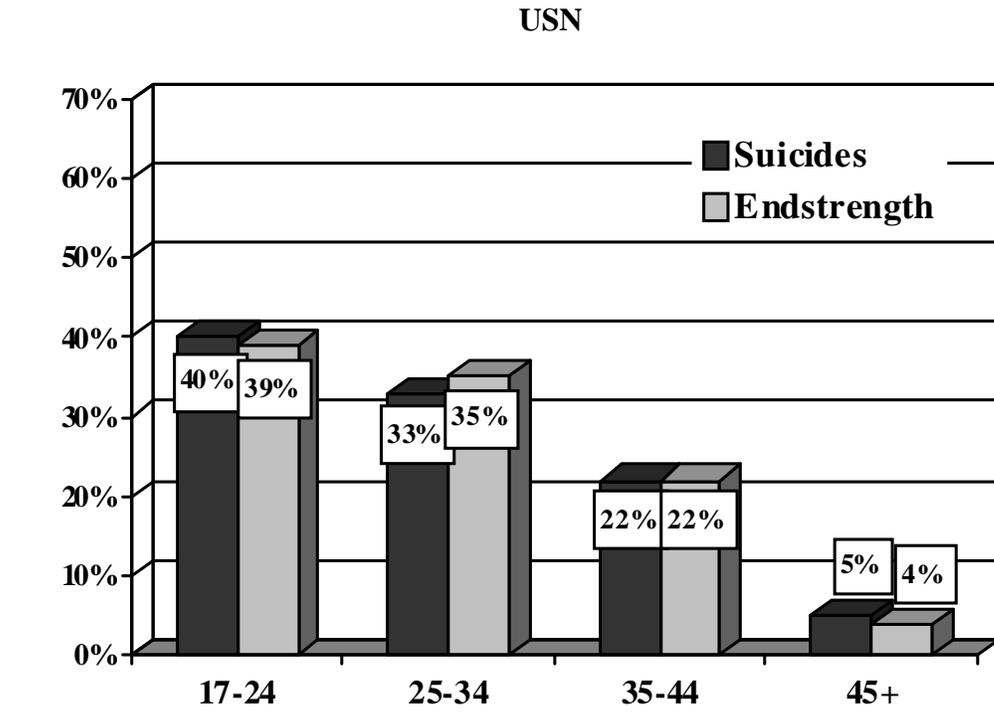


Figure A3. Race of DON Suicide Decedents, 1999–2007

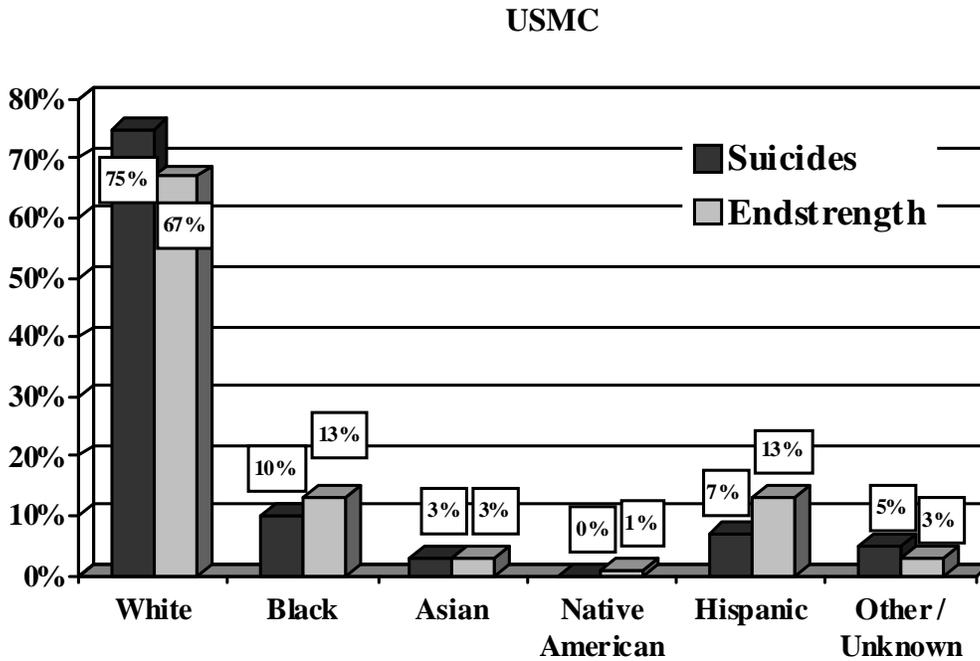
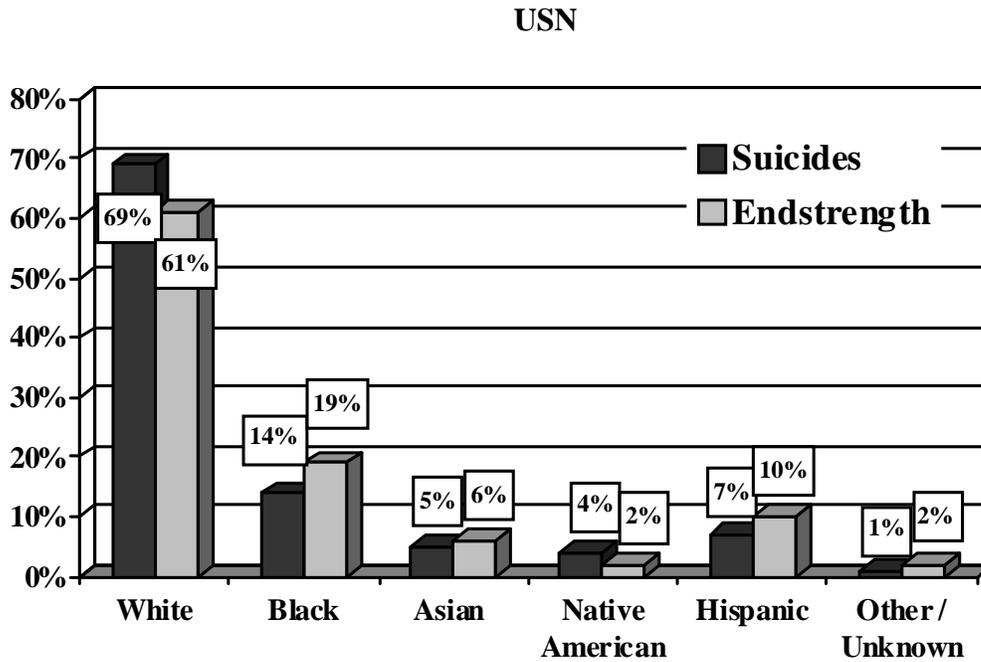


Table A. Standardized Mortality Ratios Comparing Suicide Rates for the U.S. Civilian Population With Rates for the USN and USMC

Subpopulation	USN		USMC	
	SMR	99% CI	SMR	99% CI
Overall	0.57	0.49–0.65	0.72	0.61–0.85
Gender				
Men	0.56	0.48–0.64	0.72	0.60–0.85
Women	0.88	0.44–1.56	1.31	0.28–3.70
Age, years				
17–19	0.73	0.42–1.19	0.98	0.62–1.48
20–24	0.60	0.47–0.76	0.73	0.56–0.92
25–34	0.54	0.42–0.68	0.65	0.45–0.90
35–44	0.52	0.38–0.69	0.73	0.43–1.16
45–54	0.66	0.32–1.19	0.00	0.00–0.90
Race/Ethnicity				
White	0.53	0.45–0.63	0.72	0.59–0.86
Black	0.60	0.39–0.83	0.72	0.40–1.19
Asian/Pacific Islander	0.99	0.50–1.73	1.57	0.46–3.83
Native American	0.56	0.27–1.04	0.17	0.00–1.25
Hispanic	0.76	0.43–1.23	0.76	0.38–1.33

Note. Standard mortality ratios (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 ($p < .01$), and 1.00 minus the bolded figure indicates the percent by which the corresponding service rate is below the standardized U.S. rate. All figures are calculated excluding persons of “other” or unknown race from USN and USMC data in order to enhance category compatibility between service and U.S. data.

Table B. Key Risk Factors Reported on the DONSIR for Suicide Decedents, 1999–2007

Indicator	USN	USMC	DON
Mental Health History			
1. Psychiatric history	30%	29%	30%
2. Alcohol misuse in the last year	29%	15%	23%
3. Suicide attempts or gestures	19%	19%	19%
4. Drug use/abuse in last year ^a	7%	10%	8%
<i>Total mental health history</i>	51%	40%	46%
Recent Emotional State			
5. Depression	37%	34%	36%
6. Anxiety	28%	23%	26%
7. Guilt, shame, remorse	25%	18%	22%
8. Sense of failure	20%	20%	20%
9. A desire to be free of problems	19%	13%	17%
10. A desire to die	18%	16%	17%
11. Hopelessness or uselessness	16%	17%	16%
12. Loneliness	18%	10%	14%
13. Isolation	15%	11%	14%
14. Powerlessness	12%	13%	12%
15. Lack of interest in usual activities	10%	12%	11%
16. Feeling burdensome to others	9%	9%	9%
<i>Total recent emotional state</i>	64%	51%	59%

Table B Continued

Key Risk Factors Reported on the DONSIR for Suicide Decedents, 1999–2007

Indicator	USN	USMC	DON
Recent Change in Affect or Behavior			
17. Change in usual mood	23%	20%	22%
18. Change in sleep patterns	15%	15%	15%
19. Poorer work performance	10%	10%	10%
20. Change in eating patterns	11%	8%	10%
21. Change in weight	8%	11%	9%
<i>Total recent changes</i>	38%	34%	36%
Self-Destructive or Aggressive Behavior			
22. Arranging affairs	13%	10%	12%
23. Impulsivity	12%	10%	11%
24. Aggressive behavior	8%	10%	9%
25. Self-deprecation	7%	7%	7%
26. Self-mutilation	5%	5%	5%
<i>Total destructive behavior</i>	32%	28%	31%

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 416–527 (USN, 249–302; USMC, 167–225).

Table C. Associated Stressors Reported on the DONSIR for Suicide Decedents, 1999–2007

Stressor	USN	USMC	DON
Relationship Problem			
1. Recent romantic relationship problem	54%	49%	52%
2. Recent death of family/friend	11%	7%	9%
3. Domestic violence/sexual abuse	8%	4%	7%
<i>Total relationship problems</i>	60%	53%	57%
Disciplinary/Legal Problem			
4. Military legal/admin action	26%	33%	29%
5. Discipline/conflict with authority	21%	27%	23%
6. Civil legal difficulties	14%	11%	13%
7. Under criminal investigation	12%	10%	11%
<i>Total disciplinary/legal problems</i>	39%	43%	41%
Work-Related Problem			
8. Other work	28%	34%	31%
9. Job dissatisfaction	29%	28%	29%
10. Job stress	20%	17%	18%
11. Job loss	14%	12%	13%
<i>Total work-related problems</i>	50%	50%	50%
Other			
12. Physical health	35%	33%	34%
13. Financial	16%	13%	15%
14. School	8%	3%	6%
<i>Total other problems</i>	51%	43%	47%

Note. Due to missing data, N's vary (489–527) (USN, N = 280–302; USMC, N = 209–225).

Table D. Evidence of Service Use Prior to Suicide Reported on the DONSIR for Decedents, 1999–2007

Support Service	USN		USMC	
	1 Year	30 Days	1 Year	30 Days
1. Outpatient, military facility	59%	18%	51%	19%
2. Inpatient, military facility	16%	4%	15%	3%
3. Civilian facility	10%	3%	10%	4%
<i>Total medical service use</i>	61%	20%	55%	21%
4. Mental health counseling	23%	10%	20%	8%
5. Substance abuse counseling	10%	2%	6%	2%
6. Stress management	5%	1%	5%	1%
7. Anger management	4%	0%	3%	0%
<i>Total mental health service use</i>	28%	12%	22%	9%
8. Chaplain service	14%	7%	16%	8%
9. Financial counseling	5%	1%	8%	0%
10. Family advocacy	4%	2%	4%	2%
11. Exceptional family member	3%	2%	2%	0%
<i>Total other service use</i>	22%	11%	23%	9%

Note. Due to missing data, $N = 506$ (USN = 291, USMC = 215).

REPORT DOCUMENTATION PAGE

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB Control number. **PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.**

1. Report Date (DD MM YY) 24 03 09	2. Report Type Final	3. DATES COVERED (from - to) January 1999 – December 2007
4. TITLE AND SUBTITLE Department of the Navy Suicide Incident Report (DONSIR): Summary of 1999–2007 Findings		5a. Contract Number:
6. AUTHORS Hilton, Susan M., M.A., Service, David B., CAPT, USN, Stander, Valerie A., Ph.D., Werbel, Aaron D., CDR, USN, and Chavez, Bonnie R., LCDR, USN		5b. Grant Number:
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Health Research Center 140 Sylvester Rd San Diego, CA 92106-3521		5c. Program Element:
8. SPONSORING/MONITORING AGENCY NAMES(S) AND ADDRESS(ES) Commanding Officer Commander Naval Medical Research Center Navy Medicine Support Command 503 Robert Grant Ave P.O. Box 140 Silver Spring, MD 20910-7500 Jacksonville, FL 32212-0140		5d. Project Number:
		5e. Task Number:
		5f. Work Unit Number: 6821 (Reimbursable)
		9. PERFORMING ORGANIZATION REPORT NUMBER Report No. 09-15
		10. Sponsor/Monitor's Acronyms(s) NMRC/NMSC, HQ USMC, COMNAVPERS
		11. Sponsor/Monitor's Report Number(s)

12 DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT (maximum 200 words)

The Department of the Navy Suicide Incident Report (DONSIR) was used to collect data on completed suicides in the Navy (USN) and Marine Corps (USMC) between 1999 and 2007. During that 9-year period, 615 active-duty personnel (365 USN and 250 USMC) committed suicide. The crude suicide rate for the USN was significantly lower than for the USMC, and standardized rates were both significantly lower than for U.S. civilians. Most DON decedents were enlisted men, and suicide rates were significantly higher among men and lower among officers. A significant service difference for race/ethnic group in the USN is based on small counts in the Native American and Other categories. Suicide rates did not differ significantly as a function of age, length of service, or enlisted paygrade. Suicides generally occurred while the decedent was on liberty at a private residence. A firearm was the usual suicide method, though hanging was equally likely used by those on government property at the time. The most commonly noted key risk factor was recent depression, and the most commonly noted associated stressor was problems in a primary romantic relationship. Reported numbers conform to 2006 Department of Defense-wide guidelines regarding active-duty suicide case definition. On January 1, 2008, DONSIR was replaced by the Department of Defense Suicide Event Report.

15. SUBJECT TERMS suicide, suicide prevention, suicide assessment in the military, Navy, Marine Corps, incidence, registry, risk factors, epidemiology

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 47	19a. NAME OF RESPONSIBLE PERSON CAPT Kerry R. Thompson, Commanding Officer
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U			19b. TELEPHONE NUMBER (INCLUDING AREA CODE) COMM/DSN: (619) 553-8429