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U.S. military mental health care utilization and attrition prior to the wars in Iraq and Afghanistan

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Abstract *Objective* Health care utilization studies of mental disorders focus largely on the ICD-9 category 290–319, and do not generally include analysis of visits for mental health problems identified under V-code categories. Although active duty service members represent a large young adult employed population who use mental health services at similar rates as age-matched civilian populations, V-codes are used in a larger proportion of mental health visits in military mental health care settings than in civilian settings. However, the utilization of these diagnoses has not been systematically studied. The purpose of this study is to characterize outpatient behavioral health visits in military health care facilities prior to Operation Iraqi Freedom, including the use of diagnoses outside of the ICD-9 290–319 range, in order to evaluate the overall burden of mental health care. This study establishes baseline rates of mental health care utilization in military mental health clinics in 2000 and serves as a comparison for future studies of the mental health care burden of the current war. *Methods* All active duty service members who received care in military outpatient clinics in 2000 ($n = 1.35$ million) were included. Primary diagnoses were grouped according to men-

tal health relevance in the following categories: mental disorders (ICD-9 290–319), mental health V-code diagnoses (used primarily by behavioral health providers that were indicative of a potential mental health problem), and all other diagnoses. Rates of service utilization within behavioral health clinics were compared with rates in other outpatient clinics for each of the diagnostic groups, reported as individuals or visits per 1,000 person-years. Cox proportional hazard regression was used to produce hazard ratios as measures of association between each of the diagnostic groups and attrition from military service. Time to attrition in months was the difference between the date of military separation and the date of first clinic visit in 2000. Data were obtained from the Defense Medical Surveillance System. *Results* The total number of individuals who utilized behavioral health services in 2000 was just over 115 per 1,000 person-years, almost 12% of the military population. Out of every 1,000 person-years, 57.5 individuals received care from behavioral health providers involving an ICD-9 290–319 mental disorder diagnosis, and an additional 26.7 per 1,000 person-years received care in behavioral health clinics only for V-code diagnoses. Attrition from service was correlated with both categories of mental health-related diagnoses. After 1 year, approximately 38% of individuals who received a mental disorder diagnosis left the military, compared with 23% of those who received mental health V-code diagnoses and 14% of those who received health care for any other reason (which included well visits for routine physicals). *Conclusions* This study establishes baseline rates of pre-war behavioral healthcare utilization among military service members, and the relationship of mental health care use and attrition from service. The research indicates that in the military population the burden of mental illness in outpatient clinics is significantly greater when V-code diagnoses are included along with conventional mental disorder diagnostic codes.

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Introduction

According to the Global Burden of Disease study, mental disorders are leading causes of disability burden worldwide [1]. In the active duty U.S. Armed Forces, mental disorders present a significant health care and occupational burden—they are the number one cause of hospitalization for men and second only to pregnancy-related admissions for women [7]. Moreover, at least 6% of all U.S. military service members on active duty receive outpatient treatment for a mental disorder each year, and mental illness is the leading medical correlate of attrition from military service [7].

Healthcare services research often relies on electronic databases that capture utilization data coded according to *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)*. Although mental health clinicians generally utilize the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)* for classifying diagnoses, the DSM-IV provides instructions for which ICD-9 codes correspond to each diagnosis for use in health care records. Mental health services research has focused on the ICD-9 range of 290–319, the category for mental disorders. However, mental health care can also be provided under diagnostic codes outside of the ICD-9 290–319 range, particularly V-codes. Mental health V-code diagnoses include a variety of problems that are not attributable to a mental disorder but are important areas for treatment (i.e. partner relationships, family circumstances, interpersonal relationships, or stressful life events) [28]. While V-code problems are ubiquitous, few studies have addressed the burden of care related to V-code diagnoses.

The U.S. Armed Forces provides an excellent population for psychiatric epidemiology and health services research [7, 8]. Military service members are young, ethnically diverse, and predominantly healthy (prospective members undergo a comprehensive evaluation for any serious medical conditions prior to entry and again prior to deployment); furthermore, each individual is employed and has universal access to medical care. Population-based studies of the U.S. military are facilitated by the existence of automated databases that integrate all medical encounters (in- and outpatient) with data from personnel records that provide demographic and military occupational data on service members [7, 8].

Combat and deployment have been shown to be strongly associated with mental disorders [9, 11, 13, 15]. Recent articles have measured an upsurge of

mental illness in troops returning from deployment to Operation Iraqi Freedom (OIF) [9, 11]. In order to document increased post-deployment behavioral health services utilization, it is critical to have a baseline utilization rate. This study provides a baseline rate of behavioral healthcare utilization and its impact on attrition in the U.S. military just prior to the terrorist attacks of 11 September 2001.

The purpose of this study was to characterize military outpatient behavioral health visits, including diagnoses outside of the ICD-9 290–319 range (particularly V-codes), in order to evaluate the overall pre-OIF burden of mental health care. The two measures that were used to quantify mental health burden were clinic visits and individuals affected. One would expect that all behavioral health encounters would be for mental disorders by definition. However, in 2000, only 56% of all 891,132 outpatient visits to military behavioral health providers were associated with a primary diagnosis of mental disorder coded in the 290–319 range. Most of the remaining ambulatory visits to military behavioral health providers involved V-code diagnoses. We hypothesize that the burden of mental health problems, in terms of health services use and attrition, is under-represented when these diagnoses are not included.

Materials and methods

■ Data source

The sample of data from the year 2000 was derived from the Defense Medical Surveillance System (DMSS), a public health surveillance system that contains information relevant to all individuals who have served on active duty in the U.S. Armed Forces from 1989 to the present [26]. Records in the system document demographic characteristics, military experiences, health-related behaviors, immunizations, prescriptions, hospitalizations, outpatient visits, and deaths. Diagnoses are coded in the DMSS according to ICD-9. The Armed Forces Health Surveillance Center (AFHSC) of the United States Army Center for Health Promotion and Preventive Medicine (USACHPPM), Washington DC, routinely and systematically collects population-based data for the DMSS from various administrative sources, maintains the system, and monitors data quality. The data quality has been shown to compare favorably with that of other recognized health services research data (e.g. data from the Health Care Financing Administration and large insurers) [19].

This research was conducted under a protocol approved by the Walter Reed Army Institute of Research, utilizing the DMSS database. The protocol conformed to all existing human use regulations (32 CFR 219) [34]. The data used for analyses in this paper do not contain identifiers and the study was classified as Exempt for Review by the Institutional Review Board, Office of Human Research at George Washington University.

■ Mental health diagnoses (Table 1)

Only primary diagnoses for each outpatient visit were included in the analyses, since compliance by clinicians with reporting secondary diagnoses is variable. Secondary diagnoses were not found

Table 1 ICD-9 groupings of diagnostic categories

Diagnostic category	ICD-9 codes
ICD-9 290–319 mental disorders	
Substance	291, 303, 305.0, 292 (excludes 292.2), 304, 305.2–305.7, 305.9
Adjustment	309.0, 309.24, 309.28, 309.3, 309.4, 309.9
Personality	301.0, 301.2, 301.4, 301.50, 301.6, 301.7, 301.81–301.84, 301.89, 301.9
Mood	296.0, 296.2–296.7, 296.80, 196.89, 296.90, 300.4, 301.13, 311
Psychotic	295.1–295.4, 295.6, 295.7, 295.9, 297.1, 297.3, 298.8, 298.9
Anxiety	300.00–300.02, 300.21–300.29, 300.3, 308.3, 309.81
Somatoform	300.11–300.19, 300.6, 300.7, 300.81, 307.80, 307.89
Other	All 290–319 not listed above, excluding 305.1
V-code mental health problems	
Partner relationship problems	V61.0, V61.1 (excludes V61.11, V61.12)
Family circumstance problems	V61.2 (excludes V61.21, V61.22), V61.8, V61.9
Maltreatment related	V61.11, V61.12, V61.21, V61.22, V62.83, 995.8 (excludes 995.86, 995.89)
Life circumstance problems	V62 (excludes V62.6, V62.83)
Mental, behavioral problems and substance abuse counseling	V40 (excludes V40.0, V40.1), V65.42
Other medical illnesses	All ICD-9 codes not listed above

for 84% of the records, and the 16% that did contain them would have increased the overall rate of mental health concerns by only 0.2% in the population. (Clinical workload in the military health care system is based mostly on the number of total visits and procedures per clinician, rather than number of diagnoses given at each visit.) Primary mental disorders in the ICD-9 290–319 range were subdivided into eight diagnostic categories using previously published criteria [7]. These included substance use disorders, adjustment disorders, personality disorders, mood disorders, psychoses, anxiety disorders, somatoform/dissociative disorders, and all other mental disorders (Table 1). Tobacco dependence (ICD-9 305.1) was not included since tobacco-cessation efforts are widespread within primary care clinics and are not treated as mental health problems.

All ICD-9 codes outside of the 290–319 range that were used primarily by behavioral health providers and were indicative of a potential mental health problem were also grouped into five categories (e.g. relational problems, family circumstance problems, problems related to abuse, life circumstance/occupational problems, and other psychosocial circumstances) (Table 1). These “mental health V-code diagnoses” categories included only one code that was not a V-code, ICD-9 995.8 (adult maltreatment, abuse, and neglect). Mental health-related codes that were used more often in primary care clinics than behavioral health clinics were excluded (e.g. counseling for HIV/STDs/injury prevention, counseling not otherwise specified). All V-codes recognized by DSM-IV were included.

■ Study population

All active duty U.S. military personnel who accessed ambulatory care in military treatment facilities in 2000 ($n = 1.35$ million) were grouped into mutually exclusive categories by primary diagnosis and clinic service (behavioral health or other outpatient). The first group included all individuals with at least one visit for an ICD-9 290–319 mental disorder (they may have also had visits for V-code diagnoses during the same year); the second group included individuals who only received care for a mental health V-code diagnosis; and the third group included the remainder of the population—those who received care for other medical illnesses. It should be noted that this study population is not a sample, but rather includes virtually all U.S. service members since every individual receives ambulatory care for routine physicals. Ambulatory visits of U.S. service members in fixed military and non-military (reimbursed through the Military Health System) medical treatment facilities are documented with standardized, automated records that are routinely archived for health surveillance purposes

in the DMSS. Records of ambulatory visits not documented with automated records (e.g. during deployments, field training exercises, shipboard) were not included.

Behavioral health care was defined as any care rendered by psychiatrists, psychologists, social workers, or counselors. Although most care is provided within behavioral health clinics, there are times when behavioral health providers may deliver services within primary care or emergency clinic settings. For purposes of this study the terms “behavioral health provider,” “behavioral health services,” and “behavioral health clinics” are used synonymously, since most care by behavioral health providers does take place within specified clinics.

■ Data analyses

Rates of service utilization within behavioral health versus other outpatient clinics for each of the diagnostic groups were reported as individuals or visits per 1,000 person-years. Person-year denominators were obtained from the Defense Medical Epidemiological Database (DMED), calculated as the sum of days each service member of the Army, Air Force, Navy, or Marines contributed while on active duty in 2000, divided by 366 (since 2000 was a leap year). If service members left the military in 2000, they stopped contributing time to the denominator on the day of separation. Summary statistics on the number of visits and the number of individuals with one clinic visit in 2000 were obtained for each diagnostic group. Demographics in each of the diagnostic groups were compared by percentage. To assess the significance of differences in gender, age group, race, marital status, education level, occupation, service, and grade, Chi-square tests were performed.

Cox proportional hazard regression was used to produce hazard ratios as measures of association between each of the diagnostic groups and attrition from military service. Time to attrition in months was the difference between the date of military separation and the date of first clinic visit in 2000. Individuals were considered to be at risk for attrition until they separated from service, or until the end of the observation period, which was 31 December 2001. The cumulative attrition rate increased in each subsequent month. Hazard ratios and corresponding 95% confidence intervals tested the hypotheses that the attrition rate was statistically different after an ICD-9 290–319 mental disorder diagnosis than after a medical diagnosis, and that the attrition rate was statistically different after a mental health V-code diagnosis than after a medical diagnosis. Confidence intervals not containing 1.0 indicated a statistically significant result. The Cox proportional hazard regression model was also expanded to include the demographic variables of gender,

Table 2 Demographics of individuals visiting behavioral health clinics, active duty U.S. Armed Forces, 2000

	ICD-9 290–319 mental disorders		V-code mental health problems		Other medical illnesses	
	N	%	N	%	N	%
Total	78,008	100	36,139	100	41,952	100
Gender, $\chi^2 = 399.39$						
Men	59,168	75.8	28,386	78.5	33,889	80.8
Women	18,840	24.2	7,753	21.5	8,063	19.2
Age (years), $\chi^2 = 2,303.99$						
17–24	46,193	59.2	16,355	45.3	21,046	50.2
25–34	20,487	26.3	13,514	37.4	14,149	33.7
35–65	11,328	14.5	6,270	17.3	6,757	16.1
Race, $\chi^2 = 1,489.62$						
White	56,896	72.9	22,595	62.5	28,636	68.3
Black	14,032	18.0	9,950	27.5	9,268	22.1
Other	6,983	9.0	3,562	9.9	3,927	9.4
Missing	97	0.1	32	0.1	121	0.3
Marital status, $\chi^2 = 5,200.87$						
Single	44,321	56.8	12,472	34.5	19,942	47.5
Married	30,606	39.2	22,259	61.6	20,198	48.1
Other	3,014	3.9	1,384	3.8	1,776	4.2
Missing	67	0.1	24	0.1	36	0.1
Education $\chi^2 = 1,595.33$						
High school or less	56,933	73.0	24,782	68.6	26,173	62.4
At least some college	17,888	22.9	9,691	26.8	14,075	33.6
Missing	3,187	4.1	1,666	4.6	1,704	4.1
Occupation $\chi^2 = 138.70$						
Combat	19,799	25.4	9,367	25.9	9,533	22.7
Healthcare	7,895	10.1	3,745	10.4	4,388	10.5
Other	50,314	64.5	23,027	63.7	28,031	66.8
Service $\chi^2 = 9,472.89$						
Air force	16,773	21.5	7,920	21.9	17,510	41.7
Army	34,372	44.1	20,872	57.8	16,415	39.1
Marines	7,303	9.4	1,626	4.5	1,687	4.0
Navy	19,560	25.1	5,721	15.8	6,340	15.1
Grade $\chi^2 = 363.31$						
Enlisted	73,764	94.6	33,349	92.3	38,937	92.8
Officer	3,903	5.0	2,471	6.8	2,867	6.8
Warrant officer	341	0.4	319	0.9	148	0.4

All comparisons are statistically significant at $P < 0.0001$

race, age, marital status, education level, occupation, service, grade, and average number of visits per month. Mean and median time to attrition for each of the groups was reported. These analyses were performed using SAS Statistical Packages, version 8.0.

Results

Demographics (Table 2)

In 2000, 10,725,085 visits to outpatient clinics were documented among 1,345,281 individuals. Of these, 891,132 visits to behavioral health clinics occurred among 156,099 individuals.

In general, military personnel who received care for V-code mental problems were demographically similar to those who received care for ICD-9 290–319 mental disorder diagnoses. Because of the extremely large size of the study population, all of the comparisons were statistically significant. Those receiving V-code diagnoses were slightly older and more likely to be married. This result is probably due to the fact that

V-code diagnoses include partner relationship and family circumstance problems. Likely because of the age difference, those receiving ICD-9 290–319 mental disorder diagnoses were more likely to have a lower level of education. Those receiving ICD-9 290–319 mental disorder diagnoses were also more likely to be white. In terms of service-specific differences, proportionally more soldiers received V-code diagnoses, while more sailors and Marines received ICD-9 290–319 mental disorder diagnoses.

Outpatient clinic utilization (Table 3)

Out of every 1,000 person-years, 57.5 individuals received care from behavioral health providers involving an ICD-9 290–319 mental disorder in 2000 (Table 3). An additional 26.7 per 1,000 person-years received care in behavioral health clinics only for V-code diagnoses. Thus, a total of 84 individuals out of every 1,000 person-years received care by behavioral health providers in 2000, representing 8% of the en-

Table 3 Outpatient utilization, active duty U.S. Armed Forces, 2000

Primary diagnosis	Individuals ^a		Visits		Visits per individual ^c				Number with only one clinic visit in 2000 ^{a,e}
	N	Rate ^b	N	Rate ^b	Median	Mean	Max	IQR ^d	
Behavioral health clinics									
ICD-9 290–319 mental disorders	78,008	57.5	501,698	370.0	3	6	380	6	25,664
Substance	22,577	16.7	236,335	174.3	4	9	380	11	f
Adjustment	21,974	16.2	74,353	54.8	2	3	77	2	f
Personality	3,880	2.9	18,771	13.8	1	3	58	2	f
Mood	15,327	11.3	100,996	74.5	2	5	128	4	f
Psychotic	666	0.5	7,952	5.9	2	6	108	4	f
Anxiety	6,571	4.8	35,096	25.9	2	4	86	3	f
Somatoform	623	0.5	3,267	2.4	1	3	47	2	f
Other	6,390	4.7	24,928	18.4	1	3	116	2	f
V-code mental health problems	36,139	26.7	210,135	155.0	2	4	79	3	17,092
Partner relationship problems	9,909	7.3	61,107	45.1	2	3	50	3	f
Family circumstance problems	5,564	4.1	27,917	20.6	1	3	50	2	f
Maltreatment related	4,208	3.1	38,427	28.3	2	5	78	5	f
Life circumstance problems	14,256	10.5	69,358	51.2	1	2	48	1	f
Mental, behavioral problems, and substance abuse counseling	2,202	1.6	13,326	9.8	1	3	31	2	f
Other medical	41,952	30.9	179,299	132.2	1	2	80	1	27,507
Behavioral health clinics total	156,099	115.1	891,132	657.3	2	6	416	5	f
Other outpatient clinics									
ICD-9 290–319 mental disorders	24,274	17.9	76,669	56.5	1	2	69	1	19,680
Substance	2,142	1.6	9,833	7.3	1	2	28	0	f
Adjustment	1,411	1.0	9,131	6.7	1	2	43	1	f
Personality	72	0.1	812	0.6	1	2	26	0	f
Mood	4,409	3.3	18,746	13.8	1	2	53	1	f
Psychotic	80	0.1	1,277	0.9	1	3	34	1	f
Anxiety	4,515	3.3	10,826	8.0	1	1	34	0	f
Somatoform	1,206	0.9	2,416	1.8	1	1	33	0	f
Other	10,439	7.7	23,628	17.4	1	1	69	0	f
V-code mental health problems	6,099	4.5	13,120	9.7	1	2	42	0	4,964
Partner relationship problems	170	0.1	770	0.6	1	2	39	0	f
Family circumstance problems	406	0.3	898	0.7	1	2	20	1	f
Maltreatment related	215	0.2	565	0.4	1	1	15	0	f
Life circumstance problems	3,670	2.7	7,400	5.5	1	1	39	0	f
Mental, behavioral problems and substance abuse counseling	1,638	1.2	3,487	2.6	1	2	13	0	f
Other medical	1,158,809	854.7	9,744,164	7,187.0	5	7	315	7	176,025
Other outpatient clinics total	1,189,182	877.1	9,833,953	7,253.2	5	7	315	7	f
All clinics	1,345,281	992.2	10,725,085	7,910.5	5	8	425	8	f

^aFirst visit by the following priority: 290–319 in BH clinic, 290–319 in non-BH clinic, V-code in BH clinic, V-code in non-BH clinic, other in BH clinic, other in non-BH clinic

^bRate per 1,000 person-years

^cBecause most individuals had multiple visits with varying diagnoses, descriptive statistics are based on visits; individuals are unique by diagnostic group only

^d75% quartile minus 25% quartile; the 25% quartile was 1 in every group

^eCalculated as the number of individuals with one visit within their prioritized diagnostic group

^fNumbers cannot be summed because some individuals had more than one visit in other diagnostic groups

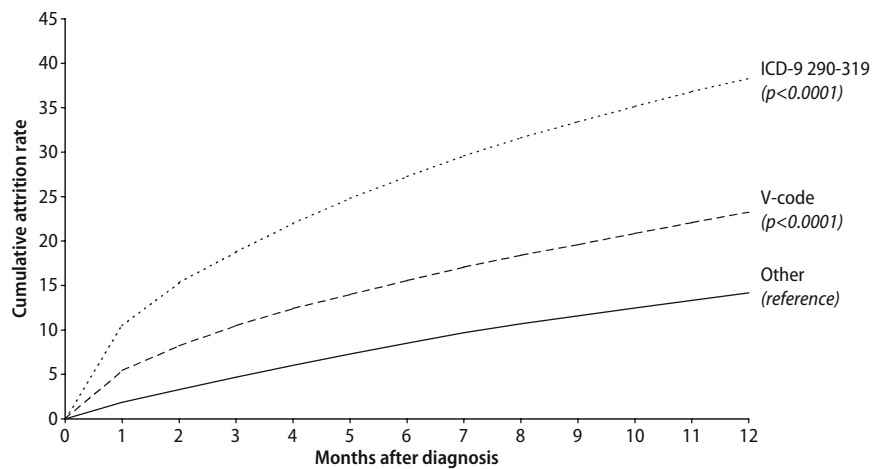
tire active duty population. An additional 30.9 individuals per 1,000 person-years were seen in behavioral health clinics for screening, exams, and observations, but did not receive any of the mental disorder or mental health V-code diagnoses, so were included in the “other” group. The most common diagnoses given in this category were “no axis I or axis II diagnosis” (V71.09) or “diagnosis deferred” (V79.99). The total number of individuals who utilized behavioral health services in 2000 was just over 115 out of 1,000 person-years, almost 12% of the military population.

Additional mental disorder diagnoses were documented in outpatient clinic settings other than

behavioral health (mostly primary care); 17.9 individuals out of 1,000 person-years were treated for an ICD-9 290–319 mental disorder by providers in outpatient clinics other than behavioral health. An additional 4.5 per 1,000 person-years received care for mental health V-codes by providers in other outpatient clinics. This additional burden corresponds to about 2% of the military population.

Overall, the median number of outpatient visits per person by behavioral health services in 2000 was 3 for ICD-9 290–319 mental disorders and 2 for V-code mental health problems. The maximum number of visits for any one person was 380 for ICD-9 290–319 mental disorders and 79 for V-code mental health

Fig. 1 Attrition from military service after first clinic visit, active duty U.S. Armed Forces, 2000



problems in behavioral health clinics, although the interquartile ranges were much lower. Many individuals had only one behavioral health outpatient visit in 2000 ($n = 25,664$ for ICD-9 290–319 mental disorders and $n = 17,092$ for V-code mental health problems).

■ Attrition (Fig. 1, Table 4)

The figure shows the time after individuals first received a primary diagnosis of an ICD-9 290–319 mental disorder, mental health V-code, or other medical diagnosis to the day they left military service (or end of the first year after diagnosis). The x -axis shows time in months after diagnosis, and the y -axis shows the cumulative attrition rate. On or before the

date a diagnosis was given, the attrition rate was zero and the rates increase in each subsequent month. The lowest attrition rate was observed among individuals treated for diagnoses other than mental health. Individuals who received an ICD-9 290–319 mental disorder diagnosis had the highest attrition rate and those who received a mental health V-code diagnosis were between the two other groups. For example, Table 4 shows that after 6 months, approximately 9% of individuals who received a physical health diagnosis left the military, whereas 16% of those who received mental health V-code diagnoses and 27% of those who received ICD-9 290–319 mental disorder diagnoses had left. After one year, 14, 23, and 38% had left, respectively, leaving 86% of individuals treated for physical health conditions, 77% of those

Table 4 Attrition from military service after first clinic visit, active duty U.S. Armed Forces, 2000

	ICD-9 290–319 mental disorders		V-code mental health problems		Other medical illnesses		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
All personnel	102,282	100	42,238	100	1,200,761	100	1,345,281	100
Personnel who left military service, by time period after clinic visit ^{a,b}								
3 months	19,209	18.8	4,428	10.5	57,896	4.8	81,533	6.1
6 months	27,874	27.3	6,570	15.6	103,802	8.6	138,246	10.3
9 months	34,155	33.4	8,276	19.6	140,765	11.7	183,196	13.6
1 year	39,165	38.3	9,828	23.3	171,875	14.3	220,868	16.4
Personnel who remained in military service more than 1 year	63,117	61.7	32,410	76.7	1,028,886	85.7	1,124,413	83.6
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Days to attrition after clinic visit ^a	431	386	487	453	601	540	588	525
	Unadjusted	Adjusted ^c	Unadjusted	Adjusted ^c				
Hazard ratios	1.844	1.796	1.571	1.605	(reference)			
95% confidence intervals	(1.832, 1.856)	(1.784, 1.808)	(1.556, 1.587)	(1.588, 1.621)	(reference)			

^aFirst visit in 2000 by the following priority: 290–319 in BH clinic, 290–319 in non-BH clinic, V-code in BH clinic, V-code in non-BH clinic, other in BH clinic, other in non-BH clinic

^bCumulative numbers and percentages of military personnel

^cCox proportional hazards regression model adjusted for gender, race, age, marital status, education level, occupation, service, grade, and average number of visits per month

who were treated for V-code mental health diagnoses, and 62% of those who received ICD-9 290–319 mental disorder diagnoses remaining in service. Individuals with personality disorders and psychoses had the highest rates of attrition (after 6 months, 61 and 58% had left, respectively).

Table 4 also shows the mean and median number of days to attrition after the first clinic visit in 2000. As expected, the shortest time was for ICD-9 290–319 mental disorders, with a median 170 days less than other medical illnesses. V-code mental health problems had a median 114 days less than other medical illnesses.

Cox proportional hazard ratios and corresponding 95% confidence intervals compare the rate of attrition after an ICD-9 290–319 mental disorder diagnosis and the rate of attrition after a mental health V-code diagnosis to the rate of attrition after a medical diagnosis (reference category). Both yielded precise statistically significant differences [adjusted $h(t) = 1.80$ (1.78, 1.81) and $h(t) = 1.61$ (1.59, 1.62), respectively]. An individual who received an ICD-9 290–319 mental disorder or mental health V-code diagnosis was 1.8 times or 1.6 times (respectively) more likely to leave the military than an individual who received a medical diagnosis.

Discussion

This is a unique study that looks at the additional burden of mental health care related to diagnoses other than traditional mental disorders (ICD-9 290–319), predominantly V-code diagnoses, in the military health care system prior to the wars in Iraq and Afghanistan. Focusing on ICD-9 290–319 mental disorders to the exclusion of V-codes substantially underestimates the true burden of baseline mental health service utilization. The rate per 1,000 person-years diagnosed with mental health problems was 46% higher in behavioral health clinics and 25% higher in other medical clinics when V-code mental health problems were included. Overall, approximately 11% of the military population accessed care for mental disorders or mental health V-code diagnoses in 1 year.

V-code mental health diagnoses appear to be associated with significant occupational morbidity, as measured by attrition from military service. Although persons who received treatment for V-code diagnoses had lower attrition rates than persons diagnosed with more traditional mental disorders, rates of attrition among those treated only for V-code diagnoses were still nearly twice those seen among persons treated for physical health categories. We are not aware of any studies that have systematically looked at the level of functional impairment associated with V-code diagnoses in adult populations. Comparable to college drop-out and job resignation in civilian settings,

attrition causes the military to lose a substantial investment expended particularly in recruiting and training costs each year, a cost measured in the hundreds of millions of dollars [30].

Diagnostic practices among behavioral health clinicians may be influenced by the practice environment. The rate of ICD-9 290–319 diagnoses is higher in civilian settings than in the military. From 1998 to 1999, the rate of ambulatory visits to physicians was 195.1 per 1,000 person-years in civilians (CDC, National Ambulatory Care Survey) versus 99.7 per 1,000 person-years (crude) and 171.7 per 1,000 person-years (adjusted for age and gender) in the military. The military health care system provides high quality comprehensive medical services to active duty personnel who receive all care free of charge. There is no management of mental health care among active duty personnel, and clinicians are salaried employees who do not get reimbursed or receive any incentives related to the care they provide. Within the context of this environment, military behavioral health clinicians frequently provide care under adjustment disorder and V-code diagnoses. In contrast, in civilian practice settings, diagnosis and procedure codes are primarily assigned to ensure reimbursement [23].

Further research is needed to understand the complex relationship between diagnostic practices and the environment where care is delivered. One hypothesis is that civilian providers “upcode” mental health problems in order that patients can receive needed care and clinicians can be reimbursed for care rendered. In 2004, the Centers for Medicare and Medicaid estimated that upcoding an improper diagnosis in all areas of medicine amounted to \$4.8 billion, or 5.2% of all payments [29]. Although there has been little research into psychiatric diagnostic practices, and coding mental health problems can be more ambiguous than coding physical illness [22], there have been several studies on obesity and on smoking cessation that found that counseling is rarely reimbursed compared to other manners of treatment [14, 21, 31]. Moreover, studies involving other fields of medicine have shown that clinicians may exaggerate diagnoses in an effort to secure care for their patients [3, 6, 16, 20, 24, 32, 33]. It would not be surprising if this were the case also for patients with psychiatric diagnoses. One study implied that fee-for-service psychiatric treatment led to better care than prepaid service [25]. Further research is needed to understand the influence that managed care has on psychiatric diagnostic practices [12].

It is also likely that some behavioral health problems lead to treatment in the military but not in civilian practice settings. For example, behaviors related to misconduct, personality disorders, or alcohol abuse or may lead to rapid termination from a civilian job setting [5], whereas in the military these problems may involve mental health referral and counseling before separation may be initiated. Also, military practitioners may be less likely to give ICD-9 290–319

diagnoses due to the associated occupational stigma [9]. Two studies have suggested that limitations in confidentiality and methods of referral in the military health care system may influence psychiatric diagnostic practices [17, 18].

ICD-9 and other standardized coding systems have inherent limitations for estimating the burden of mental disorders in a population, and the burden of mental illness is underestimated by any utilization data [2]. Administrative data can only identify services received, not services needed; thus, the burden of mental illness is underestimated by utilization data. Prior research has found an association between increased medical service utilization and mental illness [27]. It is possible that service members with many visits to medical clinics had undiagnosed mental illness; unfortunately, this is impossible to determine using administrative data.

Another limitation is that due to variability in clinician compliance, only the primary diagnosis for each outpatient visit was included in this analysis. Secondary mental disorder as well as secondary physical illness diagnoses were not assessed, since they were present in only 16% of records, also possibly underestimating the true burden of care and attrition.

Bias also could have occurred in including the individuals within the specified diagnostic groups. If an individual had visits for both ICD-9 290–319 mental disorders as well as visits for V-code diagnoses during the same year, they were counted in the ICD-9 290–319 group. This would underestimate the utilization due to V-code diagnoses; however, an analysis of all visits in addition to the prioritized individual analysis provided the appropriate impact of V-code diagnoses.

Another limitation is that the DMSS does not give accurate data on the reason for leaving the military [11]. Individuals could have left for a specific reason, but rates also reflect voluntary separation at end-of-service obligations. In spite of this limitation, this definition of attrition has been validated in previous research as a general measure of the occupational impact of mental health problems [4, 9–11].

Despite these limitations, this study establishes a baseline rate of pre-war behavioral healthcare utilization and its impact on attrition. The research also clearly indicates that in the military population the burden of mental illness in outpatient clinics is significantly greater when V-code and other diagnoses are included along with conventional mental disorder diagnostic codes. Further research is needed to address how diagnostic practices may differ between military and civilian practice settings, and how managed care, insurance reimbursement, and the occupational environment may influence how clinicians prescribe diagnoses.

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References

1. Andrews G, Sanderson K, Beard J (1998) Burden of disease. Methods of calculating disability from mental disorder. *Br J Psychiatry* 173:123–131
2. Bland RC (1998) Psychiatry and the burden of mental illness. *Can J Psychiatry* 43(8):801–810
3. Bloche MG (2000) Fidelity and deceit at the bedside. *JAMA* 283(14):1881–1884
4. Creamer M, Carboon I, Forbes AB, McKenzie DP, McFarlane AC, Kelsall HL, Sim MR (2006) Psychiatric disorder and separation from military service: a 10-year retrospective study. *Am J Psychiatry* 163(4):733–734
5. Dooley D, Fielding J, Levi L (1996) Health and unemployment. *Annu Rev Public Health* 17:449–465
6. Freeman VG, Rathore SS, Weinfurt KP, Schulman KA, Sulmasy DP (1999) Lying for patients: physician deception of third-party payers. *Arch Int Med* 159(19):2263–2270
7. Hoge CW, Lesikar SE, Guevara R, Lange JL, Brundage JF, Engel CC, Messer SC, Orman DT (2002) Mental disorders among U.S. military personnel in the 1990s: association with high levels of health care utilization and early military attrition. *Am J Psychiatry* 159:1576–1583
8. Hoge CW, Messer SC, Engel CC, Krauss M, Amoroso P, Ryan MA, Orman DT (2003) Priorities for psychiatric research in the U.S. military: an epidemiological approach. *Mil Med* 168(3):182–185
9. Hoge CW, Castro CA, Messer SC, McGurk A, Cotting DI, Koffman RL (2004) Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *N Engl J Med* 351(1):13–22
10. Hoge CW, Toboni HE, Messer SC, Bell N, Amoroso P, Orman DT (2005) The occupational burden of mental disorders in the US military: psychiatric hospitalizations, involuntary separations, and disability. *Am J Psychiatry* 162:585–591
11. Hoge CW, Auchterlonie JL, Milliken CS (2006) Mental health problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. *JAMA* 295(9):1023–1032
12. Iglehart JK (1996) Managed care and mental health. *N Engl J Med* 334(2):131–135
13. Kang HK, Natelson BH, Mahan CM, Lee KY, Murphy FM (2003) Post-traumatic stress disorder and chronic fatigue syndrome-like illness among Gulf War veterans: a population-based survey of 30,000 veterans. *Am J Epidemiol* 157(2):141–148
14. Kaper J, Wagena EJ, van Schayck CP, Severens JL (2006) Encouraging smokers to quit: the cost effectiveness of reimbursing the costs of smoking cessation treatment. *Pharmacoeconomics* 24(5):453–464
15. Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB (1995) Posttraumatic stress disorder in the National Comorbidity Survey. *Arch Gen Psychiatry* 52(12):1048–1060
16. Kinghorn W (1999) Should doctors ever lie on behalf of patients? *JAMA* 282(17):1674–1675
17. McCarroll JE, Orman DT, Lundy AC (1993) Clients, problems, and diagnoses in a military community mental health clinic: a 20-month study. *Mil Med* 158:701–705
18. McCarroll JE, Orman DT, Lundy AC (1993) Differences in self- and supervisor-referrals to a military mental health clinic. *Mil Med* 158:705–708

19. Meyer GS, Krakauer H (1998) Validity of the Department of Defense Standard Inpatient Data Record for quality management and health services research. *Mil Med* 163(7):461-465
20. Novack DH, Detering BJ, Arnold R, Forrow L, Ladinsky M, Pezzullo JC (1989) Physicians attitudes toward using deception to resolve difficult ethical problems. *JAMA* 261:2980-2985
21. O'Donnell DC, Brown CM, Dastani HB (2006) Barriers to counseling patients with obesity: a study of Texas community pharmacists. *J Am Pharm Assoc* 46(4):465-471
22. O'Malley KJ, Cook KF, Price MD, Raiford Wildes K, Hurdle JF, Ashton CM (2005) Measuring diagnoses: ICD code accuracy. *Health Serv Res* 40(5 Pt 2):1620-1639
23. Parman CC (2005) Using codes for patient tracking. *J Oncol Manag* 14(2):31-32
24. Rifkin DE (1999) Community considerations: the many effects of miscoding. *JAMA* 282(17):1676-1679
25. Rogers WH, Wells KB, Meredith LS, Sturm R, Burnam MA (1993) Outcomes for adult outpatients with depression under prepaid or fee-for-service financing. *Arch Gen Psychiatry* 50(7):517-525
26. Rubertone MV, Brundage JF (2002) The Defense Medical Surveillance System and the Department of Defense serum repository: glimpses of the future of public health surveillance. *Am J Public Health* 92(12):1900-1904
27. Schmitz N, Kruse J (2002) The relationship between mental disorders and medical service utilization in a representative community sample. *Soc Psychiatry Psychiatr Epidemiol* 37(8):380-386
28. Siddique CM, Aubry T (1997) Use of mental health resources in the treatment of adult outpatients with no diagnosable mental disorders. *Acta Psychiatr Scand* 95(1):19-25
29. Steinbusch PJ, Oostenbrink JB, Zuurbier JJ, Schaepkens FJ (2007) The risk of upcoding in casemix systems: a comparative study. *Health Policy* 81(2-3):289-299
30. The United States General Accounting Office (1997) Military attrition: better screening of enlisted personnel could save DOD millions of dollars, March 5, 1997, GAO/T-NSIAD-97-102. <http://www.fas.org/man/gao/ns97102.htm>
31. Tsai AG, Asch DA, Wadden TA (2006) Insurance coverage for obesity treatment. *J Am Diet Assoc* 106:1651-1655
32. Werner RM, Alexander GC, Fagerlin A, Ubel PA (2002) The "Hassle Factor": what motivates physicians to manipulate reimbursement rules? *Arch Intern Med* 162(10):1134-1139
33. Wynia MK, Cummins DS, VanGeest JB, Wilson IB (2000) Physician manipulation of reimbursement rules for patients: between a rock and a hard place. *JAMA* 283(14):1858-1865
34. The United States Code of Federal Regulations. Title 32: National Defense. Chapter 1: Office of the Secretary of Defense. Part 219: Protection of human subjects