



MSMR



Medical Surveillance Monthly Report

Vol. 12 No. 9

December 2006

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Contents

Body Mass Index (BMI) among 18-year old Civilian Applicants for U.S. Military Service 1996-2005.....2

Carbon Monoxide Poisoning, U.S. Armed Forces, January 1998-September 2006.....7

Incident Abnormal Findings Within 30 Days of Medical Examinations, Active Components, U.S. Armed Forces, January 1998-October 2006.....10

ARD surveillance update.....17

Pre- and post-deployment health assessments, U.S. Armed Forces, January 2003-November 2006.....18

Deployment-related conditions of special interest.....24

Sentinel reportable events.....26

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Body Mass Index (BMI) among 18-year old Civilian Applicants for U.S. Military Service, 1996-2005

Children who are overweight are more likely than their counterparts to be overweight as adults, and overweight adults are at greater risk for cardiovascular diseases, type 2 diabetes, some cancers, and other chronic illnesses.^{1,2} National health surveys indicate an increasing trend in the prevalence of overweight among adolescents and adults in the United States over the past decade – in the past 10 years, the proportion of young adults (18-29 years old) in the United States with body mass indexes (BMI) of 30 or greater has increased from 10.2% to 17.7%.³

Military service is inherently physically demanding. All military members must maintain prescribed levels of health and physical fitness. Weight in relation to height is a correlate of health and fitness – hence, it is a criterion for accession to and continuation in military service. As more young adult Americans become overweight, fewer are eligible to serve in the military. A report in 2002 estimated that 13-18% of men and 17-43% of women between 17 and 20 years old in the United States exceeded military weight standards.⁴

For this report, we estimated prevalences and trends of nominal “overweight” among 18-year old applicants for military service whose heights and weights were measured at Military Entrance Processing Stations (MEPS).

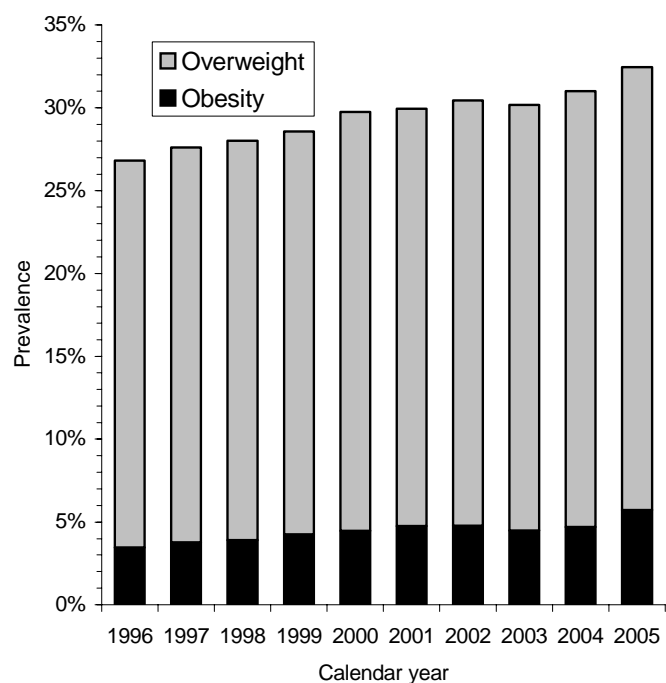
Methods: The surveillance population included all 18 year-old civilians in the United States and its territories who applied for military service for the first time between 1 January 1996 and 31 December 2005. To exclude individuals who may have lost weight to meet accession criteria during the application process, only those applicants whose heights and weights were recorded at their first MEPS visits were included. All data were derived from the Defense Medical Surveillance System (DMSS).

For this analysis, heights and weights that were measured at MEPS were used to calculate body mass indexes (BMI) ($703 \times \text{weight in pounds} / \text{height in inches}^2$).⁵ Only applicants with recorded heights between 49 and 83 inches, weights between 80 and 300 pounds and complete data for gender, race/ethnicity and home of record were included. For purposes of this report, nominal “overweight” and

“obese” were defined as BMIs greater than or equal to 25.0 and 30.0, respectively⁵ (obese was included in overweight). Finally, the distributions of BMI for male and female applicants were compared to the age- and sex-specific percentiles used by the Centers for Disease Control and Prevention (CDC) to interpret BMI in teenagers.⁶

Results: During the 10 years between 1996 and 2005, 554,597 18-year old civilians had their heights and weights recorded at their first MEPS visits and met the other criteria for this analysis. These individuals comprised nearly half of all 18-year olds who presented at MEPS during the period. Most of the applicants were men (80%) and white/non-hispanic (73%) or black/non-hispanic (16%). One-third of the applicants were from Texas, California, Florida, or Ohio and less than 1% were from the territories. The number of applicants per year ranged from 43,803 (in 2005) to 62,115 (in 2002).

Figure 1. Prevalences of nominal "overweight" and "obesity" among 18-year old civilian applicants for U.S. military service, by year, 1996-2005



Between 1996 and 2005, the prevalence of nominal “overweight” among all applicants increased from 27% to 32%; and the prevalence of “obesity” increased from 3% to 6% (Figure 1). The prevalence of overweight was higher among men than women in all years (Figure 2). Among both men and women, prevalences of overweight tended to increase from year to year (except from 2002-2003 among men and from 2001-2002 and 2002-2003 among women). Over the entire period, the prevalence of overweight increased from 29% to 34% among men and from 19% to 25% among women (Figure 2).

Similar trends were observed in relation to race/ethnicity (Figure 3). In 1996, prevalences of overweight in applicants who described their races as “black”, “white” or “other” were 27%, 27% and 28%, respectively – in 2005, the corresponding prevalences of overweight were 31%, 32% and 34%.

Because as many as five states had fewer than 100 applicants in a given year, state-specific overweight prevalences were calculated in two 5-year periods: 1996-2000 and 2001-2005. During the first period, three states had overweight prevalences among 18-year old military applicants of 30% or more. During the second period, 32 states had overweight prevalences among applicants of 30% or more (Figure 4).

The northeast and midwest regions accounted for about three-fifths (n=17) of the states that transitioned from less than to greater than 30% prevalence of overweight from the first to the second period. Specifically, during the first period, no state in the northeast or midwest had more than 30% of its applicants considered overweight; during the second period, seven of nine northeastern states and 10 of 12 midwestern states exceeded 30% prevalence of

Figure 2. Prevalences of nominal "overweight" among 18-year old applicants for U.S. military service, by gender, 1996-2005

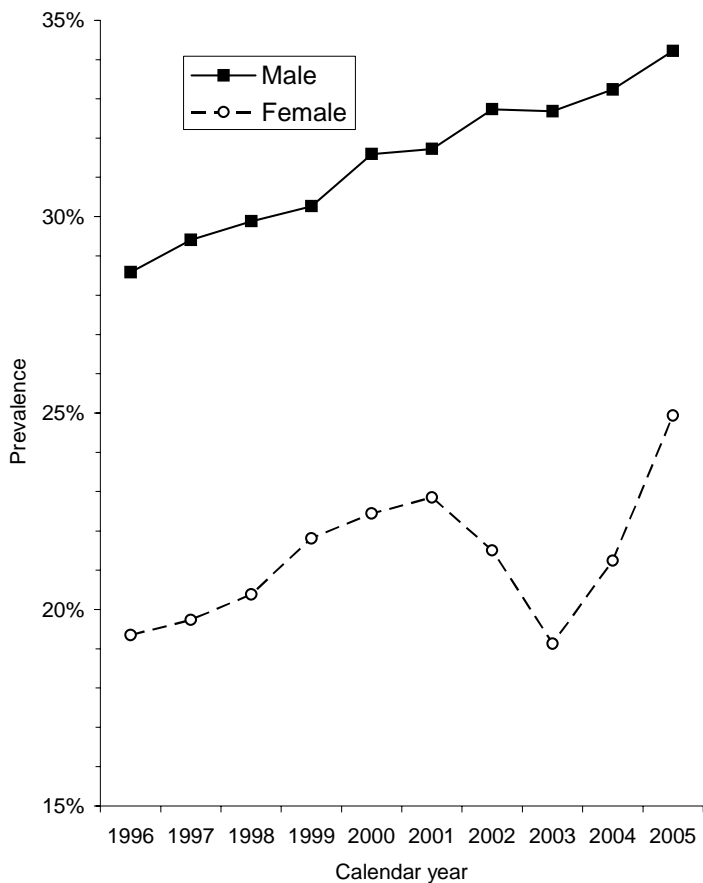


Figure 3. Prevalences of nominal "overweight" among 18-year old applicants for U.S. military service, by race, 1996-2005

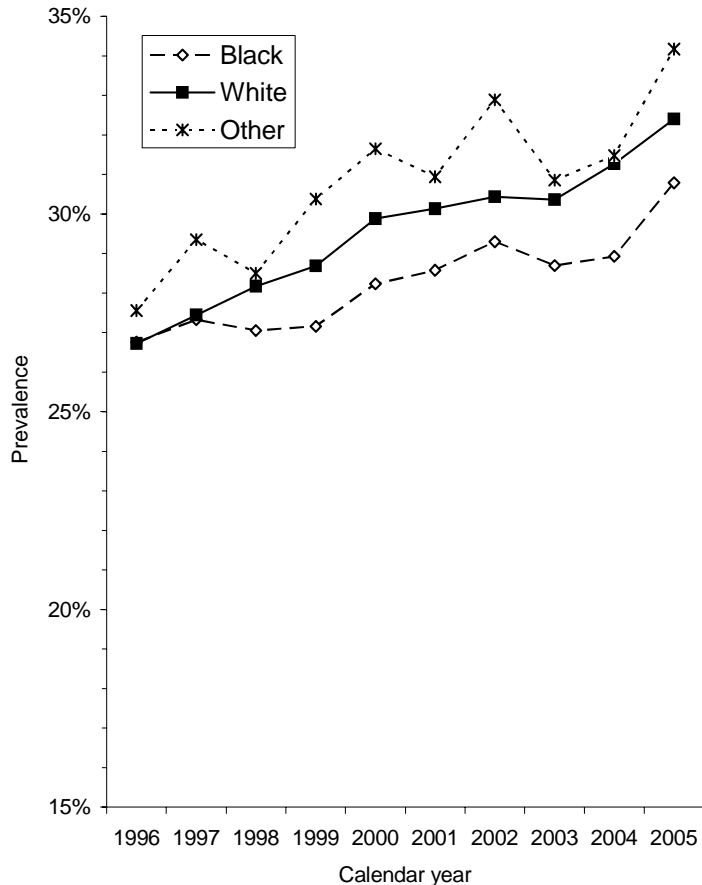
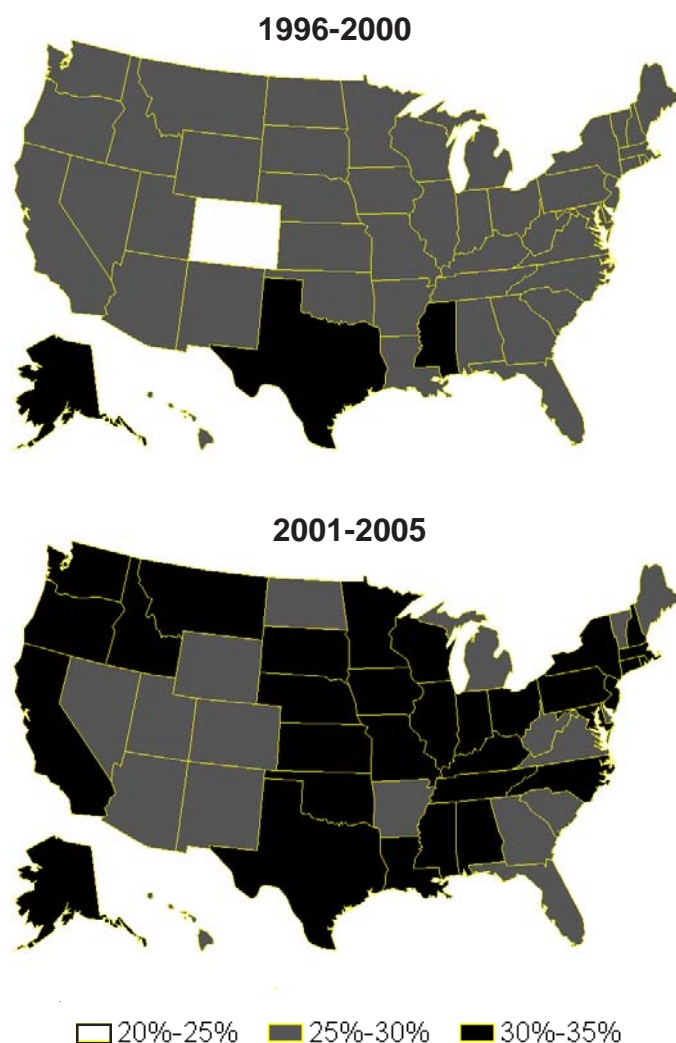


Figure 4. Percent of 18-year old applicants for military service who were nominally “overweight”, 1996-2000 and 2001-2005



overweight among its applicants (Figure 4). In the territories, the prevalence of overweight among applicants from Guam rose from 22% in 1996 to 30% in 2005.

Compared to applicants to the active components of the Services, relatively fewer applicants to the Reserves and relatively more to the National Guard were overweight. Still, prevalences of overweight increased by two to three percent from the first to second 5-year period among applicants to all components (active, 1st period: 28%; 2d period: 31%; Reserves: 1st period: 27%; 2d period: 29%;

National Guard: 1st period: 30%; 2d period: 32%).

Finally, BMIs were slightly higher among 18-year old males and females who applied for military service compared to their counterparts in the general population of the United States (Figure 5).

Data analysis by Lucy Hsu, MPH and Chris Martin, MHS, Army Medical Surveillance Activity.

Editorial comment: This summary documents an increasing trend in prevalences of nominal “overweight” among 18-year old applicants to military service during the past ten years. The finding reflects a similar trend in young adults in the United States. The results of this analysis must be interpreted cautiously.

For example, in young adults, body mass index is highly correlated with but is not a direct measure of body fat. Of note, it does not account for differences in muscle mass among individuals. Some individuals (including many who serve in the military) are nominally “overweight” based on BMI because of excessive muscle mass rather than excessive fat. For this reason, the Department of Defense uses circumference measures (of the abdomen and neck) to confirm body fat assessments.⁷ Such measures were not accounted for in this report.

Among young people, BMI is considered relatively specific in classifying “overweight” (i.e., it is more likely to misclassify those who are overweight than those who are normal weight). Of note, the relationship between BMI and “overweight” or “obesity” varies in relation to age, gender, and race/ethnicity.^{5,8} Despite these limitations, BMI is generally considered an appropriate measure of body fatness in late adolescence⁹; and nominal overweight based on BMI in older adolescents does identify individuals who are at increased risk of obesity in adulthood.¹⁰

Prevalences of nominal “overweight” based on BMI among 18-year old applicants to military service do not reliably indicate prevalences of overweight in the general population of 18-year olds. There are many self and institutional selection factors that differentiate applicants for service from their counterparts. For example, applicants for service are nearly all high school graduates; they are motivated to pursue, at least temporarily, a physically demanding – and potentially dangerous – lifestyle; and they are aware of the medical and physical fitness requirements to join and remain in military service. Also, weight-

for-height requirements for military recruitment may discourage overweight youth from applying for service or encourage them to postpone a MEPS visit until they are in better physical condition. For these and other reasons, it seems likely that 18-year old military applicants are healthier and more physically fit than their civilian counterparts.

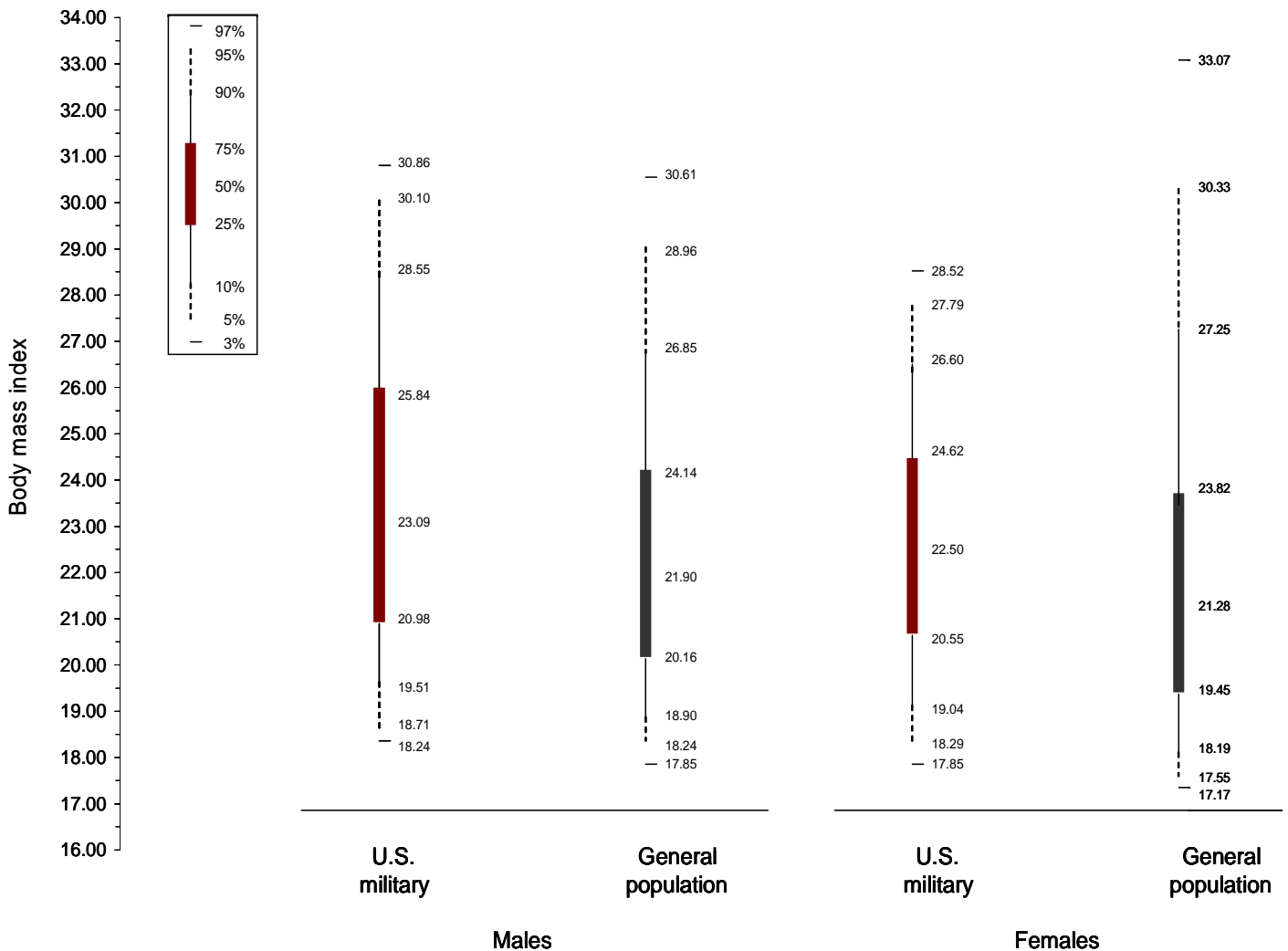
Clearly, the increasing prevalence of nominal “overweight” among teenagers in the United States is a military as well as a general public health concern. The National Research Council reported that a BMI enlistment standard of 25 would disqualify as many as 40% of young women and 25% of young men from the pool of potential military applicants.¹¹ An Institute

of Medicine report estimated that “almost 80 percent of recruits who exceed the military accession weight-for-height standards at entry leave the military before they complete their first term of enlistment.”¹² Because overweight 18-year olds are at risk of becoming overweight or obese adults, population-based prevention programs are indicated. The U.S. Centers for Disease Control and Prevention has recently published nutrition and physical activity guidelines to assist states to develop prevention plans.¹³

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Figure 5. Distributions of body mass index (BMI) among 18-year old applicants for military service and in the 18-year old general population of U.S., by gender, 1996-2005



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CORRECTION

Rates of pertussis in each Service during CY2004 were reported incorrectly in table 3, page 12, of the May/June 2005 issue of the *MSMR*.

The correct numbers of cases and rates of pertussis in the Services are as listed below:

| | <u>Cases</u> | <u>Rate</u> (per 100,000 person years) |
|--------------|--------------|--|
| Army | 25 | 5.1 |
| Navy | 9 | 2.4 |
| Air Force | 35 | 9.4 |
| Marine Corps | 2 | 1.1 |

Carbon Monoxide Poisoning, U.S. Armed Forces, January 1998-September 2006

In the United States, there are more than 500 deaths each year due to unintentional carbon monoxide (CO) poisoning.^{1,2} Of these, approximately 30 are attributable to occupational inhalations. Unintentional poisonings with CO are most often related to malfunctioning and/or inadequately ventilated heating or cooking devices (e.g., furnaces, fireplaces, stoves, barbecues, water heaters), motor vehicles (e.g., automobiles, trucks, tractors, fork lifts, motorboats), and gasoline-powered tools (e.g., pumps, compressors, power generators).⁵ By their natures, many military activities, materials, and settings⁶⁻⁹ pose CO hazards. CO intoxication is a reportable medical event in the U.S. Armed Forces.

This report updates previous reports in the *MSMR* regarding episodes of CO intoxication among U.S. military members.¹⁰⁻¹² For this report, intentional and unintentional CO intoxication episodes were ascertained from records of hospitalizations, ambulatory visits, and medical event case reports in the Defense Medical Surveillance System.

Methods. The surveillance period is 1 January 1998 to 30 September 2006. For analysis purposes, a case was defined as a hospitalization, ambulatory visit, or reportable medical event case report that included a diagnosis of "toxic effect of carbon monoxide" (ICD-9 code 986) among the first four diagnoses listed. Cases were excluded if the primary (first listed) diagnosis was not directly related to or likely caused by acute CO intoxication. To exclude follow-up encounters for single CO intoxication episodes, only one episode per individual was included in any 30-day period.

Results. During the surveillance period, 853 U.S. service members were diagnosed with carbon monoxide intoxication. Approximately one of nine (n=95, 11.1%) cases were hospitalized and 8 cases (1.0%) were fatal. Numbers of cases nearly doubled from 1998 (n=65) to 2001 (n=124), peaked in 2003 (n=160), and then declined by 44% from 2003 to 2004 (Figure 1). In regard to season, case counts generally increased from late summer through early fall, were highest in late fall and early winter, decreased from late winter through early spring, and were lowest in late spring and early summer (Figure 2).

More than three-quarters of individuals with clinical and/or case reports of CO intoxication were members of either the Air Force (37.4%) or the Army (38.8%). Sailors accounted for 17.7% of cases and Marines for 6.1% of cases. Sixteen percent of cases were among members of the Reserves or National Guard (data not shown).

Figure 1. Episodes of carbon monoxide poisoning by year, U.S. Armed Forces, January 1998-September 2006

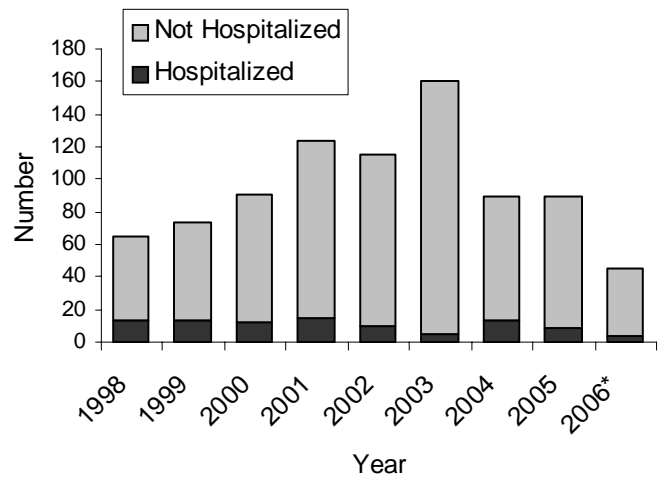


Figure 2. Episodes of carbon monoxide poisoning by month, U.S. Armed Forces, January 1998-September 2006

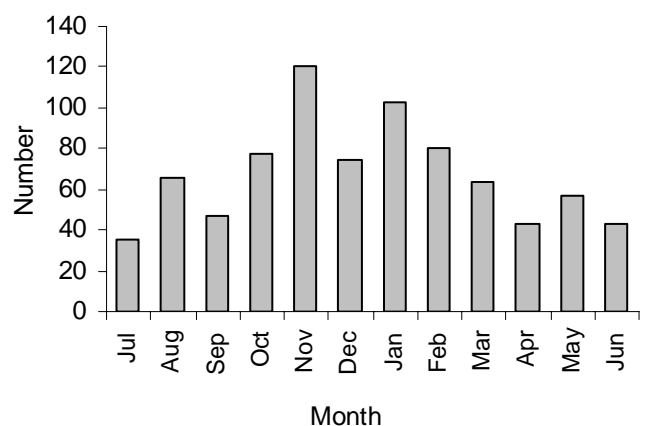


Table 1. Episodes of carbon monoxide poisoning, by installation, U.S. Armed Forces, January 1998-September 2006

| Location | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Total | |
|---------------|-----------|-----------|-----------|------------|------------|------------|-----------|-----------|-----------|------------|------------|
| | Cases | Cases | Cases | Cases | Cases | Cases | Cases | Cases | Cases | Cases | % |
| Fort Hood | 3 | 11 | 2 | 4 | 4 | 1 | 3 | 1 | 1 | 30 | 3.5 |
| Fort Sill | 1 | 2 | 1 | 8 | 0 | 4 | 0 | 5 | 0 | 21 | 2.5 |
| McConnell AFB | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 1 | 0 | 21 | 2.5 |
| Fort Carson | 3 | 4 | 7 | 1 | 1 | 2 | 2 | 0 | 0 | 20 | 2.3 |
| Fort Bragg | 1 | 1 | 2 | 3 | 1 | 2 | 4 | 1 | 0 | 15 | 1.8 |
| Peterson AFB | 0 | 0 | 10 | 0 | 0 | 3 | 0 | 2 | 0 | 15 | 1.8 |
| Eglin AFB | 0 | 2 | 2 | 1 | 0 | 7 | 1 | 1 | 0 | 14 | 1.6 |
| Fort Lewis | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 12 | 1.4 |
| Other | 56 | 52 | 66 | 105 | 108 | 119 | 79 | 78 | 42 | 705 | 82.7 |
| Total | 65 | 73 | 91 | 124 | 115 | 160 | 90 | 90 | 45 | 853 | 100 |

CO poisoning cases were widely distributed among units and installations in the United States. Installations with the most cases during the period were Fort Hood, Texas (30 cases); Fort Sill, Oklahoma and McConnell AFB, Kansas (21 cases each) and Fort Carson, Colorado (20 cases) (Table 1). Fifteen percent of cases (n=137) affected service members assigned outside the United States (data not shown).

NATO Standardized Agreement (STANAG) cause-of-injury codes were available for more than two-thirds of the hospitalized cases. Of the 64 hospitalized cases with cause-of-injury codes, 27 (42.2%) were coded "intentionally self-inflicted". Six (22.2%) of the self-inflicted CO poisonings were fatal -- only 2 deaths (5.4%) occurred due to CO poisonings from other causes (data not shown).

Editorial comment This report documents that clinically recognized carbon monoxide intoxications among U.S. service members increased from 1998 to 2003 and sharply declined in 2004. The increase in cases through 2003 may be related to more complete ascertainment of cases (i.e., detection, diagnosis, and reporting) and/or increasing numbers of individuals on active duty (e.g., Reserve, National Guard) and more demanding operational activities since the beginning of the Global War on Terrorism. The 20 episodes at McConnell AFB in 2003 were all ambulatory visits that occurred on the same day and additional information was not available. The reasons for the sharp decline in 2004 are unclear. Still, the relatively high sustained incidence of a life threatening and preventable intoxication such as with CO remains a cause for concern.

This report also documents that CO-related risks increase through the late summer and early fall and are highest during the late fall and early winter. This seasonal pattern generally corresponds with trends in ambient outdoor temperatures and uses of indoor heating. The Consumer Products Safety Commission has published prevention guidelines that address, for example, hazards associated with furnaces and other heating devices (Table 2).

As usual, the results of this analysis should be interpreted with consideration of some inherent shortcomings. For example, cases for this report were ascertained from standardized clinical records and notifiable medical event reports that are routinely submitted from fixed medical treatment facilities. Thus, cases diagnosed and treated in deployed settings (e.g., field hospitals, Navy ships) and fatal cases that did not present premortem to the military health system are not included.

In summary, service members, unit leaders, and supervisors at all levels should be aware of and responsive to the dangers of CO poisoning; CO hazards related to residential, recreational, occupational, and military operational circumstances, equipment, and activities; and appropriate preventive measures. This is especially important for service members who repair or maintain vehicles.³ Finally, primary medical care providers (including unit medics and emergency medical technicians) should be knowledgeable of and sensitive to the early clinical manifestations of CO intoxication.

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Table 2. General recommendations to prevent carbon monoxide poisoning

Install appliances in accordance with manufacturer's instructions and local building codes.

Inspect and service heating systems (including chimneys and vents) annually. Check chimneys and flues for blockages, corrosion, disconnections, and loose connections.

Install a CO detector/alarm that meets the requirements of the current UL standard 2034 or the requirements of the IAS 6-96 standard. A carbon monoxide detector/alarm can provide added protection, but is no substitute for proper use and upkeep of appliances that can produce CO.

Never burn charcoal (for cooking, heating, etc.) inside a home, garage, vehicle, or tent.

Never use portable fuel-burning camping equipment inside a home, garage, vehicle, or tent.

Never leave cars or other vehicles running in garages (even with doors open) if they are attached to living spaces.

Never service fuel-burning appliances without proper knowledge, skills, and tools. Always refer to the owner's manual when performing minor adjustments or servicing fuel-burning appliances.

Never use gas appliances such as ranges or ovens for heating living spaces.

Never operate unvented fuel-burning appliances in rooms/tents with closed doors or windows or in rooms/tents where people are sleeping.

Do not use gasoline-powered tools or engines indoors. If such uses are unavoidable, ensure that adequate ventilation is available and whenever possible place engine unit to exhaust outdoors.

If you think you are experiencing symptoms of CO poisoning such as headache, fatigue or nausea, get fresh air immediately. Open windows and doors for more ventilation, turn off any combustion appliances and report your symptoms.

Source: Adapted from Consumer Product Safety Commission
Document #466 <http://www.cpsc.gov/CPSCPUB/PUBS/466.html>

Incident Abnormal Findings Within 30 Days of Medical Examinations, Active Components, U.S. Armed Forces, January 1998-October 2006

In the United States, evidence-based guidelines do not recommend annual medical examinations or diagnostic testing of asymptomatic young adults.^{1,2} In lieu of population-based screening, current guidelines favor targeted case finding based on individual health risk assessments.¹⁻³ Prevention activities which used to be inherent to routine periodic medical examinations are now recommended for integration into all encounters with the health care system (“Put Prevention into Practice”).¹⁻³ Still, however, many primary care providers do not agree with current guidelines; in addition, many healthy adults still desire annual physical examinations with extensive diagnostic testing.^{1,2,4}

In the U.S. military, all members are extensively medically evaluated prior to entering active service. In addition, subgroups of military members are medically evaluated prior to, during, and after military activities that have special physical demands (e.g., aviation) and/or unique health risks (e.g., overseas deployments). Finally, the U.S. military conducts routine periodic screening tests (e.g., cervical cancer, HIV-1 infection) and general medical examinations of all of its members. Not surprisingly, a large proportion of all encounters of service members with the Military Health System are not related to current illnesses or injuries.

In 2005, nearly 6 million (48.7% of the total) routinely reported ambulatory visits of active U.S. military members were for “other contact with health services.”⁵ This category (indicated by “V” codes of the ICD-9-CM) includes health care not related to a current illness or injury. Of these, more than 2.8 million were for examinations of presumably healthy service members (e.g., periodic and occupation-related physical examinations, pre- and post-deployment health assessments). Thus, enormous health care provider and service member time and other resources are spent examining presumably healthy service members. The benefits of such examinations are not clear.

For this report, we assessed the number and nature of selected “abnormal findings” that were temporally related to medical examinations of service members who were not currently sick or injured. Specifically, we identified the ICD-9-CM codes of

abnormal findings that are often searched for during general medical examinations of healthy adults. We then identified all incident (first time ever) reports of each finding per individual where the report date was within 30 days of a medical examination. Finally, we summarized the number, nature, and distribution of incident abnormal findings – overall and in demographic subgroups – that were temporally related to a medical examination.

Methods. The surveillance period was 1 January 1998 through 1 October 2006. The surveillance population included all individuals who served in an active component of the U.S. Armed Forces any time during the surveillance period. All data used for analyses were derived from the Defense Medical Surveillance System (DMSS).

Among all members of the surveillance population, all ambulatory visits with a diagnosis code (in any position) indicative of a medical examination (ICD-9-CM codes: V70-82) were identified. Only one medical examination per individual per day was maintained.

First ever reports per individual of the following conditions (based on relevant ICD-9-CM codes in any diagnosis position) were identified: ICD-9-CM: 611.72 “lump or mass in breast”, 790.93 “elevated prostate specific antigen (PSA)”, 783.2 “abnormal weight loss”, 784.2 “swelling, mass, lump in head/neck”, 785.6 “enlarged lymph nodes”, 789.3 “swelling, mass, lump in abdomen/pelvis”, 789.1 “hepatomegaly”, 789.2 “splenomegaly”, 578.1 “blood in stool”, 362.1 “background retinopathy/retinal vascular changes”, 790.2 “abnormal glucose tolerance test”, 790.4 “nonspecific elevation of levels of transaminase/lactic dehydrogenase”, 790.5 “other abnormal serum enzyme levels”, 790.6 “other abnormal blood chemistry”, 791 “nonspecific findings on examination of urine”, 795.0 “nonspecific abnormal Papanicolaou smear of cervix”, 785.0 “tachycardia”, 785.2 and 785.3 “undiagnosed cardiac murmur, abnormal heart sounds”, 786.07 “wheezing”, 786.7 “abnormal chest sounds”, 793.1 “nonspecific abnormal findings on exam of lung field”, 280-285 “anemias”, 172-173 “malignant melanoma/other neoplasm of skin”, 140-149 “malignant neoplasm of lip, oral cavity,

pharynx”, 796.2 “elevated blood pressure reading without diagnosis of hypertension” and 236.4 “neoplasm, uncertain behavior, testis.” For analysis purposes, all diagnoses of interest that were first reported on the day of or within 29 days after a medical examination were considered temporally associated with the examination (“incident abnormal findings [selected]”).

Results. During the surveillance period, there were approximately 19 million reports of medical examinations of members of active components of the U.S. Armed Forces. Within 30 days of a medical examination, there were 202,977 incident reports of selected abnormal findings.

The most frequent incident abnormal findings (selected) overall were “elevated blood pressure reading without diagnosis of hypertension” (n=41,048); “nonspecific abnormal Papanicolaou smear of the cervix” (n=34,577); “anemia” (n=28,824); “lump or

mass in breast” (n=14,797); “undiagnosed cardiac murmur, abnormal heart sounds” (n=14,614); and “blood in stool” (n=10,406) (Table 1). These findings were among the most frequent (although not in the same order) in all demographic and military subgroups (Table 2). For example, in the Air Force and Army, the most frequent finding by far was elevated blood pressure; however, in the Navy and Marine Corps, the most frequent findings were anemia and abnormal Papanicolaou smear of the cervix, respectively. Among females, the most frequent abnormal findings by far were abnormal Papanicolaou smear of the cervix, breast mass, and anemia; however, among males, the most frequent abnormal findings were elevated blood pressure, anemia, cardiac murmur, and blood in stool. Among teenaged servicemembers, anemia, abnormal Papanicolaou smear of the cervix, and cardiac murmur were the most frequently reported findings; in contrast, among servicemembers 40 years and older, elevated blood pressure, blood in stool,

Table 1. Incident diagnoses of selected "abnormal findings" within 30 days of medical examinations, active components, U.S. Armed Forces, January 1998-October 2006

| ICD-9 code | Diagnosis | Cases | Rate* | Examinations / detection |
|--------------|--|--------|-------|--------------------------|
| 796.2 | Elevated blood pressure without diagnosis of hypertension | 41,048 | 21.68 | 461 |
| 795.0 | Nonspecific abnormal Papanicolaou smear of cervix | 34,577 | 18.26 | 548 |
| 280-285 | Anemias | 28,824 | 15.22 | 657 |
| 611.72 | Lump or mass in breast | 14,797 | 7.81 | 1,280 |
| 785.2, 785.3 | Undiagnosed cardiac murmur, abnormal heart sounds | 14,614 | 7.72 | 1,295 |
| 578.1 | Blood in stool | 10,406 | 5.50 | 1,818 |
| 785.6 | Enlarged lymph nodes | 8,008 | 4.23 | 2,364 |
| 784.2 | Swelling, mass, lump in head/neck | 6,466 | 3.41 | 2,933 |
| 791 | Nonspecific findings on examination of urine | 5,339 | 2.82 | 3,546 |
| 785.0 | Tachycardia | 4,221 | 2.23 | 4,484 |
| 790.2 | Abnormal glucose tolerance test | 3,951 | 2.09 | 4,785 |
| 790.6 | Other abnormal blood chemistry | 3,930 | 2.08 | 4,808 |
| 790.4 | Nonspecific elevation of transaminase/lactic dehydrogenase | 3,924 | 2.07 | 4,831 |
| 789.3 | Swelling, mass, lump in abdomen/pelvis | 3,753 | 1.98 | 5,051 |
| 172-173 | Malignant melanoma/other neoplasm of skin | 3,724 | 1.97 | 5,076 |
| 786.07 | Wheezing | 3,415 | 1.80 | 5,556 |
| 783.2 | Abnormal weight loss | 3,265 | 1.72 | 5,814 |
| 793.1 | Nonspecific abnormal findings on exam of lung field | 2,291 | 1.21 | 8,264 |
| 790.5 | Other abnormal serum enzyme levels | 1,980 | 1.05 | 9,524 |
| 790.93 | Elevated prostate specific antigen (PSA) | 1,909 | 1.01 | 9,901 |
| 362.1 | Background retinopathy/retinal vascular changes | 1,056 | 0.56 | 17,857 |
| 140-149 | Malignant neoplasm of lip, oral cavity, pharynx | 385 | 0.20 | 50,000 |
| 789.2 | Splenomegaly | 342 | 0.18 | 55,556 |
| 789.1 | Hepatomegaly | 314 | 0.17 | 58,824 |
| 236.4 | Neoplasm, uncertain behavior, testis | 221 | 0.12 | 83,333 |
| 786.7 | Abnormal chest sounds | 217 | 0.11 | 90,909 |

*Rates are expressed as incident findings per 10,000 examinations

anemia, elevated prostate specific antigen, abnormal glucose tolerance, and melanoma and other neoplasms of the skin were the most frequent findings (Table 2).

An informative measure of the utility of medical examinations in various populations and settings is the number of examinations required to detect a previously undetected finding of clinical and/or public health importance (“exams/detection”). Overall, there was one incident abnormal finding per 93 medical examinations. However, only three findings – elevated blood pressure (461 exams/detection), abnormal Papanicolaou smear of the cervix (548 exams/detection), and anemia (657 exams/detection) – required fewer than 1,000 examinations per detection (Table 3).

Not surprisingly, there was significant variability in the utility of medical examinations across subgroups. For example, the fewest examinations required to detect any abnormal finding were among service members who were 50 years and older (41.4 exams/detection), female (47.6 exams/detection), 40-49 years old (57.8 exams/detection), or black non-Hispanic (64.0 exams/detection). The most examinations required to detect any abnormal finding were among service members who were in combat-specific occupations (139.3 exams/detection), in the Marine Corps (132.5 exams/detection), or male (129.7 exams/detection) (Table 3).

Among females, five findings required fewer than 1,000 exams/detection: abnormal Papanicolaou

Table 2. Incident abnormal findings (selected) within 30 days of a medical examination, by military and demographic characteristics, active components, U.S. Armed Forces, January 1998-October 2006

| ICD-9-CM: | Elevated blood pressure | Nonspecific abn PAP cervix | Anemia | Breast mass | Cardiac murmur | Blood in stool | Enlarged lymph nodes | Lump in head/neck | Nonspecific findings urine | Tachycardia | Abn glucose tolerance | Abn blood chemistry | Elevation of LDH |
|----------------------------|-------------------------|----------------------------|---------|-------------|----------------|----------------|----------------------|-------------------|----------------------------|-------------|-----------------------|---------------------|------------------|
| | 796.2 | 795.0 | 280-285 | 796.20 | 785.2-3 | 578.1 | 785.6 | 611.7 | 791 | 785.0 | 790.2 | 790.6 | 790.4 |
| Service | | | | | | | | | | | | | |
| Army | 14,694 | 10,237 | 10,127 | 5,255 | 4,543 | 4,430 | 3,831 | 2,642 | 2,908 | 1,581 | 1,465 | 1,796 | 1,595 |
| Navy | 8,616 | 12,208 | 12,258 | 3,678 | 4,885 | 2,834 | 1,435 | 1,610 | 1,378 | 897 | 1,494 | 931 | 1,020 |
| Air Force | 16,168 | 10,111 | 4,560 | 5,170 | 3,185 | 2,502 | 2,139 | 1,631 | 729 | 1,472 | 833 | 934 | 1,091 |
| Marine Corps | 1,570 | 2,021 | 1,879 | 694 | 2,001 | 640 | 603 | 583 | 324 | 271 | 159 | 269 | 218 |
| Gender | | | | | | | | | | | | | |
| Male | 35,204 | na | 15,677 | 1,398 | 9,703 | 8,274 | 5,200 | 4,774 | 3,807 | 2,704 | 3,269 | 3,137 | 3,454 |
| Female | 5,844 | 34,474 | 13,147 | 13,399 | 4,911 | 2,132 | 2,808 | 1,692 | 1,532 | 1,517 | 682 | 793 | 470 |
| Age group | | | | | | | | | | | | | |
| <20 | 1,395 | 7,378 | 8,077 | 1,181 | 3,551 | 471 | 737 | 424 | 424 | 449 | 54 | 257 | 182 |
| 20-24 | 8,543 | 16,508 | 8,468 | 4,238 | 4,177 | 2,098 | 2,885 | 1,695 | 1,664 | 1,306 | 336 | 665 | 701 |
| 25-29 | 7,782 | 5,751 | 3,804 | 2,884 | 2,135 | 1,535 | 1,664 | 1,237 | 1,023 | 783 | 471 | 556 | 633 |
| 30-39 | 14,244 | 3,765 | 5,153 | 4,201 | 2,872 | 2,831 | 1,840 | 1,826 | 1,397 | 1,074 | 1,341 | 1,289 | 1,322 |
| 40-49 | 8,191 | 1,094 | 2,944 | 2,097 | 1,637 | 2,898 | 808 | 1,089 | 750 | 545 | 1,431 | 1,001 | 954 |
| 50+ | 893 | 81 | 378 | 196 | 242 | 573 | 74 | 195 | 81 | 64 | 318 | 162 | 132 |
| Race ethnicity | | | | | | | | | | | | | |
| Black nonhisp | 10,571 | 9,315 | 14,514 | 5,019 | 4,364 | 2,089 | 2,101 | 1,436 | 1,856 | 868 | 983 | 1,077 | 903 |
| Hispanic/other | 6,337 | 7,613 | 5,266 | 2,534 | 2,505 | 1,875 | 1,195 | 1,050 | 935 | 713 | 915 | 774 | 901 |
| White nonhisp | 24,140 | 17,649 | 9,044 | 7,244 | 7,745 | 6,442 | 4,712 | 3,980 | 2,548 | 2,640 | 2,053 | 2,079 | 2,120 |
| Military status | | | | | | | | | | | | | |
| Officer | 6,985 | 3,094 | 2,737 | 2,828 | 1,919 | 2,466 | 1,107 | 1,279 | 623 | 514 | 806 | 629 | 675 |
| Enlisted | 34,063 | 31,483 | 26,087 | 11,969 | 12,695 | 7,940 | 6,901 | 5,187 | 4,716 | 3,707 | 3,145 | 3,301 | 3,249 |
| Military occupation | | | | | | | | | | | | | |
| Combat | 6,266 | 2,595 | 3,217 | 994 | 1,734 | 1,860 | 1,322 | 1,173 | 792 | 593 | 514 | 624 | 613 |
| Medical | 4,467 | 5,508 | 2,721 | 3,217 | 1,709 | 1,238 | 1,065 | 856 | 540 | 609 | 558 | 403 | 465 |
| Other | 30,315 | 26,474 | 22,886 | 10,586 | 11,171 | 7,308 | 5,621 | 4,437 | 4,007 | 3,019 | 2,879 | 2,903 | 2,846 |
| <i>Total</i> | 41,048 | 34,577 | 28,824 | 14,797 | 14,614 | 10,406 | 8,008 | 6,466 | 5,339 | 4,221 | 3,951 | 3,930 | 3,924 |

smear of the cervix (124 exams/detection), mass in breast (320 exams/detection), anemia (326 exams/detection), elevated blood pressure (733 exams/detection), and cardiac murmur (872 exams/detection); in contrast, among males, only two findings – elevated blood pressure (416 exams/detection) and anemia (935 exams/detection) – required fewer than 1,000 exams/detection. Among service members in medical occupations, four findings required fewer than 1,000 exams/detection: abnormal Papanicolaou smear of the cervix (347 exams/detection), elevated blood pressure (428 exams/detection), cardiac murmur (595 exams/detection), and anemia (703 exams/detection); in contrast, among those in combat-specific occupations, only one finding – elevated blood pressure (581 exams/

detection) – required fewer than 1,000 exams/detection. Among service members older than 50, seven findings required fewer than 1,000 exams/detection – elevated blood pressure (223 exams per detection), blood in stool (347 exams/detection), elevated prostate specific antigen (392 exams/detection), melanoma/other neoplasm of the skin (490 exams/detection), anemia (526 exams/detection), abnormal glucose tolerance (626 exams/detection), and cardiac murmur (822 exams/detection); in contrast, among service members in their thirties, only two findings required fewer than 1,000 examinations per detection: elevated blood pressure (329 exams/detection) and anemia (909 exams/detection) (Table 3).

Table 2 Continued. Incident abnormal findings (selected) within 30 days of a medical examination, by military and demographic characteristics, active components, U.S. Armed Forces, January 1998-October 2006

| | Mass abdomen/pelvis | Melanoma/oth neoplasm skin | Wheezing | Abnormal weight loss | Abn findings lung field | Other abn serum enzymes | Elevated PSA | Retinopathy/retinal vascular | Neoplasm lip, oral cavity, pharynx | Splenomegaly | Hepatomegaly | Neoplasm testis | Abn chest sounds | Total |
|----------------------------|---------------------|----------------------------|----------|----------------------|-------------------------|-------------------------|--------------|------------------------------|------------------------------------|--------------|--------------|-----------------|------------------|---------|
| ICD-9-CM: | 789.3 | 172-173 | 786.07 | 783.2 | 793.1 | 790.5 | 795.00 | 362.1 | 140-149 | 784.2 | 785.6 | 236.4 | 786.7 | |
| Service | | | | | | | | | | | | | | |
| Army | 1,487 | 1,090 | 1,581 | 1,404 | 1,028 | 966 | 860 | 358 | 117 | 149 | 162 | 74 | 62 | 74,442 |
| Navy | 898 | 1,012 | 583 | 688 | 472 | 444 | 411 | 193 | 123 | 63 | 66 | 40 | 31 | 58,268 |
| Air Force | 1,186 | 1,379 | 959 | 839 | 573 | 474 | 556 | 426 | 116 | 86 | 68 | 83 | 57 | 57,327 |
| Marine Corps | 182 | 243 | 292 | 334 | 218 | 96 | 82 | 79 | 29 | 44 | 18 | 24 | 67 | 12,940 |
| Gender | | | | | | | | | | | | | | |
| Male | 1,342 | 3,026 | 2,406 | 1,941 | 1,931 | 1,685 | 1,903 | 894 | 294 | 297 | 224 | 221 | 192 | 112,957 |
| Female | 2,411 | 698 | 1,009 | 1,324 | 360 | 295 | na | 162 | 91 | 45 | 90 | na | 25 | 89,911 |
| Age group | | | | | | | | | | | | | | |
| <20 | 210 | 46 | 502 | 366 | 150 | 127 | 4 | 54 | 27 | 37 | 15 | 12 | 57 | 26,187 |
| 20-24 | 933 | 322 | 1,152 | 1,216 | 359 | 384 | 17 | 153 | 76 | 107 | 76 | 54 | 67 | 58,200 |
| 25-29 | 637 | 371 | 615 | 634 | 308 | 305 | 19 | 113 | 63 | 76 | 51 | 49 | 26 | 33,525 |
| 30-39 | 1,190 | 1,235 | 740 | 721 | 679 | 659 | 210 | 309 | 115 | 75 | 105 | 77 | 30 | 49,300 |
| 40-49 | 691 | 1,344 | 352 | 289 | 667 | 427 | 1,151 | 356 | 80 | 43 | 58 | 29 | 35 | 30,961 |
| 50+ | 92 | 406 | 54 | 39 | 128 | 78 | 508 | 71 | 24 | 4 | 9 | 0 | 2 | 4,804 |
| Race ethnicity | | | | | | | | | | | | | | |
| Black nonhisp | 1,233 | 160 | 750 | 771 | 453 | 517 | 449 | 271 | 75 | 34 | 75 | 31 | 29 | 59,944 |
| Hispanic/other | 602 | 388 | 641 | 662 | 339 | 408 | 273 | 174 | 70 | 38 | 71 | 37 | 43 | 36,359 |
| White nonhisp | 1,918 | 3,176 | 2,024 | 1,832 | 1,499 | 1,055 | 1,187 | 611 | 240 | 270 | 168 | 153 | 145 | 106,674 |
| Military status | | | | | | | | | | | | | | |
| Officer | 671 | 1,759 | 343 | 353 | 493 | 329 | 978 | 248 | 109 | 58 | 34 | 51 | 26 | 31,114 |
| Enlisted | 3,082 | 1,965 | 3,072 | 2,912 | 1,798 | 1,651 | 931 | 808 | 276 | 284 | 280 | 170 | 191 | 171,863 |
| Military occupation | | | | | | | | | | | | | | |
| Combat | 361 | 942 | 483 | 414 | 383 | 330 | 439 | 180 | 69 | 84 | 47 | 48 | 37 | 26,114 |
| Medical | 665 | 545 | 422 | 445 | 264 | 247 | 265 | 118 | 49 | 26 | 40 | 27 | 12 | 26,481 |
| Other | 2,727 | 2,237 | 2,510 | 2,406 | 1,644 | 1,403 | 1,205 | 758 | 267 | 232 | 227 | 146 | 168 | 150,382 |
| <i>Total</i> | 3,753 | 3,724 | 3,415 | 3,265 | 2,291 | 1,980 | 1,909 | 1,056 | 385 | 342 | 314 | 221 | 217 | 202,977 |

Data summaries conducted by Stephen B. Taubman, PhD, Army Medical Surveillance Activity.

Editorial comment: This report provides general insights into the utility of conducting medical examinations in a fully employed, physically active, generally healthy adult population. For many reasons, the results must be interpreted cautiously. For example, the abnormal findings used as endpoints are not exhaustive; and many findings during examinations may not be recorded as diagnoses in standardized records that document the encounters. In turn, many significant findings of medical examinations may not

be accounted for in this summary. In addition, the endpoints of this analysis were selected because they are indicators of potentially significant underlying conditions – however, they are not definitive diagnoses of the conditions themselves. For example, in the ICD-9-CM, sickle cell trait is coded as an “hereditary hemolytic anemia” even though it has no significant pathophysiologic consequences in most affected U.S. servicemembers.⁶ Also, “blood in stool, especially in young adults, is unlikely to be caused by colon cancer;⁷ and high proportions of signs/symptoms of breast cancer detected during routine physical examinations are “false alarms.” Thus, many of the abnormal findings included in this summary may not indicate

Table 3. Medical examinations per incident abnormal finding (selected), by military and demographic characteristics, active components, U.S. Armed Forces, January 1998-October 2006

| | Elevated blood pressure | Nonspecific abn PAP cervix | Anemia | Breast lump | Cardiac murmur | Blood in stool | Enlarged lymph nodes | Lump in head/neck | Nonspecific urine | Tachycardia | Abn glucose tolerance | Blood chemistry | Elevation of LDH |
|----------------------------|-------------------------|----------------------------|---------|-------------|----------------|----------------|----------------------|-------------------|-------------------|-------------|-----------------------|-----------------|------------------|
| ICD-9-CM: | 796.2 | 795.0 | 280-285 | 796.20 | 785.2-3 | 578.1 | 785.6 | 611.7 | 791 | 785.0 | 790.2 | 790.6 | 790.4 |
| Service | | | | | | | | | | | | | |
| Army | 573 | 822 | 831 | 1,601 | 1,852 | 1,900 | 2,197 | 3,185 | 2,894 | 5,323 | 5,744 | 4,686 | 5,276 |
| Navy | 560 | 395 | 394 | 1,311 | 987 | 1,702 | 3,361 | 2,996 | 3,500 | 5,377 | 3,229 | 5,181 | 4,729 |
| Air Force | 246 | 394 | 873 | 770 | 1,250 | 1,591 | 1,861 | 2,441 | 5,461 | 2,704 | 4,779 | 4,262 | 3,649 |
| Marine Corps | 1,092 | 848 | 912 | 2,470 | 857 | 2,679 | 2,843 | 2,941 | 5,291 | 6,326 | 10,782 | 6,373 | 7,864 |
| Gender | | | | | | | | | | | | | |
| Male | 416 | na | 935 | 10,482 | 1,510 | 1,771 | 2,818 | 3,070 | 3,849 | 5,419 | 4,483 | 4,671 | 4,243 |
| Female | 732 | 124 | 326 | 319 | 872 | 2,008 | 1,524 | 2,530 | 2,794 | 2,821 | 6,276 | 5,397 | 9,107 |
| Age group | | | | | | | | | | | | | |
| <20 | 1,628 | 308 | 281 | 1,923 | 640 | 4,822 | 3,082 | 5,357 | 5,357 | 5,058 | 42,060 | 8,837 | 12,479 |
| 20-24 | 728 | 377 | 734 | 1,467 | 1,488 | 2,964 | 2,155 | 3,668 | 3,736 | 4,761 | 18,504 | 9,350 | 8,869 |
| 25-29 | 485 | 656 | 992 | 1,308 | 1,767 | 2,458 | 2,268 | 3,051 | 3,689 | 4,819 | 8,012 | 6,787 | 5,961 |
| 30-39 | 329 | 1,244 | 909 | 1,115 | 1,631 | 1,654 | 2,546 | 2,565 | 3,353 | 4,361 | 3,493 | 3,634 | 3,543 |
| 40-49 | 218 | 1,636 | 608 | 853 | 1,093 | 617 | 2,215 | 1,643 | 2,386 | 3,283 | 1,251 | 1,788 | 1,876 |
| 50+ | 223 | 2,457 | 526 | 1,015 | 822 | 347 | 2,689 | 1,020 | 2,457 | 3,109 | 626 | 1,228 | 1,507 |
| Race ethnicity | | | | | | | | | | | | | |
| Black nonhispanic | 363 | 412 | 264 | 765 | 879 | 1,837 | 1,826 | 2,672 | 2,068 | 4,421 | 3,904 | 3,563 | 4,250 |
| Hispanic/other | 559 | 465 | 673 | 1,398 | 1,414 | 1,889 | 2,964 | 3,374 | 3,788 | 4,968 | 3,871 | 4,576 | 3,931 |
| White nonhispanic | 479 | 655 | 1,278 | 1,595 | 1,492 | 1,794 | 2,452 | 2,903 | 4,535 | 4,377 | 5,628 | 5,558 | 5,450 |
| Military status | | | | | | | | | | | | | |
| Officer | 399 | 902 | 1,019 | 986 | 1,454 | 1,131 | 2,520 | 2,181 | 4,478 | 5,427 | 3,461 | 4,435 | 4,133 |
| Enlisted | 474 | 513 | 619 | 1,349 | 1,272 | 2,033 | 2,340 | 3,113 | 3,423 | 4,355 | 5,134 | 4,891 | 4,969 |
| Military occupation | | | | | | | | | | | | | |
| Combat | 581 | 1,402 | 1,131 | 3,660 | 2,098 | 1,956 | 2,752 | 3,101 | 4,593 | 6,135 | 7,078 | 5,830 | 5,935 |
| Medical | 428 | 347 | 703 | 595 | 1,119 | 1,545 | 1,796 | 2,234 | 3,542 | 3,141 | 3,428 | 4,746 | 4,113 |
| Other | 441 | 506 | 585 | 1,264 | 1,198 | 1,831 | 2,381 | 3,016 | 3,340 | 4,433 | 4,649 | 4,610 | 4,703 |
| <i>Total</i> | 461 | 548 | 657 | 1,280 | 1,295 | 1,818 | 2,364 | 2,933 | 3,546 | 4,484 | 4,785 | 4,808 | 4,831 |

Shaded cells indicate abnormal findings that require fewer than 1,000 examinations per detection.

serious underlying diseases.

Also, it is not certain that all of the medical examinations included in this analysis were conducted on individuals with no current illnesses or injuries. Finally, for this report, the indications for, natures, and intensities of the examinations were not accounted for – even though, for example, the focuses and thoroughness of various examinations (e.g., annual “well woman,” pre- and post-deployment, routine periodic, aviation, pre-retirement) significantly vary.

In spite of the many limitations of the analysis presented here, the results are still informative and potentially useful. For example, the results suggest that, in less than 9 years, more than 200,000 potentially

significant abnormalities may have been detected for the first time during routine medical examinations. Thus, even if many abnormal findings turned out to be insignificant, it is likely that earlier interventions in disease processes with severe long term consequences were enabled in a large number of cases. Finally, it suggests that examinations are much more likely to detect abnormalities in certain subgroups of service members – e.g., females and older than 40 year olds – compared to others.

Further analyses are planned to assess the positive predictive values in relation to clinically significant diseases of abnormal findings detected on routine medical examinations.

Table 3 Continued. Medical examinations per incident abnormal finding (selected), by military and demographic characteristics, active components, U.S. Armed Forces, January 1998-October 2006

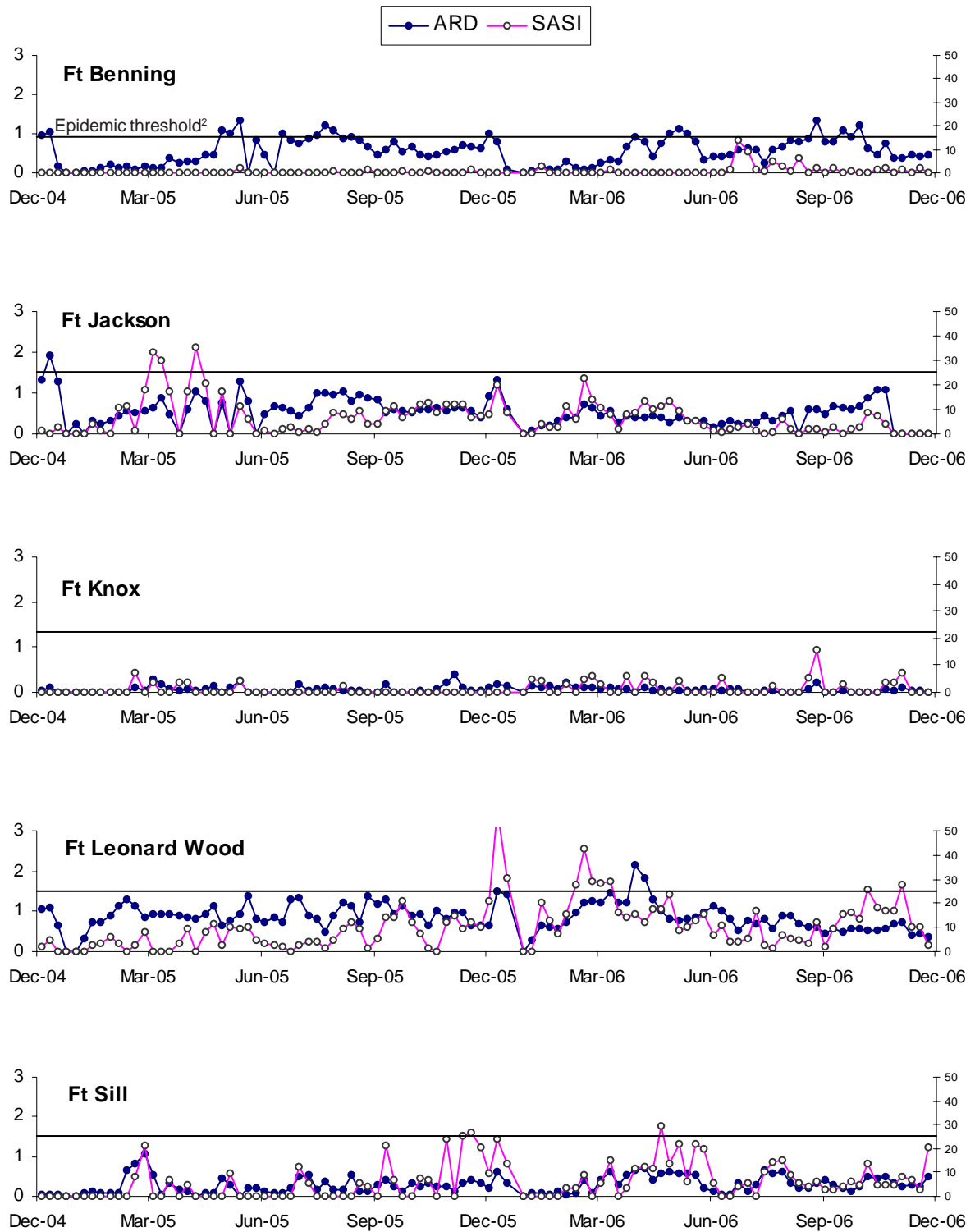
| | Abdominal lump | Melanoma/oth neoplasm skin | Wheezing | Abnormal weight loss | Lung fields, nonspec abn findings | Abn serum enzymes | Elevated PSA | Retinopathy/re tinal vascular | Neoplasm lip, oral cavity, pharynx | Splenomegaly | Hepatomegaly | Neoplasm testis | Abn chest sounds | Total |
|----------------------------|----------------|----------------------------|----------|----------------------|-----------------------------------|-------------------|--------------|-------------------------------|------------------------------------|--------------|--------------|-----------------|------------------|-------|
| ICD-9-CM: | 789.3 | 172-173 | 786.07 | 783.2 | 793.1 | 790.5 | 795.00 | 362.1 | 140-149 | 784.2 | 785.6 | 236.4 | 786.7 | |
| Service | | | | | | | | | | | | | | |
| Army | 5,659 | 7,721 | 5,323 | 5,994 | 8,186 | 8,712 | 9,786 | 23,507 | 71,928 | 56,481 | 51,948 | 113,725 | 135,736 | 113 |
| Navy | 5,371 | 4,766 | 8,274 | 7,011 | 10,219 | 10,864 | 11,736 | 24,993 | 39,216 | 76,565 | 73,085 | 120,590 | 155,600 | 83 |
| Air Force | 3,357 | 2,887 | 4,151 | 4,745 | 6,947 | 8,398 | 7,160 | 9,345 | 34,318 | 46,289 | 58,542 | 47,962 | 69,840 | 69 |
| Marine Corps | 9,419 | 7,055 | 5,871 | 5,133 | 7,864 | 17,857 | 20,906 | 21,700 | 59,114 | 38,962 | 95,240 | 71,430 | 25,587 | 132 |
| Gender | | | | | | | | | | | | | | |
| Male | 10,920 | 4,843 | 6,091 | 7,550 | 7,589 | 8,697 | 7,701 | 16,392 | 49,844 | 49,341 | 65,421 | 66,309 | 76,324 | 130 |
| Female | 1,775 | 6,132 | 4,242 | 3,233 | 11,889 | 14,509 | na | 26,421 | 47,035 | 95,115 | 47,558 | na | 171,208 | 48 |
| Age group | | | | | | | | | | | | | | |
| <20 | 10,815 | 49,374 | 4,524 | 6,206 | 15,141 | 17,884 | 567,806 | 42,060 | 84,119 | 61,384 | 151,415 | 189,269 | 39,846 | 87 |
| 20-24 | 6,664 | 19,309 | 5,397 | 5,113 | 17,319 | 16,191 | 365,732 | 40,637 | 81,808 | 58,107 | 81,808 | 115,138 | 92,798 | 107 |
| 25-29 | 5,924 | 10,171 | 6,136 | 5,952 | 12,252 | 12,372 | 198,609 | 33,394 | 59,898 | 49,652 | 73,991 | 77,012 | 145,137 | 113 |
| 30-39 | 3,936 | 3,792 | 6,329 | 6,496 | 6,898 | 7,107 | 22,303 | 15,158 | 40,728 | 62,450 | 44,607 | 60,828 | 156,124 | 95 |
| 40-49 | 2,590 | 1,331 | 5,084 | 6,192 | 2,683 | 4,191 | 1,555 | 5,027 | 22,368 | 41,616 | 30,853 | 61,706 | 51,128 | 58 |
| 50+ | 2,163 | 490 | 3,685 | 5,102 | 1,555 | 2,551 | 392 | 2,802 | 8,291 | 49,744 | 22,109 | na | 99,488 | 41 |
| Race ethnicity | | | | | | | | | | | | | | |
| Black nonhisp | 3,112 | 23,983 | 5,116 | 4,977 | 8,471 | 7,422 | 8,546 | 14,160 | 51,165 | 112,863 | 51,165 | 123,785 | 132,322 | 64 |
| Hispanic/other | 5,884 | 9,129 | 5,526 | 5,351 | 10,449 | 8,682 | 12,975 | 20,357 | 50,603 | 93,215 | 49,890 | 95,735 | 82,376 | 97 |
| White nonhisp | 6,024 | 3,638 | 5,709 | 6,307 | 7,708 | 10,952 | 9,735 | 18,911 | 48,145 | 42,796 | 68,779 | 75,522 | 79,689 | 108 |
| Military status | | | | | | | | | | | | | | |
| Officer | 4,157 | 1,586 | 8,133 | 7,902 | 5,658 | 8,479 | 2,852 | 11,248 | 25,592 | 48,095 | 82,044 | 54,696 | 107,288 | 90 |
| Enlisted | 5,238 | 8,216 | 5,256 | 5,544 | 8,979 | 9,779 | 17,341 | 19,981 | 58,496 | 56,848 | 57,660 | 94,970 | 84,528 | 94 |
| Military occupation | | | | | | | | | | | | | | |
| Combat | 10,077 | 3,862 | 7,532 | 8,787 | 9,499 | 11,024 | 8,287 | 20,211 | 52,724 | 43,309 | 77,404 | 75,791 | 98,323 | 139 |
| Medical | 2,876 | 3,510 | 4,532 | 4,298 | 7,245 | 7,744 | 7,218 | 16,209 | 39,035 | 73,566 | 47,818 | 70,841 | 159,393 | 72 |
| Other | 4,908 | 5,983 | 5,332 | 5,563 | 8,141 | 9,539 | 11,107 | 17,657 | 50,126 | 57,688 | 58,959 | 91,669 | 79,665 | 89 |
| <i>Total</i> | 5,051 | 5,076 | 5,556 | 5,814 | 8,264 | 9,524 | 9,901 | 17,857 | 50,000 | 55,556 | 58,824 | 83,333 | 90,909 | 93 |

Shaded cells indicate abnormal findings that require fewer than 1,000 examinations per detection.

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Acute respiratory disease (ARD)¹ and streptococcal pharyngitis (SASI)², Army basic training centers, by week through October 31, 2006



¹ ARD rate = cases per 100 trainees per week

² SASI (Strep ARD surveillance index) = (ARD rate)x(rate of Group A beta-hemolytic strep)

³ ARD rate ≥ 1.5 or SASI ≥ 25.0 for 2 consecutive weeks indicates an "epidemic"

Update: Pre- and Post-deployment Health Assessments, U.S. Armed Forces, January 2003-November 2006

The June 2003 issue of the *MSMR* summarized the background, rationale, policies, and guidelines related to pre-deployment and post-deployment health assessments of service members.¹⁻¹⁰ Briefly, prior to deploying, the health of each servicemember is assessed to ensure his/her medical fitness and readiness for deployment. At the time of redeployment, the health of each service member is again assessed to identify medical conditions and/or exposures of concern to ensure timely and comprehensive evaluation and treatment.

Completed pre- and post-deployment health assessment forms are routinely sent to the Army Medical Surveillance Activity (AMSA) where they are archived in the Defense Medical Surveillance System (DMSS).¹¹ In the DMSS, data recorded on pre- and post-deployment health assessments are integrated with data that document demographic characteristics, military experiences, and medical encounters of all service members (e.g., hospitalizations, ambulatory visits, immunizations).¹¹ The continuously expanding DMSS database can be used to monitor the health of service members who participated in major overseas deployments.¹¹⁻¹³

The overall success of deployment force health protection efforts depends at least in part on the completeness and quality of pre- and post-deployment health assessments. This report summarizes characteristics of servicemembers who completed pre- and post-deployment forms since 1 January 2003, responses to selected questions on pre- and post-deployment forms, and changes in responses of individuals from pre-deployment to post-deployment.

Methods: For this update, the DMSS was searched to identify all pre- and post-deployment health assessments (DD Form 2795 and DD Form 2796, respectively) that were completed after 1 January 2003.

Results: From 1 January 2003 to 30 November 2006, 1,491,934 pre-deployment health assessments and 1,549,775 post-deployment health assessments were

completed at field sites, shipped to AMSA, and integrated in the DMSS database (Table 1).

In general, the distributions of self-assessments of “overall health” were similar among pre- and post-deployment form respondents (Figure 1). For example, both prior to and after deployment, the most frequent descriptor of “overall health” was “very good.” Of note, however, relatively more pre- (34%) than post- (24%) deployment respondents assessed their overall health as “excellent”; while more post- (40%) than pre- (25%) deployment respondents assessed their overall health as “good,” “fair,” or “poor” (Figure 1).

Among service members (n=773,077) who completed both a pre- and a post-deployment health assessment, fewer than half (44%) chose the same descriptor of their overall health before and after deploying (Figures 2, 3). Of those (n=429,979) who changed their assessments from pre- to post-deployment, three-fourths (75%) changed by a single category (on a five category scale) (Figure 3); and of those who changed by more than one category, nearly 5-times as many indicated a decrement in overall health (n=88,605; 11.5% of all respondents) as an improvement (n=18,716; 2.4% of all respondents) (Figure 3).

On post-deployment forms, 22% of active and 41% of Reserve component respondents reported “medical/dental problems” during deployment (Table 2). Among active component respondents, “medical/dental problems” were more frequently reported by soldiers and Marines than by members of the other Services. Among Reservists, members of the Air Force reported “medical/dental problems” much less often than members of the other Services (Table 2).

Approximately 5% and 6% of active and Reserve component respondents, respectively, reported “mental health concerns.” “Mental health concerns” were reported relatively more frequently among soldiers (active: 7%; Reserve: 8%) than members of the other Services (Table 2). Post-deployment forms from approximately one-fifth (18%) of active component and one-fourth (24%) of Reserve component members documented that “referrals” were indicated (Table 2); and 88% and 86% of all

Table 1. Total pre-deployment and post-deployment health assessments, by month, US Armed Forces, January 2003-November 2006

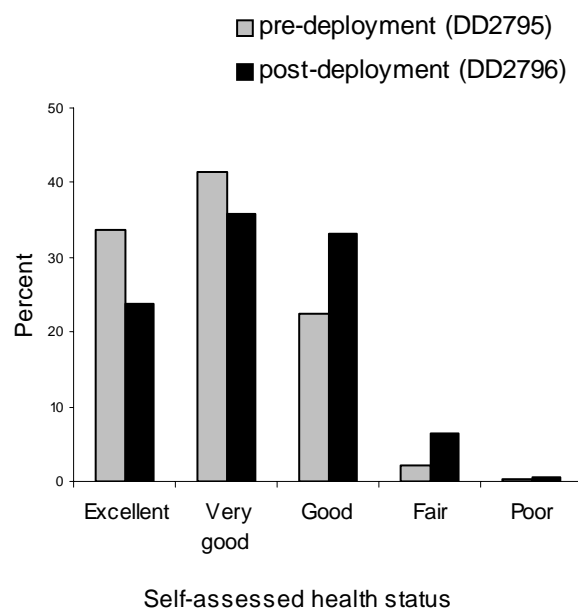
| | Pre-deployment | | Post-deployment | |
|--------------|------------------|--------------|------------------|--------------|
| | No. | % | No. | % |
| Total | 1,491,934 | 100.0 | 1,549,775 | 100.0 |
| 2003 | | | | |
| January | 69,390 | 4.7 | 6,221 | 0.4 |
| February | 110,571 | 7.4 | 5,077 | 0.3 |
| March | 69,855 | 4.7 | 6,755 | 0.4 |
| April | 37,599 | 2.5 | 19,351 | 1.2 |
| May | 12,885 | 0.9 | 92,882 | 6.0 |
| June | 14,417 | 1.0 | 65,381 | 4.2 |
| July | 18,062 | 1.2 | 52,903 | 3.4 |
| August | 16,513 | 1.1 | 35,154 | 2.3 |
| September | 12,800 | 0.9 | 32,447 | 2.1 |
| October | 24,170 | 1.6 | 27,047 | 1.7 |
| November | 19,703 | 1.3 | 21,542 | 1.4 |
| December | 36,157 | 2.4 | 22,242 | 1.4 |
| 2004 | | | | |
| January | 70,229 | 4.7 | 40,000 | 2.6 |
| February | 39,203 | 2.6 | 32,286 | 2.1 |
| March | 22,843 | 1.5 | 66,655 | 4.3 |
| April | 19,947 | 1.3 | 44,506 | 2.9 |
| May | 27,798 | 1.9 | 17,911 | 1.2 |
| June | 24,666 | 1.7 | 28,404 | 1.8 |
| July | 22,805 | 1.5 | 24,342 | 1.6 |
| August | 34,302 | 2.3 | 23,013 | 1.5 |
| September | 32,207 | 2.2 | 24,396 | 1.6 |
| October | 35,657 | 2.4 | 15,865 | 1.0 |
| November | 36,239 | 2.4 | 22,086 | 1.4 |
| December | 38,613 | 2.6 | 27,071 | 1.7 |
| 2005 | | | | |
| January | 34,691 | 2.3 | 56,313 | 3.6 |
| February | 24,766 | 1.7 | 70,990 | 4.6 |
| March | 20,887 | 1.4 | 53,592 | 3.5 |
| April | 26,992 | 1.8 | 19,136 | 1.2 |
| May | 18,785 | 1.3 | 21,168 | 1.4 |
| June | 25,597 | 1.7 | 19,386 | 1.3 |
| July | 21,630 | 1.4 | 17,765 | 1.1 |
| August | 47,320 | 3.2 | 29,703 | 1.9 |
| September | 34,499 | 2.3 | 40,233 | 2.6 |
| October | 37,203 | 2.5 | 37,689 | 2.4 |
| November | 35,217 | 2.4 | 38,845 | 2.5 |
| December | 21,239 | 1.4 | 56,959 | 3.7 |
| 2006 | | | | |
| January | 29,840 | 2.0 | 41,890 | 2.7 |
| February | 22,206 | 1.5 | 24,390 | 1.6 |
| March | 20,707 | 1.4 | 21,771 | 1.4 |
| April | 18,581 | 1.2 | 19,651 | 1.3 |
| May | 23,928 | 1.6 | 24,222 | 1.6 |
| June | 30,613 | 2.1 | 17,329 | 1.1 |
| July | 34,035 | 2.3 | 27,508 | 1.8 |
| August | 38,921 | 2.6 | 34,944 | 2.3 |
| September | 37,458 | 2.5 | 37,245 | 2.4 |
| October | 25,330 | 1.7 | 43,026 | 2.8 |
| November | 14,858 | 1.0 | 42,483 | 2.7 |

active and Reserve component respondents, respectively, had hospitalizations and/or medical encounters within 6 months after documented post-deployment referrals (Table 2).

During interviews by health care providers, approximately 16% of respondents expressed concerns about possible exposures or events during the deployment that they felt may affect their health (“exposure concerns”) (Table 3). The proportion of respondents who reported exposure concerns significantly varied from month to month. In general, in the active components, rates of exposure concerns increased through calendar year 2003 and have been relatively stable (5-15%) since the spring of 2004 (Figure 4). In the Reserve components, rates of exposure concerns increased through the spring of 2004 and have been relatively high (15-30%) since then (Figure 4). Reports of exposure concerns have been generally higher in the Army than the other services and in the Reserve compared to the active component (Table 3). Finally, prevalences of exposure concerns increase with age (Tables 3, 4).

Editorial comment: Since January 2003, approximately 75% of U.S. service members have

Figure 1. Percent distributions of self-assessed health status, pre- and post-deployment, US Armed Forces, January 2003-November 2006



assessed their overall health as “very good” or “excellent” when they are mobilized and/or prior to deploying overseas; and approximately 60% have assessed their overall health as “very good” or “excellent” at the end of their deployments. Most of the changes in assessments of overall health from pre- to post-deployment have been relatively minor (i.e., one category on a 5-category scale). Still, however, approximately one of nine post-deployers have indicated relatively significant declines (i.e., two or more categories) in their overall health from pre- to post-deployment. The findings are attributable at least in part to the extreme physical and psychological stresses associated with mobilization, overseas deployment, and harsh and dangerous living and working conditions.^{14,15}

The deployment health assessment process is specifically designed to identify, assess, and follow-up as necessary all service members with concerns regarding their health and/or deployment-related exposures. Overall, for example, approximately one-fifth of all returning soldiers had “referral indications” documented on post-deployment health assessments; and of those, most had documented outpatient visits and/or hospitalizations within 6 months after they returned.

Of interest, “exposure concerns” among post-deploying respondents significantly vary from month to month. Since the beginning of 2004, exposure concerns have been much more common among Reserve compared to active component members. Among both active and Reserve component members, exposure concerns significantly increase with age, and in both components, service members older than 40 are approximately twice as likely as those younger than 20 to report exposure concerns.

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Figure 2. Self-assessed health status on post-deployment form, in relation to self-assessed health status on pre-deployment form, U.S. Armed Forces, January 2003-November 2006

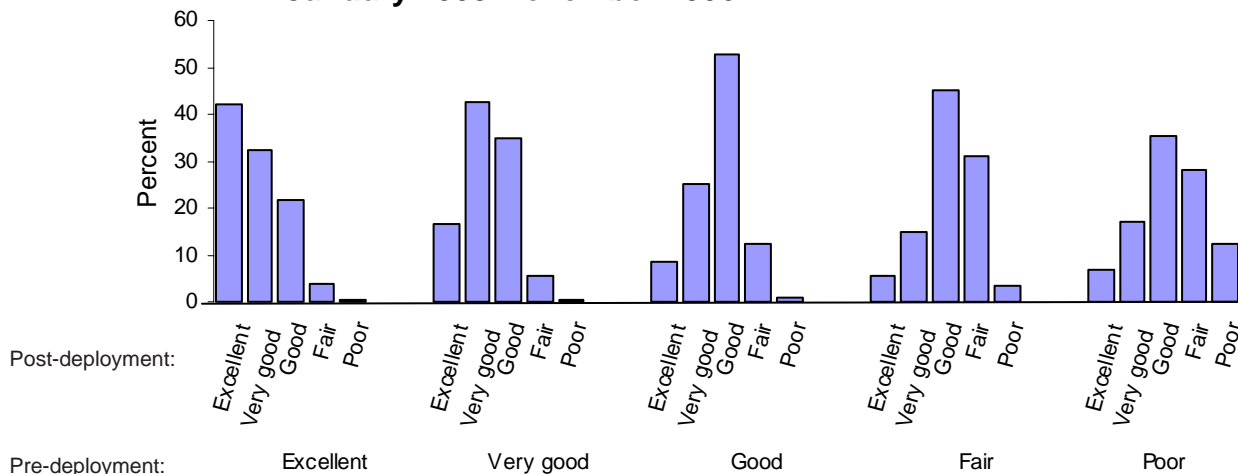


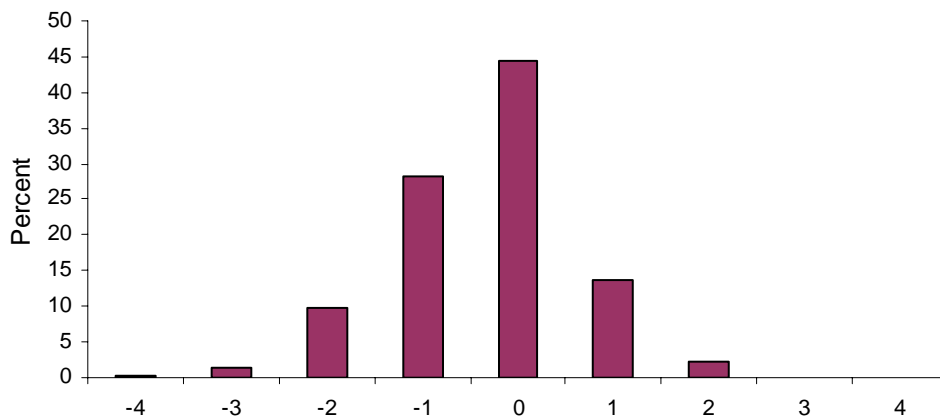
Table 2. Responses to selected questions from post-deployment forms (DD2796), by service and component, U.S. Armed Forces, January 2003-November 2006

| | Army | Navy | Air Force | Marine Corps | Total |
|--|----------------|----------------|----------------|----------------|----------------|
| Active component | | | | | |
| SMs with DD 2796 in DMSS | 333,791 | 108,815 | 131,774 | 102,140 | 676,520 |
| Electronic version | 83% | 12% | 76% | 28% | 62% |
| General health ("fair" or "poor") | 9% | 5% | 2% | 5% | 6% |
| Medical/dental problems during deploy | 30% | 12% | 12% | 20% | 22% |
| Currently on profile | 11% | 2% | 2% | 2% | 6% |
| Mental health concerns | 7% | 3% | 1% | 2% | 5% |
| Exposure concerns | 17% | 5% | 4% | 10% | 11% |
| Health concerns | 13% | 6% | 6% | 8% | 10% |
| Referral indicated | 27% | 7% | 10% | 14% | 18% |
| Med. visit following referral ¹ | 93% | 70% | 91% | 65% | 88% |
| Post deployment serum ² | 89% | 81% | 90% | 85% | 87% |
| Reserve component | | | | | |
| SMs with DD 2796 in DMSS | 288,913 | 17,706 | 45,647 | 21,562 | 373,828 |
| Electronic version | 75% | 18% | 66% | 27% | 68% |
| General health ("fair" or "poor") | 11% | 6% | 2% | 8% | 9% |
| Medical/dental problems during deploy | 45% | 36% | 15% | 35% | 41% |
| Currently on profile | 15% | 4% | 2% | 3% | 12% |
| Mental health concerns | 8% | 4% | 1% | 3% | 6% |
| Exposure concerns | 25% | 20% | 8% | 25% | 23% |
| Health concerns | 22% | 22% | 11% | 22% | 21% |
| Referral indicated | 27% | 19% | 11% | 24% | 24% |
| Med. visit following referral ¹ | 90% | 79% | 59% | 55% | 86% |
| Post deployment serum ² | 93% | 87% | 70% | 83% | 90% |

¹ Inpatient or outpatient visit within 6 months after referral.

² Only calculated for DD 2796 completed since 1 June 2003.

Figure 3. Distribution of changes in self-assessed health status as reported on pre- and post-deployment forms, U.S. Armed Forces, January 2003-November 2006



Change in self-assessment of overall health status, pre- to post-deployment, calculated as: post deployment response - pre-deployment response, using the following scale for health status: 1="poor"; 2="fair"; 3="good"; 4="very good"; and 5="excellent"

Table 3. Reports of exposure concerns on post-deployment health assessments, U.S. Armed Forces, January 2003-November 2006

| | Total ¹ | Exposure concerns | % with exposure concerns |
|-----------------------|--------------------|-------------------|--------------------------|
| Total | 1,052,157 | 163,346 | 15.5 |
| Component | | | |
| Active | 673,301 | 76,106 | 11.3 |
| Reserve | 378,856 | 87,240 | 23.0 |
| Service | | | |
| Army | 624,678 | 129,823 | 20.8 |
| Navy | 125,303 | 8,728 | 7.0 |
| Air Force | 179,269 | 9,555 | 5.3 |
| Marine Corps | 122,907 | 15,240 | 12.4 |
| Age (years) | | | |
| <20 | 24,952 | 1,928 | 7.7 |
| 20-29 | 563,935 | 72,042 | 12.8 |
| 30-39 | 289,010 | 50,016 | 17.3 |
| >39 | 174,240 | 39,360 | 22.6 |
| Gender | | | |
| Men | 933,855 | 142,941 | 15.3 |
| Women | 118,301 | 20,405 | 17.2 |
| Race/ethnicity | | | |
| Black | 178,220 | 30,180 | 16.9 |
| Hispanic | 104,756 | 17,581 | 16.8 |
| Other | 2,617 | 256 | 9.8 |
| White | 689,523 | 103,199 | 15.0 |
| Grade | | | |
| Enlisted | 915,515 | 140,725 | 15.4 |
| Officer | 136,578 | 22,619 | 16.6 |

¹Totals do not include non-responses/missing data

Figure 4. Proportion of post-deployment forms that include reports of exposure concerns, by month, U.S. Armed Forces, January 2003-November 2006

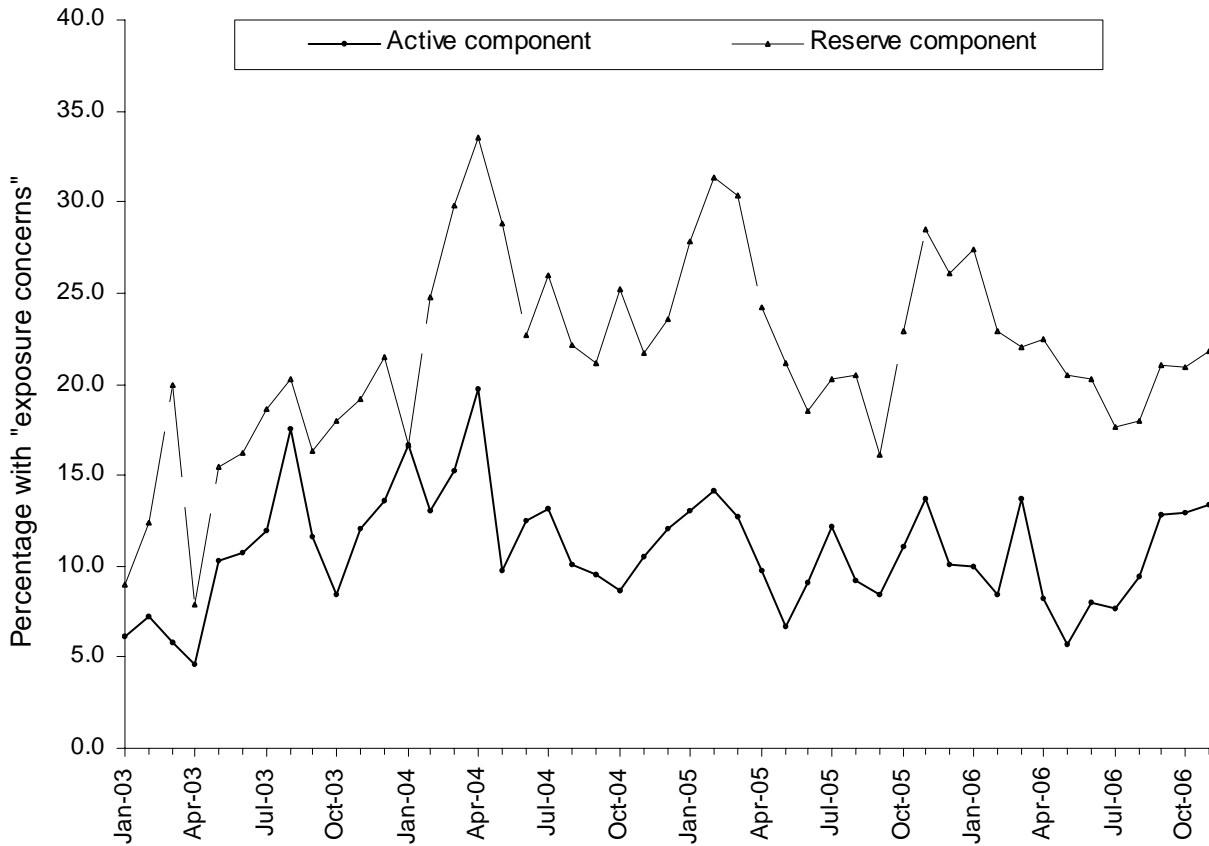
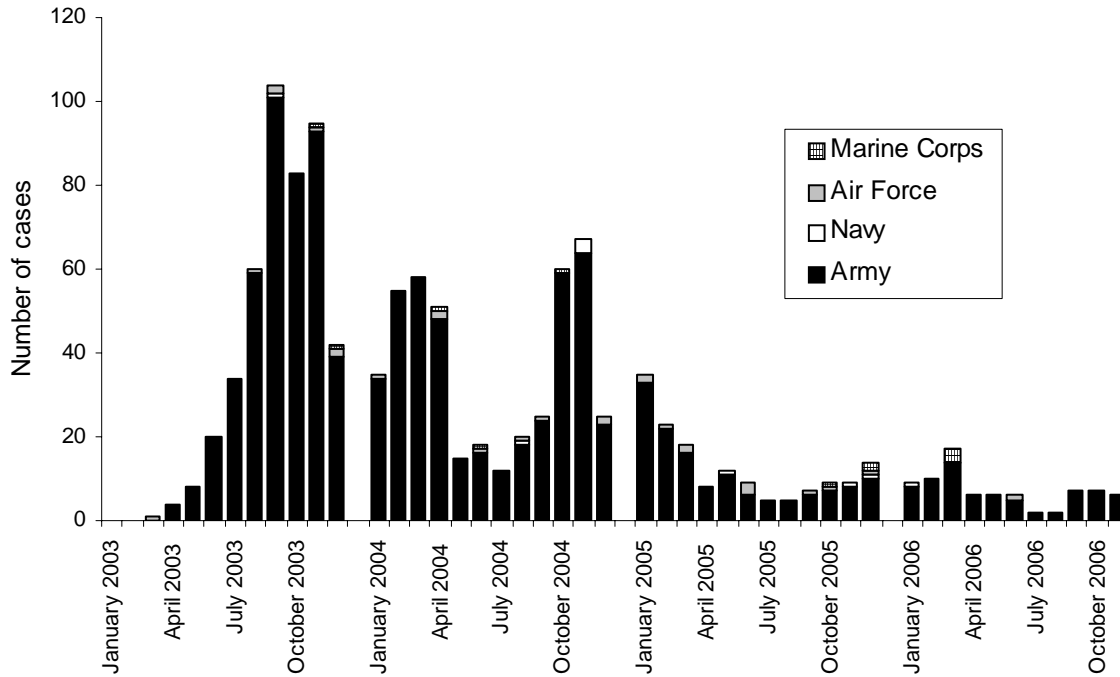


Table 4. Proportion of post-deployment forms that include reports of exposure concerns, by age group, U.S. Armed Forces, January 2003-November 2006

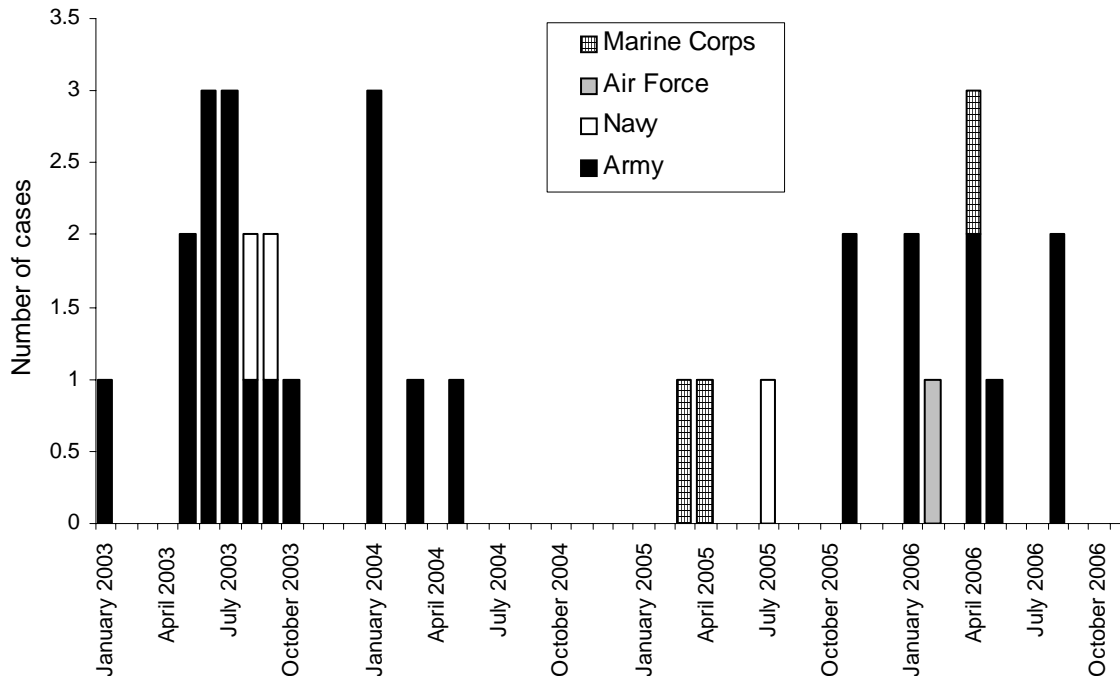
| Age group | Active | Reserve |
|-----------|--------|---------|
| <20 | 6.1 | 14.0 |
| 20-29 | 10.2 | 20.3 |
| 30-39 | 13.0 | 23.9 |
| >39 | 15.9 | 26.1 |

Deployment related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003-November 2006

Leishmaniasis (ICD-9-CM: 085.0-85.5)¹



Acute respiratory failure/ARDS (ICD-9-CM:518.81, 518.82)²



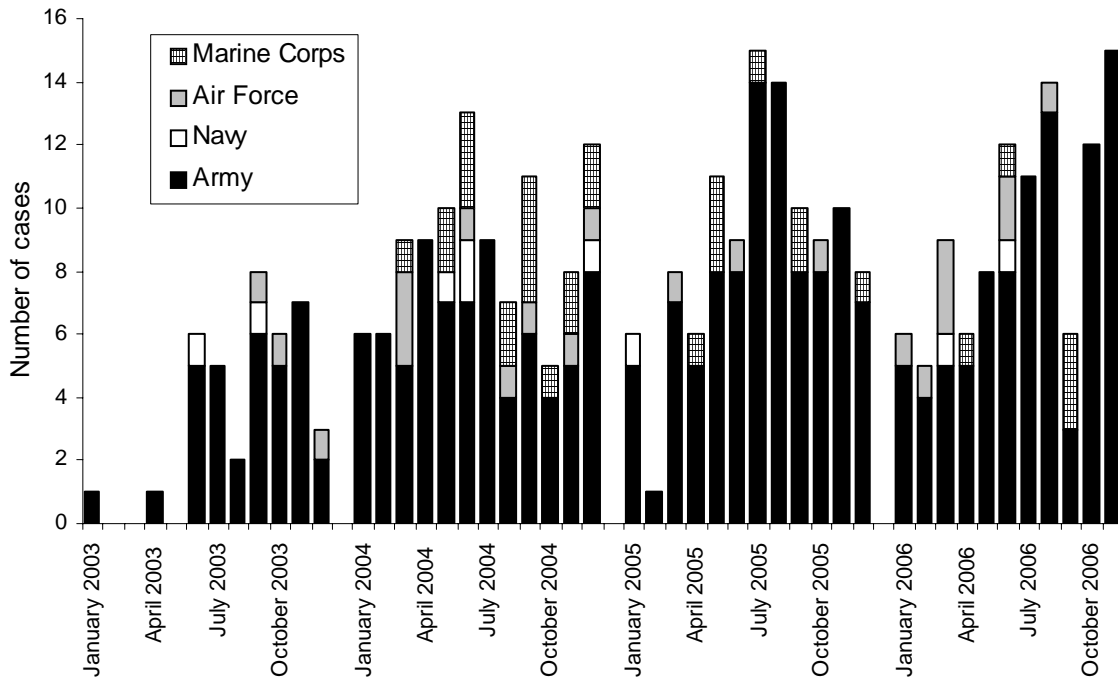
Footnotes:

¹ Indicator diagnosis (one per individual) during a hospitalization, ambulatory visit, and/or from a notifiable medical event during/after service in OEF/OIF.

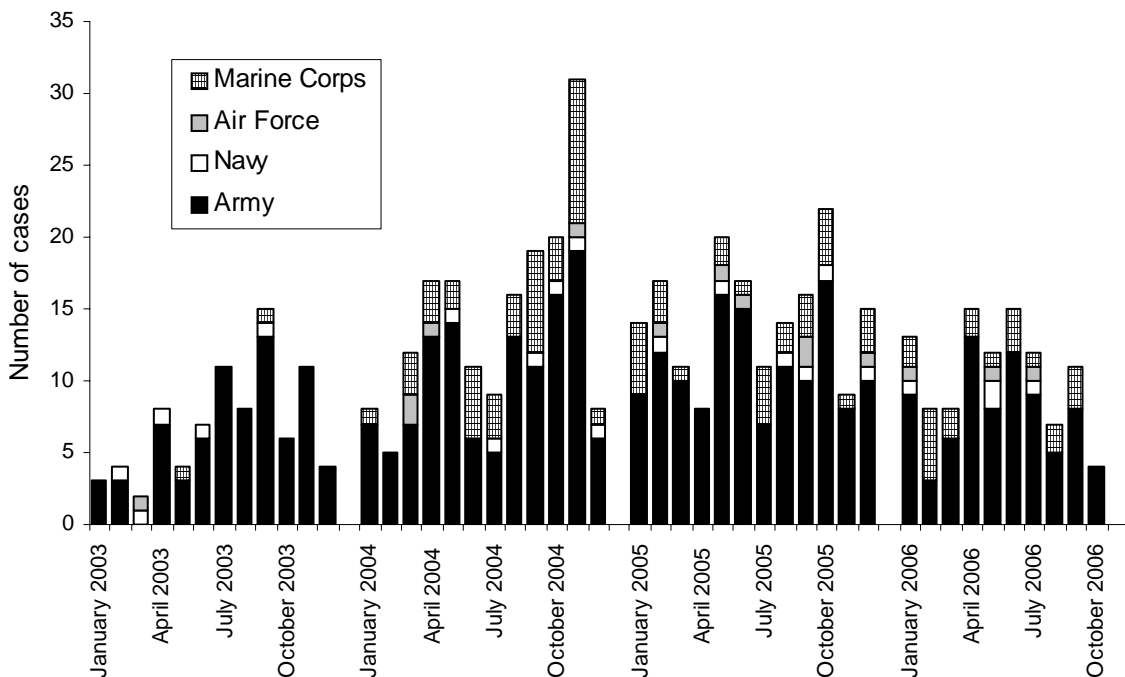
² Indicator diagnosis (one per individual) during a hospitalization while deployed to/within 30 days of returning from OEF/OIF.

Deployment related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003-November 2006

Deep vein phlebitis/thromboembophlebitis and/or pulmonary embolism/infarction (ICD-9-CM: 541.1, 451.81, 415.1)³



Amputations (ICD-9-CM: 84.0, 84.1, 887, 896, V49.6, V49.7)⁴



Footnotes:

³ Indicator diagnosis (one per individual) during a hospitalization or ambulatory visit while deployed to/within 30 days of returning from OEF/OIF.

⁴ Indicator diagnosis (one per individual) during a hospitalization of a servicemember during/after service in OEF/OIF.

**Sentinel reportable events for all beneficiaries¹ at U.S. Army medical facilities,
cumulative numbers² for calendar years through Nov 30, 2005 and 2006**

| Reporting location | Number of reports all events ³ | | Food-borne | | | | | | | | Vaccine Preventable | | | | | |
|------------------------|---|---------------|----------------|-----------|-----------|-----------|------------|------------|-----------|-----------|---------------------|-----------|-------------|-----------|-----------|-----------|
| | | | Campylo-bacter | | Giardia | | Salmonella | | Shigella | | Hepatitis A | | Hepatitis B | | Varicella | |
| | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 |
| NORTH ATLANTIC | | | | | | | | | | | | | | | | |
| Washington, DC Area | 388 | 257 | 4 | 5 | 9 | 4 | 5 | 3 | 6 | . | . | 3 | 1 | 2 | . | . |
| Aberdeen, MD | 73 | 11 | . | . | . | . | . | . | 1 | . | . | . | . | . | . | . |
| FT Belvoir, VA | 356 | 324 | 8 | 11 | . | 1 | 8 | 9 | 1 | 2 | . | . | 1 | . | . | 5 |
| FT Bragg, NC | 1,515 | 1,631 | 7 | 12 | . | . | 25 | 32 | 3 | . | . | . | . | . | . | . |
| FT Drum, NY | 230 | 210 | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| FT Eustis, VA | 280 | 229 | . | . | . | . | 1 | . | . | . | . | . | . | . | . | . |
| FT Knox, KY | 279 | 279 | 4 | . | . | 2 | 4 | . | . | 2 | . | . | . | . | . | . |
| FT Lee, VA | 198 | 345 | . | . | . | . | . | . | . | . | . | . | . | . | . | 6 |
| FT Meade, MD | 118 | 111 | . | . | . | . | 1 | 2 | . | . | . | . | 1 | 1 | . | . |
| West Point, NY | 48 | 55 | . | . | . | . | . | 1 | . | . | . | . | 3 | . | . | . |
| GREAT PLAINS | | | | | | | | | | | | | | | | |
| FT Sam Houston, TX | 487 | 314 | . | . | . | 1 | 5 | 1 | 2 | . | 5 | 2 | 10 | 4 | . | . |
| FT Bliss, TX | 377 | 510 | 1 | . | 5 | 2 | 3 | 12 | 6 | 2 | . | 3 | . | 2 | . | 1 |
| FT Carson, CO | 763 | 788 | 5 | 1 | 3 | 3 | 4 | 5 | . | . | 1 | 2 | . | . | . | . |
| FT Hood, TX | 2,364 | 1,604 | 7 | 6 | 1 | 3 | 13 | 12 | 4 | 13 | . | . | . | . | . | 1 |
| FT Huachuca, AZ | 73 | 92 | 1 | . | . | . | . | 11 | . | . | . | . | . | . | . | . |
| FT Leavenworth, KS | 55 | 54 | . | . | 1 | 4 | 1 | . | 1 | . | . | . | . | . | . | . |
| FT Leonard Wood, MO | 341 | 307 | 1 | . | 1 | 5 | 1 | 2 | . | . | . | . | . | . | 3 | 6 |
| FT Polk, LA | 245 | 225 | 1 | 2 | 1 | 1 | 5 | 1 | . | . | . | 2 | 1 | . | . | . |
| FT Riley, KS | 291 | 254 | . | 2 | 2 | . | 2 | . | . | . | . | . | . | . | . | . |
| FT Sill, OK | 154 | 222 | . | . | 1 | . | . | 1 | 1 | . | . | . | . | . | . | 2 |
| SOUTHEAST | | | | | | | | | | | | | | | | |
| FT Gordon, GA | 396 | 442 | . | . | . | . | . | . | . | . | . | . | 8 | 11 | 2 | 1 |
| FT Benning, GA | 325 | 449 | 2 | 3 | 1 | 1 | 9 | 12 | 2 | 2 | . | . | . | . | . | . |
| FT Campbell, KY | 820 | 686 | 3 | 1 | 1 | . | 9 | 1 | 4 | . | . | . | . | . | 1 | . |
| FT Jackson, SC | 215 | 265 | . | . | . | . | . | . | . | . | 2 | . | 1 | 1 | . | 1 |
| FT Rucker, AL | 31 | 81 | . | 1 | . | . | . | 5 | . | . | . | . | . | . | . | . |
| FT Stewart, GA | 544 | 951 | . | . | 2 | . | 16 | 8 | 27 | 18 | 8 | 4 | 32 | 11 | 1 | 3 |
| WESTERN | | | | | | | | | | | | | | | | |
| FT Lewis, WA | 521 | 563 | 4 | . | . | . | 1 | 5 | . | . | . | . | . | 1 | . | 1 |
| FT Irwin, CA | 71 | 106 | . | 1 | . | . | . | . | . | 1 | . | . | 1 | . | . | . |
| FT Wainwright, AK | 141 | 189 | 4 | . | . | . | 2 | 3 | . | . | . | . | . | . | 1 | 1 |
| OTHER LOCATIONS | | | | | | | | | | | | | | | | |
| Hawaii | 790 | 905 | 34 | 38 | 7 | 1 | 15 | 11 | 4 | 2 | 1 | 1 | 1 | . | 1 | 2 |
| Europe | 1,471 | 904 | 15 | 12 | 1 | 2 | 25 | 24 | 1 | . | 3 | 2 | 7 | 2 | 3 | 1 |
| Korea | 513 | 687 | . | . | . | . | . | . | . | . | 1 | . | 1 | 3 | . | 5 |
| Total | 14,473 | 14,050 | 101 | 95 | 36 | 30 | 155 | 161 | 63 | 42 | 21 | 16 | 66 | 40 | 15 | 36 |

¹ Includes active duty servicemembers, dependents, and retirees

² Events reported by Dec 7, 2005 and 2006.

³ Seventy events specified by Tri-Service Reportable Events, Version 1.0, July 2000

Note: Completeness and timeliness of reporting vary by facility

Source: Army Reportable Medical Events System

**Sentinel reportable events for all beneficiaries¹ at U.S. Army medical facilities,
cumulative numbers² for calendar years through Nov 30, 2005 and 2006**

| Reporting location | Arthropod-borne | | | | Sexually Transmitted | | | | | | | | Environmental | | | |
|------------------------|-----------------|-----------|-----------|-----------|----------------------|--------------|--------------|--------------|-----------------------|-----------|-------------------------|------------|---------------|-----------|------------|------------|
| | Lyme disease | | Malaria | | Chlamydia | | Gonorrhea | | Syphilis ⁴ | | Urethritis ⁵ | | Cold | | Heat | |
| | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 | 2005 | 2006 |
| NORTH ATLANTIC | | | | | | | | | | | | | | | | |
| Washington, DC Area | 1 | 3 | 3 | 3 | 164 | 147 | 24 | 24 | 8 | 3 | . | 1 | 1 | . | 2 | . |
| Aberdeen, MD | 4 | . | . | . | 31 | 8 | 3 | 1 | 2 | . | . | . | . | . | . | . |
| FT Belvoir, VA | 1 | 2 | . | . | 211 | 185 | 43 | 41 | . | . | . | . | . | . | . | . |
| FT Bragg, NC | . | 2 | . | 21 | 1,038 | 1,121 | 202 | 170 | 3 | 4 | 101 | 124 | 1 | 2 | 112 | 135 |
| FT Drum, NY | . | . | . | . | 166 | 187 | 15 | 22 | . | . | . | . | 2 | . | 1 | . |
| FT Eustis, VA | . | . | . | . | 158 | 153 | 34 | 48 | . | . | . | . | 2 | . | 39 | 19 |
| FT Knox, KY | 1 | 6 | 1 | 2 | 176 | 195 | 30 | 44 | . | 2 | . | . | 6 | 4 | 20 | 11 |
| FT Lee, VA | 1 | . | . | . | 158 | 266 | 33 | 43 | . | . | . | . | 1 | . | 5 | 3 |
| FT Meade, MD | . | . | . | . | 104 | 93 | 12 | 13 | . | . | . | 1 | . | . | . | . |
| West Point, NY | 7 | 16 | . | . | 28 | 25 | 2 | . | . | . | . | . | 1 | 1 | 3 | 2 |
| GREAT PLAINS | | | | | | | | | | | | | | | | |
| FT Sam Houston, TX | . | . | . | . | 298 | 229 | 88 | 62 | 7 | 6 | . | . | . | . | 11 | 1 |
| FT Bliss, TX | . | . | 1 | 1 | 167 | 291 | 41 | 54 | 6 | 5 | . | . | . | . | 14 | 9 |
| FT Carson, CO | . | . | 4 | . | 549 | 569 | 71 | 92 | . | . | 24 | 39 | 1 | 1 | . | . |
| FT Hood, TX | . | . | 1 | 1 | 1,454 | 1,081 | 467 | 249 | 1 | . | 196 | 40 | . | . | 140 | 32 |
| FT Huachuca, AZ | . | . | . | . | 54 | 71 | 15 | 9 | . | . | . | . | . | 1 | 2 | . |
| FT Leavenworth, KS | . | . | . | . | 43 | 44 | 6 | 6 | . | . | . | . | 1 | . | 2 | . |
| FT Leonard Wood, MO | . | . | 1 | . | 210 | 217 | 47 | 19 | 2 | . | 1 | . | 4 | . | 19 | 15 |
| FT Polk, LA | . | . | 1 | 2 | 145 | 122 | 36 | 35 | 1 | 2 | . | . | . | . | 48 | 58 |
| FT Riley, KS | . | 1 | . | . | 177 | 207 | 59 | 25 | . | . | . | . | 5 | . | 11 | 10 |
| FT Sill, OK | . | . | . | . | 56 | 71 | 31 | 25 | 2 | 2 | . | . | . | . | 31 | 58 |
| SOUTHEAST | | | | | | | | | | | | | | | | |
| FT Gordon, GA | . | . | 2 | . | 246 | 319 | 27 | 72 | 1 | . | . | 3 | . | . | 53 | 4 |
| FT Benning, GA | . | . | 2 | 1 | 165 | 266 | 53 | 78 | 1 | . | . | . | 1 | . | 86 | 76 |
| FT Campbell, KY | 2 | . | 1 | . | 560 | 504 | 95 | 67 | . | . | . | . | 1 | . | 68 | 33 |
| FT Jackson, SC | . | . | . | . | 170 | 219 | 27 | 39 | . | . | 1 | . | . | . | 6 | . |
| FT Rucker, AL | . | . | . | . | 21 | 58 | 9 | 5 | . | 1 | . | . | . | . | . | 10 |
| FT Stewart, GA | 3 | 3 | . | 4 | 248 | 599 | 100 | 161 | 4 | 2 | 15 | 18 | 1 | 1 | 40 | 95 |
| WESTERN | | | | | | | | | | | | | | | | |
| FT Lewis, WA | 1 | . | 5 | 9 | 350 | 442 | 57 | 68 | . | 1 | 79 | 25 | . | . | 2 | . |
| FT Irwin, CA | . | . | . | . | 49 | 76 | 15 | 13 | . | 3 | . | . | . | . | 4 | 10 |
| FT Wainwright, AK | . | . | 1 | 17 | 99 | 116 | 9 | 14 | 1 | . | . | . | 16 | 28 | . | . |
| OTHER LOCATIONS | | | | | | | | | | | | | | | | |
| Hawaii | . | . | 13 | 6 | 536 | 644 | 78 | 79 | . | . | . | . | . | . | 15 | 35 |
| Europe | 41 | 34 | 5 | 14 | 957 | 576 | 248 | 176 | 3 | 4 | 1 | 1 | 5 | 1 | 4 | 5 |
| Korea | . | . | 9 | 18 | 411 | 557 | 65 | 79 | 2 | 3 | . | . | 3 | 2 | 13 | 12 |
| Total | 62 | 67 | 50 | 99 | 9,199 | 9,658 | 2,042 | 1,833 | 44 | 38 | 418 | 252 | 52 | 41 | 751 | 633 |

⁴ Primary and secondary

⁵ Urethritis, non-gonococcal (NGU)

Note: Completeness and timeliness of reporting vary by facility

Source: Army Reportable Medical Events System

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The Medical Surveillance Monthly Report (MSMR) is prepared by the Army Medical Surveillance Activity, Directorate of Epidemiology and Disease Surveillance, US Army Center for Health Promotion and Preventive Medicine (USACHPPM).

Data in the MSMR are provisional, based on reports and other sources of data available to AMSA.

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