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Post-Deployment Health Reassessment (PDHRA) Program, U.S. Armed Forces: Responses by Service and Component, September 2005-August 2006

The force health protection strategy of the U.S. Armed Forces is designed to deploy medically ready forces, minimize illnesses and injuries during deployments, and provide care for medical conditions following deployments. In March 2005, the Department of Defense launched the Post-Deployment Health Reassessment (PDHRA) program to identify and respond to servicemember health concerns that persist for three to six months following deployment, with a specific emphasis on mental health.¹ The PDHRA is an extension of the deployment health assessment process, which screens servicemembers before deploying and immediately after they return from theater.² Specifically, the PDHRA is intended to address health and readjustment concerns that may not become apparent until a servicemember has returned home to family, work, and daily life.

The PDHRA program mandates that all servicemembers who have returned from operational deployments complete an electronic or web-enabled version of the Post-Deployment Health Reassessment (DD Form 2900) (appendix), ideally within three to four months (but up to 180 days) of their return. After completing the form, the servicemember visits a healthcare provider who reviews information on the form, conducts a brief behavioral risk assessment, and refers the servicemember to healthcare or community-based services for further evaluation or treatment as indicated. Data from each PDHRA is routinely sent to the Army Medical Surveillance Activity (AMSA) for inclusion in the Defense Medical Surveillance System (DMSS). This report summarizes PDHRA data received by AMSA during a recent one-year period.

Methods: The DMSS was searched to identify all PDHRA forms that were completed between 1 September 2005 and 31 August 2006 by members of the active and reserve components of the Army, Navy, Air Force and Marine Corps. If a servicemember had more than one PDHRA on record, only the most recent was used for analysis.

Because the Air Force exempts its members from a provider visit if they report no health problems

or concerns, only 42% of Air Force members who filed a PDHRA completed an interview with a healthcare provider. For comparison purposes, the denominator in the summary of provider assessments for the Air Force includes all Air Force members who completed PDHRAs.

Finally, while all servicemembers were engaged in active service while deployed, for this summary, “active” and “reserve” refer to individuals who were members of the active components or the Reserves/National Guard of their respective services.

Results: During the 12-month surveillance period, electronic PDHRA forms were completed by 118,715 U.S. military members. Relatively few forms were completed from September 2005 through February 2006; however, the numbers of forms sharply increased between March and May of 2006 and were relatively stable thereafter (Figure 1).

More than three-quarters (77%) of all forms were completed by members of the active components of the services, and more than 90% were completed by members of the Army (66%) or Air Force (28%). Most respondents were men (89.5%), between the ages of 20 and 39 (87.6%), white nonhispanic (67.7%), and enlisted (87.7%) (Table 1). Nearly one-third (30.2%) of respondents were in combat-specific military occupations. The median length of deployments overall was 244 days.

Across the services, the Marine Corps and Air Force had the highest relative numbers of males (98.6%) and females (16.3%), respectively. Of note, nearly two-thirds (65.2%) of Marines were 20-24 years old, more than 60% were in combat-specific occupations, and only 5.5% were officers — all sharply different from the other services. Nearly one-fifth (19.4%) of all Navy respondents were in medical military occupations. Finally, compared to active component respondents, Reservists were more likely to be older than 40, male, white nonhispanic, and in combat-specific military occupations (Table 1).

In general, the health problems/concerns that were queried on the PDHRA were much more frequently endorsed by members of the Army and Marine Corps than the other services and by members

of the reserve compared to the active component (Figures 2,3). In the following sections, health problems and concerns and assessments of health care providers are summarized in each service and by component.

Army

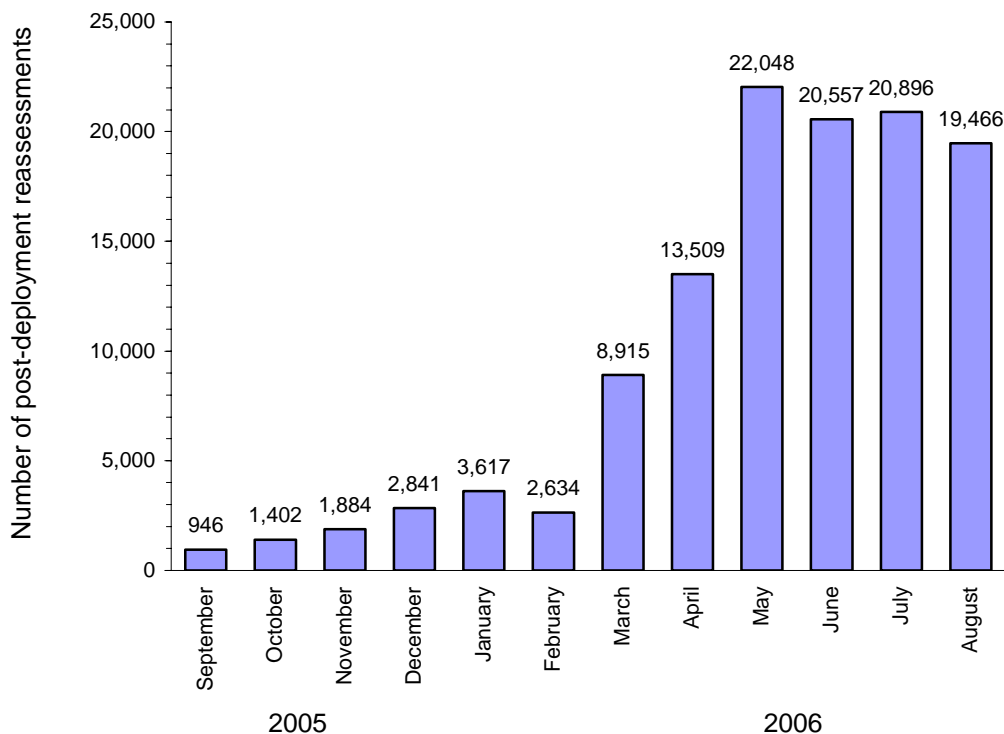
Health problems/concerns: Of the 78,133 soldiers who completed PDHRA forms, 70% were in the active component. Reserve compared to active component soldiers were approximately 40% more likely to rate their overall health as “fair” or “poor” (reserve: 21.5%; active: 15.5%) and approximately 50% more likely to report “somewhat worse” or “much worse” health after deployment compared to before (reserve: 39.9%; active: 26.7%). Relatively more reserve than active component soldiers endorsed each of the health problems/concerns included on the PDHRA (Table 2).

Four health-related questions were among the five most frequently endorsed by both reserve and active component soldiers: concerns other than wound or injury (reserve: 60.6%; active: 36.8%;

reserve:active ratio: 1.65); health somewhat worse or much worse after deploying (reserve: 39.9%; active 26.7%; reserve:active ratio: 1.49); concerns about exposures to harmful agents (reserve: 44.4%; active 21.2%; reserve:active ratio: 2.09) and wounded or injured (reserve: 34.2%; active 19.4%; reserve:active ratio 1.76). Approximately one-fifth of active component soldiers reported more than three health care visits since redeployment; and nearly one-third (31.8%) of reserve component soldiers requested a visit with a health care provider to discuss health concerns (Table 2).

The largest relative differences in responses of reserve and active component soldiers were related to requests for a visit with a healthcare provider (reserve:active ratio: 2.12) and exposure concerns (reserve:active ratio: 2.09). The smallest relative differences between reserve and active component soldiers were related to being hospitalized (reserve: 7.1%; active: 6.4%; reserve:active ratio: 1.12) and having seen a healthcare provider more than three times (reserve: 24.0%; active: 21.6%;reserve:active ratio: 1.11) since returning from deployment (Table 2).

Figure 1. Post-deployment health reassessments (DD 2900), by month, U.S. Armed Forces, September 2005-August 2006.



The PDHRA includes four traumatic stress screening questions: nearly one-quarter (23.9%) of all reserve and one-sixth (16.0%) of all active component respondents screened “positive” — defined as endorsement of 2 or more screening questions — for possible post-traumatic stress (indicating that an evaluation by a mental health professional may have been warranted).³ In addition, 11.9% of active and 14.8% of reserve component soldiers reported using more alcohol than they had meant to and/or feeling the need to cut down on alcohol consumption since returning from deployment. Also, more than one-tenth (10.3%) of active and one-eighth (13.0%) of reserve component soldiers reported signs of depression “more than half the days” since returning from deployment. Finally, 20.8% and 13.4% of reserve and active respondents, respectively, were concerned about a “serious conflict” with a spouse, family member, or at work that had occurred since returning.

Relatively few active (3.4%) and reserve (5.5%) component respondents indicated that problems/concerns reported on the PDHRA made it “very difficult” or “extremely difficult” to work, take care of things at home, or get along with others. Still, nearly one of five (19.8%) reserve and more than one of twelve (12.1%) active component soldiers expressed interest in receiving information or assistance for emotional or alcohol problems — and even more (reserve: 30.9%; active: 14.1%) requested a visit with a provider to discuss their health concerns.

Health care provider assessments and referrals: Health care providers referred more than half (54.6%) of all reserve and more than one-quarter (26.2%) of all active component respondents for further evaluations (Table 3). Of note, Reservists (12.7%) were more than three times as likely as active (4.1%) component soldiers to receive behavioral health referrals in primary care settings, while active (4.6%) component respondents were approximately 60% more likely than Reservists (2.9%) to be referred for mental health specialty care.

Finally, the “major concerns” most frequently identified by providers during their evaluations were physical symptoms (reserve: 25.9%; active: 8.4%); post-traumatic stress disorder symptoms (reserve: 7.6%; active: 2.9%); symptoms of depression (reserve: 4.1%; active: 2.5%); and social or family conflict (reserve: 5.0%; active: 2.2%). Providers considered anger/aggression a major concern in relatively few

reserve (3.5%) and active (1.8%) component soldiers; and based on brief behavioral assessments, they considered relatively few reserve (0.2%) and active (0.4%) component soldiers to pose risks to themselves or others (Table 3).

Marine Corps

Health problems/concerns: Of the 6,348 Marines who completed PDHRA forms, 75% were in the active component. Compared to their active component counterparts, Reserves were approximately 20% more likely to rate their overall health as “fair” or “poor” (reserve: 11.0%; active: 9.3%) and to report “somewhat worse” or “much worse” health after deployment compared to before (reserve: 23.9%; active: 19.5%). A higher proportion of reserve than active component Marines reported each of the health-related problems/concerns included on the PDHRA except for symptoms of depression and that their health concerns made life very or extremely difficult (Table 2).

The five most frequently endorsed health-related questions were the same among reserve and active component Marines: concerns other than wound or injury (reserve: 39.9%; active: 24.4%; reserve:active ratio: 1.64); health somewhat worse or much worse after deploying (reserve: 23.9%; active: 19.5%; reserve:active ratio: 1.22); positive screen for post-traumatic stress (reserve: 21.7%; active: 12.9%; reserve:active ratio: 1.68); wounded or injured (reserve: 28.8%; active: 14.9%; reserve:active ratio: 1.94); and exposure concerns (reserve: 23.9%; active: 13.7%; reserve:active ratio: 1.74) (Table 2).

The largest relative differences in responses of reserve and active component Marines were related to having been wounded or injured (reserve:active ratio: 1.93), requests for referral to a health care provider (reserve:active ratio: 1.87), and interest in receiving social information or assistance for social or emotional problems (reserve:active ratio: 1.85). Of note, active component Marines were more likely than Reserves to report symptoms of depression (reserve:active ratio: 0.79) and to endorse the statement that health problems make life very or extremely difficult (reserve:active ratio: 0.96) (Table 2).

More than one-eighth (12.9%) of reserve and one-fifth (21.7%) of active component Marines screened positive for symptoms of post-traumatic stress. Of note, compared to members of the other

services, Marines were the most likely to report potential alcohol problems — 17.9% of reserve and 12.3% of active component Marines reported using more alcohol than they had meant to and/or feeling the need to cut down on alcohol consumption since returning from deployment. Approximately one-tenth of both active (11.4%) and reserve (9.0%) component Marines reported symptoms of depression “more than half the days” since returning from deployment; and 14.5% and 9.4% of reserve and active component respondents, respectively, were concerned about a “serious conflict” with a spouse, family member, or at work (Table 2).

Health care provider assessments and referrals: Forty-four percent and 14.7% of reserve and active component Marines, respectively, were referred for further evaluation and follow-up (Table 3). Of note, Reservists (8.7%) were approximately 20 times more likely than their active (0.4%) component counterparts to receive behavioral health referrals in primary care settings; however, active (2.1%) component Marines were more than twice as likely as Reserves (0.8%) to be referred for mental health specialty care.

The “major concerns” most frequently identified by health care providers were physical (reserve: 14.7%; active: 1.9%) and post-traumatic stress (reserve: 5.7%; active: 1.3%) symptoms. Providers considered “anger/aggression” a major concern in few active (0.6%) and reserve (2.0%) component Marines; and based on brief behavioral assessments, they considered few active (0.2%) or reserve (0.2%) component Marines to pose risks to themselves or others (Table 3).

Air Force

Health problems/concerns: Of the 32,349 Air Force members who completed PDHRA forms, 94% were in the active component. In contrast to the other services, in the Air Force, active component members were more likely than Reserves to endorse each of the health problems/concerns on the PDHRA except concerns about exposures to harmful agents. Specifically, active component members were much more likely than Reserves to rate their overall health as “fair” or “poor” (active: 5.3%; reserve: 2.8%), to report “somewhat” or “much worse” health after deployment compared to before (active: 10.8%; reserve: 6.5%), and to request a referral to a health care provider (active: 3.7%; reserve: 2.2%). In

addition, active component members were more likely than Reserves to have three or more medical visits and to be hospitalized since returning from deployment (Table 2).

The five most frequently endorsed health-related questions were the same among reserve and active component members: concerns other than wound or injury (reserve: 11.4%; active: 17.0%; reserve:active ratio: 0.67); health somewhat worse or much worse after deploying (reserve: 6.5%; active 10.8%; reserve:active ratio: 0.60); more than three healthcare visits since returning (reserve: 11.4%; active 16.4%; reserve:active ratio: 0.69); exposure concerns (reserve: 14.2%; active 12.2%; reserve:active ratio: 1.16); and wounded or injured (reserve: 7.2%; active 10.1%; reserve:active ratio: 0.72) (Table 2).

The largest relative differences in responses of active and reserve component Air Force members were related to symptoms of depression (active:reserve ratio: 2.06), overall health fair or poor (active:reserve ratio: 1.92), and conflicts with family members or at work (active:reserve ratio: 1.86) (Table 2).

Relatively few Air Force members screened positive for post-traumatic stress symptoms (active: 3.0%; reserve: 1.9%), and fewer than 2% of active and reserve respondents reported symptoms of alcohol problems since returning from deployment. Conflicts at home or work (active: 4.6%; reserve: 2.4%) and symptoms of depression (active: 3.1%; reserve: 1.5%) were also reported relatively infrequently (Table 2).

Provider assessment and referral: In contrast to health problems and concerns, more reserve (17.3%) than active (9.0%) component members were referred for medical evaluations/follow-ups (Table 3). There were relatively few behavioral or mental health referrals among Air Force members in general. Finally, concerns were relatively infrequently recorded by health care providers. For example, the most frequently reported “major concern” was physical symptoms which affected fewer than 5% of all Air Force respondents. Also, providers reported very few major concerns regarding alcohol/substance abuse, anger/aggression, or risk to self or others (Table 3).

Navy

Health problems/concerns: Of the 1,885 sailors who completed PDHRA forms, most (94%) were in the active component. A higher proportion of reserve than

active component members endorsed each of the health problems/concerns on the PDHRA except “fair” or “poor” overall health. Reserves were much more likely than active component members to report “somewhat” or “much worse” health after deployment compared to before (reserve: 23.4%; active: 10.7%), to request a referral to a health care provider (reserve: 15.9%; active: 6.9%), to have three or more healthcare visits since returning from deployment (reserve: 19.6%; active: 10.2%), and to be hospitalized since returning (reserve: 5.6%; active: 3.3%) (Table 2).

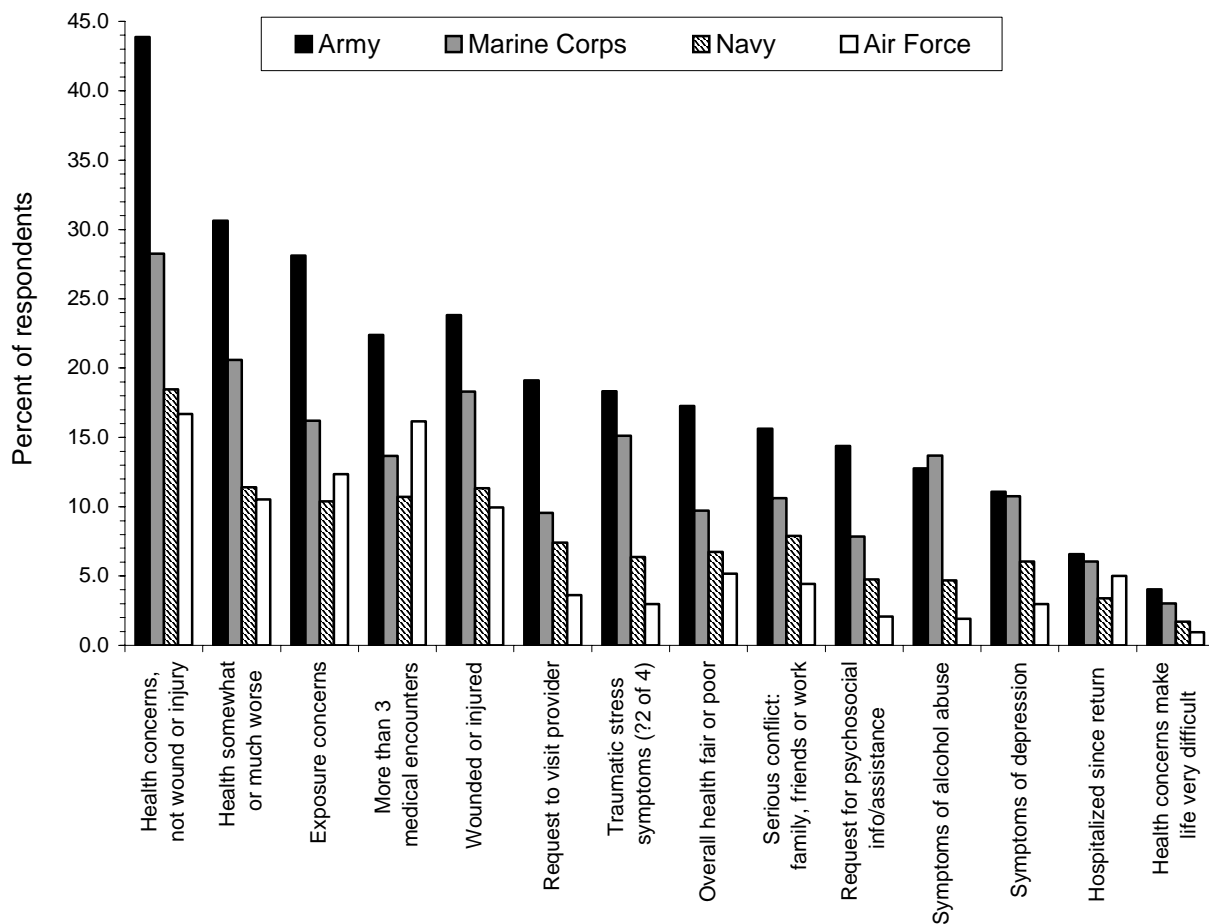
The five most frequently endorsed health-related questions were the same among reserve and active component sailors: concerns other than wound or injury (reserve: 41.1%; active: 17.1%; reserve:active ratio: 2.41); health somewhat worse or much worse after deploying (reserve: 23.4%; active 10.7%; reserve:active ratio: 2.19); wounded or injured (reserve: 24.3%; active 10.6%; reserve:active ratio:

2.30); more than three medical encounters since returning (reserve: 19.6%; active 10.2%; reserve:active ratio: 1.93); and exposure concerns (reserve: 29.9%; active: 9.2%; reserve:active ratio: 3.24) (Table 2).

The largest relative differences in responses of reserve and active component sailors were related to interest in receiving social information or assistance (reserve:active ratio: 5.11) and exposure concerns (reserve:active ratio: 3.24) (Table 2).

Finally, Reserves (13.1%) were approximately twice as likely as active (6.0%) component sailors to screen positive for post-traumatic stress symptoms. Of note, 15.9% of reserve and 7.4% of active component sailors reported concern about serious conflict at home, with a spouse, or at work since returning from deployment. Symptoms of depression and alcohol problems were relatively frequently reported among both reserve (depression: 9.3%;

Figure 2. Responses to selected questions form post-deployment health reassessments (DD 2900), by service, U.S. Armed Forces, September 2005-August 2006.



alcohol: 5.6%) and active (depression: 5.8%; alcohol: 4.6%) component sailors; and referrals for health care were requested by 15.9% and 6.9% of reserve and active component sailors, respectively (Table 2).

Provider assessment and referral: Approximately one-third (35.5%) of all reserve and one-sixth (16.9%) of all active component sailors were referred for medical evaluations/follow-ups. Of note, however, there were relatively few behavioral health referrals. Health care providers reported remarkably few “major concerns” among redeployed sailors in general; in particular, there were few reported concerns regarding

alcohol/substance abuse, anger/aggression, or risk to self or others (Table 3).

Editorial comment: This report documents that deployment veterans of the Army and Marine Corps are much more likely than those of the Air Force and Navy to endorse the health problems/concerns queried on the PDHRA. However, the report does not account for differences across the services in the demographic characteristics or military occupations of the respondents or the physical and psychological stresses of their activities while deployed. If the effects of such factors were accounted for, it is likely that the

Table 2. Responses to selected questions from post-deployment health reassessment forms (DD 2900) by service and component, U.S. Armed Forces, September 2005-August 2006

	Question No.	Army	Navy	Air Force	Marine Corps	Total
Active component						
Servicemembers with DD 2900						
Overall health fair or poor	1	15.5%	6.8%	5.3%	9.3%	11.6%
Health somewhat worse or much worse	2	26.7%	10.7%	10.8%	19.5%	20.7%
More than 3 medical encounters since return	3	21.7%	10.2%	16.4%	12.0%	19.2%
Hospitalized since return	4	6.4%	3.3%	5.1%	5.3%	5.8%
Wounded or injured during deployment	5	19.4%	10.6%	10.1%	14.9%	15.9%
Health concerns, not wound or injury	6	36.8%	17.1%	17.0%	24.4%	29.2%
Exposure concerns (persistent and major)	7	21.2%	9.2%	12.2%	13.7%	17.6%
Serious conflict: family, friends or work	8	13.4%	7.4%	4.6%	9.4%	10.2%
Traumatic stress symptoms (2 or more)	9	16.0%	6.0%	3.0%	12.9%	11.3%
Symptoms of alcohol abuse	10	11.9%	4.6%	1.9%	12.3%	8.5%
Symptoms of depression	11	10.3%	5.8%	3.1%	11.4%	7.9%
Health concerns/probs make life very difficult	12	3.4%	1.6%	1.0%	3.1%	2.5%
Request to discuss health with provider	13	14.1%	6.9%	3.7%	7.7%	10.2%
Request for psychosocial info or assistance	14-16	12.1%	3.9%	2.1%	6.6%	8.3%
Reserve component						
Servicemembers with DD 2900						
Overall health fair or poor	1	21.5%	5.6%	2.8%	11.0%	19.5%
Health somewhat worse or much worse	2	39.9%	23.4%	6.5%	23.9%	36.5%
More than 3 medical encounters since return	3	24.0%	19.6%	11.4%	18.8%	22.8%
Hospitalized since return	4	7.1%	5.6%	4.0%	8.4%	7.0%
Wounded or injured during deployment	5	34.2%	24.3%	7.2%	28.8%	31.9%
Health concerns, not wound or injury	6	60.6%	41.1%	11.4%	39.9%	55.9%
Exposure concerns (persistent and major)	7	44.4%	29.9%	14.2%	23.9%	41.0%
Serious conflict: family, friends or work	8	20.8%	15.9%	2.4%	14.5%	19.1%
Traumatic stress symptoms (2 or more)	9	23.9%	13.1%	1.9%	21.7%	22.2%
Symptoms of alcohol abuse	10	14.8%	5.6%	1.8%	17.9%	14.1%
Symptoms of depression	11	13.0%	9.3%	1.5%	9.0%	11.9%
Health concerns/probs make life very difficult	12	5.5%	3.7%	0.6%	2.9%	5.0%
Request to discuss health with provider	13	30.9%	15.9%	2.2%	15.3%	27.9%
Request for psychosocial info or assistance	14-16	19.8%	18.7%	1.5%	11.7%	18.0%

differences across the services would be significantly reduced.

Less easy to explain are the much higher prevalences of virtually all health care problems/concerns queried on the PDHRA among reserve compared to active component respondents. There are several likely contributory factors to the finding. First, as a group, Reservists are older than their active component counterparts. For example, in the Army, only 7.0% of active but nearly one-fourth (24.0%) of reserve respondents were at least 40 years old; and in the Air Force and Navy, fewer than one of nine

active but nearly half of all reserve respondents were at least 40 years old. In the U.S. military in general, servicemembers older than 40 tend to have more health problems — as manifested by hospitalization rates, for example — than their younger counterparts³. Second, in the past, medical conditions potentially related to war-time experiences were often not identified until years after the relevant war experiences.⁴ Currently, reserve component members have full access to health care in the Military Health System for 90 days after they return from deployments to southwest Asia/Middle East.⁵ Clearly, there is an

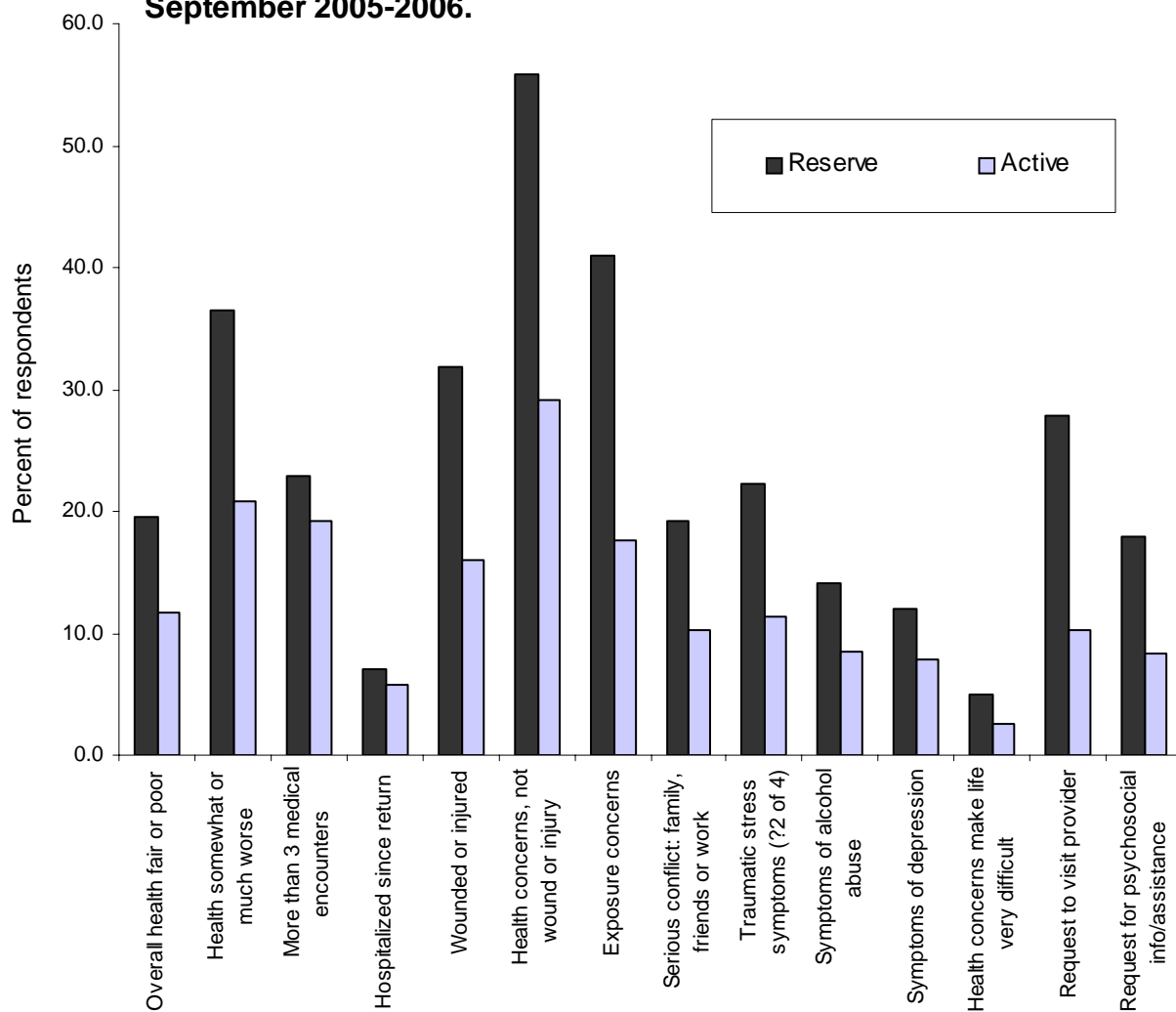
Table 3. Provider responses on post-deployment health reassessment forms (DD 2900) by service and component, U.S. Armed Forces, September 2005-August 2006

	Army		Navy		Air Force		Marine Corps		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Active component										
Servicemembers with DD 2900	54,867		1,778		30,466		4,780		91,891	
Referral indicated	14,399	26.2	301	16.9	2,754	9.0	704	14.7	18,158	19.8
Behavioral health primary referral	2,276	4.2	5	0.3	222	0.7	20	0.4	2,523	2.8
Mental health specialty referral	2,495	4.5	26	1.5	458	1.5	101	2.1	3,080	3.4
Substance abuse referral	145	0.3	7	0.4	15	0.1	25	0.5	192	0.2
Poses harm to self or others	229	0.4	0	0.0	9	0.0	7	0.2	245	0.3
Provider concerns										
Physical symptom	4,595	8.4	32	1.8	522	1.7	89	1.9	5,238	5.7
Exposure	336	0.6	4	0.2	128	0.4	9	0.2	477	0.5
Depression symptoms	1,389	2.5	15	0.8	177	0.6	48	1.0	1,629	1.8
PTSD symptoms	1,580	2.9	13	0.7	101	0.3	61	1.3	1,755	1.9
Anger/aggression	999	1.8	10	0.6	35	0.1	30	0.6	1,074	1.2
Suicide ideation	94	0.2	0	0.0	6	0.0	6	0.1	106	0.1
Social/family conflict	1,207	2.2	14	0.8	113	0.4	29	0.6	1,363	1.5
Alcohol use	431	0.8	6	0.3	21	0.1	31	0.6	489	0.5
Reserve component										
Servicemembers with DD 2900	23,266		107		1,883		1,568		26,824	
Referral indicated	12,704	54.6	38	35.5	325	17.3	690	44.0	13,757	51.3
Behavioral health primary referral	2,960	12.7	8	7.5	18	1.0	136	8.7	3,122	11.6
Mental health specialty referral	683	2.9	0	0.0	1	0.1	13	0.8	697	2.6
Substance abuse referral	156	0.7	0	0.0	0	0.0	6	0.4	162	0.6
Poses harm to self or others	51	0.2	0	0.0	0	0.0	3	0.2	54	0.2
Provider concerns										
Physical symptom	6,019	25.9	13	12.1	49	2.6	230	14.7	6,311	23.5
Exposure	684	2.9	1	0.9	14	0.7	12	0.8	711	2.7
Depression symptoms	955	4.1	1	0.9	9	0.5	40	2.6	1,005	3.7
PTSD symptoms	1,779	7.6	7	6.5	11	0.6	89	5.7	1,886	7.0
Anger/aggression	810	3.5	0	0.0	4	0.2	31	2.0	845	3.2
Suicide ideation	66	0.3	0	0.0	3	0.2	3	0.2	72	0.3
Social/family conflict	1,173	5.0	2	1.9	10	0.5	30	1.9	1,215	4.5
Alcohol use	238	1.0	0	0.0	4	0.2	13	0.8	255	1.0

institutional intent as well as strong personal incentives for Reservists to have all of their deployment-related health problems/concerns evaluated — and documented — during the limited time after deployment when they have access to military health care. Third, because active component members are in military service full-time, the personal and professional lives of Reservists tend to be disrupted more than those of active members by long overseas deployments to combat environments. The stresses associated with such disruptions may make Reservists more concerned about deployment-related exposures

and experiences with potentially harmful long-term health effects. In this regard, it is interesting that the most significant differences in the responses of reserve and active component members were related to requests for referrals to health care providers and concerns about exposures with potentially long-term harmful health effects. In contrast, the smallest differences in responses of reserve and active component members were related to objective measures of current health — hospitalizations and multiple (3 or more) medical encounters since redeploying.

Figure 3. Responses to selected questions from post-deployment reassessments (DD 2900), by component, U.S. Armed Forces, September 2005-2006.



Analysis by Stephen Taubman, PhD, Analysis Group, Army Medical Surveillance Activity.

References

1. Assistant Secretary of Defense (Health Affairs). Memorandum for the Assistant Secretaries of the Army (M&RA), Navy (M&RA), and Air Force (M&RA), subject: Post-deployment health reassessment (HA policy: 05-011), dated 10 March 2005. Washington, DC. Accessed on 18 October 2006 at: < <http://www.ha.osd.mil/policies/2005/05-011.pdf> >.
2. Undersecretary of Defense for Personnel and Readiness. Department of Defense Instruction (DODI) Number 6490.3. Subject: Deployment health, dated 11 August 2006. Accessed on 18 October 2006 at: < http://www.dtic.mil/whs/directives/corres/pdf/649003_081106/649003p.pdf >.
3. Hoge CW, Auchterlonie, JL, Milliken CS. Mental Health Problems, Use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. *JAMA*. 2006 Mar; (295): 1023-1032.
4. Engel CC, Jaffer A, Adkins J, Riddle JR, Gibson R. Can we prevent a second 'Gulf War syndrome'? Population-based healthcare for chronic idiopathic pain and fatigue after war. *Adv Psychosom Med*. 2004;25:102-22.
5. Office of the Assistant Secretary of Defense (Health Affairs) and the TRICARE Management Activity. Fact sheet. Transitional assistance management program: a transitional health care benefit for servicemembers and their families. Updated: January 6, 2005. Accessed on 18 October 2006 at: < <http://www.tricare.osd.mil/factsheets/viewfactsheet.cfm?id=317> >.

Appendix: Post-Deployment Health Reassessment (PDHRA). Form DD 2900, June 2005, pages 2 and 3.

1. Overall, how would you rate your health during the PAST MONTH?
 Excellent Very Good Good Fair Poor
2. Compared to before your most recent deployment, how would you rate your health in general now?
 Much better now than before I deployed
 Somewhat better now than before I deployed
 About the same as before I deployed
 Somewhat worse now than before I deployed
 Much worse now than before I deployed
3. Since you returned from deployment, about how many times have you seen a healthcare provider for any reason, such as in sick call, emergency room, primary care, family doctor, or mental health provider?
 No visits 1 visit 2-3 visits 4-5 visits Over 6 visits
4. Since you returned from deployment, have you been hospitalized? Yes No
5. During your deployment, were you wounded, injured, assaulted or otherwise physically hurt? Yes No
If NO, skip to Question 6.
- 5a. **IF YES**, are you still having problems related to this wound, assault, or injury? Yes No Unsure
6. Other than wounds or injuries, do you currently have a health concern or condition that you feel is related to your deployment? Yes No Unsure
IF NO, skip to Question 7.
- 6a. **IF YES**, please mark the item(s) that best describe your deployment-related condition or concern:
- | | |
|---|---|
| <input type="radio"/> Chronic cough | <input type="radio"/> Redness of eyes with tearing |
| <input type="radio"/> Runny nose | <input type="radio"/> Dimming of vision, like the lights were going out |
| <input type="radio"/> Fever | <input type="radio"/> Chest pain or pressure |
| <input type="radio"/> Weakness | <input type="radio"/> Dizziness, fainting, light headedness |
| <input type="radio"/> Headaches | <input type="radio"/> Difficulty breathing |
| <input type="radio"/> Swollen, stiff or painful joints | <input type="radio"/> Diarrhea, vomiting, or frequent indigestion |
| <input type="radio"/> Back pain | <input type="radio"/> Problems sleeping or still feeling tired after sleeping |
| <input type="radio"/> Muscle aches | <input type="radio"/> Difficulty remembering |
| <input type="radio"/> Numbness or tingling in hands or feet | <input type="radio"/> Increased irritability |
| <input type="radio"/> Skin diseases or rashes | <input type="radio"/> Taking more risks such as driving faster |
| <input type="radio"/> Ringing of the ears | <input type="radio"/> Other: _____ |
7. Do you have any persistent major concerns regarding the health effects of something you believe you may have been exposed to or encountered while deployed? Yes No
IF NO, skip to Question 8.
- 7a. **IF YES**, please mark the item(s) that best describe your concern:
- | | |
|--|--|
| <input type="radio"/> DEET insect repellent applied to skin | <input type="radio"/> Paints |
| <input type="radio"/> Pesticide-treated uniforms | <input type="radio"/> Radiation |
| <input type="radio"/> Environmental pesticides (like area fogging) | <input type="radio"/> Radar/microwaves |
| <input type="radio"/> Flea or tick collars | <input type="radio"/> Lasers |
| <input type="radio"/> Pesticide strips | <input type="radio"/> Loud noises |
| <input type="radio"/> Smoke from oil fire | <input type="radio"/> Excessive vibration |
| <input type="radio"/> Smoke from burning trash or feces | <input type="radio"/> Industrial pollution |
| <input type="radio"/> Vehicle or truck exhaust fumes | <input type="radio"/> Sand/dust |
| <input type="radio"/> Tent heater smoke | <input type="radio"/> Blast or motor vehicle accident |
| <input type="radio"/> JP8 or other fuels | <input type="radio"/> Depleted Uranium (if yes, explain) |
| <input type="radio"/> Fog oils (smoke screen) | <input type="radio"/> Other: _____ |
| <input type="radio"/> Solvents | |



Appendix (con't): Post-Deployment Health Reassessment (PDHRA). Form DD 2900, June 2005, pages 2 and 3.

8. Since return from your deployment, have you had serious conflicts with your spouse, family members, close friends, or at work that continue to cause you worry or concern? Yes No Unsure
9. Have you had any experience that was so frightening, horrible, or upsetting that, IN THE PAST MONTH, you
- a. Have had any nightmares about it or thought about it when you did not want to Yes No
- b. Tried hard not to think about it or went out of your way to avoid situations that remind you of it Yes No
- c. Were constantly on guard, watchful, or easily startled Yes No
- d. Felt numb or detached from others, activities, or your surroundings Yes No
10. a. In the PAST MONTH, did you use alcohol more than you meant to? Yes No
- b. In the PAST MONTH, have you felt that you wanted to or needed to cut down on your drinking? Yes No
11. Over the PAST MONTH, have you been bothered by the following problems?
- | | Not
at all | Few or
several
days | More than
half the
days | Nearly
every
day |
|--|-----------------------|---------------------------|-------------------------------|------------------------|
| a. Little interest or pleasure in doing things | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Feeling down, depressed, or hopeless | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
12. If you checked off any problems or concerns on this questionnaire, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?
- Not difficult at all Somewhat difficult Very difficult Extremely difficult
13. Would you like to schedule a visit with a healthcare provider to further discuss your health concern(s)? Yes No
14. Are you currently interested in receiving information or assistance for a stress, emotional or alcohol concern? Yes No
15. Are you currently interested in receiving assistance for a family or relationship concern? Yes No
16. Would you like to schedule a visit with a chaplain or a community support counselor? Yes No

Cold Weather Injuries, US Armed Forces, July 2001-June 2006

U.S. military operations are conducted in diverse weather and geographic conditions. Prolonged and/or intense exposures to cold can significantly impact the health, well-being and operational effectiveness of service members and their units. The U.S. military has developed extensive countermeasures against threats associated with training and operating in cold environments¹ and rates of hospitalization due to cold weather injuries among military personnel have generally declined during the past 20 years.² However, cold injuries still affect hundred servicemembers each year. This report summarizes frequencies, rates, and correlates of risk of cold injuries among active component members of the U.S. Armed Forces during the past five years.

Methods: The surveillance period was defined as 1 July 2001 to 30 June 2006. The surveillance cohort included all individuals who served in an active component of the U.S. Armed Forces any time during the surveillance period. For summary purposes, years were divided into 1 July through 30 June intervals to include complete “cold weather seasons” in each yearly interval.

Inpatient, outpatient and reportable medical event records in the Defense Medical Surveillance System (DMSS) were searched to identify all primary (first listed) diagnoses of “frostbite” (ICD-9-CM codes: 991.0-991.3), “immersion foot” (ICD-9-CM code: 991.4), “hypothermia”(ICD-9-CM code: 991.6), and “unspecified effect of reduced temperature” (ICD-9-CM code: 991.9) during the surveillance period.

To exclude follow-up medical encounters, only one of each type of cold injury per individual per year was included. Case counts, rates, and trends were summarized by location, by service and in relation to general military and demographic characteristics.

Results: During the 2005 cold weather season, at least 290 members of the U.S. Armed Forces had at least one medical encounter with a primary diagnosis of cold injury (Tables 1,2). Compared to the prior four years, rates of cold injuries (of any type) in the past

year were lower in the Army, Air Force and Marine Corps and generally similar in the Navy.

During the past cold season, more than two-thirds (69%) of servicemembers with cold injuries (of any type) were in the Army (Table 1). The rate of cold injuries in the Army (41.1 per 100,000 person-years) was nearly three times higher than the rate in the Marines (14.6 per 100,000 person-years). The most frequently reported cold injury in the past year was “frostbite”—overall and in the Army and Air Force. Still, rates of frostbite in the Army and Air Force were lower in the past year than in any of the prior four years. In the Navy and Marine Corps, the most frequently reported cold injury in the past cold season was “hypothermia.” In both services, rates of hypothermia in the past year were similar to previous years.

During the five-year surveillance period, females had sharply higher rates than males of “frostbite” in the Army and Marine Corps and of “unspecified” cold injuries in the Army. In contrast, there were not strong relationships between gender and cold injury risk in the Air Force and Navy, either overall or by type.

In all services, rates of cold injuries of all types were generally higher among the youngest aged (and junior enlisted) members. In the Army and Air Force, overall cold injury rates were significantly higher among black servicemembers as compared with others. Rates of “frostbite” were higher among black servicemembers compared to others in all services. Of note, there were not strong relationships between demographic characteristics (other than junior grade) and hypothermia risk (Tables 1,2).

The location with the most cold injuries was Fort Wainwright, AK, with 63% of the U.S. military’s cold injuries during the past cold season (but only 9% of all the cold injuries over the past 5 years). Servicemembers stationed in Europe, Korea and at twelve installations in the United States accounted for the majority of cold injuries during the surveillance period. One Air Force base (Elmendorf, AK), one Marine Corps base (Quantico, VA) and one of the largest Army installations (Fort Bragg, NC) were

**Table 1. Incident primary diagnoses of cold injuries by type, active duty, U.S. Army and Navy
July 2001 - June 2006**

	Army												Navy									
	Frostbite		Immersion		Hypothermia		Unspecified		Any cold		Frostbite		Immersion		Hypothermia		Unspecified		Any cold			
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate		
Gender																						
Male	556	26.9	174	8.4	103	5.0	174	8.4	1,007	48.7	47	3.0	24	1.5	40	2.5	7	0.4	118	7.5		
Female	234	64.7	35	9.7	14	3.9	110	30.4	393	109.0	6	2.3	2	0.8	5	1.9	4	1.5	17	6.4		
Age group																						
<20	45	38.6	20	17.2	17	14.6	35	30.0	117	100.0	1	1.2	6	7.1	0	0.0	1	1.2	8	9.4		
20-<30	504	37.3	151	11.2	84	6.2	181	13.4	920	68.0	41	4.1	15	1.5	33	3.3	7	0.7	96	9.5		
30-<40	196	28.0	32	4.6	12	1.7	50	7.1	290	41.4	9	1.7	3	0.6	8	1.5	3	0.6	23	4.3		
40-<50	41	17.3	5	2.1	1	0.4	17	7.2	64	27.0	2	1.0	2	1.0	4	2.0	0	0.0	8	3.9		
50+	4	16.2	1	4.1	3	12.2	1	4.1	9	36.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0		
Race/ethnicity																						
White, non-hisp	296	20.5	139	9.6	58	4.0	96	6.7	589	40.8	29	2.6	21	1.9	33	3.0	4	0.4	87	7.9		
Black, non-hisp	381	66.3	42	7.3	43	7.5	138	24.0	604	105.0	15	4.4	2	0.6	3	0.9	2	0.6	22	6.4		
Hispanic	61	25.2	19	7.9	9	3.7	24	9.9	113	46.8	5	2.5	2	1.0	2	1.0	5	2.5	14	7.0		
Other	52	30.3	9	5.3	7	4.1	26	15.2	94	54.8	4	2.0	1	0.5	7	3.4	0	0.0	12	5.9		
Rank																						
E1-4	483	43.4	135	12.1	87	7.8	191	17.2	896	80.5	30	3.9	17	2.2	27	3.5	4	0.5	78	10.2		
E5-9	261	28.3	38	4.1	20	2.2	76	8.3	395	42.9	18	2.2	8	1.0	11	1.4	6	0.7	43	5.3		
Officer	46	11.6	36	9.1	10	2.5	17	4.3	109	27.5	5	1.8	1	0.4	7	2.6	1	0.4	14	5.2		
Cold year																						
2001-2002	182	38.2	32	6.7	23	4.8	67	14.1	304	63.9	8	2.1	1	0.3	6	1.6	2	0.5	17	4.6		
2002-2003	180	37.1	52	10.7	35	7.2	63	13.0	330	68.0	22	5.8	7	1.9	8	2.1	0	0.0	37	9.8		
2003-2004	167	33.9	47	9.5	26	5.3	54	11.0	294	59.7	14	3.7	10	2.7	8	2.1	4	1.1	36	9.6		
2004-2005	157	32.1	42	8.6	18	3.7	55	11.2	272	55.6	5	1.4	3	0.8	15	4.1	2	0.5	25	6.9		
2005-2006	104	21.4	36	7.4	15	3.1	45	9.3	200	41.1	4	1.1	5	1.4	8	2.3	3	0.8	20	5.7		

*Rate calculated per 100,000 person-years.

**Table 2. Incident primary diagnoses of cold injuries by type, active duty, U.S. Air Force and Marine Corps
July 2001-June 2005**

	Air Force						Marine Corps															
	Frostbite		Immersion		Hypothermia		Unspecified		Any cold		Frostbite		Immersion		Hypothermia		Unspecified		Any cold			
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate		
Gender																						
Male	143	9.9	29	2.0	33	2.3	21	1.4	226	15.6	54	6.5	77	9.3	75	9.1	18	2.2	224	27.1		
Female	30	8.5	6	1.7	7	2.0	4	1.1	47	13.4	12	22.8	6	11.4	6	11.4	2	3.8	26	49.4		
Age group																						
<20	6	9.6	3	4.8	2	3.2	2	3.2	13	20.8	18	21.9	27	32.9	16	19.5	2	2.4	63	76.7		
20-<30	132	14.4	23	2.5	28	3.1	21	2.3	204	22.2	38	6.3	54	9.0	58	9.7	18	3.0	168	28.0		
30-<40	26	4.7	6	1.1	7	1.3	1	0.2	40	7.3	8	5.3	2	1.3	6	4.0	0	0.0	16	10.6		
40-<50	8	3.1	3	1.2	3	1.2	1	0.4	15	5.9	2	4.6	0	0.0	1	2.3	0	0.0	3	6.9		
50+	1	5.6	0	0.0	0	0.0	0	0.0	1	5.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0		
Race/ethnicity																						
White, non-hisp	106	8.3	24	1.9	31	2.4	15	1.2	176	13.8	35	6.2	52	9.2	45	8.0	11	2.0	143	25.4		
Black, non-hisp	44	16.2	8	2.9	5	1.8	6	2.2	63	23.1	20	18.2	10	9.1	12	10.9	3	2.7	45	40.8		
Hispanic	9	8.1	3	2.7	1	0.9	2	1.8	15	13.5	4	3.2	14	11.1	8	6.3	2	1.6	28	22.2		
Other	14	9.9	0	0.0	3	2.1	2	1.4	19	13.5	7	8.7	7	8.7	16	20.0	4	5.0	34	42.4		
Rank																						
E1-4	110	16.8	19	2.9	26	4.0	17	2.6	172	26.2	44	8.3	71	13.5	64	12.1	14	2.7	193	36.6		
E5-9	47	6.0	14	1.8	10	1.3	4	0.5	75	9.5	13	5.0	4	1.5	13	5.0	5	1.9	35	13.5		
Officer	16	4.4	2	0.6	4	1.1	4	1.1	26	7.2	9	9.7	8	8.6	4	4.3	1	1.1	22	23.6		
Year																						
2001-2002	38	10.8	5	1.4	4	1.1	1	0.3	48	13.6	13	7.6	14	8.2	8	4.7	2	1.2	37	21.6		
2002-2003	29	8.0	8	2.2	13	3.6	2	0.5	52	14.3	22	12.6	23	13.2	16	9.2	2	1.1	63	36.1		
2003-2004	44	11.8	5	1.3	9	2.4	6	1.6	64	17.1	10	5.6	19	10.7	22	12.4	3	1.7	54	30.5		
2004-2005	44	12.1	8	2.2	6	1.6	7	1.9	65	17.8	14	7.9	20	11.3	23	13.0	13	7.3	70	39.5		
2005-2006	18	5.2	9	2.6	8	2.3	9	2.6	44	12.6	7	3.9	7	3.9	12	6.7	0	0.0	26	14.6		

Rate calculated per 100,000 person-years.

among the top ten U.S installations in relation to rates of cold injury during the surveillance period (Table 3).

Editorial comment: In general, during the past cold season, rates of cold injuries among U.S. servicemembers were lower than in recent years. The overall decline was largely accounted for by the continuation of a declining trend of “frostbite” in the Army and Air Force.

As in the past, the largest numbers and highest rates of cold injuries by far are reported from the Army. This likely reflects differences in the natures, locations, and circumstances of the training and operations of the services as well as differences in ascertainment of cold injury cases across the services (e.g., records of medical encounters during field exercises, deployment operations, and aboard Navy ships are not routinely available for health surveillance purposes).

This report documents that, in the Army and Marine Corps, the youngest, the most junior, and female enlisted servicemembers have higher rates of cold injuries—particularly frostbite—than their counterparts. In the Army and the Air Force, black servicemembers have significantly higher rates of cold injuries overall. Other reports have documented that African American soldiers and individuals with cold

injuries in the past have increased susceptibilities to cold injuries during prolonged or intense cold exposures.¹ Special vigilance by individuals, line supervisors, commanders, and medical staffs is indicated to prevent cold injuries among those with known or suspected increased susceptibilities.

Commanders and supervisors at all levels should ensure that appropriate countermeasures to prevent cold injuries (e.g., training, clothing, equipment) in general are implemented.³ The Disease Prevention and Control Program of the U.S. Army Center for Health Promotion in collaboration with the U.S. Army Research Institute of Environmental Medicine provide up-to-date cold injury prevention materials (including posters, presentation outlines, policies, regulations, and technical bulletins) at <http://chppm-www.apgea.army.mil/coldinjury/>

Analysis by Vivian Kong, MPH, Analysis Group, Army Medical Surveillance Activity.

References

- 1 Cattermole TJ. The epidemiology of cold injury in Antarctica. *Aviat Space Environ Med.* 1999 Feb;70(2):135-40
- 2 DeGroot DW, Castellani JW, Williams JO, Amoroso PJ. Epidemiology of U.S. Army cold weather injuries, 1980-1999. *Aviat Space Environ Med.* 2003 May;74(5):564-70.
- 3 Castellani JW, O'Brien C, Baker-Fulco C, Sawka MN, Young AJ. Sustaining health and performance in cold weather operations. Technical note no. TN/02-2. US Army Research Institute of Environmental Medicine, Natick, Massachusetts. October 2001.

Table 3. Installations (with at least 30 total cases) with the highest incident rates of any cold injury, US Armed Forces, July 2001-June 2006

	2001-2002		2002-2003		2003-2004		2004-2005		2005-2006		Total	
	Cases	Rate*	Cases	Rate*	Cases	Rate*	Cases	Rate*	Cases	Rate*	Cases	Rate*
Ft. Wainwright, AK	71	1583.9	26	569.0	59	1410.7	14	331.8	13	287.6	183	832.8
Ft. Richardson, AK	17	798.8	7	308.5	24	795.5	12	335.5	26	501.5	86	531.7
Ft. Drum, NY	10	90.3	33	287.0	7	60.4	38	270.8	13	81.2	101	157.3
Ft. Lee, VA	4	70.1	8	143.9	2	38.1	11	218.2	6	106.5	31	114.0
Elmendorf AFB, AK	4	142.2	3	45.3	11	161.6	9	133.4	4	61.4	31	105.1
MCB Quantico, VA	2	23.9	12	149.6	11	154.9	2	28.5	5	73.3	32	85.8
Ft. Leonard Wood, MO	11	107.4	7	67.1	6	56.7	16	163.4	3	27.3	43	82.6
Korea	9	23.4	41	103.5	38	93.5	19	52.3	21	72.2	128	69.5
Ft. Riley, KS	15	151.1	4	38.9	1	9.3	8	76.6	3	27.9	31	59.4
Ft. Bragg, NC	18	45.5	41	97.3	31	72.2	14	32.8	16	37.9	120	57.3
Ft. Sill, OK	5	36.6	6	46.8	11	86.2	9	76.2	4	34.5	35	55.9
Ft. Lewis, WA	20	111.1	11	56.5	10	50.7	7	32.9	4	16.3	52	50.4
Europe	45	63.2	41	58.2	12	17.3	27	36.9	19	29.7	144	41.3
Ft. Benning, GA	5	24.5	7	37.1	5	25.8	15	77.5	8	39.7	40	40.8
Ft. Campbell, KY	7	29.1	13	51.9	5	19.5	17	61.6	4	13.5	46	34.9
Camp LeJeune, NC	5	18.6	18	66.6	8	24.4	13	39.3	2	5.8	46	29.8
Camp Pendleton, CA	3	9.3	6	18.1	10	27.7	14	38.4	2	5.3	35	19.9
Ft. Hood, TX	12	29.3	12	28.7	4	9.3	3	6.9	7	15.7	38	17.8

*All rates are incident cases per 100,000 person-years.

Hepatitis A Immunity among Enlisted Accessions to the U.S. Army, Fort Benning, GA, April-August 2006

In 1995, the Food and Drug Administration (FDA) licensed the first hepatitis A vaccine. In 1999, the Advisory Committee on Immunization Practices (ACIP) recommended immunization against hepatitis A of children residing in states with annual rates of hepatitis A in 1987 of 20 or more cases per 100,000 population.¹ These states (designated ACIP region 1) were Alaska, Arizona, California, Idaho, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, and Washington. The ACIP also recommended that immunization be considered for children living in states with historical annual rates of 10 or more cases per 100,000. These states (designated ACIP Region 2) were Arkansas, Colorado, Missouri, Montana, Texas, and Wyoming. The Recommended Childhood Immunization Schedule published in 2000 limited its recommendations regarding hepatitis A vaccine to children up to age 12¹; however, in 2001, the recommendations were expanded to include adolescents through age 18.²

In 1995, the Armed Forces Epidemiological Board (AFEB) was asked to evaluate the potential use of hepatitis A vaccine in military populations. The AFEB recommended that the vaccine be considered for military forces assigned or deployed to geographic areas of known high risk.⁴ In addition, the AFEB suggested that screening for antibodies to hepatitis A to identify those already immune could be cost-effective.⁴ Recent studies have confirmed that screening for pre-existing immunity to hepatitis A can be cost-effective under certain combinations of screening and vaccine costs.⁵

In May 1995, the U.S. Army directed that all new accessions be immunized against hepatitis A (subject to vaccine availability).⁶ Currently, all new Army trainees receive the two-dose series of adult monovalent hepatitis A vaccine—alone or in combination with hepatitis B vaccine (as a three-dose series of bivalent hepatitis A/B vaccine [Twinrix®]). Until recently, the U.S. Army did not perform large-scale serosurveillance testing of new enlisted accessions to determine preexisting immunity to vaccine preventable diseases. The U.S. Army Accession Screening and Immunization Program (ASIP) was developed by staff of the Army Medical

Surveillance Activity (AMSA) to implement the April 2004 recommendations of the AFEB to use serologic screening, where feasible, to reduce unnecessary immunizations among basic trainees. Based upon a successful pilot screening program implemented at the Fort Leonard Wood Reception Battalion in the summer of 2005⁷, the Army directed full implementation of the ASIP across all basic training sites.⁸

This report documents results of serologic screening for antibodies to hepatitis A among new trainees who processed through the Fort Benning Reception Battalion during the early months of the ASIP program.

Methods: For this analysis, qualitative results of hepatitis A antibody testing performed at the Fort Benning Reception Battalion between 3 April 2006 and 31 August 2006 were merged with demographic data maintained in the Defense Medical Surveillance System (DMSS). In accordance with processing rules implemented through the ASIP, initially indeterminate test results were treated as negative test results and not repeated. Analyses were limited to new accessions to the Army who had no documented prior military service — and, thus, no prior military-associated vaccinations. Prevalences of antibodies to hepatitis A were calculated among new recruits in relation to their ages and home states of record.

Results: From 3 April 2006 through 31 August 2006, results of hepatitis A laboratory testing were obtained from 7,581 first-time accessions to the U.S. Army. Approximately 60% (59.9%) of the trainees were teenagers, nearly one-third (31.4%) were 20-24 years old, and the others (8.7%) were older. All but 2 trainees were male.

Overall, approximately 1 of 7 trainees (14.8%) had serologic evidence of immunity to hepatitis A. However, the prevalence of immunity was approximately one-third higher among trainees younger than 21 years old (16.0%) compared to those older (11.9%) (Table 1). In addition, prevalences of immunity sharply varied across ACIP regions. For example, overall prevalences were 34.4%, 18.3%, and

7.6% among trainees from ACIP region 1 (childhood/adolescent hepatitis A vaccination recommended since 2001), region 2 (childhood/adolescent hepatitis A vaccination recommended for consideration), and region 3 (childhood/adolescent hepatitis A vaccination not recommended), respectively. Of note, the prevalence of immunity sharply declined from ACIP region 1 to region 3 among 17-19 and 20-24 year olds but not among older accessions (Figures 1,2).

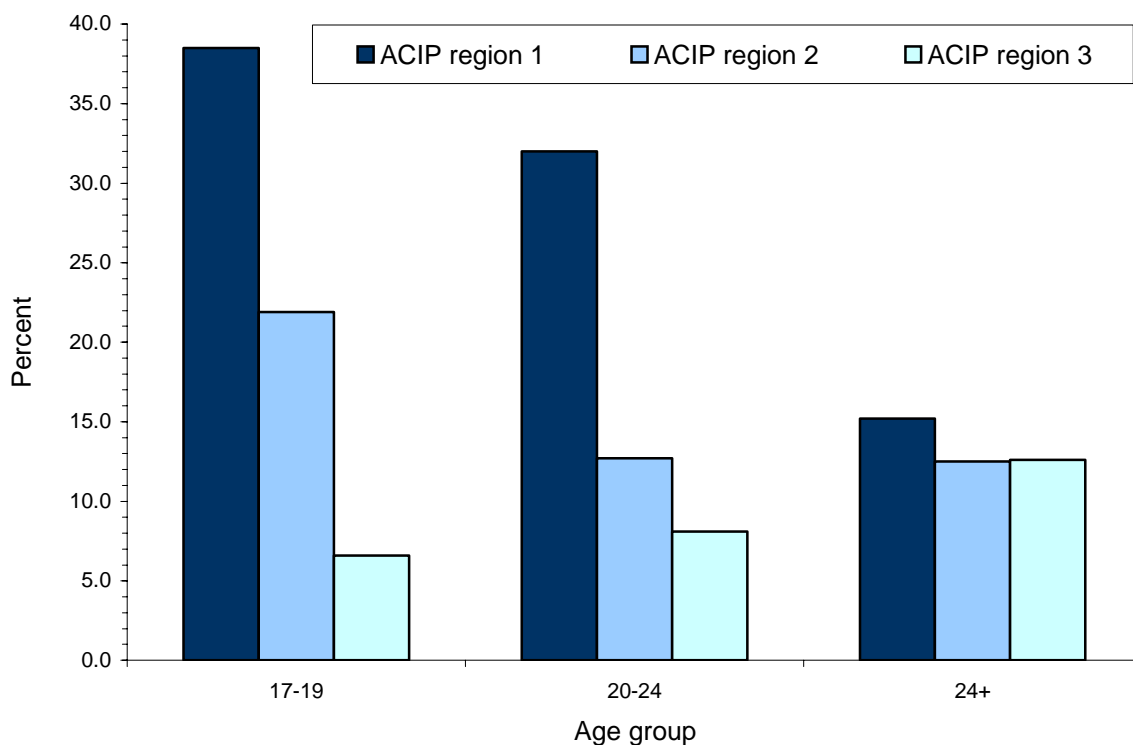
Editorial comment: Prevalences of naturally acquired immunity to endemic infectious diseases generally increase with age. However, among accessions to the U.S. Army in 2006, prevalences of immunity to hepatitis A were sharply higher among 17-20 year olds compared to those older. Of note in this regard, prevalences of immunity were highest among teen-aged recruits from states where hepatitis A immunizations of children and adolescents have been recommended since 2001. Clearly, the higher

prevalence of hepatitis A immunity among younger accessions to the U.S. Army in 2006 reflects effects of immunization practices in high-risk states over the past 5 years

The variability of hepatitis A immunity among recruits in relation to their ages and home states underscores the value of serologic screening prior to immunization. Over time, the routine screening of new accessions to identify those already immune to hepatitis A (and other diseases targeted by recruit immunizations) will prevent numerous unnecessary vaccinations and avoid the associated costs.

Finally, this report demonstrates the emerging role of routine serosurveillance (i.e., surveillance of results of population-based serologic testing) for vaccine preventable diseases to improve the cost-effectiveness of military immunization programs. This serosurveillance has the incidental benefit of documenting the effects of vaccine recommendations and their implementation in the general U.S. population.

Figure 1. Prevalence of immunity to hepatitis A, by age group and ACIP region (of home state), enlisted accessions to the U.S. Army, Fort Benning, GA, April-August 2006.



Analysis and report by Angie Eick, PhD, Zheng Hu, MS, Zhong Wang, PhD, MPH, Hayley Hughes, MPH, and CPT Remington Nevin, MD, MPH, Army Medical Surveillance Activity Center for Biosurveillance

References

1. Centers for Disease Control and Prevention. Prevention of hepatitis A through active or passive immunization. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR. 1999; 48(RR12): 1-37.
2. Centers for Disease Control and Prevention. Notice to readers: Recommended childhood immunization schedule – United States, 2000. MMWR. 2000;49(02):35-38,47.
3. Centers for Disease Control and Prevention. Recommended childhood immunization schedule – United States, 2001. MMWR 2001;50(01):7-10,19.
4. Armed Forces Epidemiological Board. Memorandum for the Assistant Secretary of Defense (Health Affairs) and the Surgeons General of the Army, Navy , and Air Force, subject: Recommendations regarding the use of the newly licensed hepatitis A vaccine in military personnel. Department of Defense, Falls Church, Virginia, 28 February 1995. Accessed on-line on 2 October 2006 at: <http://www.ha.osd.mil/afeb/1995/1995-02.pdf>
5. Nevin RL, Niebuhr DW. Incremental cost-benefit of serologic screening for hepatitis A immunity [Poster 176]. In: Abstracts. Am J. Trop Med. Hygiene. 2005;73(6 Supplement):59.
6. Headquarters, U.S. Army Medical Command. Memorandum for Commanders, HSSAs (Prov), DENCOM, and VETCOM, subject: Use of HAVRIX (Hepatitis A vaccine inactivated). Fort Sam Houston, Texas, 22 May 1995. Accessed on-line on 2 October 2006 at: <http://www.vaccines.mil/documents/705HavrixPolicy.pdf>
7. Army Medical Surveillance Activity. Hepatitis B immunity among U.S. Army basic trainees, Fort Leonard Wood, Missouri, July 2005-December 2005. Medical Surveillance Monthly Report (MSMR) 2005 Jul;12(5):7-8.
8. Headquarters, U.S. Army Medical Command. Memorandum thru commanders, MEDCOM regional medical commands, for commanders, U.S. Army MEDDACs, Fort Benning, GA; Fort Jackson, SC; Fort Knox, KY; Fort Leonard Wood, MO; Fort Sill, OK, subject: Standards for immunization delivery at basic combat training posts, dated 18 November 2005. Accessed on-line on 2 October 2006 at: <http://www.vaccines.mil/documents/950Memo18NOV05Standards.pdf>.(Endnotes)

Figure 2. Prevalence of immunity to hepatitis A, among enlisted accessions to the U.S. Army at Fort Benning, GA, by age group, April-August 2006.

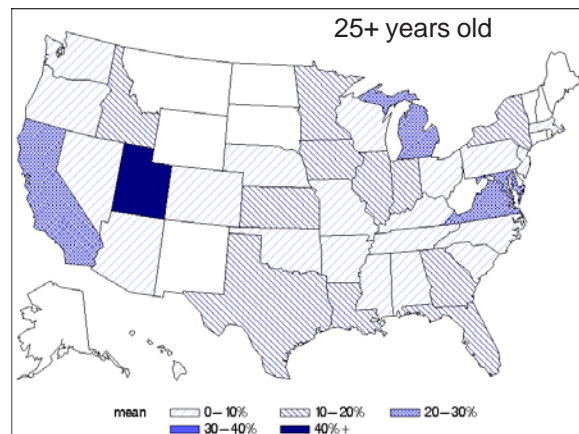
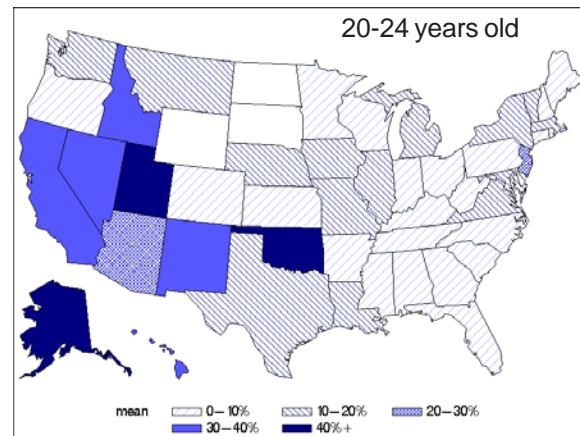
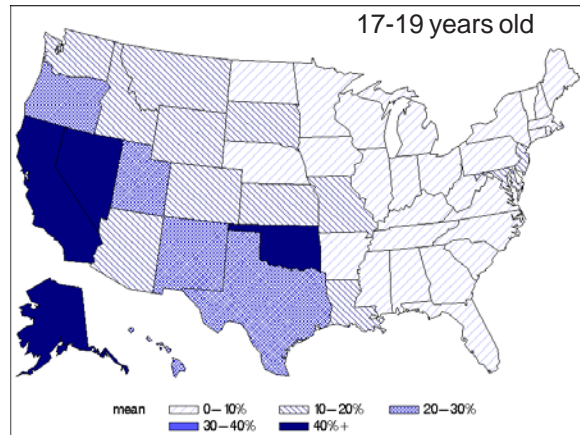


Table 1. Prevalence of immunity to hepatitis A by age, enlisted accessions to the U.S. Army, Fort Benning, Georgia, April-August 2006

Age	Number of accessions	Number with antibodies to hepatitis A	% with antibodies to hepatitis A
17	941	175	18.6
18	2,300	369	16.0
19	1,299	182	14.0
20	814	132	16.2
21	587	71	12.1
22	425	54	12.7
23	316	34	10.8
24	242	21	8.7
25+	657	86	13.1
	7,581	1,124	14.8

Incidence of Mumps in Relation to Universal MMR Vaccination Versus Vaccination after Serological Screening of U.S. Military Recruits, 2000-2004

Mumps is an acute viral illness that is characterized by fever and swelling of the salivary glands. The virus is efficiently transmitted by respiratory droplets of infected individuals. Before a vaccine was available, mumps was an extremely common disease of childhood (with peak incidence among 5-9 year olds). Since the licensure of a vaccine in 1967, however, mumps incidence in the United States has declined by more than 99%. Since 1989, a two-dose regimen of MMR (measles, mumps and rubella) vaccination — with the first dose in infancy and a booster prior to beginning school — has been recommended.¹

In spite of recommendations for universal vaccination, cases and outbreaks of mumps continue due to low vaccination coverage and/or primary or secondary vaccine failures.^{2,3} In addition, prior to the routine use of mumps vaccine and the 2-dose schedule, outbreaks and relatively high seronegativity rates were frequently reported in U.S. military members.⁴⁻⁹

Policies for MMR immunization vary among the U.S. military services. The U.S. Army, Navy, and Marine Corps vaccinate all newly enlisted recruits against MMR regardless of their immunization histories. The U.S. Air Force uses serological screening prior to immunization and administers an MMR vaccine to recruits shown susceptible to measles or rubella by an EIA qualitative IgG assay. This targeted vaccination policy was adopted in the 1990s in an effort to reduce both immunization costs and redundant immunizations. To determine whether a targeted vaccination strategy is as effective as a strategy of universal MMR vaccination in protecting servicemembers from mumps infection, we compared mumps incidence in the Air Force with that of the other services during the years 2000-2004.

Methods: The surveillance period was 1 January 2000 through 31 December 2004. The surveillance cohort included all 17-29 year old enlisted members of the active components of the U.S. Air Force, Army, Navy, or Marine Corps who began military service during the surveillance period. Data on military service, demographics, immunizations, and medical experiences

were obtained from the Defense Medical Surveillance System (DMSS).¹⁰

For this analysis, a case of mumps was defined as a medical encounter of a cohort member during the surveillance period with a discharge diagnosis (in any position) of “mumps” (ICD-9-CM code: 072.0-072.9). Person-time at risk was calculated by summing the times from each individual’s entry into the cohort to the end of the surveillance period or a censoring event. Censoring events (which would result in a change in risk or a loss of visibility in the DMSS) included MMR immunization, deployment, termination of military service, change in status from active to Reserve component for 60 days or more, or diagnosis of mumps. Rates of mumps diagnoses were compared between members of the U.S. Air Force (“targeted vaccination group”) and members of the U.S. Army, Navy and Marine Corps (“universal vaccination group”).

Results: The surveillance cohort was comprised of 856,475 servicemembers who contributed approximately 1.2 million person-years of follow-up. The “universal vaccination group” (n=686,768) was approximately 4-times larger than the “targeted vaccination group” (n=169,707). Demographic characteristics of the groups reflected those of the respective military services.

Overall, there were 44 diagnoses of mumps — 11 in the targeted vaccination group and 33 in the universal vaccination group — during the 5-year surveillance period. The overall incidence rate (IR) of mumps was 4.1 per 100,000 person-years (p-yrs) in the targeted vaccination group and 3.6 per 100,000 p-yrs in the universal vaccination group (Table 2). The difference in rates between the groups was not statistically significant (incidence rate ratio [IRR]=1.14, p=0.34).

Of note, among U.S.-born servicemembers, mumps incidence rates did not significantly differ between the universal (IR: 3.7 per 100,000 p-yrs) and targeted (IR: 3.3 per 100,000 p-yrs) vaccination groups (IRR=0.88, p=0.39). Among foreign-born

Table 1. Demographic characteristics of basic trainees, by vaccination group, active components, U.S. Armed Forces, 2000-2004

	Targeted vaccination group				Universal vaccination group			
	Recruits	%	Follow-up (1,000 person- years)	Mean (years)	Recruits	%	Follow-up (1,000 person- years)	Mean (years)
<i>Total cohort</i>	169,707		270	1.6	686,768		926	1.3
<i>Age group (years)</i>								
17-19	105,083	62	167	1.6	425,445	62	583	1.4
20-24	57,968	34	92	1.6	219,541	32	289	1.3
25-29	6,656	4	11	1.6	41,782	6	54	1.3
<i>Sex</i>								
Male	128,920	76	203	1.6	577,603	84	778	1.3
Female	40,787	24	67	1.6	109,165	16	148	1.4
<i>Race-ethnicity</i>								
White non-Hispanic	116,920	69	177	1.5	427,641	62	554	1.3
Black non-Hispanic	25,642	15	43	1.7	111,823	16	159	1.4
Hispanic	9,999	6	20	2.0	77,677	11	117	1.5
Other/unknown	17,146	10	29	1.7	69,627	10	97	1.4
<i>Marital status</i>								
Single, never married	119,750	71	166	1.4	529,525	77	647	1.2
Married	46,264	27	97	2.1	151,279	22	270	1.8
Other/unknown	3,693	2	8	2.1	5,964	1	10	1.6
<i>Years of education</i>								
9-10	1,312	1	2	1.6	13,638	2	18	1.4
11-12	145,813	86	231	1.6	610,995	89	822	1.3
13+	21,443	13	35	1.6	59,591	9	83	1.4
Unknown	1,139	1	1	0.9	2,544	1	3	1.1
<i>Birthplace</i>								
United States	153,809	91	244	1.6	619,172	90	830	1.3
Foreign-born	14,770	9	25	1.7	66,103	10	95	1.4
Unknown	1,128	1	1	0.9	1,493	1	1	0.9
<i>Censoring reason</i>								
End of study	133,858	79	208	1.6	461,053	67	585	1.3
MMR immunization	1,476	1	1	0.8	23,663	3	21	0.9
Deployment	34,362	20	61	1.8	202,019	29	320	1.6
Mumps diagnosis	11	~0	<1	1.4	33	~0	<1	0.9

P <0.001 for all categories by chi-square

servicemembers, the incidence rate of mumps was more than 5-times higher (IRR=5.75, p=0.07) in the targeted (IR: 12.5 per 100,000 p-yrs) compared to the universal (IR: 2.2 per 100,000 p-yrs) vaccination group, however, this difference was not statistically significant.

Editorial comment: On a population level, it appears that targeted MMR vaccination of servicemembers based on serological immunity to measles and rubella does not significantly increase the risk of mumps infection as compared with universal vaccination. A group of foreign-born servicemembers under a targeted vaccination policy experienced 10 more cases of mumps per 100,000 person-years of exposure to risk during military service than did a group of foreign-born servicemembers subjected to universal MMR vaccination. Thus, the risk of a diagnosis of mumps was approximately five times higher among foreign-born members of the Air Force versus the other services, although this increased risk did not reach statistical significance.

Because foreign-born servicemembers comprise only ten percent of all servicemembers, extending a targeted MMR vaccination policy to the other services would only result in approximately one additional case of mumps per year. These findings should alleviate concerns that implementation of targeted MMR vaccination to all services would result in a significant increase in the number of mumps cases. Studies investigating the proportion of foreign-born recruits with seropositivity to mumps by serological assay at entry into the military could help inform future decisions regarding MMR vaccination policies.

Analysis and report by Angelia Eick, PhD, Zheng Hu, MS, Zhong Wang, PhD, MPH, Hayley Hughes, MPH, and CPT Remington Nevin, MD, MPH, Army Medical Surveillance Activity.

References

1. Watson JC, Hadler SC, Dykewicz CA, Reef S, Phillips L. Measles, mumps, and rubella—vaccine use and strategies for elimination of measles, rubella, and congenital rubella syndrome and control of mumps: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 1998;47:1-57.
2. Centers for Disease Control and Prevention (CDC). Update: multistate outbreak of mumps—United States, January 1-May 2, 2006. *Morb Mortal Wkly Rep (MMWR)* 2006;55:559-63.
3. Vandermeulen C, Roelants M, Vermoere M, et al. Outbreak of mumps in a vaccinated child population: a question of vaccine failure? *Vaccine* 2004;22:2713-6.

4. Arday DR, Kanjarpane DD, Kelley PW. Mumps in the US Army 1980-86: should recruits be immunized?. *Am J Public Health* 1989;79:471-4.
5. Paul JR. A nationwide serum survey of U.S. recruits; the three Armed Services. *Mil Med* 1965;130:1-12.
6. Kelley PW, Petrucelli BP, Stehr-Green P, Erickson RL, Mason CJ. The susceptibility of young adult Americans to vaccine-preventable infections. A national serosurvey of US Army recruits. *JAMA* 1991;266:2724-9.
7. Struewing JP, Hyams KC, Tueller JE, Gray GC. The risk of measles, mumps, and varicella among young adults: a serosurvey of US Navy and Marine Corps recruits. *Am J Public Health* 1993;83:1717-20.
8. Liao SJ, Benenson AS. Immunity status of military recruits in 1951 in the United States. II. Results of mumps complement-fixation tests. *Am J Hyg* 1954;59:273-81.
9. Kuhlman JC. Mumps outbreak aboard the USS Reuben James. *Mil Med* 1994;159:255-7.
10. Rubertone MV, Brundage JF. The Defense Medical Surveillance System and the Department of Defense serum repository: glimpses of the future of public health surveillance. *Am J Public Health* 2002;92:1900-4.

Table 2. Incidence rate of mumps diagnosis in targeted MMR vaccination group versus universal MMR vaccination group, active component, U.S. Armed Forces, 2000-2004

Vaccination cohort	Incidence rate per 100,000	Incidence rate ratio	p-value
Total cohort			
Universal	3.6		
Targeted	4.1	1.14 (0.52-2.32)	0.68
By location of birth			
U.S.			
Universal	3.7		
Targeted	3.3	0.88 (0.35-1.95)	0.77
Outside U.S.			
Universal	2.2		
Targeted	12.5	5.75 (0.66-68.83)	0.07

Update: Pre- and Post-deployment Health Assessments, U.S. Armed Forces, January 2003-September 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 servicemembers.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 servicemember 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 (in hard copy or electronic form) 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 servicemembers (e.g., hospitalizations, ambulatory visits, immunizations).¹¹ The continuously expanding DMSS database can be used to monitor the health of servicemembers 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 September 2006, 1,448,091 pre-deployment health assessments and 1,429,342 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 servicemembers (n=727,374) who completed both pre- and post-deployment health assessments, fewer than half (45%) chose the same descriptor of their overall health before and after deploying (Figures 2,3). Of those (n=402,576) 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=82,210; 11.3% of all respondents) as an improvement (n=17,664; 2.4% of all respondents) (Figure 3).

On post-deployment forms, 22% of active and 40% 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 4% 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: 7%) 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 85% of all active and Re-

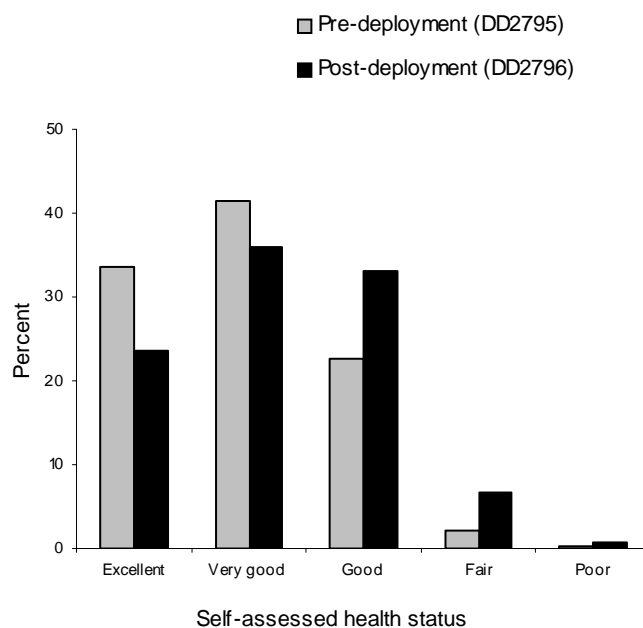
Table 1. Total pre-deployment and post-deployment health assessments, by month and year, U.S. Armed Forces, January 2003-September 2006

	Pre-deployment		Post-deployment	
	No.	%	No.	%
Total	1,448,091	100.0	1,429,342	100.0
2003				
January	69,390	4.8	6,221	0.4
February	110,571	7.6	5,077	0.4
March	69,855	4.8	6,755	0.5
April	37,599	2.6	19,350	1.4
May	12,885	0.9	92,882	6.5
June	14,416	1.0	65,381	4.6
July	18,062	1.2	52,902	3.7
August	16,513	1.1	35,154	2.5
September	12,799	0.9	32,447	2.3
October	24,170	1.7	27,047	1.9
November	19,703	1.4	21,542	1.5
December	36,157	2.5	22,242	1.6
2004				
January	70,229	4.8	39,999	2.8
February	39,203	2.7	32,285	2.3
March	22,843	1.6	66,655	4.7
April	19,947	1.4	44,505	3.1
May	27,798	1.9	17,911	1.3
June	24,666	1.7	28,404	2.0
July	22,805	1.6	24,342	1.7
August	34,302	2.4	23,013	1.6
September	32,207	2.2	24,396	1.7
October	35,657	2.5	15,865	1.1
November	36,239	2.5	22,085	1.5
December	38,613	2.7	27,069	1.9
2005				
January	34,687	2.4	56,090	3.9
February	24,764	1.7	70,037	4.9
March	20,887	1.4	53,549	3.7
April	26,990	1.9	19,122	1.3
May	18,778	1.3	21,095	1.5
June	25,597	1.8	19,384	1.4
July	21,629	1.5	17,748	1.2
August	47,315	3.3	29,692	2.1
September	34,498	2.4	40,208	2.8
October	37,197	2.6	37,659	2.6
November	35,214	2.4	38,805	2.7
December	21,237	1.5	56,840	4.0
2006				
January	29,831	2.1	37,935	2.7
February	22,195	1.5	18,866	1.3
March	20,697	1.4	20,477	1.4
April	18,567	1.3	17,963	1.3
May	23,883	1.6	22,937	1.6
June	30,421	2.1	16,217	1.1
July	33,199	2.3	20,773	1.5
August	37,089	2.6	28,837	2.0
September	36,787	2.5	31,579	2.2

serve component respondents, respectively, had hospitalizations and/or ambulatory visits 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 while deployed 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, however, in the active components, rates of exposure concerns increased through the spring of 2004 and were slightly lower and relatively stable (5-15%) since then (Figure 4). In the Reserve components, rates of exposure concerns increased through the spring of 2004 and were relatively high (15-30%) since then (Figure 4). In general, reports of exposure concerns have been higher in the Army than the other services, in the Reserve than the active component, and increased with age (Tables 3, 4).

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



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

While prevalences of “exposure concerns” among post-deploying respondents vary from month to month, since the spring of 2004, they have been relatively stable. Consistently, exposure concerns are much more common among Reserve compared to active component members. Of note, among both active and Reserve component members, exposure concerns significantly increase with age, and in both components, servicemembers older than 40 are approximately twice as likely as those younger than 20 to report exposure concerns.

References

1. Medical readiness division, J-4, JCS. Capstone document: force health protection. Washington, DC. Available at: < <http://www.dtic.mil/jcs/j4/organization/hssd/fhpcapstone.pdf> >.

2. Brundage JF. Military preventive medicine and medical surveillance in the post-cold war era. *Mil Med.* 1998 May;163(5):272-7.
3. Trump DH, Mazzuchi JF, Riddle J, Hyams KC, Balough B. Force health protection: 10 years of lessons learned by the Department of Defense. *Mil Med.* 2002 Mar;167(3):179-85.
4. Hyams KC, Riddle J, Trump DH, Wallace MR. Protecting the health of United States military forces in Afghanistan: applying lessons learned since the Gulf War. *Clin Infect Dis.* 2002 Jun 15;34(Suppl 5):S208-14.
5. DoD instruction 6490.3, subject: Implementation and application of joint medical surveillance for deployments. 7 Aug 1997.
6. 10 USC 1074f, subject: Medical tracking system for members deployed overseas. 18 Nov 1997.
7. ASD (Health Affairs) memorandum, subject: Policy for pre- and post-deployment health assessments and blood samples (HA policy: 99-002). 6 Oct 1998.
8. ASD (Health Affairs) memorandum, subject: Updated policy for pre- and post-deployment health assessments and blood samples (HA policy: 01-017). 25 Oct 2001.
9. JCS memorandum, subject: Updated procedures for deployment health surveillance and readiness (MCM-0006-02). 1 Feb 2002.
10. USD (Personnel and Readiness) memorandum, subject: Enhanced post-deployment health assessments. 22 Apr 2003.
11. Rubertone MV, Brundage JF. The Defense Medical Surveillance System and the Department of Defense Serum Repository: glimpses of the future of comprehensive public health surveillance. *Am J Pub Hlth.* 2002 Dec;92(12):1900-4.
12. Brundage JF, Kohlhase KF, Gambel JM. Hospitalization experiences of U.S. servicemembers before, during, and after participation in peacekeeping operations in Bosnia-Herzegovina. *Am J Ind Med.* 2002 Apr;41(4):279-84.
13. Brundage JF, Kohlhase KF, Rubertone MV. Hospitalizations for all causes of U.S. military service members in relation to participation in Operations Joint Endeavor and Joint Guard, Bosnia-Herzegovina, January 1995 to December 1997. *Mil Med.* 2000 Jul;165(7):505-11.
14. Trump DH. Self-rated health and health care utilization after military deployments. *Mil Med.* 2006 Jul;171(7):662-8.
15. Hyams KC, Wignall FS, Roswell R. War syndromes and their evaluation: from the U.S. Civil War to the Persian Gulf War. *Ann Intern Med.* 1996 Sep 1;125(5):398-405.
16. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *N Engl J Med.* 2004 Jul 1;351(1):13-22.
17. Hoge CW, Auchterlonie JL, Milliken CS. Mental health problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. *JAMA.* 2006 Mar 1;295(9):1023-32.

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- September 2006.

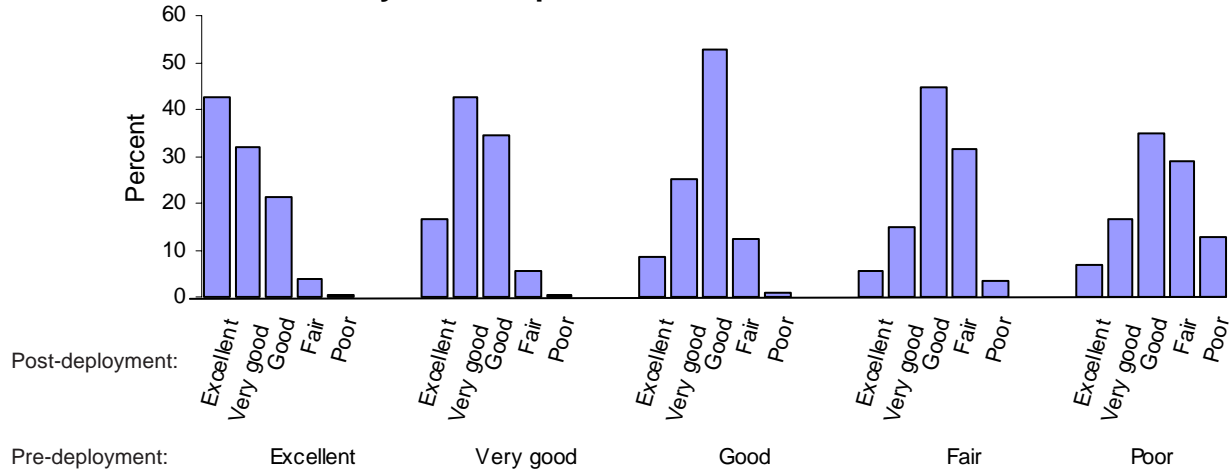


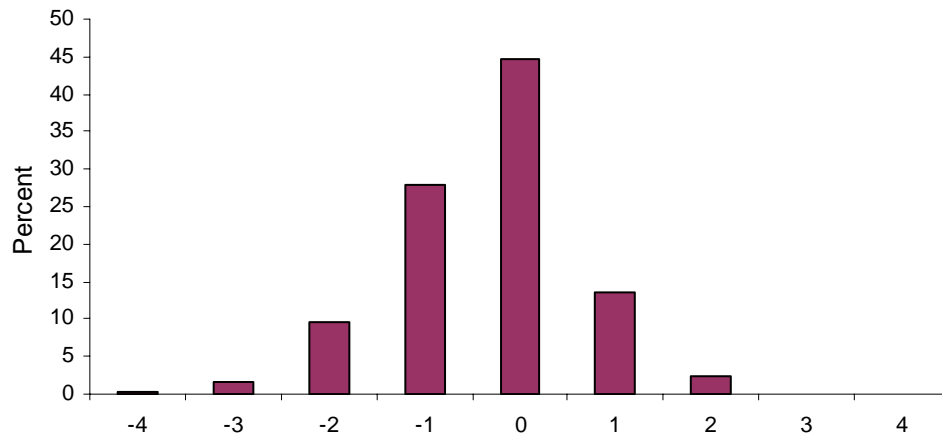
Table 2. Responses to selected questions from post-deployment forms (DD2796) by service and component, U.S. Armed Forces, January 2003-September 2006

	Army	Navy	Air Force	Marines	Total
Active component					
SMs with DD 2796 in DMSS	309,622	102,977	129,608	90,424	632,631
Electronic version	81%	7%	75%	14%	58%
General health ("fair" or "poor")	9%	5%	2%	6%	6%
Medical/dental problems during deploy	30%	12%	12%	20%	22%
Currently on profile	11%	2%	2%	3%	6%
Mental health concerns	7%	3%	1%	2%	4%
Exposure concerns	17%	5%	4%	11%	11%
Health concerns	13%	6%	6%	9%	10%
Referral indicated	27%	7%	10%	13%	18%
Med. visit following referral ¹	93%	72%	88%	65%	88%
Post deployment serum ²	89%	81%	89%	88%	88%
Reserve component					
SMs with DD 2796 in DMSS	283,015	16,764	47,200	19,775	366,754
Electronic version	73%	15%	65%	17%	67%
General health ("fair" or "poor")	11%	6%	2%	8%	10%
Medical/dental problems during deploy	45%	36%	15%	35%	40%
Currently on profile	14%	4%	2%	3%	12%
Mental health concerns	8%	3%	1%	3%	6%
Exposure concerns	25%	20%	8%	25%	23%
Health concerns	22%	21%	11%	22%	21%
Referral indicated	27%	19%	11%	23%	24%
Med. visit following referral ¹	89%	79%	57%	56%	85%
Post deployment serum ²	93%	91%	69%	89%	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-September 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-September 2006

	Total ¹	Exposure concerns	% with exposure concerns
Total	993,839	156,419	15.7
Component			
Active	629,245	72,509	11.5
Reserve	364,594	83,910	23.0
Service			
Army	590,232	124,541	21.1
Navy	118,132	8,050	6.8
Air Force	176,228	9,385	5.3
Marine Corps	109,247	14,443	13.2
Age (years)			
<20	24,484	1,952	8.0
20-29	527,998	68,690	13.0
30-39	274,730	48,059	17.5
>39	166,608	37,718	22.6
Gender			
Men	881,232	136,842	15.5
Women	112,606	19,577	17.4
Race/ethnicity			
Black	170,603	29,247	17.1
Hispanic	97,516	16,683	17.1
Other	2,466	249	10.1
White	653,525	99,264	15.2
Grade			
Enlisted	864,090	134,594	15.6
Officer	129,680	21,824	16.8

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-September 2006.

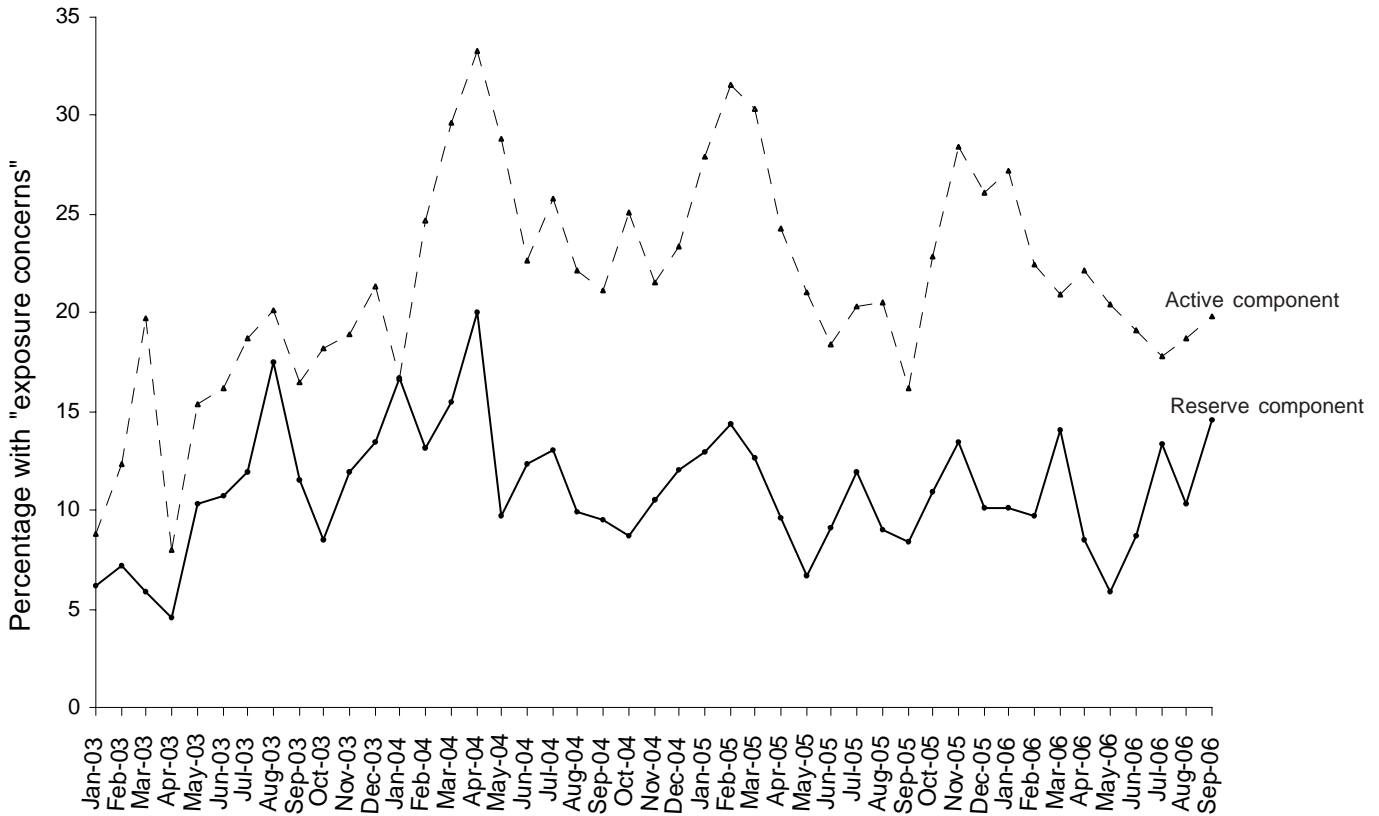
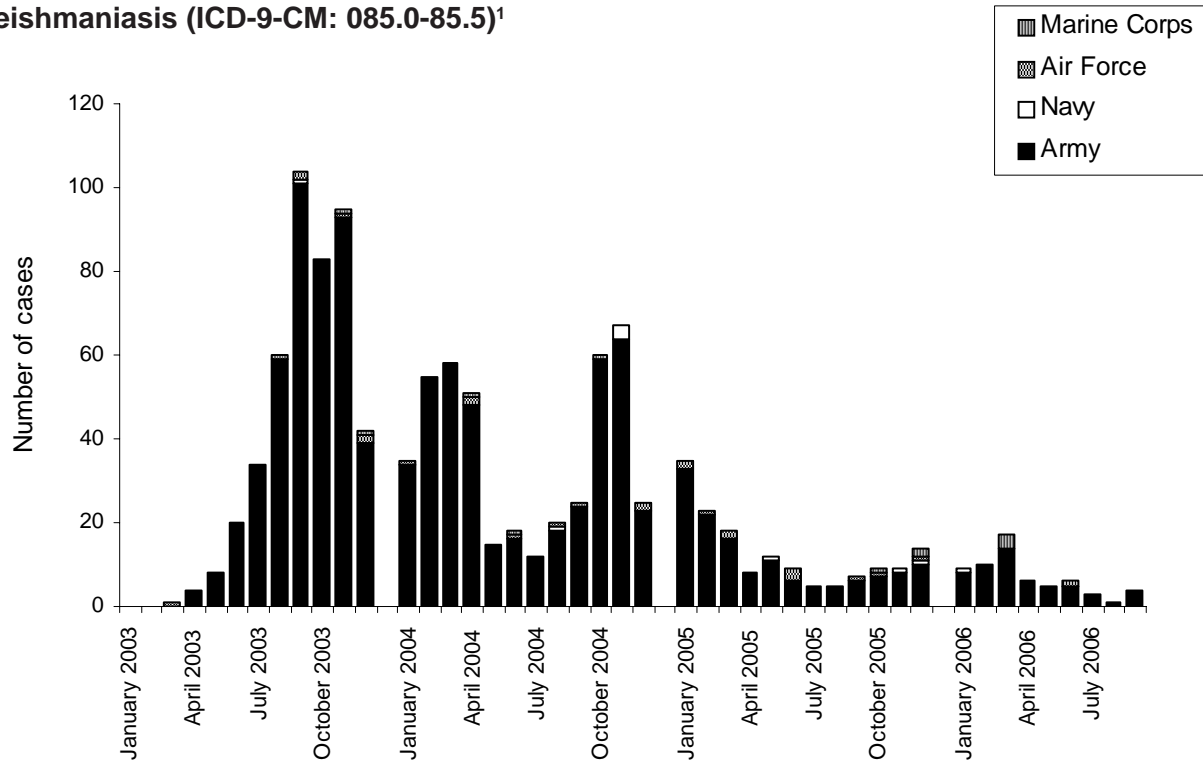


Table 4. Proportion of post-deployment forms that include reports of exposure concerns, by age group and component, U.S. Armed Forces, January 2003-September 2006

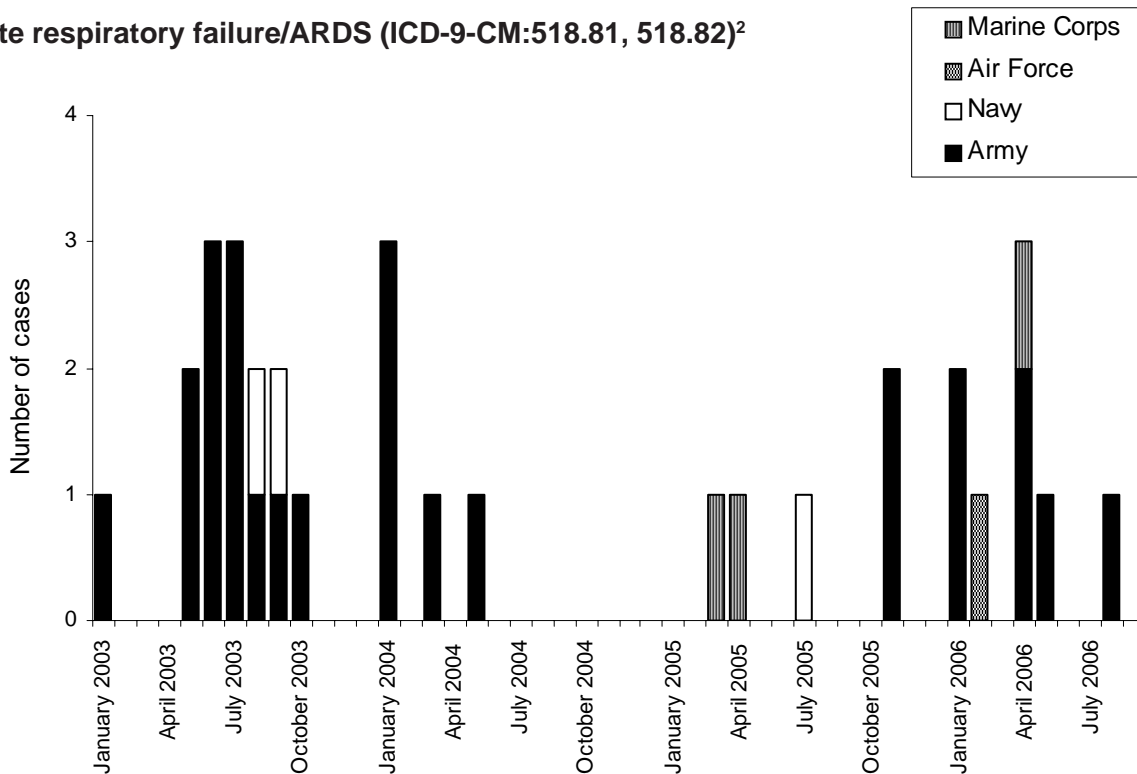
Age group	Active	Reserve
<20	6.4	13.8
20-29	10.4	20.3
30-39	13.2	23.9
>39	16.0	26.0

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

Leishmaniasis (ICD-9-CM: 085.0-85.5)¹



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

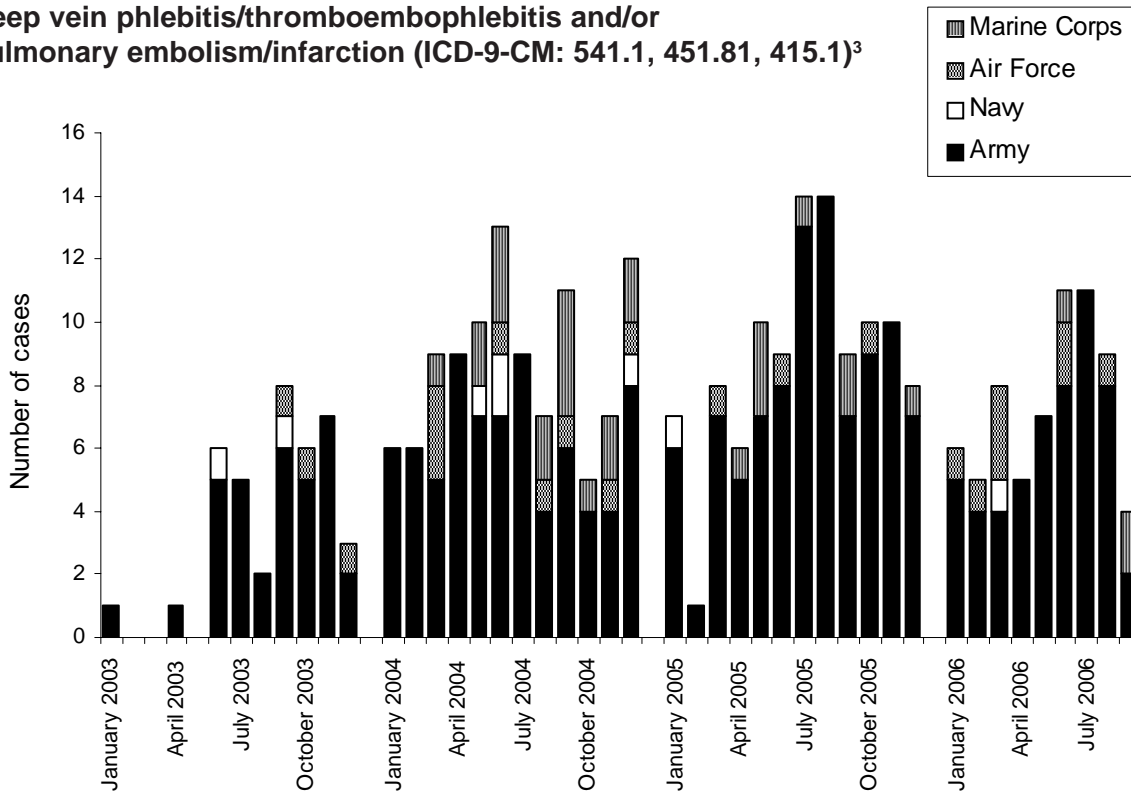


Footnotes:

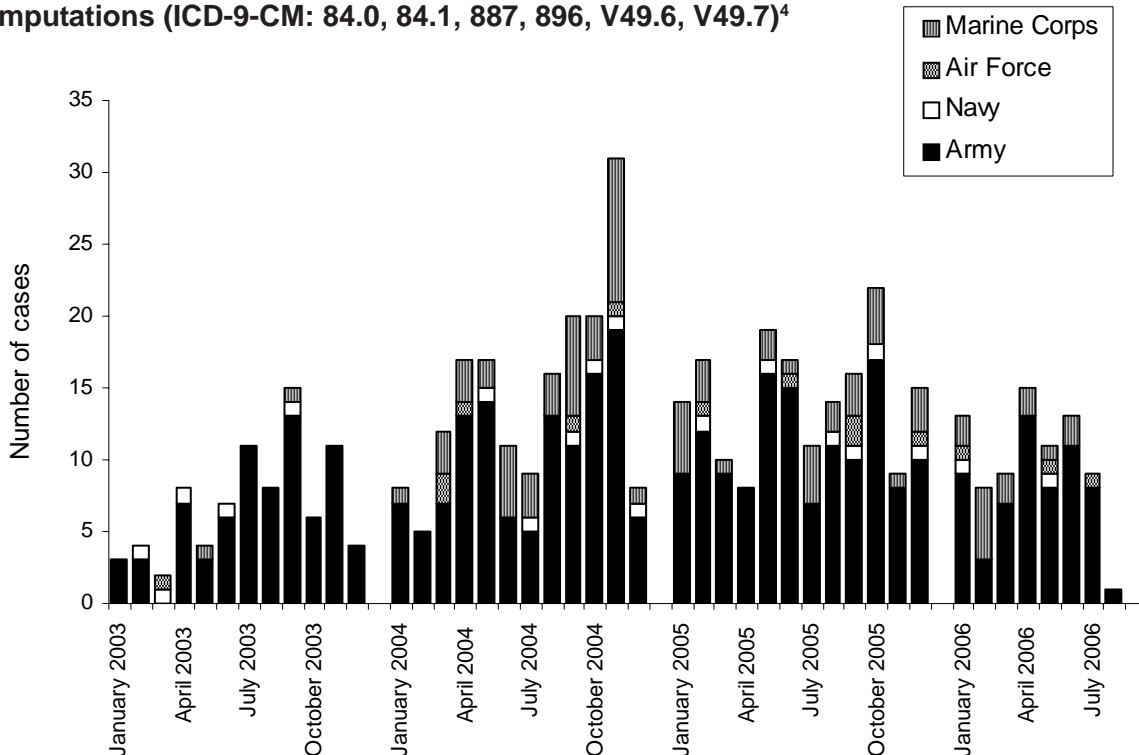
¹ Indicator diagnosis (one per individual) during a hospitalization, ambulatory visit, and/or from a notifiable medical event during/after service in OEF/OIF.
² Indicator diagnosis (one per individual) during a hospitalization while deployed to/within 30 days of returning from OEF/OIF.

(Con't.) Deployment related conditions of special surveillance interest, U.S. Armed Forces, by month and service, January 2003-September 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 September 30, 2005 and 2006**

Reporting location	Number of reports all events ³		Food-borne								Vaccine Preventable					
			Campylobacter		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	357	221	3	4	9	3	5	2	5	.	.	.	2	1	2	.
Aberdeen, MD	65	11	.	.	.	.	.	.	1	.	.	.	.	.	.	.
FT Belvoir, VA	309	283	8	11	.	.	8	9	1	2	.	.	1	.	.	5
FT Bragg, NC	1,318	1,358	6	10	.	.	18	19	3	.	.	.	.	.	.	.
FT Drum, NY	195	171	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FT Eustis, VA	250	193	.	.	.	.	1	.	.	.	.	.	.	.	.	.
FT Knox, KY	217	239	4	.	.	2	3	.	.	1	.	.	.	.	.	.
FT Lee, VA	154	280	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FT Meade, MD	101	98	.	.	.	.	1	2	.	.	.	.	.	.	1	.
West Point, NY	44	52	.	.	.	.	.	1	.	.	.	.	.	3	.	.
GREAT PLAINS																
FT Sam Houston, TX	388	314	.	.	.	1	5	1	2	.	.	2	7	4	.	.
FT Bliss, TX	331	435	1	.	4	2	3	9	6	2	.	3	.	1	.	1
FT Carson, CO	636	655	4	1	3	3	4	4	.	.	.	2	.	.	.	.
FT Hood, TX	1,956	1,356	6	4	1	1	8	10	4	10	.	.	.	.	.	1
FT Huachuca, AZ	57	73	.	.	.	.	.	11	.	.	.	.	.	.	.	.
FT Leavenworth, KS	40	36	.	.	.	2	1	.	1	.	.	.	.	.	.	.
FT Leonard Wood, MO	312	258	1	.	1	5	1	2	.	.	.	.	.	.	2	6
FT Polk, LA	211	210	.	2	1	1	2	1	.	.	.	2	1	.	.	.
FT Riley, KS	232	254	.	2	2	.	2	.	.	.	.	.	.	.	.	.
FT Sill, OK	136	193	.	.	1	.	.	1	1	.	.	.	.	.	.	2
SOUTHEAST																
FT Gordon, GA	350	372	.	.	.	.	.	.	.	.	.	.	7	11	2	1
FT Benning, GA	282	387	2	2	1	1	8	12	2	1	.	.	.	.	.	.
FT Campbell, KY	749	550	2	1	.	.	8	1	4	.	.	.	.	.	1	.
FT Jackson, SC	167	217	.	.	.	.	.	.	.	.	2	.	.	1	.	.
FT Rucker, AL	30	69	.	1	.	.	.	3	.	.	.	.	.	.	.	.
FT Stewart, GA	434	735	.	.	2	.	11	7	3	5	8	3	29	8	1	3
WESTERN																
FT Lewis, WA	432	470	4	.	.	.	1	5	.	.	.	.	.	1	.	1
FT Irwin, CA	59	90	.	.	.	.	.	.	.	.	.	.	1	.	.	.
FT Wainwright, AK	129	157	3	.	.	.	1	3	.	.	.	.	.	.	1	.
OTHER LOCATIONS																
Hawaii	654	788	31	33	6	1	10	10	3	1	1	1	1	.	1	1
Europe	1,295	692	14	11	1	1	20	17	1	.	3	2	4	1	3	1
Korea	421	520	.	.	.	.	.	.	.	.	1	.	1	3	.	5
Total	12,311	11,737	89	82	32	23	121	130	37	22	15	15	54	34	14	27

¹ Includes active duty servicemembers, dependents, and retirees.

² Events reported by October 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.

(Cont'd) Sentinel reportable events for all beneficiaries¹ at U.S. Army medical facilities, cumulative numbers² for calendar years through September 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	1	3	3	146	127	21	21	7	2	.	1	1	.	2	.	
Aberdeen, MD	4	.	.	.	24	8	3	1	2	.	.	.	.	.	.	.
FT Belvoir, VA	1	2	.	.	173	150	36	36	.	.	.	.	.	.	.	.
FT Bragg, NC	.	1	.	18	890	925	181	136	2	4	87	103	1	1	112	134	
FT Drum, NY	.	.	.	.	136	154	10	17	.	.	.	.	2	.	1	.
FT Eustis, VA	.	.	.	.	132	127	30	38	.	.	.	.	2	.	39	19
FT Knox, KY	1	6	1	.	130	167	20	36	.	2	.	.	1	3	20	11	
FT Lee, VA	1	.	.	.	124	213	23	37	.	.	.	.	1	.	5	3
FT Meade, MD	.	.	.	.	92	83	7	12	.	.	.	1	.	.	.	.
West Point, NY	6	17	.	.	25	21	2	.	.	.	.	.	1	1	3	2
GREAT PLAINS																	
FT Sam Houston, TX	.	.	.	.	236	229	67	62	7	6	.	.	.	.	11	1
FT Bliss, TX	.	.	1	1	139	241	31	43	4	4	.	.	.	.	14	9
FT Carson, CO	.	.	4	.	442	461	58	78	.	.	20	31	1	.	.	.	
FT Hood, TX	.	.	1	1	1,144	888	387	213	1	.	188	36	.	.	139	32	
FT Huachuca, AZ	.	.	.	.	40	53	14	8	.	.	.	.	.	1	2	.
FT Leavenworth, KS	.	.	.	.	32	30	3	4	.	.	.	.	1	.	2	.
FT Leonard Wood, MO	.	.	1	.	187	176	43	16	2	.	1	.	4	.	18	15	
FT Polk, LA	.	.	1	.	122	111	30	33	1	2	.	.	.	.	48	58
FT Riley, KS	.	1	.	.	130	207	47	25	.	.	.	.	5	.	11	10
FT Sill, OK	.	.	.	.	52	51	27	20	.	2	.	.	.	.	29	58
SOUTHEAST																	
FT Gordon, GA	.	.	2	.	209	266	23	57	1	.	.	3	.	.	53	4	
FT Benning, GA	.	.	2	.	136	231	44	65	1	.	.	.	1	.	83	67	
FT Campbell, KY	2	.	1	.	499	386	90	53	.	.	.	.	1	.	68	32
FT Jackson, SC	.	.	.	.	133	182	21	30	.	.	1	.	.	.	6	.
FT Rucker, AL	.	.	.	.	20	49	9	4	.	1	.	.	.	.	.	10
FT Stewart, GA	3	3	.	3	202	446	84	130	.	2	13	18	1	1	40	87	
WESTERN																	
FT Lewis, WA	1	.	5	9	293	362	45	57	.	1	60	24	.	.	2	.	
FT Irwin, CA	.	.	.	.	41	66	13	11	.	3	.	.	.	.	4	10
FT Wainwright, AK	.	.	1	17	91	97	9	14	1	.	.	.	14	16	.	.	
OTHER LOCATIONS																	
Hawaii	.	.	11	6	442	562	56	71	.	.	.	.	.	.	10	33
Europe	37	21	5	11	833	444	217	133	2	3	1	1	5	.	4	4	
Korea	.	.	7	13	336	407	54	67	2	3	.	.	3	2	13	12	
Total	57	52	46	82	7,631	7,920	1,705	1,528	33	35	371	218	45	25	739	611	

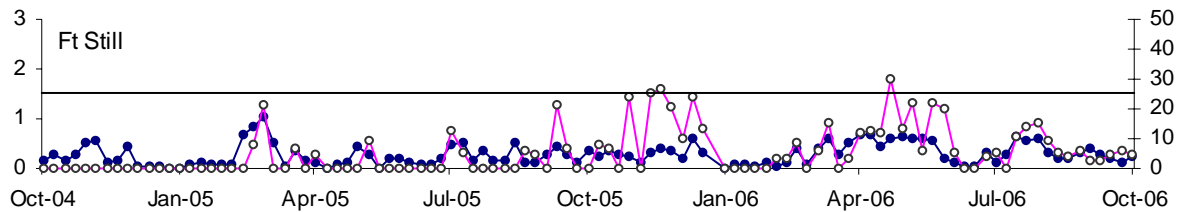
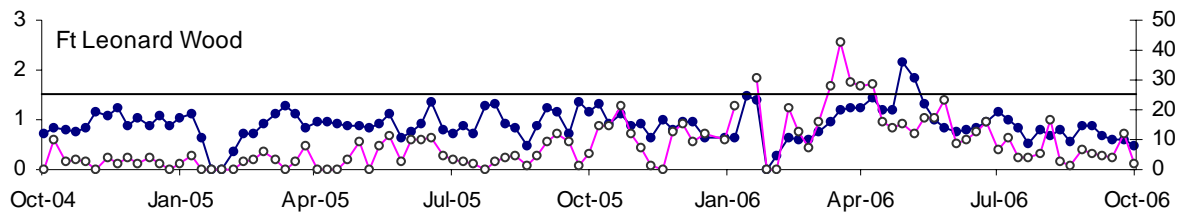
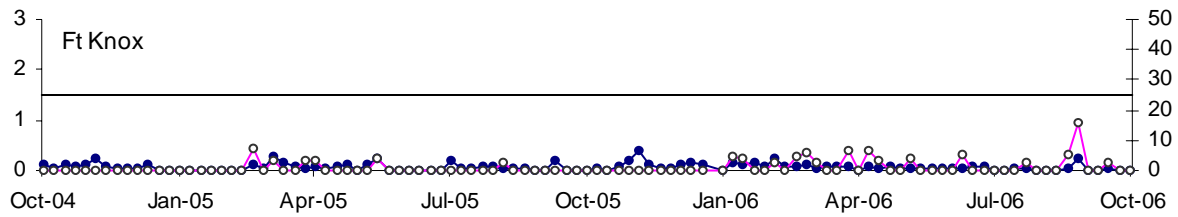
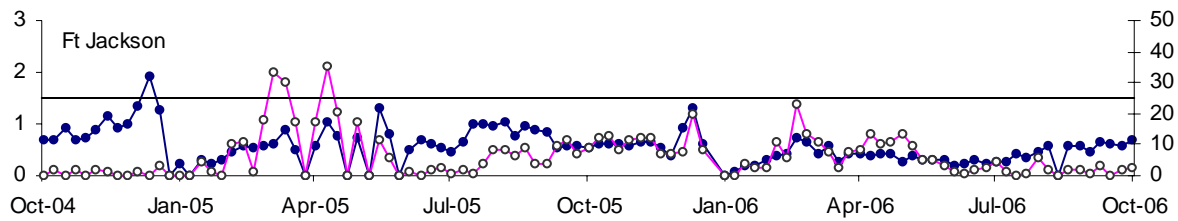
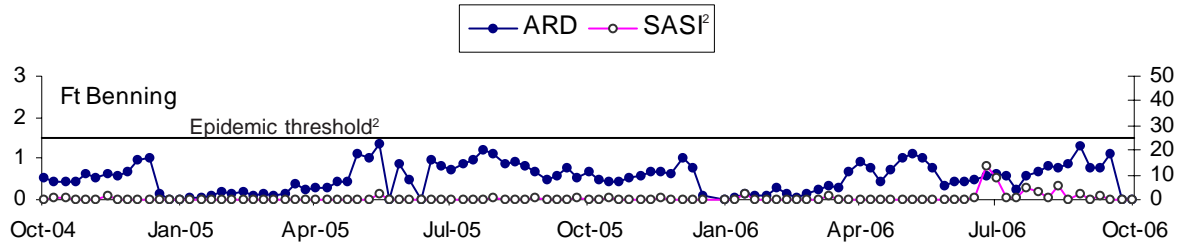
⁴ Primary and secondary.

⁵ Urethritis, non-gonococcal (NGU).

Note: Completeness and timeliness of reporting vary by facility.

Source: Army Reportable Medical Events System.

Acute respiratory disease (ARD) and streptococcal pharyngitis (SASI), Army basic training centers, by week through September 30, 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"

In the next MSMR:

Medical Experiences Within Six Months of
Return from Deployment in Relation to
Changes in Self-Rated Health from Pre- to
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