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Cold Weather Injuries Among Active Duty Soldiers, US Army, January 1997-July 2002

Cold weather injuries (CWIs) include a spectrum of clinically significant manifestations of intense and/or prolonged exposures to cold. CWI-related diagnoses include hypothermia, frostbite, immersion foot, and chilblains. Previous reports in the MSMR have documented overall recent increases in rates of CWIs among US soldiers.* In light of the US military's ongoing necessity to train and operate in harsh, cold environments, CWI prevention remains an important force health protection priority. This report examines trends in the nature, frequencies, and rates of CWIs among active duty soldiers of the US Army.

Methods. The overall surveillance period was 1 January 1997 to 31 July 2002. All records of hospitalizations, ambulatory visits, and reportable medical events with diagnosis codes indicative of a CWI (International Classification of Disease codes: 991.1-991.9 "effects of reduced temperature") were identified from the Defense Medical Surveillance System. All medical encounters with any diagnosis of a CWI were included in analyses (in contrast to past reports which included only primary diagnoses of CWIs)^{1,2}. Cases were summarized per type of CWI during each one-year interval of the surveillance period.

Results, in general. During the 5-year period from 1997-2001, there were 1,714 reported cases of CWIs among soldiers; in most (92.9%) of the cases, CWI was the primary diagnosis (table 1). During the one-year period from August 2001 through July 2002, there were 284 reported cases of CWIs; again, in most (90.1%) of the cases, CWI was the primary diagnosis (table 1). There was approximately a 25% decline in CWI diagnoses in 2001-2002 compared to the preceding 12-months.

From 1997-2001, the most frequently reported CWIs were frostbite, "unspecified" cases, and immersion foot (table 1). During 2001-2002, the most frequently reported CWIs were frostbite, "unspecified" cases, and chilblains (table 1). Frostbite accounted for approximately 37% of all reported CWIs during both periods (table 1).

Anatomic distribution. Overall, the anatomical sites most frequently affected by frostbite were the feet, hands, and face. In 2001-2002, approximately one-third (36%) of all frostbite cases affected the feet.

Age and grade. During 1997-2001 and 2001-2002, the highest rates of CWIs were among soldiers younger than 20, but approximately two-thirds of all CWI cases affected soldiers from 20-29 years old. Not surprisingly, enlisted soldiers had more cases and higher rates of CWIs than officers.

Gender. From 1997-2001, the rate of CWIs was approximately twice as high among females (122.6 cases per 100,000 person years [p-yrs]) compared to males (63.3 cases per 100,000 p-yrs); however, there were more cases reported among males than females. Similarly, during 2001-2002, the rate among females (110.4 per 100,000 p-yrs) was more than twice as high as among males (50.4 per 100,000 p-yrs); but there were more than twice as many cases among males than females.

Race/ethnicity. From 1997-2001, the rate of CWIs was consistently higher among Black soldiers compared to White soldiers. Similarly, during 2001-2002, the rate among Black soldiers (99.8 cases per 100,000 p-yrs) was more than twice as high as among White soldiers (41.6 cases per 100,000 p-yrs); however, there were similar numbers of cases among Black (n=123) and White (n=116) soldiers.

Installations. During the 2001-2002 period, the installations (in the continental US) with the most diagnoses of CWIs were the infantry training center (Fort Benning) and those with the largest combat forces (figure 1).

Editorial comment. It has long been recognized that CWIs can adversely impact military operations—and that CWIs are largely preventable. In World War I, for example, in response to high numbers of cold injuries, the British developed and implemented a protocol for CWI prevention³. Subsequent declines in CWIs among British soldiers were attributed to

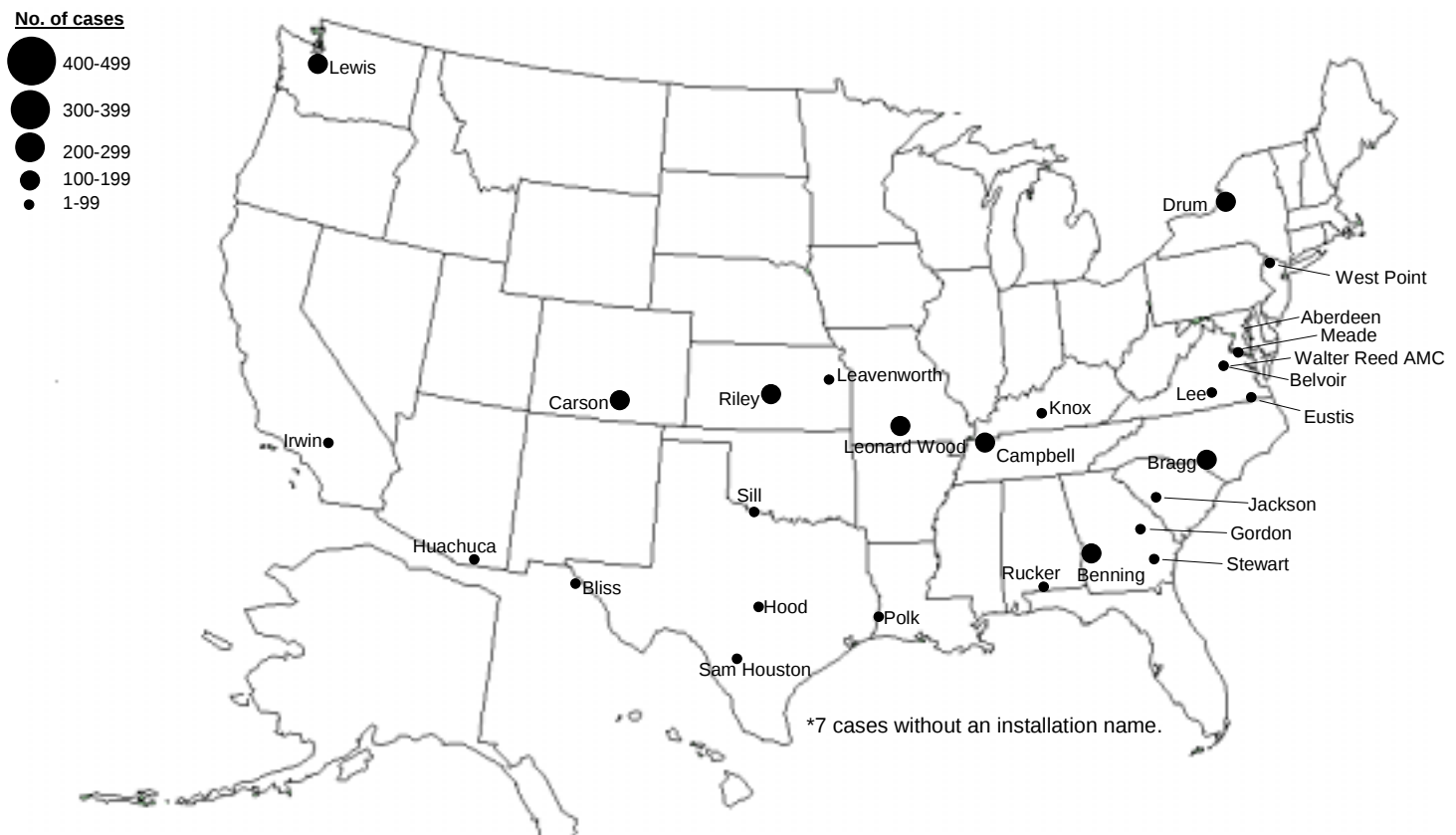
*Slight decrease in 2000-2001 season.

Table 1. Cold weather injuries, primary diagnosis only and any diagnosis (1st - 8th), active duty, US Army, 1997-2002

	1997-1998		1998-1999		1999-2000		2000-2001		2001-2002		Total	
	cases	rate*	cases	rate*	cases	rate*	cases	rate*	cases	rate*	cases	rate*
Primary diagnosis only												
Frostbite	114	23.7	135	28.7	118	25.1	127	26.8	99	20.8	593	25.0
Immersion foot	34	7.1	48	10.2	56	11.9	44	9.3	39	8.2	221	9.3
Chilblains	26	5.4	29	6.2	50	10.6	64	13.5	46	9.7	215	9.1
Hypothermia	26	5.4	23	4.9	18	3.8	24	5.1	16	3.4	107	4.5
Other/unspecified	80	16.6	99	21.0	119	25.3	102	21.5	56	11.8	456	19.2
Total	280	58.3	334	71.0	361	76.7	361	76.1	256	53.7	1592	67.1
Any diagnosis												
Frostbite	121	25.2	144	30.6	131	27.8	136	28.7	104	21.8	636	26.8
Immersion foot	36	7.5	50	10.6	67	14.2	45	9.5	42	8.8	240	10.1
Chilblains	27	5.6	29	6.2	52	11.0	67	14.1	52	10.9	227	9.6
Hypothermia	29	6.0	26	5.5	21	4.5	27	5.7	22	4.6	125	5.3
Other/unspecified	85	17.7	105	22.3	124	26.3	108	22.8	64	13.4	486	20.5
Total	298	62.0	354	75.3	395	83.9	383	80.7	284	59.6	1714	102.5

*Rates are per 100,000 person-years.

Figure 1. Frequency of cold injuries, by Army installation (continental US only), 1997-2002.



strict enforcement of effective preventive measures³. In turn, the U.S. Armed Forces adopted the British system of CWI prevention³.

Still, during World War II, General George S. Patton wrote, "The most serious menace confronting us today is...the weather which...may well destroy us through the incidence of trench foot."⁴ During the winter of 1950-51 in Korea, there were 5,600 medical evacuations of US troops due to cold injuries⁵. Recent studies⁶⁻⁸ have reported high rates of CWIs due to, for example, ignorance and poor monitoring of CWI preventive measures, particularly related to the feet.

Low temperatures, high/cool winds, dampness, and water immersion are factors that interact to increase CWI risks. As a result, CWIs can occur at temperatures above freezing due to, for example, wind chill effects and water immersion. During combat and training operations, soldiers are often exposed to multiple and/or severe CWI risks for extended periods. In Afghanistan, for example, temperatures have been recorded as low as -51°F. in the north-central mountains; there are an average of 10 to 30 days of snowfall per year in the mountain valleys and more in the high passes; and strong winds can occur throughout the year⁹. During operations in such environments, even when temperatures are above freezing, CWI preventive measures are critical to protect the health and operational effectiveness of soldiers. Current guidelines for preventing cold injuries among soldiers in general are posted at the USACHPPM website: <http://chppm-www.apgea.army.mil/coldinjury/>.

For the past several years, the most frequently diagnosed cold weather injuries among soldiers have been frostbite^{1,2}, and the most frequently affected anatomical sites have been the feet. A recent review of CWIs among soldiers in Alaska found that hands, feet, and ears, respectively, were the most commonly affected sites of frostbite¹⁰; and a report of a cluster of frostbite injuries among Special Forces soldiers who were training in the Arctic cited the hands, ears, and exposed facial skin as the most commonly affected sites⁸. Clearly, the anatomic sites at greatest

risk of frostbite depend on the nature and duration of cold exposures and the nature and degree of CWI protection.

Finally, in the continental US, installations with large numbers of infantry trainees/combat forces (e.g., Forts Benning, Bragg, Campbell, Carson, Drum, Lewis, Riley) tend to have the most intensive training-related exposures to cold injury risk and the highest numbers of CWIs. In addition, in recent years, CWI rates have been consistently higher among female, Black, and teenaged soldiers compared to their counterparts; yet, more cases have been reported among male, white, and 20-29 year old soldiers. The findings suggest that CWI prevention training, as well as strict enforcement of CWI countermeasures, are indicated for all soldiers at all installations. However, increased monitoring of young, Black, and female enlisted soldiers may be warranted during intensive and/or prolonged exposures to cold environments.

Data analysis and report by CN King, MPH, Ph.D. and Garret Lum, MPH

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**Table 2. Frostbite by affected anatomical site (all diagnosis levels),
active duty, US Army, 1997-2002**

Year**	Foot		Hand		Face		Other/unspecified	
	cases	rate*	cases	rate*	cases	rate*	cases	rate*
1997-1998	21	4.4	11	2.3	1	0.2	88	18.3
1998-1999	33	7.0	9	1.9	2	0.4	100	21.3
1999-2000	39	8.3	12	2.5	1	0.2	79	16.8
2000-2001	46	9.7	21	4.4	5	1.1	64	13.5
2001-2002	37	7.8	25	5.2	4	0.8	38	8.0
Total	176	7.4	78	3.3	13	0.5	369	15.6

*Rates are per 100,000 person-years.

**Years are from October through September.

**Table 3. Demographic characteristics, soldiers with a cold weather injury
(any diagnosis level), active duty, US Army, 1997-2002**

	1997-1998		1998-1999		1999-2000		2000-2001		2001-2002		Total	
	cases	rate*	cases	rate*	cases	rate*	cases	rate*	cases	rate*	cases	rate*
Gender												
Male	225	55.0	281	70.1	296	73.9	271	67.4	203	50.4	1276	63.3
Female	73	102.6	73	105.0	99	140.5	112	154.0	81	110.4	438	122.6
Race/ethnicity												
White	130	44.9	149	53.1	157	56.5	179	64.4	116	41.6	731	52.0
Black	138	107.8	168	134.7	194	156.0	168	133.9	123	99.8	791	126.4
All others	30	47.7	37	57.0	44	64.2	36	50.5	45	60.7	192	56.2
Age group												
< 20	46	117.5	57	143.7	59	142.8	62	137.9	43	100.5	267	128.5
20-29	183	71.4	222	88.5	259	103.7	235	93.6	187	74.0	1086	86.2
30-39	53	37.1	69	49.8	71	51.6	76	55.8	42	30.7	311	45.0
> 40	16	37.7	6	14.5	6	14.2	10	23.6	12	27.3	50	23.5
Grade												
E1-E4	192	88.8	245	113.9	273	126.1	255	114.8	188	85.2	1153	105.7
E5-E9	95	51.3	95	53.7	96	54.3	94	53.3	65	36.3	445	49.7
O1-O3, W1-W3	8	15.8	11	22.4	23	48.1	30	63.4	26	54.3	98	40.4
O4-O9, W4-W5	3	10.8	3	10.5	3	10.4	4	14.0	5	17.5	18	12.6
Total	298	62.0	254	75.3	395	83.9	383	80.7	284	59.6	1714	72.2

*Rates are per 100,000 person-years.

Cellulitis Among Active Duty Servicemembers, US Armed Forces, 1998-2001

Intact skin is an effective barrier against invasion by pathogenic microorganisms. However, breakdowns of the physical integrity of skin (e.g., punctures, lacerations, abrasions, blisters, ulcers, stings, bites, surgical procedures) and/or of immunologic function (e.g., chronic diseases, immunosuppressive drugs) can allow microorganisms to invade and proliferate in underlying tissues.¹ Cellulitis is acute, non-contagious inflammation of the connective tissue of skin.¹ In adults, cellulitis is usually caused by staphylococcal or streptococcal infections¹⁻⁴; however, it may also be caused by other organisms including *Pasteurella multocida* (e.g., from bites of dogs and cats)^{1,5} and *Erysipelothrix rhusiopathiae* (e.g., from handling fish, shellfish, swine, poultry).^{1,6} In military populations, cellulitis is generally preceded by friction blisters or other minor traumatic injuries.^{2,3,7-10}

Signs and symptoms of cellulitis include redness, pain, tenderness, warmth, and a tight, glossy appearance of affected skin. Systemic manifestations may include fever, chills, sweating, and fatigue. Untreated cellulitis can progress to tissue necrosis, lymphangitis, necrotizing fasciitis, sepsis, toxic shock, and disseminated infections (e.g., meningitis).¹

This report documents frequencies, rates, trends, and correlates of risk of cellulitis among US servicemembers, particularly during their first 6 months of military service, during a 4-year surveillance period.

Methods. The Defense Medical Surveillance System was searched to identify all incident ambulatory visits and hospitalizations of active duty servicemembers with a primary diagnosis of cellulitis (ICD-9-CM codes: 681 "cellulitis and abscess of finger and toe" and 682 "other cellulitis and abscess") between 1 January 1998 and 31 December 2001. Each affected individual was counted only once per diagnostic code.

Results. A total of 104,738 incident diagnoses of cellulitis were reported among servicemembers between 1 January 1998 and 31 December 2001. The overall incidence rate was 19.1 per 100,000 person-years. There was a slight increase in rates from 1998

to 2001 (table 1).

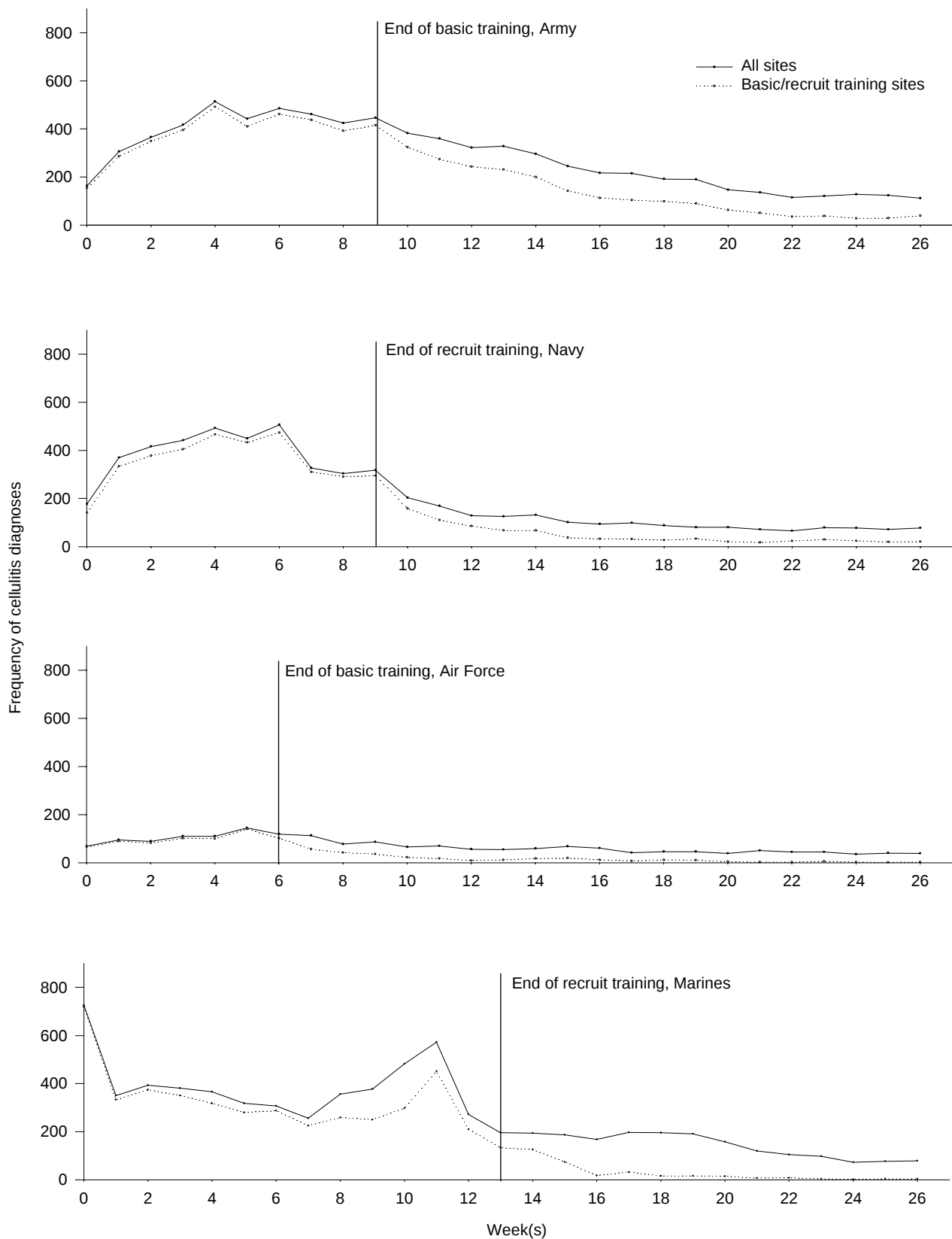
Ninety-seven percent of all cases were diagnosed in ambulatory clinics. The anatomic sites most frequently reported among ambulatory cases were "other/unspecified" (62.4%), toe (11.2%), leg (5.5%), and foot (5.1%) (data not shown). Of cases that required hospitalization, the most frequently affected sites were the leg (39.6%), arm (12.9%), foot (11.6%), and hand (9.3%) (data not shown).

During the surveillance period, the incidence rate among servicemembers younger than 20 years of age was 2-to 3-times higher than rates among older servicemembers. Females had higher rates than males, and black servicemembers had lower rates than whites and all others. Rates among Marines were consistently higher than rates among members of other services (table 1).

More than one-fifth (n=22,275) of all cases occurred among individuals with 6 months or less of military service; and more than 70% of all cases during the first 6 months of service occurred at basic/recruit training installations. In each service, the highest numbers of cases during the first 6 months of service occurred during weeks that corresponded to basic/recruit training (figure 1). Specifically, in the Army, the numbers of cases increased each week to a peak in week 4 ("marksmanship week"); in the Navy, the numbers of cases increased each week to a plateau in weeks 4 through 6; in the Air Force, the numbers of cases gradually increased through week 5; and among Marines, there were spikes in numbers of cases in week 0 (receiving and forming) and week 11 (the which includes up to 40 miles of marching during the "Crucible" training exercise) (figure 1).

Editorial comment. During combat operations, especially in tropical climates, skin disorders are often significant causes of ambulatory visits, hospitalizations, medical evacuations, and lost combat strength. For example, in Vietnam, of all medical conditions, skin disorders were the leading cause of outpatient visits and the third leading cause of hospitalizations⁴. In the Southwest Pacific theater of World War II and in Vietnam, skin disorders accounted for 10% and 15% of all medical

Figure 1. Cellulitis diagnoses at basic/recruit training installations among active duty servicemembers, by week of service (up to 26 weeks), 1998-2001.



evacuations, respectively⁴. More recently, in Bosnia-Herzegovina, Kosovo, and Southwest Asia, skin disorders were among the leading causes of outpatient visits of deployed US servicemembers.¹¹

In contrast, in non-deployed settings, skin disorders are generally not leading sources of morbidity or lost duty time among servicemembers. For example, in 2001, skin disorders were the ninth and eleventh most frequent causes of ambulatory visits and hospitalizations of servicemembers, respectively.^{12,13} However, among skin disorders, cellulitis is a leading cause of hospitalizations;¹³ and in two particular settings—basic/recruit training and special operations training—cellulitis, particularly of the lower extremities, is consistently a significant threat to the health and operational effectiveness of trainees.^{3,7,8-10} Factors that may increase cellulitis risk among basic/recruit and special operations trainees include rigorous activities; extreme physical exertion; blisters and other minor injuries of the skin; sleep deprivation, reduced food intake, stiff and/or poor fitting footwear; and prolonged exposures to wet environments (e.g., rain, streams, swamps).^{3,4,7-10}

A number of recommendations have been made to reduce cellulitis risk during Army Ranger

training.^{7,9,10} The recommendations have included the use of protective devices (i.e., knee pads, shin guards, elbow pads) to reduce repetitive minor injuries, early detection and aggressive antibiotic treatment of infections, and mandatory daily breaks for personal hygiene.^{7,9,10} If effective in Army Ranger training, such preventive measures may have value during other rigorous training and combat activities.

Among basic/recruit trainees, cellulitis has often been associated with friction blisters of the heels, ankles, and toes. Several authors have noted that repeated rubbing of skin against rigid surfaces (e.g., new footwear) produces frictional forces that can cause blisters which can lead to cellulitis.^{2,3,8,14,15} A study among Navy recruits documented the highest rates of cellulitis during the first two weeks of training—when new shoes and boots were being broken in⁸; and a study among Air Force recruits reported that “march cellulitis” was associated with prolonged marching in stiff new footwear.³ Not surprisingly, the anatomic distributions of cellulitis and friction blisters among basic trainees have been found to be nearly identical.^{2,3,8}

However, the findings of this surveillance report are not entirely consistent with those of earlier

Table 1. Cellulitis among active duty members, US Armed Forces, 1998-2001

	1998		1999		2000		2001		Total	
	cases	rate*	cases	rate*	cases	rate*	cases	rate*	cases	rate*
Gender										
Male	21014	17.6	20805	17.8	22215	19.1	22449	19.3	86483	18.5
Female	4396	22.7	4370	22.7	4841	24.6	4648	23.0	18255	23.3
Race/ethnicity										
White	17531	18.8	17303	19.2	18424	20.8	18480	21.0	71738	19.9
Black	4589	16.6	4512	16.6	4866	17.7	4807	17.3	18774	17.1
All others	3290	18.4	3360	18.0	3766	19.1	3810	18.5	14226	18.5
Age groups										
< 20	4273	37.9	3829	32.9	5165	41.5	5081	39.2	18348	38.0
20-29	12829	18.0	13100	18.8	13418	19.3	13736	19.5	53083	18.9
30-39	6296	14.5	6092	14.6	6228	15.3	6012	15.2	24628	14.9
> 40	2012	15.6	2154	16.7	2245	17.1	2268	17.3	8679	16.7
Service										
Army	9470	19.9	8925	19.1	8789	18.6	9562	20.2	36746	19.4
Navy	7072	18.8	6433	17.7	7612	20.9	6771	18.4	27888	18.9
Air Force	5084	13.9	5701	16.0	6086	17.4	6229	17.9	23100	16.3
Marines	3784	22.1	4116	24.1	4569	26.7	4535	26.4	17004	24.8
Total	25410	18.3	25175	18.5	27056	19.9	27097	19.9	104738	19.1

*Rate per 100,000 person-years.

studies. For example, the surveillance data suggest that rates of cellulitis are generally higher during later weeks of basic/recruit training. If so, infections of blisters acquired during rigorous field training activities^{7,14,15} (e.g., road marching, land navigation, kneeling, crawling)—rather than marching while breaking in new boots and shoes—may now be the most important sources of cellulitis among basic trainees/recruits. Field studies may be useful to validate the findings of this surveillance and to identify new opportunities to prevent blisters and cellulitis, especially among basic/recruit trainees.

Analysis and report by Garret R. Lum, MPH, Analysis Group, Army Medical Surveillance Activity.

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Installation-specific Lost Duty Time Reports: Hospitalization and Ambulatory Encounters at the Installation Level—Overall Experience of the US Army, August 2002

Lost duty secondary to illnesses and injuries is an important obstacle to the readiness and operational effectiveness of the Armed Forces. Illness and injury risks can vary in relation to individual, daily activity, and environmental exposure factors. In turn, specific illnesses and injuries may be more or less likely to occur at certain installations relative to others. To the extent possible and reasonable, prevention programs should be tailored at installation levels to counter the illnesses and injuries that account for the most lost duty time among servicemembers assigned to them.

The Army Medical Surveillance Activity (AMSA) generates monthly service and installation-specific reports that summarize the experiences at 32 Army, 19 Marine Corps, 39 Navy, and 78 Air Force installations and regions. Installation-specific illness and injury lost duty reports are posted at the AMSA website (< www.amsa.army.mil >). This report presents an example of a monthly lost duty time report—for all soldiers on active duty in the US Army during August 2002.

Methods. All data used to produce monthly installation-specific reports are derived from the Defense Medical Surveillance System. For summary purposes, all medical encounters of all active duty service members are identified using inpatient and outpatient records by location and service. Medical encounters are grouped into major diagnostic categories based on the ICD-9-CM codes of primary diagnoses.

Lost duty time due to hospitalizations is summarized as the total number of days of inpatient care (bed days) based on reported dates of admissions and discharges. Lost duty related to ambulatory clinic visits is summarized based on standard disposition codes: sick at home/quarters (“quarters”), released with duty limitations (“light duty”), and released without limitations. Rates of ambulatory visits by disposition are calculated by dividing the total number of visits with each disposition by the number of active duty service members who are permanently assigned to military units that are based at the installations or regions of interest.

Results. During August 2002, among 485,247 active duty soldiers, there were 7,251 lost duty days due to hospitalizations. The diagnostic categories that accounted for the most lost duty days due to hospitalizations were “mental disorders” (1,914 bed days) and “pregnancy complications” (1,176 bed days). These two categories accounted for nearly 43% of all hospital-related lost duty days. Injuries and poisonings accounted for 1,106 hospital bed days; and nearly one-third of all injury-related bed days were due to injuries of the trunk (including the back) (data not shown).

During August 2002, there were 6,193 ambulatory clinic visits that resulted in “quarters” dispositions and 51,812 that resulted in “light duty” dispositions. The diagnostic categories that accounted for the most “quarters” dispositions were respiratory disorders (1,179 visits), and “ill-defined conditions” (745 visits). Injuries and poisonings accounted for 789 visits with “quarters” dispositions; and injuries to the trunk (including the back) accounted for nearly one-third of all injury-related “quarters” dispositions (data not shown).

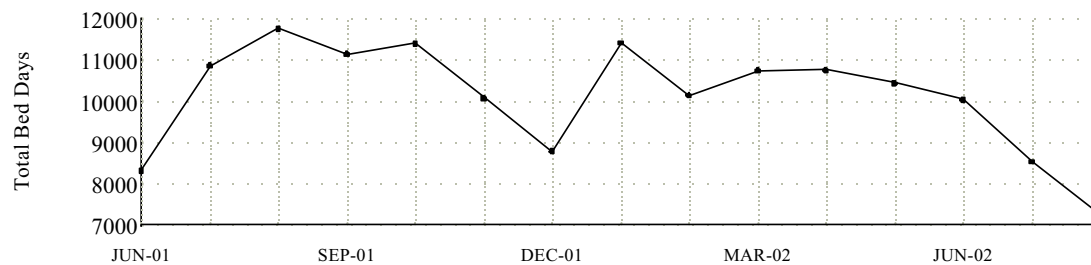
The diagnostic categories that accounted for the most “light duty” dispositions were musculoskeletal disorders (20,816 visits) and other contact with health services (13,156 visits). These categories accounted for approximately two-thirds of all visits with “light duty” dispositions. Injuries to the knee accounted for the largest number of injury-related “light duty” dispositions (data not shown).

Editorial comment. Installation-specific lost duty time reports are designed to give installation commanders and staffs insights into the relative impacts of lost duty time secondary to hospitalizations and ambulatory visits for various categories of illnesses and injuries. These reports may be useful for targeting illness and injury prevention strategies; in turn, they may contribute to improving the health, readiness, and operational effectiveness of servicemembers.

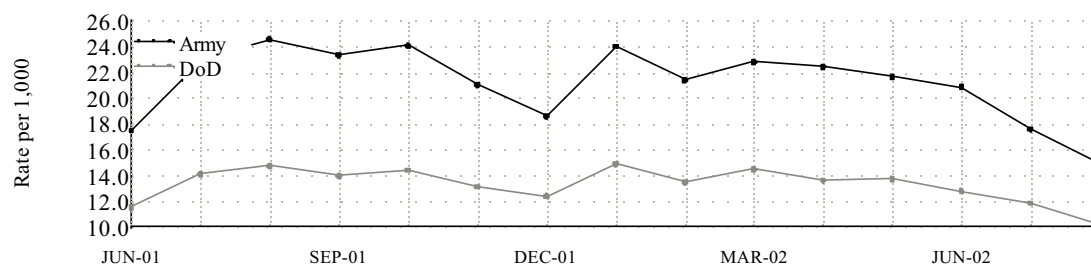
Analysis and report by Barbara E. Nagaraj, MPH, Analysis Group, Army Medical Surveillance Activity.

Lost duty days secondary to hospitalization (bed days),
Army active duty personnel, August 2002

Bed days per month among Army active duty personnel



Bed days per 1,000 Army active duty personnel compared to DoD*



Bed days by major diagnostic category for the month of August 2002

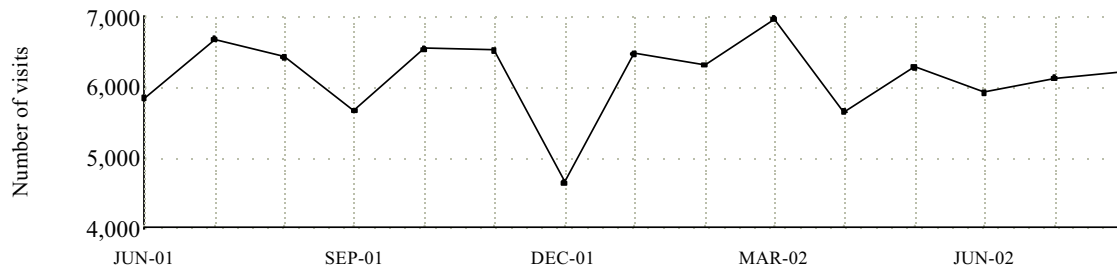
Army					DoD			
Rank	Cause	Number of days	% of all days	Cum. %	Cause	Number of days	% of all days	Cum. %
	All Causes	7,251	100.0		All Causes	14,262	100.0	
1	Mental disorder	1,914	26.4	26.4	Mental disorder	3,241	22.7	22.7
2	Pregnancy complications	1,176	16.2	42.6	Pregnancy complications	3,035	21.3	44.0
3	Injury and poisoning	1,106	15.3	57.9	Injury and poisoning	1,906	13.4	57.4
4	Digestive system	613	8.5	66.3	Digestive system	1,200	8.4	65.8
5	Musculoskeletal system	434	6.0	72.3	Musculoskeletal system	908	6.4	72.1
6	Respiratory system	351	4.8	77.1	Respiratory system	660	4.6	76.8
7	Ill-defined conditions	331	4.6	81.7	Ill-defined conditions	612	4.3	81.1
8	Skin diseases	250	3.4	85.2	Skin diseases	450	3.2	84.2
9	Other contact with health services	203	2.8	88.0	Neoplasms	418	2.9	87.2
10	Genitourinary system	189	2.6	90.6	Genitourinary system	387	2.7	89.9
11	Circulatory system	166	2.3	92.9	Other contact with health services	372	2.6	92.5
12	Neoplasms	162	2.2	95.1	Circulatory system	367	2.6	95.0
13	Nervous system	162	2.2	97.3	Nervous system	252	1.8	96.8
14	Infectious and parasitic diseases	124	1.7	99.0	Infectious and parasitic diseases	234	1.6	98.5
15	Endocrine, nutrition, and immunity	24	0.3	99.4	Endocrine, nutrition, and immunity	94	0.7	99.1
16	Hematologic disorders	24	0.3	99.7	Hematologic disorders	74	0.5	99.6
17	Congenital anomalies	22	0.3	100.0	Congenital anomalies	52	0.4	100.0

* Weighted to account for differences in age, sex, and grade
Note: All figures based on location of assignment only.

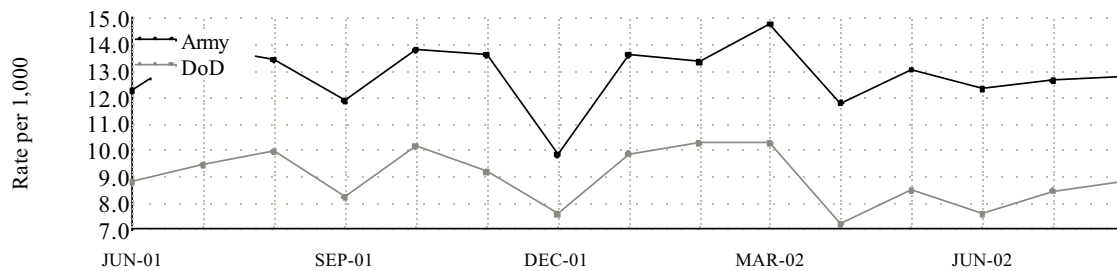
Source: DMSS
Initial Report Date: October 25, 2002
Data Updated on: November 25, 2002

Clinic visits resulting in quarters,
Army active duty personnel, August 2002

Clinic visits resulting in quarters by month among Army active duty personnel



Clinic visits resulting in quarters per 1,000 Army active duty personnel compared to DoD*



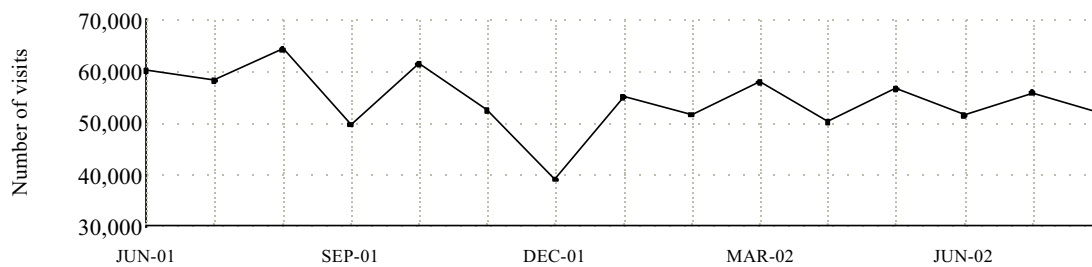
Major diagnostic categories resulting in quarters after clinic visit for the month of August 2002

Army					DoD			
Rank	Cause	Number of visits	% of all visits	Cum.%	Cause	Number of visits	% of all visits	Cum.%
	All Causes	6,193	100.0		All Causes	12,329	100.0	
1	Respiratory system	1,179	19.0	19.0	Respiratory system	3,029	24.6	24.6
2	Injury and poisoning	789	12.7	31.8	Infectious and parasitic diseases	1,770	14.4	38.9
3	Ill-defined conditions	745	12.0	43.8	Ill-defined conditions	1,438	11.7	50.6
4	Digestive system	638	10.3	54.1	Digestive system	1,214	9.8	60.4
5	Infectious and parasitic diseases	595	9.6	63.7	Injury and poisoning	1,206	9.8	70.2
6	Musculoskeletal system	574	9.3	73.0	Musculoskeletal system	913	7.4	77.6
7	Nervous system	451	7.3	80.3	Nervous system	755	6.1	83.7
8	Other contact with health services	420	6.8	87.0	Other contact with health services	660	5.4	89.1
9	Genitourinary system	238	3.8	90.9	Skin diseases	432	3.5	92.6
10	Skin diseases	231	3.7	94.6	Genitourinary system	376	3.0	95.7
11	Mental disorder	93	1.5	96.1	Endocrine, nutrition, and immunity	163	1.3	97.0
12	Endocrine, nutrition, and immunity	84	1.4	97.5	Mental disorder	147	1.2	98.2
13	Pregnancy complications	84	1.4	98.8	Pregnancy complications	119	1.0	99.1
14	Circulatory system	46	0.7	99.6	Circulatory system	68	0.6	99.7
15	Neoplasms	17	0.3	99.9	Neoplasms	23	0.2	99.9
16	Congenital anomalies	5	0.1	99.9	Hematologic disorders	10	0.1	100.0
17	Hematologic disorders	4	0.1	100.0	Congenital anomalies	6	0.0	100.0

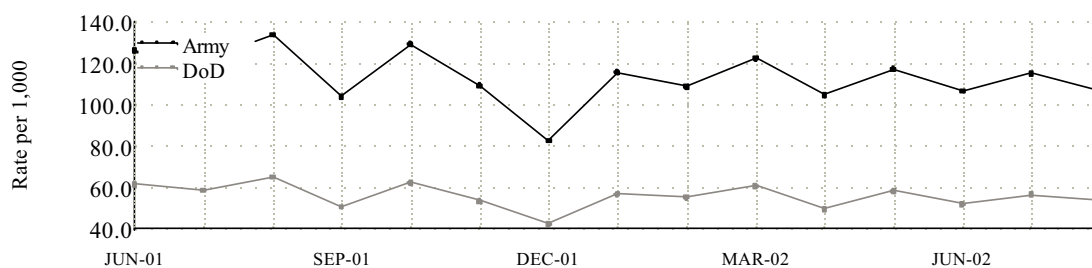
* Weighted to account for differences in age, sex, and grade
Note: All figures based on location of assignment only.

Clinic visits resulting in light duty, Army active duty personnel, August 2002

Clinic visits resulting in light duty by month among Army active duty personnel



Clinic visits resulting in light duty per 1,000 Army active duty personnel compared to DoD*



Major diagnostic categories resulting in light duty after clinic visit for the month of August 2002

Army					DoD			
Rank	Cause	Number of visits	% of all visits	Cum. %	Cause	Number of visits	% of all visits	Cum. %
	All Causes	51,812	100.0		All Causes	75,443	100.0	
1	Musculoskeletal system	20,816	40.2	40.2	Musculoskeletal system	27,498	36.4	36.4
2	Other contact with health services	13,156	25.4	65.6	Other contact with health services	18,373	24.4	60.8
3	Injury and poisoning	10,226	19.7	85.3	Injury and poisoning	15,207	20.2	81.0
4	Respiratory system	2,062	4.0	89.3	Respiratory system	3,996	5.3	86.3
5	Skin diseases	1,173	2.3	91.5	Skin diseases	1,955	2.6	88.8
6	Ill-defined conditions	1,155	2.2	93.8	Ill-defined conditions	1,916	2.5	91.4
7	Nervous system	636	1.2	95.0	Nervous system	1,374	1.8	93.2
8	Digestive system	591	1.1	96.1	Mental disorder	1,306	1.7	94.9
9	Infectious and parasitic diseases	440	0.8	97.0	Digestive system	1,020	1.4	96.3
10	Mental disorder	415	0.8	97.8	Infectious and parasitic diseases	922	1.2	97.5
11	Genitourinary system	309	0.6	98.4	Genitourinary system	543	0.7	98.2
12	Endocrine, nutrition, and immunity	278	0.5	98.9	Endocrine, nutrition, and immunity	372	0.5	98.7
13	Congenital anomalies	196	0.4	99.3	Circulatory system	289	0.4	99.1
14	Circulatory system	162	0.3	99.6	Congenital anomalies	268	0.4	99.5
15	Neoplasms	98	0.2	99.8	Neoplasms	191	0.3	99.7
16	Pregnancy complications	66	0.1	99.9	Pregnancy complications	155	0.2	99.9
17	Hematologic disorders	33	0.1	100.0	Hematologic disorders	58	0.1	100.0

* Weighted to account for differences in age, sex, and grade
Note: All figures based on location of assignment only.

Source: DMSS
Initial Report Date: October 25, 2002
Data Updated on: November 25, 2002

**Sentinel reportable events for all beneficiaries¹ at US Army medical facilities,
cumulative numbers² for calendar years through October 31, 2001 and 2002**

Reporting location	Number of reports all events ³		Food-borne								Vaccine Preventable					
			Campylo-bacter		Giardia		Salmonella		Shigella		Hepatitis A		Hepatitis B		Varicella	
	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002
NORTH ATLANTIC																
Washington, DC Area	99	90	1	3	3	2	3	-	3	4	-	2	-	-	2	-
Aberdeen, MD	39	29	-	-	-	1	-	-	-	-	-	-	1	1	-	-
FT Belvoir, VA	62	64	5	4	4	-	2	3	-	-	-	-	-	-	-	-
FT Bragg, NC	1,071	1,357	2	7	-	-	3	6	1	4	-	-	5	1	2	-
FT Drum, NY	116	98	1	1	-	-	1	-	-	-	-	-	-	-	-	-
FT Eustis, VA	146	151	1	1	-	-	1	1	-	1	-	-	-	1	1	2
FT Knox, KY	163	136	-	3	1	1	2	1	-	-	-	-	-	-	1	-
FT Lee, VA	167	156	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Meade, MD	45	64	-	-	-	-	-	-	-	-	-	-	-	-	-	1
West Point, NY	43	79	1	-	-	-	1	-	-	-	2	2	-	1	-	-
GREAT PLAINS																
FT Sam Houston, TX	225	193	-	-	1	-	-	-	-	-	-	-	-	-	-	-
FT Bliss, TX	113	116	1	-	3	1	-	-	-	1	-	-	1	2	1	-
FT Carson, CO	440	342	-	6	3	2	2	1	-	-	-	-	1	1	-	-
FT Hood, TX	1,290	1,544	1	1	-	-	1	4	-	-	-	-	8	-	2	-
FT Huachuca, AZ	27	45	1	-	-	-	-	-	-	-	-	-	-	-	1	-
FT Leavenworth, KS	16	26	-	-	-	-	1	-	-	1	-	-	-	-	-	-
FT Leonard Wood, MO	148	167	1	-	-	-	-	3	-	-	1	-	-	-	6	4
FT Polk, LA	173	147	-	-	-	-	-	1	-	1	-	-	-	-	-	-
FT Riley, KS	149	198	-	-	-	-	1	-	-	-	-	-	1	1	-	1
FT Sill, OK	302	228	-	1	-	-	1	-	-	-	-	-	1	-	2	-
SOUTHEAST																
FT Gordon, GA	129	103	-	-	-	-	-	-	-	-	1	-	1	-	-	-
FT Benning, GA	265	306	1	-	1	1	2	6	-	-	-	-	-	-	5	3
FT Campbell, KY	508	423	3	1	6	1	2	1	1	2	-	-	-	-	-	2
FT Jackson, SC	245	221	-	-	-	-	-	-	-	-	-	-	5	1	2	1
FT Rucker, AL	51	47	-	1	-	-	1	-	-	-	-	-	-	-	-	-
FT Stewart, GA	327	368	-	-	-	1	1	1	-	1	-	-	1	-	-	1
WESTERN																
FT Lewis, WA	456	466	3	1	-	-	4	1	-	-	-	-	1	-	-	-
FT Irwin, CA	59	44	-	-	-	-	-	-	-	-	2	-	1	1	2	-
FT Wainwright, AK	73	79	-	1	-	-	-	-	-	-	-	-	-	-	-	-
OTHER LOCATIONS																
Hawaii	456	440	16	19	5	3	8	4	3	-	-	-	1	1	-	-
Europe	1,173	1,526	25	20	-	-	32	15	1	1	3	1	8	6	7	5
Korea	46	457	-	-	-	-	1	5	-	-	-	1	-	-	2	1
Total	8,622	9,710	63	70	27	13	70	53	9	16	9	6	36	17	36	21

1. Includes active duty servicemembers, dependents, and retirees.

2. Events reported by November 7, 2001 and 2002.

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 US Army medical facilities, cumulative numbers² for calendar years through October 31, 2001 and 2002

Reporting location	Arthropod-borne				Sexually Transmitted								Environmental			
	Lyme Disease		Malaria		Chlamydia		Gonorrhea		Syphilis ³		Urethritis ⁴		Cold		Heat	
	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002	2001	2002
NORTH ATLANTIC																
Washington, DC Area	1	3	-	1	45	47	14	10	6	4	-	-	-	-	-	2
Aberdeen, MD	-	1	-	-	25	23	8	3	-	-	2	-	2	-	-	-
FT Belvoir, VA	-	2	-	-	35	37	10	11	-	1	-	-	-	-	3	2
FT Bragg, NC	-	-	9	4	409	938	223	179	-	-	215	111	7	-	188	106
FT Drum, NY	-	-	-	2	86	60	23	21	1	-	-	-	2	-	-	14
FT Eustis, VA	-	1	-	-	89	110	42	31	-	-	-	-	-	-	10	3
FT Knox, KY	-	-	1	-	125	97	28	29	2	-	-	-	-	-	2	3
FT Lee, VA	-	1	-	-	123	129	44	24	-	-	-	-	-	-	-	2
FT Meade, MD	-	3	-	-	33	51	11	6	1	-	-	2	-	-	-	-
West Point, NY	26	17	-	-	10	13	1	8	-	-	1	-	-	-	1	37
GREAT PLAINS																
FT Sam Houston, TX	-	-	1	-	174	149	34	35	-	-	2	-	1	-	8	2
FT Bliss, TX	1	-	4	-	70	85	23	15	-	1	-	-	-	-	5	1
FT Carson, CO	-	-	-	2	313	235	44	35	-	-	76	54	-	1	-	-
FT Hood, TX	-	-	3	5	656	810	267	324	2	3	285	348	-	-	60	40
FT Huachuca, AZ	-	-	-	-	22	38	3	5	-	-	-	-	-	-	-	2
FT Leavenworth, KS	-	-	-	1	11	18	2	6	-	-	-	-	-	-	-	-
FT Leonard Wood, MO	-	-	-	1	85	114	27	27	-	-	5	2	3	-	15	12
FT Polk, LA	-	-	1	1	123	98	44	40	-	2	-	-	-	-	2	1
FT Riley, KS	-	-	1	2	91	137	26	41	-	-	-	-	3	11	25	3
FT Sill, OK	1	-	1	2	160	122	68	39	-	-	52	45	-	-	12	19
SOUTHEAST																
FT Gordon, GA	-	1	-	1	109	77	10	14	-	1	-	-	-	-	2	1
FT Benning, GA	1	-	1	1	131	116	48	79	-	1	1	-	-	-	43	94
FT Campbell, KY	2	-	1	3	384	298	99	82	1	1	-	-	-	1	8	24
FT Jackson, SC	-	-	-	-	151	178	53	35	3	1	-	-	-	3	27	2
FT Rucker, AL	-	-	-	-	37	27	8	14	-	-	-	-	-	-	4	5
FT Stewart, GA	-	2	1	-	80	211	98	108	-	1	135	-	-	-	11	42
WESTERN																
FT Lewis, WA	-	-	-	3	279	304	62	54	1	2	101	97	4	-	-	-
FT Irwin, CA	-	-	-	-	28	31	11	10	-	-	-	-	-	-	13	1
FT Wainwright, AK	-	1	-	-	58	56	2	5	-	-	-	-	12	13	-	-
OTHER LOCATIONS																
Hawaii	-	-	-	2	359	323	48	64	-	1	1	-	-	-	-	10
Europe	4	6	3	5	894	1105	169	336	1	6	2	3	9	4	5	8
Korea	-	-	13	18	7	319	16	95	1	-	1	1	-	3	4	12
Total	36	38	40	54	5,202	6,356	1,566	1,785	19	25	879	663	43	36	448	448

3. Primary and secondary.

4. Urethritis, non-gonococcal (NGU).

Note: Completeness and timeliness of reporting vary by facility.

Source: Army Reportable Medical Events System.

Varicella among Active Duty Soldiers, US Army, October 1999-September 2002

Varicella zoster virus (VZV) is the cause of chickenpox and shingles.¹ VZV is efficiently transmitted from person-to-person; and as a result, most Americans are infected with and acquire immunity to VZV during childhood.¹ However, if large numbers of young adults from varied backgrounds are placed in close living conditions (e.g., basic training), risks of VZV infections and outbreaks are increased.²⁻⁶

Compared to children with chickenpox, adults tend to have more severe clinical manifestations, more complications, and higher case-fatality rates.¹ In addition, outbreaks of chickenpox in military settings often have significant operational impacts.²⁻⁶ Because of its public health and military operational consequences, chickenpox in a US servicemember is a reportable medical event.

In March 1995, a live attenuated varicella vaccine was licensed for use in the US. The vaccine was estimated to be 70%-90% effective in preventing chickenpox and more than 95% effective in preventing severe disease from VZV infection. In July 1996, the Advisory Committee on Immunization Practices, Centers for Disease Control and Prevention, recommended that vaccination "be considered for susceptible persons who are at high risk of exposure" such as "military personnel."⁷ In November 1999, the Department of Defense issued a policy that requires immunization of military accessions and health care workers who are susceptible to infection with VZV and offers vaccination to "other susceptible active duty members, especially nonpregnant women of childbearing age and men living in households with young children."⁸

This report summarizes cases of varicella among active duty soldiers at basic training and other installations from October 1999 (shortly before the DoD policy was issued) through September 2002.

Methods. All diagnoses and case reports of varicella (ICD-9-CM: 052) among active duty soldiers were identified from records of hospitalizations, ambulatory visits, and reportable medical events from 1 October 1999 to 30 September 2002. For analysis purposes, only one case per individual was included.

Results. During the surveillance period, there were 828 cases of varicella among active duty soldiers. Overall, the number of cases per calendar quarter significantly declined during the period (figure 1). Case frequencies generally declined at both basic training and other installations; however, the decline in cases overall was most attributable to declines in incidence at non-basic training installations (figure 1).

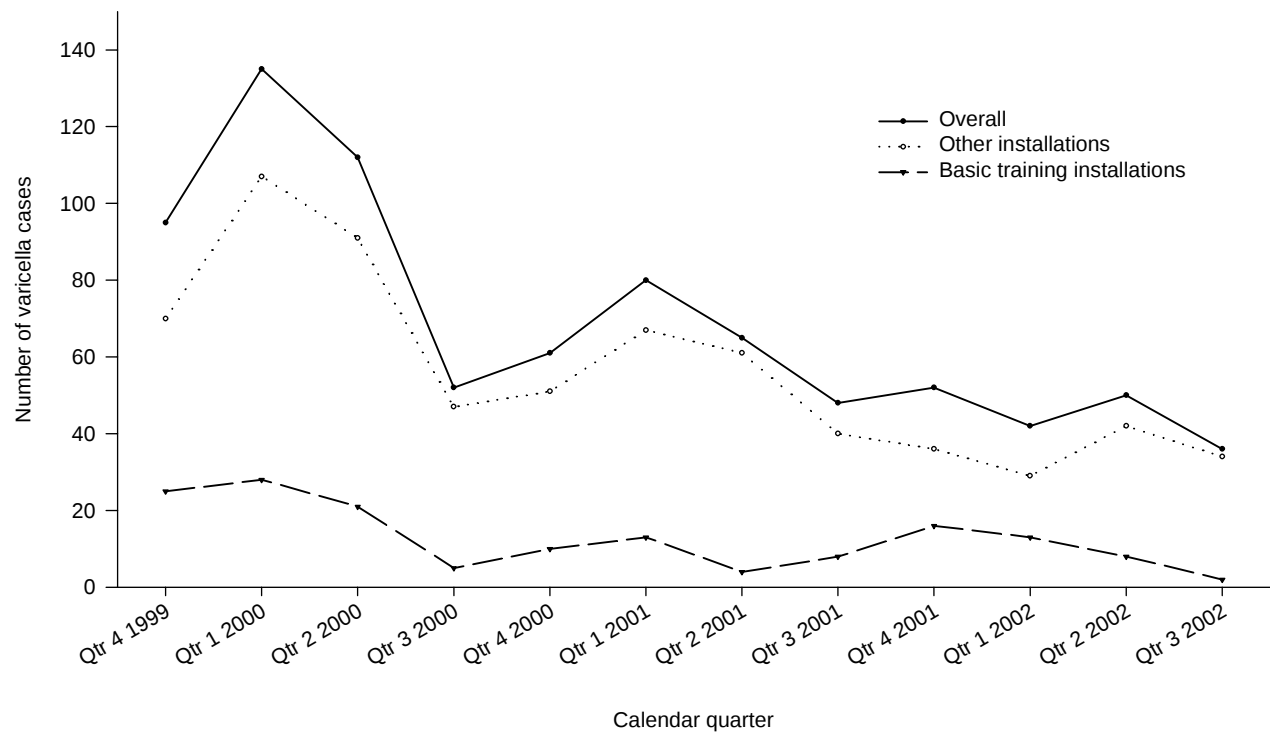
Editorial comment. Hospitalizations of US servicemembers for varicella declined during the early and mid-1990s.^{5,6} This summary documents that since the 4th quarter of calendar year 1999 (when DoD issued its varicella vaccination policy), the incidence of varicella among active duty soldiers has significantly declined; in addition, most of the decline in incidence overall was attributable to declines in cases at non-basic training installations. The effect of VZV vaccination on the declining incidence trend is unclear.

Data summary provided by Garret Lum, MPH, Analysis Group, Army Medical Surveillance Activity.

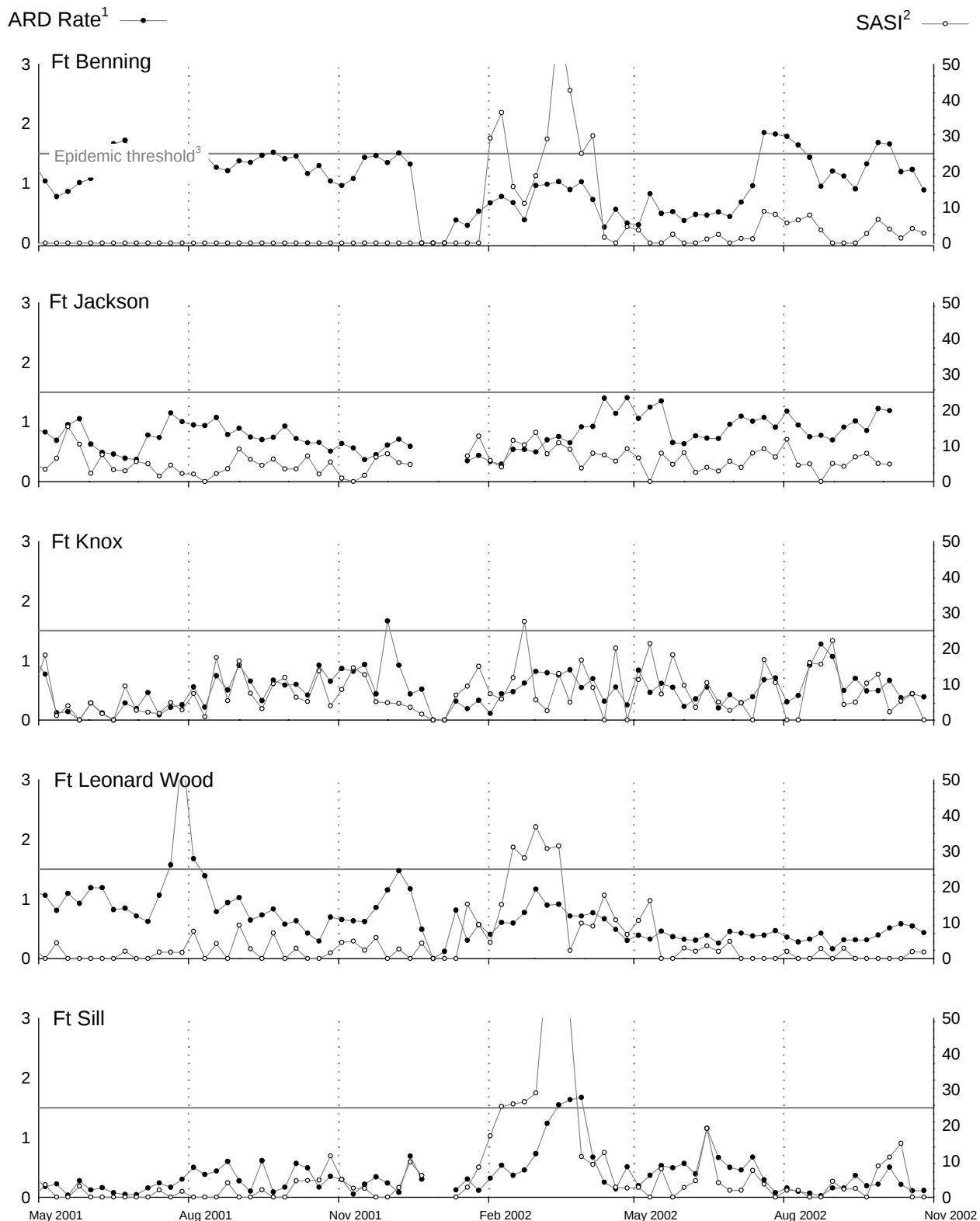
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Figure 1. Varicella cases among active duty soldiers, at basic training and other installations, by calendar quarter, October 1999 - September 2002.



Acute respiratory disease (ARD) and streptococcal pharyngitis (SASI), Army Basic Training Centers by week through October 31, 2002



¹ARD rate = cases per 100 trainees per week

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

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

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