MSMR

Medical Surveillance Monthly Report

Vol. 6 No. 5 **May / June 2000**

USACHPPM

Contents

Data in the MSMR are provisional, based on reports and other sources of data available to the Army Medical Surveillance Activity (AMSA). Notifiable events are reported by date of onset (or date of notification when date of onset is absent). Only cases submitted as confirmed are included.

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Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
JUN 2000		**00-05-2000 to 00-06-2000**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Medical Surveillance Monthly Report (MSMR). Volume 6, Number 5, May/June 2000	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **U.S. Army Center for Health Promotion and Preventive Medicine,Armed Forces Health Surveillance Center (AFHSC),2900 Linden Lane, Suite 200,Silver Spring,MD,20910**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

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

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**16**	

Surveillance Trends

Skin Cancer, US Armed Forces, 1998-1999

Skin cancers, including nonmelanomas and melanomas, are the most common malignancies in the United States.[1,2] Nonmelanoma skin cancers, predominantly basal cell and squamous cell carcinomas, account for 95% of all skin cancer cases.[3] The American Cancer Society (ACS) predicts that this year there will be 1 million new cases of nonmelanoma and 2,000 deaths attributable to it in the United States.[3] Melanoma, the most lethal form of skin cancer, causes 80% of all skin cancer deaths.[4] The ACS predicts that this year there will be 47,000 new cases of melanoma and 7,700 deaths.[4]

The risk of skin cancer is highest among whites, particularly fair-skinned individuals who are exposed to prolonged ultraviolet light (e.g. sunlight, x-rays).[5] Intense exposure during childhood appears to be more strongly associated with the development of skin cancer than does exposure during adulthood.[6-8] In general, the incidence of skin cancers and the attributable mortality are higher in the southern regions of the United States than in the northern ones.[5]

This study reports the incidence of outpatient visits for skin cancers in the US Armed Forces. Additionally, high-risk groups for these malignancies are identified.

Methods. The study population of 2.8 million persons included all individuals who served on active duty in the US Armed Forces between October 1997 and September 1999. Outpatient visits for skin cancers were identified by searching the primary diagnostic field in the Standard Ambulatory Data Record (SADR). As defined by the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM), the diagnostic codes for melanoma and nonmelanoma were 172 and 173, respectively.[9] Incident cases were defined as the first outpatient visit, per 3-digit ICD-9-CM diagnosis, for individuals who had more than one visit for skin cancer during the surveillance period.

Demographic variables examined included year of visit, gender, ethnicity, age, level of education, and region of childhood residence. Region of childhood residence was determined by the first three digits of the study individual's social security number (SSN).[10] Prior to 1972, SSNs represented the state in which the card was issued.[10] Since 1972, SSNs have been based on the zip code of the applicant's mailing address.[10]

All analyses were population-based using the entire military population as the denominator. Incidence rates were calculated as the ratio of incident outpatient visits for skin cancer to the number of person-years the study population was at risk. Poisson regression was used to determine the adjusted incidence of outpatient visits for skin cancer while simultaneously controlling for the effects of all covariates

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

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Table 1. Incident outpatient diagnoses of melanoma, US Armed Forces, October 1997 - September 1999

Characteristic	Incident visits	Person-years	Crude rate per 100,000	Crude rate ratio	Adjusted rate ratio (95% CI)
Total	381	2,761,438	13.8	-	-
Year of visit					
1999	158	1,363,769	11.6	1.0	1.0
1998	223	1,397,669	16.0	1.4	1.4 (1.1 - 1.7)
Gender					
Men	311	2,374,924	13.1	1.0	1.0
Women	70	386,514	18.1	1.4	1.8 (1.4 - 2.3)
Race/ethnicity					
Black	4	551,604	0.7	1.0	1.0
Hispanic	5	195,741	2.6	3.7	3.9 (1.0 - 14.6)
Other	7	166,001	4.2	6.0	4.2 (1.2 - 14.6)
White	365	1,848,092	19.8	28.3	25.0 (9.3 - 67.3)
Age					
< 25	46	1,062,356	4.3	1.0	1.0
25 - 29	60	580,716	10.3	2.4	2.2 (1.5 - 3.2)
30 - 34	71	453,446	15.7	3.7	3.3 (2.2 - 4.8)
35 - 39	92	406,531	22.6	5.3	4.7 (3.3 - 6.8)
40 - 44	59	178,822	33.0	7.7	6.0 (4.0 - 9.0)
> 44	53	79,567	66.6	15.5	9.8 (6.4 - 15.1)
Education					
High school	212	2,275,293	9.3	1.0	1.0
College	169	486,145	34.8	3.7	1.7 (1.3 - 2.1)
Region of childhood residence (based on SSN)					
Northeast	65	523,030	12.4	1.0	1.0
North Central	72	538,528	13.4	1.1	1.0 (0.7 - 1.4)
Northwest	24	124,550	19.3	1.6	1.5 (1.0 - 2.5)
Southeast	88	742,785	11.8	0.9	1.3 (0.9 - 1.8)
South Central	47	403,652	11.6	0.9	1.2 (0.8 - 1.8)
Southwest	85	428,893	19.8	1.6	2.1 (1.5 - 2.9)

(i.e., year of visit, gender, ethnicity, age, level of education, and region of childhood residence).

Results, melanoma (table 1). During the 2-year surveillance period, there were 381 (13.8 per 100,000 person-years) incident outpatient visits for melanoma among individuals having more than one outpatient visit for melanoma. After adjusting for all other covariates, women had an incidence nearly twice that of men. The incidence was 25 times higher among whites than blacks, and approximately 4 times higher among Hispanics and the 'other' ethnic group than blacks. Incidence increased with age, with the oldest age group (> 44 years) having an incidence nearly 10 times higher than the youngest age group (< 25 years) (figure 1, page 7). Individuals with a college education had an incidence nearly twice as high as those with a high school education. Melanoma incidence was associated with region of childhood residence, as indicated by SSNs (table 2). In general, incidence rates were higher among residents of the south compared to the north; they were also higher among residents of the west compared to those of the central or east. Childhood residents of the Southwest region (highest incidence) had a twofold higher incidence than residents of the Northeast or North Central regions (lowest incidence).

Continued on page 7

Table I. Sentinel reportable events, US Army medical treatment facilities[1]
Cumulative events for all beneficiaries, calendar year through May 31, 1999 and 2000[2]

Reporting facility	Number of reported events[c]		Environmental				Food- and Water-borne							
			Cold		Heat		Campylobacter		Giardia		Salmonella		Shigella	
	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000
NORTH ATLANTIC RMC														
Walter Reed AMC, DC	88	86	-	-	-	-	3	-	4	4	-	5	-	1
Aberdeen Prov. Grd., MD	22	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Belvoir, VA	88	81	-	-	-	-	1	6	4	1	4	2	1	-
FT Bragg, NC	415	444	8	-	13	2	2	-	2	-	8	1	-	-
FT Drum, NY	108	91	15	9	-	-	1	-	2	-	-	-	-	-
FT Eustis, VA	94	87	1	-	-	-	-	3	-	-	2	-	-	-
FT Knox, KY	122	97	1	-	-	-	-	-	-	-	1	1	-	-
FT Lee, VA	77	104	-	-	-	-	-	-	-	-	-	-	-	-
FT Meade, MD	38	39	-	-	-	-	-	-	-	-	-	1	-	-
West Point, NY	12	34	-	1	-	-	-	-	-	-	-	3	-	-
GREAT PLAINS RMC														
Beaumont AMC, TX	116	138	-	-	3	1	-	-	-	-	1	4	-	1
Brooke AMC, TX	233	140	-	-	-	1	-	-	-	2	2	3	4	5
FT Carson, CO	321	288	2	-	-	-	3	-	3	-	4	-	-	1
FT Hood, TX	342	678	-	1	-	5	-	1	1	-	1	-	-	2
FT Huachuca, AZ	9	23	-	-	-	1	-	-	-	-	-	-	-	-
FT Leavenworth, KS	-	8	-	-	-	-	-	-	-	-	-	1	-	-
FT Leonard Wood, MO	75	60	3	3	1	-	-	-	-	-	1	-	-	-
FT Polk, LA	102	107	-	-	-	-	-	-	-	-	-	-	-	-
FT Riley, KS	141	118	1	22	-	1	-	-	-	-	-	-	-	-
FT Sill, OK	144	96	-	-	1	-	-	-	-	-	-	-	-	-
SOUTHEAST RMC														
Eisenhower AMC, GA	89	93	1	-	1	-	-	-	-	-	-	-	-	-
FT Benning, GA	150	122	-	-	15	8	1	-	1	1	-	2	1	-
FT Campbell, KY	225	209	2	2	1	-	9	-	-	2	6	3	27	9
FT Jackson, SC	146	227	-	-	-	-	-	-	-	-	-	-	-	-
FT Rucker, AL	26	36	-	-	-	-	-	-	-	-	-	1	-	-
FT Stewart, GA	165	204	-	-	1	-	-	-	-	-	1	-	-	-
WESTERN RMC														
Madigan AMC, WA	280	294	-	-	-	-	1	1	4	1	5	-	-	1
FT Irwin, CA	10	19	-	-	-	-	-	-	-	-	-	-	-	-
FT Wainwright, AK	72	37	42	4	-	-	-	-	-	-	-	-	-	-
OTHER LOCATIONS														
Tripler, HI	207	329	-	-	-	1	5	14	5	6	3	3	1	-
Europe	246	649	3	5	-	-	6	3	-	1	3	11	1	-
Korea	177	229	8	2	-	-	-	-	-	-	-	1	-	-
Total	**4,340**	**5,167**	**87**	**49**	**36**	**20**	**32**	**28**	**26**	**18**	**42**	**42**	**35**	**20**

1. Main and satellite clinics.
2. Events reported by June 7, 1999 and 2000.
3. Tri-Service Reportable Events, Version 1.0, July 1999.

Table I. (Cont'd) Sentinel reportable events, US Army medical treatment facilities[1] Cumulative events for all beneficiaries, calendar year through May 31, 1999 and 2000[2]

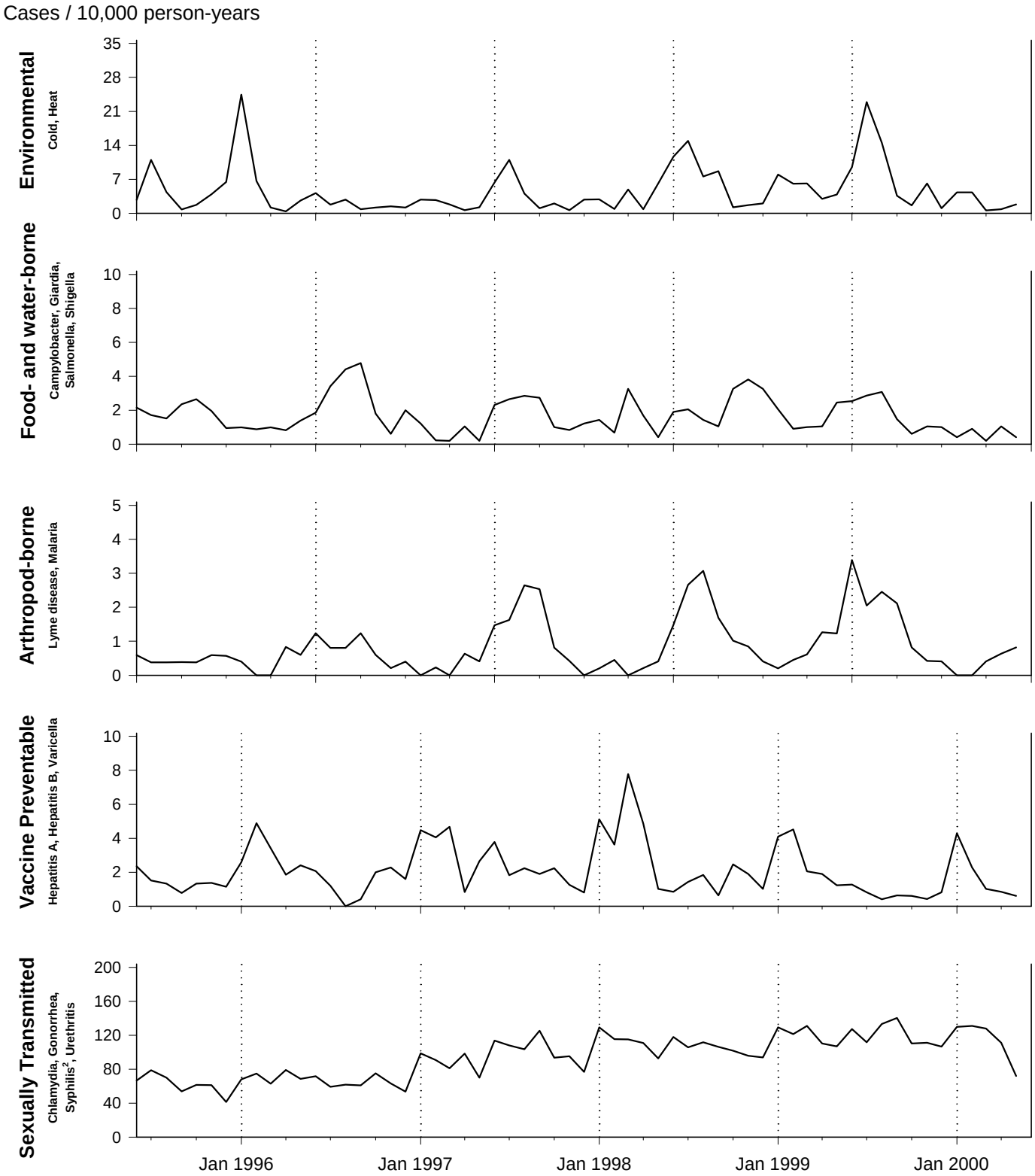
Arthropod-borne				Vaccine Preventable						Sexually Transmitted							
Lyme Disease		Malaria		Hepatitis A		Hepatitis B		Varicella		Chlamydia		Gonorrhea		Syphilis[d]		Urethritis	
Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000	Cum. 1999	Cum. 2000
1	2	1	-	1	1	-	1	2	2	38	21	6	12	1	1	1	-
-	-	-	-	-	-	-	-	1	-	7	-	12	-	-	-	2	-
-	-	-	-	-	-	-	3	-	-	53	55	24	7	-	2	-	-
-	1	2	2	-	-	-	-	1	1	214	192	100	104	-	1	64	139
-	-	1	-	-	-	-	-	6	3	52	54	28	22	-	-	2	2
-	1	-	-	-	-	-	1	1	-	69	66	19	12	-	-	-	-
-	-	-	-	-	-	-	1	1	4	87	67	31	22	-	1	-	-
-	-	-	-	-	-	-	-	-	-	61	82	15	22	1	-	-	-
-	-	-	-	-	-	-	-	1	-	33	28	3	5	-	-	-	1
1	2	-	-	-	-	-	-	1	2	9	21	1	4	-	-	-	-
-	-	1	-	-	2	-	-	2	1	88	107	10	15	-	-	8	3
-	-	-	1	2	-	3	-	2	2	75	69	27	20	-	2	1	-
-	-	-	1	-	-	1	-	1	-	236	235	32	37	-	-	37	13
-	-	-	-	-	-	1	1	1	2	199	375	72	128	3	-	60	142
-	-	-	-	1	-	-	-	-	-	7	16	1	6	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-
-	-	-	-	-	-	1	-	8	10	38	30	12	12	1	-	7	5
-	-	-	-	-	-	-	-	-	-	84	99	14	8	2	-	-	-
-	-	-	-	-	-	-	-	-	-	105	69	35	25	-	1	-	-
-	-	-	-	-	-	6	-	6	2	74	65	34	12	-	-	19	12
-	-	-	-	-	-	1	-	1	1	73	82	7	7	-	-	-	-
-	-	-	1	1	-	-	-	1	6	57	65	48	33	1	3	-	-
-	-	2	1	-	-	-	-	1	2	124	111	53	74	-	1	-	-
-	-	-	-	-	-	-	-	4	3	120	198	19	25	3	-	-	-
-	-	-	-	-	-	-	-	-	-	19	25	7	10	-	-	-	-
-	-	1	-	-	-	-	-	4	-	50	85	40	48	-	-	68	70
-	-	1	1	1	-	-	1	-	-	176	192	40	26	1	-	44	57
-	-	-	-	-	-	2	-	-	-	8	19	-	-	-	-	-	-
-	-	-	-	-	-	1	-	2	-	22	32	3	1	-	-	-	-
-	-	1	-	-	1	-	1	-	1	120	221	34	38	-	-	-	-
-	-	1	-	-	-	2	5	1	7	185	501	32	105	-	1	1	-
-	-	5	1	-	-	14	1	-	1	124	194	6	10	7	8	-	4
2	**6**	**16**	**8**	**6**	**4**	**32**	**15**	**48**	**50**	**2,607**	**3,381**	**765**	**850**	**20**	**21**	**314**	**448**

4. Primary and Secondary.

Note: Completeness and timeliness of reporting varies by facility.

Source: Army Reportable Medical Events System.

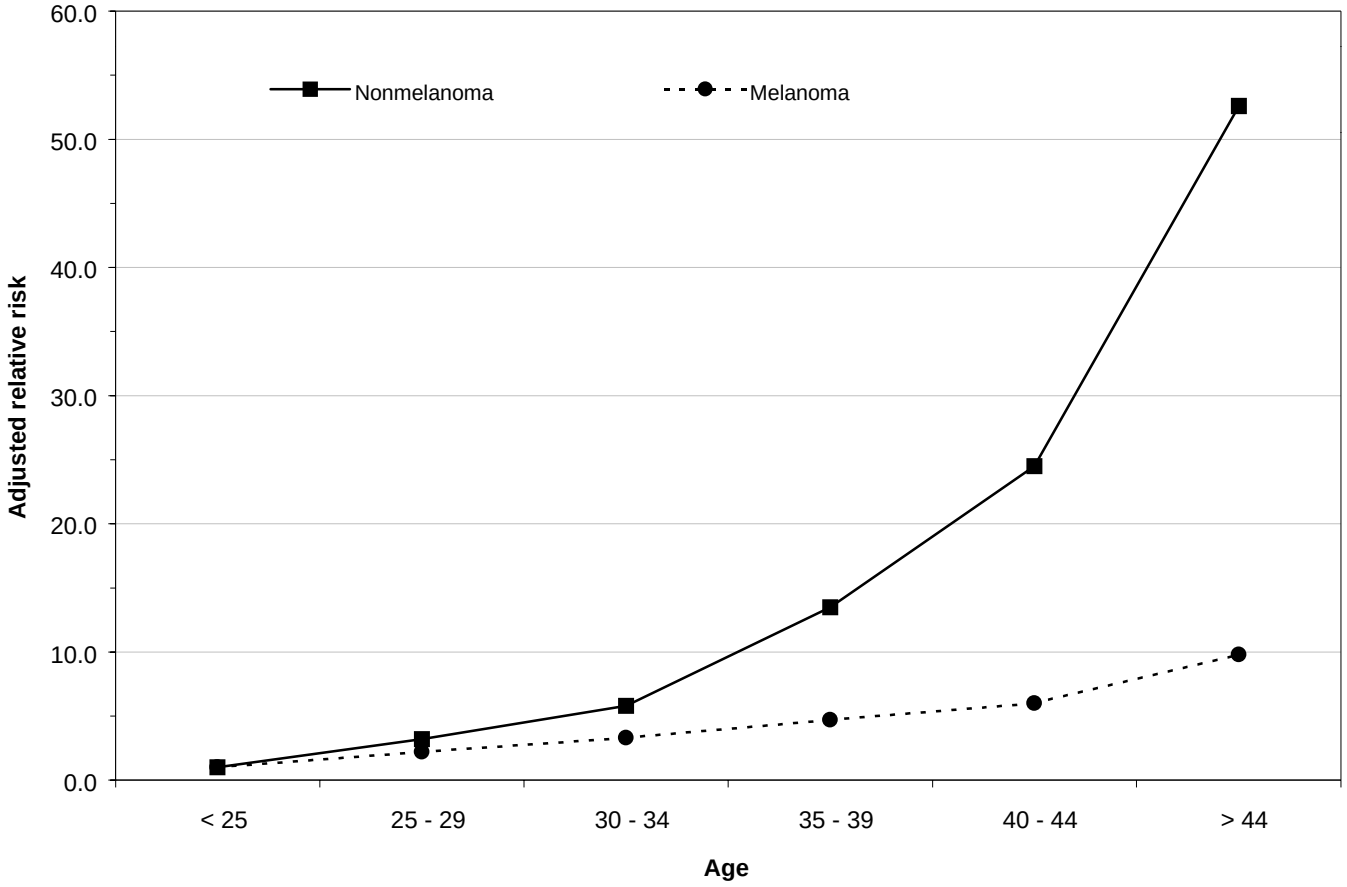
Figure I. Sentinel reportable events (grouped), active duty soldiers, June 1995 - May 2000[1]



1. Events reported by June 7, 2000.
2. Primary and Secondary.

Source: Army Reportable Medical Events System.

Figure 1. Adjusted relative risks of melanoma and nonmelanoma skin cancers, by age, US Armed Forces, October 1997 - September 1999



Continued from page 3

Results, nonmelanoma (table 3, page 9). The incidence of nonmelanoma (52.4 per 100,000 person-years) was almost four times higher than the incidence of melanoma. The adjusted incidence of nonmelanoma was 10% higher for women than men. The incidence among whites was twelve times higher than among blacks; Hispanics and the 'other' ethnic group had incidence rates 2 to 3 times higher than blacks. The incidence roughly doubled with each five years of age. The oldest age group (> 44 years) had an incidence 50 times higher than the youngest age group (< 25 years). The incidence among college-educated personnel was 60% higher than among personnel with a high school education. The incidence of nonmelanoma was higher among childhood residents of the south compared to the north; but there were no clear relationships to prior residence in the east, central, or west regions of the US (table 2). Finally, prior residents of the Southeast region (highest incidence) had an 80% higher incidence than prior residents of the Northwest (lowest incidence).

Editorial comment. This study documents the incidence of outpatient diagnoses of skin cancers between October 1, 1997 and September 30, 1999 among members of the US Armed Forces. We found that women, whites, the oldest age group (> 44 years), the college educated, and childhood residents of the south were at highest risk of having an outpatient diagnosis of melanoma or nonmelanoma. These findings generally reflect those of studies in other populations, with one exception. In

Table 2. Adjusted rate ratios of melanoma and nonmelanoma by region of childhood residence,[1] US Armed Forces, October 1997 - September 1999

Melanoma					
	West	Central	East	West:Central ratio	West:East ratio
North	1.5	1.0	1.0	1.5	1.5
South	2.1	1.2	1.3	1.8	1.6
South:North Ratio	1.4	1.2	1.3	-	-

Nonmelanoma					
	West	Central	East	West:Central ratio	West:East ratio
North	0.9	1.0	1.0	0.8	0.9
South	1.4	1.3	1.6	1.1	0.9
South:North Ratio	1.6	1.3	1.6	-	-

1. Based on SSN.

most published studies of skin cancer incidence, men had similar rates of melanoma and higher rates of nonmelanoma than women.[11, 12] In this study, both the crude and adjusted rates of melanoma were higher among women than men. This finding deserves further study.

The primary diagnosis for an outpatient visit reflects the best clinical judgment of the health care provider. For this study, it was not known whether, or which, skin cancer diagnoses were confirmed with biopsies. Therefore, it is likely that there were misclassifications both in the numbers and types of skin cancers that were counted as cases. In order to increase the specificity of outpatient diagnoses of skin cancer, only individuals with more than one visit for each skin cancer type were considered "cases" for this analysis.

As with most cancers, the incidence of skin cancer increases with age. However, some studies report that the most damaging sun exposure for the development of skin cancer occurs during childhood.[6-8] In order to determine the risk of skin cancer associated with region of childhood residence, we matched the first three digits of each study participant's SSN to a geographic region of the US. The first three digits of the SSN are based on the state where the number was issued or on the zip code of the applicant's mailing address. This method does not precisely document the location, nor the duration in each location, of childhood residence. However, since the misclassification by this method is probably not systematic, the bias that results is probably towards the null; in turn, actual risks associated with childhood residence are most likely underestimated by this analysis.

Data analysis and report by Gabriella Andreotti, MPH, Analysis Group, Army Medical Surveillance Activity.

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Table 3. Incident outpatient diagnoses of nonmelanoma, US Armed Forces, October 1997 - September 1999

Characteristic	Incident visits	Person-years	Crude rate per 100,000	Crude rate ratio	Adjusted rate ratio (95% CI)
Total	1,446	2,761,438	52.4	-	-
Year of visit					
1999	646	1,363,769	47.4	1.0	1.0
1998	800	1,397,669	57.2	1.2	1.2 (1.1 - 1.3)
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Men	1,274	2,374,924	53.6	1.0	1.0
Women	172	386,514	44.5	0.8	1.1 (0.9 - 1.3)
Race/ethnicity					
Black	30	551,604	5.4	1.0	1.0
Hispanic	22	195,741	11.2	2.1	2.7 (1.6 - 4.8)
Other	23	166,001	13.9	2.6	2.3 (1.3 - 3.9)
White	1,371	1,848,092	74.2	13.7	12.5 (8.7 - 18.0)
Age					
< 25	62	1,062,356	5.8	1.0	1.0
25 - 29	122	580,716	21.0	3.6	3.2 (2.4 - 4.4)
30 - 34	175	453,446	38.6	6.7	5.8 (4.4 - 7.8)
35 - 39	369	406,531	90.8	15.7	13.5 (10.3 - 17.8)
40 - 44	332	178,822	185.7	32.0	24.5 (18.6 - 32.4)
> 44	386	79,567	485.1	83.7	52.6 (39.7 - 69.7)
Education					
High school	679	2,275,293	29.8	1.0	1.0
College	767	486,145	157.8	5.3	1.6 (1.4 - 1.8)
Region of childhood residence (based on SSN)					
Northeast	261	523,030	49.9	1.0	1.0
North Central	283	538,528	52.6	1.1	1.0 (0.9 - 1.2)
Northwest	52	124,550	41.8	0.8	0.9 (0.7 - 1.2)
Southeast	443	742,785	59.6	1.2	1.6 (1.4 - 1.8)
South Central	192	403,652	47.6	1.0	1.3 (1.1 - 1.6)
Southwest	215	428,893	50.1	1.0	1.4 (1.2 - 1.7)

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Surveillance Trends

Bell's Palsy, US Armed Forces, 1998-1999

Bell's Palsy is the sudden onset of unilateral dysfunction of the seventh cranial ("facial") nerve with resulting paralysis of the muscles on the same side of the face. By definition, the cause of Bell's Palsy is unknown.[1]

While Bell's Palsy is a well known and relatively common condition, its epidemiology is unclear. In the US, estimates of its incidence have ranged from 13 to 34 cases per 100,000 persons per year.[2] Most studies have found comparable rates among men and women. While some studies have found higher rates among young and middle-aged adults,[3] others have documented rates that increased with age.[4] Finally, there have been inconsistent findings of associations between the risk of developing Bell's Palsy and seasonal,[5,6,7] geographic, racial/ethnic, and environmental factors.

Studies of Bell's Palsy incidence in the US have generally focused on state or community samples or on special populations.[8,9] In this study, we estimated incidence rates in demographic subgroups of active duty US military servicemembers and assessed temporal and regional patterns of its incidence.

Methods. Data were derived from the Defense Medical Surveillance System. Records of hospitalizations and clinic visits between October 1997 and September 1999 were searched to identify those with a primary discharge diagnosis of Bell's Palsy (ICD-9-CM 351.0). Incident cases were defined as those active duty servicemembers whose first Bell's Palsy diagnosis occurred during the study period. Crude rates per 100,000 person-years were calculated overall and for demographic subgroups. Adjusted relative rates were estimated through Poisson regression.

Results. There were 1,181 incident cases of Bell's Palsy identified among active duty US military servicemembers during the 2-year surveillance period (crude rate 42.72 per 100,000 person-years). The incidence of Bell's Palsy was slightly higher for women than for men and increased with age (table 1). Blacks and Hispanics had higher rates than those in other racial/ethnic groups. Incidence rates were higher among married versus unmarried servicemembers and among enlisted personnel versus officers. Rates were higher among Air Force and Navy personnel than among soldiers or Marines. Finally, there were no long-term or seasonal trends in Bell's Palsy incidence (figure 1, page 12).

In relation to assignment locations in the US, incidence rates were generally higher in the south than in the north. For example, the crude rate among servicemembers in the southwest region (the highest) was nearly twice as high as the rate in the north-central region (the lowest). With adjustments for potentially confounding effects, the rate among servicemembers assigned in the southern US was approximately 40% higher than the rate in the north (adjusted relative rate, south vs north: 1.39, 95% confidence interval: 1.12-1.70; data not shown).

Editorial comment. In this study, hospital and ambulatory clinic records were systematically reviewed to identify all incident diagnoses of Bell's Palsy among US servicemembers. The results document that nearly 600 new cases occur each year. The rates among US servicemembers are higher than those reported in other studies.[9-12] There may be several reasons for this difference. First, our case ascertainment may have been more complete than that of other investigators since nearly all care in fixed military medical treatment facilities is documented in the Defense Medical Surveillance System. Second, we included diagnoses as "cases" without independent validation; as a result, we undoubtedly included some misdiagnoses of other conditions (e.g., Ramsay Hunt Syndrome, a facial palsy caused by varicella zoster virus reactivation[10]). Third, rates in military populations may in fact be higher than in other populations.

Because of its sudden and unpredictable onset, Bell's Palsy can be emotionally and physically debilitating. Fortunately, the long-term prognosis is good. Most patients achieve complete or partial recovery, and only approximately 15% suffer moderate or severe sequelae. Recovery times generally range from a few

Table 1. Incident cases of Bell's Palsy, US Armed Forces, October 1997-September 1999

Characteristics	Incident cases	Person-years	Crude rate per 100,000	Adjusted rate ratio (95% CI) [1,2]
Total	1,181	2,764,666	42.72	-
Gender				
Female	182	387,144	47.01	1.16 (0.99 - 1.35)
Male	999	2,377,499	42.02	1.00 -
Age				
17-24	309	1,067,163	28.96	1.00 -
25-29	262	580,326	45.15	1.47 (1.24 - 1.75)
30-39	451	859,380	52.48	1.67 (1.41 - 1.98)
40-65	159	257,740	61.69	2.14 (1.73 - 2.66)
Race/ethnicity				
Black	288	552,467	52.13	1.28 (1.11 - 1.47)
Hispanic	116	198,069	58.57	1.59 (1.31 - 1.92)
Other	62	164,655	37.65	0.94 (0.73 - 1.22)
White	715	1,848,762	38.67	1.00 -
Marital status				
Married	804	1,571,993	51.15	1.34 (1.15 - 1.55)
Other	51	102,322	49.84	1.15 (0.84 - 1.57)
Single	322	1,087,028	29.62	1.00 -
Grade				
Enlisted	1,026	2,318,886	44.25	1.59 (1.34 - 1.90)
Officer	155	443,728	34.93	1.00 -
Service				
Army	382	949,852	40.22	0.82 (0.71 - 0.95)
Air Force	335	725,490	46.18	0.92 (0.79 - 1.07)
Marines	125	343,083	36.43	0.81 (0.65 - 0.99)
Navy	339	746,240	45.43	1.00 -
Region[2]				
North				
North Central	33	119,136	27.70	0.52 (0.36 - 0.74)
Northeast	33	87,699	37.63	0.67 (0.47 - 0.96)
Northwest	34	92,948	36.58	0.67 (0.47 - 0.96)
South				
South Central	172	367,253	46.83	0.90 (0.73 - 1.10)
Southeast	378	876,628	43.12	0.82 (0.69 - 0.96)
Southwest	209	396,757	52.68	1.00 -
Outside CONUS	307	789,978	38.86	0.70 (0.59 - 0.84)

1. Adjusted for gender, age, race, marital status, grade, service, and region.
2. Based on 1,166 cases.

weeks to a year, although the absence of recovery within 4 months implies a relatively poor outcome.

Finally, several findings from this analysis are informative regarding etiologies of Bell's Palsy among US servicemembers. For example, the lack of seasonality in incidence, the relatively lower rates in northern states, the comparability of rates among men and women, and the increasing incidence with age suggest that certain infectious agents that have been associated with Bell's Palsy risk (e.g., *Borrelia burgdorferi*, the agent that causes Lyme disease) may not be significant causes in this population.

Data analysis and report by Karen E. Campbell, MS, Analysis Group, Army Medical Surveillance Activity.

Figure 1. Bell's Palsy incidence rates by month, US Armed Forces, 1998-1999

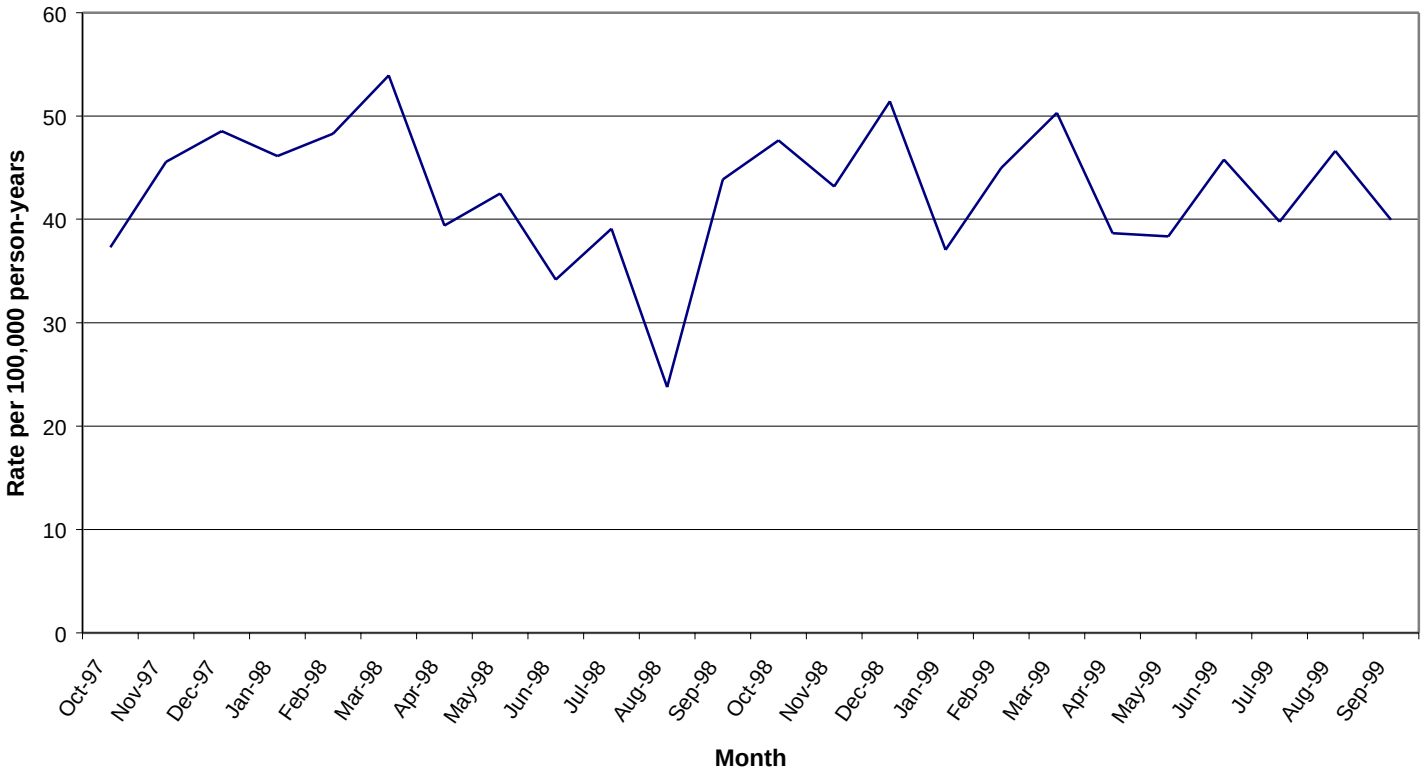

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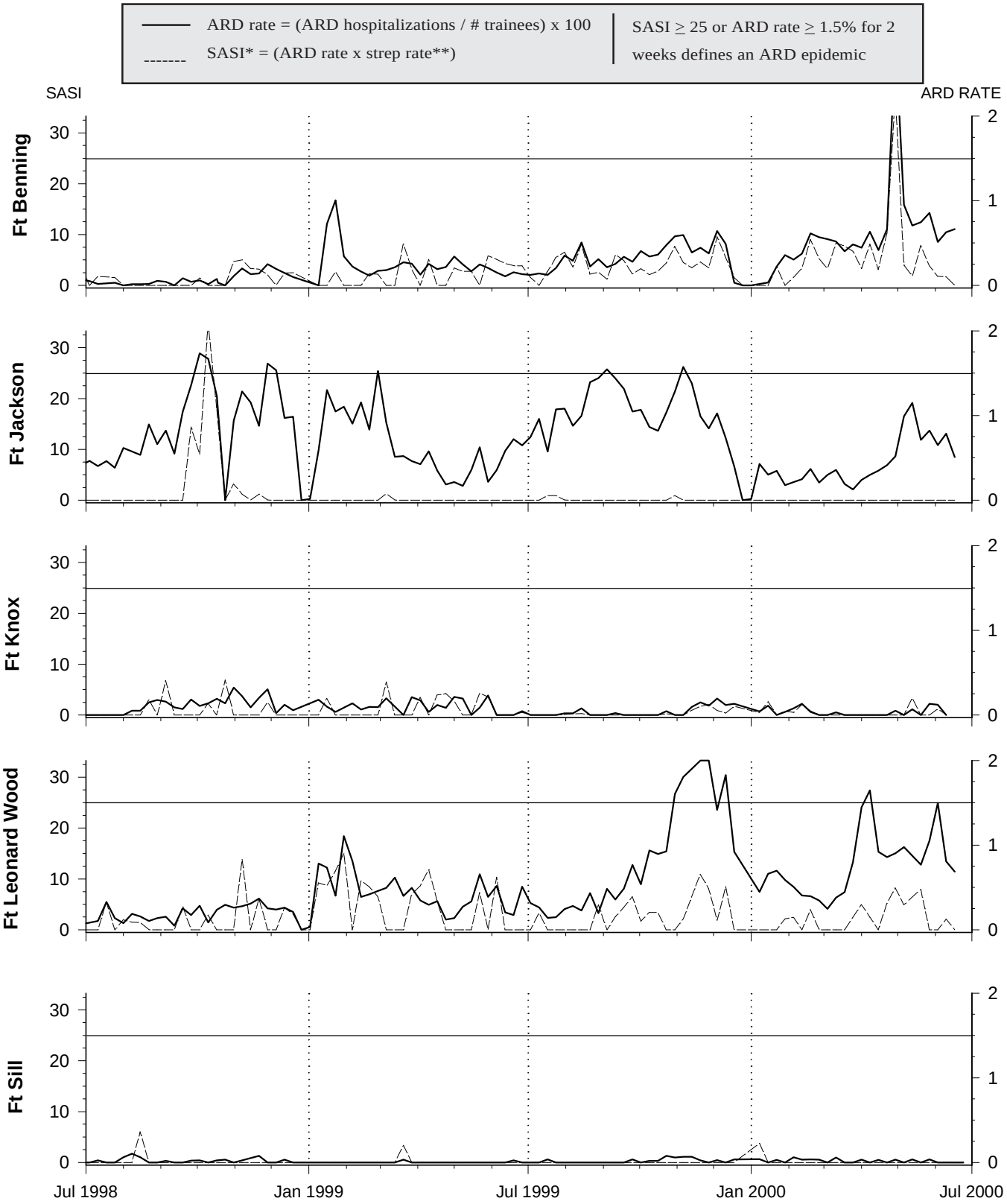
Figure II. Acute respiratory disease (ARD) surveillance update
US Army initial entry training centers



* SASI (Strep ARD Surveillance Index) is a reliable predictor of serious strep-related morbidity

** Strep rate = (Group A beta-hemolytic strep(+) / # cultures) x 100

Surveillance Trends

Carpal Tunnel Syndrome among US soldiers, 1998-1999

Injuries among military personnel are significant sources of morbidity, mortality, disability, and lost duty time.[1-4] Work-related injuries are a major fraction of all injuries and a high priority for prevention efforts.[2,3,5-7] Upper extremity injuries are some of the most common and debilitating work-related injuries, yet many of these injuries are preventable. The purpose of this report is to describe the rates of carpal tunnel syndrome in relation to personnel characteristics and military occupational specialty.

Methods. Standard ambulatory data records maintained in the Defense Medical Surveillance System were searched to identify all outpatient visits among active duty soldiers from January 1998 through December 1999 with primary diagnoses of carpal tunnel syndrome (ICD-9-CM code 354.0). An incident case was defined as the first outpatient visit during the study period. Incidence rates per 100,000 person-years were calculated by gender, grade, age, and occupational specialty.

Results. Overall, the rate of carpal tunnel syndrome was 507 per 100,000 person-years (table 1). Carpal tunnel syndrome was more than 3 times more common in women than men, and its rates were higher for senior compared to junior personnel. The rate of carpal tunnel increased steadily with age. This relationship

Table 1. Incident ambulatory visits for carpal tunnel syndrome by demographic characteristics and occupation, active duty soldiers, 1998-1999

Characteristics	Carpal Tunnel	
	Incident visits	Rate per 100,000
Total	4,739	507
Gender		
Female	1,764	1,274
Male	2,975	374
Grade		
Junior enlisted	1,925	446
Senior enlisted	2,190	612
Junior officer	346	349
Senior officer	290	509
Age		
17-20	177	226
20-24	1,031	365
25-29	1,074	499
30-34	829	532
35-39	909	758
40-65	808	977
Enlisted occupations		
Infantry, gun crews, and seamanship	688	324
Electronic equipment repair	225	439
Communications and intelligence specialists	387	508
Health care specialists	534	853
Other technical and allied specialists	147	574
Functional support and administration	987	774
Electrical/mechanical equipment repairers	563	518
Craftsworkers	75	494
Service and supply handlers	516	546
Non-occupational	10	170
Officer occupations		
0fficer, unknown	35	344
General officers and execs, NEC	-	-
Tactical operations officers	142	274
Intelligence officers	45	534
Engineering and maintenance officers	64	399
Scientists and professionals	38	473
Health care officers	188	725
Administrators	40	452
Supply,procurement, and allied officers	67	489
Non-occupational	27	252

with age is consistent with prior studies and supports the hypothesis that these injuries result from repetitive movements with exposure accumulating over time.[9]

In order to examine the relationship between primary military occupation and carpal tunnel syndrome, we examined the incidence rates of carpal tunnel syndrome for the 19 major occupational specialty groups. For enlisted personnel and for officers, the occupations with the highest rates were "health care specialist" and "health care officers" (853 and 725 per 100,000 person-years, respectively). In the enlisted "health care specialist" category, dental laboratory technicians had the highest rate. In the "health care officers" category, nurses and dentists had the highest rates (table 2).

Editorial comment. Carpal tunnel syndrome results from the compression of the median nerve at the wrist and is associated with movements involving high repetition, force, awkward positioning, and segmental vibrations.[9] Such work-related upper extremity disorders often have a gradual onset and can be prevented by reductions in frequency, duration, or intensity of exposure to repetitious or high force movements. Health care workers frequently have higher rates of carpal tunnel syndrome. Interventions should focus on high risk activities and settings, particularly among health care workers.

Analysis by Sandra Lesikar, PhD, Analysis Group, Army Medical Surveillance Activity.

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Table 2. Ambulatory visits, by specific occupation within health care categories, active duty soldiers, 1998-1999

Occupation	Carpal Tunnel	
	Number	Rate /100,000
Enlisted		
Dental laboratory	5	2624
Physiology	1	2312
Diet therapy	16	1532
Orthopedics	4	1532
Radiology	28	1496
Medical administration	24	1371
Therapy	6	1356
Dental care, general	39	1325
Opthamology/optometry	8	1303
Surgery	25	1100
Medical logistics	31	1083
Veterinary medicine	29	1057
Biomedical laboratory sciences	40	1003
Behavioral sciences	14	948
Biomedical equipment and repair	12	916
Environmental health services	10	812
Medical care and treatment, general	239	653
Pharmacy	6	610
Officers		
Nurses	68	1130
Dentists	20	1077
Veterinarians	7	821
Biomedical sciences and allied health officers	34	791
Physicians	42	496
Health services administration officers	17	382

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