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Epidemiologic Notes and Reports

Kaposi's Sarcoma and *Pneumocystis* Pneumonia Among Homosexual Men – New York City and California

During the past 30 months, Kaposi's sarcoma (KS), an uncommonly reported malignancy in the United States, has been diagnosed in 26 homosexual men (20 in New York City [NYC]; 6 in California). The 26 patients range in age from 26-51 years (mean 39 years). Eight of these patients died (7 in NYC, 1 in California)—all 8 within 24 months after KS was diagnosed. The diagnoses in all 26 cases were based on histopathological examination of skin lesions, lymph nodes, or tumor in other organs. Twenty-five of the 26 patients were white, 1 was black. Presenting complaints from 20 of these patients are shown in Table 1.

Skin or mucous membrane lesions, often dark blue to violaceous plaques or nodules, were present in most of the patients on their initial physician visit. However, these lesions were not always present and often were considered benign by the patient and his physician.

A review of the New York University Coordinated Cancer Registry for KS in men under age 50 revealed no cases from 1970-1979 at Bellevue Hospital and 3 cases in this age group at the New York University Hospital from 1961-1979.

Seven KS patients had serious infections diagnosed after their initial physician visit. Six patients had pneumonia (4 biopsy confirmed as due to *Pneumocystis carinii* [PC]), and one had necrotizing toxoplasmosis of the central nervous system. One of the patients with *Pneumocystis* pneumonia also experienced severe, recurrent, herpes simplex infection; extensive candidiasis; and cryptococcal meningitis. The results of tests for cytomegalovirus (CMV) infection were available for 12 patients. All 12 had serological evidence of past or present CMV infection. In 3 patients for whom culture results were available, CMV was isolated from blood, urine and/or lung of all 3. Past infections with amebiasis and hepatitis were commonly reported.

TABLE 1. Presenting complaints in 20 patients with Kaposi's sarcoma

Presenting complaint	Number (percentage) of patients
Skin lesion(s) only	10 (50%)
Skin lesions plus lymphadenopathy	4 (20%)
Oral mucosal lesion only	1 (5%)
Inguinal adenopathy plus perirectal abscess	1 (5%)
Weight loss and fever	2 (10%)
Weight loss, fever, and pneumonia (one due to *Pneumocystis carinii*)	2 (10%)

Kaposi's Sarcoma — Continued

Since the previous report of 5 cases of *Pneumocystis* pneumonia in homosexual men from Los Angeles (*1*), 10 additional cases (4 in Los Angeles and 6 in the San Francisco Bay area) of biopsy-confirmed PC pneumonia have been identified in homosexual men in the state. Two of the 10 patients also have KS. This brings the total number of *Pneumocystis* cases among homosexual men in California to 15 since September 1979. Patients range in age from 25 to 46 years.

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Editorial Note: KS is a malignant neoplasm manifested primarily by multiple vascular nodules in the skin and other organs. The disease is multifocal, with a course ranging from indolent, with only skin manifestations, to fulminant, with extensive visceral involvement (*2*).

Accurate incidence and mortality rates for KS are not available for the United States, but the annual incidence has been estimated between 0.02-0.06 per 100,000; it affects primarily elderly males (*3,4*). In a series of 92 patients treated between 1949 and 1975 at the Memorial Sloan-Kettering Cancer Institute in NYC, 76% were male, and the mean age was 63 years (range 23-90 years) at the time of diagnosis (*5*).

The disease in elderly men is usually manifested by skin lesions and a chronic clinical course (mean survival time is 8-13 years) (*2*). Two exceptions to this epidemiologic pattern have been noted previously. The first occurs in an endemic belt across equatorial Africa, where KS commonly affects children and young adults and accounts for up to 9% of all cancers (*3*). Secondly, the disease appears to have a higher incidence in renal transplant recipients (*6-9*) and in others receiving immunosuppressive therapy (*10-12*).

The occurrence of this number of KS cases during a 30-month period among young, homosexual men is considered highly unusual. No previous association between KS and sexual preference has been reported. The fulminant clinical course reported in many of these patients also differs from that classically described for elderly persons.

The histopathologic diagnosis of KS may be difficult for 2 reasons. Changes in some lesions may be interpreted as nonspecific, and other cutaneous and soft tissue sarcomas, such as angiosarcoma of the skin, may be confused with KS (*13,14*).

That 10 new cases of *Pneumocystis* pneumonia have been identified in homosexual men suggests that the 5 previously reported cases were not an isolated phenomenon (*1*).

Kaposi's Sarcoma — Continued

In addition, CDC has a report of 4 homosexual men in NYC who developed severe, progressive, perianal herpes simplex infections and had evidence of cellular immunodeficiencies. Three died, 1 with systemic CMV infection. The fourth patient is currently undergoing therapy. It is not clear if or how the clustering of KS, pneumocystis, and other serious diseases in homosexual men is related. What is known is that the patients with *Pneumocystis* pneumonia described in the previous report showed evidence of impaired cellular immunity and previous or current CMV infection (*1*). Furthermore, serologic evidence of past CMV infection and active shedding of CMV have been shown to be much more common among homosexual men than heterosexual men attending a sexually transmitted disease clinic (*15*). A specific serologic association with CMV infection has been demonstrated among American and European patients with KS (*16, 17*) and herpes-type virus particles have been demonstrated in tissue culture cell lines from African cases of KS (*18*). It has been hypothesized that activation of oncogenic virus during periods of immunosuppression may result in the development of KS (*19*). Although immunosuppression often results in CMV infection, it is not yet clear whether CMV infection precedes or follows the above-mentioned disorders.

Although it is not certain that the increase in KS and PC pneumonia is restricted to homosexual men, the vast majority of recent cases have been reported from this group. Physicians should be alert for Kaposi's sarcoma, PC pneumonia, and other opportunistic infections associated with immunosuppression in homosexual men.

References

1. CDC. *Pneumocystis* pneumonia — Los Angeles. MMWR 1981;30:250.
2. Safai B, Good RA. Kaposi's sarcoma: a review and recent developments. CA 1981;31:1-12.
3. Oettle AG. Geographical and racial differences in the frequency of Kaposi's sarcoma as evidence of environmental or genetic causes. Acta Un Int Cancr 1962;18:330-63.
4. Rothman S. Remarks on sex, age, and racial distribution of Kaposi's sarcoma and on possible pathogenetic factors. Acta Un Int Cancr 1962;18:326-9.
5. Safai B, Miké V, Giraldo G, Beth E, Good RA. Association of Kaposi's sarcoma with second primary malignancies: possible etiopathogenic implications. Cancer 1980;45:1472-9.
6. Harwood AR, Osoba D, Hofstader SL, et al. Kaposi's sarcoma in recipients of renal transplants. Am J Med 1979;67:759-65.
7. Stribling J, Weitzner S, Smith GV: Kaposi sarcoma in renal allograft recipients. Cancer 1978; 42:442-6.
8. Myers BD, Kessler E, Levi J, Pick A, Rosenfeld JB, Tikvah P. Kaposi sarcoma in kidney transplant recipients. Arch Intern Med 1974;133:307-11.
9. Penn I. Kaposi's sarcoma in organ transplant recipients: report of 20 cases. Transplantation 1979,27:8-11.
10. Gange RW, Jones EW. Kaposi's sarcoma and immunosuppressive therapy: an appraisal. Clin Exp Dermatol 1978;3:135-46.
11. Klepp O, Dahl O, Stenwig JT. Association of Kaposi's sarcoma and prior immunosuppressive therapy: a 5-year material of Kaposi's sarcoma in Norway. Cancer 1978;42:2626-30.
12. Hoshaw RA, Schwartz RA. Kaposi's sarcoma after immunosuppressive therapy with prednisone. Arch Dermatol 1980:116;1280-2.
13. Girard C, Johnson WC, Graham JH. Cutaneous angiosarcoma. Cancer 1970;26:868-83.
14. Rosai J, Sumner HW, Kostianovsky M, Perez-Mesa C. Angiosarcoma of the skin. A clinicopathologic and fine structural study. Hum Pathol 1976;7:83-109.
15. Drew WL, Mintz L, Miner RC, Sands M, Ketterer B. Prevalence of cytomegalovirus infection in homosexual men. J Infect Dis 1981;143:188-92.
16. Giraldo G, Beth E, Kourilsky FM, et al. Antibody patterns to herpesvirus in Kaposi's sarcoma: serologic association of European Kaposi's sarcoma with cytomegalovirus. Int J Cancer 1975; 15:839-48.
17. Giraldo G, Beth E, Henle W, et al. Antibody patterns to herpesvirus in Kaposi's sarcoma. II. serological association of American Kaposi's sarcoma with cytomegalovirus. Int J Cancer 1978; 22:126-31.

Kaposi's Sarcoma — Continued

18. Giraldo G, Beth E, Haguenau F. Herpes-type virus particles in tissue culture of Kaposi's sarcoma from different geographic regions. J Natl Cancer Inst 1972;49:1509-26.
19. Kapadia SB, Krause JR. Kaposi's sarcoma after long-term alkylating agent therapy for multiple myeloma. South Med J 1977;70:1011-3.

Cutaneous Larva Migrans in American Tourists — Martinique and Mexico

Since October 19, 1980, the Parasitic Diseases Division, Center for Infectious Diseases, has received reports that 7 American tourists, who had vacationed briefly at Club Mediteranee seaside resorts in both Martinique and Mexico, returned with cutaneous larva migrans. The patients, 5 men and 2 women ranging in age from 33 to 38 years, resided in Massachusetts, Pennsylvania, Georgia, and Ohio, and were exposed on different dates.

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TABLE I. Summary — cases of specified notifiable diseases, United States

[Cumulative totals include revised and delayed reports through previous weeks.]

DISEASE	25th WEEK ENDING		MEDIAN	CUMULATIVE, FIRST 25 WEEKS		
	June 27 1981	June 21 1980	1976-1980	June 27 1981	June 21 1980	MEDIAN 1976-1980
Aseptic meningitis	133	107	107	1,859	1,619	1,126
Brucellosis	3	5	6	73	82	82
Chickenpox	3,801	4,577	4,353	157,690	144,465	144,465
Diphtheria	–	–	–	3	2	35
Encephalitis: Primary (arthropod-borne & unspec.)	20	8	18	360	282	287
Post-infectious	2	4	4	44	98	102
Hepatitis, Viral: Type B	404	364	317	9,425	7,977	7,262
Type A	430	579	595	11,981	12,945	14,023
Type unspecified	185	214	178	5,367	5,296	4,253
Malaria	43	58	19	634	853	265
Measles (rubeola)	85	463	924	2,292	11,224	20,679
Meningococcal infections: Total	48	50	40	2,021	1,533	1,357
Civilian	46	49	39	2,009	1,522	1,299
Military	2	1	1	12	11	21
Mumps	54	158	422	2,665	6,382	11,698
Pertussis	23	26	26	482	524	524
Rubella (German measles)	30	82	362	1,443	2,756	9,753
Tetanus	4	4	1	27	29	29
Tuberculosis	505	613	689	12,863	12,672	13,778
Tularemia	8	7	4	87	70	62
Typhoid fever	7	10	8	224	171	171
Typhus fever, tick-borne (Rky. Mt. spotted)	57	39	48	436	318	299
Venereal diseases:						
Gonorrhea: Civilian	18,174	20,192	20,192	463,413	452,245	452,245
Military	579	368	495	13,731	12,756	12,844
Syphilis, primary & secondary: Civilian	610	488	452	14,248	12,387	11,575
Military	6	5	5	178	151	146
Rabies in animals	162	136	73	3,479	3,250	1,509

TABLE II. Notifiable diseases of low frequency, United States

	CUM. 1981		CUM. 1981
Anthrax	–	Poliomyelitis: Total	–
Botulism	29	Paralytic	–
Cholera	1	Psittacosis (Mass. 1, Ohio 1, La. 1, Tex. 1, Colo. 1)	57
Congenital rubella syndrome	4	Rabies in man	–
Leprosy (Upstate N.Y. 1)	103	Trichinosis (Conn. 1)	91
Leptospirosis (Ark. 2)	19	Typhus fever, flea-borne (endemic, murine) (Tex. 1)	16
Plague	5		

All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending June 27, 1981 and June 21, 1980 (25th week)

REPORTING AREA	ASEPTIC MENINGITIS	BRUCELLOSIS	CHICKENPOX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS (VIRAL), BY TYPE			MALARIA	
						Primary		Post-infectious	B	A	Unspecified		
	1981	1981	1981	1981	CUM. 1981	1981	1980	1981	1981	1981	1981	1981	CUM. 1981
UNITED STATES	133	3	3,801	-	3	20	8	2	404	430	185	43	634
NEW ENGLAND	3	-	607	-	-	-	-	-	14	12	10	3	34
Maine	1	-	38	-	-	-	-	-	-	1	-	-	1
N.H.	1	-	32	-	-	-	-	-	3	5	-	-	3
Vt.	-	-	13	-	-	-	-	-	-	-	-	-	2
Mass.	1	-	253	-	-	-	-	-	4	3	10	2	17
R.I.	-	-	47	-	-	-	-	-	2	2	-	-	2
Conn.	-	-	224	-	-	-	-	-	5	1	-	1	9
MID. ATLANTIC	6	-	510	-	-	1	2	1	70	62	33	3	70
Upstate N.Y.	4	-	454	-	-	-	-	-	13	9	12	3	20
N.Y. City	-	-	54	-	-	-	-	-	17	13	6	-	23
N.J.	-	-	NN	-	-	-	2	-	33	34	14	-	19
Pa.	2	-	2	-	-	1	-	1	7	6	1	-	8
E.N. CENTRAL	13	-	1,942	-	-	4	1	-	65	60	10	3	28
Ohio	3	-	319	-	-	1	-	-	26	20	5	-	6
Ind.	1	-	137	-	-	1	1	-	12	11	4	-	6
Ill.	-	-	393	-	-	1	-	-	8	17	1	2	7
Mich.	8	-	683	-	-	1	-	-	17	12	-	1	9
Wis.	1	-	410	-	-	-	-	-	2	-	-	-	-
W.N. CENTRAL	3	1	24	-	-	2	-	-	20	9	4	1	19
Minn.	-	-	9	-	-	1	-	-	4	-	-	1	8
Iowa	1	-	7	-	-	-	-	-	9	4	1	-	2
Mo.	2	1	4	-	-	-	-	-	6	3	3	-	2
N. Dak.	-	-	3	-	-	-	-	-	-	-	-	-	1
S. Dak.	-	-	-	-	-	-	-	-	1	-	-	-	1
Nebr.	-	-	1	-	-	1	-	-	-	2	-	-	-
Kans.	-	-	-	-	-	-	-	-	-	-	-	-	5
S. ATLANTIC	16	2	258	-	1	1	-	-	87	52	22	1	72
Del.	-	-	22	-	-	-	-	-	-	2	-	-	1
Md.	-	-	31	-	-	-	-	-	5	3	3	-	15
D.C.	-	-	1	-	-	-	-	-	-	-	-	-	1
Va.	1	-	13	-	-	-	-	-	4	2	-	-	11
W. Va.	-	-	84	-	-	-	-	-	3	1	-	-	3
N.C.	2	-	NN	-	-	-	-	-	14	7	6	-	6
S.C.	-	-	12	-	-	-	-	-	13	3	2	-	1
Ga.	1	1	10	-	-	-	-	-	16	10	-	-	8
Fla.	12	1	85	-	1	1	-	-	32	24	11	1	26
E.S. CENTRAL	12	-	76	-	-	4	1	-	35	22	8	-	4
Ky.	2	-	60	-	-	-	-	-	15	11	4	-	-
Tenn.	7	-	NN	-	-	3	-	-	10	5	2	-	-
Ala.	2	-	14	-	-	-	1	-	4	1	2	-	3
Miss.	1	-	2	-	-	1	-	-	6	5	-	-	1
W.S. CENTRAL	36	-	115	-	-	4	2	1	23	48	32	4	43
Ark.	-	-	-	-	-	-	1	-	3	4	3	1	3
La.	3	-	NN	-	-	-	1	1	4	4	5	-	2
Okla.	6	-	-	-	-	-	-	-	1	1	1	-	4
Tex.	27	-	115	-	-	4	-	-	15	39	23	3	34
MOUNTAIN	5	-	41	-	1	1	-	-	6	26	19	1	22
Mont.	-	-	-	-	1	-	-	-	-	1	-	-	-
Idaho	-	-	-	-	-	-	-	-	-	-	-	-	-
Wyo.	-	-	-	-	-	-	-	-	-	-	-	-	-
Colo.	1	-	39	-	-	-	-	-	2	8	3	1	11
N. Mex.	4	-	-	-	-	-	-	-	-	2	1	-	1
Ariz.	-	-	NN	-	-	1	-	-	-	5	9	-	4
Utah	-	-	1	-	-	-	-	-	1	5	2	-	3
Nev.	-	-	1	-	-	-	-	-	3	5	4	-	3
PACIFIC	39	-	228	-	1	3	2	-	84	139	47	27	342
Wash.	3	-	193	-	-	-	-	-	5	7	3	1	18
Oreg.	-	-	4	-	-	-	-	-	9	7	-	1	9
Calif.	35	-	3	-	-	3	2	-	67	124	44	25	311
Alaska	1	-	5	-	1	-	-	-	-	1	-	-	1
Hawaii	-	-	23	-	-	-	-	-	3	-	-	-	3
Guam	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	1
P.R.	3	-	23	-	-	-	-	-	2	11	3	-	8
V.I.	-	-	-	-	-	-	-	-	-	-	-	-	2
Pac. Trust Terr.	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	-

NN: Not notifiable. NA: Not available.
All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending June 27, 1981 and June 21, 1980 (25th week)

REPORTING AREA	MEASLES (RUBEOLA)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1981	CUM. 1981	CUM. 1980	1981	CUM. 1981	CUM. 1980	1981	CUM. 1981	1981	1981	CUM. 1981	CUM. 1981
UNITED STATES	85	2,292	11,224	48	2,021	1,533	54	2,665	23	30	1,443	27
NEW ENGLAND	–	72	644	5	131	99	3	126	–	1	101	1
Maine	–	5	32	1	20	3	1	24	–	–	33	–
N.H.	–	4	316	–	12	5	1	14	–	–	35	–
Vt.	–	1	226	–	6	13	–	4	–	–	–	–
Mass.	–	54	47	2	32	34	–	40	–	1	22	–
R.I.	–	–	2	–	11	7	–	17	–	–	–	–
Conn.	–	8	21	2	50	37	1	27	–	–	11	1
MID. ATLANTIC	40	717	3,354	10	264	261	6	478	5	7	175	1
Upstate N.Y.	3	196	607	3	89	90	1	76	3	2	73	–
N.Y. City	3	52	974	3	45	70	2	53	2	–	46	1
N.J.	–	51	747	–	61	57	1	81	–	3	46	–
Pa.	34	418	1,026	4	69	44	2	268	–	2	10	–
E.N. CENTRAL	–	72	1,866	5	234	172	21	769	10	5	302	4
Ohio	–	15	229	2	84	64	2	113	1	–	–	–
Ind.	–	8	84	1	36	31	1	89	7	5	105	–
Ill.	–	21	275	2	57	27	13	151	1	–	71	–
Mich.	–	27	219	–	53	39	1	288	1	–	31	3
Wis.	–	1	1,059	–	4	11	4	128	–	–	95	1
W.N. CENTRAL	–	8	1,232	4	94	64	–	171	–	1	73	3
Minn.	–	4	1,007	1	33	18	–	6	–	–	6	2
Iowa	–	1	20	1	18	6	–	40	–	1	4	–
Mo.	–	1	62	2	28	28	–	27	–	–	3	1
N. Dak.	–	–	–	–	1	1	–	–	–	–	–	–
S. Dak.	–	–	–	–	3	4	–	1	–	–	–	–
Nebr.	–	1	80	–	–	–	–	3	–	–	1	–
Kans.	–	1	63	–	11	7	–	94	–	–	59	–
S. ATLANTIC	8	318	1,710	3	467	357	5	346	3	3	131	6
Del.	–	–	3	–	4	2	1	9	–	–	1	–
Md.	–	1	47	–	29	33	1	70	–	–	1	–
D.C.	–	1	–	–	1	1	–	1	–	–	–	–
Va.	–	6	294	2	58	32	1	81	–	–	5	–
W. Va.	1	8	7	–	19	12	–	59	–	–	19	–
N.C.	–	4	113	1	69	72	–	12	–	–	4	2
S.C.	–	–	139	–	63	44	–	9	–	1	8	1
Ga.	2	101	770	–	79	64	–	33	1	2	44	1
Fla.	5	197	337	–	145	97	2	72	2	–	49	2
E.S. CENTRAL	2	2	301	2	150	144	1	64	1	1	25	1
Ky.	–	–	51	–	43	46	1	31	–	1	14	–
Tenn.	–	–	145	2	43	40	–	20	1	–	10	–
Ala.	2	2	21	–	48	37	–	12	–	–	1	1
Miss.	–	–	84	–	16	21	–	1	–	–	–	–
W.S. CENTRAL	25	795	899	11	348	178	2	157	1	3	122	5
Ark.	–	1	14	–	23	14	–	1	–	–	1	1
La.	–	–	11	4	86	65	–	3	–	–	9	2
Okla.	–	6	757	1	27	16	–	–	–	–	–	1
Tex.	25	788	117	6	212	83	2	153	1	3	112	1
MOUNTAIN	3	32	324	2	71	56	2	95	–	–	63	1
Mont.	–	–	1	–	6	2	–	5	–	–	4	–
Idaho	–	1	–	–	3	4	–	4	–	–	3	–
Wyo.	–	–	–	–	–	2	–	1	–	–	1	–
Colo.	3	8	17	–	31	14	–	39	–	–	26	–
N. Mex.	–	9	11	–	6	7	–	–	–	–	2	–
Ariz.	–	4	242	1	16	9	–	21	–	–	17	1
Utah	–	–	46	1	5	2	2	14	–	–	3	–
Nev.	–	10	7	–	4	16	–	11	–	–	7	–
PACIFIC	7	276	894	6	262	202	14	459	3	9	451	5
Wash.	–	1	165	–	51	34	1	129	1	1	59	–
Oreg.	–	3	–	–	38	39	1	55	–	–	30	–
Calif.	7	270	719	6	165	127	11	255	2	8	357	5
Alaska	–	–	5	–	4	2	–	5	–	–	–	–
Hawaii	–	2	5	–	4	–	1	15	–	–	5	–
Guam	NA	4	5	–	–	1	NA	6	NA	NA	1	–
P.R.	2	195	89	–	9	7	1	93	3	–	3	2
V.I.	–	4	6	–	–	1	–	4	–	–	–	–
Pac. Trust Terr.	NA	–	6	–	–	–	NA	4	NA	NA	1	–

NA: Not available.
All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending June 27, 1981 and June 21, 1980 (25th week)

REPORTING AREA	TUBERCULOSIS		TULAREMIA	TYPHOID FEVER		TYPHUS FEVER (Tick-borne) (RMSF)		VENEREAL DISEASES (Civilian)						RABIES (in Animals)
								GONORRHEA			SYPHILIS (Pri. & Sec.)			
	1981	CUM. 1981	CUM. 1981	1981	CUM. 1981	1981	CUM. 1981	1981	CUM. 1981	CUM. 1980	1981	CUM. 1981	CUM. 1980	CUM. 1981
UNITED STATES	505	12,863	87	7	224	57	436	18,174	463,413	452,245	610	14,248	12,387	3,479
NEW ENGLAND	23	360	1	–	12	–	5	477	11,492	11,671	13	313	269	13
Maine	–	23	–	–	1	–	–	12	568	685	–	2	4	7
N.H.	–	9	–	–	–	–	–	15	383	383	–	10	1	1
Vt.	–	11	–	–	–	–	–	5	200	277	–	13	3	–
Mass.	16	203	–	–	7	–	3	242	4,670	4,788	13	207	151	1
R.I.	–	21	–	–	–	–	–	31	602	699	–	18	15	–
Conn.	7	93	1	–	4	–	2	172	5,069	4,839	–	63	95	4
MID. ATLANTIC	92	2,090	10	–	39	1	9	2,111	53,771	48,916	87	2,165	1,801	28
Upstate N.Y.	5	352	10	–	6	–	2	368	9,189	8,834	18	207	143	24
N.Y. City	22	789	–	–	22	–	2	900	21,454	19,143	45	1,307	1,191	–
N.J.	45	468	–	–	7	1	3	430	10,562	9,099	11	283	230	–
Pa.	20	481	–	–	4	–	2	413	12,566	11,840	13	368	237	4
E.N. CENTRAL	50	1,707	1	–	14	7	17	1,988	69,256	69,920	37	889	1,183	441
Ohio	13	325	–	–	1	7	15	584	25,135	18,791	–	128	199	32
Ind.	–	148	–	–	–	–	2	127	6,513	6,641	3	103	92	33
Ill.	5	690	–	–	6	–	–	454	16,359	21,980	32	443	665	348
Mich.	26	455	1	–	5	–	–	600	14,996	15,652	2	168	180	3
Wis.	6	89	–	–	2	–	–	223	6,253	6,856	–	47	47	25
W.N. CENTRAL	27	472	7	–	8	5	13	1,031	22,380	20,092	14	275	149	1,490
Minn.	12	84	–	–	2	–	–	98	3,495	3,430	4	101	54	270
Iowa	–	49	–	–	2	–	–	110	2,405	2,242	–	13	8	480
Mo.	10	198	6	–	1	5	8	422	10,285	8,419	10	138	72	120
N. Dak.	–	20	–	–	–	–	–	8	314	301	–	4	2	239
S. Dak.	1	36	–	–	1	–	–	33	635	630	–	2	1	167
Nebr.	–	15	1	–	1	–	1	123	1,737	1,691	–	3	5	111
Kans.	4	70	–	–	1	–	4	237	3,509	3,379	–	14	7	103
S. ATLANTIC	104	2,885	8	2	34	35	255	4,703	114,308	111,127	110	3,743	2,943	199
Del.	1	41	1	–	–	2	2	72	1,686	1,538	–	7	8	–
Md.	15	293	–	1	11	4	32	141	11,718	11,726	6	285	207	8
D.C.	8	172	–	–	1	–	–	215	7,150	7,863	8	311	201	–
Va.	12	293	–	–	1	3	32	436	10,522	9,438	8	347	261	34
W. Va.	10	96	–	–	4	1	4	85	1,723	1,457	–	9	12	9
N.C.	21	488	1	–	1	15	94	826	17,796	16,316	14	298	218	2
S.C.	–	275	2	–	–	6	60	487	10,727	10,518	5	252	151	14
Ga.	–	453	4	–	2	4	25	1,278	23,779	21,051	28	967	862	93
Fla.	37	774	–	1	14	–	6	1,163	29,207	31,220	41	1,267	1,023	39
E.S. CENTRAL	53	1,130	2	–	5	5	45	1,150	38,423	36,833	27	922	1,009	233
Ky.	18	309	2	–	–	–	2	175	4,948	5,389	1	44	72	67
Tenn.	5	363	–	–	1	3	32	445	14,581	12,975	9	364	407	129
Ala.	21	311	–	–	2	–	2	209	11,664	10,941	8	251	208	37
Miss.	9	147	–	–	2	2	9	321	7,230	7,528	9	263	322	–
W.S. CENTRAL	64	1,411	43	3	21	2	82	2,388	61,623	58,762	176	3,473	2,397	653
Ark.	11	141	20	–	–	–	15	267	4,269	4,448	4	67	79	91
La.	14	269	2	–	–	–	–	254	9,756	10,381	62	796	574	20
Okla.	3	161	12	–	3	2	55	338	6,631	5,812	3	84	50	123
Tex.	36	840	9	3	18	–	12	1,529	40,967	38,121	107	2,526	1,694	419
MOUNTAIN	18	358	12	–	17	2	9	746	18,472	17,331	24	371	285	98
Mont.	1	23	4	–	4	2	4	25	642	645	1	9	1	58
Idaho	–	6	2	–	–	–	2	59	780	794	6	15	9	–
Wyo.	1	6	1	–	–	–	2	13	413	509	1	7	7	5
Colo.	1	42	2	–	4	–	–	180	4,909	4,641	–	106	78	10
N. Mex.	2	68	1	–	–	–	–	100	2,023	2,228	–	71	50	16
Ariz.	11	157	–	–	9	–	–	131	5,739	4,614	11	80	93	7
Utah	2	19	1	–	–	–	–	42	864	809	3	14	7	–
Nev.	–	37	1	–	–	–	1	196	3,102	3,091	2	69	40	2
PACIFIC	74	2,450	3	2	74	–	1	3,580	73,688	77,593	122	2,097	2,351	324
Wash.	–	192	1	–	5	–	–	184	5,895	6,361	–	66	118	–
Oreg.	6	94	–	–	3	–	–	138	4,647	5,440	–	45	54	3
Calif.	67	2,064	2	2	66	–	1	3,136	59,883	62,327	120	1,943	2,084	308
Alaska	–	34	–	–	–	–	–	76	1,849	1,859	–	5	4	13
Hawaii	1	66	–	–	–	–	–	46	1,414	1,606	2	38	91	–
Guam	NA	7	–	NA	–	NA	–	NA	47	70	NA	–	4	–
P.R.	–	149	–	–	3	–	–	69	1,599	1,270	12	327	259	41
V.I.	–	1	–	–	1	–	–	6	77	108	3	7	10	–
Pac. Trust Terr.	NA	23	–	NA	–	NA	–	NA	134	199	NA	–	–	–

NA: Not available.
All delayed reports and corrections will be included in the following week's cumulative totals.

TABLE IV. Deaths in 121 U.S. cities,* week ending June 27, 1981 (25th week)

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)						P&I** TOTAL
	ALL AGES	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	665	414	168	46	19	18	35
Boston, Mass.	177	94	51	17	7	8	12
Bridgeport, Conn.	61	39	16	5	–	1	11
Cambridge, Mass.	35	30	4	1	–	–	2
Fall River, Mass.	23	18	5	–	–	–	2
Hartford, Conn.	49	29	13	2	3	2	–
Lowell, Mass.	17	7	9	–	1	–	–
Lynn, Mass.	18	12	5	1	–	–	–
New Bedford, Mass	26	18	6	2	–	–	2
New Haven, Conn.	37	26	7	1	1	2	–
Providence, R.I.	76	43	19	7	4	3	2
Somerville, Mass.	10	6	3	–	1	–	–
Springfield, Mass.	46	28	11	6	–	1	2
Waterbury, Conn.	28	16	8	2	1	1	–
Worcester, Mass.	62	48	11	2	1	–	2
MID. ATLANTIC	2,575	1,624	613	178	81	79	101
Albany, N.Y.	44	21	12	4	2	5	–
Allentown, Pa.	20	13	7	–	–	–	–
Buffalo, N.Y.	100	60	30	5	4	1	12
Camden, N.J.	22	16	5	1	–	–	1
Elizabeth, N.J.	31	23	7	1	–	–	–
Erie, Pa.†	33	19	13	–	1	–	1
Jersey City, N.J.	44	30	10	3	–	1	1
N.Y. City, N.Y.	1,325	857	275	115	43	35	42
Newark, N.J.	76	28	25	6	4	13	–
Paterson, N.J.	34	20	11	2	1	–	4
Philadelphia, Pa.	390	226	115	23	12	14	24
Pittsburgh, Pa.†	75	47	22	2	3	1	4
Reading, Pa.	50	36	11	1	2	–	4
Rochester, N.Y.	119	91	20	3	1	4	2
Schenectady, N.Y.	24	18	4	2	–	–	–
Scranton, Pa.†	25	17	4	1	1	2	1
Syracuse, N.Y.	76	44	24	1	5	2	1
Trenton, N.J.	34	19	13	2	–	–	–
Utica, N.Y.	17	14	–	2	–	1	–
Yonkers, N.Y.	36	25	5	4	2	–	4
E.N. CENTRAL	2,247	1,337	573	166	96	75	80
Akron, Ohio	99	67	22	3	4	3	2
Canton, Ohio	49	37	10	–	–	2	2
Chicago, Ill.	492	281	124	44	20	23	10
Cincinnati, Ohio	150	89	42	12	3	4	16
Cleveland, Ohio	191	111	52	13	13	2	6
Columbus, Ohio	129	79	30	6	5	9	2
Dayton, Ohio	107	67	29	3	6	2	1
Detroit, Mich.	272	134	80	34	12	12	16
Evansville, Ind.	44	29	14	–	1	–	–
Fort Wayne, Ind.	45	28	11	1	4	1	3
Gary, Ind.	21	8	5	6	2	–	2
Grand Rapids, Mich.	46	25	10	3	3	5	–
Indianapolis, Ind.	150	86	44	10	7	3	1
Madison, Wis.	38	21	7	3	5	2	5
Milwaukee, Wis.	113	78	28	5	–	2	–
Peoria, Ill.	33	18	9	3	2	1	3
Rockford, Ill.	38	22	7	5	3	1	5
South Bend, Ind.	58	34	14	6	3	1	1
Toledo, Ohio	91	66	17	5	2	1	4
Youngstown, Ohio	81	57	18	4	1	1	1
W.N. CENTRAL	674	404	172	41	33	24	19
Des Moines, Iowa	68	38	20	1	5	4	1
Duluth, Minn.	14	11	3	–	–	–	–
Kansas City, Kans.	36	20	10	5	1	–	1
Kansas City, Mo.	109	69	24	5	2	9	2
Lincoln, Nebr.	29	17	8	2	2	–	3
Minneapolis, Minn.	75	50	11	8	5	1	1
Omaha, Nebr.	83	51	20	5	5	2	1
St. Louis, Mo.	141	78	44	7	9	3	6
St. Paul, Minn.	55	37	12	2	2	2	–
Wichita, Kans.	64	33	20	6	2	3	4
S. ATLANTIC	1,110	635	315	90	44	26	54
Atlanta, Ga.	149	75	55	13	6	–	3
Baltimore, Md.	159	68	59	17	11	4	8
Charlotte, N.C.	65	42	16	2	4	1	4
Jacksonville, Fla.	101	63	19	11	3	5	6
Miami, Fla.	108	58	39	7	2	2	4
Norfolk, Va.	60	32	20	3	2	3	2
Richmond, Va.	75	45	18	5	4	3	7
Savannah, Ga.	39	22	12	3	2	–	2
St. Petersburg, Fla.	96	85	6	2	2	1	7
Tampa, Fla.	79	53	20	4	2	–	3
Washington, D.C.	149	71	45	21	5	7	8
Wilmington, Del.	30	21	6	2	1	–	–
E.S. CENTRAL	676	420	174	39	16	27	24
Birmingham, Ala.	109	69	31	4	1	4	–
Chattanooga, Tenn.	57	41	11	5	–	–	2
Knoxville, Tenn.	45	29	10	3	3	–	1
Louisville, Ky.	108	70	26	5	3	4	5
Memphis, Tenn.	165	98	47	9	4	7	5
Mobile, Ala.	50	28	12	3	2	5	3
Montgomery, Ala.	39	28	4	1	–	6	–
Nashville, Tenn.	103	57	33	9	3	1	8
W.S. CENTRAL	1,265	735	304	108	59	59	28
Austin, Tex.	49	32	10	2	3	2	–
Baton Rouge, La.	44	28	12	3	1	–	4
Corpus Christi, Tex.	43	27	6	4	1	5	1
Dallas, Tex.	164	91	32	16	8	17	–
El Paso, Tex.	60	26	19	5	4	6	3
Fort Worth, Tex.	82	52	19	7	3	1	–
Houston, Tex.	370	205	92	34	27	12	7
Little Rock, Ark.	93	57	23	6	3	4	3
New Orleans, La.	115	57	39	13	2	4	–
San Antonio, Tex.	145	91	30	14	5	5	6
Shreveport, La.	30	18	11	–	–	1	1
Tulsa, Okla.	70	51	11	4	2	2	3
MOUNTAIN	601	358	124	51	46	22	18
Albuquerque, N.Mex.	76	35	19	9	13	–	–
Colo. Springs, Colo.	46	32	7	1	5	1	4
Denver, Colo.	112	66	29	8	6	3	4
Las Vegas, Nev.	66	29	18	8	8	3	2
Ogden, Utah	15	13	1	1	–	–	–
Phoenix, Ariz.	123	71	24	12	10	6	2
Pueblo, Colo.	29	22	3	3	–	1	4
Salt Lake City, Utah	58	37	10	4	2	5	2
Tucson, Ariz.	76	53	13	5	2	3	–
PACIFIC	1,815	1,159	403	132	68	53	84
Berkeley, Calif.	22	16	3	2	1	–	1
Fresno, Calif.	89	47	22	9	9	2	2
Glendale, Calif.	38	29	7	1	1	–	2
Honolulu, Hawaii	67	35	21	6	3	2	4
Long Beach, Calif.	84	44	26	5	4	5	1
Los Angeles, Calif.	482	324	99	35	14	10	17
Oakland, Calif. §	85	55	18	6	3	3	3
Pasadena, Calif.	38	30	7	–	–	1	5
Portland, Oreg.	119	76	31	9	1	2	2
Sacramento, Calif.	75	47	13	6	7	2	5
San Diego, Calif.	142	95	30	7	3	7	4
San Francisco, Calif.	146	89	32	20	1	4	6
San Jose, Calif.	207	132	46	14	10	5	21
Seattle, Wash.	129	75	30	9	8	7	3
Spokane, Wash.	55	38	12	1	2	2	7
Tacoma, Wash.	37	27	6	2	1	1	1
TOTAL	11,628††	7,086	2,846	851	462	383	443

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza

†Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

§Data not available this week. Figures are estimates based on average percent of regional totals.

Cutaneous Larva Migrans — Continued

Clinical findings were similar in all cases; 1 case report follows:

On February 1, 1981, a 38-year-old male, in generally good health, returned to his home in Philadelphia following a one-week stay in Martinique at a limited-access resort. Six days after his return, multiple, subcutaneous, reddish-purple, pruritic lesions erupted on the soles of both feet. Within 12 hours, it was painful for him to stand, and within 24 hours, serpiginous lines appeared (contiguous with the original lesions) and spread over the soles and onto the dorsum of his feet.

A dermatologist and an infectious disease physician diagnosed cutaneous larva migrans. The patient was treated with 1.0 g thiabendazole (Mintezol) twice a day for a total of 4 doses, and because of the relatively heavy infection with marked secondary swelling and inflammation, 30 mg prednisone was also given daily.

Initial improvement was noted, and within 12-18 hours after the first dose of thiabendazole, no further extension of the serpiginous lines was seen. Steroid therapy was stopped after 3 days. Five to six days after initial therapy, large vesicles formed at the site of the initial lesions and walking became quite painful. Mild periorbital swelling was noted at this time, but a differential count (48 hours after prednisone had been stopped) revealed no eosinophilia. Prednisone was reinitiated (topically and systematically) with gradual (5-6 days) resolution of the lesions.

Reported by DJ Wyler, MD, C Panosian, MD, S Gorbach, MD, Tufts University School of Medicine, Boston; DJ Eskin, MD, Abington, Pennsylvania; LK Feinerman, MD, Atlanta, Georgia; Parasitic Diseases Division, Center for Infectious Diseases, CDC.

Editorial Note: Cutaneous larva migrans (creeping eruption) is a form of dermatitis caused by the burrowing of certain types of nematode larvae and characterized by a progressive, linear, papulo-vesicular, pruritic lesion which marks the migratory course of the invading larva (*1*). Human exposure results from skin contact with warm, moist sandy soil containing filariform larvae of hookworms originating from the excreta of dogs and cats. The most common causative agent in the southern United States and, perhaps in the Caribbean, is the dog and cat hookworm *Ancylostoma braziliense* whose range includes the Atlantic and Gulf coastal regions from Maryland to Texas. Larvae of nonhuman species of *Strongyloides* and some other species of skin-penetrating nematodes may also produce the syndrome. After entering the skin, the parasite migrates between the stratum germinativum and the stratum corneum, producing a serpiginous tract that is raised, firm, and vesiculo-bullous, surrounded by an area of erythema. The tracts are intensely pruritic and scratching may lead to secondary bacterial infections. Hypersensitivity reactions are a common feature of the disease, and may persist and generalize as in 2 patients in this series who had recurrent episodes of localized urticarial swelling. Even after the original rash had faded, 1 patient had allergic symptoms that included episodes of pharyngeal edema. These symptoms probably represented continued allergic reactions to larval proteins released by dying larvae after treatment.

The patients recalled no skin contact with ground surfaces outside the resort. Although no obvious fecal contamination of beaches or other areas was noted, several persons reported seeing cats in beach areas. The management of the resort chain was contacted and advised that local investigations should be carried out. Recommendations for control of probable sources of exposure emphasized removal of cats and dogs from public areas within the resort.

Reference

1. Faust EC, Beaver PC, Jung RC. Animal agents and vectors of human disease. 4th ed. Philadelphia: Lea and Febiger, 1975:275-8.

Measles — U.S. Military

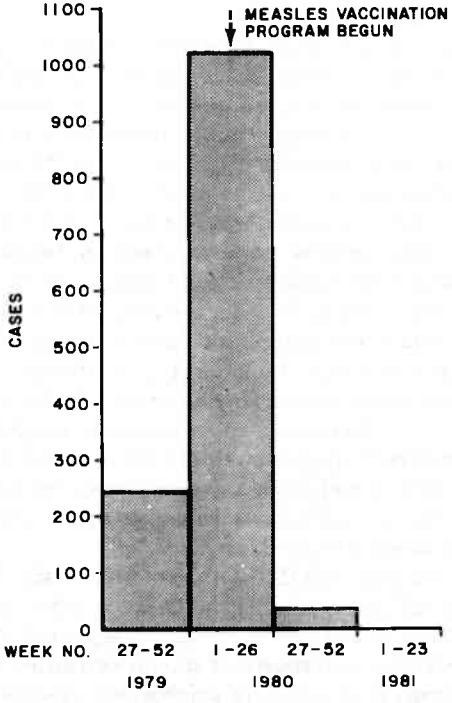
Measles incidence in the Armed Forces has dropped sharply in the United States as the result of a recently instituted measles vaccination program.

Military-related cases include cases among military personnel and cases among military dependents and civilians traced to military personnel with measles. Cases among military dependents were excluded when sources were not known to be military personnel, even though the cases may have occurred on a military base. For the past 2 years, CDC has kept records of cases of measles among military personnel, as well as the spread of measles from military personnel to the community. Military-related measles cases accounted for 245 (9.0%) of the 2,714 reported cases in the United States during the last half of 1979 and 1,025 (8.9%) of the 11,564* reported cases during the first half of 1980 (Figure 1).

On February 20, 1980, the Armed Forces Epidemiological Board issued a recommendation that "the Armed Forces establish a routine program for immunizing recruits

*Provisional data.

FIGURE 1. Reported measles cases related to the military,* by 6-month periods, July 1, 1979-June 13, 1981



*Military-related cases include cases among military personnel and cases among military dependents and civilians resulting from military personnel with measles. Cases in military dependents were excluded when sources were not known to be military personnel, even though the cases may have occurred on a military base.

Measles – Continued

against measles" (*1*). This policy was quickly adopted. As a result, only 34 (1.8%) of the 1,866* reported cases during the second half of 1980 were military related. Of the 2,103* reported cases during the first 23 weeks of 1981, none was reported to be related to the military. The last reported military-related case was that of a military recruit with rash onset on August 17, 1980.

In 1980, the Armed Forces also adopted a policy requiring measles vaccination for attendance at Department of Defense (DOD) schools and day-care centers. All new teachers in DOD schools had to be vaccinated, and vaccination of volunteers and older staff members of schools and day-care centers was encouraged.

Reported by Col. AK Cheng, Office of the Surgeon General, U.S. Air Force; Col. GET Stebbing, Office of the Surgeon General, U.S. Army; Capt. RL Marlor, Navy Bur of Medicine and Surgery, U.S. Navy; Immunization Div, Center for Prevention Services, CDC.

Editorial Note: Measles has been a problem for the U.S. military at least since the Civil War, perhaps because of the unique epidemiologic environment of the military. During the first year of the Civil War, 21,676 cases and 551 deaths were reported among Union Troops (*2*). During World War I, approximately 30,000 U.S. soldiers per year were hospitalized with measles (*3*).

In the past few years, a number of military-related outbreaks have been documented (*1,3-12*) in which several patterns of measles transmission occurred. The most common pattern was endemic transmission on a single base from recruit to recruit in basic training (*1,3-6*). This ongoing transmission occasionally involved military dependents at day-care centers or schools (*7-12*), or civilian populations in communities surrounding military bases (*11*). In some states most of the cases were due to military-related transmission (*4,7*). A second pattern of transmission involved spread from 1 base to another when infected recruits finished basic training and were transferred for advanced training (*1*). A third transmission pattern involved spread to civilian populations in distant parts of the country as infected personnel went home on leave (*1,10,11*).

The data in Figure 1 indicate that the measles vaccination program instituted by the military has been highly successful. No military-related cases have been reported to CDC for the past 40 weeks. The Armed Forces have apparently succeeded in eliminating measles more than 2 years ahead of the national goal to eliminate indigenous measles.

The primary component of the current measles-elimination strategy is to achieve high percentages of immunity in the population through comprehensive vaccination programs. The results of the military program show that measles can be eliminated by this strategy.

References

1. CDC. Measles associated with Fort Dix. MMWR 1980;29:166-7.

(Continued)

*Provisional data.

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The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Send reports to: Attn: Editor, Morbidity and Mortality Weekly Report, Centers for Disease Control, Atlanta, Georgia 30333.

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Measles — Continued

2. Woodward JJ. Outlines of the chief camp diseases of the United States armies as observed during the present war. A practical contribution to military medicine. Philadelphia: Lippincott, 1863:267.
3. Cooch JW. Measles in U.S. Army recruits. Am J Dis Child 1962;103:264-6.
4. CDC. Measles — Texas, 1978. MMWR 1978;27:489-90.
5. CDC. Measles and rubella at a military recruit training center — Illinois. MMWR 1979;28:147-8.
6. CDC. Measles in Air Force recruits — Texas. MMWR 1979;28:553-4.
7. Schaffner W, Schluederberg AE, Byrne EB. Clinical epidemiology of sporadic measles in a highly immunized population. N Engl J Med 1968;279:783-9.
8. CDC. Measles and school immunizations — Alaska. MMWR 1977;26:85-6.
9. CDC. Measles in military dependents — Texas. MMWR 1979;28:58-60.
10. CDC. Measles importations into Montana — 1977-1979. MMWR 1979;28:202-4.
11. CDC. Military to civilian transmission of measles — Illinois, Nebraska. MMWR 1980;29:13-5.
12. CDC. Measles in a day-care center — Washington. MMWR 1980;29:426-7.

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