CENTERS FOR DISEASE CONTROL

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

June 22, 1984 / Vol. 33 / No. 24

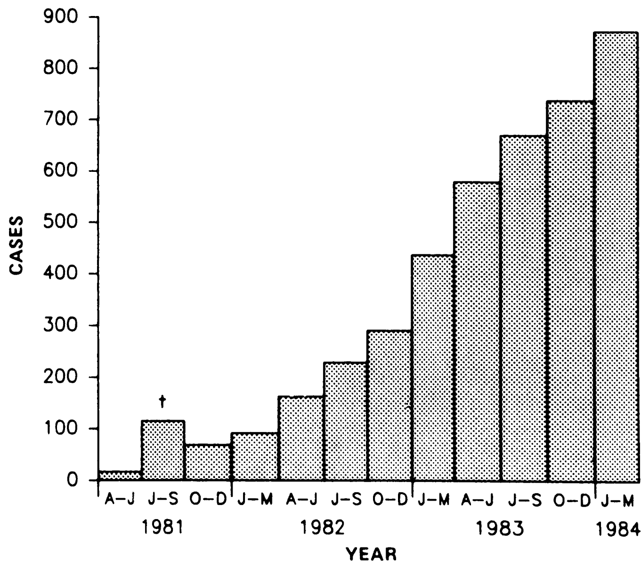
Update: Acquired Immunodeficiency Syndrome (AIDS) — United States

As of June 18, 1984, physicians and health departments in the United States had reported 4,918 patients meeting the surveillance definition for acquired immunodeficiency syndrome (*1,2*). Over 70% of the adult AIDS patients and nearly 80% of the pediatric patients have been reported since January 1983 (Figure 1). Although 2,221 (45%) of all reported patients are known to have died (45% of the adults and 68% of the children), more than 76% of patients diagnosed before July 1982 are dead.

Adult patients: Among 4,861 adult AIDS patients, *Pneumocystis carinii* pneumonia (PCP) continues to be the most common opportunistic disease. Fifty-three percent of patients had PCP without Kaposi's sarcoma (KS); 24% had KS without PCP; 6% had both PCP and KS; and 17% had other opportunistic diseases without either PCP or KS. Of the 1,502 patients with KS, 1,396 (93%) have been homosexual or bisexual men. Ninety percent of adult AIDS patients are 20-49 years old, and 333 (7%) are women. Fifty-eight percent of the cases have occurred among whites; 25%, among blacks; and 14%, among persons of Hispanic origin.

Groups at highest risk of acquiring AIDS continue to be homosexual or bisexual men (72%

FIGURE 1. AIDS cases, by quarter of report — United States,* second quarter 1981 through first quarter 1984



*Because of incomplete data, cases reported during the second quarter of 1984 are not shown.
†Includes backlog of cases identified at beginning of CDC surveillance.

AIDS — Continued

of patients) and intravenous drug abusers (17%); 11% of patients have other or unknown risk factors. These include persons born in Haiti (4% of total cases), patients with hemophilia (1%), heterosexual partners of persons with AIDS or at increased risk for acquiring AIDS (1%), and recipients of blood transfusions (1%). The 52 adults with "transfusion-associated" AIDS have no other known risk factor for AIDS and were transfused with blood or blood components within 5 years of illness onset. Twenty-seven (52%) are known to have died. To examine possible trends in all patient groups, adult patients were divided into four equal categories based on date of report (Table 1). Except for a statistically significant decrease in the proportion of Haitian-born patients ($p < 0.001$), the distribution of cases by patient groups has remained relatively constant over time.

Seventy-eight percent of the adults were reported to be residents of New York, California, Florida, or New Jersey at the time of their onsets of illness. The remaining patients were reported from 41 other states, the District of Columbia, and Puerto Rico. Over time, the proportion of patients from New York has significantly decreased ($p < 0.001$), while the proportion for other states has significantly increased ($p < 0.001$) (Table 2).

Pediatric patients: Of the 57 patients under 5 years of age, 45 (79%) were reported to be residents of New York, Florida, California, or New Jersey at the time of their onsets of illness. Thirty-one (54%) of the 57 patients were male. Forty-four (77%) of the patients had PCP without KS; one (2%) had KS without PCP; two (4%) had both PCP and KS; and 10 (18%) had opportunistic infections without either PCP or KS. Twenty-nine percent of the pediatric patients are white; 50%, black; and 21%, of Hispanic origin. Of the 57 pediatric patients, 23 came from families in which one or both parents had a history of intravenous drug abuse; 13 had one or both parents who were born in Haiti; and 12 had transfusions with blood or blood components before their onsets of illness. Risk factor information on the parents of eight of the nine remaining patients is incomplete.

TABLE 1. Percent distribution of adult AIDS patients, by patient group, divided into quartiles based on date of report — United States

	Patient group							
Quartile*	**Homosexual/ bisexual**	**IV drug user**	**Haitian-born**	**Hemophiliac**	**Transfusion recipient**	**Heterosexual sex partners**	**Other/ unknown**	**Total**
1	72.3	16.4	5.0	0.9	0.4	1.1	3.9	100% (N = 1,216)
2	70.9	17.2	4.7	0.6	1.4	0.9	4.3	100% (N = 1,215)
3	72.4	18.0	3.2	0.4	1.2	0.6	4.2	100% (N = 1,215)
4	71.9	18.4	2.5	1.2	1.3	0.5	4.2	100% (N = 1,215)
Total	71.9	17.5	3.8	0.8	1.1	0.8	4.1	100% (N = 4,861)

*Quartile 1 contains cases reported during or before February 1983; quartile 2, between February 1983 and September 1983; quartile 3, between September 1983 and February 1984; and quartile 4, during or after February 1984.

TABLE 2. Percent distribution of adult AIDS patients, by residence at onset of illness, divided into quartiles based on date of report — United States

	Residence at onset of illness					
Quartile*	**California**	**Florida**	**New Jersey**	**New York**	**Other**	**Total**
1	20.1	6.7	6.7	49.5	17.0	100% (N = 1,216)
2	22.7	7.9	5.9	41.2	20.3	100% (N = 1,215)
3	25.4	6.8	6.7	37.0	24.1	100% (N = 1,215)
4	21.7	6.3	6.5	39.5	26.0	100% (N = 1,215)
Total	22.5	6.9	6.4	41.8	22.4	100% (N = 4,861)

*Quartile 1 contains cases reported during or before February 1983; quartile 2, between February 1983 and September 1983; quartile 3, between September 1983 and February 1984; and quartile 4, during or after February 1984.

AIDS — Continued

Reported by State and Territorial Epidemiologists; AIDS Activity, Center for Infectious Diseases, CDC.

Editorial Note: Nationally, the reported incidence of AIDS among adults continues to increase but at an apparently slower rate than in early 1983. Despite this increase, the proportion of adult patients outside of population groups previously identified as being at increased risk for AIDS has remained constant.

Most adult AIDS patients continue to be reported from among residents of a small number of states. It is unknown whether the decrease in the proportion of patients reported from New York and the increase in reporting from other states represents a true change in geographic distribution of patients or increased recognition and reporting of this syndrome in other states. Forty-one states, the District of Columbia, and Puerto Rico have either made AIDS reportable or have legislation pending to do so.

The geographic distribution of AIDS in children under 5 years old is similar to that seen for adult AIDS patients and is compatible with transmission from affected mothers before or at birth or transmission through blood transfusion. In both children and heterosexual adults, AIDS is much more likely to present with opportunistic infections than with KS.

References

1. CDC. Update: acquired immunodeficiency syndrome (AIDS)—United States. MMWR 1984;32: 688-91.
2. Selik RM, Haverkos HW, Curran JW. Acquired immune deficiency syndrome (AIDS) trends in the United States, 1978-1982. Am J Med 1984;76:493-500.

Human Arboviral Encephalitis — United States, 1983

In 1983, 105 cases of arboviral encephalitis were reported in the United States (Figures 2 and 3). Brief reports follow.

St. Louis encephalitis (SLE): In the central United States, where epidemic *Culex pipiens*-borne SLE was expected, remarkably few cases were reported: two occurred in Cook County, Illinois, and one, in Jackson County, Indiana. Sporadic cases were documented in a Florida man who traveled widely in the month before onset of illness and in residents of El Paso County, Texas, and Bernalillo County, New Mexico.

An outbreak of *Cx. tarsalis*-borne SLE occurred in California and Arizona in association with flooding of the lower Colorado River. The estimated attack rate for California residents of census subdivisions contiguous with the river in Riverside, Imperial, and San Bernadino Counties was 4/25,928 (15.4/100,000). Two residents of other California counties visited flooded sections of the Colorado River in the 2 weeks before their onsets of illness and also may have been infected there. Five SLE cases occurred among Arizona residents, but exposures of only three were temporally and geographically associated with Colorado River flooding. The estimated attack rate for Arizona census subdivisions adjoining the river was 3/130,107 (2.3/100,000). Although the reasons for a lower attack rate in Arizona are unclear, a larger urban population (removed from exposure to *Cx. tarsalis*) in areas of risk in Arizona may have been a contributing factor.

Contrary to observations in California's central valley in the 1940s and 1950s, nine of the 14 cases in California and Arizona in 1983 occurred among adults 50 years of age or older (Figure 4). The increased number of cases among adults may reflect a decline in endemic transmission with age during the past 30 years, resulting from an increase in susceptibility.

Eastern equine encephalitis (EEE): Fourteen EEE cases occurred in 1983. Increased transmission of EEE virus in Massachusetts' Taunton Valley led to six human cases. In Rhode Island, where EEE was reported in humans for the first time, two cases occurred.

Other human cases occurred in recognized endemic foci of EEE virus activity: Onondaga County, New York; Lowndes County, Georgia; Elkhart County, Indiana; and several Florida counties.

Human Arboviral Encephalitis — Continued

FIGURE 2. Human and equine arboviral encephalitides, by etiologic agent — United States, 1983

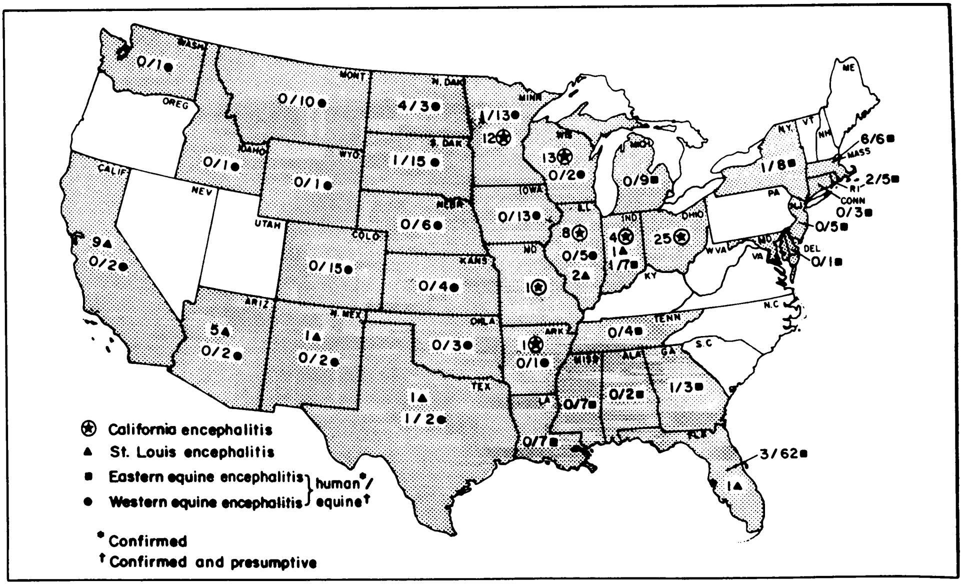
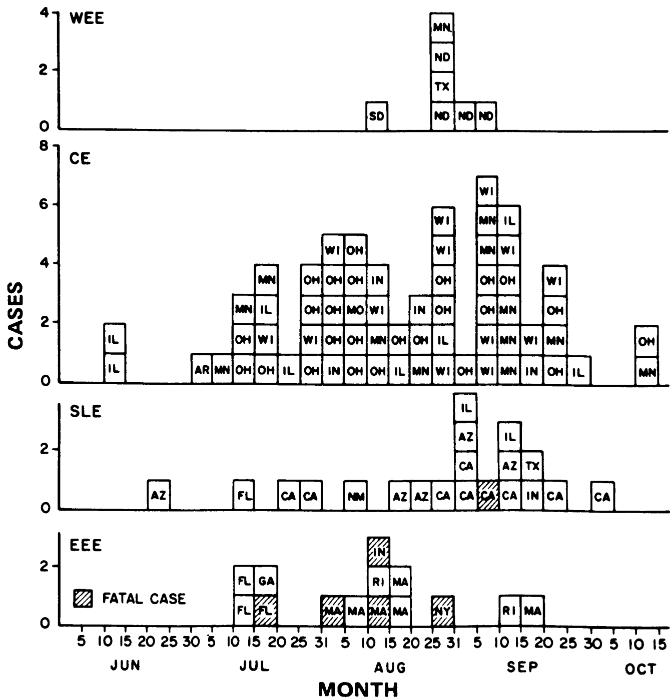


FIGURE 3. Human arboviral encephalitides, by date of onset, etiologic agent, and state of residence — United States, 1983



Human Arboviral Encephalitis — Continued

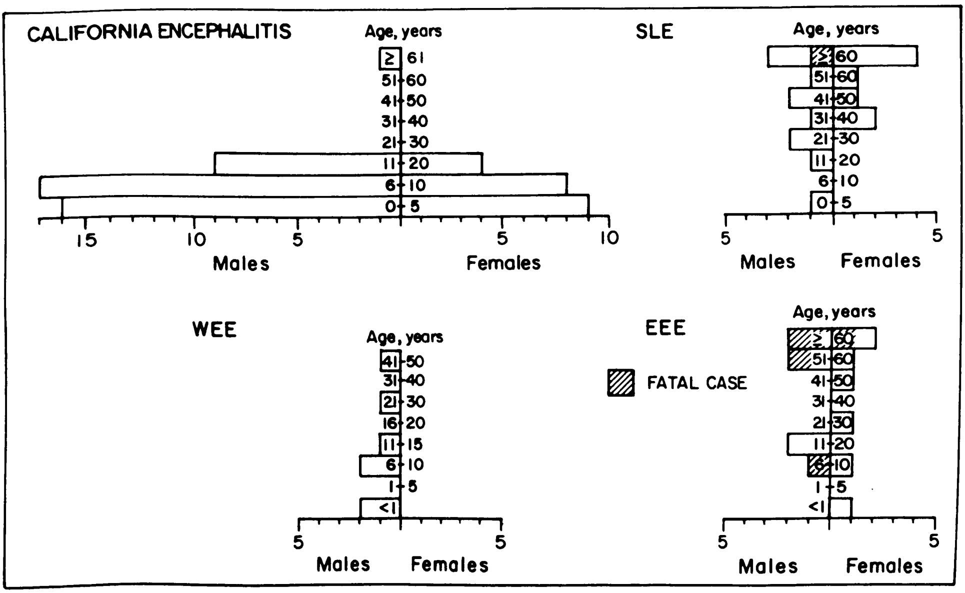
The overall case-fatality ratio was 35.7% (five deaths among 14 cases). A trend was observed toward greater mortality among males—57.1%, compared with 14.3% among females ($p = 0.13$) (Figure 3).

Western equine encephalitis (WEE): An outbreak of WEE led to six human cases in geographically disparate areas of Minnesota, North Dakota, and South Dakota. Although no fatalities occurred, two infants sustained residual neurologic damage. All cases occurred among males, and all but one, among children (Figure 3). A single WEE case occurred in a 45-year-old Hale County, Texas, man.

California encephalitis (CE): Sixty-four CE cases were reported primarily among residents of states bordering the Great Lakes. The disease occurred focally in southeastern Minnesota counties and adjacent western counties in Wisconsin. A greater proportion of cases from Minnesota and Wisconsin occurred late in the summer—13 of 25 patients from these states and 10 of 39 patients from other states had onset after September 1 ($X^2_1 = 4.60$ $p < 0.05$). Forty-three cases (67%) occurred among males (Figure 3), and 50 cases (78%) occurred among children 0-10 years of age. The geographic, temporal, age, and sex distributions of cases in 1983 were similar to observations in other years.

Reported by LH Lauerman, DVM, Alabama Dept of Agriculture and Industries, WE Birch, DVM, State Epidemiologist, Alabama Dept of Public Health; H Webster, MD, W Stromberg, PhD, ME Wright, J Doll, PhD, NJ Petersen, SM, State Epidemiologist, Arizona Dept of Health Svcs; JP Lofgren MD, State Epidemiologist, Arkansas Dept of Health; R Emmons, MD, R Murray, MD, R Roberto, MD, J Chin, MD, State Epidemiologist, California State Dept of Health Svcs; JK Emerson, DVM, SW Ferguson, PhD, State Epidemiologist, Colorado State Dept of Health; A Main, PhD, R Shope, MD, Yale Arbovirus Research Unit, New Haven, MA Markowski, EE Jones, MD, State Epidemiologist, Connecticut State Dept of Health Svcs; PR Silverman, DrPH, State Epidemiologist, Delaware Dept of Health and Social Svcs; HL Rubin, DVM, Florida Dept of Agriculture and Consumer Svcs, F Sorhage, MD, W Bigler, PhD, JJ Sacks, MD, Acting State Epidemiologist, Florida State Dept of Health and Rehabilitative Svcs; J Cole, DVM, Universtiy of Georgia, Tifton, RK Sikes, DVM, State Epidemiologist, Georgia Dept of Human Resources; HJ Dominick, Pesticides and Vector Control, W Turnock, MD, Chicago Dept of Health, RJ Martin, DVM, C Langkop, MD, BJ Francis, MD, State Epidemiologist, Illinois State Dept of Public Health; M Sinsko, PhD, CL Barrett, MD, State Epidemiologist, Indiana State Board of Health; D Dorsey, PhD, LA Wintermeyer, MD, State Epidemi-

FIGURE 4. Arboviral encephalitides, by age, sex, and etiologic agent — United States, 1983



Human Arboviral Encephalitis — Continued

ologist, Iowa Dept of Health; DE Wilcox, MD, State Epidemiologist, Kansas State Dept of Health and Environment; JC McCammon, Louisville and Jefferson County Dept of Health, MW Hinds, MD, State Epidemiologist, Kentucky State Cabinet for Human Resources; W Atkinson, MD, HB Bradford, Jr, PhD, L McFarland, DrPH, CT Caraway, DVM, State Epidemiologist, Louisiana State Dept of Health and Human Resources; CP Lazar, MD, G Stern, DVM, Maryland Dept of Agriculture, E Israel, MD, State Epidemiologist, Maryland State Dept of Health and Mental Hygiene; V Berardi, H Maxfield, NJ Fiumara, MD, State Epidemiologist, Massachusetts State Dept of Public Health; H McGee, MPH, KR Wilcox, MD, State Epidemiologist, Michigan State Dept of Public Health; L Boyd, PhD, MT Osterholm, PhD, AG Dean, MD, State Epidemiologist, Minnesota State Dept of Health; DL Sykes, QA Long, Gulf Coast Mosquito Control Commission, Gulfport, FE Thompson, MD, State Epidemiologist, Mississippi State Board of Health; HD Donnell, Jr, MD, State Epidemiologist, Missouri State Dept of Social Svcs; JK Gedrose, State Epidemiologist, Montana State Dept of Health and Environmental Sciences; PA Stoesz, MD, State Epidemiologist, Nebraska State Dept of Health; WJ Crans, PhD, New Jersey Agricultural Experiment Station, New Brunswick, WE Parkin, DVM, State Epidemiologist, New Jersey State Dept of Health; J Montes, HF Hull, MD, Acting State Epidemiologist, New Mexico Health and Environment Dept; M Grayson, PhD, R Deibel, MD, DL Morse, MD, R Rothenberg, MD, State Epidemiologist, New York State Dept of Health; JN MacCormack, MD, State Epidemiologist, North Carolina Dept of Human Resources; K Tardiff, JL Pearson, DrPH, State Epidemiologist, North Dakota State Dept of Health; ED Peterson, M Parsons, MS, TJ Halpin, MD, State Epidemiologist, Ohio State Dept of Health; E Witte, DVM, CW Hays, MD, State Epidemiologist, Pennsylvania State Dept of Health; SG Morin, Rhode Island Dept of Environmental Management, RA Keenlyside, MBBS, State Epidemiologist, Rhode Island State Dept of Health; KA Senger, State Epidemiologist, South Dakota Dept of Health; JG Hamm, SJ Jones, JR Oates, WP Kelly, Memphis-Shelby County

(Continued on page 347)

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

Disease	24th Week Ending			Cumulative, 24th Week Ending		
	June 16, 1984	June 18, 1983	Median 1979-1983	June 16, 1984	June 18, 1983	Median 1979-1983
Acquired Immunodeficiency Syndrome (AIDS)	100	N	N	1,778	N	N
Aseptic meningitis	124	154	139	1,845	2,076	1,797
Encephalitis: Primary (arthropod-borne & unspec.)	18	19	19	374	416	372
Post-infectious	3	2	2	42	50	50
Gonorrhea: Civilian	15,396	18,900	18,900	362,184	406,182	432,043
Military	403	464	450	9,299	11,108	12,551
Hepatitis: Type A	425	404	527	9,994	10,365	11,799
Type B	526	474	446	10,885	10,345	9,067
Non A, Non B	81	61	N	1,673	1,551	N
Unspecified	119	139	181	2,731	3,349	4,576
Legionellosis	11	24	N	255	325	N
Leprosy	3	3	3	106	121	89
Malaria	25	17	17	336	319	427
Measles: Total*	46	39	60	1,577	957	2,119
Indigenous	43	31	N	1,415	786	N
Imported	3	8	N	162	171	N
Meningococcal infections: Total	40	63	52	1,500	1,584	1,584
Civilian	40	63	52	1,496	1,568	1,568
Military	-	-	-	4	16	10
Mumps	53	52	159	1,699	1,991	3,710
Pertussis	32	62	19	908	828	503
Rubella (German measles)	30	31	66	401	636	1,562
Syphilis (Primary & Secondary): Civilian	577	717	566	12,650	14,941	13,764
Military	7	1	2	159	205	176
Toxic Shock syndrome	9	12	N	187	220	N
Tuberculosis	398	507	582	9,634	10,302	12,085
Tularemia	13	8	7	61	94	78
Typhoid fever	4	7	8	137	151	179
Typhus fever, tick-borne (RMSF)	43	66	49	195	222	283
Rabies, animal	127	127	136	2,334	3,053	3,053

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1984		Cum. 1984
Anthrax (Ariz. 1)	2	Plague (Calif. 1)	9
Botulism: Foodborne	6	Poliomyelitis: Total	1
Infant	44	Paralytic	1
Other (Mass. 1)	3	Psittacosis (Upstate N.Y. 2, Nev. 1)	35
Brucellosis	45	Rabies, human	-
Cholera	-	Tetanus (Md. 1, S.C. 1, Fla. 1)	18
Congenital rubella syndrome	3	Trichinosis (N.J. 1)	36
Diphtheria	-	Typhus fever, flea-borne (endemic, murine) (Okla. 1)	7
Leptospirosis	8		

*Three of the 46 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending June 16, 1984 and June 18, 1983 (24th Week)

Reporting Area	AIDS	Aseptic Menin-gitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionel-losis	Leprosy
			Primary	Post-in-fectious			A	B	NA,NB	Unspeci-fied		
	Cum. 1984	1984	Cum. 1984	Cum. 1984	Cum. 1984	Cum. 1983	1984	1984	1984	1984	1984	Cum. 1984
UNITED STATES	1,778	124	374	42	362,184	406,182	425	526	81	119	11	106
NEW ENGLAND	63	4	25	1	10,613	9,984	6	23	2	12	-	5
Maine	-	-	-	-	421	542	-	1	-	-	-	-
N.H.	1	-	4	-	290	285	2	4	1	-	-	-
Vt.	-	-	2	-	176	184	-	-	-	-	-	-
Mass.	35	4	12	-	4,176	4,395	2	12	-	12	-	4
R.I.	4	-	-	-	687	552	-	-	-	-	-	1
Conn.	23	-	7	1	4,863	4,026	2	6	1	-	-	-
MID ATLANTIC	829	17	51	4	50,211	51,742	56	122	9	10	1	16
Upstate N.Y.	80	2	18	3	7,568	7,968	6	18	3	-	-	2
N.Y. City	596	4	3	-	21,305	21,271	15	47	-	4	1	14
N.J.	116	5	17	-	8,279	9,812	18	26	3	5	-	-
Pa.	37	6	13	1	13,059	12,691	17	31	3	1	-	-
E.N. CENTRAL	87	12	79	12	45,747	58,263	18	41	5	6	4	6
Ohio	12	1	31	5	13,034	15,639	8	18	3	1	3	2
Ind.	12	4	12	-	5,589	6,380	2	4	-	3	-	-
Ill.	45	-	11	6	7,034	16,188	2	5	-	-	-	2
Mich.	11	7	20	-	14,375	15,090	6	14	2	2	1	2
Wis.	7	-	5	1	5,715	4,966	-	-	-	-	-	-
W.N. CENTRAL	17	3	11	-	17,229	18,927	7	7	3	-	-	1
Minn.	4	1	3	-	2,535	2,685	3	1	1	-	-	-
Iowa	1	-	5	-	1,984	2,099	1	2	-	-	-	1
Mo.	9	2	1	-	8,154	9,224	-	2	-	-	-	-
N. Dak.	-	-	-	-	177	179	-	-	-	-	-	-
S. Dak.	-	-	-	-	462	526	3	2	-	-	-	-
Nebr.	1	-	1	-	1,211	1,104	-	-	-	-	-	-
Kans.	2	-	1	-	2,706	3,110	-	-	2	-	-	-
S. ATLANTIC	221	24	72	10	93,588	104,114	28	94	10	9	4	5
Del.	3	-	1	-	1,643	1,866	1	1	-	-	-	-
Md.	17	3	17	-	10,566	13,036	1	22	3	-	-	-
D.C.	33	-	-	-	6,724	7,116	-	-	-	-	-	1
Va.	14	6	17	4	8,834	8,888	2	11	-	1	3	3
W. Va.	3	1	4	-	1,134	1,093	-	-	-	-	1	-
N.C.	4	4	16	5	15,088	15,244	4	10	1	1	-	-
S.C.	4	1	2	-	8,854	9,761	3	11	-	2	-	-
Ga.	20	3	2	-	18,191	22,336	1	16	1	-	-	-
Fla.	123	6	13	1	22,554	24,774	16	23	5	5	-	1
E.S. CENTRAL	14	11	17	2	30,511	34,100	9	30	2	4	-	-
Ky.	7	-	2	-	3,850	4,025	5	3	-	1	-	-
Tenn.	3	2	3	-	12,790	13,832	3	20	2	1	-	-
Ala.	3	9	11	2	9,836	10,639	1	6	-	2	-	-
Miss.	1	-	1	-	4,035	5,604	-	1	-	-	-	-
W.S. CENTRAL	88	27	28	3	50,260	56,943	53	36	5	38	-	7
Ark.	-	2	-	2	4,391	4,282	-	-	1	6	-	-
La.	14	4	4	-	11,591	9,927	7	10	2	2	-	-
Okla.	4	1	7	1	5,435	6,709	11	4	-	-	-	-
Tex.	70	20	17	-	28,843	36,025	35	22	2	30	-	7
MOUNTAIN	21	4	13	4	11,808	12,500	66	30	8	13	-	7
Mont.	-	-	-	-	516	535	5	1	-	-	-	-
Idaho	-	-	-	-	553	569	5	1	-	-	-	-
Wyo.	1	-	-	-	353	329	2	1	-	-	-	-
Colo.	12	4	7	-	3,381	3,515	17	6	3	2	-	-
N. Mex.	-	-	-	-	1,323	1,505	8	-	-	2	-	-
Ariz.	6	-	2	1	3,252	3,524	20	18	3	9	-	5
Utah	1	-	4	3	588	618	8	1	2	-	-	1
Nev.	1	-	-	-	1,842	1,905	1	2	-	-	-	1
PACIFIC	438	22	78	6	52,217	59,609	182	143	37	27	2	59
Wash.	23	4	3	-	3,513	4,393	4	4	4	2	-	3
Oreg.	3	-	-	-	3,107	3,032	18	12	6	2	-	1
Calif.	408	18	73	6	43,445	49,517	158	126	27	23	2	40
Alaska	-	-	-	-	1,285	1,438	-	-	-	-	-	-
Hawaii	4	-	2	-	867	1,229	2	1	-	-	-	15
Guam	-	U	-	-	89	86	U	U	U	U	U	-
P.R.	26	2	-	1	1,606	1,480	7	-	-	7	-	-
V.I.	-	-	-	-	189	132	-	-	-	-	-	-
Pac. Trust Terr.	-	U	-	-	-	-	U	U	U	U	U	-

N: Not notifiable U: Unavailable

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending June 16, 1984 and June 18, 1983 (24th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported *		Total									
	Cum. 1984	1984	Cum. 1984	1984	Cum. 1984	Cum. 1983	Cum. 1984	1984	Cum. 1984	1984	Cum. 1984	Cum. 1983	1984	Cum. 1984	Cum. 1983
UNITED STATES	336	43	1,415	3	162	957	1,500	53	1,699	32	908	828	30	401	636
NEW ENGLAND	26	-	80	-	8	13	96	1	54	3	15	28	3	30	8
Maine	-	-	-	-	-	-	1	-	16	-	-	-	-	1	-
N.H.	-	-	26	-	3	3	6	-	9	-	2	6	-	-	2
Vt.	2	-	2	-	2	-	22	-	3	3	11	3	-	-	3
Mass.	15	-	43	-	-	3	32	-	13	-	1	16	3	29	3
R.I.	3	-	-	-	-	-	9	-	4	-	1	3	-	-	-
Conn.	6	-	9	-	3	7	26	1	9	-	-	-	-	-	-
MID ATLANTIC	59	3	70	-	21	45	246	13	216	4	67	223	16	125	117
Upstate N.Y.	18	-	16	-	7	6	91	5	46	4	45	64	12	95	18
N.Y. City	13	3	51	-	7	35	36	5	12	-	3	32	4	27	84
N.J.	16	-	3	-	3	1	54	3	123	-	4	14	-	2	3
Pa.	12	-	-	-	4	3	65	-	35	-	15	113	-	1	12
E.N. CENTRAL	23	18	508	3	66	526	231	5	634	11	252	210	1	57	93
Ohio	6	-	1	3†	5	56	83	-	257	2	47	66	-	2	1
Ind.	-	-	2	-	1	342	32	-	33	9	168	16	-	2	15
Ill.	6	2	159	-	1	123	45	3	146	-	15	96	1	30	41
Mich.	5	16	339	-	54	5	45	2	151	-	12	11	-	16	14
Wis.	6	-	7	-	5	-	26	-	47	-	10	21	-	7	22
W.N. CENTRAL	9	1	1	-	2	1	98	1	76	-	75	55	5	26	29
Minn.	1	-	-	-	2	1	20	-	2	-	7	20	-	1	5
Iowa	1	-	-	-	-	-	17	-	17	-	3	5	-	-	-
Mo.	6	1	1	-	-	-	28	1	7	-	12	11	-	-	-
N. Dak.	-	-	-	-	-	-	1	-	1	-	-	1	-	3	-
S. Dak.	-	-	-	-	-	-	6	-	-	-	3	2	-	-	-
Nebr.	-	-	-	-	-	-	7	-	3	-	2	-	-	-	-
Kans.	1	-	-	-	-	-	19	-	46	-	48	16	5	22	24
S. ATLANTIC	59	-	10	-	17	172	333	6	127	3	59	111	-	20	71
Del.	3	-	-	-	-	-	3	-	2	-	-	2	-	-	-
Md.	13	-	4	-	5	4	25	1	26	-	3	17	-	1	1
D.C.	1	-	-	-	5	-	4	-	-	-	-	-	-	-	-
Va.	15	-	1	-	1	22	38	1	11	-	7	37	-	-	1
W. Va.	1	-	-	-	-	-	4	3	27	1	7	4	-	-	-
N.C.	4	-	-	-	-	-	48	-	14	-	17	5	-	-	7
S.C.	1	-	-	-	-	4	31	-	1	-	1	7	-	-	-
Ga.	4	-	-	-	-	6	69	-	16	-	2	25	-	2	10
Fla.	17	-	5	-	6	136	111	1	30	2	22	14	-	17	52
E.S. CENTRAL	2	-	1	-	2	6	59	1	35	-	5	7	2	7	8
Ky.	-	-	1	-	-	1	4	-	8	-	1	2	2	3	7
Tenn.	-	-	-	-	2	-	21	1	11	-	2	2	-	-	-
Ala.	2	-	-	-	-	5	23	-	5	-	-	1	-	1	1
Miss.	-	-	-	-	-	-	11	-	11	-	2	2	-	3	-
W.S. CENTRAL	31	13	332	-	14	70	171	6	99	1	225	88	-	13	83
Ark.	-	-	-	-	-	10	25	-	4	-	11	5	-	3	-
La.	5	-	-	-	-	25	35	-	-	-	3	2	-	-	9
Okla.	3	-	6	-	-	1	23	N	N	-	200	60	-	-	-
Tex.	23	13	326	-	14	34	88	6	95	1	11	21	-	10	74
MOUNTAIN	12	-	79	-	10	3	52	10	189	6	67	75	-	10	21
Mont.	1	-	-	-	-	-	1	-	3	-	17	1	-	-	2
Idaho	2	-	-	-	-	-	6	1	8	-	2	2	-	1	8
Wyo.	-	-	-	-	-	-	2	-	1	-	3	4	-	2	1
Colo.	1	-	-	-	-	2	19	-	12	4	25	46	-	2	-
N. Mex.	-	-	56	-	8	-	7	N	N	-	5	6	-	-	-
Ariz.	6	-	-	-	-	1	13	9	159	1	9	9	-	-	4
Utah	2	-	23	-	2	-	4	-	5	1	4	7	-	5	5
Nev.	-	-	-	-	-	-	-	-	1	-	2	-	-	-	1
PACIFIC	115	8	334	-	22	121	214	10	269	4	143	31	3	113	206
Wash.	3	-	89	-	-	4	27	-	27	1	18	2	-	1	6
Oreg.	5	-	-	-	-	7	33	N	N	-	9	5	-	-	12
Calif.	104	3	234	-	19	109	146	10	228	1	50	24	3	110	188
Alaska	-	-	-	-	-	-	7	-	4	-	-	-	-	-	-
Hawaii	3	5	11	-	3	1	1	-	10	2	66	-	-	2	-
Guam	-	U	83	U	2	2	1	U	5	U	-	-	U	1	-
P.R.	2	-	-	-	-	76	3	6	85	-	-	8	-	5	3
V.I.	-	-	-	-	-	5	-	-	3	-	-	-	-	-	1
Pac. Trust Terr.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending June 16, 1984 and June 18, 1983 (24th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1984	Cum. 1983	1984	Cum. 1984	Cum. 1983	Cum. 1984	Cum. 1984	Cum. 1984	Cum. 1984
UNITED STATES	12,650	14,941	9	9,634	10,302	61	137	195	2,334
NEW ENGLAND	256	320	-	268	284	1	7	1	15
Maine	2	9	-	13	17	-	-	-	9
N.H.	4	11	-	20	23	-	-	-	-
Vt.	1	1	-	3	2	-	-	-	-
Mass.	151	197	-	144	153	1	5	1	5
R.I.	8	11	-	23	25	-	-	-	-
Conn.	90	91	-	65	64	-	2	-	1
MID ATLANTIC	1,744	1,899	-	1,744	1,851	-	18	1	137
Upstate N.Y.	121	149	-	296	299	-	7	1	8
N.Y. City	1,085	1,120	-	719	767	-	4	-	-
N.J.	320	372	-	378	386	-	3	-	2
Pa.	218	258	-	351	399	-	4	-	127
E.N. CENTRAL	474	831	-	1,279	1,268	-	18	9	96
Ohio	121	225	-	251	206	-	3	9	9
Ind.	64	71	-	132	90	-	2	-	10
Ill.	60	403	-	527	563	-	8	-	42
Mich.	191	96	-	292	337	-	2	-	8
Wis.	38	36	-	77	72	-	3	-	27
W.N. CENTRAL	205	179	3	275	344	17	5	18	371
Minn.	59	77	-	45	70	-	2	-	34
Iowa	10	6	-	34	33	-	-	-	72
Mo.	105	62	-	129	180	16	2	3	33
N. Dak.	4	1	-	7	3	-	-	-	74
S. Dak.	2	8	-	9	22	1	-	1	94
Nebr.	9	11	-	15	8	-	-	-	27
Kans.	16	14	3	36	28	-	1	14	37
S. ATLANTIC	3,795	3,902	-	2,056	2,039	3	15	75	722
Del.	12	17	-	27	15	-	-	-	1
Md.	246	256	-	244	153	-	-	5	428
D.C.	144	168	-	77	80	-	5	-	-
Va.	203	272	-	197	201	-	4	10	125
W. Va.	10	14	-	71	72	-	-	2	17
N.C.	375	363	-	309	279	1	1	27	9
S.C.	353	243	-	247	190	-	1	24	19
Ga.	658	735	-	261	380	2	1	6	75
Fla.	1,794	1,834	-	623	669	-	3	1	48
E.S. CENTRAL	828	1,007	-	881	990	-	5	19	119
Ky.	52	58	-	203	247	-	2	2	29
Tenn.	220	285	-	274	295	-	2	10	54
Ala.	287	409	-	271	248	-	1	4	36
Miss.	269	255	-	133	200	-	-	3	-
W.S. CENTRAL	3,020	3,953	-	1,062	1,243	24	8	66	502
Ark.	89	95	-	116	137	18	-	9	56
La.	574	827	-	142	209	3	1	1	21
Okla.	79	111	-	115	126	3	1	40	58
Tex.	2,278	2,920	-	689	771	-	6	16	367
MOUNTAIN	302	334	1	230	286	12	9	4	88
Mont.	1	5	-	11	22	-	1	4	50
Idaho	13	6	-	15	14	3	-	-	-
Wyo.	3	6	-	-	6	-	-	-	-
Colo.	68	73	-	22	26	4	2	-	7
N. Mex.	41	108	-	45	53	1	2	-	9
Ariz.	122	77	-	103	128	2	3	-	20
Utah	10	11	-	18	23	2	-	-	-
Nev.	44	48	1	16	14	-	1	-	2
PACIFIC	2,026	2,516	5	1,839	1,997	4	52	2	284
Wash.	60	89	-	93	99	-	1	-	1
Oreg.	63	46	1	75	85	2	1	1	1
Calif.	1,864	2,343	4	1,544	1,666	2	46	-	276
Alaska	3	7	-	28	25	-	1	1	6
Hawaii	36	31	-	99	122	-	3	-	-
Guam	-	-	U	5	3	-	-	-	-
P.R.	410	400	-	205	237	-	3	-	29
V.I.	7	8	-	2	1	-	-	-	-
Pac. Trust Terr.	-	-	U	-	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending June 16, 1984 (24th Week Ending)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	842	594	163	45	14	26	76
Boston, Mass.	213	138	46	14	5	10	26
Bridgeport, Conn.	61	42	12	3	1	3	1
Cambridge, Mass.	39	33	5	1	-	-	8
Fall River, Mass.	27	21	6	-	-	-	1
Hartford, Conn.	87	60	20	4	-	3	-
Lowell, Mass.	28	25	1	2	-	-	4
Lynn, Mass.	26	18	7	1	-	-	-
New Bedford, Mass.	32	26	4	1	-	1	1
New Haven, Conn.	58	35	12	6	2	3	6
Providence, R.I.	71	42	18	5	3	3	9
Somerville, Mass.	6	5	1	-	-	-	-
Springfield, Mass.	58	46	7	-	2	3	7
Waterbury, Conn.	42	32	6	3	1	-	5
Worcester, Mass.	94	71	18	5	-	-	8
MID. ATLANTIC	2,746	1,892	566	169	73	46	103
Albany, N.Y.	57	45	7	2	1	2	-
Allentown, Pa.	17	12	4	1	-	-	-
Buffalo, N.Y.	120	71	29	9	6	5	9
Camden, N.J.	31	21	9	1	-	-	1
Elizabeth, N.J.	30	21	8	-	1	-	1
Erie, Pa.†	36	30	3	3	-	-	4
Jersey City, N.J.	61	37	17	6	1	-	-
N.Y. City, N.Y.	1,688	1,161	339	112	50	26	45
Newark, N.J.	49	25	14	5	2	3	3
Paterson, N.J.	31	23	4	-	-	4	4
Philadelphia, Pa.†	163	112	36	12	3	-	7
Pittsburgh, Pa.†	83	56	20	5	-	2	2
Reading, Pa.	26	22	4	-	-	-	2
Rochester, N.Y.	130	97	21	5	4	3	14
Schenectady, N.Y.	25	15	8	1	-	1	1
Scranton, Pa.†	24	18	5	1	-	-	-
Syracuse, N.Y.	92	67	22	1	2	-	6
Trenton, N.J.	24	17	3	1	3	-	1
Utica, N.Y.	23	19	3	1	-	-	1
Yonkers, N.Y.	36	23	10	3	-	-	2
E.N. CENTRAL	2,255	1,549	422	132	60	84	87
Akron, Ohio	64	36	14	5	4	5	-
Canton, Ohio	46	35	6	2	-	3	3
Chicago, Ill §	474	424	6	9	12	15	10
Cincinnati, Ohio	128	88	29	5	2	4	13
Cleveland, Ohio	172	94	50	18	1	9	2
Columbus, Ohio	133	78	31	14	6	4	7
Dayton, Ohio	119	73	36	4	3	3	-
Detroit, Mich.	277	150	74	27	10	16	8
Evansville, Ind.	48	34	11	1	-	2	-
Fort Wayne, Ind.	61	39	17	3	1	1	7
Gary, Ind.	18	9	2	4	-	3	-
Grand Rapids, Mich.	46	34	7	3	2	-	2
Indianapolis, Ind.	152	90	43	8	4	7	1
Madison, Wis.	37	28	6	-	1	2	4
Milwaukee, Wis.	132	98	21	8	3	2	9
Peoria, Ill.	37	22	8	2	3	2	2
Rockford, Ill.	29	24	2	-	1	2	3
South Bend, Ind.	58	43	10	3	1	1	4
Toledo, Ohio	125	86	24	11	2	2	11
Youngstown, Ohio	99	64	25	5	4	1	1
W.N. CENTRAL	775	511	164	41	26	32	25
Des Moines, Iowa	59	42	12	1	2	1	2
Duluth, Minn.	19	15	1	1	1	1	1
Kansas City, Kans.	28	18	7	2	1	-	-
Kansas City, Mo.	120	86	23	4	3	4	4
Lincoln, Nebr.	45	33	7	4	-	1	3
Minneapolis, Minn.	88	57	12	6	4	9	1
Omaha, Nebr.	93	59	24	3	3	4	2
St. Louis, Mo.	152	94	35	9	5	9	1
St. Paul, Minn.	61	40	13	4	2	2	-
Wichita, Kans.	110	67	30	7	5	1	11
S. ATLANTIC	1,097	676	253	95	33	40	57
Atlanta, Ga.	144	85	38	12	2	7	6
Baltimore, Md.	143	86	38	14	2	3	5
Charlotte, N.C.	74	48	12	7	4	3	6
Jacksonville, Fla.	111	64	23	10	8	6	9
Miami, Fla.	107	57	25	17	5	3	1
Norfolk, Va.	47	26	9	5	1	6	6
Richmond, Va.	69	43	19	4	3	-	4
Savannah, Ga.	41	27	10	2	-	2	3
St. Petersburg, Fla.	93	68	18	5	1	1	6
Tampa, Fla.	47	34	7	2	2	2	5
Washington, D.C.	188	116	46	14	5	7	4
Wilmington, Del.	33	22	8	3	-	-	2
E.S. CENTRAL	664	418	155	47	27	17	22
Birmingham, Ala.	84	48	16	12	4	4	1
Chattanooga, Tenn.	51	35	12	1	-	3	3
Knoxville, Tenn.	54	39	9	4	2	-	1
Louisville, Ky.	113	75	20	7	7	4	5
Memphis, Tenn.	138	87	35	10	6	-	7
Mobile, Ala.	61	30	21	2	3	5	2
Montgomery, Ala.	55	37	16	2	-	-	2
Nashville, Tenn.	108	67	26	9	5	1	1
W.S. CENTRAL	1,260	708	324	118	65	45	56
Austin, Tex.	46	22	9	6	6	3	7
Baton Rouge, La.	40	21	11	3	2	3	-
Corpus Christi, Tex.	46	29	9	4	2	2	1
Dallas, Tex.	202	112	52	14	17	7	8
El Paso, Tex.	45	30	10	2	2	1	2
Fort Worth, Tex.	83	56	17	6	3	1	3
Houston, Tex.	396	194	114	53	21	14	11
Little Rock, Ark.	41	24	13	3	1	-	3
New Orleans, La.	44	28	11	3	-	2	-
San Antonio, Tex.	184	106	49	14	5	10	14
Shreveport, La.	29	22	5	2	-	-	1
Tulsa, Okla.	104	64	24	8	6	2	6
MOUNTAIN	617	395	145	42	15	20	15
Albuquerque, N.Mex.	60	32	20	5	1	2	-
Colo. Springs, Colo.	33	22	6	3	-	2	1
Denver, Colo.	99	70	19	7	2	1	2
Las Vegas, Nev.	76	43	24	5	-	4	2
Ogden, Utah	36	26	7	-	2	1	2
Phoenix, Ariz.	158	97	41	11	5	4	3
Pueblo, Colo.	25	20	4	-	1	-	3
Salt Lake City, Utah	41	23	10	3	1	4	1
Tucson, Ariz.	89	62	14	8	3	2	1
PACIFIC	1,766	1,162	365	121	58	58	89
Berkeley, Calif.	18	15	2	1	-	-	-
Fresno, Calif.	59	42	8	4	3	2	2
Glendale, Calif.	28	23	3	-	1	-	2
Honolulu, Hawaii	53	32	13	2	4	2	6
Long Beach, Calif.	92	62	16	7	3	4	-
Los Angeles, Calif.	491	308	118	34	20	10	11
Oakland, Calif.	74	51	17	3	1	2	5
Pasadena, Calif.	33	22	5	2	-	4	4
Portland, Oreg.	98	72	10	7	2	7	7
Sacramento, Calif.	119	76	30	6	4	3	13
San Diego, Calif.	131	86	30	6	6	3	13
San Francisco, Calif.	154	94	30	15	6	9	4
San Jose, Calif.	160	107	27	18	4	4	11
Seattle, Wash.	137	87	33	8	3	6	4
Spokane, Wash.	51	36	9	3	1	2	5
Tacoma, Wash.	68	49	14	5	-	-	2
TOTAL	12,022††	7,905	2,557	810	371	368	530

* 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 4 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. Figures are estimates based on average of past 4 weeks.

Human Arboviral Encephalitis — Continued

Health Dept, RH Hutcheson, Jr, MD, State Epidemiologist, Tennessee State Dept of Public Health; JW Flosi, PhD, G Hunt, PhD, Harris County Mosquito Control District, RL Johns, PhD, C Reed, MPH, CE Alexander, MD, State Epidemiologist, Texas State Dept of Health; C Nichols, MPH, RE Johns, Jr, MD, State Epidemiologist, Utah Dept of Health; GB Miller, Jr, MD, State Epidemiologist, Virginia Dept of Health; JM Kobayashi, MD, State Epidemiologist, Washington State Dept of Social and Health Svcs; JP Davis, MD, State Epidemiologist, Wisconsin State Dept of Health and Social Svcs; J Pearson, DVM, National Veterinary Svcs Laboratory, US Dept of Agriculture, Ames, Iowa; Div of Vector-Borne Viral Diseases, Center for Infectious Diseases, CDC.

Editorial Note: Active surveillance of encephalitis caused by SLE, EEE, WEE, and California serogroup viruses is maintained at CDC by periodic telephone contact with state health departments and laboratories during the spring and summer months. Active surveillance is supplemented with the following passive systems: review of encephalitis case reports submitted to CDC by health departments and identification of arboviral encephalitis cases diagnosed in CDC's Arbovirus Reference Branch from unsolicited specimens.

The diagnosis of arboviral encephalitis is confirmed if virus is isolated from the patient or a fourfold or greater rise or fall in antibody titer is documented. The recent introduction of immunoglobulin M-capture, enzyme-linked immunosorbent assays for the diagnosis of EEE, WEE, SLE, and LaCrosse encephalitis has made possible specific diagnoses using cerebrospinal fluid or serum obtained during the acute phase of illness. These techniques are currently in use in CDC's Arbovirus Reference Branch.

Nonfatal Arsenic Poisoning in Three Hmong Patients — Minnesota

Between December 1983 and April 1984, physicians at the Saint Paul Ramsey Medical Center in Saint Paul, Minnesota, diagnosed arsenic poisoning in three Hmong patients. Hmong are recent immigrants to the United States from the highland area of Northern Laos. The source of arsenic poisoning is suspected to be Hmong folk remedies, although two of the three patients denied using them. None of the three patients had occupational exposures to arsenic-containing compounds or pesticides.

Patient 1: A 68-year-old woman was admitted in December 1983 with a 3-month history of abdominal pain, anorexia, sour taste and burning sensation in the mouth, generalized pain, and paresthesias. Six weeks earlier, she had been admitted with similar complaints. The diagnosis at that time was goiter and hyperthyroidism, and she was treated with radioiodine. During this second admission, leukopenia (3,200/mm^3), anemia (hemoglobin 9.3 μg/dl, hematocrit 27.5%), and a prolonged QT-interval on electrocardiogram (EKG) were observed. She had elevated levels of arsenic in 24-hour collections of urine on both her first and sixth day of hospitalization (3,334 μg and 1,284 μg, respectively; the normal level for this laboratory is less than 25 μg per 24-hour urine collection). Her serum arsenic level on the sixth day of hospitalization was less than 0.01 μg/ml (normal for this laboratory is less than 0.07 μg/ml). She was treated with dimercaprol (BAL) intramuscularly and with oral penicillamine. Despite this therapy, moderately severe peripheral neuropathy developed, persisting for several months. All other manifestations of arsenic poisoning resolved. The patient denied using Hmong folk remedies.

Patient 2: A 47-year-old woman was admitted in March 1984 with a history of severe depression, anorexia, pain in the chest and arms, and malaise. She was found to have leukopenia (2,900/mm^3), hypocalcemia (7.6 mg/dl), hypomagnesemia (1.3 mg/dl), and hypokalemia (2.7 meq/l). A prolonged QT-interval was noted on EKG. Her urine arsenic level 11 days after admission was 327 μg per 24-hour collection. Her serum arsenic was less than 0.01 μg/ml. She recovered, and all hematologic and biochemical abnormalities resolved without chelation therapy. The patient denied using folk remedies to overcome depression or any other illness.

Patient 3: A 39-year-old man suffered a "respiratory arrest" at home in April 1984. He

Arsenic Poisoning — Continued
had awakened in the middle of the night and had taken a root-type Hmong folk remedy. Ten minutes later, while awake, he became unconscious, and his wife called for help. Paramedics found his pulse to be 30 beats per minute, and his respirations were shallow and feeble. The man was resuscitated and hospitalized. His EKG showed sinus tachycardia with nonspecific ST changes. On monitoring, short runs of supraventricular tachycardia were noted. Pancytopenia and mild gastrointestinal bleeding developed during the patient's hospitalization. His 24-hour urine specimen contained high levels of several metals, including arsenic (1,815 μg), zinc (1,699 μg; normal is 300-600 μg), and iron (352 μg; normal is 100-300 μg). On dermatologic examination, he had hyperkeratosis of the palms and soles consistent with arsenic poisoning. He was treated with BAL and oral penicillamine and recovered.

Reported by N Holtan, MD, S Hall, MD, F Knight, MD, B Campion, MD, C Drage, MD, Saint Paul Ramsey Medical Center; R Danila, MPH, Saint Paul Div of Public Health; JN Kuritsky, MD, Medical Epidemiologist, Minnesota Dept of Health; Special Studies Br, Chronic Diseases Div, Center for Environmental Health, CDC.

Editorial Note: These appear to be the first three reported cases of arsenic poisoning among the Hmong in the United States. Although the source of arsenic poisoning in these patients has not been identified, it is possible that their clinical conditions resulted from ingestion of arsenic-containing folk remedies. There has been concern about possible arsenic exposure in the Hmong, since arsenic (in addition to lead and mercury) was found in some samples of Hmong folk remedies (*1*). Arsenic poisoning also has been reportedly associated with herbal preparations used as medicine (*2-4*). Although only one of the three patients gave a history of using a folk remedy, that is still the likeliest source of arsenic poisoning. The use of folk remedies should be suspected in all Hmong patients—not only those with manifestations of acute or chronic illness, but also those who think they may be ill. Patients may go to great expense in seeking cures with herbal and other folk remedies. A reliable and accurate history of folk remedy usage from Hmong patients is very difficult to obtain. There have been incidents reported of Hmong admitting, and later denying, that they used folk remedies, as well as conflicting reports from within the same family about folk remedy use.

These patients had no other known exposures to arsenic, such as occupational exposures or use of arsenic-containing pesticides. Arsenic exposure from dietary sources (such as from seafood) usually does not result in acute toxicity as seen in these patients (*5*).

The near-fatal case of the 39-year-old man is suggestive of the sudden unexplained death syndrome (SUDS) among male Southeast Asian refugees reported recently (*6*). Although the epidemiologic investigations of those deaths suggested that poisoning was an unlikely cause of SUDS, toxicologic examinations did not include assays for arsenic or other heavy metals. While it is possible that preparations of folk remedies may have been taken at bedtime and could have resulted in effects shortly thereafter, family histories of such practice among the patients were negative. At present, there is insufficient evidence to link arsenic ingestion or folk remedy use with SUDS.

The root-type Hmong folk remedy taken by the 39-year-old man is being evaluated by health authorities and others to ascertain its potential toxic effects and chemical composition. Arsenic is toxic to multiple organs and has neurologic (central and peripheral), dermatologic, renal, hepatic, hematologic, and cardiac manifestations. The effects of arsenic on the heart include T-wave abnormalities and a prolonged QT-interval (*5*). Screening for arsenic, mercury, and lead is indicated in Southeast Asian refugees who present with symptoms consistent with heavy metal toxicity, especially those who report recent use of folk remedies. Testing for arsenic and mercury is best performed on 24-hour urine specimens collected in acid-rinsed containers; testing for lead poisoning should include blood lead and erythrocyte protoporphyrin in whole blood (*7*). Documented cases of heavy metal poisoning in the refugees should be reported to local and state health departments and to CDC.

Arsenic Poisoning — Continued

References

1. CDC. Folk remedy-associated lead poisoning in Hmong children—Minnesota. MMWR 1983;32:555-6.
2. Tay C-H, Seah C-S. Arsenic poisoning from anti-asthmatic herbal preparations. Med J Aust 1975;2:424-8.
3. Tay C-H. Cutaneous manifestations of arsenic poisoning due to certain Chinese herbal medicine. Australas J Dermatol 1974;15:121-31.
4. Parsons JS. Contaminated herbal tea as a potential source of chronic arsenic poisoning. NC Med J 1981;42:38-9.
5. Perhsgen G. The epidemiology of human arsenic exposure. In: Fowler BA, ed. Biological and environmental effects of arsenic. New York: Elsevier Science Publishing Company, 1983.
6. Baron RC, Thacker SB, Gorelkin L, et al. Sudden death among Southeast Asian refugees. An unexplained nocturnal phenomenon. JAMA 1983; 250:2947-51.
7. CDC. Preventing lead poisoning in young children: a statement by the Center for Disease Control. Atlanta, Georgia: Center for Disease Control, April 1978.

Measles Outbreak among Vaccinated High School Students — Illinois

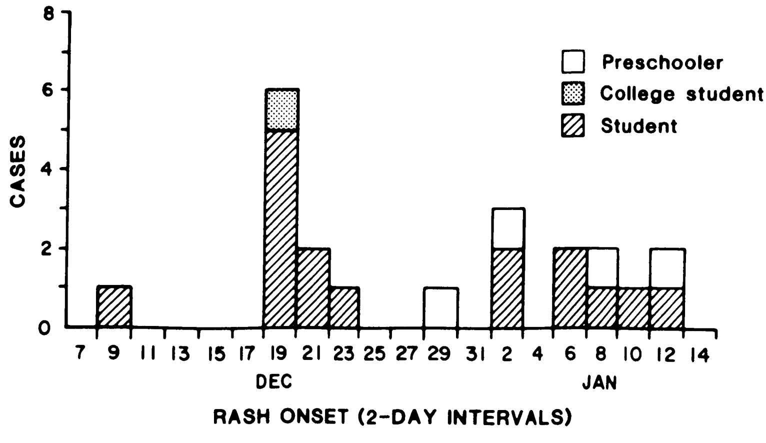
From December 9, 1983, to January 13, 1984, 21 cases of measles occurred in Sangamon County, Illinois.* Nine of the cases were confirmed serologically. The outbreak involved 16 high school students, all of whom had histories of measles vaccination after 15 months of age documented in their school health records. Of the five remaining cases, four occurred in unvaccinated preschool children, two of whom were under 15 months of age, and one case occurred in a previously vaccinated college student (Figure 5).

The affected high school had 276 students and was in the same building as a junior high school with 135 students. A review of health records in the high school showed that all 411 students had documentation of measles vaccination on or after the first birthday, in accordance with Illinois law.

Measles vaccination histories were obtained from the school health records of all 276 senior high school students. Risk of infection was not significantly associated with type of vaccine, medical provider, age at most recent vaccination, or revaccination. All the students with measles had received their most recent vaccinations after 15 months of age. However, the measles attack rate increased with increasing years since most recent vaccination ($p = 0.024$) (Table 3). The attack rate was four times greater for students vaccinated 10 or more years before the outbreak than for students vaccinated more recently ($p < 0.05$). When these data are corrected for the number of vaccinations, the trend was still observed and

*All patients met a clinical definition of (1) a generalized maculopapular rash lasting 3 or more days; (2) temperature of 38.3 C (101 F) or greater; and (3) one of the following: cough, coryza, conjunctivitis.

FIGURE 5. Measles outbreak—Sangamon County, Illinois, December 1983-January 1984



Measles — Continued

achieved a borderline level of statistical significance ($p = 0.07$). Age at first or last vaccination was not a confounding variable.

The index patient, Student A, was a 17-year-old male in the 11th grade; he was present in school with a productive cough for 3 consecutive days before his onset of rash. The source of his infection was not identified. Nine students with first-generation cases developed onset of rash 10-14 days after exposure to Student A (Figure 5). The attack rate was 6% (16/276) for senior high school students and 0% (0/135) for junior high school students. The highest attack rate was 12% (9/74) for the 11th grade students ($p < 0.02$).

Repeated and close exposure to Student A was associated with a greater risk of illness (Table 4). The eight patients with first-generation cases who attended the high school were used to analyze the degree of exposure to Student A. The measles attack rate was 3% for students who did have classroom exposure to Student A versus 2% for those who did not. Moreover, the attack rate was 21% for students whom Student A identified as "close friends" from the school enrollment roster, compared with 2% for students not so identified ($p < 0.001$).

No vaccinations were given as part of the outbreak control program. Immune globulin (IG) was administered to three susceptibles: an elementary school child with a medical contraindication to measles revaccination and two preschool siblings who had contact with a measles patient. The outbreak subsided spontaneously, and active surveillance for illnesses with rash in the community did not identify any additional cases of measles during the 4 weeks before or after the outbreak.

Reported by J Doglio, PhD, D Goodroe, M Messmore, J Richmond, C Selinger, Auburn School District, O Eastham, MD, GA Weisgerber, MD, Auburn Medical Clinic, Auburn, N Mody, MD, Dept of Laboratory Medicine, Memorial Medical Center, M Schwartz, Springfield City Health Dept, Springfield, R Barger, C Jennings, K Kelly, R March, D Reynolds, Immunization Program, BJ Francis, MD, State Epidemiologist, Illinois Dept of Public Health; Div of Field Svcs, Epidemiology Program Office, Div of Immunization, Center for Prevention Svcs, CDC.

Editorial Note: This outbreak demonstrates that transmission of measles can occur within a school population with a documented immunization level of 100%. This level was validated during the outbreak investigation. Previous investigations of measles outbreaks among highly immunized populations have revealed risk factors such as improper storage or handling of vaccine, vaccine administered to children under 1 year of age, use of globulin with vaccine, and use of killed virus vaccine (*1-5*). However, these risk factors did not adequately explain the occurrence of this outbreak.

TABLE 3. Measles attack rates, by years since vaccination and number of doses administered in a high school outbreak—Illinois, December 1983-January 1984.

Years since vaccination	One dose attack rate	Two doses attack rate	Total attack rate
0-4	0.0 (0/10)*	0.0 (0/28)	0.0 (0/38)
5-9	3.2 (1/31)	3.2 (2/62)	3.2 (3/93)
10-14	9.9 (7/91)	15.8 (3/19)	9.1 (10/110)
15+	8.8 (3/34)	0.0 (0/1)	8.6 (3/35)
Total	6.6 (11/166)	4.5 (5/110)	5.8 (16/276)

*Number of cases/number of high school students.

TABLE 4. Degree of exposure of first-generation cases to index patient in a high school measles outbreak — Illinois, December 1983-January 1984

Degree of exposure*	Cases	High school students	Attack rate (%)
No classes	3	186	1.6
Shared classes	2	75	2.7
Close friend	3	14	21.4

*Exposure categories are mutually exclusive.

Measles — Continued

The attack rates indicated that the greatest transmission occurred within the same grade as the index patient (Student A). This finding suggested a cohort effect, such as a faulty vaccine lot or particular provider, but none was found. Although detailed vaccine information was not available from providers of vaccine, there were several different providers who served these patients, and patients had not been vaccinated during a common time.

In this outbreak, vaccinated persons were at greater risk of clinical illness if they had close exposure to a measles patient and if 10 or more years had elapsed since their most recent measles vaccinations. This finding is different from those of previous studies, some of which covered shorter intervals between vaccination and exposure to measles. Such studies have uniformly revealed the persistence of vaccine-induced immunity over the period studied (*5*). A serologic study has shown that up to 15% of persons lose detectable measles specific antibody, measured with standard techniques, within the 16 years following vaccination. Upon revaccination, such individuals typically produce secondary immune responses, implying they are still protected from measles disease (*6*). Further evidence against waning immunity is that measles incidence is at near record low levels 21 years after vaccine licensure. If loss of immunity with time since vaccination were a major problem, higher incidence rates would be expected. Nevertheless, since this outbreak suggests a potential problem, detailed investigations of other measles outbreaks in highly vaccinated populations should address this issue.

If waning immunity is not a problem, this outbreak suggests that measles transmission can occur within the 2%-10% of expected vaccine failures (*5,7*). However, transmission was not sustained beyond 36 days in this outbreak, and community spread was principally among unvaccinated preschool children. The infrequent occurrence of measles among highly vaccinated persons suggests that this outbreak may have resulted from chance clustering of otherwise randomly distributed vaccine failures in the community. That measles transmission can occur among vaccine failures makes it even more important to ensure persons are adequately vaccinated. Had there been a substantial number of unvaccinated or inadequately vaccinated students in the high school and the community, transmission in Sangamon County probably would have been sustained.

References

1. Lerman SJ, Gold E. Measles in children previously vaccinated against measles. JAMA 1971;216:1311-4.
2. Linneman CC, Hegg ME, Rotte TC, et al. Measles IgM response during reinfection of previously vaccinated children. J Pediatr 1973;82:798-801.
3. Rawls WE, Rawls ML, Chernesky MA. Analysis of a measles epidemic: possible role of vaccine failures. Can Med Assoc J 1975;13:941-4.
4. Hayden GF. Measles vaccine failure. A survey of causes and means of prevention. Clin Pediatr 1979;18:155-6, 161-3, 167.
5. CDC. Measles Surveillance Report No. 11, 1977-1981. 1982.
6. Krugman S. Further-attenuated measles vaccine: characteristics and use. Rev Infect Dis 1983;5:477-81.
7. Brunell PA, Weigle K, Murphy MD, Shehab Z, Cobb E. Antibody response following measles-mumps-rubella vaccine under conditions of customary use. JAMA 1983;250:1409-12.

Street-Drug Contaminant causing Parkinsonism

The following information was submitted by the National Institute on Drug Abuse and the National Institute of Mental Health, and has been sent to state alcohol and drug abuse agencies and drug treatment programs.

Recently, a street-drug contaminant has appeared that can cause parkinsonism in drug abusers. The compound N-methyl-4-phenyl-1, 2, 3, 6-tetrahydropyridine (MPTP) has been identified in underground laboratory preparations of a potent analog of meperidine (Demerol).

Parkinsonism — Continued

Over the past 8 years, sporadic outbreaks of MPTP-induced parkinsonism have occurred among drug abusers in California, Maryland, and Vancouver, British Columbia.

Two different synthetic methods were used by the underground chemists, and, in both instances, MPTP was present as a side product in the final drug preparation used or sold in conjunction with these outbreaks. The MPTP-containing powder, sometimes sold as a new "synthetic heroin," was dissolved in water and administered intravenously or taken by the intranasal route. This contaminant has been documented to produce irreversible chronic parkinson symptoms in drug abusers. Two deaths in Vancouver, British Columbia, have been attributed to use of this drug.

MPTP-induced parkinsonism in man is remarkably similar to idiopathic Parkinson's disease. All the major clinical features of Parkinson's disease are present: generalized slowing and difficulty moving, rigidity, resting tremor, flexed posture, and loss of postural reflexes. In addition, neurochemical abnormalities resembling those seen in patients with Parkinson's disease have been noted. These symptoms and signs subside temporarily after treatment with L-dopa or with bromocriptine, drugs used in treating Parkinson's disease. The neurotoxicity of MPTP has produced a severe, permanent parkinsonian syndrome in a number of drug abusers who continue to require treatment. Based on autopsy findings in one case, MPTP appears to destroy nerve cells in the substantia nigra, an area of the brain that plays a major role in controlling movement.

Since some cases of MPTP-induced parkinsonism have been misdiagnosed as catatonic schizophrenia, careful diagnostic evaluation and appropriate treatment are indicated.

While the instances of MPTP-induced parkinsonism have been limited to relatively few individuals, the possibility of far greater public health impact must be considered, because more drug-abusing individuals than those already identified have probably been exposed, and the effects of the drug appear to be cumulative and may not appear for several years.

Further studies of patients with MPTP-induced parkinsonism are currently under way at the National Institute of Mental Health.

If patients with suspected MPTP-induced parkinsonism are identified or if additional information is needed, contact Dorynne Czechowicz, M.D., Assistant Director for Medical and Clinical Affairs, Division of Prevention and Communications, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, at (301) 443-6780.

☆U.S. Government Printing Office: 1984-746-149/2042B Region IV

DEPARTMENT OF
HEALTH & HUMAN SERVICES
Public Health Service
Centers for Disease Control
Atlanta GA 30333

