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Epidemiologic Notes and Reports

Chloroquine-Resistant *Plasmodium falciparum* Malaria Acquired in East Africa — Pennsylvania

On June 27, 1981, a 17-year-old American arrived in Kenya as an exchange student. He spent 1 week in Mombasa and Nairobi and then lived for the next 6 weeks in several smaller towns in western Kenya, near Lake Victoria. On June 14, he had begun malaria chemoprophylaxis with 500 mg (300 mg base) chloroquine phosphate. He continued taking 1 dose a week until July 26. He returned to the United States on August 19. On August 23, he again began chloroquine prophylaxis and continued with a weekly dose through September 20.

On September 25, 5 days after the last dose of chloroquine, he experienced onset of fever, headache, and chills. He sought medical attention on September 30, and was found to have 0.9% parasitemia with *Plasmodium falciparum.* A blood sample was also drawn for determination of chloroquine concentration. On the assumption that his infection represented a failure of chloroquine prophylaxis, treatment was started. It consisted of a standard therapeutic course of 2.5 g (1.5 g base) chloroquine phosphate plus 800 mg sulfamethoxazole and 160 mg trimethoprim twice daily for 7 days. Results of the laboratory tests subsequently showed that on September 30 (10 days after the last prophylactic dose of chloroquine), the patient's whole-blood chloroquine concentration had been 114 ppb (ng/ml). The patient showed rapid clinical improvement and has remained clinically well since.

Reported by FL Ruben, MD, University of Pittsburgh, M Richards, MD, J Sarandria, Allegheny County Health Dept, Pittsburgh; EJ Witte, VMD, State Epidemiologist, Pennsylvania State Dept of Health, Harrisburg; Malaria Br, Parasitic Diseases Div, Center for Infectious Diseases, CDC.

Editorial Note: In 1978, 3 *P. falciparum* infections acquired in Kenya and Tanzania were reported that failed to be cured by a standard (25 mg base/kg) course of chloroquine (*1-4*). Since then, an additional 7 similar cases have been documented (*5-9*). In each instance the infection occurred in a traveler from the United States or Europe who had acquired falciparum malaria in East Africa. Following initial supervised therapy with chloroquine (25 mg base/kg, orally), each patient had experienced, within 7 days, a clinical cure and the clearing of malaria parasites from the blood. In all cases, however, a recrudescence of patent parasitemia occurred within 1-8 weeks, even though there had been no opportunity for reinfection. In general, this pattern of treatment failure meets the World Health Organization criteria for R-I resistance (*10*). These recrudescences have been treated successfully with either an increased therapeutic dosage of chloroquine or a combination of sulfonamide with dihydrofolate reductase inhibitor (Fansidar* or Bactrim/Septra).

Most persons who experienced treatment failure had also taken chloroquine prophylaxis while in Africa. Recently, 4 cases of *P. falciparum* malaria have been reported in persons who

*Use of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Plasmodium falciparum — Continued

had been in East Africa and who were taking, or had recently completed, chloroquine chemoprophylaxis (5-10 mg/kg/week) (*7,11,12*). In each case the blood chloroquine concentration, measured at the time of diagnosis (before treatment), established failure of chloroquine prophylaxis against these *P. falciparum* strains from East Africa.

The present case fits this pattern of chloroquine-prophylaxis failure. The chloroquine concentration, 114 ppb, is consistent with a history of appropriate prophylaxis and would be expected to suppress chloroquine-sensitive strains of *P. falciparum* (*13*).

In the past year, CDC has received reports of 8 other U.S. travelers to East Africa, in addition to the present case, who have experienced failure of chloroquine therapy or prophylaxis associated with documented *P. falciparum* infection. The countries now known to be involved are Kenya, Madagascar, Tanzania, and the Comoro Islands. The epidemiologic and parasitologic features of these cases are consistent with the pattern established in the other reported cases. However, because of delayed notification, not all critical elements of case descriptions, such as quantification of blood chloroquine, have been available.

At present, chloroquine continues to be a relatively safe and effective antimalarial for prophylaxis in East Africa. Since the prevalence of chloroquine-resistant *P. falciparum* in that area remains unknown and the degree of resistance is low, it is unclear whether current recommendations for chloroquine prophylaxis for travelers to East Africa need to be altered. CDC is maintaining intensive surveillance for failure of chloroquine prophylaxis and treatment. As additional information on this evolving situation becomes available, it will be reported. CDC can provide in vitro drug-sensitivity testing and determine blood chloroquine concentrations and would like to receive reports through state health departments of all suspected cases of chloroquine-resistant *P. falciparum* malaria acquired in Africa.

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Current Trends

The Cost of One Rabid Dog — California

On May 10, 1980, a dog in Yuba County, California, was placed under observation after it bit 3 persons in a parking lot in the Olivehurst area. Because the dog appeared ill, it was killed, and tissues were tested and found positive for rabies on May 12. The subsequent investigation by Sutter-Yuba County Health Department personnel eventually resulted in the identification of 70 persons, who received antirabies prophylaxis because of known or probable exposure to the dog. Because investigators found that only 20% of the dogs and cats in the area had up-to-date vaccinations, special clinics were held in which 2,000 dogs were vaccinated; over 300 unclaimed dogs and cats were destroyed.

No persons or other animals were known to develop rabies as a result of this episode. However, the costs generated by this single rabid dog were estimated as: $92,650 for human antirabies treatment, $4,190 for animal vaccination and veterinary services, and $8,950 for health-department and animal-control programs. The total cost of the episode was $105,790, or over $1,500 per person treated, not including lost work time, patient travel time, and costs of the 6 months' quarantine imposed on animals exposed to the rabid dog.

Reported by MK Cusick, MD, Sutter-Yuba County Health Dept, G Humphrey, DVM, Dept of Health Svcs, California; Viral Diseases Div, Center for Infectious Diseases, CDC.

Editorial Note: There have been few reports in the literature in which costs could be assigned to 1 specific case of rabies. Although human rabies has become a rarity in the United States—0-5 cases per year—the cost of controlling the disease is an increasing burden on health budgets.

Epidemiologic Notes and Reports

Food-Borne Illness due to Inadvertent Consumption of Marijuana — California

On July 10, 1981, health officials in San Bernardino County, California, were notified of a possible food-borne outbreak associated with a covered-dish brunch at a local college. Fifteen persons who ate at the brunch were interviewed. Nine complained of illness, which involved at least 2 of the following symptoms: dry mouth (9), dizziness (7), tachycardia (5), blurred vision (5), memory lapse (5), "tingling" (3), anxiety (3), confusion and drowsiness (3), nausea (1), and headache (1). The age groups of ill persons were as follows: 20-29 years old, 1 person; 30-39 years old, 3 persons; 40-49 years old, 2 persons; and 50+ years old, 3 persons. The mean incubation period was 1.1 hours (range, 50 minutes to 2 hours); the median duration of illness was 3 hours. The 3 persons hospitalized for observation were released within 24 hours.

A standard questionnaire was administered to the 15 persons, and food-specific attack rates implicated a zucchini cake as the common source of illness. The preparer of the cake, when questioned, admitted to the possibility of having inadvertently added marijuana to the recipe.

Microscopic examination of the zucchini cake showed cystolithic hairs (indicating plant cell-wall material), and a Duquenois-Levine test for cannabinoids confirmed the presence of marijuana in the cake.

Food-Borne Illness – Continued

Reported by AF Taylor, MPH, JJ Kalnas, LE Mahoney, MD, DrPH, San Bernardino County Dept of Public Health, California; Special Studies Br, Chronic Diseases Div, Center for Environmental Health, CDC.

Editorial Note: A similar episode occurred in Colorado in 1978 in which 9 of 22 persons exposed to marijuana in a bundt cake became ill(*1*).

The symptoms described in the present outbreak are physiologically consistent with the effects of marijuana (*2*). Tolerance to marijuana is well substantiated (*3*), and persons with repeated experience with the substance may have less pronounced physiologic (as well as psychologic) changes. Furthermore, persons who deliberately use marijuana for its psychologic effects would experience and interpret such "symptoms" differently than described herein.

Marijuana, obtained from the hemp plant *Cannabis sativa*, is a complex mixture of over 400 chemicals. Delta-9-tetrahydrocannabinol (THC) is the major source of psychoactivity, but there are numerous cannabinoids that have biological activity. THC is 3-5 times as potent when inhaled as when ingested, because it is insoluble in water at room temperature and its composition is altered by the acid pH of the stomach. However, the fatty substances in baked foods facilitate absorption and the production of a pharmacologically active dose (*3*). Because the composition of marijuana is varied and the absorption is incomplete, the onset and duration of symptoms may vary also. Symptoms usually begin from 1/2 to 1 hour after ingestion and last from 3 to 6 hours (*4*). THC leaves the blood rapidly but is taken up by the tissues. Complete elimination of a dose may take up to 30 days.

(Continued on page 533)

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

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

DISEASE	42nd WEEK ENDING		MEDIAN 1976-1980	CUMULATIVE, FIRST 42 WEEKS		
	October 24 1981	October 18 1980		October 24 1981	October 18 1980	MEDIAN 1976-1980
Aseptic meningitis	270	245	245	7,449	5,980	5,135
Brucellosis	6	1	3	130	146	146
Chickenpox	927	671	886	170,856	160,551	160,551
Diphtheria	–	–	–	3	2	63
Encephalitis: Primary (arthropod-borne & unspec.)	29	38	38	1,117	952	952
Post-infectious	–	2	3	72	173	186
Hepatitis, Viral: Type B	400	319	319	16,430	14,349	12,141
Type A	523	494	629	20,109	22,604	24,046
Type unspecified	215	206	155	8,840	9,208	7,093
Malaria	27	33	15	1,140	1,644	605
Measles (rubeola)	18	38	110	2,750	13,059	24,545
Meningococcal infections: Total	48	39	29	2,848	2,199	1,978
Civilian	48	39	27	2,837	2,183	1,954
Military	–	–	1	11	16	17
Mumps	102	69	153	3,505	7,461	14,037
Pertussis	27	42	39	993	1,398	1,398
Rubella (German measles)	24	29	68	1,850	3,417	10,968
Tetanus	3	–	1	48	67	60
Tuberculosis	567	520	556	21,908	21,853	23,467
Tularemia	7	2	3	214	183	137
Typhoid fever	22	14	13	481	423	414
Typhus fever, tick-borne (Rky. Mt. spotted)	9	5	13	1,125	1,090	990
Venereal diseases:						
Gonorrhea: Civilian	20,495	17,974	21,518	812,582	807,241	807,241
Military	338	465	514	22,575	22,390	22,390
Syphilis, primary & secondary: Civilian	689	556	556	24,758	21,470	19,585
Military	7	5	5	314	256	248
Rabies in animals	104	109	75	5,911	5,341	2,578

TABLE II. Notifiable diseases of low frequency, United States

	CUM. 1981		CUM. 1981
Anthrax	–	Poliomyelitis: Total	6
Botulism(Ariz. 1, Calif. 2)	64	Paralytic (Mo. 1, Minn. 1)	5
Cholera	3	Psittacosis	88
Congenital rubella syndrome	10	Rabies in man	1
Leprosy (Wash. 1, Calif. 1)	206	Trichinosis	115
Leptospirosis (Tex. 1)	38	Typhus fever, flea-borne (endemic, murine)	37
Plague	9		

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 October 24, 1981 and October 18, 1980 (42nd 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	270	6	927	–	3	29	38	–	400	523	215	27	1,140
NEW ENGLAND	10	1	112	–	–	2	–	–	23	9	19	1	60
Maine	–	–	43	–	–	–	–	–	2	–	–	–	1
N.H.	–	–	–	–	–	–	–	–	–	2	–	–	3
Vt.	–	–	4	–	–	–	–	–	–	–	–	–	6
Mass.	9	–	28	–	–	2	–	–	4	2	13	–	31
R.I.	–	1	1	–	–	–	–	–	3	2	–	–	3
Conn.	1	–	36	–	–	–	–	–	14	3	6	1	16
MID. ATLANTIC	33	–	40	–	–	2	2	–	64	54	18	1	147
Upstate N.Y.	13	–	30	–	–	–	1	–	15	12	3	–	34
N.Y. City	4	–	10	–	–	1	–	–	19	16	3	1	56
N.J.	7	–	NN	–	–	–	1	–	30	26	12	–	42
Pa.	9	–	–	–	–	1	–	–	NA	NA	NA	–	15
E.N. CENTRAL	66	–	380	–	–	15	11	–	40	61	16	1	53
Ohio	47	–	35	–	–	14	6	–	19	13	7	–	8
Ind.	4	–	47	–	–	1	1	–	2	7	4	–	6
Ill.	–	–	49	–	–	–	1	–	4	20	2	–	17
Mich.	15	–	155	–	–	–	1	–	15	21	3	1	22
Wis.	–	–	94	–	–	–	2	–	–	–	–	–	–
W.N. CENTRAL	24	1	130	–	–	3	4	–	6	4	7	–	31
Minn.	6	–	3	–	–	3	2	–	2	2	–	–	12
Iowa	4	1	47	–	–	–	1	–	–	–	1	–	4
Mo.	6	–	1	–	–	–	1	–	3	1	6	–	3
N. Dak.	–	–	–	–	–	–	–	–	–	–	–	–	1
S. Dak.	3	–	9	–	–	–	–	–	–	1	–	–	1
Nebr.	–	–	14	–	–	–	–	–	1	–	–	–	2
Kans.	5	–	56	–	–	–	–	–	–	–	–	–	8
S. ATLANTIC	47	2	146	–	1	1	6	–	87	67	25	4	139
Del.	–	–	–	–	–	–	–	–	1	–	3	–	1
Md.	–	–	7	–	–	1	4	–	9	4	6	1	34
D.C.	–	–	–	–	–	–	–	–	3	1	1	–	9
Va.	14	1	4	–	–	–	1	–	18	7	4	2	29
W. Va.	3	–	97	–	–	–	1	–	4	1	1	–	4
N.C.	5	–	NN	–	–	–	–	–	3	3	1	1	12
S.C.	1	–	–	–	–	–	–	–	10	4	–	–	2
Ga.	2	1	–	–	–	–	–	–	11	16	–	–	8
Fla.	22	–	38	–	1	–	–	–	28	31	9	–	40
E.S. CENTRAL	23	–	3	–	–	3	2	–	20	18	4	–	10
Ky.	3	–	1	–	–	1	–	–	2	1	–	–	–
Tenn.	16	–	NN	–	–	1	1	–	15	15	1	–	–
Ala.	–	–	–	–	–	1	1	–	2	1	3	–	9
Miss.	4	–	2	–	–	–	–	–	1	1	–	–	1
W.S. CENTRAL	19	2	47	–	–	2	9	–	43	129	65	1	88
Ark.	–	1	–	–	–	–	–	–	4	4	1	–	4
La.	3	–	NN	–	–	–	5	–	16	39	10	1	8
Okla.	3	–	–	–	–	–	–	–	3	4	4	–	6
Tex.	13	1	47	–	–	2	4	–	20	82	50	–	70
MOUNTAIN	9	–	8	–	1	1	1	–	8	46	13	2	40
Mont.	1	–	–	–	1	–	–	–	2	2	–	–	1
Idaho	–	–	–	–	–	–	–	–	–	4	–	1	4
Wyo.	–	–	–	–	–	–	–	–	–	1	–	–	–
Colo.	5	–	–	–	–	–	–	–	3	17	4	1	19
N. Mex.	1	–	–	–	–	–	–	–	–	6	–	–	3
Ariz.	1	–	NN	–	–	1	–	–	2	8	3	–	6
Utah	1	–	–	–	–	–	1	–	–	5	4	–	4
Nev.	–	–	8	–	–	–	–	–	1	3	2	–	3
PACIFIC	39	–	61	–	1	–	3	–	109	135	48	17	572
Wash.	1	–	54	–	–	–	–	–	8	12	1	–	25
Oreg.	–	–	–	–	–	–	–	–	5	12	4	–	15
Calif.	30	–	4	–	–	–	3	–	91	111	41	15	520
Alaska	–	–	–	–	1	–	–	–	1	–	2	2	3
Hawaii	8	–	3	–	–	–	–	–	4	–	–	–	9
Guam	NA	NA	NA	NA	–	NA	–	NA	NA	NA	NA	NA	2
P.R.	–	–	18	–	–	–	–	–	3	3	2	–	11
V.I.	–	–	–	–	–	–	–	–	–	–	–	–	4
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 October 24, 1981 and October 18, 1980 (42nd 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	18	2,750	13,059	48	2,848	2,199	102	3,505	27	24	1,850	48
NEW ENGLAND	-	86	675	3	185	119	3	176	1	-	121	2
Maine	-	5	33	1	23	5	1	34	-	-	33	-
N.H.	-	7	331	-	17	7	-	22	-	-	51	-
Vt.	-	3	226	1	8	14	-	6	-	-	-	-
Mass.	-	61	58	-	60	41	-	47	1	-	25	-
R.I.	-	-	2	1	17	9	1	23	-	-	-	-
Conn.	-	10	25	-	60	43	1	44	-	-	12	2
MID. ATLANTIC	1	830	3,806	9	405	376	13	597	8	5	224	4
Upstate N.Y.	1	216	696	3	132	115	6	124	5	4	109	1
N.Y. City	-	87	1,192	1	65	96	1	81	-	-	54	3
N.J.	-	58	837	1	90	81	1	90	1	1	48	-
Pa.	-	469	1,081	4	118	84	5	302	2	-	13	-
E.N. CENTRAL	-	81	2,442	5	342	284	36	979	2	2	375	9
Ohio	-	16	380	1	130	81	13	168	-	-	3	2
Ind.	-	9	92	1	46	42	2	113	-	-	132	2
Ill.	-	23	348	1	80	83	10	190	-	-	89	-
Mich.	-	30	247	2	81	62	8	324	1	1	35	3
Wis.	-	3	1,375	-	5	16	3	184	1	1	116	2
W.N. CENTRAL	-	9	1,337	7	132	82	14	205	2	-	77	3
Minn.	-	2	1,102	-	44	18	-	8	-	-	6	2
Iowa	-	1	20	3	24	11	8	62	-	-	4	-
Mo.	-	1	65	1	39	38	2	20	-	-	2	1
N. Dak.	-	-	-	-	2	1	-	-	-	-	-	-
S. Dak.	-	-	-	2	7	5	-	1	2	-	-	-
Nebr.	-	4	83	-	-	-	-	3	-	-	1	-
Kans.	-	1	67	1	16	9	4	111	-	-	64	-
S. ATLANTIC	5	445	1,960	12	656	521	17	506	4	2	143	8
Del.	-	-	3	-	4	2	-	10	-	-	1	-
Md.	-	5	83	-	45	46	2	91	-	-	1	-
D.C.	-	1	-	1	4	2	-	3	-	-	-	-
Va.	-	9	338	6	86	50	3	125	-	1	13	-
W. Va.	-	9	9	-	24	18	1	83	-	-	22	-
N.C.	-	3	130	1	96	92	2	20	1	-	5	2
S.C.	-	2	159	-	82	58	1	16	-	-	8	2
Ga.	-	112	826	1	108	92	-	38	-	-	37	1
Fla.	5	304	412	3	207	161	8	120	3	1	56	3
E.S. CENTRAL	-	5	331	2	201	186	1	82	1	1	38	2
Ky.	-	1	55	2	58	58	1	41	-	1	22	-
Tenn.	-	2	170	-	56	50	-	21	1	-	15	-
Ala.	-	2	22	-	62	51	-	16	-	-	1	2
Miss.	-	-	84	-	25	27	-	4	-	-	-	-
W.S. CENTRAL	7	882	951	3	447	240	3	209	-	3	168	11
Ark.	1	22	16	-	26	18	1	6	-	-	3	3
La.	-	4	11	-	109	90	-	5	-	-	9	2
Okla.	1	7	775	2	39	18	-	-	-	1	2	1
Tex.	5	849	149	1	273	114	2	198	-	2	154	5
MOUNTAIN	-	35	473	3	118	89	4	125	3	1	91	2
Mont.	-	-	2	-	9	3	1	11	-	-	4	-
Idaho	-	1	-	2	6	4	-	6	-	-	3	-
Wyo.	-	1	-	1	2	3	-	1	2	-	11	-
Colo.	-	10	24	-	42	25	-	45	-	-	27	-
N. Mex.	-	8	12	-	7	10	-	-	1	-	5	-
Ariz.	-	5	379	-	20	15	3	32	-	1	21	1
Utah	-	-	47	-	5	6	-	17	-	-	8	1
Nev.	-	10	9	-	27	23	-	13	-	-	12	-
PACIFIC	5	377	1,084	4	362	302	11	626	6	10	613	7
Wash.	-	3	177	2	64	53	3	148	-	-	89	-
Oreg.	-	5	-	-	51	50	2	64	-	-	51	-
Calif.	5	362	895	2	232	190	2	377	6	10	461	7
Alaska	-	-	6	-	11	9	4	15	-	-	1	-
Hawaii	-	7	6	-	4	-	-	22	-	-	11	-
Guam	NA	5	6	-	-	1	NA	6	NA	NA	1	-
P.R.	-	283	160	-	11	9	1	140	-	-	4	5
V.I.	-	25	6	-	1	1	-	5	-	-	1	-
Pac. Trust Terr.	NA	1	12	-	-	-	NA	15	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 October 24, 1981 and October 18, 1980 (42nd 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	567	21,908	214	22	481	9	1,125	20,495	812,582	807,241	689	24,758	21,470	5,911
NEW ENGLAND	16	627	3	-	16	-	9	472	20,191	20,446	15	483	418	39
Maine	1	42	-	-	1	-	-	42	1,063	1,178	-	5	5	13
N.H.	-	18	-	-	-	-	-	18	716	719	-	11	4	7
Vt.	-	20	1	-	-	-	-	11	347	467	-	15	5	-
Mass.	14	359	1	-	8	-	5	179	8,380	8,608	12	309	246	11
R.I.	-	46	-	-	-	-	2	22	1,176	1,315	3	29	27	2
Conn.	1	142	1	-	7	-	2	200	8,509	8,159	-	114	131	6
MID. ATLANTIC	107	3,411	10	5	74	-	40	2,396	98,045	89,111	83	3,572	2,997	100
Upstate N.Y.	12	607	10	1	13	-	14	576	16,857	16,277	17	325	266	70
N.Y. City	42	1,286	-	2	40	-	3	850	40,490	34,517	44	2,141	1,940	-
N.J.	18	736	-	2	13	-	10	528	18,424	16,411	8	510	364	21
Pa.	35	782	-	-	8	-	13	442	22,274	21,906	14	596	427	9
E.N. CENTRAL	92	2,977	5	1	36	3	49	2,812	120,424	124,963	65	1,826	2,021	782
Ohio	6	541	-	1	10	3	39	1,282	38,645	33,294	20	252	308	62
Ind.	11	343	4	-	2	-	3	189	10,404	12,477	2	239	152	84
Ill.	38	1,212	-	-	15	-	6	355	33,562	39,131	37	956	1,156	496
Mich.	33	724	1	-	7	-	1	709	26,660	28,462	5	302	327	14
Wis.	4	157	-	-	2	-	-	277	11,153	11,599	1	77	78	126
W.N. CENTRAL	20	752	32	-	18	-	50	1,171	38,959	38,309	20	543	290	2,352
Minn.	2	129	-	-	2	-	2	270	5,993	6,259	2	166	99	409
Iowa	-	71	-	-	3	-	7	205	4,276	4,130	3	24	23	764
Mo.	12	349	26	-	8	-	26	388	18,172	16,802	15	306	136	214
N. Dak.	-	28	-	-	-	-	-	13	489	550	-	8	3	335
S. Dak.	3	56	1	-	1	-	-	17	1,052	1,134	-	2	4	278
Nebr.	3	23	3	-	2	-	3	84	2,881	2,966	-	9	7	172
Kans.	-	96	2	-	2	-	12	194	6,096	6,468	-	28	18	180
S. ATLANTIC	118	4,721	13	-	60	2	643	4,500	199,628	202,427	185	6,621	5,187	521
Del.	1	54	1	-	-	-	3	68	3,178	2,848	-	13	14	1
Md.	4	487	-	-	14	-	58	639	23,588	21,704	4	479	356	43
D.C.	3	282	-	-	1	-	1	248	11,289	13,988	12	538	388	-
Va.	12	480	3	-	1	-	105	544	18,383	18,321	13	571	461	111
W. Va.	3	149	-	-	6	-	6	62	3,028	2,718	3	21	15	25
N.C.	29	828	2	-	5	2	287	759	30,940	30,005	10	519	386	18
S.C.	9	436	3	-	1	-	101	348	19,263	19,064	19	463	304	40
Ga.	21	778	4	-	4	-	72	1,069	41,546	39,514	41	1,637	1,492	195
Fla.	36	1,227	-	-	28	-	10	763	48,413	54,265	83	2,380	1,771	88
E.S. CENTRAL	45	1,950	10	1	8	3	132	1,852	67,788	65,804	51	1,622	1,772	405
Ky.	8	476	3	-	-	-	2	189	8,344	9,700	4	82	111	114
Tenn.	19	658	7	-	3	2	82	692	25,624	23,877	22	595	741	193
Ala.	10	534	-	1	3	1	21	630	20,750	19,317	19	480	391	94
Miss.	8	282	-	-	2	-	27	341	13,070	12,910	6	465	529	4
W.S. CENTRAL	57	2,473	97	11	124	1	167	3,200	107,897	101,708	151	5,943	4,328	966
Ark.	11	278	51	-	4	-	38	168	8,389	8,098	-	126	173	134
La.	-	441	5	-	2	1	1	550	18,778	18,585	28	1,350	1,089	33
Okla.	9	272	26	-	4	-	94	329	11,623	10,237	3	133	85	190
Tex.	37	1,482	15	11	114	-	34	2,153	69,107	64,788	120	4,334	2,981	609
MOUNTAIN	3	596	35	1	23	-	28	872	31,851	31,220	17	613	506	238
Mont.	2	30	5	-	4	-	12	24	1,168	1,177	-	11	2	111
Idaho	-	8	4	-	-	-	5	45	1,433	1,323	1	18	16	7
Wyo.	-	9	1	-	-	-	5	33	803	910	-	10	11	17
Colo.	-	71	8	-	8	-	1	192	8,354	8,468	3	181	136	35
N. Mex.	1	117	3	-	-	-	-	122	3,537	3,776	2	107	85	27
Ariz.	-	273	-	1	10	-	-	258	9,551	8,420	7	157	176	25
Utah	-	47	13	-	1	-	2	37	1,586	1,568	-	23	13	11
Nev.	-	41	1	-	-	-	3	161	5,419	5,578	4	106	67	5
PACIFIC	109	4,401	9	3	122	-	7	3,220	127,799	133,253	102	3,535	3,951	508
Wash.	9	313	1	-	3	-	1	239	10,443	11,389	-	131	204	15
Oreg.	-	153	1	-	4	-	-	186	7,651	9,194	4	90	91	9
Calif.	93	3,747	7	3	111	-	6	2,663	103,895	106,831	96	3,244	3,515	468
Alaska	-	48	-	-	-	-	-	81	3,290	3,212	-	12	8	16
Hawaii	7	140	-	-	4	-	-	51	2,520	2,627	2	58	133	-
Guam	NA	28	-	NA	-	NA	-	NA	72	105	NA	-	5	-
P.R.	3	360	-	-	4	-	-	71	2,627	2,201	13	542	497	63
V.I.	-	1	-	-	6	-	-	4	198	108	-	17	10	-
Pac. Trust Terr.	NA	49	-	NA	-	NA	-	NA	329	338	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 October 24, 1981 (42nd week)

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)						P&I** TOTAL
	ALL AGES	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	654	460	127	37	12	18	36
Boston, Mass.	164	103	33	14	4	10	13
Bridgeport, Conn.	66	42	15	4	1	4	6
Cambridge, Mass.	26	17	4	5	–	–	–
Fall River, Mass.	27	17	9	1	–	–	–
Hartford, Conn.	58	41	12	3	1	1	2
Lowell, Mass.	31	23	6	1	1	–	2
Lynn, Mass.	21	13	6	1	1	–	1
New Bedford, Mass.	31	23	8	–	–	–	2
New Haven, Conn.	51	36	12	2	–	1	6
Providence, R.I. §	39	39	–	–	–	–	1
Somerville, Mass.	7	6	1	–	–	–	–
Springfield, Mass.	52	37	9	4	1	1	1
Waterbury, Conn.	25	24	1	–	–	–	2
Worcester, Mass.	56	39	11	2	3	1	–
MID. ATLANTIC	2,640	1,700	587	206	67	79	105
Albany, N.Y.	54	36	12	6	–	–	1
Allentown, Pa.	22	19	3	–	–	–	2
Buffalo, N.Y.	100	68	22	5	3	2	14
Camden, N.J.	28	13	10	2	1	1	–
Elizabeth, N.J.	40	31	7	1	1	–	–
Erie, Pa.†	52	34	15	1	1	1	4
Jersey City, N.J.	55	38	10	3	2	2	2
N.Y. City, N.Y.	1,497	963	329	115	41	49	42
Newark, N.J.	75	44	17	10	2	2	3
Paterson, N.J.	43	19	8	6	7	3	3
Philadelphia, Pa.†	211	123	52	24	5	7	12
Pittsburgh, Pa.†	70	38	18	10	1	3	2
Reading, Pa.	39	31	7	1	–	–	6
Rochester, N.Y.	115	86	20	6	–	3	5
Schenectady, N.Y.	32	23	6	2	1	–	3
Scranton, Pa.†	22	17	4	–	1	–	1
Syracuse, N.Y.	97	55	29	7	1	5	3
Trenton, N.J.	32	25	5	1	–	1	1
Utica, N.Y.	23	15	6	2	–	–	–
Yonkers, N.Y.	33	22	7	4	–	–	1
E.N. CENTRAL	2,335	1,453	605	125	72	80	65
Akron, Ohio	51	37	9	2	1	2	–
Canton, Ohio	42	30	11	–	–	1	5
Chicago, Ill.	563	348	132	36	19	28	15
Cincinnati, Ohio	142	88	39	9	4	2	2
Cleveland, Ohio	158	86	52	8	4	8	1
Columbus, Ohio	129	76	33	9	7	4	6
Dayton, Ohio	145	99	38	4	2	2	1
Detroit, Mich.	259	157	64	17	12	9	4
Evansville, Ind.	54	33	14	4	1	2	–
Fort Wayne, Ind.	45	25	18	–	–	2	6
Gary, Ind.	43	22	16	4	–	1	1
Grand Rapids, Mich.	61	37	18	3	2	1	4
Indianapolis, Ind.	133	78	36	6	7	6	2
Madison, Wis.	36	26	6	2	2	–	5
Milwaukee, Wis.	165	113	40	5	5	2	–
Peoria, Ill.	28	14	12	1	–	1	2
Rockford, Ill.	53	40	12	1	–	–	2
South Bend, Ind.	57	37	14	3	2	1	3
Toledo, Ohio	98	57	26	5	4	6	4
Youngstown, Ohio	73	50	15	6	–	2	2
W.N. CENTRAL	704	446	164	42	16	35	30
Des Moines, Iowa	45	30	9	1	2	3	2
Duluth, Minn.	25	19	5	–	–	1	6
Kansas City, Kans.	29	19	7	2	–	–	1
Kansas City, Mo.	132	79	35	7	1	10	3
Lincoln, Nebr.	20	17	3	–	–	–	3
Minneapolis, Minn.	84	51	18	10	1	4	1
Omaha, Nebr.	70	44	20	4	–	2	1
St. Louis, Mo.	153	96	34	7	7	9	2
St. Paul, Minn.	70	41	16	6	3	4	2
Wichita, Kans.	76	50	17	5	2	2	9

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)						P&I** TOTAL
	ALL AGES	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,414	870	345	106	50	43	47
Atlanta, Ga.	135	80	36	10	2	7	–
Baltimore, Md.	342	220	80	21	15	6	10
Charlotte, N.C.	74	43	17	4	8	2	1
Jacksonville, Fla.	105	70	20	11	2	2	5
Miami, Fla.	87	56	21	6	1	3	2
Norfolk, Va.	46	26	13	2	2	3	5
Richmond, Va.	94	54	25	8	2	5	5
Savannah, Ga.	57	34	12	5	4	2	5
St. Petersburg, Fla.	97	76	16	1	1	3	3
Tampa, Fla.	78	50	20	5	1	2	6
Washington, D.C.	252	135	69	32	9	7	2
Wilmington, Del.	47	26	16	1	3	1	3
E.S. CENTRAL	652	385	198	36	13	20	31
Birmingham, Ala.	97	53	33	4	4	3	2
Chattanooga, Tenn.	44	23	16	4	–	1	5
Knoxville, Tenn.	50	34	12	1	1	2	1
Louisville, Ky.	126	78	30	10	1	7	12
Memphis, Tenn.	158	93	54	7	3	1	3
Mobile, Ala.	22	13	9	–	–	–	2
Montgomery, Ala.	35	18	13	2	–	2	3
Nashville, Tenn.	120	73	31	8	4	4	3
W.S. CENTRAL	1,418	769	368	138	74	69	45
Austin, Tex.	38	17	15	5	1	–	6
Baton Rouge, La.	33	17	8	2	3	3	3
Corpus Christi, Tex.	61	35	14	5	4	3	–
Dallas, Tex.	212	117	54	21	11	9	1
El Paso, Tex.	53	30	19	1	1	2	7
Fort Worth, Tex.	102	65	15	13	3	6	11
Houston, Tex.	383	170	118	55	35	5	2
Little Rock, Ark.	74	50	19	2	2	1	–
New Orleans, La.	168	96	40	12	4	16	1
San Antonio, Tex.	162	93	39	14	4	12	7
Shreveport, La.	45	22	11	3	1	8	1
Tulsa, Okla.	87	57	16	5	5	4	6
MOUNTAIN	610	374	128	50	27	31	22
Albuquerque, N.Mex.	75	53	8	7	3	4	5
Colo. Springs, Colo.	30	21	5	1	1	2	1
Denver, Colo.	122	62	29	15	7	9	2
Las Vegas, Nev.	59	33	15	9	1	1	3
Ogden, Utah	25	14	6	1	2	2	–
Phoenix, Ariz.	130	80	33	4	7	6	2
Pueblo, Colo.	26	18	3	5	–	–	2
Salt Lake City, Utah	58	35	13	3	2	5	1
Tucson, Ariz.	85	58	16	5	4	2	6
PACIFIC	1,692	1,071	388	109	57	67	62
Berkeley, Calif.	22	15	6	–	1	–	–
Fresno, Calif.	85	56	20	4	4	1	5
Glendale, Calif.	33	21	10	–	1	1	–
Honolulu, Hawaii	45	20	14	7	1	3	3
Long Beach, Calif.	109	72	24	6	4	3	5
Los Angeles, Calif.	502	314	118	30	16	24	16
Oakland, Calif.	62	40	13	5	1	3	1
Pasadena, Calif.	39	30	5	2	2	–	3
Portland, Oreg.	102	72	23	2	1	4	–
Sacramento, Calif.	64	36	14	7	3	4	6
San Diego, Calif.	94	58	24	6	2	4	–
San Francisco, Calif.	146	92	31	13	3	7	4
San Jose, Calif.	174	109	43	11	7	4	14
Seattle, Wash.	121	84	19	8	6	4	3
Spokane, Wash.	49	27	15	1	2	4	1
Tacoma, Wash.	45	25	9	7	3	1	1
TOTAL	12,119††	7,528	2,910	849	388	442	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 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 this week. Figures are estimates based on average percent of regional totals.

Food-Borne Illness — Continued

It is difficult to specify an active dose of marijuana, and equally difficult to quantify exposure through chemical analyses of body fluids. Although sophisticated assays do exist for determining cannabinoid and cannabinoid-metabolite levels in humans, they are not currently available for clinical use.

These 2 episodes of marijuana-associated illness suggest that marijuana might be considered as a toxin when food-borne outbreaks are being investigated.

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1. CDC. Food-borne marijuana outbreak—Colorado. MMWR 1978;27:404-5.
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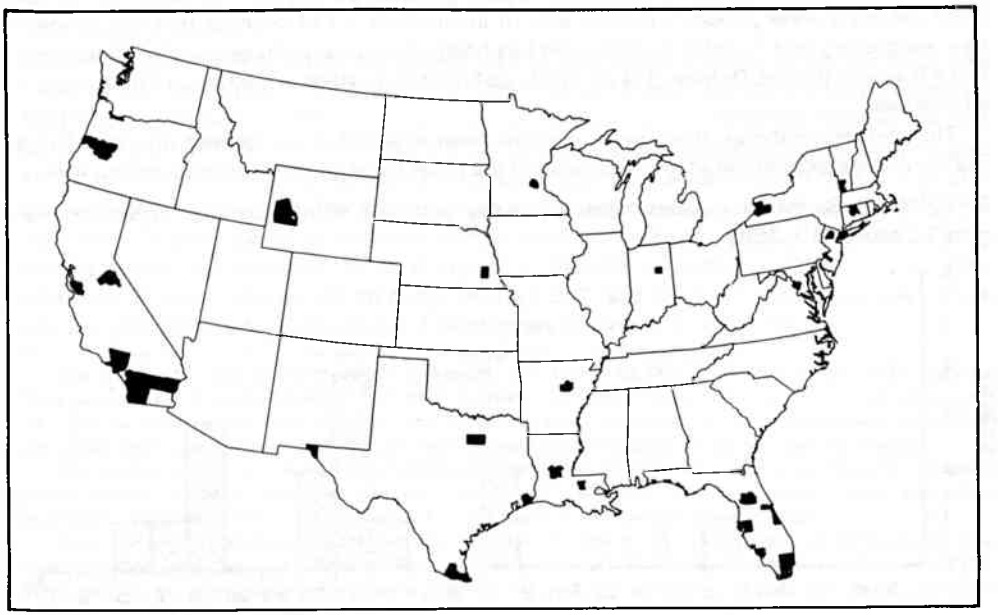
Measles, United States — Weeks 37-40, 1981

In the first 40 weeks of 1981, a total of 2,696 cases of measles were reported in the United States; this represents a 79% drop from the 12,957 cases reported in the same period in 1980. During the 4-week period from September 13 to October 10, 1981, reporting weeks 37-40, 125 cases were reported. These 125 cases occurred in only 1.3% (41) of the nation's 3,144 counties (Figure 1). A measles outbreak among college students and their contacts in Arkansas accounted for almost 13% of these cases.

FIGURE 1. U.S. counties reporting measles, weeks 37-40 (September 13-October 10), 1981



Measles — Continued

As of October 10, 16 confirmed cases of measles had occurred in an outbreak in White County, Arkansas (Figure 2); 13 patients were students at Harding University, and 3 were contacts of students. The outbreak was traced to four university students who had visited Honduras from August 2 to 16, 1981. The measles immunity status of these 4 students had not been assessed before their trip. None of the 4 had documented evidence of having received live-measles vaccine on or after their first birthday or of having a physician-documented history of measles disease. Two of these students were infected with measles in Honduras and had onset of rash on August 17 and August 24, respectively. The other 2 students, siblings of the second patient, had acquired measles from their sister after returning to the United States. Spread to 9 other students resulted from contact with infected persons in dormitories, classrooms, and recreational settings.

The 3 cases in persons who were not university students resulted from contact with ill students who were seeking medical attention. These cases occurred in a hospital employee, a preschool child, and a pregnant woman. The pregnant woman went into labor, presumably as a result of her measles, and had a premature infant who was otherwise healthy.

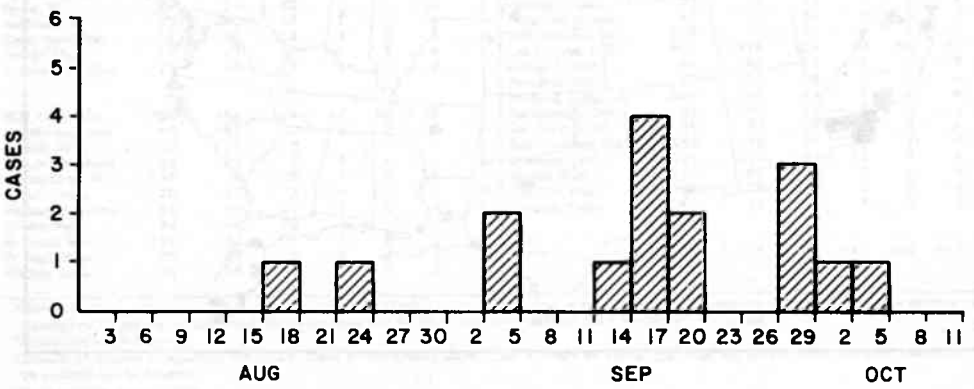
The diagnosis of measles was delayed for the first four patients, because they were initially hospitalized for suspected typhoid fever. After the outbreak was reported to the state health department on September 18, state and county health officials rapidly instituted control programs at the university, which has an enrollment of 3,076 students. By September 23, 2,054 people had been vaccinated in voluntary clinics held on campus. Active surveillance has been set up in the county, and aggressive outbreak-control measures are being implemented in connection with new cases.

Reported by E Roberts, RN, K Smith, RN, T Altman, Harding University, C Ross, PHN, White County Health Dept, Searcy, F Turnage, PHN, B Henderson, PHN, C Beets, JP Lofgren, MD, State Epidemiologist, Arkansas Dept of Health, Little Rock; Field Services Div, Epidemiology Program Office, Immunization Div, Center for Prevention Services, CDC.

Editorial Note: Measles transmission continues to occur at very low levels in the United States. In the 4-week period discussed, 99% of the nation's 3,144 counties reported no measles, suggesting that measles transmission has been interrupted in these counties. During the first 40 weeks (ending October 10) of 1981, 290 (9.2%) counties in the United States reported measles.

The measles outbreak in Arkansas resulted from importation of measles into the United States. A rising proportion of measles cases in the United States have occurred among Ameri-

FIGURE 2. Reported measles cases, by 3-day intervals, White County, Arkansas, August 1-October 10, 1981



Measles – Continued

cans returning from travel abroad (*1*). This outbreak raises the question of the need for children and young adults to be adequately protected against measles before traveling abroad (*1*). It also shows that physicians should consider the diagnosis of measles for persons with a history of recent travel abroad who have febrile illness accompanied by rash.

Participation by college students in vaccination clinics during outbreaks has usually been low, although controlled studies have shown that there is no increased risk of serious side effects from measles vaccination for young adults (*2,3*). Consequently, the high degree of participation by students in the voluntary vaccination clinics at Harding University is noteworthy.

Several college-based measles outbreaks have been described in recent years (*2-4*). Continued reporting of outbreaks such as the one discussed above has led the Immunization Practices Advisory Committee to emphasize the need for college officials to strongly consider requiring documented evidence of immunity for entering students (*5*).

References

1. CDC. Measles importations—United States. MMWR 1981;30:455-6,461-2.
2. CDC. Measles vaccination reactions among college students. MMWR 1980;29:549-51.
3. CDC. Measles and measles vaccine reactions among college students—Wisconsin. MMWR 1980;29:21-2.
4. CDC. Measles—Oregon, California. MMWR 1977;26:161-2.
5. CDC. Rubella—United States, 1977-1980. MMWR 1980;29:378-80.

Recommendation of the Immunization Practices Advisory Committee (ACIP)

Supplementary Statement on Rabies Vaccine and Serologic Testing

Human diploid cell strain rabies vaccine (HDCV) was licensed in the United States in June 1980. At its meeting on October 15, 1981, the Immunization Practices Advisory Committee (ACIP) reviewed data on seroconversion in persons properly vaccinated with HDCV; the data showed that 100% of vaccinees (510/510) had protective antibody levels following pre-exposure treatment, and following post-exposure treatment, 99.9% (1,299/1,300) had protective antibody levels. In view of these findings, which corroborate prelicensure data, the ACIP now sees no reason to continue routine serologic testing of persons who receive the recommended pre-exposure or post-exposure treatment regimens of HDCV, i.e., pre-exposure: 3 intramuscular, 1.0-ml doses on days 0, 7, and 21 or 28; post-exposure: rabies immune globulin plus 5 intramuscular, 1.0-ml doses on days 0, 3, 7, 14, and 28.

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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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ACIP Recommendation — Rabies

Furthermore, the ACIP believes that routine serologic testing is no longer necessary following booster doses of HDCV for persons given the recommended primary HDCV vaccination or those shown to have had an adequate antibody response to primary vaccination with duck embryo vaccine (DEV) or other rabies vaccines.

Serologic testing is still recommended for persons vaccinated with DEV or those whose immune responses might be diminished by drug therapy or for other reasons.

Editorial Note: In accord with the ACIP's conclusion on routine rabies antibody testing, effective November 30, 1981, CDC will no longer test serum for rabies antibody except in persons vaccinated with DEV or suspected of being immunocompromised. Those who have not completed vaccination with HDCV will be advised to do so rather than to submit serum for testing.

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