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MORBIDITY AND MORTALITY WEEKLY REPORT

Delta Hepatitis — Massachusetts

An outbreak of hepatitis B (HB) that began in September 1983 is continuing in Worcester, Massachusetts, primarily involving parenteral drug abusers (PDAs) and their sexual contacts. As of August 1, 1984, 75 cases of acute HB have been identified, 50 of which are considered outbreak-related. Fulminant hepatitis has been a prominent feature of this outbreak. Six deaths have occurred, for an outbreak-related case fatality ratio of 12%.

Patients meeting all the following criteria were considered outbreak-related HB cases: (1) an acute clinical illness compatible with HB; (2) elevated serum glutamic-oxaloacetic transaminase (SGOT) or serum glutamic-pyruvic transaminase (SGPT) two or more times greater than the upper limit of normal (when such results were available); (3) positive serology for hepatitis B surface antigen (HBsAg); (4) residence and/or primary diagnosis and treatment within the city of Worcester; and (5) a PDA or a direct contact of a PDA.

Patients with acute HB who could be located were interviewed regarding their drug and alcohol use, as well as risk factors for HB. Serum samples were obtained to test for markers of hepatitis B virus (HBV) infection and delta virus infection.

Of the 50 outbreak-related case patients, 35 were male. Twenty-nine were white, non-Hispanic; 17 were Hispanic; two were black; and two were of unknown race. Ages ranged from 15 years to 43 years (median 25 years). Forty-three patients used needles; six were sexual contacts of PDAs; and one had direct contact with open wounds of a person with hepatitis. Of the six patients who died, three were male; five were white, non-Hispanic, and one was Hispanic. Ages ranged from 19 years to 34 years of age (median 27 years). Five were PDAs, and one was a sexual contact of a known PDA.

Drugs that were self-injected were primarily heroin and cocaine. No 3,4-methylene diamphetamine (MDA), a drug implicated in fulminant HB/PDA deaths in North Carolina in 1979, was used (1). The only potential hepatotoxin identified was alcohol.

Testing for HB markers confirmed HB in all cases. Serum specimens were available from four patients who died; three had immunoglobulin M (IgM) anti-delta virus antibodies. IgM anti-delta virus antibodies were also present in four of 22 PDAs with nonfulminant acute HB, one of seven PDA contacts with nonfulminant acute HB, and none of 11 nonoutbreak-related patients with acute HB. In addition, two of 13 non-ill HBsAg-positive PDAs had serologic markers of delta virus infection (one with IgG antibodies and one with IgM).

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Editorial Note: Previous clusters of fulminant HB deaths among PDAs have been reported in this country (1,2); however, this is the first outbreak of fulminant HB in the United States in which the delta virus has clearly been shown to have contributed to the severity of the illness.

Hepatitis — Continued

Delta virus is composed of a protein antigen (delta antigen) and a ribonucleic acid of low molecular weight. Although transmissible as an independent infectious agent, delta virus can only infect and cause illness in the presence of active HBV infection. To be infectious, this incomplete virus requires a coat of HBsAg (3). Delta virus and HBV may simultaneously infect a host (coprimary infection with HBV/delta virus), or delta virus may superinfect an existing HBV carrier. Either coprimary infection or superinfection may cause acute hepatitis; both types of infection have been associated with fulminant HB in Europe (4).

Delta virus infection is endemic in southern Italy. Based on limited serosurveys, it has also been found in the Middle East and in certain parts of South America and Western Africa. Superinfection with delta virus was implicated as the major cause of an exceptionally severe hepatitis epidemic among Venezuelan Indians in which 34 of 149 patients died (5). Delta virus infection has been limited to hemophilia patients and PDA populations in the rest of Western Europe, North America, and Australia (7,8). Fulminant coprimary HBV/delta virus infections among PDAs have occurred sporadically in Los Angeles (6).

Although delta virus is transmitted in a manner similar to HBV, to date, delta virus infection has not been reported in this country in health-care workers or male homosexuals, the other major groups at risk for HB. Because delta virus infections have never been found in the absence of infection with HBV, there appears to be little risk of spread outside of groups known to be at risk of acquiring HB. Testing for delta virus is indicated in the setting of fulminant HB infection or acute hepatitis occurring in a known HB carrier.

Control of HB outbreaks among PDAs is difficult. Efforts to control the current outbreak have focused on educating PDAs on the modes of transmission of HB and on updating physicians regarding serodiagnosis and reporting of HB and recommended prophylaxis of needle, sexual, and familial contacts of patients (9). Since HB vaccine will prevent both HB and delta virus infections, a program to vaccinate PDAs in Worcester is currently under development as a control measure.

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Outbreak of Diarrhea Linked to Dietetic Candies — New Hampshire

A 13-year-old girl was treated at a Milford, New Hampshire, hospital emergency room April 30, 1984, for acute abdominal pain and diarrhea. Induced vomiting yielded partially digested pieces of a hard candy. The New Hampshire Poison Center notified the Epidemiology Office, New Hampshire Division of Public Health Services, that candy possibly caused the illness.

Investigation disclosed that, earlier that day, eight neighborhood playmates, ages 5-13 years (mean 9 years), had experienced abdominal cramps, urgency in defecation, and two to

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six loose bowel movements each, ½ to 1½ hours after eating three to 16 pieces of a dietetic candy per child. There was no known common exposure to other food, drink, or toxic substance. Only the 13-year-old girl received medical attention; the other seven children recovered spontaneously within 2-3 hours after the illness began. Each of three additional playmates who ate one piece of candy and four who ate no candy did not become ill. The attack rate for children who had eaten any of the candy was 8/12 (67%); it was 8/9 (89%) for children who had eaten three or more pieces.

The candies, purchased locally, had been manufactured in Pennsylvania and are one of a number of dietetic candy products distributed widely for the past 6 years to retailers throughout the United States and to countries overseas. The candies in this outbreak each contained approximately 3 grams of sorbitol as a sweetener. Sorbitol, a hexahydric sugar alcohol, acts as an osmotic laxative. The candies were purchased in bulk and individually wrapped. The wrappers carried no ingredient information and no warning of adverse effects if eaten in excess. A survey of a number of sorbitol-containing dietetic products on the market in New Hampshire revealed instances of inadequate and inaccurate labeling.

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Editorial Note: Sorbitol has been responsible for both acute and chronic diarrheal illnesses in adults and children (1-3). In a normal adult, after a 35-gram oral dose, levels of sorbitol in blood remain undetectable, and serum glucose remains unchanged (4). Ingestion of 10 grams of sorbitol caused bloating and flatulence in most of seven volunteers in one study. Twenty grams caused more severe symptoms of cramping and diarrhea (5). In children, the dose of sorbitol required to produce gastrointestinal symptoms is markedly less than in adults. Sorbitol ingestion has not been associated with harmful effects other than diarrhea and gastrointestinal discomfort. In unexplained cases of acute or chronic diarrhea, a careful dietary history should be obtained, with careful attention to the possible ingestion of sorbitol.

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Measles — United States, First 26 Weeks, 1984

During the first 26 weeks of 1984, a provisional total of 1,759 measles cases was reported in the United States (incidence rate 0.8 per 100,000 population) (Figure 1). This represents a 60.6% increase from the 1,095 cases reported during the same period in 1983 (0.5/100,000). A total of 1,234 cases (70.2%) was reported from four states—Michigan (430), Texas (377), California (267), and Illinois (160). Nine states (New Mexico, Michigan, Hawaii, New Hampshire, Texas, Washington, Utah, Illinois, California) and New York City had incidence rates of 1/100,000 population or higher.

Although the overall incidence rate increased, the number of states reporting measles decreased during the first 26 weeks of 1984, compared with the same period of 1983. Twenty-four states reported no measles cases (indigenous or imported), compared with 22 states and the District of Columbia during the same period in 1983. In 1984, 80 (2.5%) of the nation's

Measles — Continued

3,139 counties reported measles cases during the first 26 weeks, compared with 95 (3.0%) during the same period in 1983 (Table 1).

One hundred seventy-five cases (9.9%) were associated with international or out-of-state importations—an average of 6.7 cases per week—compared with 174 cases during the same period in 1983 (1).

During the first 26 weeks, detailed information was provided to the Division of Immunization, CDC, on 1,765 cases. The difference between this number and the 1,759 cases reported to the *MMWR* reflect delays in reporting. Of 1,765 cases, 1,723 (97.6%) met the standard clinical case definition for measles,* and 721 (40.8%) were serologically confirmed.

Among most of the measles patients, onset of rash occurred from week 9 through week 15, peaking at week 11 (130 cases) (Figure 2).

Age characteristics of reported cases changed from 1983 to 1984 (Table 2). In 1983, the highest incidence rates were reported for preschoolers. In contrast, the rates for the first 26 weeks of 1984 were greatest for children 10 years to 14 years of age who experienced a more than twofold increase in incidence rates, compared with all of 1983. Of the 351 preschoolers who had measles in 1984, 92 (26.2%) were under 12 months of age; 68 (19.4%)

*Fever (38.3 C [101 F] or higher, if measured), generalized rash of 3 days' or longer duration, and at least one of the following: cough, coryza, conjunctivitis.

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

Disease	35th Week Ending			Cumulative, 35th Week Ending		
	Sept. 1, 1984	Sept. 3, 1983	Median 1979-1983	Sept. 1, 1984	Sept. 3, 1983	Median 1979-1983
Acquired Immunodeficiency Syndrome (AIDS)	106	N	N	2,748	N	N
Aseptic meningitis	250	741	471	4,140	6,593	4,967
Encephalitis: Primary (arthropod-borne & unsp.)	18	109	60	639	1,042	811
Post-infectious	1	1	1	67	66	66
Gonorrhea: Civilian	14,604	16,343	20,619	548,769	597,452	658,232
Military	280	308	621	14,108	16,161	18,272
Hepatitis: Type A	216	402	460	13,714	13,961	16,907
Type B	318	472	402	16,633	15,879	13,586
Non A, Non B	32	54	N	2,430	2,278	N
Unspecified	79	103	206	3,927	4,765	6,731
Legionellosis	15	11	N	381	474	N
Leprosy	5	6	5	147	169	142
Malaria	11	12	27	589	520	728
Measles: Total*	24	1	10	2,203	1,206	2,523
Indigenous	23	1	N	1,950	1,002	N
Imported	1	-	N	253	204	N
Meningococcal infections: Total	30	25	32	1,962	1,986	1,986
Civilian	30	25	32	1,957	1,971	1,971
Military	-	-	-	5	15	14
Mumps	28	25	30	2,163	2,407	4,183
Pertussis	14	69	36	1,276	1,525	995
Rubella (German measles)	27	7	17	535	758	1,963
Syphilis (Primary & Secondary): Civilian	507	574	574	18,521	21,734	20,357
Military	4	6	9	223	276	250
Toxic Shock syndrome	2	4	N	289	297	N
Tuberculosis	332	449	520	14,107	15,598	17,941
Tularemia	5	11	10	213	204	163
Typhoid fever	5	16	14	206	273	310
Typhus fever, tick-borne (RMSF)	37	46	44	626	904	886
Rabies, animal	86	126	124	3,493	4,332	4,332

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1984		Cum. 1984
Anthrax	1	Plague	17
Botulism: Foodborne	7	Polioomyelitis: Total	2
Infant	65	Paralytic	2
Other	5	Psittacosis	57
Brucellosis (N.C. 1, Tex. 1)	73	Rabies, human	1
Cholera	-	Tetanus (Tex. 1)	40
Congenital rubella syndrome	3	Trichinosis	59
Diphtheria	-	Typhus fever, flea-borne (endemic, murine)	15
Leptospirosis	13		

*There were no cases of internationally imported measles reported for this week.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending
September 1, 1984 and September 3, 1983 (35th 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	2,748	250	639	67	548,769	597,452	216	318	32	79	15	147
NEW ENGLAND	93	22	35	1	15,629	15,187	4	11	1	20	-	7
Maine	-	2	-	-	648	749	-	1	-	-	-	-
N.H.	1	9	5	-	441	483	-	2	-	-	-	-
Vt.	-	2	3	-	250	291	2	1	-	-	-	-
Mass.	51	5	19	-	6,427	6,535	2	4	-	20	-	5
R.I.	6	-	-	-	1,080	822	-	2	-	-	-	2
Conn.	35	4	8	1	6,783	6,307	-	1	1	-	-	-
MID ATLANTIC	1,207	67	82	8	74,785	75,994	29	83	3	12	-	30
Upstate N.Y.	115	37	30	5	11,633	12,269	2	20	1	4	-	2
N.Y. City	865	9	4	-	31,319	30,528	20	54	-	3	-	28
N.J.	166	21	23	-	12,554	13,968	7	9	2	5	-	-
Pa.	61	U	25	3	19,279	19,229	U	U	U	U	U	-
E. N. CENTRAL	120	42	163	17	76,583	86,003	23	32	1	1	6	6
Ohio	15	20	49	9	19,879	22,156	9	11	-	-	4	2
Ind.	16	3	35	-	8,410	8,737	2	2	-	-	-	-
Ill.	63	1	19	6	17,425	24,468	7	4	1	1	1	2
Mich.	16	18	39	-	22,328	23,180	5	15	-	-	1	2
Wis.	10	-	21	2	8,541	7,462	-	-	-	-	-	-
W. N. CENTRAL	26	11	51	1	27,120	28,250	10	30	1	-	-	1
Minn.	7	-	20	-	4,048	3,888	1	3	1	-	-	-
Iowa	1	5	20	-	2,938	3,082	1	2	-	-	-	1
Mo.	13	3	7	-	13,132	13,988	2	19	-	-	-	-
N. Dak.	-	-	-	-	260	288	-	-	-	-	-	-
S. Dak.	-	-	-	1	625	746	3	1	-	-	-	-
Nebr.	2	1	1	-	1,940	1,802	-	-	-	-	-	-
Kans.	3	2	3	-	4,177	4,456	3	5	-	-	-	-
S. ATLANTIC	397	49	96	15	139,840	154,409	19	83	7	6	7	6
Del.	4	-	1	-	2,538	2,764	1	1	-	-	4	-
Md.	28	8	23	-	15,689	19,886	-	17	2	-	-	-
D. C.	62	2	-	-	10,166	10,609	1	1	-	-	1	1
Va.	23	16	22	5	13,435	13,810	3	9	1	-	-	4
W. Va.	4	2	7	-	1,650	1,603	-	2	-	-	-	-
N. C.	9	11	20	7	22,824	23,673	3	13	1	3	1	-
S. C.	6	1	4	-	14,236	14,666	-	17	-	-	1	-
Ga.	39	-	2	1	25,575	30,946	-	-	-	-	-	-
Fla.	222	9	17	2	33,727	36,452	11	23	3	3	-	1
E. S. CENTRAL	20	9	33	6	47,955	49,644	14	35	4	4	-	-
Ky.	9	8	6	-	5,871	5,839	10	2	-	-	-	-
Tenn.	5	1	9	1	20,105	20,773	3	26	1	4	-	-
Ala.	4	-	16	5	14,622	14,952	1	5	3	-	-	-
Miss.	2	-	2	-	7,357	8,080	-	2	-	-	-	-
W. S. CENTRAL	181	32	44	4	75,247	84,126	66	29	13	31	-	16
Ark.	1	-	-	2	6,567	6,553	3	3	-	2	-	1
La.	24	4	6	-	16,862	15,849	9	4	7	2	-	1
Okla.	6	4	14	1	8,261	9,792	5	1	1	-	-	-
Tex.	150	24	24	1	43,557	51,932	49	21	5	27	-	14
MOUNTAIN	43	13	21	7	17,616	19,000	45	13	-	4	1	7
Mont.	-	-	-	-	745	795	15	-	-	-	-	-
Idaho	-	2	-	-	882	807	3	5	-	-	-	-
Wyo.	1	-	-	-	495	494	-	-	-	-	-	-
Colo.	25	6	7	-	5,075	5,331	13	7	-	4	-	-
N. Mex.	-	-	-	-	2,130	2,354	2	1	-	-	1	-
Ariz.	9	U	7	3	4,591	5,412	U	U	U	U	U	5
Utah	3	5	7	4	873	899	6	-	-	-	-	1
Nev.	5	-	-	-	2,825	2,908	6	-	-	-	-	1
PACIFIC	661	5	114	8	73,994	84,839	6	2	2	1	1	74
Wash.	34	2	7	-	5,534	6,666	-	1	1	-	1	3
Oreg.	7	-	-	-	4,554	4,555	4	1	-	1	-	1
Calif.	607	U	105	8	60,719	69,776	U	U	U	U	U	55
Alaska	1	-	-	-	1,901	2,143	-	-	1	-	-	-
Hawaii	12	3	2	-	1,286	1,699	2	-	-	-	-	15
Guam	-	U	-	-	95	114	U	U	U	U	U	-
P.R.	33	U	-	1	2,253	1,881	U	U	U	U	U	2
V.I.	-	-	-	-	325	188	-	-	-	-	-	-
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 September 1, 1984 and September 3, 1983 (35th Week)

Reporting Area	Malaria Cum. 1984	Measles (Rubeola)					Merino- coccal Infections Cum. 1984	Mumps		Pertussis			Rubella		
		Indigenous		Imported *		Total		1984	Cum. 1984	1984	Cum. 1984	Cum. 1983	1984	Cum. 1984	Cum. 1983
		1984	Cum. 1984	1984	Cum. 1984	Cum. 1983									
UNITED STATES	589	23	1,950	1	253	1,206	1,962	28	2,163	14	1,276	1,525	27	535	758
NEW ENGLAND	37	-	93	-	11	16	117	2	69	-	36	47	-	18	14
Maine	-	-	-	-	-	-	1	2	22	-	1	4	-	1	-
N.H.	-	-	33	-	3	3	7	-	15	-	6	7	-	1	4
Vt.	3	-	2	-	5	-	26	-	-	-	17	7	-	-	5
Mass.	21	-	48	-	-	5	42	-	10	-	10	24	-	16	5
R.I.	4	-	-	-	-	-	11	-	8	-	1	5	-	-	-
Conn.	9	-	10	-	3	8	30	-	9	-	-	-	-	-	-
MID ATLANTIC	95	-	111	-	30	93	345	8	253	2	113	284	25	205	134
Upstate N.Y.	24	-	21	-	10	9	119	5	65	2	66	90	-	101	25
N.Y. City	21	-	86	-	14	54	75	1	19	-	5	46	25	85	86
N.J.	30	-	4	-	2	27	69	2	130	-	6	18	-	15	3
Pa.	20	U	-	U	4	3	82	U	39	U	36	130	U	4	20
E.N. CENTRAL	54	15	602	-	69	632	315	2	871	7	342	357	1	78	114
Ohio	15	-	3	-	6	85	108	-	432	5	62	105	-	2	2
Ind.	1	-	2	-	1	400	38	1	50	2	222	36	1	3	23
Ill.	19	15	176	-	1	139	67	1	162	2	21	126	-	46	48
Mich.	9	-	402	-	54	7	60	-	157	-	21	25	-	19	15
Wis.	10	-	19	-	7	1	42	-	70	-	16	65	-	8	26
W.N. CENTRAL	17	-	3	-	7	2	119	4	88	1	106	95	-	31	31
Minn.	6	-	-	-	3	1	22	-	4	-	12	33	-	2	6
Iowa	1	-	-	-	-	-	21	-	19	-	9	5	-	1	-
Mo.	6	-	3	-	-	1	35	3	9	-	16	20	-	-	-
N. Dak.	1	-	-	-	-	-	-	-	2	-	1	6	-	3	-
S. Dak.	-	-	-	-	-	-	6	-	-	1	8	6	-	-	-
Nebr.	1	-	-	-	-	-	11	-	4	-	11	-	-	-	-
Kans.	2	-	-	-	4	-	23	1	50	-	50	30	-	25	25
S. ATLANTIC	95	-	14	1	28	195	406	8	162	1	107	198	-	21	91
Del.	4	-	-	-	-	-	3	-	2	-	2	3	-	-	-
Md.	23	-	6	-	14	10	32	3	32	-	8	25	-	1	3
D.C.	1	-	-	-	5	-	5	-	-	-	-	-	-	-	-
Va.	25	-	1	-	2	23	47	-	15	1	13	45	-	2	7
W. Va.	1	-	-	-	-	-	5	4	35	-	10	7	-	-	-
N.C.	7	-	-	-	-	1	60	-	17	-	21	21	-	-	10
S.C.	2	-	-	-	-	4	43	-	4	-	1	13	-	-	1
Ga.	8	-	-	1	8	81	81	-	17	-	10	57	-	2	11
Fla.	24	-	7	-	6	149	130	1	40	-	42	27	-	18	64
E.S. CENTRAL	6	-	1	-	2	6	110	1	42	1	12	21	-	9	11
Ky.	-	-	1	-	-	1	43	-	9	-	1	9	-	3	10
Tenn.	2	-	-	-	2	-	28	1	13	1	7	4	-	-	-
Ala.	4	-	-	-	-	5	26	-	6	-	4	4	-	3	1
Miss.	-	-	-	-	-	-	13	-	14	-	4	4	-	3	-
W.S. CENTRAL	55	8	487	-	23	73	209	2	114	-	244	279	-	13	98
Ark.	-	-	-	-	-	12	27	-	5	-	15	18	-	3	-
La.	7	8	8	-	-	25	44	-	-	-	4	5	-	-	9
Okla.	8	-	-	-	8	1	23	N	N	-	208	205	-	-	-
Tex.	40	-	479	-	15	35	115	2	109	-	17	51	-	10	89
MOUNTAIN	20	-	91	-	39	4	67	-	205	2	94	157	-	16	28
Mont.	1	-	-	-	-	-	2	-	6	-	19	11	-	-	3
Idaho	2	-	-	-	23	-	6	-	9	-	7	11	-	1	8
Wyo.	-	-	-	-	-	1	2	-	2	-	3	6	-	2	3
Colo.	3	-	-	-	6	2	24	-	16	2	34	100	-	-	-
N. Mex.	1	-	68	-	8	-	7	N	N	-	6	9	-	-	-
Ariz.	9	U	-	U	-	1	14	U	165	U	17	14	U	1	6
Utah	4	-	23	-	2	-	7	-	5	-	6	16	-	6	7
Nev.	-	-	-	-	-	-	5	-	2	-	2	-	-	4	1
PACIFIC	210	-	548	-	44	185	274	1	359	-	222	87	1	144	237
Wash.	8	-	125	-	13	5	42	-	36	-	58	13	-	1	9
Oreg.	10	-	-	-	-	9	40	N	N	-	14	6	-	1	3
Calif.	189	U	270	U	27	168	184	U	297	U	81	66	U	137	213
Alaska	-	-	-	-	-	2	7	1	8	-	-	-	-	1	1
Hawaii	3	-	153	-	4	1	1	-	18	-	69	2	1	4	1
Guam	1	U	83	U	2	2	1	U	5	U	-	-	U	2	-
P.R.	4	U	-	U	-	89	3	U	107	U	-	9	U	7	4
V.I.	-	-	-	-	-	5	-	-	5	-	-	-	-	-	2
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 ¹International [§]Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending
September 1, 1984 and September 3, 1983 (35th 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	18,521	21,734	2	14,107	15,598	213	206	626 +50	3,493
NEW ENGLAND	350	455	-	406	447	4	12	4	33
Maine	3	15	-	20	26	-	-	-	10
N.H.	13	19	-	24	30	-	-	-	10
Vt.	1	1	-	9	6	-	-	-	-
Mass.	201	279	-	213	238	4	10	3	8
R.I.	14	16	-	30	32	-	-	-	-
Conn.	118	125	-	110	115	-	2	1	5
MID ATLANTIC	2,494	2,781	-	2,612	2,739	-	32	17	261
Upstate N.Y.	179	250	-	444	416	-	12	6	48
N.Y. City	1,551	1,626	-	1,037	1,109	-	7	1	-
N.J.	457	539	-	582	599	-	7	3	14
Pa.	307	366	U	549	615	-	6	7	199
E.N. CENTRAL	876	1,175	-	1,875	2,045	6	28	45	154
Ohio	162	300	-	355	314	-	5	29	15
Ind.	91	87	-	211	220	-	2	4	17
Ill.	300	572	-	759	893	6	10	9	59
Mich.	274	159	-	429	510	-	4	3	17
Wis.	49	57	-	121	108	-	7	-	46
W.N. CENTRAL	276	263	-	446	505	69	6	44	543
Minn.	76	104	-	77	103	1	2	-	59
Iowa	11	14	-	45	45	-	-	6	113
Mo.	139	99	-	228	251	34	3	12	41
N. Dak.	10	2	-	10	5	-	-	-	115
S. Dak.	-	9	-	17	33	31	-	4	133
Nebr.	11	11	-	22	20	-	-	4	37
Kans.	29	24	-	47	48	3	1	18	45
S. ATLANTIC	5,526	5,778	-	2,971	3,157	5	28	297	1,033
Del.	14	25	-	39	25	-	-	1	4
Md.	338	368	-	302	248	-	3	28	594
D.C.	227	260	-	119	127	-	6	-	-
Va.	284	401	-	317	334	-	7	48	158
W. Va.	13	18	-	92	96	-	-	6	33
N.C.	563	543	-	432	472	1	1	110	19
S.C.	519	363	-	355	283	-	1	69	39
Ga.	931	1,057	-	429	584	4	1	33	122
Fla.	2,637	2,743	-	886	988	-	9	2	64
E.S. CENTRAL	1,298	1,474	-	1,296	1,409	3	5	60	178
Ky.	73	103	-	313	332	-	2	10	46
Tenn.	339	421	-	394	442	3	2	32	62
Ala.	419	569	-	385	362	-	1	11	70
Miss.	467	381	-	204	273	-	-	7	-
W.S. CENTRAL	4,545	5,682	-	1,621	1,902	93	12	145	718
Ark.	126	136	-	176	217	68	-	25	76
La.	806	1,173	-	216	302	7	1	2	44
Okla.	150	146	-	157	168	16	2	95	86
Tex.	3,463	4,227	-	1,072	1,215	2	9	23	512
MOUNTAIN	416	460	2	363	428	25	10	11	195
Mont.	2	6	-	14	34	3	1	8	87
Idaho	18	6	-	24	24	6	-	1	8
Wyo.	4	10	-	-	11	1	-	2	12
Colo.	108	106	-	42	58	5	2	-	31
N. Mex.	60	128	-	70	83	2	3	-	9
Ariz.	145	114	U	168	161	3	3	-	34
Utah	12	17	2	29	31	3	-	-	2
Nev.	67	73	-	16	26	2	1	-	12
PACIFIC	2,740	3,666	-	2,517	2,966	8	73	3	378
Wash.	83	131	-	124	159	2	2	-	1
Oreg.	78	94	-	110	123	2	1	1	1
Calif.	2,523	3,383	U	2,096	2,486	4	65	1	369
Alaska	3	10	-	43	42	-	1	1	7
Hawaii	53	48	-	144	156	-	4	-	-
Guam	-	-	U	5	5	-	-	-	-
P.R.	537	673	U	254	333	-	3	-	40
V.I.	8	16	-	2	2	-	3	-	-
Pac. Trust Terr.	-	-	U	-	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending
September 1, 1984 (35th Week Ending)

Reporting Area	All Causes, By Age (Years)						P&I** Total	Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1			All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	600	407	123	38	16	16	34	S. ATLANTIC	1,171	695	301	101	32	42	47
Boston, Mass.	174	101	40	16	7	10	11	Atlanta, Ga.	126	74	34	14	3	1	3
Bridgeport, Conn.	32	21	10	1	-	-	3	Baltimore, Md.	133	89	30	8	3	1	1
Cambridge, Mass.	19	13	2	3	1	-	-	Charlotte, N.C.	65	38	15	7	5	-	2
Fall River, Mass.	34	30	3	1	-	-	1	Jacksonville, Fla.	108	63	30	10	4	1	9
Hartford, Conn.	53	34	11	5	1	2	3	Miami, Fla.	139	78	48	10	-	3	1
Lowell, Mass.	31	25	4	-	2	-	1	Norfolk, Va.	59	33	14	3	1	8	2
Lynn, Mass.	21	18	2	-	1	-	-	Richmond, Va.	68	46	19	1	-	2	6
New Bedford, Mass.	20	15	5	-	-	-	-	Savannah, Ga.	37	22	7	6	1	1	2
New Haven, Conn.	38	26	7	5	-	-	3	St. Petersburg, Fla.	92	77	9	4	-	2	9
Providence, R.I.	55	35	15	1	2	2	1	Tampa, Fla.	60	37	15	5	-	3	4
Somerville, Mass.	5	3	2	-	-	-	-	Washington, D.C.	248	117	70	30	13	18	5
Springfield, Mass.	35	25	7	1	2	-	2	Wilmington, Del.	36	21	10	3	2	-	3
Waterbury, Conn.	31	24	5	2	-	-	6	E.S. CENTRAL	667	397	164	59	26	21	34
Worcester, Mass.	52	37	10	3	-	2	3	Birmingham, Ala.	121	60	41	9	6	5	1
MID ATLANTIC	2,458	1,574	537	219	64	64	86	Chattanooga, Tenn.	62	36	18	5	3	-	3
Albany, N.Y.	66	45	16	3	1	1	1	Knoxville, Tenn.	63	41	13	4	2	3	7
Allentown, Pa.	15	14	1	-	-	-	-	Louisville, Ky.	86	53	20	4	4	5	5
Buffalo, N.Y.	131	92	29	6	3	1	5	Memphis, Tenn.	153	95	35	14	6	3	5
Camden, N.J.	25	16	6	1	1	1	1	Mobile, Ala.	45	22	11	5	4	3	2
Elizabeth, N.J.	22	19	2	-	-	1	4	Montgomery, Ala.	39	28	7	3	-	1	6
Erie, Pa.†	38	26	9	3	-	-	-	Nashville, Tenn.	98	62	19	15	1	1	5
Jersey City, N.J.	43	25	10	5	-	3	-	W.S. CENTRAL	1,236	709	327	95	57	48	31
N.Y. City, N.Y.	1,348	854	291	136	39	28	47	Austin, Tex.	54	31	11	7	1	4	6
Newark, N.J.	69	24	24	14	2	5	4	Baton Rouge, La.	52	32	12	4	1	3	-
Paterson, N.J.	24	17	4	2	1	-	1	Corpus Christi, Tex.	36	28	6	2	-	-	-
Philadelphia, Pa.†	259	152	57	27	9	14	12	Dallas, Tex.	186	105	45	21	8	7	1
Pittsburgh, Pa.†	57	33	18	4	1	1	2	El Paso, Tex.	74	46	14	6	4	4	4
Reading, Pa.	26	21	3	2	-	-	1	Fort Worth, Tex.	98	50	34	4	5	5	-
Rochester, N.Y.	116	83	20	6	3	4	5	Houston, Tex.	296	157	83	25	22	9	6
Schenectady, N.Y.	26	18	7	-	-	1	1	Little Rock, Ark.	57	38	13	2	-	4	4
Scranton, Pa.†	26	20	5	1	-	-	-	New Orleans, La.	119	71	37	5	3	3	1
Syracuse, N.Y.	92	63	21	4	2	2	1	San Antonio, Tex.	139	74	36	15	9	5	6
Trenton, N.J.	38	26	11	1	-	-	-	Shreveport, La.	41	26	13	-	-	2	1
Utica, N.Y.	16	10	2	1	2	1	-	Tulsa, Okla.	84	51	23	4	4	2	2
Yonkers, N.Y.	21	16	1	3	-	1	1	MOUNTAIN	588	360	126	47	25	30	24
E.N. CENTRAL	2,083	1,421	368	144	65	75	64	Albuquerque, N.Mex.	79	42	22	6	3	6	3
Akron, Ohio	81	55	15	4	3	4	-	Colorado Springs, Colo.	23	15	4	2	1	1	1
Canton, Ohio	32	21	6	3	2	-	2	Denver, Colo.	109	66	20	12	6	5	7
Chicago, Ill. §	451	407	3	7	14	10	9	Las Vegas, Nev.	65	37	20	6	-	2	1
Cincinnati, Ohio	96	59	25	5	2	5	9	Ogden, Utah	18	10	7	-	1	-	-
Cleveland, Ohio	162	79	33	38	5	7	4	Phoenix, Ariz.	140	94	26	8	5	7	4
Columbus, Ohio	124	80	26	10	5	3	5	Pueblo, Colo.	24	15	5	1	3	-	2
Dayton, Ohio	103	74	22	2	2	3	2	Salt Lake City, Utah	48	23	10	5	4	6	-
Detroit, Mich.	266	141	75	32	9	9	4	Tucson, Ariz.	82	58	12	7	2	3	6
Evansville, Ind.	41	29	8	1	1	2	1	PACIFIC	1,931	1,268	405	156	41	57	95
Fort Wayne, Ind.	61	42	12	-	3	4	3	Berkeley, Calif. §	17	17	-	-	-	-	-
Gary, Ind.	20	9	8	2	-	1	-	Fresno, Calif.	68	41	15	4	4	4	8
Grand Rapids, Mich.	66	46	10	4	1	5	2	Glendale, Calif.	37	29	3	3	-	1	1
Indianapolis, Ind.	162	117	28	12	1	4	5	Honolulu, Hawaii	64	38	17	7	-	2	6
Madison, Wis.	29	14	7	2	3	3	2	Long Beach, Calif.	99	75	16	5	2	1	14
Milwaukee, Wis.	115	79	25	3	-	8	3	Los Angeles, Calif.	581	380	119	56	15	9	21
Peoria, Ill.	45	29	9	5	1	1	3	Oakland, Calif.	55	33	10	5	3	4	2
Rockford, Ill.	48	33	8	3	2	2	3	Sacadena, Calif.	27	18	5	2	-	2	1
South Bend, Ind.	22	14	6	2	-	-	4	Portland, Ore.	135	96	23	11	3	2	7
Toledo, Ohio	98	55	26	6	9	2	3	Sacramento, Calif.	132	92	29	7	1	3	4
Youngstown, Ohio	61	38	16	3	2	2	-	San Diego, Calif.	132	85	25	14	4	4	8
W.N. CENTRAL	720	481	150	42	22	25	19	San Francisco, Calif.	150	96	31	15	1	7	3
Des Moines, Iowa	47	24	12	4	3	4	4	San Jose, Calif.	177	95	59	12	4	7	11
Duluth, Minn.	38	30	6	2	-	-	-	Seattle, Wash.	121	74	30	7	2	8	4
Kansas City, Kans.	37	21	8	5	2	1	1	Spokane, Wash.	62	41	11	5	2	3	2
Kansas City, Mo.	112	79	18	9	4	2	1	Tacoma, Wash.	74	58	12	3	-	1	3
Lincoln, Nebr.	22	14	6	1	1	-	-	TOTAL	11,454††	7,312	2,501	901	348	378	434
Minneapolis, Minn.	93	65	14	5	2	7	2								
Omaha, Nebr.	100	61	30	4	1	4	8								
St. Louis, Mo.	141	97	28	8	2	6	2								
St. Paul, Minn.	55	43	11	-	1	-	1								
Wichita, Kans.	75	47	17	4	6	1	-								

* 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.

Measles — Continued

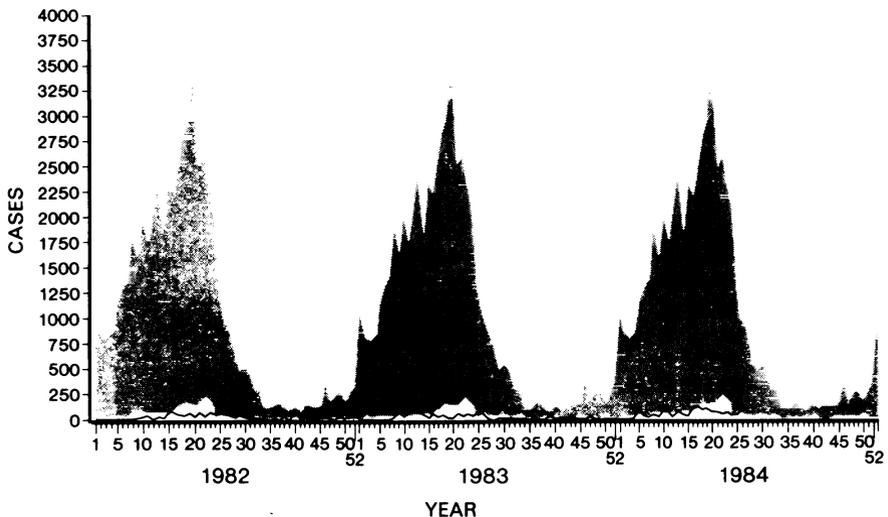
were 12-14 months of age; 18 (5.1%) were 15 months; and 173 (49.3%) were 16 months to 4 years of age. Persons 12-14 months-of age accounted for 3.9% of the 1,765 cases.

Of the 1,765 persons with measles, 911 (51.6%) had been vaccinated; 776 (44.0%) had been vaccinated on or after the first birthday; and 135 (7.6%) had been vaccinated before the first birthday (Table 3). A total of 854 (48.4%) persons were either unvaccinated or of unknown vaccination status. Prior physician-diagnosed measles in the absence of vaccination was reported for 21 (1.2%) persons.

Of the 1,765 cases, 610 (34.6%) were classified as preventable[†] (1) (Table 4). The highest proportion of preventable cases occurred among persons who were not of school age. More than 70% of the cases among children 16 months to 4 years and adults 20-24 years were preventable. Although more than half of the preventable cases occurred among persons 5-19 years of age, only 29.5% of cases occurring in that age group were considered preventable. The proportion of preventable cases in this age group increased progressively with increasing age.

[†]A case is considered preventable if measles occurs in a U.S. citizen: (1) at least 16 months of age, (2) born after 1956, (3) lacking adequate evidence of immunity to measles (documented receipt of live measles vaccine on or after the first birthday and at least 2 weeks before onset of illness, or a physician-diagnosed measles or laboratory evidence of immunity), (4) without a medical contraindication to receiving vaccine, and (5) with no religious or philosophic exemption under state law.

FIGURE 1. Reported measles cases* — United States, 1982-1984



*Shaded area represents maximum and minimum weekly values during 5-year period, 1977-1981.

Source: *MMWR* weekly reports.

TABLE 1. Geographic distribution and incidence rates* of measles cases — United States, first 26 weeks, 1983 and 1984

	1983	1984
No. cases	1,095	1,759
Incidence rate [†]	0.5	0.8
States without measles	22	24
Counties without measles	3,044 (97.0%)	3,059 (97.5%)

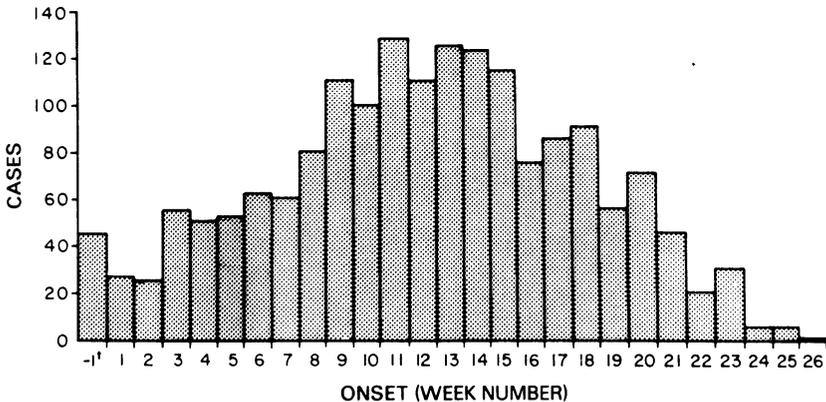
*Provisional data.

[†]Per 100,000 population.

Measles — Continued

Of the 1,155 persons who had nonpreventable measles, 178 (15.4%) were too young for routine vaccination (15 months of age or under). Fifty-seven (4.9%) were born before 1957; vaccination is not ordinarily recommended for this group. Of the 920 persons 16 months to 27 years of age who acquired measles, 775 (84.2%) had been vaccinated on or after the first birthday; 18 (2.0%) had prior physician-diagnosed measles; 32 (3.5%) had international importations and were not U.S. citizens; and 41 (4.5%) had exemptions under state law. In addition, 54 (5.9%) persons—recruits at Great Lakes Naval Training Station—were considered immune because they had positive results to an indirect immunoperoxidase assay for measles antibody before their illnesses (Table 5).

FIGURE 2. Reported measles cases, by week of rash onset* — United States, first 26 weeks, 1984



*No dates of rash onset reported for seven patients.

†Rash onset in 1983.

TABLE 2. Age distribution and estimated incidence rates* of measles cases† — United States, 1983 and first 26 weeks, 1984

Age group	1983 (52 weeks) [§]			1984 (26 weeks) [¶]		
	No.	%	Rate	No.	%	Rate
0-4 yrs.	451	31.5	2.6	351	19.9	2.0
5-9 yrs.	160	11.2	1.0	201	11.4	1.3
10-14 yrs.	195	13.6	1.1	515	29.2	2.9
15-19 yrs.	382	26.7	2.1	470	26.6	2.4
20-24 yrs.	163	11.4	0.8	137	7.8	0.6
≥ 25 yrs.	80	5.6	0.1	91	5.1	0.1
Total age known	1,431	95.6	—	1,765	100.0	—
Total age unknown	66	4.4	—	—	—	—
Total	1,497	100.0	0.6	1,765	100.0	0.8

*Cases per 100,000 population extrapolating cases with known age to total reported cases.

†Provisional data.

§Total cases reported to the *MMWR* in 1983.

¶Total cases reported to CDC's Division of Immunization during the first 26 weeks of 1984.

Measles — Continued

Reported by N El-Tantawy, MD, Emory University School of Medicine, Atlanta, Georgia; Div of Immunization, Center for Prevention Svcs, CDC.

Editorial Note: Although the number of reported measles cases has increased in 1984, compared with the same period in 1983, it is still far below the number in the prevaccine era (1950-1962), when an average of over 525,000 cases was reported annually. Despite the increased occurrence of measles during the first 26 weeks of 1984 over all of 1983, the geographic distribution of measles is more restricted and focal.

A total of 43.9% of the persons who had measles in 1984 had been adequately vaccinated. This is within expected limits, given the high vaccine coverage in the United States (2). Since 1980, over 95% of kindergarten and first-grade students have had evidence of measles immunity. Higher coverage will be associated with higher proportions of persons who are vaccinated. Recent epidemiologic evaluations have shown a measles vaccine efficacy of 90% or higher. The increased occurrence of measles in 1984 does not appear to be due to poor vaccine efficacy.

Greater emphasis needs to be placed on ensuring that persons 10-14 years old and 15-19 years old have evidence of measles immunity (3). Enactment and vigorous enforcement of regulations requiring all students in grades kindergarten through 12 to have evidence of immunity is an important means of ensuring high levels of measles immunity (2).

Further efforts need to be made in preschool- and post-school-aged groups. Over 70% of the cases among young adults (20-24 years old) and preschoolers (16 months to 4 years old)

TABLE 3. Age at most recent measles vaccination — United States, first 26 weeks, 1984*

Age at vaccination	Measles cases	
	No.	%
< 12 months	135	7.6
12-14 months	255	14.4
15 months	34	1.9
16 months-4 years	303	17.2
5-9 years	139	7.9
10-14 years	32	1.8
15-19 years	8	0.5
≥ 20 years	2	0.1
> 12 months†	3	0.2
Unvaccinated or unknown	854	48.4
Total	1,765	100.0

*Provisional data. †Unknown age at vaccination, definitely older than 12 months.

TABLE 4. Age distribution and preventability of measles cases — United States, first 26 weeks, 1984*

Age group	No. cases	No. preventable (%)	No. nonpreventable (%)
≤ 15 mos.	178	0 (0%)	178 (100.0%)
16 mos.-4 yrs.	173	127 (73.4%)	46 (26.6%)
5-9 yrs.	201	43 (21.4%)	158 (78.6%)
10-14 yrs.	515	137 (26.6%)	378 (73.4%)
15-19 yrs.	470	170 (36.2%)	300 (63.8%)
20-24 yrs.	137	106 (77.4%)	31 (22.6%)
25-29 yrs.	51	27 (52.9%)	24 (47.0%)
≥ 30 yrs.	40	0 (0%)	40 (100.0%)
Total	1,765	610 (34.6%)	1,155 (65.4%)

*Provisional data.

Measles — Continued

were preventable. Every opportunity should be taken to vaccinate susceptible children against measles. Many colleges are considering regulations requiring evidence of measles immunity for matriculation (4). All institutions where young adults congregate should consider requiring evidence of measles immunity.

References

1. CDC. Classification of measles cases and categorization of measles elimination programs. MMWR 1982;31:707-11.
2. CDC. Measles Surveillance Report No. 11, 1977-1981. September 1982.
3. ACIP. Measles prevention. MMWR 1982;31:217-24, 229-31.
4. American College Health Association. Statement of immunization policy. November 25, 1983;1-3.

TABLE 5. Reasons measles cases were classified as nonpreventable — United States, first 26 weeks, 1984*

Causes of nonpreventability		No. cases (%)	Total cases (%) [†]
1.	Persons < 16 months of age (too young for routine vaccination)	178 (15.4%)	(10.1%)
2.	Born before 1957 (vaccination is not routinely recommended)	57 (4.9%)	(3.2%)
3.	Persons 16 months-27 years	920 (79.7%)	(52.1%)
a.	Adequately vaccinated (on or after the first birthday)	775 (84.2%) [§]	
b.	Prior physician diagnosis	18 (2.0%)	
c.	International importations (non-U.S. citizens)	32 (3.5%)	
d.	Exemptions	41 (4.5%)	
	1. Medical	4 (10%)	
	2. Religious	16 (39%)	
	3. Philosophic	16 (39%)	
	4. Nonspecified exemptions	5 (12%)	
e.	Laboratory evidence of immunity	54 (5.9%)	
Total		1,155 (100.0%)	(65.4%)

*Provisional data. [†]1,765 cases.

[§]Does not include one adequately vaccinated person who was born before 1957.

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