

# MMWR

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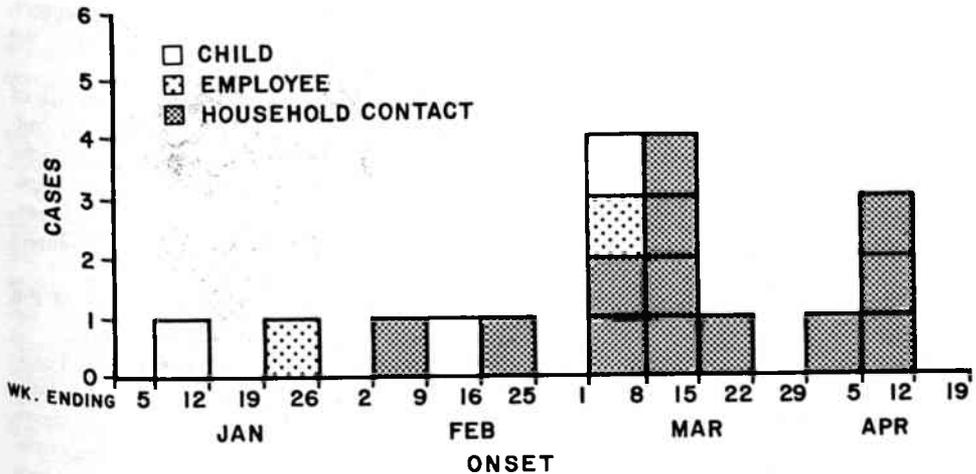
MORBIDITY AND MORTALITY WEEKLY REPORT

## *Epidemiologic Notes and Reports*

### Hepatitis A Outbreak in a Day-Care Center — Texas

In the period January 11-May 22, 1980, the El Paso County (Texas) Health Unit investigated an outbreak of 1 suspected and 17 known cases of hepatitis A associated with a local child-care center. The index case occurred in a 5-year-old child, followed 2 weeks later by infection in the director of the center. Over the next 14 weeks, 2 other children, 1 other employee of the center, and 13 household contacts (2 siblings, 11 parents) developed hepatitis (Figure 1). The 13 ill household contacts came from 9 families, which had 11 children enrolled in the center. None of these 11 children was observed to have symptoms of hepatitis.

FIGURE 1. Hepatitis A in a day-care center, El Paso, Texas, January 1-April 19, 1980



The day-care center had 28 employees and served 163 children, who ranged in age from infancy to 5 years. Thirty-nine (24%) were age 2 years or less, 42 (26%) age 3 years, and the remainder older than 3 years. Investigation revealed that there was a significant risk of acquiring hepatitis for persons who had contact with young children ( $p < .01$ ). Nine of the 13 (69%) infected household contacts were associated with children 2 years old or less. Five other patients (1 employee, 4 parents) had close association with 3-year-olds, and 1 patient was associated only with children older than 3.

On February 29, when the outbreak was recognized, several measures were recommended to control transmission of disease: 1) that the center be kept open, 2) that there

*Hepatitis — Continued*

be no new admissions until the outbreak had terminated; and 3) that center employees and parents of children consult their physicians about use of prophylactic human normal immunoglobulin (HNIG). No new cases were recognized in center attendees, staff, or household contacts after mid-April, 6 weeks after the control measures were recommended. Some parents transferred their children to other day-care centers when the outbreak was recognized; surveillance of these children revealed no evidence of spread to other centers.

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**Editorial Note:** This outbreak is an example of the increasingly recognized problem of the transmission of hepatitis A in day-care centers. Such outbreaks have been reported in at least 17 states over the past 3 years, and large series of outbreaks have been reported from Phoenix, Arizona, and New Orleans, Louisiana (1,2). Nationwide, between 9%-12% of hepatitis type A or hepatitis, type unspecified, is estimated to be day-care related, and in some areas the figure approaches 40% (3).

This outbreak demonstrates the 3 characteristics that were common to the day-care-related hepatitis outbreaks reported from New Orleans and Phoenix: 1) hepatitis in children of day-care age is usually asymptomatic; 2) household contacts are often infected as a consequence of spread within a center, and generally constitute the majority of recognized cases; and 3) diapered children age 2 years or less are most likely to transmit infection to household contacts; children age 4 and older rarely spread infection beyond the center (1,2). Detection of outbreaks is therefore dependent upon center directors, parents, and health authorities recognizing that cases in families of children attending the center may indicate asymptomatic spread among children at the center.

A follow-up study in Phoenix has pinpointed several factors which increase the risk of a hepatitis outbreak at a day-care center: 1) a center population of more than 20 children, 2) long hours ( $\geq 9$ /day) of operation, and 3) the presence of diapered children under the age of 2 years. The last factor is the primary one in facilitating transmission of hepatitis. In fact, in this study, after an index case occurred in a child or center employee, 70% of centers enrolling children less than 2 had outbreaks; by contrast, 10% of centers enrolling children only age 2 or older had outbreaks.

Centers serving children under age 2 are concentrated in the southern half of the country in a belt from North Carolina and Florida west to New Mexico and Arizona.

Prevention and control of hepatitis in day-care centers should focus on diapered children age 2 years or under. Maintenance of appropriate hygienic standards, particularly washing the hands of staff and of young children who cannot adequately wash themselves, should be emphasized. Surfaces on which diapers are changed should be impermeable and should be cleaned and disinfected with the appropriate solution.\* Accessory items (e.g., cans of baby powder, jars of vaseline) should also be disinfected each day, as they can be inadvertently soiled during a diaper change.

As illustrated here, day-care related outbreaks of hepatitis are controlled by either suspending new admissions or requiring them to receive prophylactic HNIG before entering, by preventing dissemination of disease to other centers, and by the appropri-

\*A 1:32 dilution (1/2 cup per gallon) of household bleach in tap water, prepared daily and dispensed in spray bottles, is the preferred solution.

*Hepatitis — Continued*

ate use of HNIG. Centers should not be closed, and parents should be discouraged from transferring their children to other centers.

The efficacy of administering HNIG to all children and employees at day-care centers in outbreaks is being evaluated. However, it would appear that even the presence of only 1 case in a child or employee of a center that has children under age 2 would appropriately call for the administration of HNIG to all center children and employees. In the period extending to 6 weeks after the last case, any children newly admitted to the center should also receive HNIG. In situations in which several cases are recognized simultaneously in multiple families at a single center, administration of HNIG to household contacts of children age 3 or less might also be considered. In those centers having only children age 2 and older, spread is less likely after an index infection, and HNIG should be considered only for center staff and for age-group contacts of the infected child.

*References*

1. Storch G, McFarland LM, Kelso K, Heilman CJ, Caraway CT. Viral hepatitis associated with day-care centers. *JAMA* 1979; 242:1514-8.
2. Hadler SC, Webster HM, Erben JJ, Swanson JE, Maynard JE. Hepatitis A in day-care centers: a community-wide assessment. *N Engl J Med* 1980;302:1222-7.
3. CDC. Hepatitis surveillance report no. 45. Issued May 1980.

### Fatal Measles in an Adult — California

On July 4, 1980, a 33-year-old woman from Santa Ana died because of apparent viral encephalitis. A subsequent review of her case indicated that the cause of death was almost certainly measles encephalitis.

According to her private physician, the woman had onset of fever, coryza, and malaise on May 28. On June 2, she had onset of a facial rash, which then became generalized. On June 4, her physician noted a bright morbilliform rash typical of measles.

The next day, she called to complain of numbness and pain in her lower extremities. Her physician advised immediate hospital admission. By the time the ambulance arrived, the patient could no longer walk; by the time of arrival at the hospital, she was unconscious, and shortly thereafter she suffered a cardiorespiratory arrest. She was resuscitated but never regained consciousness and died 1 month later. Her rash lasted a total of 8 days. Neurologic examination at admission revealed coma with no localized findings. Viral and bacterial cultures of cerebrospinal fluid were negative. An electroencephalogram showed diminished activity, and computerized tomography scan suggested generalized swelling of the brain.

A serum specimen taken on June 6, 9 days after onset of illness, showed a complement-fixation (CF) titer to measles of 8, a hemagglutination-inhibition titer to rubella of 64, and CF titers  $<8$  for herpes simplex, varicella zoster, and cytomegalovirus. After the patient's death, a portion of the June 6 serum specimen (the only serum available) was referred for measles IgM antibody testing by the indirect-immunofluorescence technique at the state's Viral and Rickettsial Disease Laboratory. Her IgM titer was  $\geq 512$ , indicating recent measles infection. (Measles IgM antibody generally rises before CF.)

The patient had a negative history for prior measles disease or immunization. None of her household contacts had had recent measles-like illness, but she worked as a retail clerk in a store when measles was present in Orange County.

## Measles — Continued

Reported by R Morton, MD, Santa Ana, T Prendergast, MD, B Peck, PHN, R Greenwood, PhD, Orange County Health Dept, LG Dales, MD, J Chin, MD, State Epidemiologist, California Dept of Health Services, in the California Morbidity Weekly Report, November 7, 1980; Surveillance and Assessment Br, Immunization Div, Bur of State Services, CDC.

**Editorial Note:** This case illustrates an unusual but severe complication of measles. Although the overall ratio of measles encephalitis to measles cases is approximately 1 per 1,000 reported cases, the risk of encephalitis increases in adolescents and adults (1). The death-to-case ratio for measles encephalitis is substantial: between 1963 and 1977, 13.9% of all persons reported with measles encephalitis died (2). Most cases occur between 4 and 7 days following the onset of rash, with a range of 1 to 15 days (3,4). The most frequently reported signs and symptoms are fever, convulsions, lethargy, irritability, and coma. Other manifestations include headache, disorientation, tremors, nystagmus, and nuchal rigidity. The cerebrospinal fluid is usually abnormal. Lymphocytic pleocytosis occurs in 75%-85% of cases, and protein elevations in 50%-100% of patients. The glucose level is usually normal.

Measles should be considered in the differential diagnosis of any suspected viral encephalitis with rash.

(Continued on page 573)

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

(Cumulative totals include revised and delayed reports through previous weeks.)

DISEASE	47th WEEK ENDING		MEDIAN 1975-1979	CUMULATIVE, FIRST 47 WEEKS		
	November 22, 1980	November 24, 1979		November 22, 1980	November 24, 1979	MEDIAN 1975-1979
Aseptic meningitis	147	151	74	6,717	7,676	4,294
Brucellosis	4	2	8	164	156	206
Chickenpox	2,577	1,768	2,322	166,833	180,642	163,575
Diphtheria	—	—	1	4	59	80
Encephalitis: Primary (arthropod-borne & unspec.)	27	19	24	1,027	996	1,095
Post-infectious	7	8	7	200	222	222
Hepatitis, Viral: Type B	389	290	267	16,329	13,277	13,457
Type A	485	479	566	25,450	26,775	27,659
Type unspecified	237	218	185	10,732	9,391	7,620
Malaria	29	12	6	1,737	697	490
Measles (rubeola)	47	124	195	13,198	12,892	25,592
Meningococcal infections: Total	56	33	33	2,384	2,328	1,595
Civilian	56	33	33	2,372	2,308	1,584
Military	—	—	—	12	20	20
Mumps	81	166	280	7,909	12,590	19,082
Pertussis	21	15	17	1,502	1,227	1,449
Rubella (German measles)	35	48	89	3,546	11,213	15,673
Tetanus	—	2	1	65	65	73
Tuberculosis	503	339	421	24,791	24,657	27,104
Tularemia	5	1	3	199	176	128
Typhoid fever	4	6	6	459	473	378
Typhus fever, tick-borne (Rky. Mt. spotted)	3	13	6	1,116	1,018	1,018
Venereal diseases:						
Gonorrhea: Civilian	22,003	15,073	17,003	913,044	903,183	903,751
Military	326	629	390	24,279	25,049	25,049
Syphilis, primary & secondary: Civilian	524	371	369	24,641	22,461	21,669
Military	11	7	9	281	287	287
Rabies in animals	101	65	31	5,760	4,589	2,797

TABLE II. Notifiable diseases of low frequency, United States

	CUM. 1980		CUM. 1980
Anthrax	1	Poliomyelitis: Total	8
Botulism Calif. 3	60	Paralytic	6
Cholera	8	Psittacosis Ore. 3	97
Congenital rubella syndrome	46	Rabies in man	—
Leprosy Tex. 1, Calif. 1	197	Trichinosis	105
Leptospirosis	68	Typhus fever, flea-borne (endemic, murine) Ohio 1, Tex. 1	71
Plague	18		

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 November 22, 1980, and November 24, 1979 (47th week)

REPORTING AREA	ASEPTIC MENINGITIS	BRU- CEL- LOSIS	CHICKEN- POX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS (VIRAL), BY TYPE			MALARIA	
						Primary		Post-in- fectious	B	A	Unspecified		
						1980	1979						
UNITED STATES	147	4	2,577	-	4	27	19	7	389	485	237	29	1,737
NEW ENGLAND	8	-	414	-	-	3	-	-	12	11	9	1	107
Maine	1	-	172	-	-	-	-	-	-	1	1	-	16
N.H.	-	-	25	-	-	-	-	-	-	2	-	-	7
Vt.	-	-	80	-	-	-	-	-	-	1	-	-	1
Mass.	1	-	38	-	-	1	-	-	6	2	8	1	56
R.I.	-	-	28	-	-	-	-	-	-	3	-	-	9
Conn.	6	-	71	-	-	2	-	-	6	2	-	-	18
MID. ATLANTIC	46	1	62	-	1	7	2	-	35	45	22	4	230
Upstate N.Y.	6	1	38	-	-	2	-	-	8	11	3	1	40
N.Y. City	4	-	24	-	1	-	-	-	6	13	5	-	63
N.J.	2	-	NN	-	-	-	-	-	21	21	14	1	57
Pa.	34	-	-	-	-	5	2	-	NA	NA	NA	2	70
E.N. CENTRAL	3	-	831	-	1	2	6	3	51	42	23	1	106
Ohio	-	-	54	-	-	-	3	2	10	7	12	-	18
Ind.	-	-	107	-	-	-	1	-	2	5	3	-	12
Ill.	1	-	70	-	-	-	-	-	24	18	3	-	41
Mich.	2	-	313	-	1	-	2	-	11	8	5	-	23
Wis.	-	-	287	-	-	2	-	1	4	4	-	1	12
W.N. CENTRAL	6	-	695	-	1	6	3	-	16	14	10	1	70
Minn.	-	-	-	-	-	5	-	-	1	3	-	1	20
Iowa	-	-	425	-	-	1	2	-	-	3	-	-	7
Mo.	4	-	5	-	1	-	-	-	12	5	5	-	13
N. Dak.	-	-	14	-	-	-	-	-	-	-	-	-	-
S. Dak.	-	-	82	-	-	-	-	-	-	-	1	-	4
Neb.	-	-	38	-	-	-	-	-	1	1	4	-	7
Kans.	2	-	131	-	-	-	1	-	2	2	-	-	13
S. ATLANTIC	34	-	210	-	-	4	-	4	95	87	25	5	185
Del.	-	-	3	-	-	-	-	-	-	-	-	-	-
Md.	4	-	25	-	-	3	-	-	16	3	6	-	32
D.C.	1	-	1	-	-	-	-	-	2	4	-	-	4
Va.	4	-	9	-	-	-	-	-	9	14	4	1	62
W. Va.	1	-	70	-	-	-	-	-	1	3	-	-	4
N.C.	11	-	NN	-	-	-	-	-	7	3	2	-	17
S.C.	1	-	12	-	-	-	-	-	13	2	1	-	10
Ga.	1	-	2	-	-	-	-	-	20	11	-	2	19
Fla.	11	-	88	-	1	-	4	-	27	47	12	2	37
E.S. CENTRAL	12	-	46	-	-	-	3	-	39	34	12	1	13
Ky.	1	-	1	-	-	-	1	-	9	8	4	-	3
Tenn.	1	-	NN	-	-	-	1	-	11	11	1	-	-
Ala.	6	-	43	-	-	-	-	-	17	6	7	1	8
Miss.	4	-	2	-	-	-	1	-	2	9	-	-	2
W.S. CENTRAL	10	2	41	-	-	2	-	-	28	63	42	3	147
Ark.	1	-	2	-	-	-	-	-	3	4	3	1	9
La.	-	-	NN	-	-	-	-	-	9	18	8	-	42
Okla.	1	1	-	-	-	-	-	-	1	3	-	-	12
Tex.	8	1	39	-	-	2	-	-	15	38	31	2	84
MOUNTAIN	2	1	101	-	-	1	-	-	20	46	31	-	89
Mont.	-	-	34	-	-	-	-	-	-	-	-	-	1
Idaho	-	1	-	-	-	-	-	-	-	2	-	-	1
Wyo.	-	-	-	-	-	-	-	-	-	2	1	-	2
Colo.	-	-	66	-	-	-	-	-	6	21	5	-	36
N. Mex.	-	-	-	-	-	-	-	-	1	6	1	-	6
Ariz.	-	-	-	-	-	-	-	-	5	14	16	-	18
Utah	-	-	NN	-	-	-	-	-	-	-	1	-	15
Nev.	2	-	1	-	-	1	-	-	8	1	7	-	10
PACIFIC	26	-	177	-	1	2	5	-	93	143	63	13	790
Wash.	2	-	145	-	1	-	1	-	8	16	3	3	52
Oreg.	2	-	1	-	-	-	-	-	10	13	3	-	45
Calif.	16	-	-	-	-	2	2	-	73	113	57	10	670
Alaska	-	-	24	-	-	-	-	-	2	1	-	-	6
Hawaii	6	-	3	-	-	-	1	-	-	-	-	-	17
Guam	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	3
P.R.	-	-	5	-	-	-	-	-	-	-	2	-	3
V.I.	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	-
Pac. Trust Terr.	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	2

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 November 22, 1980, and November 24, 1979 (47th week)

REPORTING AREA	MEASLES (RUBEOLA)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1980	CUM. 1980	CUM. 1979	1980	CUM. 1980	CUM. 1979	1980	CUM. 1980	1980	1980	CUM. 1980	CUM. 1980
UNITED STATES	47	13,198	12,892	56	2,384	2,328	81	7,909	21	35	3,546	65
NEW ENGLAND	3	675	291	3	135	135	4	594	-	2	211	3
Maine	-	33	18	-	6	8	-	300	-	1	69	1
N.H.	3	331	33	-	8	13	-	22	-	-	37	-
Vt.	-	226	119	-	14	8	-	12	-	-	3	-
Mass.	-	58	15	-	48	51	3	129	-	1	72	-
R.I.	-	2	102	-	10	9	-	31	-	-	9	1
Conn.	-	25	4	3	49	46	1	100	-	-	21	1
MID. ATLANTIC	17	3,829	1,569	16	421	368	11	890	3	8	571	8
Upstate N.Y.	10	714	663	3	125	126	3	145	-	2	218	3
N.Y. City	-	1,198	801	2	103	83	3	97	-	1	101	2
N.J.	7	836	58	3	89	96	1	122	-	-	101	-
Pa.	-	1,081	47	8	104	63	4	526	3	5	151	3
E.N. CENTRAL	1	2,448	3,355	10	278	269	41	2,975	4	6	845	5
Ohio	-	380	294	6	93	105	5	1,183	1	-	8	1
Ind.	-	93	225	-	42	47	4	141	-	1	359	-
Ill.	-	347	1,468	2	57	25	5	392	2	5	172	1
Mich.	-	250	846	2	70	73	21	904	-	-	129	1
Wis.	1	1,378	522	-	16	19	6	355	1	-	177	2
W.N. CENTRAL	-	1,321	1,822	1	104	75	5	307	3	2	202	4
Minn.	-	1,105	1,218	-	34	17	1	20	3	-	28	1
Iowa	-	-	16	-	13	13	3	54	-	-	9	1
Mo.	-	65	421	-	38	34	-	101	-	-	42	1
N. Dak.	-	1	21	-	2	1	-	4	-	-	2	-
S. Dak.	-	-	2	-	6	4	-	4	-	-	2	-
Nebr.	-	83	69	-	-	-	-	9	-	-	1	-
Kans.	-	67	75	1	11	6	1	115	-	2	115	1
S. ATLANTIC	4	1,968	2,082	11	557	565	7	1,071	6	5	353	11
Del.	-	3	1	-	2	5	-	40	-	-	1	-
Md.	-	83	16	-	51	57	3	343	-	-	71	1
D.C.	-	5	-	-	2	-	-	4	-	-	1	-
Va.	-	339	279	2	58	80	-	74	1	-	56	3
W. Va.	2	17	61	-	20	10	-	122	-	-	27	1
N.C.	-	130	114	2	97	86	3	97	-	1	47	1
S.C.	-	159	182	2	64	62	-	210	1	1	55	3
Ga.	-	826	561	2	105	84	-	11	-	-	-	-
Fla.	2	406	868	3	158	181	1	170	4	3	95	2
E.S. CENTRAL	1	335	236	1	198	165	1	880	-	-	87	6
Ky.	1	57	39	-	61	34	-	756	-	-	43	2
Tenn.	-	172	71	-	54	47	-	31	-	-	39	2
Ala.	-	22	102	-	52	39	1	30	-	-	3	2
Miss.	-	84	24	1	31	45	-	63	-	-	2	-
W.S. CENTRAL	6	984	934	3	255	336	-	288	1	2	146	18
Ark.	-	16	7	-	19	26	-	22	-	-	4	2
La.	-	12	256	2	93	120	-	68	-	-	13	5
Okla.	-	776	22	1	23	37	-	-	-	-	6	1
Tex.	6	180	649	-	120	153	-	198	1	2	123	10
MOUNTAIN	5	503	326	2	101	92	4	220	-	2	160	-
Mont.	-	2	56	-	3	11	-	60	-	-	45	-
Idaho	-	-	18	-	6	10	-	16	-	-	2	-
Wyo.	-	-	36	1	5	1	-	-	-	-	1	-
Colo.	-	24	70	1	25	7	1	62	-	-	12	-
N. Mex.	-	14	38	-	10	5	-	-	-	-	5	-
Ariz.	5	406	77	-	18	36	3	46	-	2	41	-
Utah	-	47	19	-	5	9	-	27	-	-	28	-
Nev.	-	10	12	-	29	13	-	9	-	-	6	-
PACIFIC	10	1,135	2,277	9	335	323	8	684	4	8	971	10
Wash.	-	177	1,139	2	61	57	-	142	4	1	89	-
Oreg.	1	1	66	1	54	26	-	88	-	-	65	-
Calif.	9	945	987	5	210	224	8	421	-	7	800	10
Alaska	-	6	17	1	10	6	-	13	-	-	12	-
Hawaii	-	6	68	-	-	10	-	20	-	-	5	-
Guam	NA	6	12	-	1	1	NA	10	NA	NA	2	-
P.R.	2	161	374	-	11	6	-	150	-	2	26	12
V.I.	NA	6	5	-	1	3	NA	2	NA	NA	-	-
Pac. Trust Terr.	NA	10	10	-	-	1	NA	21	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 November 22, 1980, and November 24, 1979 (47th week)

REPORTING AREA	TUBERCULOSIS		TULA- REMIA	TYPHOID FEVER		TYPHUS FEVER (Tick-borne) (RMSF)		VENEREAL DISEASES (Civilian)						RABIES (in Animals)
								GONORRHEA		SYPHILIS (Pri. & Sec.)				
	1980	CUM. 1980	CUM. 1980	1980	CUM. 1980	1980	CUM. 1980	1980	CUM. 1980	CUM. 1979	1980	CUM. 1980	CUM. 1979	
UNITED STATES	503	24,791	199	4	459	3	1,116	22,003	913,044	903,183	524	24,641	22,461	5,760
NEW ENGLAND	10	683	6	-	12	-	14	527	23,160	22,233	8	475	437	56
Maine	1	50	-	-	1	-	-	24	1,324	1,561	-	6	10	24
N.H.	-	15	-	-	-	-	-	29	814	822	-	6	16	7
Vt.	-	24	-	-	-	-	-	20	517	592	-	6	2	-
Mass.	4	377	4	-	7	-	7	245	9,770	8,758	8	287	251	14
R.I.	2	66	1	-	3	-	2	31	1,476	1,787	-	31	19	1
Conn.	3	151	1	-	3	-	5	178	9,259	8,723	-	139	139	10
MID. ATLANTIC	102	4,004	3	1	85	-	48	3,264	103,524	98,865	86	3,382	3,410	69
Upper N.Y.	12	768	1	1	15	-	14	624	18,694	17,233	-	283	255	37
N.Y. City	37	1,437	1	-	38	-	3	1,150	41,187	38,950	63	2,198	2,314	-
N.J.	33	887	1	-	19	-	19	855	18,782	17,110	7	401	449	13
Pa.	20	912	-	-	13	-	12	635	24,861	25,572	16	500	392	19
E.N. CENTRAL	85	3,549	1	1	49	1	31	4,273	142,011	141,607	66	2,540	2,823	870
Ohio	15	652	-	1	14	1	18	1,526	37,289	38,938	10	344	564	53
Ind.	9	391	-	-	-	-	2	550	15,173	11,803	6	181	188	70
Ill.	27	1,226	-	-	18	-	6	1,289	44,647	44,910	42	1,560	1,589	478
Mich.	32	1,063	1	-	11	-	3	565	31,868	33,210	6	364	407	15
Wis.	2	217	-	-	6	-	2	343	13,034	12,746	2	91	75	254
W.N. CENTRAL	26	914	29	-	28	-	54	1,018	43,959	44,728	11	330	286	1,883
Minn.	-	183	1	-	3	-	-	253	7,260	7,355	2	107	78	223
Iowa	7	86	1	-	2	-	3	71	4,591	5,316	-	23	29	431
Mo.	9	417	24	-	19	-	34	421	19,554	19,328	3	154	131	360
N. Dak.	2	48	-	-	1	-	-	17	612	783	-	4	2	219
S. Dak.	-	42	-	-	1	-	2	33	1,258	1,459	-	5	2	413
Nebr.	-	36	1	-	1	-	5	62	3,370	3,165	2	12	7	91
Kans.	8	102	2	-	1	-	10	161	7,314	7,322	4	25	37	146
S. ATLANTIC	110	5,447	11	1	44	1	696	5,059	228,998	218,145	139	5,927	5,325	466
Dell.	1	68	-	-	1	-	2	95	3,263	3,576	-	19	27	1
Md.	10	664	2	-	3	-	74	722	24,488	27,019	9	407	331	32
D.C.	6	342	-	-	4	-	-	401	15,802	14,426	10	442	416	-
Va.	-	568	1	-	8	-	-	317	20,921	20,896	9	532	428	26
W. Va.	4	197	-	1	5	-	5	52	3,140	2,954	-	16	48	24
N.C.	15	969	3	-	5	1	315	908	34,998	31,815	9	437	401	20
S.C.	10	467	-	-	3	-	141	487	21,415	20,572	10	349	283	60
Ga.	21	743	5	-	-	-	57	1,141	44,859	40,962	43	1,689	1,473	235
Fla.	43	1,429	-	-	15	-	7	936	60,112	55,925	49	2,036	1,918	68
E.S. CENTRAL	70	2,307	10	-	12	-	113	2,086	74,659	76,997	31	2,015	1,503	324
Ky.	14	519	-	-	3	-	19	223	10,804	10,339	2	120	148	136
Tenn.	26	751	7	-	1	-	61	500	26,909	27,928	16	855	626	137
Ala.	11	603	1	-	3	-	17	1,069	22,544	22,703	7	443	273	51
Miss.	19	434	2	-	5	-	16	294	14,402	16,027	6	597	456	-
W.S. CENTRAL	36	2,786	90	1	73	-	138	2,855	115,158	115,959	95	4,958	4,094	1,301
La.	8	302	58	-	8	-	35	293	9,346	9,143	8	203	142	168
Dkta.	-	505	-	-	2	-	3	394	20,571	20,770	49	1,249	1,052	16
Tex.	-	303	21	-	6	-	72	293	11,508	11,466	3	101	80	230
	28	1,676	11	1	57	-	28	1,875	73,733	74,580	35	3,405	2,820	887
MOUNTAIN	16	695	34	-	26	1	17	658	34,808	36,330	13	601	447	234
Mont.	-	30	9	-	1	-	3	NA	1,166	1,805	NA	5	8	57
Idaho	-	25	1	-	1	1	2	32	1,533	1,605	1	27	26	2
Wyo.	-	22	4	-	-	-	2	11	1,010	1,029	-	12	8	17
Colo.	6	120	8	-	7	-	5	237	9,498	9,762	8	163	95	54
N. Mex.	1	127	2	-	3	-	4	82	4,277	4,501	-	106	81	44
Ariz.	9	299	1	-	7	-	-	100	9,255	10,002	-	190	125	56
Utah	-	44	6	-	7	-	1	50	1,770	1,869	-	15	4	3
Nev.	-	28	3	-	-	-	-	146	6,299	5,757	4	83	100	1
PACIFIC	48	4,406	15	-	130	-	5	2,263	146,767	148,319	75	4,413	4,136	557
Wash.	5	377	-	-	3	-	-	NA	12,168	13,214	NA	189	193	-
Oreg.	4	166	4	-	9	-	1	210	10,193	9,392	4	103	153	4
Calif.	38	3,713	10	-	116	-	4	1,917	117,827	118,286	71	3,975	3,679	506
Alaska	-	60	1	-	-	-	-	61	3,636	4,560	-	8	25	47
Hawaii	1	90	-	-	2	-	-	75	2,943	2,867	-	138	86	-
Guam	NA	54	-	NA	1	NA	-	NA	99	109	NA	5	-	-
P.R.	12	221	-	-	8	-	-	37	2,469	1,992	14	554	520	52
V.I.	NA	-	-	NA	-	NA	-	NA	108	142	NA	10	8	-
Pac. Trust Terr.	NA	35	-	NA	-	NA	-	NA	379	441	NA	-	1	-

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  
November 22, 1980 (47th week)

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			ALL AGES	>65	45-64	25-44	<1	
<b>NEW ENGLAND</b>	769	508	195	39	14	52	<b>S. ATLANTIC</b>	1,438	860	367	93	69	65
Boston, Mass.	207	119	59	17	7	16	Atlanta, Ga.	136	78	39	9	3	3
Bridgeport, Conn.	57	39	13	4	1	9	Baltimore, Md.††	269	155	74	19	10	5
Cambridge, Mass.	23	20	3	-	-	1	Charlotta, N.C.	76	41	21	7	4	3
Fall River, Mass.	35	23	11	-	-	1	Jacksonville, Fla.	99	61	25	6	3	5
Hartford, Conn.	79	51	21	4	-	1	Miami, Fla.	131	76	36	8	8	4
Lowell, Mass.	35	27	7	-	-	2	Norfolk, Va.	79	50	21	3	3	3
Lynn, Mass.	19	14	4	1	-	2	Richmond, Va.	62	30	21	9	-	4
New Bedford, Mass.	22	13	8	-	1	-	Savannah, Ga.	40	25	12	1	1	8
New Haven, Conn.	61	36	16	4	2	5	St. Petersburg, Fla.	64	51	7	1	4	9
Providence, R.I.	81	61	15	3	2	4	Tampa, Fla.	72	48	15	6	1	8
Somerville, Mass.	13	12	-	1	-	-	Washington, D.C.	355	210	81	20	32	10
Springfield, Mass.	41	25	13	2	1	4	Wilmington, Del.	55	35	15	4	-	3
Waterbury, Conn.	35	28	6	1	-	5							
Worcester, Mass.	61	40	19	2	-	2							
							<b>E.S. CENTRAL</b>	704	411	176	45	40	25
<b>MID. ATLANTIC</b>	2,672	1,778	602	159	70	126	Birmingham, Ala.	89	51	22	6	1	2
Albany, N.Y.	63	39	16	4	4	-	Chattanooga, Tenn.	57	36	13	2	2	2
Allentown, Pa.	23	18	5	-	-	-	Knoxville, Tenn.	56	39	12	-	3	5
Buffalo, N.Y.	129	82	29	7	6	4	Louisville, Ky.	112	67	33	5	5	8
Camden, N.J.	47	27	16	4	-	-	Memphis, Tenn.	200	112	41	16	23	1
Elizabeth, N.J.	35	24	9	1	-	2	Mobile, Ala.	39	19	12	6	-	5
Erie, Pa.†	36	32	3	-	-	3	Montgomery, Ala.	42	27	11	1	2	3
Jersey City, N.J.	43	24	13	2	1	2	Nashville, Tenn.	109	60	32	9	4	
Newark, N.J.	66	30	24	6	2	4							
N.Y. City, N.Y.	1,473	1,010	317	86	31	81	<b>W.S. CENTRAL</b>	1,373	794	335	116	66	45
Patterson, N.J.	25	14	6	-	4	-	Austin, Tex.	63	36	20	5	1	4
Philadelphia, Pa.†	262	157	67	22	9	10	Baton Rouge, La.	60	39	9	7	3	5
Pittsburgh, Pa.†	85	50	26	4	1	5	Corpus Christi, Tex.	32	17	9	2	3	1
Reading, Pa.†	29	24	3	2	-	1	Dallas, Tex.	208	125	50	13	12	7
Rochester, N.Y.	113	71	27	6	6	10	El Paso, Tex.	64	39	21	3	1	1
Schenectady, N.Y.	26	21	6	-	-	-	Fort Worth, Tex.	75	50	18	6	2	3
Scranton, Pa.†	31	24	5	2	-	3	Houston, Tex.	275	147	71	38	5	6
Syracuse, N.Y.	94	69	17	4	2	1	Little Rock, Ark.	82	46	25	5	4	5
Trenton, N.J.	31	15	9	2	3	-	New Orleans, La.	158	92	29	12	13	8
Utica, N.Y.	32	25	2	4	1	-	San Antonio, Tex.	222	120	54	19	15	1
Yonkers, N.Y.	29	22	4	3	-	-	Shreveport, La.	62	37	12	7	4	4
							Tulsa, Okla.	72	46	17	1	3	4
<b>E.N. CENTRAL</b>	2,467	1,477	636	177	103	59	<b>MOUNTAIN</b>	642	385	170	37	27	30
Akron, Ohio	63	49	4	3	7	-	Albuquerque, N. Mex.	54	34	11	3	2	2
Canton, Ohio	41	24	13	3	1	1	Colo. Springs, Colo.	22	14	6	2	-	4
Chicago, Ill.	560	311	162	44	22	7	Denver, Colo.	126	79	31	9	3	2
Cincinnati, Ohio	185	114	48	15	4	2	Las Vegas, Nev.	71	39	24	3	2	1
Cleveland, Ohio	203	98	73	14	9	2	Ogden, Utah	19	12	4	1	-	2
Columbus, Ohio	177	97	46	20	7	8	Phoenix, Ariz.	157	97	40	5	11	3
Dayton, Ohio	104	61	29	5	7	3	Pueblo, Colo.	23	15	7	-	-	5
Detroit, Mich.	267	150	68	31	13	6	Salt Lake City, Utah	61	29	21	2	6	8
Evansville, Ind.	49	33	11	3	2	1	Tucson, Ariz.	109	66	26	12	3	
Fort Wayne, Ind.	69	49	14	4	-	5							
Gary, Ind.	18	6	6	3	2	1							
Grand Rapids, Mich.	53	39	9	1	4	1	<b>PACIFIC</b>	2,018	1,317	441	118	79	83
Indianapolis, Ind.	169	107	38	11	5	3	Berkeley, Calif.	13	7	5	1	-	3
Madison, Wis.	31	20	5	1	4	2	Fresno, Calif.	80	48	14	8	4	1
Milwaukee, Wis.	155	119	27	4	4	-	Glendale, Calif.	38	30	7	-	-	4
Peoria, Ill.	38	25	9	1	2	2	Honolulu, Hawaii	52	23	20	3	4	1
Rockford, Ill.	39	24	4	6	-	-	Long Beach, Calif.	109	69	30	6	1	26
South Bend, Ind.	60	39	19	1	1	4	Los Angeles, Calif.	574	392	114	33	15	2
Toledo, Ohio	126	76	35	4	6	7	Oakland, Calif.	88	56	19	10	2	2
Youngstown, Ohio	60	37	16	3	3	4	Pasadena, Calif.	36	26	7	-	1	2
							Portland, Oreg.	162	99	39	11	9	6
<b>W.N. CENTRAL</b>	842	575	160	38	36	34	Sacramento, Calif.	97	57	22	6	8	1
Des Moines, Iowa	63	48	13	1	4	-	San Diego, Calif.	142	86	36	10	6	4
Duluth, Minn.	34	24	3	3	3	6	San Francisco, Calif.	169	109	34	14	8	12
Kansas City, Kans.	36	23	8	1	1	1	San Jose, Calif.	159	113	31	7	1	4
Kansas City, Mo.	120	82	25	5	5	3	Seattle, Wash.	185	123	38	4	19	8
Lincoln, Nebr.	47	29	11	6	-	4	Spokane, Wash.	72	43	21	4	1	3
Minneapolis, Minn.	99	64	16	6	10	4	Tacoma, Wash.	42	36	4	1	-	8
Omaha, Nebr.	106	80	18	2	4	2							
St. Louis, Mo.	180	115	39	9	7	8							
St. Paul, Minn.	80	60	14	3	1	1							
Wichita, Kans.	72	50	15	2	1	7	<b>TOTAL</b>	12,925	8,105	3,082	822	504	519

\*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.

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

*Measles — Continued**References*

1. Orenstein WA, Halsey NA, Hayden GF, et al. Current status of measles in the United States, 1973-1977. *J Infect Dis* 1978;6:847-53.
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3. Greenberg M, Pellitteri O, Eisenstein DT. Measles encephalitis: I. prophylactic effect of gamma globulin. *J Pediatr* 1955;46:642-7.
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## Follow-up on Tuberculosis Among Indochinese Refugees

Two surveys of all state tuberculosis control programs for information about tuberculosis among Indochinese refugees have been conducted by CDC (1). The responding areas received 92% of arriving refugees in 1979 and 86% of the refugees who entered the United States from January through June 1980. A summary of the data from these 2 surveys follows.

Participating areas reported that 920 Indochinese refugees were added to tuberculosis case registers in 1979; 1,272 more were added during the first 6 months of 1980. Based upon these data, it is estimated that as of June 30, 1980, the prevalence of current tuberculosis among those refugees who entered the United States in 1979 was approximately 1,500 per 100,000—nearly 60 times the estimated prevalence of current tuberculosis among other persons in the United States. As of the same date, the prevalence of tuberculosis among those refugees who entered the United States this year was about 1,100 per 100,000. The latter rate is expected to increase because the medical evaluation of some refugees who entered this year was incomplete at the time of the survey.

The annual incidence of tuberculosis among Indochinese refugees who entered the United States in 1979 and who did not have tuberculosis when evaluated overseas is estimated to have been 500 per 100,000, approximately 40 times the incidence of tuberculosis among other persons in the United States. Incidence rates of this order of magnitude have been reported from developing countries where there is a high prevalence of tuberculous infection (2). Since January 1979, Indochinese refugees have accounted for an estimated 4.5% of the newly reported cases; when cases are included that were verified overseas and therefore not counted in U.S. morbidity statistics, refugees accounted for 6.1% of cases added to tuberculosis case registers.

Preventive therapy of refugees who are infected with *Mycobacterium tuberculosis* can prevent many cases of tuberculosis. Data from participating areas indicate that approximately 14% of Indochinese refugees have been started on such therapy. Therefore, in addition to the estimated 2,500 refugees added to tuberculosis case registers, more than 26,000 refugees have been started on preventive therapy by tuberculosis control programs throughout the country.

*Reported by the Tuberculosis Control Div, Bur of State Services, CDC.*

*References*

1. MMWR 1980; 29:383-4,389-90.
2. Lowell AM. Tuberculosis in the world. Atlanta, Ga.:CDC, 1976. (DHEW publication no. (CDC)76-8317).

## Carbon Monoxide Inhalation — Florida

In December 1979, the employees of at least 2 establishments located in Hollywood (Broward County), Florida, became ill from the inhalation of carbon monoxide (CO).

On the afternoon of December 5, a dentist informed the Broward County Health Department (BCHD) that he and 4 of his employees were ill and unable to work. A visit was made that afternoon by an investigator from the BCHD. Initial investigation revealed that the dental office was but one of several one-story structures located side-by-side in a small shopping center. The establishments comprising this center were, in sequence, a dry cleaning store, a dress shop, the dental office, and a restaurant. Although the businesses were separated by common partitions, they shared the same ceiling. Since natural gas was used extensively in the dental laboratory, the investigator initially thought that the illnesses were caused by a gas leak; however, immediate testing disproved this theory.

The next day, the dentist and an employee were interviewed. Their symptoms, which included dizziness, sore throat, headache, nausea, and tinnitus, had been present for approximately 1 week, despite medical treatment.

Following the interviews, use of an air-sampling pump and CO detector tube revealed that CO was present in a range of 10-50 parts per million (ppm). On December 7, an Ecolyzer\* was used for a more accurate CO determination. The dental office gave readings from 52 ppm in the waiting room to 69 ppm in the laboratory. The dress shop had CO levels of 100 ppm; CO levels in the restaurant ranged from 38 to 43 ppm.

The dry cleaning store had readings of only 5 ppm in the customer waiting room and employee work area, which was ventilated by outside air. A separately partitioned gas-fired boiler that was located in the rear of the cleaning establishment was used to provide heat for the clothes dryers. Testing within the boiler room indicated a reading of 100 ppm.

It was determined that an explosion had occurred some time earlier in this boiler room, causing a section of a galvanized vent stack to collapse. This allowed the release of incompletely combusted material. Based on this information and the CO readings, the fire department ordered an immediate shutdown of the boiler for repairs. The required repairs were made quickly, and tests were conducted about an hour later. These tests were essentially normal.

The dental office remained closed for the remainder of the day and for the ensuing weekend. On December 10, tests of the dental office revealed a residual CO level of 40-50 ppm; however, this was reduced to a normal range by natural ventilation. A recheck of the dress shop and of the boiler room also indicated normal readings. All subsequent tests have remained within an acceptable range, and no further complaints of illness have occurred.

*Reported by T Melchar, RS, MPH, G Galbreath, P Hughes, MD, Broward County Health Dept; T Bryant, RS, MSEH, E Poole, RS, MS, Environmental Health Program, Health Program Office, RA Gunn, MD, State Epidemiologist, Florida State Dept of Health and Rehabilitative Services.*

**Editorial Note:** The symptoms experienced by persons exposed to persistent low-level CO inhalation are often insidious and easily dismissed as psychosomatic. However, in this situation, a thorough investigation revealed the true cause of illness. Environmental health epidemiologists must be alert to the possible existence of CO inhalation when investigating acute illness occurring in the work place. Faulty heating systems with inadequate ventilation are frequent causes of CO elevation in closed areas.

\*Use of trade names is for identification only and does not constitute endorsement by the Public Health Service, U.S. Dept of Health and Human Services.

## Influenza A — Colorado, New Mexico

Colorado and New Mexico have each reported influenza A(H3N2) virus isolates from persons who were ill in early November. These are the first influenza isolates of the current season in both states.

In Colorado, the isolates were obtained from 4 persons who had onset of illness from November 4-8. Two of the isolates were from young adult males who work at Lowry Air Force Base in Denver, where sporadic influenza-like illness has been noted since early November. The other 2 isolates were from adult females in Moffat County (in northwest Colorado). Three of the 4 isolates have been identified as A/Bangkok/1/79-like by the University of Colorado Health Sciences Center; identification of the other isolate is pending. Fever, cough, chills, myalgias, nausea, and headache were prominent early symptoms in all cases. Two of the 4 patients had diarrhea.

The New Mexico case was in a 34-year-old woman from Albuquerque, who had onset of illness consistent with influenza on November 10. The woman was subsequently seen by a physician. A culture was taken, and the state laboratory reported isolation of influenza A(H3N2) virus. The patient's mother-in-law, who lives with her, had onset of illness 2 days later.

*Reported by C Meiklejohn, MD, P Graves, J I, University of Colorado Health Sciences Center, Denver; Lowry Air Force Base Clinic and Laboratory, Denver; GW Bock, MD, Craig Memorial Hospital, S Harding, RN, J Kleckler, Craig Middle School, Craig, Colorado; JS Conner, R Compton, RB Trostel, RS Hopkins, MD, State Epidemiologist, Colorado State Dept of Health; SC Lapham, MD, State Epidemiologist, New Mexico State Health and Environment Dept; Field Services Div, Bur of Epidemiology, Virology Div, Bur of Laboratories, CDC.*

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