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MORBIDITY AND MORTALITY WEEKLY REPORT

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Epidemiologic Notes and Reports

Fatal Diphtheria — Wisconsin

A fatal case of diphtheria was recently reported to the Wisconsin State Department of Health and Social Services (*1*). A 9-year-old unimmunized female developed listlessness and a sore throat on June 30, 1982, 10 days after arriving at a camp in Colorado operated by a religious group that does not accept immunizations. On July 3, she returned to Wisconsin on a camp bus along with other unimmunized children and adults who had also attended the camp. On July 6, a physician evaluated the patient for her sore throat; a throat culture was taken and oral penicillin prescribed. The patient was hospitalized on July 8 for persistent sore throat, diminished fluid intake, and gingival bleeding. Laboratory tests revealed a white blood cell count of 26,500 /mm^3 with 92% polymorphonuclear cells, a blood urea nitrogen of 214 mg/dl, a creatinine of 12.4 mg/dl, and a platelet count of 10,000/mm^3. The throat culture obtained July 6 was reported to contain normal flora, group A beta hemolytic streptococci, and large numbers of diphtheroids. The patient was transferred on July 8 to a tertiary care children's hospital.

On admission, she was afebrile and had moderate upper airway obstruction, diffuse ecchymoses, bleeding from the nose and gums, prominent cervical adenopathy, and swelling of the jaw and throat. Initially, the pharynx was poorly visualized due to trismus. On later examination, it revealed severe hemorrhagic and necrotic tonsillitis; no membrane was observed. Treatment with penicillin G, gentamycin, moxalactam, peritoneal dialysis, and platelet transfusions was instituted. The hospital course was complicated by disseminated intravascular coagulation, cardiac conduction abnormalities, and mental confusion. The patient died on July 14. A *Corynebacterium* species isolated from a throat culture obtained July 10 was subsequently confirmed by the Milwaukee Bureau of Laboratories and State Laboratory of Hygiene to be a toxigenic strain of *C. diphtheriae*.

An investigation was undertaken to determine the source of exposure to *C. diphtheriae* and to identify and evaluate the patient's contacts. The camp session had been attended by 108 employees, campers, and counselors from Wisconsin and 12 other states; many were unimmunized. In addition, 119 immediate and extended family members and hospital employees in Wisconsin, who might have had close contact with the patient after onset of illness, were identified. With the aid of state and local health departments and private physicians, 224 of the 227 contacts were evaluated. None reported respiratory illness before or after exposure to the patient, and nasopharyngeal or throat cultures obtained from 218 contacts were negative for *C. diphtheriae*.

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Editorial Note: The last reported case of diphtheria in Wisconsin occurred in 1979, and the last reported case in Colorado occurred in 1978. This is the first reported diphtheria-associated fatality in Wisconsin since 1968; none has been reported in Colorado since 1976. Nationally, the number of reported diphtheria cases declined steadily from 435 in 1970 to five in 1981 (*2*). The average annual incidence rate of reported diphtheria in the United States has declined from 0.13 cases per 100,000 population for 1970-1975 to 0.03/100,000 for 1976-1981. The mortality rate from all types of diphtheria has declined from 0.015 deaths per 100,000 population in 1970 to 0.002/100,000 in 1978, the last year for which mortality information is available (*3*). From 1971 through 1981, 431 (52%) of the 829 reported noncutaneous diphtheria cases occurred among persons < 15 years of age.

The clinical manifestations of diphtheria depend on the anatomic location of infection, the virulence and toxigenicity of the infecting strain, and the host's immunity to diphtheria toxin. In the usual pharyngeal form of diphtheria, an adherent grayish-white membrane covers, to some degree, the pharyngeal and/or tonsillar areas (*4*). Infrequently, as in this case, diphtheria may present as a necrotic tonsillitis. Common complications fall into two groups: 1) the membrane and associated tissue swelling, which may cause airway obstruction; and 2) the bacterial toxin, which may cause myocarditis or neuropathy. Mortality occurs predominantly among noncutaneous cases, which accounted for 59 (95%) of the 62 reported diphtheria deaths from 1971 through 1981. Twenty-seven (46%) of the deaths among persons with noncutaneous diphtheria occurred among persons < 15 years of age.

Diphtheria is acquired primarily by contact with the infected respiratory droplets or nasopharyngeal secretions of another patient or a carrier. Infectious skin exudate is involved in spread from cutaneous diphtheria. Disease occurs most frequently and more severely among unimmunized or partially immunized persons. Carrier status may occur among both immunized and unimmunized persons. The absence of any isolates of *C. diphtheriae* among the numerous contacts cultured in this investigation may be, in part, a result of delay in diagnosing the case and, therefore, delay in obtaining cultures.

Persons with suspected or proven diphtheria should receive diphtheria antitoxin and parenteral penicillin as soon as possible. Since diphtheria infection may not confer immunity, active immunization should be initiated or completed during convalescence. All household and other close contacts of respiratory diphtheria patients should be cultured and should receive an injection of an appropriate diphtheria-toxoid preparation and should be placed under active surveillance for 7 days for evidence of disease. Unimmunized or inadequately immunized close contacts and other close contacts whose cultures are positive should receive either intramuscular benzathine penicillin or 7 days of oral erythromycin, as well as toxoid. Culture specimens should be obtained before the initiation of antibiotics and, in the instance of a toxigenic *C. diphtheria*-positive culture, following completion of the antibiotic course (*5,6*). All close contacts should complete immunization with diphtheria toxoid.

References

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Fatal Diphtheria — Continued

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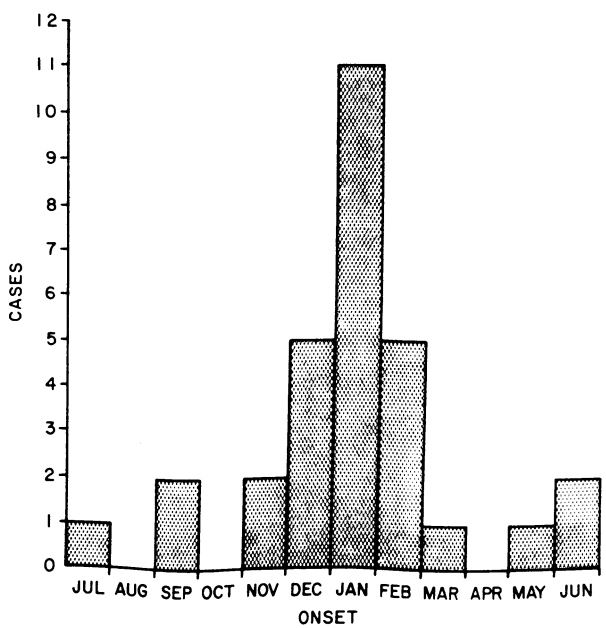
4. Dobie RA, Tobey DN. Clinical features of diphtheria in the respiratory tract. JAMA 1979;242:2197-201.
5. American Academy of Pediatrics. Report of the Committee on Infectious Diseases. 19th Ed. Evanston, Illinois: American Academy of Pediatrics 1982:71-4.
6. ACIP. Diphtheria, tetanus and pertussis: guidelines for vaccine prophylaxis and other preventive measures. MMWR 1981;30:392-6, 401-7.

Current Trends

Epidemic Typhus Associated with Flying Squirrels — United States

Since 1976, 30 cases of illness caused by *Rickettsia prowazekii*, the causative organism of epidemic typhus, have been documented serologically among residents of the United States (*1-3*). These cases have been unusual in that, unlike classic louse-borne epidemic typhus, they have occurred sporadically, primarily in rural or suburban areas of the eastern United States. Ten of the 30 cases have occurred in Georgia, four in Virginia, three in North Carolina, two in Pennsylvania, two in Indiana, and one each in California, Illinois, Maryland, Massachusetts, Ohio, New Jersey, New York, Tennessee, and West Virginia. Twenty-one of the 30 cases have occurred during the coldest months of the year—December, January, and February (Figure 1).

FIGURE 1. Cases of *Rickettsia prowazekii* infection by month of onset — United States, 1976-1982



Typhus – Continued

Of the 30 patients with sporadic *R. prowazekii* infection, 73% have been ≥ 20 years of age and 50% have been male. Clinically, patients have presented with fever (100%), headache (81%), skin rash (66%), confusion (44%), and myalgia (42%). The skin rash has been characterized as maculopapular, usually involving the trunk and spreading to the extremities. Seventy-six percent of patients have received therapy with tetracycline or chloramphenicol; recovery has been much more rapid among these patients than among those not receiving appropriate antibiotics. However, no patient with sporadic *R. prowazekii* infection, regardless of antibiotic therapy, has died.

In 10 of 18 cases of sporadic *R. prowazekii* infection for which information has been available, flying squirrels, or nests consistent with those observed for flying squirrels, have been found in a home or building frequented by the patient. In one report, the southern flying squirrel, *Glaucomys volans*, was readily trapped in the environs of the patient in six of seven cases (*2*). This rodent inhabits the eastern United States, frequently nests in the attics of houses during the winter, and is a known host of *R. prowazekii* (*4*). It is presumed that infection is acquired from this animal, although the mechanism of transmission is unknown. One case of typhus occurred in California, where *G. volans* is absent. *Glaucomys sabrinus*, a close relative of *G. volans*, is present in California, but serologic studies of this species for antibody to *R. prowazekii* have been initiated only recently.

(Continued on page 561)

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

Disease	41st Week Ending			Cumulative, First 41 Weeks		
	October 16, 1982	October 17, 1981	Median 1977-1981	October 16, 1982	October 17, 1981	Median 1977-1981
Aseptic meningitis	292	308	243	6,578	7,518	5,735
Brucellosis	5	5	3	127	130	139
Encephalitis: Primary (arthropod-borne & unspec.)	56	54	54	1,045	1,167	914
Post-infectious	1	-	4	49	74	171
Gonorrhea: Civilian	18,829	20,020	20,020	750,233	792,386	789,267
Millitary	249	460	455	21,016	22,339	21,796
Hepatitis: Type A	457	458	612	17,525	19,682	22,821
Type B	364	384	309	16,518	15,950	12,992
Non A, Non B	48	N	N	1,759	N	N
Unspecified	148	181	181	7,123	8,541	8,056
Legionellosis	8	N	N	414	N	N
Leprosy	2	2	2	150	208	137
Malaria	10	21	21	816	1,142	592
Measles (rubeola)	36	21	64	1,384	2,695	13,021
Meningococcal infections: Total	43	53	45	2,331	2,818	2,123
Civilian	43	53	45	2,318	2,807	2,105
Military	-	-	-	13	11	16
Mumps	49	42	126	4,363	3,494	11,566
Pertussis	40	27	43	1,209	988	1,354
Rubella (German measles)	6	5	38	2,063	1,831	10,873
Syphilis (Primary & Secondary): Civilian	612	642	497	25,754	24,150	19,403
Military	9	20	3	347	309	244
Tuberculosis	484	486	486	20,137	21,179	21,677
Tularemia	6	3	4	205	221	165
Typhoid fever	6	22	13	313	458	403
Typhus fever, tick-borne (RMSF)	13	16	16	917	1,119	1,047
Rabies, animal	125	113	108	4,995	6,013	4,080

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1982		Cum. 1982
Anthrax	-	Poliomyelitis: Total	4
Botulism (Del. 1)	60	Paralytic	4
Cholera	-	Psittacosis (Upst. NY 1, Wash. 1, Calif. 1)	98
Congenital rubella syndrome	5	Rabies, human	-
Diphtheria	2	Tetanus (Va. 1)	65
Leptospirosis (Fla. 1, Oreg. 1, Hawaii 2)	50	Trichinosis	74
Plague	17	Typhus fever, flea-borne (endemic, murine)	33

TABLE III. Cases of specified notifiable diseases, United States, weeks ending October 16, 1982 and October 17, 1981 (41st week)

Reporting Area	Aseptic Meningitis	Brucellosis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	1982	Cum. 1982	Cum. 1982	Cum. 1982	Cum. 1982	Cum. 1981	1982	1982	1982	1982	1982	Cum. 1982
UNITED STATES	292	127	1,045	49	750,233	792,386	457	364	48	148	8	150
NEW ENGLAND	17	3	39	5	18,197	19,452	8	13	3	15	1	1
Maine	-	-	-	-	929	1,021	1	-	-	-	-	-
N.H.	2	-	7	-	530	698	1	1	1	3	1	-
Vt.	-	-	-	-	343	336	-	-	1	-	-	-
Mass.	3	-	14	-	8,258	8,201	-	7	-	9	-	-
R.I.	5	-	-	1	1,205	1,154	4	2	-	-	-	-
Conn.	7	3	18	4	6,932	8,042	2	3	1	3	-	1
MID. ATLANTIC	25	3	107	11	94,856	95,558	68	60	4	11	-	9
Upstate N.Y.	10	3	41	3	15,634	16,190	19	19	1	5	-	1
N.Y. City	2	-	17	-	38,792	39,640	9	5	-	-	-	6
N.J.	8	-	20	-	17,496	17,896	8	12	3	4	-	1
Pa.	5	-	29	8	22,934	21,832	32	24	-	2	-	1
E.N. CENTRAL	51	3	241	10	102,698	118,320	61	63	3	10	3	3
Ohio	20	1	98	4	29,280	37,363	26	16	2	4	-	-
Ind.	9	-	68	3	12,756	10,215	14	20	-	5	-	-
Ill.	1	1	12	1	25,085	33,915	5	6	1	-	-	3
Mich.	21	1	58	-	25,919	25,951	16	21	-	1	3	-
Wis.	-	-	5	2	9,658	10,876	-	-	-	-	-	-
W.N. CENTRAL	18	15	78	4	35,492	37,562	13	10	3	9	1	4
Minn.	2	1	27	1	5,194	5,723	5	1	2	-	-	2
Iowa	4	4	37	1	3,706	4,071	1	-	1	1	-	-
Mo.	4	4	6	-	16,862	17,558	6	4	-	8	-	1
N. Dak.	-	-	-	-	471	476	-	-	-	-	-	-
S. Dak.	-	1	-	1	957	1,035	-	1	-	-	-	1
Nebr.	5	2	4	-	2,136	2,797	-	2	-	-	1	-
Kans.	3	3	4	1	6,166	5,902	1	2	-	-	-	-
S. ATLANTIC	53	24	162	8	196,693	195,147	54	68	12	22	-	9
Del.	-	-	-	-	3,251	3,129	-	-	-	2	-	-
Md.	7	-	20	-	25,029	22,949	4	14	3	6	-	3
D.C.	-	-	-	-	11,764	11,041	2	2	-	-	-	-
Va.	11	7	30	1	15,772	17,839	9	10	4	2	-	1
W. Va.	3	-	15	-	2,249	2,966	3	3	-	-	-	-
N.C.	6	-	23	1	31,382	30,181	1	5	-	3	-	-
S.C.	4	2	2	-	19,300	18,915	21	13	2	3	-	-
Ga.	-	3	14	-	36,994	40,477	-	-	-	-	-	1
Fla.	22	12	58	6	50,952	47,650	14	21	3	6	-	4
E.S. CENTRAL	29	11	57	2	65,392	66,090	14	26	2	1	1	-
Ky.	-	-	1	-	8,834	8,155	2	3	-	-	-	-
Tenn.	2	6	26	-	25,884	24,944	6	14	2	1	-	-
Ala.	23	4	16	2	18,977	20,119	1	3	-	-	1	-
Miss.	4	1	14	-	11,697	12,872	5	6	-	-	-	-
W.S. CENTRAL	39	39	176	1	104,573	104,433	110	40	3	49	1	25
Ark.	-	7	16	-	8,606	7,957	-	1	2	6	1	-
La.	5	8	22	-	19,520	18,228	12	9	-	3	-	-
Okla.	11	5	34	-	11,430	11,294	41	6	1	4	-	-
Tex.	23	19	104	1	65,017	66,954	57	24	-	36	-	25
MOUNTAIN	13	-	35	3	25,607	31,016	25	14	2	11	1	2
Mont.	-	-	-	-	1,074	1,144	-	1	-	-	-	-
Idaho	3	-	-	-	1,217	1,389	-	-	-	-	-	1
Wyo.	-	-	-	-	748	770	3	-	-	1	-	-
Colo.	5	-	17	1	6,900	8,350	11	1	1	-	-	-
N. Mex.	-	-	1	-	3,433	3,401	5	1	1	2	-	-
Ariz.	-	-	8	-	6,738	9,157	3	-	-	4	-	-
Utah	1	-	5	2	1,250	1,549	2	2	-	1	1	1
Nev.	4	-	4	-	4,247	5,256	1	9	-	3	-	-
PACIFIC	47	29	150	5	106,725	124,808	104	70	16	20	-	97
Wash.	7	1	11	-	8,983	10,433	11	10	1	2	-	8
Oreg.	2	-	3	-	6,335	7,465	12	2	1	1	-	1
Calif.	33	27	127	5	86,713	101,232	81	58	13	17	-	66
Alaska	2	1	5	-	2,695	3,209	-	-	-	-	-	1
Hawaii	3	-	4	-	1,999	2,469	-	-	1	-	-	21
Guam	U	-	-	-	97	92	U	U	U	U	U	-
P.R.	2	-	1	1	2,152	2,556	-	9	-	3	-	1
V.I.	U	-	-	-	181	189	U	U	U	U	U	-
Pac. Trust Terr.	U	-	-	-	297	354	U	U	U	U	U	13

N: Not notifiable U: Unavailable

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending October 16, 1982 and October 17, 1981 (41st week)

Reporting Area	Malaria		Measles (Rubeola)			Meningococcal Infections (Total)		Mumps		Pertussis	Rubella		
	1982	Cum. 1982	1982	Cum. 1982	Cum. 1981	1982	Cum. 1982	1982	Cum. 1982	1982	1982	Cum. 1982	Cum. 1981
UNITED STATES	10	816	36	1,384	2,695	43	2,331	49	4,363	40	6	2,063	1,831
NEW ENGLAND	1	42	-	15	83	4	122	1	181	-	-	20	119
Maine	-	-	-	-	5	-	9	-	41	-	-	-	33
N.H.	-	1	-	3	6	-	15	-	15	-	-	10	51
Vt.	-	-	-	2	3	-	8	-	7	-	-	-	-
Mass.	-	24	-	4	59	-	30	1	86	-	-	5	23
R.I.	-	3	-	-	-	1	14	-	15	-	-	1	-
Conn.	1	14	-	6	10	3	46	-	17	-	-	4	12
MID. ATLANTIC	2	136	-	162	843	13	420	4	281	11	1	102	217
Upstate N.Y.	-	25	-	112	209	3	146	2	68	3	-	49	103
N.Y. City	1	53	-	42	87	4	81	1	47	1	1	34	54
N.J.	-	29	-	4	58	4	85	-	41	-	-	18	47
Pa.	1	29	-	4	489	2	108	1	125	7	-	1	13
E.N. CENTRAL	-	58	-	76	81	6	286	15	2,222	11	1	179	383
Ohio	-	12	-	1	16	3	101	1	1,577	-	-	-	3
Ind.	-	3	-	2	9	1	29	-	37	-	-	28	132
Ill.	-	13	-	23	23	-	73	1	182	11	-	66	96
Mich.	-	26	-	50	30	2	66	6	314	-	-	49	34
Wis.	-	4	-	-	3	-	17	7	112	-	1	36	118
W.N. CENTRAL	1	20	-	49	10	4	106	5	576	1	-	59	78
Minn.	-	2	-	-	3	-	27	2	439	-	-	5	7
Iowa	1	7	-	-	1	-	9	2	34	-	-	-	4
Mo.	-	5	-	2	1	3	29	-	17	-	-	38	2
N. Dak.	-	1	-	-	-	-	6	-	-	-	-	-	-
S. Dak.	-	-	-	-	-	-	4	-	1	-	-	1	-
Nebr.	-	3	-	3	4	1	13	-	-	-	-	-	1
Kans.	-	2	-	44	1	-	18	1	85	1	-	15	64
S. ATLANTIC	4	118	2	44	439	7	491	3	265	6	-	80	135
Del.	-	4	-	-	-	-	-	-	13	-	-	1	1
Md.	-	19	-	3	5	-	34	-	29	-	-	34	1
D.C.	-	4	-	1	1	1	3	-	-	-	-	-	-
Va.	4	39	-	14	9	2	59	1	36	1	-	13	6
W. Va.	-	7	-	3	9	-	9	2	93	-	-	1	22
N.C.	-	3	1	1	3	2	97	-	16	5	-	1	5
S.C.	-	4	-	-	2	1	55	-	16	-	-	1	8
Ga.	-	15	-	-	111	-	100	-	16	-	-	13	37
Fla.	-	23	1	22	299	1	134	-	46	-	-	16	55
E.S. CENTRAL	-	8	-	7	5	1	146	2	52	1	-	46	35
Ky.	-	5	-	1	1	-	24	1	18	-	-	28	21
Tenn.	-	-	-	6	2	-	83	-	19	-	-	2	13
Ala.	-	-	-	-	2	1	48	1	9	-	-	-	1
Miss.	-	3	-	-	-	-	11	-	6	1	-	16	-
W.S. CENTRAL	-	58	26	134	856	2	280	5	193	-	-	106	163
Ark.	-	4	-	-	20	-	13	-	7	-	-	1	3
La.	-	4	-	2	4	1	59	-	6	-	-	1	9
Okla.	-	8	3	30	5	1	28	-	-	-	-	3	1
Tex.	-	42	23	102	827	-	180	5	180	-	-	101	150
MOUNTAIN	-	27	-	19	35	1	103	3	92	1	-	78	92
Mont.	-	1	-	-	-	-	4	-	3	-	-	5	3
Idaho	-	2	-	-	1	-	7	-	4	-	-	6	4
Wyo.	-	-	-	1	1	-	5	-	2	-	-	7	11
Colo.	-	11	-	6	10	1	43	-	16	-	-	6	30
N. Mex.	-	3	-	-	8	-	15	-	-	1	-	6	5
Ariz.	-	7	-	12	5	-	18	3	41	-	-	14	20
Utah	-	3	-	-	-	-	9	-	20	-	-	22	8
Nev.	-	-	-	-	10	-	2	-	6	-	-	12	11
PACIFIC	2	349	8	878	343	5	377	11	501	9	4	1,393	609
Wash.	1	20	1	41	3	1	43	-	64	5	-	38	89
Oreg.	-	13	4	23	5	2	71	-	-	-	-	6	53
Calif.	1	311	3	808	328	2	248	6	412	4	4	1,336	451
Alaska	-	1	-	1	-	-	11	1	10	-	-	5	1
Hawaii	-	4	-	5	7	-	4	4	15	-	-	8	15
Guam	U	1	U	6	6	U	2	U	3	U	U	2	2
P.R.	-	4	2	125	283	-	8	-	75	-	-	11	4
V.I.	U	-	U	-	24	U	-	U	3	U	U	-	1
Pac. Trust Terr.	U	-	U	-	1	U	2	U	5	U	U	-	1

U: Unavailable

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending October 16, 1982 and October 17, 1981 (41st week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Tuberculosis		Tularemia	Typhoid Fever		Typhus Fever (Tick-borne) (RMSF)		Rabies, Animal
	Cum. 1982	Cum. 1981	1982	Cum. 1982	Cum. 1982	1982	Cum. 1982	1982	Cum. 1982	Cum. 1982
UNITED STATES	25,754	24,150	484	20,137	205	6	313	13	917	4,995
NEW ENGLAND	459	463	22	557	6	-	17	1	10	39
Maine	4	5	1	47	-	-	-	-	-	26
N.H.	1	12	-	20	-	-	-	-	1	1
Vt.	2	15	-	13	-	-	2	-	-	1
Mass.	305	297	13	352	6	-	13	-	5	6
R.I.	19	26	-	24	-	-	-	-	2	-
Conn.	128	108	8	101	-	-	2	1	2	5
MID. ATLANTIC	3,484	3,508	77	3,357	7	2	57	2	39	174
Upstate N.Y.	337	327	24	592	7	2	9	1	13	92
N.Y. City	2,092	2,097	35	1,271	-	-	29	1	2	-
N.J.	489	502	5	648	-	-	11	-	13	17
Pa.	566	582	13	846	-	-	8	-	11	65
E.N. CENTRAL	1,415	1,802	73	3,061	1	2	26	1	81	520
Ohio	248	232	14	513	-	1	12	1	76	72
Ind.	157	237	2	381	-	1	2	-	-	70
Ill.	696	960	42	1,316	-	-	3	-	5	263
Mich.	239	297	11	690	-	-	8	-	-	6
Wis.	75	76	4	161	1	-	1	-	-	109
W.N. CENTRAL	442	528	12	583	31	-	14	1	33	1,038
Minn.	102	164	-	104	-	-	6	-	-	180
Iowa	24	21	2	59	2	-	1	-	4	329
Mo.	256	296	7	282	21	-	4	1	11	103
N. Dak.	7	8	-	12	-	-	-	-	-	86
S. Dak.	2	2	-	26	1	-	-	-	4	88
Nebr.	11	9	1	24	3	-	2	-	2	114
Kans.	40	28	2	76	4	-	1	-	12	138
S. ATLANTIC	7,084	6,436	79	4,144	12	-	40	5	497	942
Del.	19	13	-	38	-	-	-	-	-	2
Md.	383	475	-	459	1	-	9	-	48	53
D.C.	376	526	3	164	-	-	-	-	-	-
Va.	483	558	10	450	4	-	4	1	73	503
W. Va.	25	18	3	129	-	-	4	-	8	37
N.C.	572	509	13	667	-	-	2	3	211	63
S.C.	434	444	9	395	6	-	3	1	105	53
Ga.	1,465	1,596	15	653	-	-	-	-	47	170
Fla.	3,327	2,297	26	1,189	1	-	18	-	5	61
E.S. CENTRAL	1,798	1,579	60	1,856	8	-	17	1	86	566
Ky.	106	87	12	487	-	-	2	-	1	115
Tenn.	515	572	25	602	6	-	3	1	55	314
Ala.	667	461	9	501	-	-	9	-	14	130
Miss.	510	459	14	266	2	-	3	-	16	7
W.S. CENTRAL	6,737	5,792	74	2,479	105	2	32	1	153	953
Ark.	163	126	10	284	63	2	5	1	27	130
La.	1,493	1,322	12	366	3	-	3	-	2	31
Okla.	143	130	6	279	30	-	3	-	71	166
Tex.	4,938	4,214	46	1,550	9	-	21	-	53	626
MOUNTAIN	642	597	17	562	26	-	13	1	12	255
Mont.	5	11	2	37	3	-	-	-	4	84
Idaho	24	17	2	28	1	-	-	1	3	10
Wyo.	16	10	4	6	5	-	-	-	1	21
Colo.	174	178	-	68	4	-	3	-	1	47
N. Mex.	149	105	-	98	2	-	-	-	1	23
Ariz.	162	150	5	231	-	-	7	-	-	49
Utah	19	23	-	36	11	-	2	-	-	17
Nev.	93	103	4	58	-	-	1	-	2	4
PACIFIC	3,693	3,445	70	3,538	9	-	97	-	6	508
Wash.	128	144	3	223	1	-	6	-	-	7
Oreg.	90	86	10	142	1	-	4	-	1	3
Calif.	3,374	3,148	56	2,879	6	-	83	-	5	419
Alaska	14	11	-	74	1	-	1	-	-	79
Hawaii	87	56	1	220	-	-	3	-	-	-
Guam	1	-	U	36	-	U	-	U	-	-
P.R.	547	529	2	341	-	-	2	-	-	43
V.I.	21	15	U	1	-	U	-	U	-	-
Pac. Trust Terr.	-	-	U	91	-	U	-	U	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending October 16, 1982 (41st week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	585	393	131	29	20	12	32
Boston, Mass.	153	92	44	7	6	4	17
Bridgeport, Conn.	41	23	9	3	4	2	2
Cambridge, Mass.	8	6	1	1	-	-	1
Fall River, Mass.	30	26	3	1	-	-	-
Hartford, Conn.	57	38	13	1	3	2	1
Lowell, Mass.	23	16	4	3	-	-	1
Lynn, Mass.	17	10	7	-	-	-	1
New Bedford, Mass	31	19	9	-	1	2	-
New Haven, Conn.	39	24	11	2	2	-	-
Providence, R.I.	59	47	8	3	1	-	2
Somerville, Mass.	8	6	2	-	-	-	1
Springfield, Mass.	34	24	4	3	1	2	4
Waterbury, Conn.	26	20	4	2	-	-	-
Worcester, Mass.	59	42	12	3	2	-	2
MID. ATLANTIC	2,612	1,734	590	162	79	47	102
Albany, N.Y.	55	39	12	-	1	3	1
Allentown, Pa.	20	15	5	-	-	-	-
Buffalo, N.Y.	126	86	31	3	5	1	11
Camden, N.J.	31	18	11	1	1	-	-
Elizabeth, N.J.	19	14	4	-	-	1	1
Erie, Pa.†	33	15	13	2	3	-	2
Jersey City, N.J.	49	31	14	3	-	1	-
N.Y. City, N.Y.	1,342	894	287	96	41	24	35
Newark, N.J.	62	24	21	8	6	3	6
Paterson, N.J.	24	19	-	3	2	-	1
Philadelphia, Pa.†	398	255	98	27	8	10	27
Pittsburgh, Pa.†	104	60	31	9	3	1	4
Reading, Pa.	26	22	3	-	1	-	2
Rochester, N.Y.	126	100	20	4	2	-	4
Schenectady, N.Y.	22	15	5	-	2	-	1
Scranton, Pa.†	29	20	5	4	-	-	-
Syracuse, N.Y.	78	59	15	-	1	3	4
Trenton, N.J.	21	15	4	1	1	-	-
Utica, N.Y.	16	10	4	-	2	-	1
Yonkers, N.Y.	31	23	7	1	-	-	2
E.N. CENTRAL	2,123	1,363	480	138	66	76	68
Akron, Ohio	39	25	4	2	2	6	-
Canton, Ohio	42	26	9	6	-	1	1
Chicago, Ill	526	314	139	41	13	19	12
Cincinnati, Ohio	129	80	31	8	8	2	18
Cleveland, Ohio	152	99	37	7	4	5	2
Columbus, Ohio	140	81	31	14	11	3	4
Dayton, Ohio	91	54	24	4	7	2	2
Detroit, Mich.	237	143	51	23	4	16	9
Evansville, Ind.	57	41	14	1	-	1	3
Fort Wayne, Ind.	49	37	7	1	1	3	2
Gary, Ind.	15	9	4	2	-	-	-
Grand Rapids, Mich.	52	45	5	-	1	1	-
Indianapolis, Ind.	137	91	34	3	2	7	2
Madison, Wis.	33	21	10	-	1	1	3
Milwaukee, Wis.	149	103	28	6	8	4	2
Peoria, Ill.	34	20	7	5	1	1	1
Rockford, Ill.	48	37	10	1	-	-	2
South Bend, Ind.	33	25	6	1	-	1	2
Toledo, Ohio	109	76	21	9	1	2	2
Youngstown, Ohio	51	36	8	4	2	1	1
W.N. CENTRAL	722	474	149	33	31	35	38
Des Moines, Iowa	61	42	11	2	2	4	7
Duluth, Minn.	27	22	3	1	1	-	3
Kansas City, Kans.	43	30	9	2	2	-	2
Kansas City, Mo.	131	85	35	5	4	2	9
Lincoln, Nebr.	22	11	7	2	1	1	1
Minneapolis, Minn.	83	52	17	5	4	5	4
Omaha, Nebr.	80	56	11	1	5	7	4
St. Louis, Mo.	152	90	38	9	6	9	-
St. Paul, Minn.	67	51	9	1	4	2	1
Wichita, Kans.	56	35	9	5	2	5	7
S. ATLANTIC	1,052	679	233	61	29	48	31
Atlanta, Ga.	144	84	34	11	5	10	3
Baltimore, Md.	174	105	47	8	10	4	5
Charlotte, N.C.	67	36	17	9	1	4	1
Jacksonville, Fla.	89	53	23	7	3	3	-
Miami, Fla.	123	70	37	12	2	2	2
Norfolk, Va.	45	27	9	3	2	4	4
Richmond, Va.	78	38	23	5	2	10	4
Savannah, Ga.	26	20	4	1	-	1	4
St. Petersburg, Fla.	94	78	13	1	2	-	1
Tampa, Fla.	68	46	15	1	-	6	5
Washington, D.C. §	109	97	1	3	2	4	2
Wilmington, Del.	35	25	10	-	-	-	-
E.S. CENTRAL	562	363	141	21	13	24	16
Birmingham, Ala.	106	70	25	3	3	5	1
Chattanooga, Tenn.	59	37	13	4	1	4	7
Knoxville, Tenn.	37	25	12	-	-	-	-
Louisville, Ky.	83	54	20	4	1	4	4
Memphis, Tenn.	109	79	23	3	3	1	2
Mobile, Ala.	44	26	13	2	2	1	2
Montgomery, Ala.	29	17	9	-	-	3	-
Nashville, Tenn.	95	55	26	5	3	6	-
W.S. CENTRAL	1,258	714	308	106	65	65	40
Austin, Tex.	54	38	9	4	2	1	1
Baton Rouge, La.	51	31	10	2	5	3	3
Corpus Christi, Tex.	44	28	10	3	2	1	-
Dallas, Tex.	178	96	43	15	13	11	2
El Paso, Tex.	53	31	9	5	-	8	2
Fort Worth, Tex.	87	48	18	6	3	12	3
Houston, Tex.	287	132	87	39	16	13	10
Little Rock, Ark.	87	53	25	6	1	2	5
New Orleans, La.	134	74	35	13	8	4	-
San Antonio, Tex.	140	85	36	7	8	4	10
Shreveport, La.	59	42	12	2	-	3	-
Tulsa, Okla.	84	56	14	4	7	3	4
MOUNTAIN	602	371	131	49	28	23	34
Albuquerque, N.Mex.	108	56	31	12	8	1	4
Colo. Springs, Colo.	38	24	8	5	1	-	9
Denver, Colo.	131	88	25	9	4	5	6
Las Vegas, Nev.	56	30	12	11	1	2	1
Ogden, Utah	11	7	4	-	-	-	1
Phoenix, Ariz.	102	64	20	3	9	6	1
Pueblo, Colo.	18	14	1	3	-	-	2
Salt Lake City, Utah	44	27	9	1	-	7	3
Tucson, Ariz.	94	61	21	5	5	2	7
PACIFIC	1,457	947	304	100	41	64	69
Berkeley, Calif.	16	15	-	-	-	1	-
Fresno, Calif.	73	45	19	2	1	6	2
Glendale, Calif.	9	9	-	-	-	-	-
Honolulu, Hawaii	51	28	14	3	2	4	3
Long Beach, Calif.	76	51	14	4	2	5	3
Los Angeles, Calif.	284	180	53	29	9	13	10
Oakland, Calif.	81	52	20	4	3	2	4
Pasadena, Calif.	25	20	3	-	-	2	1
Portland, Oreg.	100	68	11	8	5	8	3
Sacramento, Calif.	63	41	12	4	1	5	3
San Diego, Calif.	136	103	20	7	4	2	12
San Francisco, Calif.	155	94	37	13	5	5	4
San Jose, Calif.	161	90	48	12	4	7	13
Seattle, Wash.	128	87	27	10	2	2	4
Spokane, Wash.	57	33	18	2	2	2	6
Tacoma, Wash.	42	31	8	2	1	-	1
TOTAL	10,973††	7,038	2,467	699	372	394	430

* 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.

Typhus – Continued

It has long been assumed that the causative agent of epidemic typhus existed only in the man-louse-man cycle, and that patients who had recovered from typhus constituted the reservoir of *R. prowazekii* in inter-epidemic periods (rickettsemia develops in Brill-Zinsser disease, the recrudescent form of *R. prowazekii* infection). Under this assumption, eradication of epidemic typhus on a global scale would be theoretically possible, since few patients with Brill-Zinsser disease would be alive after long inter-epidemic periods. The finding of sporadic *R. prowazekii* infecton and the existence of a sylvan reservoir of this rickettsial agent, therefore, have important implications concerning the perpetuation of epidemic typhus in humans. Since none of the patients with sporadic epidemic typhus have been infested with body lice, the possibility that sporadically acquired infection can precipitate outbreaks of epidemic typhus remains unexplored. Whether flying squirrels and/or other mammalian hosts were infected with *R. prowazekii* before the evolution of epidemic typhus in humans, or whether the reverse is true, is also unknown.

Since the causative organism has yet to be isolated from a human with sporadic *R. prowazekii* infection and since the mechanism of transmission of this disease has not been elucidated, CDC is attempting to identify as many cases of this disease as possible. Therefore, physicians who encounter patients with a rickettsial-like illness (fever, headache, myalgia, and skin rash) during the colder months are encouraged to report these cases to CDC through their local and state health departments.

Reported by Div of Viral Diseases, Center for Infectious Diseases, CDC.

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International Notes

Prevention of Blindness: Trachoma Control

Trachoma is estimated to affect approximately 500 million people, primarily in rural communities of the developing world and in the arid areas of tropical and subtropical zones. Approximately 6-9 million* people are blind from trachoma, and many more have suffered partial loss of vision.

Trachoma can be controlled, and blindness and visual loss can be prevented by appropriate application of relatively simple and inexpensive measures. Therefore, communities with uncontrolled trachoma should be identified so that appropriate control measures can be implemented. Such communities are likely to be found in countries where blindness rates are above the range of 0.5%-1%, and where more than 1%-2% of the population are blind from all causes.

*Estimate endorsed by the WHO Programme Advisory Group on the Prevention of Blindness in February 1982.

Blindness – Continued

In recent years, preventable and easily curable blindness has been recognized as a combatible public health problem. The need for blindness prevention has led to a renewed interest in trachoma and associated infections, which are still the most important causes of preventable blindness in the world.

In 1975, the Twenty-Eighth World Health Assembly, in a resolution on the prevention of blindness, requested the Director General of the World Health Organization "to encourage member countries to develop national programmes for the prevention of blindness, especially aimed at the control of trachoma, xerophthalmia, onchocerciasis, and other causes, and to introduce adequate measures for the early detection and treatment for other potentially blinding conditions such as cataract and glaucoma."

Trachoma-control programs must be aimed primarily at those severely affected communities where the disease leads to blindness. In planning and implementing control programs, consideration must be given to the simultaneous introduction of other specific measures for dealing with all causes of avoidable blindness. In recent years, knowledge about the causative agent of trachoma and about the epidemiologic patterns that determine the intensity of inflammation and the gravity of disease has increased substantially. This new information has led to a clearer definition of risk for the individual and for the community and has made it possible to distinguish communities with "blinding trachoma" from those with "non-blinding trachoma." In view of these developments and the importance of trachoma control in the prevention of blindness, a revised guide to trachoma control has been prepared (*1*).

This new field guide presents simple and effective methods suitable for widespread implementation in underserved communities with blinding trachoma. It stresses the importance of maximum participation of the people themselves in promotion of health care for the prevention and cure of blinding trachoma. This approach makes the best possible use of available but limited resources and is in accord with the defined health objectives and reorientation of health activities found in the Declaration of Alma-Ata on Primary Health Care.

The guide also outlines basic principles for the organization of trachoma-control programs. It summarizes present knowledge on the epidemiologic and clinical aspects of the disease, explains the most commonly used approach of large-scale trachoma treatment through control of infection transmission, and describes the more intensive treatment of individual cases. It also contains recommendations on training activities, health education, evaluation of results, and monitoring of programs. The basic methods described can be suitably adapted to local conditions and should allow the swift and effective implementation of trachoma-control programs.

Reported by WHO Weekly Epidemiological Record 1982;57:189-90.

Reference

1. World Health Organization. Guide to trachoma control. Geneva: World Health Organization 1981.

Epidemiologic Notes and Reports

Outbreak of *Yersinia enterocolitica* — Washington State

In December 1981 and January 1982, an outbreak of predominantly gastroenteritis caused by *Yersinia enterocolitica* occurred among 87 persons in Washington state. The illness was associated with the ingestion of a locally produced brand of tofu, an oriental soybean curd,

Yersinia enterocolitica — Continued

packed in untreated spring water. It was sold primarily in western Washington with limited distribution in Alaska, Idaho, and Oregon. *Y. enterocolitica* was isolated from the tofu, the processing plant's water supply, and several sites within the plant.

In mid-January 1982, the Seattle-King County Health Department received reports from two hospital laboratories of 12 positive stool cultures of *Y. enterocolitica* associated with gastrointestinal illness; during the previous year, 10 *Y. enterocolitica* isolates were reported in the entire county. Increased surveillance by Seattle-King County and the Washington State Department of Social and Health Services over several months identified additional cases, for a total of 87. A case was defined as anyone who was culture-positive and/or who had had contact with a case and had fever in conjunction with diarrhea or abdominal cramps.

Of the 87 cases, 56 were culture-positive; 38 patients had enteritis, six had only extra-intestinal infections, four had both extra-intestinal infections and enteritis, and eight were asymptomatic carriers. The 10 cases of extra-intestinal infection included patients with wound ulcers (two), inguinal lymphadenopathy (two, one with a perineal ulcer), pneumonia (two), labial infection (one), arthritis (one), septicemia (one), and pharyngitis (one). Nine (16.1%) of the 56 culture-positive patients were < 1 year of age, 12 (21.4%) were 1 to 4 years old, 7 (12.5%) were 5 to 18 years old, and 28 (50.0%) were > 18 years old. Among 38 culture-positive cases with enteritis, who tended to have more severe illness and on whom more complete information was available, the following were reported: fever (91%), abdominal pain (81%), diarrhea (76%), nausea (54%), vomiting (39%), bloody stools (27%), joint pain (42%), and skin rash (43%). Symptoms lasted from 1 day to 4 weeks (mean 10 days). Two patients, however, were ill for over 2 months. Seventeen patients were hospitalized for from 2 to 11 days (average 9.7 days); two of those hospitalized had appendectomies and one, a partial colectomy. One patient was also culture-positive for *Salmonella typhimurium* and one for rotavirus, as well as for *Y. enterocolitica*.

A neighborhood case-control study of 11 ill persons and 11 controls revealed an association between *Y. enterocolitica* infection and tofu consumption ($p < 0.01$). Questions regarding animal contacts, water sources, raw milk consumption, travel, and day-care settings, as well as extensive food histories, did not identify any other common sources. Further investigation revealed that 70 (80.5%) of the 87 persons interviewed had consumed the same brand of tofu within the 2 weeks before onset of symptoms. For five culture-positive persons who had consumed only one meal of tofu, the incubation period averaged 6.6 days (range 4-11 days).

The tofu plant in King County is located on a rural island in Puget Sound. The plant water supply, which originates from a spring approximately 0.5 mile from the plant, is shared by four residences and an apple-cider plant. No illness was reported among consumers of the cider. Inspection of the tofu plant on January 20, 1982, disclosed unsanitary conditions, including poor personal hygiene, use of an outdoor privy, and unsanitary equipment. Samples of tofu and the plant water supply were positive for *Y. enterocolitica*, as were stool specimens collected from two of 12 employees; both employees were asymptomatic.

A voluntary recall of the product was instituted from January 21 to January 25. Further sam-

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The editor welcomes accounts on 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.

Yersinia enterocolitica – Continued

pling and laboratory analysis of the tofu demonstrated high fecal-coliform counts. Production was resumed after a water-purification system was installed. Laboratory results of plasmid analysis, determination of enterotoxin production, and serotyping are pending.

Reported by C Nolan, MD, N Harris, DVM, Seattle-King County Health Dept, J Ballard, MS, J Allard, PhD, J Kobayashi, MD, State Epidemiologist, Washington State Dept of Social and Health Svcs.

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