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Epidemiologic Notes and Reports

Human Rabies Acquired Outside the United States from a Dog Bite

The second case of human rabies in the United States in 1981 has been reported to CDC. The illness occurred in a 40-year-old American man who was exposed to rabies in Mexico and returned to Tucson, Arizona, for treatment. He died on September 11, 24 days after onset of symptoms.

The patient, who was living in Empalme, Sonora, Mexico, had been bitten on the right hand by his dog on June 22. The animal was immediately killed, and the head shipped to the Hermosillo Health Laboratory, Hermosillo, Mexico, for rabies examination. Brain material examined histologically with Sellers' stain revealed no evidence of Negri bodies diagnostic of rabies. Because of the laboratory report and a history of recent rabies vaccination of the dog, the man was not given rabies post-exposure prophylaxis.

The patient remained well until August 19, 58 days after the bite, when he developed paresthesias and numbness of his right hand near the site of the bite. During the next several days, he complained of fever, malaise, and aching in his right arm. By August 24, 6 days after onset of symptoms, the patient noted spasms of his throat, especially when drinking water. A local physician discussed the possibility of rabies, but the patient discounted the diagnosis. Increasing agitation and insomnia ensued and hydrophobia became so severe that he elected not to shower because of the resulting painful throat spasms. On August 26, the patient traveled to Tucson, Arizona, where he was admitted to the University of Arizona Health Sciences Center with the probable diagnosis of rabies.

In the first 24 hours after admission, the patient was lucid and able to give a coherent medical history. On examination the patient was agitated with marked pharyngeal and neck muscle spasms when water was wiped on his forehead or when a stream of air was directed at his face. Right-arm weakness and right deltoid fasciculations were initially observed, and the illness progressed to flaccid paralysis of all limbs within 72 hours.

Immediately after his admission, a neck biopsy was done, and the diagnosis of rabies was confirmed by direct fluorescent antibody testing of the tissue at CDC. He was given a single dose each of human diploid cell rabies vaccine and human rabies immune globulin (HRIG). A lumbar puncture revealed an opening pressure of 270 ml H_2O, a protein level of 26 mg/dL, a glucose level of 82 mg/dL, and no cells. Urinalysis showed a specific gravity of 1.033 and was otherwise normal. Hematology examination revealed a white blood count of 14,200 with 81% polymorphonucleocytes, 2 band forms, 12 lymphocytes, and 5 monocytes. Multiple specimens were obtained for virus isolation from nasopharygeal, rectal, throat, and conjunctival swabs, whole blood, tracheal aspirates, urine and urine sediment, and cerebrospinal fluid (CSF).

Human Rabies – Continued

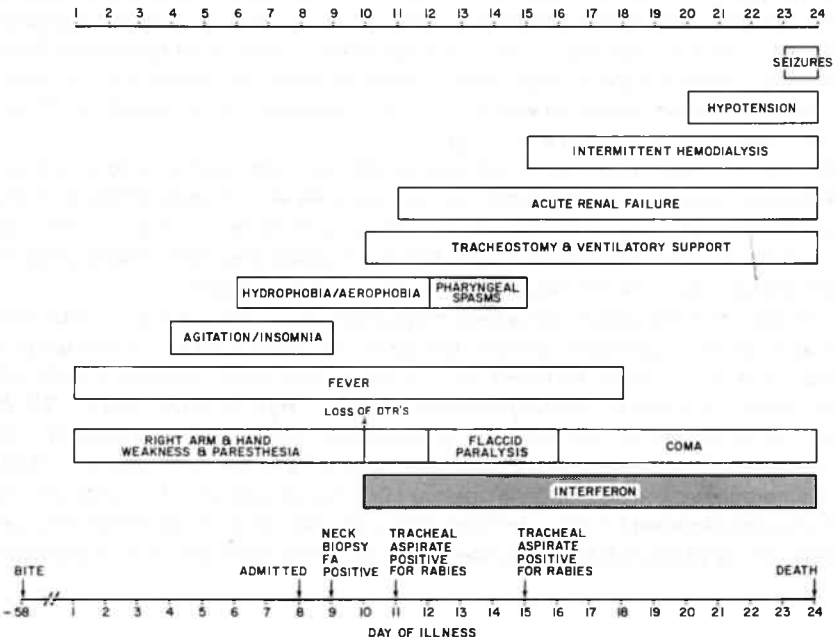
An interferon treatment protocol was begun on the tenth day of illness. Human leukocyte interferon was given twice a day intramuscularly and once a day intraventricularly through an Omaya reservoir connected by a cannula to the right lateral ventricle of his brain.

Despite intensive support, his course was complicated by bilateral bronchopneumonia, acute renal failure, hypotension, autonomic instability, and seizures (Figure 1). He died suddenly of respiratory and vascular collapse on September 11.

Serum and CSF collected daily for the entire period of hospitalization remained negative for rabies antibody by rapid fluorescent focus inhibition test done at CDC. Isolation of rabies virus was confirmed by mouse inoculation from a throat swab and tracheal aspirate on the eleventh day of illness and from another tracheal aspirate on the fifteenth day of illness. No virus was isolated from daily CSF samples. Direct fluorescent antibody staining of frozen post-mortem tissue was positive for rabies antigen from kidney parenchyma, bladder nerve tissue, skin of the neck, skin from the bite site, occipital nerve, pharynx, choroid plexis, sural nerve, dorsal root ganglion, stellate ganglion, right radial nerve, cervical spinal cord, hippocampus, and pons.

Questioning of the patient and his family revealed no known possible rabies exposure other than the dog bite. The patient also owned 3 other dogs. The male dog that had bitten him had been unusually aggressive for 3 or 4 days before the bite incident. It was assumed this behavior resulted from contact with another of the dogs, a female in estrus. Several weeks after the bite incident, the female died of a paralytic disease and was buried without being examined. Within the previous year, all 4 of the patient's dogs had been vaccinated for rabies with inactivated suckling mouse brain vaccine. The patient's wife refused to destroy the 2 remaining dogs, and they remain well as of October 1.

FIGURE 1. Clinical course of a human rabies case, by day of illness, Tucson, Arizona, 1981



DTR – DEEP TENDON REFLEX
FA – RABIES FLUORESCENT ANTIBODY

Human Rabies – Continued

Post-exposure prophylaxis with human diploid cell rabies vaccine and human rabies immune globulin was given to 5 family/friend contacts of the patient in Tucson as well as 32 hospital personnel. Four additional family members were treated in Mexico with suckling mouse brain vaccine. Of the 32 treated hospital contacts, 19 had open wound or mucous membrane exposures, 6 were exposed at the postmortem examination, 3 had needle punctures, and 3 had close patient contact. One person without documented exposure was treated because of intractable anxiety about contracting rabies after being in the same room with the patient.

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Editorial Note: The patient, who apparently acquired his infection in Mexico from a dog bite, is the second person reported to have died from rabies in the United States in 1981. During the 12-year period 1970-1981, 15 of the 25 human rabies cases in the United States were due to a known animal exposure. Of these 15 cases, 8 were exposed by dogs and 7 of the 8 were exposed in Mexico, Puerto Rico, or the Philippines. This report illustrates the continuing risk of acquiring rabies from dog bites outside the United States.

The histologic staining of brain material from the dog was negative for rabies; the histologic technique (Sellers' stain) is known to give false-negative results in 10% of specimens from dogs clinically ill with rabies (1). Direct fluorescent antibody staining of brain material is the recommended technique. Although the dog had a history of rabies vaccination within the previous year, the patient had stored vaccine in his own refrigerator and had vaccinated the dogs himself. There is no way to determine whether the vaccine was potent at the time of delivery. Because vaccines are susceptible to loss of potency through mishandling, it is strongly recommended that vaccination be given only by or under the supervision of a veterinarian. Despite the negative laboratory results and the positive vaccination history of the dog, the initial onset of paresthesias and numbness at the bite site and right-arm weakness incriminate the dog bite as the source of infection.

The treatment of this man with antirabies vaccine and HRIG was discontinued after only one dose of each because there is no evidence to suggest that vaccine and HRIG administered after onset of disease is of any benefit and there is some evidence to suggest that their administration after onset of disease may even be harmful.

This is the first case of human rabies treated with interferon in the United States. In animal studies interferon has been shown to offer protection against challenge by rabies virus only when it is administered before or shortly after virus challenge (*2,3*). In this case, the interferon therapy was initiated more than 2 months after exposure and after infection had occurred. Since rabies vaccine is an effective postexposure treatment, it is not practical to give interferon treatment, which is still experimental and extremely costly, to persons immediately after exposure. However, once clinical disease develops, the use of interferon is justified because clinical rabies is almost uniformly fatal despite active or passive immunization.

This patient died 24 days after onset of clinical illness, and it is of interest that there had been no demonstrable rabies antibody in either CSF or serum. The possible immunosuppressive effect of interferon needs to be evaluated (*4,5*). In addition, virus was isolated from a tracheal aspirate 5 days after interferon therapy was begun, and the clinical course was similar to that of other rabies cases reported in the United States (*6*). Further experience with interferon use for clinical rabies is necessary before conclusions can be drawn about its effectiveness.

Human Rabies — Continued

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Typhoid Fever — San Antonio, Texas, 1981

In the period August 16-October 15, 1981, 72 cases of typhoid fever were reported to the San Antonio Metropolitan Health District. The annual number of such cases in the last 30 years has ranged from 0 to 6 in this city.

The mean age of patients was 19 years (range 1-60); 42 were women and 30, men.

(Continued on page 545)

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

DISEASE	43rd WEEK ENDING			CUMULATIVE, FIRST 43 WEEKS		
	October 31 1981	October 25 1980	MEDIAN 1976-1980	October 31 1981	October 25 1980	MEDIAN 1976-1980
Aseptic meningitis	185	308	199	7,661	6,288	5,334
Brucellosis	3	10	3	131	156	156
Chickenpox	1,018	906	997	172,483	161,457	161,457
Encephalitis: Primary (arthropod-borne & unspec.)	31	28	30	1,151	980	980
Post-infectious	-	8	3	69	181	186
Gonorrhea: Civilian	16,471	21,991	21,991	828,658	829,232	829,232
Military	481	434	453	23,056	22,824	22,824
Hepatitis: Type A	474	594	586	20,616	23,198	24,597
Type B	417	346	307	16,846	14,695	12,411
Type unspecified	195	282	203	9,031	9,490	7,267
Leprosy	4	7	3	210	178	129
Malaria	13	21	17	1,151	1,665	624
Measles (rubeola)	31	15	125	2,802	13,074	24,670
Meningococcal infections: Total	55	35	27	2,902	2,234	2,013
Civilian	55	35	27	2,891	2,218	1,989
Military	-	-	-	11	16	17
Mumps	57	93	133	3,581	7,554	14,170
Pertussis	23	24	24	1,024	1,422	1,422
Rubella(German measles)	9	18	79	1,856	3,435	11,047
Syphilis (Primary & Secondary): Civilian	499	802	555	25,256	22,272	20,060
Military	9	6	6	323	262	258
Tuberculosis	599	557	557	22,454	22,410	24,024
Tularemia	3	2	2	217	185	141
Typhoid fever	15	9	9	497	432	427
Typhus fever, tick-borne (RMSF)	8	12	14	1,133	1,102	1,002
Rabies, animal	89	128	80	6,155	5,469	2,658

TABLE II. Notifiable diseases of low frequency, United States

	CUM. 1981		CUM. 1981
Anthrax	-	Poliomyelitis: Total	7
Botulism	64	Paralytic	6
Cholera	4	Psittacosis (Calif. 1)	89
Congenital rubella syndrome	10	Rabies, human	1
Diphtheria (Wash. 1)	4	Tetanus (Ill. 1, S.C. 1)	51
Leptospirosis (Fla. 1, Hawaii 2)	41	Trichinosis (N.J. 1)	116
Plague	9	Typhus fever, flea-borne (endemic, murine)	37

TABLE III. Cases of specified notifiable diseases, United States, weeks ending October 31, 1981 and October 25, 1980 (43rd week)

REPORTING AREA	ASEPTIC MENINGITIS	BRUCELLOSIS	CHICKEN POX	ENCEPHALITIS		GONORRHEA (Civilian)		HEPATITIS (Viral), by type			LEPROSY
				Primary	Post-infectious			A	B	Unspecified	
	1981	CUM. 1981	1981	CUM. 1981	CUM. 1981	CUM. 1981	CUM. 1980	1981	1981	1981	CUM. 1981
UNITED STATES	185	131	1,018	1,151	69	828,658	829,232	474	417	195	210
NEW ENGLAND	5	4	151	39	7	20,755	21,011	8	21	18	3
Maine	1	-	41	1	-	1,100	1,218	-	1	-	-
N.H.	-	-	6	4	-	736	734	1	-	-	-
Vt.	-	-	2	-	-	362	475	1	2	-	-
Mass.	1	3	39	15	-	8,629	8,851	3	4	16	2
R.I.	-	1	8	1	2	1,206	1,357	1	1	-	-
Conn.	3	-	55	18	5	8,722	8,376	2	13	2	1
MID. ATLANTIC	21	7	31	95	8	99,274	92,157	46	46	23	13
Upstate N.Y.	12	3	30	26	3	17,357	16,641	12	21	8	3
N.Y. City	U	1	U	19	-	40,490	36,367	U	U	U	8
N.J.	5	1	N	14	-	18,839	16,656	34	25	15	2
Pa.	4	2	1	36	5	22,588	22,493	U	U	U	-
E.N. CENTRAL	26	6	420	394	6	122,158	128,067	47	38	9	20
Ohio	14	1	53	206	2	39,056	33,733	10	5	4	-
Ind.	U	1	U	107	3	10,404	13,128	U	U	U	-
Ill.	-	-	54	6	-	33,893	40,168	15	14	1	18
Mich.	12	2	179	58	1	27,341	29,089	16	18	4	2
Wis.	-	2	134	17	-	11,464	11,949	6	1	-	-
W.N. CENTRAL	14	17	148	86	6	40,198	39,519	16	27	4	3
Minn.	8	4	-	37	3	6,305	6,453	4	1	1	1
Iowa	2	4	77	24	2	4,397	4,214	6	4	-	-
Mo.	3	4	1	9	-	18,787	17,402	3	12	1	-
N. Dak.	-	-	1	1	-	500	557	-	-	-	-
S. Dak.	-	1	39	-	-	1,066	1,161	-	1	-	-
Nebr.	1	1	8	4	-	2,961	3,044	2	6	1	-
Kans.	-	3	22	11	1	6,182	6,688	1	3	1	2
S. ATLANTIC	28	30	146	124	19	204,850	207,975	51	105	32	12
Del.	-	2	-	-	-	3,265	2,930	2	-	1	-
Md.	2	-	15	20	2	24,130	22,142	2	25	5	2
D.C.	-	-	-	-	-	11,598	14,309	1	-	1	-
Va.	5	8	6	36	3	18,821	19,026	1	6	3	3
W. Va.	1	1	75	19	-	3,089	2,754	3	4	1	-
N.C.	2	1	N	30	1	31,736	31,030	3	7	3	-
S.C.	3	-	-	4	-	19,911	19,578	4	8	-	7
Ga.	1	6	4	2	-	42,578	40,463	7	8	-	-
Fla.	14	12	46	13	13	49,722	55,743	28	47	18	-
E.S. CENTRAL	24	12	4	138	7	69,953	67,869	29	34	8	-
Ky.	11	1	4	21	2	8,530	9,886	16	11	3	-
Tenn.	5	5	N	79	1	26,280	24,436	9	17	1	-
Ala.	7	4	-	21	2	20,750	20,205	3	3	4	-
Miss.	1	2	-	17	2	13,393	13,342	1	3	-	-
W.S. CENTRAL	14	36	60	105	4	109,473	104,951	120	45	35	22
Ark.	-	5	-	5	-	8,251	8,477	7	3	3	1
La.	1	1	N	7	1	18,821	19,092	27	16	12	-
Okla.	1	7	-	21	1	11,939	10,446	6	4	-	-
Tex.	12	23	60	72	2	70,462	66,936	80	22	20	21
MOUNTAIN	17	5	1	39	2	32,558	32,062	36	14	18	5
Mont.	1	-	-	2	-	1,183	1,220	2	-	-	-
Idaho	5	-	-	-	-	1,451	1,415	1	-	-	1
Wyo.	-	-	-	1	-	823	930	1	1	-	-
Colo.	3	1	-	11	1	8,611	8,677	6	5	7	-
N. Mex.	-	-	-	-	-	3,655	3,860	4	2	-	-
Ariz.	3	1	N	15	-	9,729	8,637	16	5	5	3
Utah	5	-	1	9	1	1,631	1,609	1	-	2	-
Nev.	-	3	-	1	-	5,475	5,714	5	1	4	1
PACIFIC	36	14	57	131	10	130,439	135,621	121	87	48	132
Wash.	4	-	51	12	1	10,741	11,659	13	5	1	5
Oreg.	-	-	1	6	1	7,744	9,409	24	8	2	5
Calif.	26	14	2	104	8	105,980	108,522	82	59	43	83
Alaska	1	-	2	5	-	3,390	3,329	-	4	-	-
Hawaii	5	-	1	4	-	2,584	2,702	2	11	2	39
Guam	U	-	U	-	-	73	114	U	U	U	-
P.R.	4	-	20	1	-	2,694	2,254	4	5	-	2
V.I.	-	-	-	-	-	198	108	-	-	-	-
Pac. Trust Terr.	U	-	U	-	-	329	349	U	U	U	16

N: Not notifiable U: Unavailable

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending October 31, 1981 and October 25, 1980 (43rd week)

REPORTING AREA	MALARIA		MEASLES (RUBEOLA)			MENINGOCOCCAL INFECTIONS (Total)		MUMPS		PERTUSSIS	RUBELLA		
	1981	CUM. 1981	1981	CUM. 1981	CUM. 1980	1981	CUM. 1981	1981	CUM. 1981	1981	1981	CUM. 1981	CUM. 1980
UNITED STATES	13	1,151	31	2,802	13,074	55	2,902	57	3,581	23	9	1,856	3,435
NEW ENGLAND	4	64	-	86	675	4	190	8	185	2	-	121	207
Maine	-	1	-	5	33	1	24	1	35	-	-	33	68
N.H.	-	3	-	7	331	-	19	-	23	-	-	51	40
Vt.	-	6	-	3	226	-	8	-	6	-	-	-	3
Mass.	-	30	-	61	58	1	61	7	54	1	-	25	68
R.I.	-	3	-	-	2	-	17	-	23	1	-	-	9
Conn.	4	21	-	10	25	2	61	-	44	-	-	12	19
MID. ATLANTIC	1	146	22	872	3,809	15	419	2	603	5	-	222	560
Upstate N.Y.	1	33	1	217	696	4	135	-	123	4	-	107	214
N.Y. City	U	56	U	87	1,194	U	65	U	81	U	U	54	99
N.J.	-	42	-	58	838	3	93	1	96	-	-	48	101
Pa.	-	15	21	510	1,081	8	126	1	303	1	-	13	146
E.N. CENTRAL	1	54	-	81	2,442	10	354	17	1,010	2	1	378	824
Ohio	-	8	-	16	380	5	135	5	173	-	-	3	8
Ind.	U	6	U	9	92	U	46	U	113	U	U	132	350
Ill.	-	17	-	23	348	4	84	1	191	1	-	89	165
Mich.	1	23	-	30	247	1	82	7	331	-	-	34	127
Wis.	-	-	-	3	1,375	-	7	4	202	1	1	120	174
W.N. CENTRAL	1	32	-	10	1,337	6	139	1	206	-	-	78	202
Minn.	1	13	-	3	1,102	2	46	-	8	-	-	7	28
Iowa	-	4	-	1	20	-	25	1	63	-	-	4	9
Mo.	-	3	-	1	65	3	42	-	20	-	-	2	44
N. Dak.	-	1	-	-	-	-	2	-	-	-	-	-	6
S. Dak.	-	1	-	-	-	-	7	-	1	-	-	-	2
Nebr.	-	2	-	4	83	-	-	-	3	-	-	1	4
Kans.	-	8	-	1	67	1	17	-	111	-	-	64	109
S. ATLANTIC	-	139	1	446	1,960	10	663	8	514	2	1	142	338
Del.	-	1	-	-	3	-	4	-	10	1	-	1	1
Md.	-	34	-	5	83	-	45	2	93	-	-	1	68
D.C.	-	9	-	1	-	-	4	-	3	-	-	-	1
Va.	-	29	-	9	338	1	87	-	125	-	-	11	40
W. Va.	-	4	-	9	9	-	24	1	84	-	-	22	25
N.C.	-	12	-	3	130	2	96	2	22	-	-	5	46
S.C.	-	2	-	2	159	3	85	1	17	-	-	8	57
Ga.	-	8	-	112	826	-	107	-	38	-	-	37	-
Fla.	-	40	1	305	412	4	211	2	122	1	1	57	100
E.S. CENTRAL	1	11	-	5	331	2	201	5	87	-	-	36	85
Ky.	-	-	-	1	55	-	58	1	42	-	-	22	40
Tenn.	-	-	-	2	170	2	56	2	23	-	-	13	40
Ala.	-	9	-	2	22	-	62	2	18	-	-	1	3
Miss.	1	2	-	-	84	-	25	-	4	-	-	-	2
W.S. CENTRAL	3	91	6	888	956	4	452	7	216	4	1	169	134
Ark.	-	4	1	23	16	-	26	-	6	-	-	3	4
La.	-	8	-	4	11	-	109	-	5	-	-	9	12
Okla.	-	6	-	7	775	1	41	-	-	-	-	2	6
Tex.	3	73	5	854	154	3	276	7	205	4	1	155	112
MOUNTAIN	1	41	-	35	473	1	119	2	127	2	1	92	156
Mont.	-	1	-	-	2	-	9	-	11	-	-	4	45
Idaho	-	4	-	1	-	-	6	-	6	-	-	3	22
Wyo.	-	-	-	1	-	-	2	-	1	-	1	12	1
Colo.	-	19	-	10	24	1	43	-	45	-	-	27	12
N. Mex.	-	3	-	8	12	-	7	-	-	-	-	5	5
Ariz.	1	7	-	5	379	-	20	-	32	-	-	21	37
Utah	-	4	-	-	47	-	5	1	18	2	-	8	28
Nev.	-	3	-	10	9	-	27	1	14	-	-	12	6
PACIFIC	1	573	2	379	1,091	3	365	7	633	6	5	618	929
Wash.	-	25	-	3	177	-	64	1	149	-	1	90	84
Oreg.	-	15	-	5	-	-	51	-	64	-	-	51	62
Calif.	1	521	2	364	902	2	234	6	383	6	4	465	767
Alaska	-	3	-	-	6	1	12	-	15	-	-	1	12
Hawaii	-	9	-	7	6	-	4	-	22	-	-	11	4
Guam	U	2	U	5	6	U	-	U	7	U	U	1	2
P.R.	-	11	3	286	161	1	12	3	143	-	-	4	20
V.I.	-	4	-	25	6	-	1	-	5	-	-	1	-
Pac. Trust Terr.	U	-	U	1	12	U	-	U	15	U	U	1	1

U: Unavailable

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending October 31, 1981 and October 25, 1980 (43rd week)

REPORTING AREA	SYPHILIS (Civilian) (Primary & Secondary)		TUBERCULOSIS		TULAREMIA	TYPHOID FEVER		TYPHUS FEVER (Tick-borne) (RMSF)		RABIES, Animal
	CUM. 1981	CUM. 1980	1981	CUM. 1981	CUM. 1981	1981	CUM. 1981	1981	CUM. 1981	CUM. 1981
UNITED STATES	25,256	22,272	599	22,454	217	15	497	8	1,133	6,155
NEW ENGLAND	495	430	17	644	5	-	16	-	9	39
Maine	5	5	1	43	-	-	1	-	-	13
N.H.	11	5	1	19	-	-	-	-	-	7
Vt.	15	5	1	21	1	-	-	-	-	-
Mass.	313	255	10	369	3	-	8	-	5	11
R.I.	30	27	-	46	-	-	-	-	2	2
Conn.	121	133	4	146	1	-	7	-	2	6
MID. ATLANTIC	3,591	3,072	80	3,458	10	-	74	-	40	104
Upstate N.Y.	327	268	18	592	10	-	13	-	14	74
N.Y. City	2,141	1,989	U	1,286	-	U	40	U	3	-
N.J.	521	370	13	749	-	-	13	-	10	21
Pa.	602	445	49	831	-	-	8	-	13	9
E.N. CENTRAL	1,831	2,208	81	3,053	5	-	37	-	49	943
Ohio	252	316	14	554	-	-	10	-	39	63
Ind.	239	161	U	343	4	U	3	U	3	84
Ill.	956	1,321	26	1,238	-	-	15	-	6	503
Mich.	307	331	39	759	1	-	7	-	1	14
Wis.	77	79	2	159	-	-	2	-	-	279
W.N. CENTRAL	560	292	15	767	32	-	18	-	50	2,392
Minn.	171	99	2	131	-	-	2	-	2	424
Iowa	24	23	-	71	-	-	3	-	7	778
Mo.	314	137	5	354	26	-	8	-	26	220
N. Dak.	9	4	2	30	-	-	-	-	-	336
S. Dak.	2	4	-	56	1	-	1	-	-	279
Nebr.	9	7	2	25	3	-	2	-	3	174
Kans.	31	18	4	100	2	-	2	-	12	181
S. ATLANTIC	6,801	5,355	110	4,823	13	-	60	4	647	538
Del.	13	15	1	52	1	-	-	-	3	1
Md.	489	362	11	498	-	-	14	1	59	45
D.C.	553	396	6	288	-	-	1	-	1	-
Va.	588	476	8	488	3	-	1	-	105	115
W. Va.	22	16	5	154	-	-	6	-	6	29
N.C.	531	401	28	851	2	-	5	-	287	18
S.C.	477	312	11	447	3	-	1	1	102	41
Ga.	1,686	1,531	19	797	4	-	4	2	74	201
Fla.	2,442	1,846	21	1,248	-	-	28	-	10	88
E.S. CENTRAL	1,647	1,847	72	2,018	10	1	9	1	132	410
Ky.	82	115	21	496	3	-	-	-	2	114
Tenn.	606	772	19	674	7	-	3	1	82	194
Ala.	480	414	19	553	-	1	4	-	21	98
Miss.	479	546	13	295	-	-	2	-	27	4
W.S. CENTRAL	6,091	4,515	88	2,561	97	1	125	2	170	980
Ark.	127	181	5	283	51	-	4	-	38	139
La.	1,372	1,136	16	457	5	-	2	-	1	33
Okla.	146	92	-	272	26	-	4	-	95	193
Tex.	4,446	3,106	67	1,549	15	1	115	2	36	615
MOUNTAIN	634	518	17	613	36	-	23	-	28	239
Mont.	11	2	-	30	5	-	4	-	12	111
Idaho	18	16	1	9	4	-	-	-	5	7
Wyo.	14	11	1	10	1	-	-	-	5	17
Colo.	190	143	-	71	9	-	8	-	1	35
N. Mex.	112	88	2	119	3	-	-	-	-	27
Ariz.	158	176	10	283	-	-	10	-	-	25
Utah	25	13	3	50	13	-	1	-	2	11
Nev.	106	69	-	41	1	-	-	-	3	6
PACIFIC	3,606	4,035	119	4,517	9	13	135	1	8	510
Wash.	131	210	6	316	1	-	3	-	1	15
Oreg.	97	93	2	155	1	-	4	-	-	9
Calif.	3,305	3,591	102	3,849	7	13	124	1	7	470
Alaska	12	8	-	48	-	-	-	-	-	16
Hawaii	61	133	9	149	-	-	4	-	-	-
Guam	-	5	U	30	-	U	-	U	-	-
P.R.	554	508	9	395	-	-	4	-	-	70
V.I.	18	10	-	1	-	-	6	-	-	-
Pac. Trust Terr.	-	-	U	49	-	U	-	U	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending October 31, 1981 (43rd week)

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)						P&I** TOTAL
	ALL AGES	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	702	486	145	36	17	18	52
Boston, Mass.	186	108	44	16	6	12	14
Bridgeport, Conn.	64	48	13	1	2	–	7
Cambridge, Mass.	22	13	6	3	–	–	1
Fall River, Mass.	28	22	4	2	–	–	–
Hartford, Conn.	49	26	18	4	–	1	3
Lowell, Mass.	36	26	7	–	2	1	4
Lynn, Mass.	23	17	5	–	1	–	2
New Bedford, Mass.	22	19	3	–	–	–	1
New Haven, Conn.	66	43	16	5	2	–	4
Providence, R.I. §	44	44	–	–	–	–	2
Somerville, Mass.	11	9	2	–	–	–	1
Springfield, Mass.	67	42	18	3	3	1	3
Waterbury, Conn.	35	31	2	1	–	1	5
Worcester, Mass.	49	38	7	1	1	2	5
MID. ATLANTIC	2,809	1,894	606	163	60	85	112
Albany, N.Y.	53	38	9	1	2	3	3
Allentown, Pa.	22	17	5	–	–	–	–
Buffalo, N.Y.	150	101	39	4	2	4	–
Camden, N.J.	25	19	4	–	1	1	1
Elizabeth, N.J.	23	8	12	3	–	–	–
Erie, Pa.†	39	30	4	2	1	2	4
Jersey City, N.J.	40	28	7	4	–	1	–
N.Y. City, N.Y.	1,505	1,001	325	102	32	45	59
Newark, N.J.	64	34	16	7	3	4	3
Paterson, N.J.	32	20	10	–	1	1	–
Philadelphia, Pa.†	271	176	60	18	7	10	13
Pittsburgh, Pa.†	201	129	52	10	4	6	8
Reading, Pa.	29	22	7	–	–	–	4
Rochester, N.Y.	124	85	27	6	3	3	7
Schenectady, N.Y.	26	19	6	–	1	–	1
Scranton, Pa.†	34	24	7	3	–	–	4
Syracuse, N.Y. §	93	85	1	2	1	3	1
Trenton, N.J.	28	21	3	–	2	2	1
Utica, N.Y.	18	12	6	–	–	–	1
Yonkers, N.Y.	32	25	6	1	–	–	2
E.N. CENTRAL	2,261	1,496	484	124	70	81	54
Akron, Ohio	63	48	7	3	3	2	–
Canton, Ohio	39	24	11	3	1	–	2
Chicago, Ill.	544	318	146	44	13	23	7
Cincinnati, Ohio	136	92	26	6	5	7	5
Cleveland, Ohio	165	98	50	8	1	8	1
Columbus, Ohio	133	74	40	7	6	6	3
Dayton, Ohio	104	66	25	3	5	5	2
Detroit, Mich. §	272	240	1	8	8	9	4
Evansville, Ind.	47	33	9	2	3	–	2
Fort Wayne, Ind.	47	35	7	1	3	1	2
Gary, Ind.	7	4	–	3	–	–	–
Grand Rapids, Mich.	46	29	10	1	3	3	2
Indianapolis, Ind.	193	110	52	19	7	5	7
Madison, Wis.	37	27	5	1	3	1	3
Milwaukee, Wis.	139	97	33	4	1	4	–
Peoria, Ill.	43	30	8	1	3	1	5
Rockford, Ill.	53	35	14	2	–	2	3
South Bend, Ind.	37	27	7	1	–	2	2
Toledo, Ohio	98	68	22	3	4	1	4
Youngstown, Ohio	58	41	11	4	1	1	–
W.N. CENTRAL	714	462	142	42	28	40	26
Des Moines, Iowa	56	37	10	3	5	1	2
Duluth, Minn.	20	13	4	–	1	2	–
Kansas City, Kans.	29	19	6	1	2	1	2
Kansas City, Mo.	76	52	17	–	2	5	6
Lincoln, Nebr.	29	19	6	3	1	–	2
Minneapolis, Minn.	101	63	14	8	4	12	3
Omaha, Nebr.	80	52	20	4	1	3	–
St. Louis, Mo.	176	111	39	16	5	5	2
St. Paul, Minn.	76	57	15	–	3	1	3
Wichita, Kans.	71	39	11	7	4	10	6

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)						P&I** TOTAL
	ALL AGES	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,249	721	325	113	47	42	54
Atlanta, Ga.	140	77	37	15	5	6	7
Baltimore, Md.	221	138	51	24	5	3	6
Charlotte, N.C.	77	43	21	6	3	3	7
Jacksonville, Fla.	122	64	39	12	3	4	5
Miami, Fla.	98	51	30	10	5	2	–
Norfolk, Va.	52	28	13	7	3	1	4
Richmond, Va.	76	34	28	10	2	2	8
Savannah, Ga.	46	31	6	6	2	1	4
St. Petersburg, Fla.	110	89	15	1	2	3	4
Tampa, Fla.	79	50	16	5	5	3	4
Washington, D.C.	182	89	54	16	9	14	3
Wilmington, Del.	46	27	15	1	3	–	2
E.S. CENTRAL	689	401	183	55	23	27	35
Birmingham, Ala.	98	56	25	9	4	4	2
Chattanooga, Tenn.	75	40	23	8	4	–	10
Knoxville, Tenn.	37	25	8	3	1	–	1
Louisville, Ky.	93	62	23	3	1	4	5
Memphis, Tenn.	174	91	52	17	5	9	9
Mobile, Ala.	69	48	13	3	5	–	3
Montgomery, Ala.	34	23	9	–	–	2	1
Nashville, Tenn.	109	56	30	12	3	8	4
W.S. CENTRAL	1,216	680	304	121	68	43	40
Austin, Tex.	52	32	12	4	4	–	1
Baton Rouge, La.	29	15	7	1	2	4	–
Corpus Christi, Tex.	37	26	8	2	–	1	1
Dallas, Tex.	190	104	48	20	10	8	4
El Paso, Tex.	40	24	8	2	3	3	5
Fort Worth, Tex.	101	49	26	12	7	7	3
Houston, Tex.	324	167	83	43	24	7	4
Little Rock, Ark.	50	23	15	6	6	–	6
New Orleans, La.	136	76	40	11	4	5	2
San Antonio, Tex.	137	89	31	7	6	4	7
Shreveport, La.	40	27	7	5	1	–	1
Tulsa, Okla.	80	48	19	8	1	4	6
MOUNTAIN	630	390	147	35	36	22	26
Albuquerque, N. Mex.	69	43	14	5	5	2	8
Colo. Springs, Colo.	38	25	8	1	3	1	5
Denver, Colo.	125	77	34	4	4	6	6
Las Vegas, Nev.	64	27	21	6	7	3	1
Ogden, Utah	10	4	3	–	1	2	–
Phoenix, Ariz.	146	99	25	10	8	4	1
Pueblo, Colo.	16	8	6	1	1	–	–
Salt Lake City, Utah	49	31	10	2	4	2	1
Tucson, Ariz.	113	76	26	6	3	2	4
PACIFIC	1,751	1,119	387	121	71	52	67
Berkeley, Calif.	20	11	4	4	1	–	–
Fresno, Calif.	82	56	16	4	3	3	5
Glendale, Calif.	23	18	4	–	1	–	1
Honolulu, Hawaii	46	30	12	1	2	1	2
Long Beach, Calif.	96	60	25	4	3	4	3
Los Angeles, Calif.	504	322	109	40	25	8	19
Oakland, Calif.	78	43	21	8	2	3	4
Pasadena, Calif.	27	18	5	1	1	2	2
Portland, Oreg.	107	72	19	9	4	3	–
Sacramento, Calif.	71	51	16	3	1	–	1
San Diego, Calif.	144	79	38	10	10	7	6
San Francisco, Calif.	169	114	38	7	4	6	4
San Jose, Calif.	154	97	31	12	11	3	11
Seattle, Wash.	134	83	31	12	2	6	2
Spokane, Wash.	49	36	7	4	1	1	5
Tacoma, Wash.	47	29	11	2	–	5	2
TOTAL	12,021††	7,649	2,723	810	420	410	466

*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 the past 4 weeks.

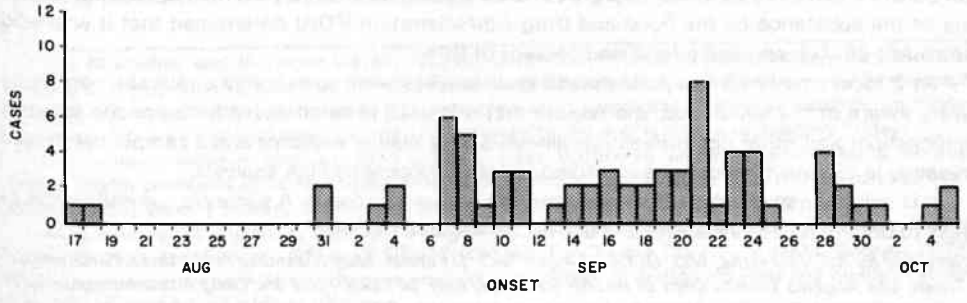
Typhoid Fever — Continued

Seventy-one were Hispanic and 58 lived on the predominantly Hispanic Westside of San Antonio. An initial investigation revealed no common sources of exposure. All patients had used water only from the municipal system and the city reported no recent breaks in water lines for the area where most patients lived. Dates of onset ranged over 6 weeks with no single peak (Figure 2). A questionnaire was administered to the first 25 patients in a search for common foods or common food sources. Analysis revealed 4 potential sources: snowcones from street vendors, food from either of 2 popular Westside fast-food establishments, and food from a specific tortilla molino (mill). A follow-up case-control study was performed. Two controls, matched for age, sex, and neighborhood of residence, were selected for each case. The only variable that demonstrated significance in the case-control study was the consumption of food from the tortilla molino ($p < .00001$); the 2 items purchased most commonly by patients were corn tortillas and barbacoa (a Mexican barbecue made of steamed cow head). The molino was closed to the public September 27; it was reopened October 8 after meeting local health department regulations for sanitation. Stool specimens from all 31 employees were cultured for *Salmonella typhi*, and serum specimens were assayed for antibodies to *S. typhi*. A stool culture from 1 employee yielded *S. typhi*, and serum specimens from 3 employees (including the culture-positive individual) showed an elevated antibody titer to the Vi antigen of *S. typhi*. None of the 3 reported a history of typhoid vaccination. Cultures of surface areas and food specimens did not yield *S. typhi*, although gram-negative bacteria were isolated from barbacoa at all levels of preparation.

Barbacoa is salted, unspiced cow head cooked overnight under steam pressure. Meat from the cow head is deboned manually by employees not wearing gloves and is held in a container on a heated grill at 160 F-175 F (71.1 C-79.4 C). It is sold in 1-2 pound portions. Corn tortillas are prepared from corn kernels mixed with a lime slurry (to remove cuticles). The mixture is boiled, washed, and ground into masa (meal), which is shaped manually into tortillas. The tortillas are heated for approximately 2 minutes on rollers warmed by gas jets and are then sorted manually by employees. The employee whose stool culture was positive for *S. typhi* worked at several locations in the molino including those where barbacoa is deboned and where corn tortillas are shaped and handled. It is not possible without long-term follow-up cultures to determine whether the employee was an acutely infected person or a chronic carrier.

All *S. typhi* isolates in specimens from patients were sensitive to chloramphenicol and ampicillin as assayed by hospital laboratories. CDC identified *S. typhi* in specimens from patients and from the employee suspected of being the carrier, as phage type degraded Vi approaching B.

FIGURE 2. Typhoid fever cases, by date of onset, San Antonio, Texas, August 17-October 5, 1981



Typhoid Fever — Continued

Reported by CN Rothe, MD, RF Bell, MD, San Antonio Metropolitan Health District, D Maserang, PhD, G Pierce, MA, J Taylor, MPH, CR Webb, Jr, MD, State Epidemiologist, Texas State Department of Health, Austin, Texas; Enteric Bacteriology and Epidemiology Br, Center for Infectious Diseases, Field Services Div, Epidemiology Program Office, CDC.

Editorial Note: In 1980, about 500 cases of typhoid fever were reported to CDC. The mean number of cases per year over the preceding 5 years was 405 (*1*). Among the cases reported in detail to CDC between 1977 and 1979, 63% were acquired in foreign countries, and 37% were acquired domestically. During this time period, only 25% of the domestic cases were associated with outbreaks. The last major common-source outbreak in the United States occurred in Dade County, Florida, in 1973, when over 300 of 1,600 exposed workers at a migrant labor camp had typhoid fever(*2*).

Routine culturing of food handlers is not recommended as previously described (*3*).

References

1. CDC. Summary—cases of specific notifiable diseases, United States. MMWR 1981;29:632.
2. Hoffman TA, Ruiz CJ, Counts GW, Sachs JM, Nitzkin JL. Waterborne typhoid fever in Dade County, Florida. Clinical and therapeutic evaluation of 105 bacteremic patients. Am J Med 1975:59;481-7.
3. CDC. Health examination of food handlers—Europe. MMWR 1981;30:267-73.

Use of Lead Tetroxide as a Folk Remedy for Gastrointestinal Illness

In June 1981, a 4-month-old Mexican-American infant was admitted to Olive View Medical Center in Los Angeles County with a 12-hour history of vomiting and diarrhea. Initially, the stools were watery and green; however, later bouts of diarrhea contained fresh blood. The boy weighed 5.85 kg; his temperature was 99.5 F (37.5 C) (rectal); heart rate, 148/minute; and respiratory rate, 40/minute. His abdomen was slightly protuberant and soft and the liver edge and spleen tip were palpable. The child was active and playful and showed no other abnormal signs.

An X ray of the abdomen revealed a radio-opaque substance in the stomach. Gastric lavage was performed immediately, and orange particles were observed. Orange particles mixed with blood had appeared in stools passed on the day of admission. The mother repeatedly denied having given any medicinal substance to the baby but when the potential danger of this unknown substance was explained, she admitted that a baby healer had given the infant an orange powder known in Mexico as azarcon.

The bloody diarrhea gradually subsided over a period of 4 days and when the baby showed no other evidence of poisoning, he was discharged on June 10.

An evaluation of the gastric aspirate revealed lead levels of 29,500 μg/L. Blood lead levels on June 11 and June 22 were 45 μg/dL and 27 μg/dL, respectively. Atomic absorption analysis of the substance by the Food and Drug Administration (FDA) determined that it was lead tetroxide (Pb_3O_4), and had a total lead content of 86%.

At 2 local county clinics, patients and their families were questioned about azarcon. Many were aware of the substance, and related that it is used in small doses for empacho (chronic indigestion) and other gastrointestinal illnesses. It is readily available and a sample purchased recently in Tijuana, Mexico, was identified as lead tetroxide by FDA analysis.

It is unknown at this time how common the use of azarcon is. A survey is currently in progress to determine its availability and use in Los Angeles County.

Reported by KK Vashistha, MD, UCLA; B Agee, MD, S Fannin, MD, S James, A Martinez, G Ramirez, S Tilsen, Los Angeles County Dept of Health Svcs; DB Barr, M Luke, Food and Drug Administration; Environmental Health Svcs Div, Center for Environmental Health, CDC.

Lead Tetroxide – Continued

Editorial Note: Children are exposed to lead from many sources, some of which may be unusual or occur infrequently. This is the first report CDC has received of azarcon as a source of childhood lead toxicity. The major sources of lead available to children are lead-based paint, soil and dust contaminated by lead-based paint, land used by lead-related industries, and lead deposits from automobile emissions and industrial air pollution. Other common, lower-dose sources include food, air, and water.

Distribution of lead tetroxide for consumption as a cure for gastrointestinal illnesses is of substantial concern. Authories in areas with Hispanic populations should be alert to this potential public health hazard. As illustrated above, parents are often reluctant to admit—especially to physicians—the use of folk remedies.

Children with lead toxicity are usually asymptomatic or have non-specific symptoms. Because of this and the estimated high prevalence rate of the disease (1,000 to 3,000/100,000 children, ages 1-5), CDC recommends that all children, ages 1-5, be screened for lead toxicity. In addition, medical providers should consider lead exposure when examining young children.

International Notes

Influenza Worldwide, June-September 1981

Influenza A (H3N2), (H1N1) and influenza B strains, which circulated early in the winter of 1980/81 in the Northern Hemisphere (*1*), have continued to be isolated in all regions of the world. In tropical regions, Asia, and the Southern Hemisphere, influenza A (H1N1) viruses were reported in Australia, Brazil, China (mainland and Taiwan), French Guiana, Hong Kong, India, New Zealand, Singapore, and South Africa from June to September, and influenza A (H3N2) viruses were isolated during the same period in many of these countries (Australia, China [mainland and Taiwan], India, Indonesia, New Zealand, and South Africa) as well as in Chile. The relative prevalence of the 2 influenza A subtypes has varied among different countries. For example, in Australia and Hong Kong, influenza A (H1N1) viruses were more common than influenza A (H3N2) viruses recently, whereas in Pune, India, and Cape Town, South Africa, most virus isolates were of influenza A (H3N2). Influenza B viruses have been less frequently reported recently, but have been isolated in Australia, Brazil, Indonesia, New Zealand and the Philippines. Antigenic analysis of viruses received at World Health Organization collaborating centers for influenza has shown the recent viruses to be generally similar to those in the Northern Hemisphere last winter; i.e., most influenza A (H1N1) strains are closely

The Morbidity and Mortality Weekly Report, circulation 97,000, is published by the Centers for Disease Control, Atlanta, Georgia. The data in this report are provisional, based on weekly telegraphs to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Send reports to: Attn: Editor, Morbidity and Mortality Weekly Report, Centers for Disease Control, Atlanta, Georgia 30333.

Send mailing list additions, deletions and address changes to: Attn: Distribution Services, Management Analysis and Services Office, 1-SB-419, Centers for Disease Control, Atlanta, Georgia 30333. When requesting changes be sure to give your former address, including zip code and mailing list code number, or send an old address label.

Influenza – Continued

related to A/England/333/80 which is considered a minor variant of A/Brazil/11/78 (*2*); influenza A (H3N2) strains generally are closely related to A/Texas/1/77 and A/Bangkok/1/79, and influenza B strains are related to B/Singapore/222/79.

Reported by the World Health Organization, Virus Diseases Unit, Geneva, Directors of national influenza laboratories, and the WHO Collaborating Center for Influenza; Viral Diseases Division, Center for Infectious Diseases, CDC.

References

1. CDC. Influenza—United States, Worldwide. MMWR 1981;30:23-4.
2. CDC. Antigenic analysis of influenza A viruses. MMWR 1981;30:110-11.

Notice to Readers

Tables I, II, and III (Notifiable Diseases) Revised

Beginning with this issue, the following changes have been made in Tables I, II, and III for notifiable diseases:

1. All diseases are listed in alphabetical order.
2. Notifiable diseases of low frequency are those with 150 or fewer reported cases in the previous year. Leprosy now appears in Tables I and III (Cases of specified notifiable diseases), and diphtheria and tetanus have been moved to Table II (Notifiable diseases of low frequency).
3. In Table III, please note that hepatitis categories are in alphabetical order.
4. In Tables II and III, if the column heading shows only the year, the number represents the report for the current week only; if "CUM" appears in the heading, the number represents cumulative total cases reported to date for the year listed.
5. Previously, corrections and delayed reports were not included in the cumulative totals until the following week. Beginning with this issue, the cumulative totals include all changes reported during the week currently shown in the tables.
6. The letters "N" and "U" define non-notifiable diseases and unavailable reports, respectively.

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