

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

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Epidemiologic Notes and Reports

Botulism in Infants — California

Since February 1976, 4 California infants, all 3 months of age or less, have been found to have botulism. In February a previously well, 5-week-old infant developed constipation, irritability, and weakness, first manifested by diminished crying and sucking. Over the next several days the baby lost neck and limb strength and became "floppy." Neurological impairment included ptosis, sluggish pupillary light reaction, facial weakness, flaccid neck and limb muscles, and poor anal sphincter tone. Stool from this infant collected at this time was later shown to contain type A botulinal toxin and *Clostridium botulinum* organisms; his serum was negative for toxin. Treatment was primarily supportive. Antibiotics were administered but antitoxin was not. The infant recovered completely and on follow-up had no neurological deficits. Botulinal toxin and organisms continued to be present in stool specimens for 8 weeks after complete clinical recovery.

After establishment of the diagnosis in the first case, another infant in Northern California and 2 infants in Southern California with similar clinical illnesses were identified. One of these infants had a respiratory arrest before being hospitalized. Stool specimens from these 3 infants contained toxin (2 type B and 1 type A) and *C. botulinum* organisms. Serum specimens were negative for toxin. These 3 other infants with botulism were treated with supportive care and antibiotics but with no botulinal antitoxin. All have recovered without sequelae.

An extensive investigation for the possible source of ingested toxin in each of the 4 cases has been unrevealing. In each instance, the infant was the only ill family member. Two infants were primarily breast-fed and 2 were formula-fed; however, all 4 infants had some exposure to other food. To date, no toxin has been found in samples of food or drugs that had been fed to the infants. *C. botulinum* organisms were isolated from honey that 1 infant had eaten.

It is unlikely that these infants were exposed to food with preformed toxin. Furthermore, an occult common-

source exposure does not appear to be responsible for these cases, since 2 were type A and 2 were type B.

Reported in California Morbidity No. 21, June 4, 1976, and No. 34 (Suppl), Sept 3, 1976.

Editorial Note: The California infants, along with a 2½-month-old New Jersey infant with confirmed type B botulism reported in 1975 (MMWR 25[9]), represent a new recognition of botulism in this age group. Identifying 5 cases in the last 18 months suggests that botulism in infants may be more common than previously recognized. Physicians should consider botulism in infants with unexplained weakness, ophthalmoplegia, dysphagia, or respiratory arrest. The presence of toxin in stool and not in serum in these 4 cases illustrates the importance of testing both types of specimens from each infant with suspected botulism.

One hypothesis of the pathogenesis of botulism in these infants is that *in vivo* germination of ingested *C. botulinum* spores resulted in the production of toxin in the infants' intestines. There is experimental evidence to support this concept (1,2).

C. botulinum spores are found in soil and dust; therefore, they may be found on raw foods. Since the spores are heat-resistant, even well-cooked food may also contain viable *C. botulinum* spores. There are thus several potential environmental sources of *C. botulinum* organisms for susceptible infants.

The mechanism of recovery from the illness remains obscure, particularly since toxin and organisms have been found in stool for at least 8 weeks after clinical recovery. Antibodies to botulinum toxin have not been measured to determine if humoral immunity may contribute to recovery. *C. botulinum* organisms may ultimately be eliminated by competition produced by other bacterial flora.

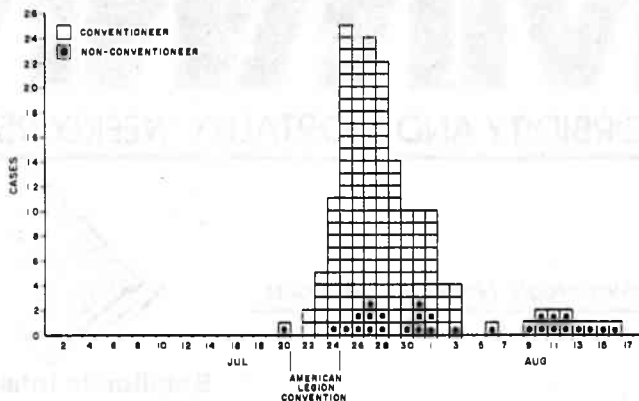
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1. Orr PF: The pathogenicity of *Bacillus botulinus*. J Infect Dis 30:118-127, 1922
2. Coleman GE, Meyer KF: Pathogenicity of *B. botulinus*. J Infect Dis 31:622-649, 1922

Follow-up — Respiratory Disease — Philadelphia

As of August 31, 1976, there were 179 cases of respiratory illness including 28 deaths that could be related to attendance at the American Legion convention in Philadelphia or to the headquarters hotel with onsets between July 1 and August 18, 1976 (Figure 1). * Affected were 148 conventioners and 31 non-conventioners. Cases ranged in age from 3 to 83 years, mean age 55.6 years; 140 were males; 68 were known to have significant preexisting illness, such as cardiopulmonary disease, diabetes mellitus, and malignancy. The case-fatality ratio was 29% for those with preexisting illness and 5% for those without. Seven cases including 2 who died were persons who had attended the Eucharistic Congress in Philadelphia on August 1 — 8. Preliminary autopsy findings for a 62-year-old man who became ill on August 11 suggested bacterial pneumonia. The other case who died was a 71-year-old woman who became ill on August 12 and died on August 25. Autopsy materials from

FIGURE 1. Epidemic respiratory disease*, by date of onset, Philadelphia, July 1 — August 18, 1976.



*Total 179 cases, date of onset unknown for 2

both cases have been sent to the Center for Disease Control (CDC) for review.

Preliminary evidence indicates that neither food nor drink can be significantly implicated as sources of the disease agent. Distribution of most cases at the headquarters hotel by room of occupancy showed no unusual pattern of occurrence. (Continued on page 275)

* A case is defined as illness occurring between July 1 and August 18, 1976, characterized by either fever and chest X-ray evidence of pneumonia, or temperature of 102°F or higher and cough (clinical criteria) in a person who either attended the American Legion convention in Philadelphia or had been in the headquarters hotel after July 1, 1976. Persons who meet the case criteria are hereafter referred to as "cases."

Table I. Summary—Cases of Specified Notifiable Diseases: United States

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

DISEASE	34th WEEK ENDING		MEDIAN 1971-1975	CUMULATIVE, FIRST 34 WEEKS		
	August 28, 1976	August 23, 1975		August 28, 1976	August 23, 1975	MEDIAN 1971-1975
Aseptic meningitis	85	138	184	1,583	1,931	1,926
Brucellosis	3	5	6	163	152	120
Chickenpox	259	359	---	146,341	116,303	---
Diphtheria	1	4	3	124	204	119
Encephalitis						
{ Primary	41	79	41	588	662	614
{ Post-Infectious	5	6	6	196	225	204
Hepatitis, Viral						
{ Type B	282	273	192	9,567	7,511	6,002
{ Type A	631	653	1,000	22,425	22,846	32,981
{ Type unspecified	193	163	---	5,770	5,277	---
Malaria	14	17	13	286	268	268
Measles (rubeola)	63	92	171	34,213	21,069	23,999
Meningococcal infections, total	12	19	17	1,102	1,022	1,012
Civilian	12	19	17	1,093	999	987
Military	---	---	---	9	23	25
Mumps	146	269	326	32,078	46,156	54,589
Pertussis	25	52	---	634	976	---
Rubella (German measles)	30	48	140	10,510	14,654	20,389
Tetanus	2	6	2	37	57	60
Tuberculosis	747	678	---	22,041	21,770	---
Tularemia	3	---	4	89	83	92
Typhoid fever	5	6	8	241	203	224
Typhus, tick-borne (Rky. Mt. spotted fever)	29	32	24	638	612	489
Venereal Diseases:						
Gonorrhea						
{ Civilian	23,098	20,750	---	651,684	635,592	---
{ Military	577	604	---	19,427	19,830	---
Syphilis, primary and secondary						
{ Civilian	460	463	---	15,767	16,706	---
{ Military	7	1	---	230	233	---
Rabies in animals	75	36	59	1,821	1,643	2,441

Table II. Notifiable Diseases of Low Frequency: United States

	CUM.		CUM.
Anthrax:	2	Poliomyelitis, total:	8
Botulism:	19	Paralytic:	7
Congenital rubella syndrome:	15	Paratuberculosis: Nebraska 20	50
Leprosy: Hawaii 3	94	Rabies in man:	1
Leptospirosis: Ark. 1	28	Trichinosis:	66
Plague:	12	Typhus, murine: Tex. 2	35

Table III
Cases of Specified Notifiable Diseases: United States
Weeks Ending August 28, 1976 and August 23, 1975 - 34th Week

AREA REPORTING	ASEPTIC MENIN- GITIS	BRUCEL- LOSIS	CHICKEN- POX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS, VIRAL			MALARIA	
						Primary: Arthropod- borne and Unspecified		Post In- fectious	Type B	Type A	Type Unspecified		
						1976	1975	1976	1975	1976	1975		
UNITED STATES	85	3	259	1	124	41	79	5	282	631	193	14	286
NEW ENGLAND	5	-	13	-	-	-	1	-	6	18	10	-	13
Maine	-	-	2	-	-	-	-	-	-	1	-	-	-
New Hampshire	-	-	-	-	-	-	-	-	-	2	-	-	-
Vermont	1	-	-	-	-	-	-	-	1	3	1	-	-
Massachusetts	-	-	4	-	-	-	-	-	2	1	8	-	6
Rhode Island	2	-	5	-	-	-	-	-	1	3	-	-	3
Connecticut	2	-	2	-	-	-	1	-	2	8	1	-	4
MIDDLE ATLANTIC	19	-	21	-	-	8	5	2	50	42	18	5	58
Upstate New York	8	-	4	-	-	2	4	-	7	17	4	-	11
New York City	2	-	16	-	-	-	-	-	15	14	-	1	24
New Jersey	5	-	NN	-	-	-	-	-	19	6	12	4	14
Pennsylvania	4	-	1	-	-	6	1	2	9	5	2	-	9
EAST NORTH CENTRAL ..	8	-	111	-	-	16	10	2	46	81	30	-	16
Ohio	3	-	5	-	-	12	6	1	4	15	-	-	7
Indiana	-	-	6	-	-	1	-	-	2	1	13	-	-
Illinois	-	-	7	-	-	-	1	-	20	25	11	-	2
Michigan	4	-	46	-	-	2	1	-	10	29	6	-	6
Wisconsin *	1	-	47	-	-	1	2	1	10	11	-	-	1
WEST NORTH CENTRAL ..	5	-	9	-	4	5	15	1	17	35	9	-	17
Minnesota	-	-	-	-	-	3	-	-	8	11	-	-	3
Iowa	-	-	3	-	-	-	-	1	4	3	1	-	-
Missouri *	4	-	6	-	1	2	1	-	3	7	4	-	9
North Dakota	1	-	-	-	-	-	10	-	-	2	-	-	-
South Dakota	-	-	-	-	3	-	4	-	-	1	-	-	3
Nebraska	-	-	-	-	-	-	-	-	-	1	-	-	1
Kansas	-	-	-	-	-	-	-	-	2	10	4	-	1
SOUTH ATLANTIC	6	1	36	-	-	1	6	-	31	113	24	3	49
Delaware	-	-	-	-	-	-	-	-	-	5	-	-	-
Maryland	-	-	3	-	-	-	3	-	11	4	7	2	9
District of Columbia ..	-	-	1	-	-	-	-	-	-	-	-	-	5
Virginia	3	1	-	-	-	1	-	-	2	11	-	-	8
West Virginia *	-	-	20	-	-	-	1	-	-	3	1	-	3
North Carolina	-	-	NN	-	-	-	-	-	5	9	4	-	4
South Carolina	-	-	1	-	-	-	-	-	-	3	5	-	1
Georgia	-	-	-	-	-	-	-	-	-	25	-	-	4
Florida	3	-	11	-	-	-	2	-	13	53	7	1	15
EAST SOUTH CENTRAL ..	8	2	-	-	-	2	31	-	15	52	1	-	1
Kentucky	-	-	-	-	-	-	1	-	4	5	-	-	-
Tennessee	5	-	NN	-	-	1	-	-	9	30	1	-	-
Alabama	2	-	-	-	-	1	5	-	2	8	-	-	-
Mississippi	1	2	-	-	-	-	25	-	-	9	-	-	1
WEST SOUTH CENTRAL ..	3	-	14	-	1	4	5	-	29	41	34	-	12
Arkansas	1	-	1	-	-	1	1	-	2	10	1	-	-
Louisiana *	-	-	NN	-	-	-	-	-	6	4	5	-	1
Oklahoma	2	-	-	-	-	-	1	-	-	6	1	-	2
Texas	-	-	13	-	1	3	3	-	21	21	27	-	9
MOUNTAIN	-	-	29	-	4	-	-	-	7	23	20	-	10
Montana	-	-	3	-	-	-	-	-	-	1	-	-	-
Idaho	-	-	-	-	-	-	-	-	-	1	-	-	-
Wyoming	-	-	-	-	-	-	-	-	-	-	1	-	-
Colorado	-	-	7	-	3	-	-	-	3	6	12	-	7
New Mexico	-	-	-	-	1	-	-	-	-	5	-	-	1
Arizona	-	-	NN	-	-	-	-	-	2	6	4	-	1
Utah	-	-	19	-	-	-	-	-	1	3	3	-	-
Nevada *	-	-	-	-	-	-	-	-	1	1	-	-	1
PACIFIC	31	-	26	1	115	5	6	-	81	226	47	6	110
Washington	-	-	23	-	110	1	-	-	4	8	3	-	2
Oregon	-	-	-	-	-	-	3	-	3	21	8	-	5
California *	25	-	-	-	1	4	3	-	69	116	33	6	102
Alaska	2	-	2	-	3	-	-	-	1	79	3	-	-
Hawaii	4	-	1	1	1	-	-	-	4	2	-	-	1
Guam	-	-	-	-	-	-	-	-	-	-	-	-	-
Puerto Rico	-	-	17	-	1	-	-	-	-	14	-	-	1
Virgin Islands	-	-	-	-	-	-	-	-	-	-	-	-	-

NN: Not notifiable

*Delayed reports: Asep. Meng; Wisc. add 1; Chickenpox: Calif. add 3; Enceph.: Wisc. add 1; Hep. B: Mo. delete 1, W. Va. add 1; Hep. A: Mo. delete 1, La. delete 2, Nev. add 1; Hep. unsp. Mo. delete 1.

Table III-Continued
 Cases of Specified Notifiable Diseases: United States
 Weeks Ending August 28, 1976 and August 23, 1975 - 34th Week

REPORTING AREA	MEASLES (Rubella)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1976	CUMULATIVE		1976	CUMULATIVE		1976	CUM. 1976	1976	1976	CUM. 1976	CUM. 1976
		1975	1976		1975	1976						
UNITED STATES	63	34,213	21,069	12	1,102	1,022	146	32,078	25	30	10,510	37
NEW ENGLAND	4	381	306	-	49	58	5	1,266	-	-	272	1
Maine	-	7	14	-	1	6	-	114	-	-	3	-
New Hampshire	-	9	22	-	4	2	-	25	-	-	11	-
Vermont*	-	36	49	-	3	-	-	8	-	-	1	-
Massachusetts	-	37	110	-	13	20	2	151	-	-	135	1
Rhode Island	-	14	3	-	5	3	1	446	-	-	5	-
Connecticut	4	278	108	-	23	27	2	522	-	-	117	-
MIDDLE ATLANTIC	6	6,960	1,741	5	157	103	19	2,993	5	5	2,272	4
Upstate New York	3	2,924	571	-	61	29	4	373	-	1	600	2
New York City	2	450	138	2	42	29	14	1,591	3	2	140	1
New Jersey	-	391	457	1	20	17	-	492	-	-	1,334	-
Pennsylvania*	1	2,995	575	2	34	28	1	537	2	2	198	1
EAST NORTH CENTRAL ..	16	14,525	6,268	-	139	138	40	13,273	4	7	3,904	2
Ohio	3	569	106	-	58	36	4	1,894	-	-	276	1
Indiana	4	3,263	374	-	6	6	1	1,429	-	3	699	-
Illinois	2	1,523	1,781	-	17	19	6	1,751	1	3	1,163	-
Michigan	3	5,830	3,005	-	49	58	7	4,825	3	-	1,361	1
Wisconsin	4	3,340	1,002	-	9	19	22	3,374	-	1	405	-
WEST NORTH CENTRAL ..	-	1,123	4,966	-	68	62	4	3,246	1	2	387	6
Minnesota	-	413	182	-	12	15	2	546	-	-	26	1
Iowa	-	33	571	-	9	5	1	1,148	-	-	84	-
Missouri*	-	17	266	-	25	30	1	316	1	2	34	2
North Dakota	-	3	1,051	-	3	-	-	121	-	-	3	1
South Dakota	-	4	356	-	1	1	-	7	-	-	19	1
Nebraska	-	55	395	-	5	2	-	99	-	-	3	-
Kansas	-	598	2,145	-	13	9	-	1,009	-	-	218	1
SOUTH ATLANTIC	7	2,252	326	3	204	208	19	2,443	4	2	1,269	7
Delaware	-	128	35	-	6	6	-	52	-	-	33	-
Maryland	-	829	48	-	16	24	9	667	-	-	3	2
District of Columbia ..	-	12	1	-	2	5	2	102	-	-	45	-
Virginia	5	759	37	1	26	17	-	197	-	-	234	1
West Virginia	2	185	148	1	7	5	6	746	3	2	285	-
North Carolina	-	15	2	1	38	36	1	372	1	-	17	-
South Carolina	-	4	-	-	36	33	-	39	-	-	590	-
Georgia	-	2	30	-	19	14	-	-	-	-	2	-
Florida	-	318	25	-	54	68	1	268	-	-	60	4
EAST SOUTH CENTRAL ..	7	819	271	-	101	151	17	2,738	1	6	354	7
Kentucky	-	746	83	-	18	61	-	952	1	2	157	2
Tennessee	7	57	177	-	43	48	12	1,469	-	4	185	4
Alabama	-	-	3	-	29	29	2	261	-	-	1	1
Mississippi	-	16	8	-	11	13	3	56	-	-	11	-
WEST SOUTH CENTRAL ..	3	688	294	2	176	166	12	2,260	9	3	516	7
Arkansas	-	-	-	-	11	8	-	72	4	-	190	-
Louisiana	-	194	1	1	35	29	-	22	-	-	85	2
Oklahoma	2	291	125	1	19	9	1	640	5	1	64	-
Texas	1	203	168	-	111	120	11	1,526	-	2	177	5
MOUNTAIN	2	5,066	1,399	-	39	34	9	1,107	-	-	469	1
Montana	1	204	50	-	4	7	1	21	-	-	234	-
Idaho	-	2,020	11	-	4	5	-	440	-	-	18	-
Wyoming	-	3	1	-	-	-	-	1	-	-	2	-
Colorado	-	305	1,158	-	11	9	-	221	-	-	22	-
New Mexico	-	15	13	-	4	4	-	127	-	-	31	-
Arizona	-	226	73	-	10	1	-	-	-	-	-	1
Utah	1	2,230	66	-	4	7	8	183	-	-	143	-
Nevada	-	63	27	-	2	1	-	114	-	-	19	-
PACIFIC	18	2,399	5,498	2	169	102	21	2,752	1	5	1,067	2
Washington*	-	336	288	1	29	16	-	848	-	1	163	-
Oregon	4	156	196	-	15	4	2	345	-	-	134	1
California	14	1,900	4,950	1	105	78	17	1,510	1	2	749	1
Alaska	-	4	-	-	17	3	1	22	-	-	1	-
Hawaii	-	3	64	-	3	1	1	27	-	2	20	-
Guam	-	12	31	-	1	2	-	13	-	-	5	-
Puerto Rico	-	334	591	-	3	1	1	641	-	-	9	5
Virgin Islands	-	9	8	-	-	-	-	22	-	-	8	1

*Delayed reports: Measles: Pa. add 6, Mo. add 1, Wash. delete 3; Men. Inf.: Mo. delete 2; Mumps: Vt. delete 2, Mo. add 1; Pertussis: Mo. add 1.

Table III-Continued
Cases of Specified Notifiable Diseases: United States
Weeks Ending August 28, 1976 and August 23, 1975 - 34th Week

REPORTING AREA	TUBERCULOSIS		TULA- REMIA	TYPHOID FEVER		TYPHUS-FEVER TICK-BORNE (RMSF)		VENEREAL DISEASES (Civilian Cases Only)						RABIES IN ANIMALS
	1976	CUM. 1976	CUM. 1976	1976	CUM. 1976	1976	CUM. 1976	GONORRHEA		SYPHILIS (Pri. & Sec.)		CUM. 1976		
								CUMULATIVE		1976	CUMULATIVE			
								1976	1975		1976		1975	
UNITED STATES	747	22,041	89	5	241	29	638	23,098	651,684	635,592	460	15,767	16,706	1,821
NEW ENGLAND	17	780	1	1	20	-	7	581	17,998	17,288	12	512	580	39
Maine	-	51	-	-	-	-	-	59	1,520	1,344	1	14	21	19
New Hampshire*	1	34	-	-	2	-	-	22	501	481	-	8	11	-
Vermont	1	22	-	-	-	-	-	18	447	428	-	6	5	-
Massachusetts	6	465	1	-	13	-	4	296	8,662	8,014	10	370	372	15
Rhode Island	4	59	-	-	-	-	2	33	1,175	1,418	-	16	13	3
Connecticut	5	149	-	1	5	-	1	153	5,693	5,603	1	98	158	2
MIDDLE ATLANTIC	126	4,180	3	-	41	3	36	2,306	76,063	74,257	84	2,648	3,071	31
Upstate New York	30	657	2	-	8	-	19	380	11,760	13,083	4	159	295	11
New York City	29	1,697	1	-	20	1	4	1,256	34,770	32,100	56	1,631	1,752	-
New Jersey	26	812	-	-	8	-	8	132	11,323	10,277	13	400	479	3
Pennsylvania	41	1,014	-	-	5	2	5	538	18,210	18,797	11	458	545	17
EAST NORTH CENTRAL	120	3,098	1	-	23	2	13	3,075	102,663	104,257	20	1,380	1,365	111
Ohio	19	585	-	-	9	2	11	566	25,325	29,096	5	322	324	12
Indiana	10	363	-	-	-	-	-	310	10,045	8,865	-	74	101	21
Illinois	63	1,074	1	-	5	-	-	948	35,605	35,976	11	753	654	18
Michigan*	28	904	-	-	8	-	2	894	21,880	20,204	3	159	226	5
Wisconsin	-	172	-	-	1	-	-	357	9,808	10,116	1	72	60	55
WEST NORTH CENTRAL	25	810	22	-	11	3	19	1,201	33,602	31,390	10	283	418	459
Minnesota	7	148	3	-	6	-	-	205	6,101	6,541	-	63	74	104
Iowa	1	70	1	-	1	1	3	120	4,221	4,410	3	32	23	98
Missouri*	12	402	15	-	3	1	8	511	13,358	11,271	3	113	201	46
North Dakota	-	23	-	-	-	-	-	15	496	492	-	-	5	88
South Dakota	1	36	1	-	-	1	3	18	938	1,229	-	4	5	55
Nebraska	-	37	-	-	-	-	-	156	2,978	2,785	1	23	14	12
Kansas	5	94	2	-	1	-	5	176	5,510	4,662	3	48	96	56
SOUTH ATLANTIC	169	4,768	6	1	32	13	321	7,007	158,761	157,514	119	4,606	5,214	296
Delaware	3	53	-	-	-	-	1	77	2,114	2,247	2	47	65	14
Maryland	17	674	1	1	1	2	19	715	20,971	18,704	5	381	386	11
District of Columbia	12	206	-	-	-	-	-	299	9,299	9,258	9	409	451	-
Virginia*	16	759	2	-	4	4	75	695	16,624	15,652	13	444	402	47
West Virginia*	8	192	-	-	3	-	6	46	2,044	1,941	-	19	38	12
North Carolina*	40	871	3	-	1	6	141	1,067	23,364	21,948	15	847	652	6
South Carolina	11	345	-	-	4	1	40	433	14,909	14,789	15	264	351	3
Georgia	21	592	-	-	2	-	38	2,374	30,480	29,338	15	501	671	137
Florida	41	1,076	-	-	17	-	1	1,301	38,956	43,637	45	1,694	2,198	66
EAST SOUTH CENTRAL	74	1,856	13	-	9	5	120	1,785	57,631	53,837	16	632	726	91
Kentucky*	25	397	1	-	5	-	26	237	7,363	6,987	1	91	112	47
Tennessee	22	573	12	-	4	5	73	814	23,008	21,341	8	225	277	32
Alabama	18	546	-	-	-	-	8	427	16,307	14,843	1	131	167	12
Mississippi	9	340	-	-	-	-	13	307	10,953	10,666	6	185	170	-
WEST SOUTH CENTRAL	97	2,523	31	1	11	2	113	2,760	83,996	78,111	46	1,857	1,427	422
Arkansas	11	321	16	1	3	1	17	327	7,894	8,271	1	60	43	105
Louisiana*	17	370	2	-	2	-	-	374	12,272	14,301	4	390	337	5
Oklahoma*	11	234	7	-	1	1	85	257	7,910	7,504	-	69	53	100
Texas	58	1,598	6	-	5	-	11	1,802	55,920	48,035	41	1,338	994	212
MOUNTAIN	21	612	2	-	18	-	3	845	25,019	24,992	13	530	390	101
Montana	1	36	2	-	2	-	-	59	1,327	1,343	-	6	4	62
Idaho	-	18	-	-	1	-	1	55	1,350	1,243	1	25	10	-
Wyoming	-	16	-	-	-	-	-	44	517	576	-	8	9	1
Colorado	3	99	-	-	4	-	1	248	6,547	6,147	1	110	68	4
New Mexico	5	110	-	-	1	-	1	120	4,866	4,569	8	183	104	3
Arizona	9	283	-	-	9	-	-	298	7,397	6,812	3	155	145	21
Utah	3	27	-	-	1	-	-	9	1,275	1,597	-	17	11	10
Nevada*	-	23	-	-	-	-	-	12	1,740	2,705	-	26	39	-
PACIFIC	97	3,414	10	2	76	1	6	3,538	95,951	93,946	140	3,319	3,515	271
Washington*	-	263	2	-	3	-	4	310	8,042	8,586	13	92	118	5
Oregon	3	126	1	-	-	-	-	156	6,972	7,039	5	71	89	6
California	83	2,548	7	2	71	1	2	2,438	75,917	74,426	119	3,070	3,269	220
Alaska	-	61	-	-	-	-	-	83	2,729	2,293	1	13	5	40
Hawaii	11	416	-	-	2	-	-	551	2,291	1,602	2	73	34	-
Guam	-	30	-	-	-	-	-	-	208	279	-	1	8	-
Puerto Rico	8	267	-	-	1	-	-	45	1,879	1,892	24	399	472	29
Virgin Islands*	-	5	-	-	-	-	-	3	165	118	-	45	22	-

*Delayed reports: TB: Mich. delete 2, Mo. delete 1, Va. delete 12, N. Car. delete 7, Ky. delete 2, Alaska delete 1; Typhoid fever: W. Va. add 1; RMSF: Mo. add 1, N. Car. delete 1, Okla. delete 4, Wash. delete 1; GC: La. delete 25, Nev. add 8, V.I. add 2; Syphilis: N. Hamp. delete 1, Vt. add 2, La. delete 6, V.I. add 1.

Table IV
Deaths in 121 United States Cities*
Week Ending August 28, 1976 — 34th Week

REPORTING AREA	ALL CAUSES					Pneumonia and Influenza ALL AGES	REPORTING AREA	ALL CAUSES					Pneumonia and Influenza ALL AGES
	ALL AGES	65 Years and Over	45-64 Years	25-44 Years	Under 1 Year			ALL AGES	65 Years and Over	45-64 Years	25-44 Years	Under 1 Year	
NEW ENGLAND	661	408	170	38	23	37	SOUTH ATLANTIC ...	979	556	264	76	47	25
Boston, Mass.	193	107	51	15	12	9	Atlanta, Ga.	113	64	29	11	2	-
Bridgeport, Conn.	47	31	12	1	-	3	Baltimore, Md.	204	104	59	24	13	3
Cambridge, Mass.	34	22	5	4	3	5	Charlotte, N. C.	46	18	14	5	5	2
Fall River, Mass.	28	20	6	2	-	1	Jacksonville, Fla.	80	43	22	4	6	-
Hartford, Conn.	40	22	16	-	-	3	Miami, Fla.	87	52	27	2	4	3
Lowell, Mass.	18	13	5	-	-	-	Norfolk, Va.	50	29	17	-	4	1
Lynn, Mass.	23	19	3	-	-	-	Richmond, Va.	69	45	14	7	1	6
New Bedford, Mass.	29	22	6	1	-	2	Savannah, Ga.	36	18	10	4	2	2
New Haven, Conn.	49	28	15	3	2	-	St. Petersburg, Fla.	61	53	6	-	1	5
Providence, R.I.	61	33	17	4	2	5	Tampa, Fla.	64	33	21	6	1	2
Somerville, Mass.	7	5	1	1	-	1	Washington, D. C.	114	64	32	8	6	1
Springfield, Mass.	39	24	11	2	2	4	Wilmington, Del.	55	33	13	5	2	-
Waterbury, Conn.	29	20	7	2	-	1							
Worcester, Mass.	64	42	15	3	2	3	EAST SOUTH CENTRAL	661	373	206	34	28	36
MIDDLE ATLANTIC ...	2,851	1,728	760	168	93	137	Birmingham, Ala.	112	52	41	5	6	4
Albany, N. Y.	57	39	12	1	2	1	Chattanooga, Tenn.	55	36	14	3	1	5
Allentown, Pa.	23	16	6	1	-	2	Knoxville, Tenn.	53	34	13	4	-	-
Buffalo, N. Y.	119	63	40	6	4	4	Louisville, Ky.	101	61	26	7	6	11
Camden, N. J.	24	14	6	2	2	-	Memphis, Tenn.	157	89	44	7	7	8
Elizabeth, N. J.	23	13	8	1	1	-	Mobile, Ala.	54	24	19	4	4	-
Erie, Pa.	29	20	7	1	-	4	Montgomery, Ala.	42	23	14	-	1	5
Jersey City, N. J.	35	22	8	2	1	2	Nashville, Tenn.	107	54	35	4	3	5
Newark, N. J.	65	31	18	10	1	4							
New York City, N. Y.	1,372	850	342	87	43	52	WEST SOUTH CENTRAL	1,236	645	364	96	60	35
Peterson, N. J.	31	21	8	-	1	-	Austin, Tex.	41	25	11	2	-	-
Philadelphia, Pa.	500	277	156	31	20	32	Baton Rouge, La.	64	36	15	6	5	1
Pittsburgh, Pa.	183	95	64	10	6	14	Corpus Christi, Tex.	37	21	10	2	2	-
Reading, Pa.	37	31	6	-	-	1	Dallas, Tex.	158	80	47	11	11	2
Rochester, N. Y.	120	83	22	5	6	11	El Paso, Tex.	52	27	8	5	6	1
Schenectady, N. Y.	25	14	8	2	-	1	Fort Worth, Tex.	76	41	21	9	3	4
Scranton, Pa.	38	30	6	-	-	2	Houston, Tex.	327	141	113	37	12	10
Syracuse, N. Y.	89	52	23	6	5	2	Little Rock, Ark.	64	38	14	4	4	4
Trenton, N. J.	27	17	7	3	-	1	New Orleans, La.	106	60	38	3	3	1
Utica, N. Y.	29	21	8	-	-	-	San Antonio, Tex.	154	83	43	10	8	4
Yonkers, N. Y.	25	19	5	-	1	4	Shreveport, La.	80	40	26	6	3	3
							Tulsa, Okla.	77	53	18	1	3	5
EAST NORTH CENTRAL	2,265	1,300	605	164	82	42	MOUNTAIN	475	260	105	44	33	13
Akron, Ohio	60	36	17	-	6	-	Albuquerque, N. Mex.	52	28	8	3	6	5
Canton, Ohio	34	21	9	1	-	1	Colorado Springs, Colo.	27	14	7	3	1	-
Chicago, Ill.	569	309	160	51	23	10	Denver, Colo.	97	54	10	14	11	3
Cincinnati, Ohio	164	87	42	20	7	2	Las Vegas, Nev.	31	15	12	2	1	1
Cleveland, Ohio	192	116	51	12	3	3	Ogden, Utah	20	8	7	3	-	2
Columbus, Ohio	144	81	39	12	6	3	Phoenix, Ariz.	96	49	32	6	6	1
Dayton, Ohio	88	48	25	7	2	1	Pueblo, Colo.	23	17	3	3	-	-
Detroit, Mich.	310	159	87	31	9	2	Salt Lake City, Utah ...	45	29	8	2	5	1
Evansville, Ind.	35	27	5	-	1	2	Tucson, Ariz.	84	46	18	8	3	-
Fort Wayne, Ind.	44	26	12	2	1	2							
Gary, Ind.	17	9	6	1	1	-	PACIFIC	1,435	896	354	66	39	24
Grand Rapids, Mich.	42	26	13	1	-	2	Berkeley, Calif.	10	6	2	2	-	-
Indianapolis, Ind.	164	101	37	9	8	4	Fresno, Calif.	54	38	10	3	1	1
Madison, Wis.	30	18	8	1	2	1	Glendale, Calif.	24	23	1	-	-	-
Milwaukee, Wis.	129	79	34	6	3	-	Honolulu, Hawaii	49	30	15	3	1	1
Peoria, Ill.	31	16	10	-	5	-	Long Beach, Calif.	95	53	37	3	1	1
Rockford, Ill.	32	23	7	1	-	2	Los Angeles, Calif.	405	254	95	28	10	4
South Bend, Ind.	29	23	5	1	-	2	Oakland, Calif.	73	47	12	4	6	-
Toledo, Ohio	88	52	22	6	3	5	Pasadena, Calif.	25	18	5	1	-	-
Youngstown, Ohio	63	43	16	2	2	2	Portland, Oreg.	107	60	34	6	3	1
							Sacramento, Calif.	70	35	27	3	3	2
WEST NORTH CENTRAL	711	425	176	35	44	11	San Diego, Calif.	119	67	29	14	4	2
Des Moines, Iowa	40	27	6	4	3	-	San Francisco, Calif.	147	94	34	12	4	1
Duluth, Minn.	22	13	3	3	1	-	San Jose, Calif.	41	29	7	2	2	2
Kansas City, Kans.	36	20	6	2	2	1	Seattle, Wash.	134	82	36	8	2	4
Kansas City, Mo.	122	72	31	4	9	1	Spokane, Wash.	50	36	5	5	2	5
Lincoln, Nebr.	38	18	13	3	2	2	Tacoma, Wash.	32	24	5	2	-	-
Minneapolis, Minn.	96	54	24	7	10	-							
Omaha, Nebr.	63	41	15	-	5	1	TOTAL	11,294	6,591	3,004	751	449	362
St. Louis, Mo.	148	89	43	6	7	-	Expected Number	11,530	6,857	3,020	762	381	357
St. Paul, Minn.	73	54	14	2	3	2							
Wichita, Kans.	73	37	21	4	2	4							

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

Send mailing list additions, deletions, and address changes to: Center for Disease Control, Attn.: Distribution Services, GSO, 1-SB-36, 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.

Respiratory Disease — Continued

Evidence of illness in household contacts of 78 Legionnaire cases was sought in a telephone survey on August 17. None of 140 adult contacts and 50 child contacts who were not at the convention met the clinical criteria of a case.

A random sample of guests staying at 4 hotels in Philadelphia were surveyed by phone for subsequent illness that met the clinical criteria. The hotels surveyed were the headquarters hotel for the American Legion convention (Hotel A), another downtown hotel where many Legionnaires stayed (Hotel B), a downtown hotel where few Legionnaires stayed (Hotel C), and a hotel on the periphery of Philadelphia where no Legionnaires stayed (Hotel D). Table 1 shows that no illness meeting these criteria was found in this sample of guests registered in 3 hotels in the 2 weeks following the American Legion convention. Clinically compatible illness appears to be rare except for the week of the convention in the 2 hotels where many Legionnaires stayed. In those hotels rates of illness were significantly higher for Legionnaires than for other guests.

Chest X-rays of 23 cases including 18 who died have been reviewed at CDC; 21 showed bilateral disease. The pneumonia often appeared to be centripetal and early had an interstitial pattern. Circumscribed consolidation was present in most cases in the more advanced stages. None had definable pleural effusion.

Autopsy tissue from 14 cases has been examined histologically. The histopathologic findings in the lungs were varied and non-specific. Most showed extensive pneumonitis. In some there was mild interstitial reaction. No specific evidence of viral infection was seen. Special stains have revealed no fungi, bacteria, or other microorganisms except in 1 case with disseminated candidiasis.

Most of the liver tissue samples examined had centrilobular fatty change.

No consistent pattern of change was seen in the kidneys. Renal lesions ranged from normal to advanced tubular necrosis. Mild to moderate amounts of oxalate crystals were noted in the kidneys from a few cases. These crystals are found in acute and chronic renal diseases of a variety of causes; therefore, they were probably non-specific.

The cases also had a variety of unrelated pathologic findings in these and other organs that are compatible with the common abnormalities in patients of these age groups.

No microbial agent was detected by electron microscopy on negative staining or by observation of thin sections on lung specimens submitted from 8 cases. Conventional and fluorescent antibody staining of these and other appropriate specimens were negative for *Chlamydia*, *Rickettsia*, typhoid, pertussis, tularemia, plague, blastomycosis, coccidioidomycosis, histoplasmosis, Marburg virus, Lassa virus, influenza A virus, and lymphocytic choriomeningitis virus.

Bacterial and yeast cultures of lung specimens from 3 cases and of fecal and oral specimens from 15 other cases revealed agents that were consistent with normal microbial flora and formed no particular pattern of isolation. Respiratory tract specimens from 8 cases were negative on culture for *Mycoplasma pneumoniae* and spiroplasma.

Attempts have been made to isolate virus from specimens from up to 23 cases by amniotic, allantoic, or yolk

TABLE 1. Illness in a random sample of guests registered at 4 Philadelphia hotels, July 6-August 7, 1976

Hotel	Week of registration				
	Jul 6-10	Jul 11-17	Jul 18-24	Jul 25-31	Aug 1-7
A	0/142*	0/130	15/180	0/106	0/88
B	—	—	5/144	—	—
C	—	1/70	1/100	0/95	0/78
D	—	1/90	1/84	0/92	0/58

* Number that meet clinical criteria (see text)/number queried.

sac inoculation of embryonated eggs, or inoculation of primary rhesus monkey kidney cells, Vero cells, human embryonic lung fibroblasts, human embryonic kidney cells, rhesus monkey kidney agar overlay, rhabdomyosarcoma cells, mice, and guinea pigs. One herpesvirus has been recovered to date.

Paired sera from 26 cases have been examined by complement fixation (CF) tests for rises in antibody titers to influenza viruses, *M. pneumoniae*, psittacosis, and Q fever. Subsets were examined by various tests for evidence of antibody rise to histoplasmosis, blastomycosis, coccidioidomycosis, parainfluenza virus types 1 through 3, adenoviruses, respiratory syncytial virus, herpesvirus, mumps virus, measles virus, and coronaviruses. Several sera were also examined for antibody rises to thermoactinomyces (farmer's lung disease), and leptospira. No 4-fold or greater rises in antibody titer were detected in these cases except for blastomycosis in the case with disseminated candidiasis and for *M. pneumoniae* in another case. Paired sera were also examined by indirect fluorescent antibody and radioimmunoassay for antibody reactive with antigens that may be present in lung tissue from fatal cases. No reacting antigen/antibody has been detected. These studies are still in progress.

In order to identify a potentially toxic substance(s) in confirmed cases and controls, broad screening techniques for metals and organic toxicants were used.

Liver, kidney, and lung tissues from 3 cases were analyzed by neutron activation for 17 metals: mercury, arsenic, antimony, cobalt, cadmium, zinc, copper, iron, silver, tungsten, thallium, gold, osmium, chromium, selenium, molybdenum, and thorium. Detected concentrations were within published normal values.

Specimens from 6 cases were analyzed by atomic absorption spectrophotometry for thallium (Tl), tin (Sn), chromium (Cr), beryllium (Be), and nickel (Ni) (Table 2). No thal-

TABLE 2. Specimens analyzed by atomic absorption spectrophotometry.

Case No.	Tissue	Metals Tested
2	liver	Ni
12	kidney	Ni, Cr, Sn, Be
	liver	Ni, Tl
	lung	Ni
28	kidney	Ni, Cr, Be
	urine	Tl
34	lung	Ni
47	liver	Ni
	kidney	Ni, Cr, Sn, Be
108	lung	Ni

Respiratory Disease — Continued

limum, tin, or beryllium was detected. Chromium levels were within published normal values. Because of the way specimens were collected and analytical methodology problems, no definitive conclusions can be drawn from the nickel data.

Tissue samples from 4 cases and serum from 8 cases have been analyzed by gas chromatography and mass spectroscopy. Approximately 300 gas chromatographic and mass spectral analyses have been performed. Four different sample preparations consisting of acidic and basic extractions using polar and nonpolar organic solvents were used to ensure detection of a wide spectrum of organic toxins. Five different detector systems were used to screen the specimen extracts for selected elements. No potentially toxic substances have yet been identified.

Urine, lung, and liver specimens from 3 cases have been analyzed for Paraquat, but none has been detected. These

samples were analyzed by high-pressure liquid chromatography and extraction-aseptrophotometric methods.

Reported by RG Sharrar, MD, City of Philadelphia Dept. of Public Health; E Streiff, RN, MPH, Allegheny County Dept of Health; WE Parkin, DVM, Acting State Epidemiologist, Pennsylvania State Dept of Health; Bur of Laboratories, Bur of State Services, Bur of Training, and Bur of Epidemiology, CDC.

Editorial Note: The epidemic curve (Figure 1) suggests a common-source exposure, but the source and agent have not been identified. There is no evidence of person-to-person spread. Case criteria have been met by persons whose only known contact with Hotel A (Table 1) was after the American Legion convention, but these cases may represent "background" instances of pneumonia expected in a large city. Preliminary results in the autopsy of 1 of these cases tend to support that impression. Surveillance of guests in several hotels has yielded no evidence of a continuing epidemic.

Hyperpyrexia — Florida

Nineteen of 90 residents of a private nursing home in Palm Beach County, Florida, had sudden onset of fever ($>100.6^{\circ}\text{F}$) in the period August 9-13, 1976. Five residents, whose temperatures ranged from 103° to 106.4°F (mean 105.1°F), died.

There were no accompanying symptoms. Three patients were hospitalized and returned to euthermia within 12 hours. Chest X-rays showed no acute changes. Preliminary laboratory results showed no evidence of viral growth. A survey of the nursing home's 123 employees and volunteers showed no comparable illness.

Because of previous problems the air conditioning system was completely shut down for repairs from August 9 through 12. The single recorded temperature within the nursing home taken on August 11 was 89°F . West Palm

Beach weather bureau records for the period August 9-13 showed peak temperatures of 90° , 89° , 88° , and 87°F , respectively. Normal air conditioning was restored on August 13, at which time measures also were taken to ensure that the residents had adequate fluid intake. Non-hospitalized febrile patients returned to euthermia within 12 hours after the air conditioning was repaired.

In the absence of supporting data pointing to an infectious cause, heat stroke/hyperpyrexia secondary to environmental conditions was the working diagnosis.

Reported by JT Howell, MD, MPH, RC Page, MD, M Lund, RN, MPH, Palm Beach County Health Dept; E Buff, MS, M Kimberly, PhD, N Schneider, PhD, Office of Laboratories; EWP Smith, MD, Acting State Epidemiologist, Health Program Office, State of Florida Dept of Health and Rehabilitative Services; Field Services Div and Viral Diseases Div, Bur of Epidemiology, CDC.

Erratum, Vol. 25, No. 33

p266 In the statistical Table IV, "Deaths in 121 United States Cities," the Week Ending Date should read

August 21, 1976, 33rd week, not Week Ending August 14, 1976, 32nd week, as written.

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