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EPIDEMIOLOGIC NOTES AND REPORTS

SALMONELLA AGONA GASTROINTESTINAL ILLNESS
Arkansas

Between June 29 and July 2, 1973, 3 outbreaks of *Salmonella agona* infection were reported in Little Rock, Arkansas. On June 29, approximately 200 employees of a Little Rock firm attended a company picnic. Within 2 days, 120 of 158 picnickers interviewed developed an illness characterized by diarrhea (93%), abdominal cramps (86%), nausea (69%), headache (65%), fever (62%), chills (61%), dizziness (42%), vomiting (40%), and bloody stools (5%). The median incubation period fell between 12 and 18 hours. Stool samples from 20 symptomatic and 4 asymptomatic persons were all positive for *S. agona*.

On June 30, a wedding reception was held in Little Rock, with an estimated 200 guests attending. Fifty-eight of 126 contacted subsequently developed gastrointestinal illness.

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On the same day, approximately 50 members of a club attended a banquet in the same city, and 12 of 24 interviewed became ill in the ensuing 2 days. In each outbreak, the clustering of times of onset for known cases was consistent with a common-source exposure.

Food histories were obtained from persons present at each of the gatherings. Attack rates among picnic-goers were significantly higher among persons who had consumed at least 1 of 8 different food items at the picnic, including barbecue beef, than among those who had not eaten them (Table 1). Analysis of food-specific attack rates for the 7

TABLE I. CASES OF SPECIFIED NOTIFIABLE DISEASES: UNITED STATES
(Cumulative totals include revised and delayed reports through previous weeks)

DISEASE	33rd WEEK ENDING		MEDIAN 1968-1972	CUMULATIVE, FIRST 33 WEEKS		
	August 18, 1973	August 19, 1972		1973	1972	MEDIAN 1968-1972
Aseptic meningitis	223	135	202	2,252	1,742	1,790
Brucellosis	6	8	5	126	113	131
Chickenpox	307	366	– – –	144,253	113,049	– – –
Diphtheria	–	1	3	113	63	101
Encephalitis, primary:						
Arthropod-borne and unspecified	39	44	44	812	577	667
Encephalitis, post-infectious	5	4	8	198	195	272
Hepatitis, serum (Hepatitis B)	187	174	150	5,044	5,843	4,554
Hepatitis, infectious (Hepatitis A)	878	930	948	31,935	34,901	34,902
Malaria	4	6	48	153	651	1,735
Measles (rubeola)	89	131	194	23,807	26,480	26,480
Meningococcal infections, total	12	21	29	996	963	1,771
Civilian	12	20	26	972	925	1,588
Military	–	1	–	24	38	183
Mumps	375	371	567	54,281	55,665	73,862
Rubella (German measles)	117	118	213	25,681	20,240	42,826
Tetanus	3	2	3	53	73	73
Tuberculosis, new active	507	673	– – –	20,081	21,302	– – –
Tularemia	6	3	3	102	86	90
Typhoid fever	6	6	6	445	203	193
Typhus, tick-borne (Rky. Mt. spotted fever)	27	25	25	462	352	291
Venereal Diseases:						
Gonorrhea	18,614	15,994	– – –	509,608	455,458	– – –
Syphilis, primary and secondary	503	536	– – –	16,535	15,488	– – –
Rabies in animals	64	92	62	2,363	2,807	2,327

TABLE II. NOTIFIABLE DISEASES OF LOW FREQUENCY

	Cum.		Cum.
Anthrax:	1	Poliomyelitis, total:	3
Botulism:	13	Paralytic:	3
Congenital rubella syndrome:	19	Psittacosis: Minn.-2	15
Leprosy: Calif.-6	83	Rabies in man:	–
Leptospirosis:	20	Trichinosis:	64
Plague:	1	Typhus, murine:	25

SALMONELLA AGONA – Continued

other suspect foods was performed both for persons who had eaten barbecue beef and for those who had not. This analysis revealed that only 1 item, potato salad, might be significantly implicated independently of coincidental consumption of barbecue beef (Table 2). Food-specific attack rates for the wedding reception also implicated barbecue beef. The barbecue beef was held on a warm steam table at the reception from 4:30 to 10:00 p.m. Attack rates were higher in those eating after 6:00 p.m. (86%) than in those eating before that hour (18%). Barbecue beef was also eaten by 11 of 12 persons known to have been ill after the club banquet.

Samples of the food served at each gathering were cultured. *S. agona* was recovered from barbecue beef served at each of the 3 events as well as from barbecue beans from the picnic. Other leftover foods were negative for enteric pathogens.

Further epidemiologic investigation revealed that food served at each of the functions had been provided by the same barbecue carry-out establishment. Furthermore, 4 persons who had eaten barbecue beef bought over the counter from this store between June 20 and July 1 subsequently became ill and had stool cultures positive for *S. agona.*

When the establishment was visited on July 6, it was learned that the meat for the picnic and wedding reception was first barbecued, then chopped, placed in large pans holding approximately 25 pounds each, and stored in holding ovens for several hours before delivery. Environmental and food cultures obtained on the premises were negative for salmonella, but 6 of 9 employees had stool cultures positive for *S. agona.*

The carry-out restaurant did not routinely sell barbecued chicken, but chickens and turkeys were frequently brought in for barbecuing by individual customers.

Control measures included employee education in proper food handling and in the importance of handwashing to prevent cross-contamination from raw meat and poultry and from feces to cooked food, decreasing the amount of chopped barbecue meat held in each pan, and raising the holding oven temperature. No additional cases of illness connected with food purchased at this establishment since July 1 have occurred. Prospective surveillance has revealed little evidence of secondary spread in the households of persons affected in the 3 outbreaks.

(Reported by G. Doty Murphy III, M.D., State Epidemiologist, Arkansas State Department of Health; and an EIS Officer.)

Table 1
Food-Specific Attack Rates for Persons Attending Company Picnic
Little Rock, Arkansas – June 29, 1973

Food Item	Ate				Did Not Eat			
	Ill	Not Ill	Total	Attack Rate (Percent)	Ill	Not Ill	Total	Attack Rate (Percent)
Barbecue sauce	110	19	129	85	10	22	32	31[a]
Barbecue beef	112	21	133	84	8	20	28	29[a]
Potato salad	98	14	112	87	22	27	49	45[a]
Barbecue beans	107	24	131	82	13	17	30	43[a]
Cole slaw	74	13	87	85	45	28	73	62[b]
Fried chicken	108	30	138	78	12	11	23	52[c]
Cheese	41	6	47	87	79	35	114	69[d]
Cookies	41	6	47	87	79	35	114	69[d]
Beer	47	13	60	78	73	28	101	72
Cola	80	28	108	74	40	13	53	75

[a] $p < 0.0005$ [c] $p < 0.025$
[b] $p < 0.005$ [d] $p < 0.05$

Table 2
Food-Specific Attack Rates for Persons Attending Company Picnic, by Consumption of Barbecue Beef
Little Rock, Arkansas – June 29, 1973

Food Item	Ate Barbecue Beef				Did Not Eat Barbecue Beef			
	Ill	Not Ill	Total	Attack Rate (Percent)	Ill	Not Ill	Total	Attack Rate (Percent)
Barbecue sauce								
Ate	107	19	126	85	0	0	0	0
Did not eat	5	2	7	71	8	16	24	33
			N.S.*				N.S.	
Potato salad								
Ate	97	14	111	87	2	0	2	100
Did not eat	15	7	22	68	6	16	22	27
			p = 0.03				N.S.	
Barbecue beans								
Ate	102	20	122	84	5	4	9	55
Did not eat	10	1	11	91	3	12	15	20
			N.S.				N.S.	
Cole slaw								
Ate	71	12	83	86	1	1	2	50
Did not eat	41	9	50	82	7	15	22	32
			N.S.				N.S.	
Fried Chicken								
Ate	100	16	116	86	8	14	22	36
Did not eat	12	5	17	71	0	2	2	0
			N.S.				N.S.	
Cheese								
Ate	32	5	37	86	4	2	6	67
Did not eat	80	16	96	83	4	14	18	22
			N.S.				N.S.	
Cookies								
Ate	34	5	39	87	2	1	3	67
Did not eat	78	16	94	83	6	15	21	29
			N.S.				N.S.	

*N.S. means not statistically significant.

Editorial Note

The epidemiologic evidence strongly suggests that the food provided by the carry-out establishment to each of the 3 gatherings was contaminated with *S. agona.* The size of the barbecue meat batches placed in the holding ovens may have been too large to permit prompt attainment of high enough temperatures in the middle of each batch. Further incubation of the organisms may have occurred on the steam table at the wedding reception.

The illnesses in customers who purchased food over the counter from the carry-out restaurant indicate that introduction of *S. agona* into the establishment antedated the large outbreaks by at least 9 days. The mode of introduction remains obscure, but poultry, the source of a previous outbreak of *S. agona* infection in Arkansas, brought to the restaurant for barbecuing by individual customers is 1 possibility. The high rate of *S. agona* carriage among food handlers may only reflect their exposure to the contaminated food.

TABLE III. CASES OF SPECIFIED NOTIFIABLE DISEASES: UNITED STATES FOR WEEKS ENDING AUGUST 18, 1973 AND AUGUST 19, 1972 (33rd WEEK)

AREA	ASEPTIC MENINGITIS	BRUCELLOSIS	CHICKENPOX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS		
						Primary including unspec. cases		Post Infectious	Serum (Hepatitis B)	Infectious (Hepatitis A)	
	1973	1973	1973	1973	Cum. 1973	1973	1972	1973	1973	1973	1972
UNITED STATES	223	6	307	–	113	39	44	5	187	878	930
NEW ENGLAND	25	–	23	–	3	1	2	–	7	61	95
Maine*	–	–	–	–	–	–	–	–	–	1	10
New Hampshire *	–	–	–	–	–	–	–	–	1	5	21
Vermont	–	–	–	–	–	–	–	–	–	1	2
Massachusetts	7	–	10	–	1	1	2	–	3	37	35
Rhode Island	12	–	8	–	2	–	–	–	1	10	12
Connecticut	6	–	5	–	–	–	–	–	2	7	15
MIDDLE ATLANTIC	26	–	30	–	–	7	–	1	31	104	137
Upstate New York	2	–	1	–	–	1	–	–	1	32	49
New York City	3	–	28	–	–	–	–	–	1	10	26
New Jersey	15	–	NN	–	–	–	–	–	10	34	51
Pennsylvania	6	–	1	–	–	6	–	1	19	28	11
EAST NORTH CENTRAL	46	1	154	–	–	7	18	1	30	129	164
Ohio	7	1	63	–	–	3	10	–	11	24	52
Indiana	1	–	7	–	–	–	–	–	–	12	14
Illinois	3	–	–	–	–	1	1	1	7	27	32
Michigan	35	–	25	–	–	3	5	–	11	59	63
Wisconsin	–	–	59	–	–	–	2	–	1	7	3
WEST NORTH CENTRAL	8	1	22	–	7	–	–	1	9	31	20
Minnesota	2	–	1	–	–	–	–	1	4	6	2
Iowa	1	–	2	–	–	–	–	–	3	1	2
Missouri *	5	–	17	–	–	–	–	–	2	4	8
North Dakota	–	–	2	–	–	–	–	–	–	–	1
South Dakota	–	–	–	–	7	–	–	–	–	–	1
Nebraska	–	1	–	–	–	–	–	–	–	–	–
Kansas	–	–	–	–	–	–	–	–	–	20	6
SOUTH ATLANTIC	29	1	37	–	–	9	18	–	10	130	135
Delaware	–	–	–	–	–	–	1	–	–	2	6
Maryland	4	–	5	–	–	2	1	–	–	11	8
District of Columbia	1	–	3	–	–	–	–	–	–	3	–
Virginia	5	1	3	–	–	–	2	–	2	16	40
West Virginia	5	–	20	–	–	2	–	–	–	6	10
North Carolina	3	–	NN	–	–	–	–	–	–	15	17
South Carolina	5	–	6	–	–	3	10	–	–	13	7
Georgia	1	–	–	–	–	–	3	–	–	12	20
Florida	5	–	–	–	–	2	1	–	8	52	27
EAST SOUTH CENTRAL	15	–	13	–	–	2	–	–	11	60	49
Kentucky	3	–	8	–	–	–	–	–	1	26	23
Tennessee	2	–	NN	–	–	–	–	–	1	19	20
Alabama	10	–	5	–	–	2	–	–	8	14	5
Mississippi	–	–	–	–	–	–	–	–	1	1	1
WEST SOUTH CENTRAL	13	2	11	–	11	2	–	–	14	121	70
Arkansas*	–	–	–	–	–	–	–	–	–	1	5
Louisiana *	4	–	NN	–	–	–	–	–	8	19	6
Oklahoma	4	1	1	–	–	1	–	–	–	12	8
Texas*	5	1	10	–	11	1	–	–	6	89	51
MOUNTAIN	3	–	7	–	14	1	2	–	1	30	62
Montana	–	–	4	–	–	1	2	–	–	3	7
Idaho	3	–	–	–	–	–	–	–	–	7	6
Wyoming	---	---	---	---	–	---	–	---	---	---	–
Colorado	–	–	2	–	–	–	–	–	1	4	17
New Mexico	–	–	1	–	6	–	–	–	–	6	6
Arizona*	–	–	–	–	8	–	–	–	–	1	8
Utah	–	–	–	–	–	–	–	–	–	2	16
Nevada	–	–	–	–	–	–	–	–	–	7	2
PACIFIC	58	1	10	–	78	10	4	2	74	212	198
Washington	4	–	4	–	70	–	–	–	8	20	9
Oregon	1	–	–	–	3	–	–	–	7	17	28
California	53	1	–	–	3	10	4	2	53	172	146
Alaska	–	–	5	–	2	–	–	–	5	1	3
Hawaii	–	–	1	–	–	–	–	–	1	2	12
Guam	–	–	–	–	–	–	–	–	–	–	–
Puerto Rico	–	–	1	–	–	–	–	–	1	24	18
Virgin Islands	–	–	–	–	–	–	–	–	–	–	–

*Delayed reports: Aseptic meningitis: N. H. 3, Ark. 3
Brucellosis: Ark. 1
Chickenpox: Tex. 26
Encephalitis, primary: Mo. delete 1
Hepatitis A: Me. 1, Ark. 10, La. delete 1, Ariz. 9

TABLE III. CASES OF SPECIFIED NOTIFIABLE DISEASES: UNITED STATES
FOR WEEKS ENDING AUGUST 18, 1973 AND AUGUST 19, 1972 (33rd WEEK) – Continued

AREA	MALARIA		MEASLES (Rubeola)			MENINGOCOCCAL INFECTIONS, TOTAL			MUMPS		RUBELLA	
	1972	Cum. 1972	1972	Cumulative		1972	Cumulative		1972	Cum. 1972	1972	Cum. 1972
				1972	1971		1972	1971				
UNITED STATES	4	153	89	23,807	26,480	12	996	963	375	54,281	117	25,681
NEW ENGLAND	–	12	7	7,357	3,074	–	46	39	17	2,761	6	3,592
Maine *	–	–	–	64	243	–	1	3	3	310	–	68
New Hampshire *	–	–	–	857	228	–	6	3	–	186	1	355
Vermont	–	2	–	118	125	–	3	–	–	241	1	44
Massachusetts	–	6	6	3,918	677	–	12	18	5	810	–	2,034
Rhode Island	–	–	–	603	519	–	3	10	7	325	2	212
Connecticut	–	4	1	1,797	1,282	–	21	5	2	889	2	879
MIDDLE ATLANTIC	1	22	11	2,402	963	1	133	119	55	7,098	11	4,153
Upstate New York	1	13	2	789	124	–	46	32	NN	NN	5	414
New York City	–	1	9	879	300	–	27	36	44	4,446	5	454
New Jersey	–	4	---	389	484	1	32	24	5	1,476	---	2,997
Pennsylvania	–	4	–	345	55	–	28	27	6	1,176	1	288
EAST NORTH CENTRAL	–	21	32	8,387	10,897	–	126	141	82	14,038	44	5,859
Ohio	–	4	–	278	236	–	56	56	17	2,657	4	681
Indiana	–	3	1	619	1,228	–	4	11	9	1,163	4	928
Illinois	–	11	11	2,023	4,056	–	24	30	20	2,375	23	934
Michigan	–	3	6	4,336	1,971	–	37	38	11	3,883	4	1,810
Wisconsin	–	–	14	1,131	3,406	–	5	6	25	3,960	9	1,506
WEST NORTH CENTRAL	1	7	–	436	935	1	78	68	13	4,580	4	1,201
Minnesota	–	1	–	19	19	–	7	19	–	79	2	221
Iowa	–	1	–	277	651	–	18	2	3	2,791	1	187
Missouri	–	1	–	49	162	1	32	20	6	666	1	260
North Dakota	–	1	–	58	52	–	3	–	2	66	–	276
South Dakota	–	–	–	–	6	–	4	2	–	17	–	23
Nebraska	–	1	–	6	18	–	7	9	2	125	–	139
Kansas	1	2	–	27	27	–	7	16	–	836	–	95
SOUTH ATLANTIC	–	23	10	1,187	2,110	3	165	218	44	6,398	6	2,076
Delaware	–	–	–	8	48	–	–	1	2	264	–	13
Maryland	–	3	–	12	15	–	22	33	7	622	–	10
District of Columbia	–	1	–	5	2	–	4	9	7	102	–	3
Virginia	–	5	3	414	60	1	30	48	6	680	1	622
West Virginia	–	–	3	193	266	–	2	7	5	2,213	–	283
North Carolina	–	6	–	4	33	–	36	27	NN	NN	–	201
South Carolina	–	1	1	58	214	1	11	20	1	350	–	84
Georgia	–	3	1	149	166	1	21	15	–	29	–	11
Florida	–	4	2	344	1,306	–	39	58	16	2,138	5	849
EAST SOUTH CENTRAL	1	6	2	594	1,031	–	91	77	56	4,406	17	1,280
Kentucky	–	1	2	366	519	–	32	25	6	1,284	9	389
Tennessee	–	–	–	165	191	–	37	28	30	2,032	6	511
Alabama	1	5	–	9	140	–	15	16	20	634	2	186
Mississippi	–	–	–	54	181	–	7	8	–	456	–	194
WEST SOUTH CENTRAL	–	9	5	645	1,436	3	156	119	42	3,608	6	1,431
Arkansas	–	–	–	69	13	–	13	9	6	351	–	112
Louisiana	–	2	–	84	82	2	33	35	2	77	–	99
Oklahoma	–	1	–	52	10	–	27	6	4	425	2	177
Texas	–	6	5	440	1,331	1	83	69	30	2,755	4	1,043
MOUNTAIN	–	9	7	588	1,750	–	31	18	14	2,413	6	2,360
Montana	–	1	–	16	15	–	6	2	3	225	2	502
Idaho	–	–	4	252	24	–	4	5	–	110	2	35
Wyoming	---	–	---	80	51	---	–	1	---	420	---	6
Colorado	–	2	1	103	519	–	11	4	5	428	2	1,541
New Mexico	–	2	2	118	115	–	3	2	1	956	–	188
Arizona	–	4	–	16	871	–	3	1	–	140	–	17
Utah	–	–	–	2	155	–	2	2	5	126	–	68
Nevada	–	–	–	1	–	–	2	1	–	8	–	3
PACIFIC	1	44	15	2,211	4,284	4	170	164	52	8,979	17	3,729
Washington	–	3	6	1,008	973	–	17	15	–	1,406	–	652
Oregon	–	2	1	454	129	–	12	13	8	1,665	6	780
California	1	36	8	665	3,076	4	135	127	42	4,981	11	2,262
Alaska	–	2	–	65	11	–	6	6	–	679	–	9
Hawaii	–	1	–	19	95	–	–	3	2	248	–	26
Guam	–	–	–	26	8	–	–	11	–	17	–	8
Puerto Rico	–	–	6	1,757	614	1	8	4	6	660	–	26
Virgin Islands	–	–	–	–	2	–	–	2	–	21	–	2

*Delayed reports: Mumps: Me. 1, N. H. 8

TABLE III. CASES OF SPECIFIED NOTIFIABLE DISEASES: UNITED STATES FOR WEEKS ENDING AUGUST 18, 1973 AND AUGUST 19, 1972 (33rd WEEK) – Continued

AREA	TETANUS	TUBERCULOSIS (New Active)		TULAREMIA	TYPHOID FEVER		TYPHUS FEVER TICK-BORNE (Rky. Mt. spotted fever)		VENEREAL DISEASES		RABIES IN ANIMALS	
									GONORRHEA	SYPHILIS (Pri. & Sec.)		
	Cumulative 1973	1973	Cum. 1973	Cumulative 1973	1973	Cum. 1973	1973	Cum. 1973	1973	1973	1973	Cum. 1973
UNITED STATES	53	507	20,081	102	6	445	27	462	18,614	503	64	2,363
NEW ENGLAND	2	21	693	–	–	8	–	1	541	4	2	98
Maine	–	5	59	–	–	–	–	–	27	1	–	55
New Hampshire	–	2	41	–	–	–	–	–	18	–	1	34
Vermont	–	1	20	–	–	–	–	–	9	–	–	3
Massachusetts	–	7	360	–	–	8	–	1	285	3	1	5
Rhode Island	1	5	52	–	–	–	–	–	49	–	–	–
Connecticut	1	1	161	–	–	–	–	–	153	–	–	1
MIDDLE ATLANTIC	7	74	3,906	–	2	42	3	27	2,763	118	6	32
Upstate New York	1	3	698	–	–	6	1	13	325	3	4	14
New York City	3	35	1,484	–	1	15	2	3	1,188	61	–	–
New Jersey	2	11	668	–	–	12	–	5	366	16	–	–
Pennsylvania	1	25	1,056	–	1	9	–	6	884	38	2	18
EAST NORTH CENTRAL	8	67	3,049	2	1	25	–	17	2,463	20	11	226
Ohio *	1	20	904	–	1	10	–	13	943	1	–	29
Indiana	1	12	399	–	–	–	–	–	312	5	1	48
Illinois	3	2	911	–	–	6	–	4	386	8	3	61
Michigan	1	33	758	2	–	7	–	–	640	5	–	4
Wisconsin	2	–	77	–	–	2	–	–	182	1	7	84
WEST NORTH CENTRAL	4	30	816	10	1	18	2	16	1,006	12	14	754
Minnesota	–	7	103	–	–	4	–	–	170	5	10	266
Iowa	–	5	89	–	–	–	–	7	190	1	1	152
Missouri	3	10	375	10	–	9	1	7	343	5	2	70
North Dakota	1	–	28	–	–	–	–	–	31	–	1	123
South Dakota	–	4	58	–	–	1	–	–	33	1	–	77
Nebraska	–	3	52	–	–	1	1	2	133	–	–	3
Kansas	–	1	111	–	1	3	–	–	106	–	–	63
SOUTH ATLANTIC	10	126	3,999	9	1	231	12	231	4,441	173	3	194
Delaware	–	–	53	–	–	–	–	7	77	2	–	3
Maryland	–	9	426	–	–	6	1	10	383	20	1	10
District of Columbia	–	8	180	–	–	–	–	–	410	12	–	–
Virginia	2	21	529	3	–	3	3	49	525	36	–	58
West Virginia	–	4	184	–	–	2	1	3	66	–	–	18
North Carolina	–	25	648	1	–	4	7	103	906	3	–	1
South Carolina	–	1	341	–	–	4	–	26	374	42	–	4
Georgia	1	26	666	3	–	1	–	33	741	18	2	66
Florida	7	32	972	2	1	211	–	–	959	40	–	34
EAST SOUTH CENTRAL	7	42	1,820	7	1	20	5	72	1,581	18	3	350
Kentucky	1	10	427	1	–	3	–	–	182	8	1	189
Tennessee	4	12	563	5	–	9	4	35	641	6	2	122
Alabama	2	16	488	–	–	2	1	10	552	–	–	38
Mississippi	–	4	342	1	1	6	–	27	206	4	–	1
WEST SOUTH CENTRAL	8	48	2,057	72	–	20	5	83	2,456	68	4	436
Arkansas*	–	9	247	50	–	3	–	12	174	1	1	91
Louisiana *	3	4	330	–	–	6	–	–	564	27	–	34
Oklahoma	3	6	176	17	–	2	1	64	289	2	–	134
Texas*	2	29	1,304	5	–	9	4	7	1,429	38	3	177
MOUNTAIN	–	16	642	1	–	8	–	8	474	4	1	23
Montana	–	2	31	–	–	–	–	1	39	–	–	–
Idaho	–	–	26	–	–	–	–	2	117	–	–	–
Wyoming*	–	---	18	–	---	1	---	1	---	---	---	–
Colorado	–	–	120	–	–	1	–	1	90	3	–	–
New Mexico	–	–	140	1	–	2	–	3	45	–	–	4
Arizona	–	12	238	–	–	4	–	–	141	1	1	19
Utah	–	2	27	–	–	–	–	–	42	–	–	–
Nevada	–	–	42	–	–	–	–	–	–	–	–	–
PACIFIC	7	83	3,099	1	–	73	–	7	2,889	86	20	250
Washington	2	3	251	–	–	6	–	4	278	3	1	4
Oregon	1	2	167	–	–	2	–	2	263	–	–	6
California	4	71	2,433	1	–	63	–	1	2,294	83	18	232
Alaska	–	–	67	–	–	1	–	–	15	–	1	8
Hawaii	–	7	181	–	–	1	–	–	39	–	–	–
Guam	–	–	28	–	–	–	–	–	–	–	–	–
Puerto Rico	4	7	305	–	4	7	–	–	124	9	–	35
Virgin Islands	–	–	1	–	–	–	–	–	–	–	–	–

*Delayed reports: TB: Ohio delete 4; Tularemia: Ark. 3; Gonorrhea: La. delete 8; Syphilis: La. delete 1, Wyo. delete 1; Rabies: La. delete 1, Tex. 6

Week No. 33

TABLE IV. DEATHS IN 122 UNITED STATES CITIES FOR WEEK ENDING AUGUST 18, 1973

(By place of occurrence and week of filing certificate. Excludes fetal deaths)

Area	All Causes			Pneumonia and Influenza	Area	All Causes			Pneumonia and Influenza
	All Ages	65 years and over	Under 1 year	All Ages		All Ages	65 years and over	Under 1 year	All Ages
NEW ENGLAND	744	478	28	43	SOUTH ATLANTIC	1,282	655	51	44
Boston, Mass.	204	117	15	5	Atlanta, Ga.	162	68	6	4
Bridgeport, Conn.	47	29	–	3	Baltimore, Md.	230	107	17	8
Cambridge, Mass.	23	17	–	6	Charlotte, N. C.	78	42	2	1
Fall River, Mass.	24	19	–	–	Jacksonville, Fla.	69	39	2	–
Hartford, Conn.	62	36	3	1	Miami, Fla.	117	61	3	6
Lowell, Mass.	31	21	–	3	Norfolk, Va.	65	27	2	2
Lynn, Mass.	17	14	–	–	Richmond, Va.	85	44	3	3
New Bedford, Mass.	32	24	–	4	Savannah, Ga.	44	26	2	5
New Haven, Conn.	64	41	4	1	St. Petersburg, Fla.	91	71	4	5
Providence, R. I.	63	34	1	5	Tampa, Fla.	80	39	2	3
Somerville, Mass.	12	9	–	1	Washington, D. C.	215	103	5	7
Springfield, Mass.	58	41	–	6	Wilmington, Del.	46	28	3	–
Waterbury, Conn.	43	33	–	–					
Worcester, Mass.	64	43	5	8	EAST SOUTH CENTRAL	647	342	17	22
					Birmingham, Ala.	94	47	3	1
MIDDLE ATLANTIC	3,017	1,831	88	142	Chattanooga, Tenn.	55	22	4	6
Albany, N. Y.	56	31	2	1	Knoxville, Tenn.	22	16	1	–
Allentown, Pa.	30	25	–	3	Louisville, Ky.	109	70	4	7
Buffalo, N. Y.	136	81	7	10	Memphis, Tenn.	167	78	3	2
Camden, N. J.	27	17	–	1	Mobile, Ala.	58	30	–	1
Elizabeth, N. J.	26	15	–	1	Montgomery, Ala.	40	23	–	1
Erie, Pa.	39	29	–	1	Nashville, Tenn.	102	56	2	4
Jersey City, N. J.	64	39	2	6					
Newark, N. J.	77	39	6	3	WEST SOUTH CENTRAL	1,129	566	60	33
New York City, N. Y. †	1,404	838	35	56	Austin, Tex.	41	24	2	–
Paterson, N. J.	32	14	1	1	Baton Rouge, La.	–	–	–	–
Philadelphia, Pa.	505	294	16	26	Corpus Christi, Tex.	40	22	5	2
Pittsburgh, Pa.	176	107	6	7	Dallas, Tex.	162	78	9	6
Reading, Pa.	43	31	–	4	El Paso, Tex.	32	14	–	2
Rochester, N. Y.	134	89	6	9	Fort Worth, Tex.	90	51	5	4
Schenectady, N. Y.	25	16	–	–	Houston, Tex.	253	112	12	2
Scranton, Pa.	52	39	2	2	Little Rock, Ark.	35	18	2	1
Syracuse, N. Y.	82	55	2	2	New Orleans, La.	128	59	6	–
Trenton, N. J.	50	30	2	2	Oklahoma City, Okla. *	79	42	4	2
Utica, N. Y.	26	18	1	2	San Antonio, Tex.	154	80	12	1
Yonkers, N. Y.	33	24	–	5	Shreveport, La.	63	34	1	5
					Tulsa, Okla.	52	32	2	8
EAST NORTH CENTRAL	2,513	1,389	123	75					
Akron, Ohio	67	41	3	–	MOUNTAIN	489	269	16	12
Canton, Ohio	45	27	–	–	Albuquerque, N. Mex.	68	27	1	5
Chicago, Ill.	695	375	38	23	Colorado Springs, Colo.	29	17	1	1
Cincinnati, Ohio	147	92	8	4	Denver, Colo.	98	55	1	1
Cleveland, Ohio	181	99	10	3	Las Vegas, Nev.	18	8	–	2
Columbus, Ohio	138	81	4	5	Ogden, Utah	22	13	2	1
Dayton, Ohio	80	42	5	1	Phoenix, Ariz.	101	56	8	1
Detroit, Mich.	356	181	22	8	Pueblo, Colo.	17	13	–	1
Evansville, Ind.	38	21	2	1	Salt Lake City, Utah	55	43	2	–
Fort Wayne, Ind.	54	26	2	4	Tucson, Ariz.	81	37	1	–
Gary, Ind.	22	8	1	–					
Grand Rapids, Mich.	46	32	2	4	PACIFIC	1,591	995	51	32
Indianapolis, Ind.	168	85	8	4	Berkeley, Calif.	17	10	–	–
Madison, Wis.	51	33	4	3	Fresno, Calif.	54	27	2	3
Milwaukee, Wis.	146	93	3	2	Glendale, Calif.	26	20	–	–
Peoria, Ill.	27	19	3	2	Honolulu, Hawaii	60	31	4	–
Rockford, Ill.	28	20	–	2	Long Beach, Calif.	91	51	3	1
South Bend, Ind.	47	26	2	3	Los Angeles, Calif.	558	357	15	7
Toledo, Ohio	108	49	5	4	Oakland, Calif.	77	54	2	–
Youngstown, Ohio	69	39	1	2	Pasadena, Calif.	30	23	–	–
					Portland, Oreg.	123	81	4	3
WEST NORTH CENTRAL	762	470	29	21	Sacramento, Calif.	59	31	1	–
Des Moines, Iowa	51	33	1	–	San Diego, Calif.	105	62	3	1
Duluth, Minn.	22	18	–	1	San Francisco, Calif.	139	85	5	3
Kansas City, Kans.	27	14	3	1	San Jose, Calif.	57	39	–	2
Kansas City, Mo.	125	75	6	2	Seattle, Wash.	99	60	6	2
Lincoln, Nebr.	23	15	1	–	Spokane, Wash.	50	30	5	5
Minneapolis, Minn.	89	62	2	–	Tacoma, Wash.	46	34	1	5
Omaha, Nebr.	103	68	7	1					
St. Louis, Mo.	195	110	3	8	Total	12,174	6,995	463	424
St. Paul, Minn.	58	33	2	–					
Wichita, Kans.	69	42	4	8	Expected Number	12,105	6,837	549	392
					Cumulative Total (includes reported corrections for previous weeks)	429,434	252,792	15,960	17,710

†Delayed report for week ending August 11, 1973
*Estimate based on average percent of divisional total

EASTERN EQUINE ENCEPHALOMYELITIS – New Hampshire, Michigan

New Hampshire

On August 1, 1973, workers at a pheasant farm in Brentwood, New Hampshire, approximately 15 miles from the Atlantic Ocean, noted that several birds had an illness, characterized by a staggering gait and progressive stupor, which caused death within 1 day. Birds at the farm are presently dying at the rate of approximately 50 per day. In the past 2 weeks, several horses within a 15-mile radius of Brentwood have also become ill with an encephalitis-like disease; 23 have died. Pathologic examination of the brains of 11 of these horses has been compatible with acute viral encephalitis. Specimens from 2 horses were positive for eastern equine encephalomyelitis (EEE) virus. No concurrent human cases have been reported.

Local observers have noted exceptionally heavy rainfall in southeastern New Hampshire this year. Consequently, a large amount of standing water remained in the area, and mosquito breeding has increased, with *Aedes vexans* the most predominant species. Unseasonably hot weather during the past 2 weeks has also contributed to more rapid mosquito breeding.

(Reported by Daniel Burbank, D.V.M., private veterinarian, Kingston, New Hampshire; Clarence Dearborn, D.V.M., State Veterinarian, Vladas Kaupas, M.D., Director, Bureau of Communicable Disease Control, Hugh Wilkerson, M.D., Acting State Health Officer, Gerald Deiller, Commissioner, New Hampshire State Department of Health and Welfare; USDA Veterinary Services Diagnostic Laboratory, Ames, Iowa.)

Michigan

Since August 9, 1973, 10 horses in Michigan have become ill with an acute encephalitis; 9 died within 48 hours after onset of illness. Serologic specimens from the 1 surviving horse were positive for EEE infection. Pathologic examination of specimens of the brains from the 9 dead horses were consistent with acute viral encephalitis. Eight of these horses were kept along a 6-mile section of a single road in Oakland County, Michigan. The other 2 cases occurred in horses from Kalamazoo, Michigan, and Allegan County. All cases have occurred near swampy areas. Larger mosquito populations have been reported throughout the state this year than in previous years.

No confirmed human cases of arboviral encephalitis have been recorded in Michigan this year; however, 102 cases of undiagnosed primary encephalitis in humans have been reported so far in 1973, compared with a total of 108 in 1972.

(Reported by A. L. Trapp, D.V.M., Veterinary Pathologist, Michigan State University; John Quinn, D.V.M., State Veterinarian, Donald Coohon, D.V.M., Director, Division of Disease Control, Norman Hayner, M.D., State Epidemiologist, Michigan Department of Public Health.)

Editorial Note

Epizootics of EEE have not been reported previously from New Hampshire. The last report of EEE activity in Michigan was in 1945.

HEPATITIS-A AMONG MILITARY PERSONNEL – Turkey

Between November 1, 1972, and May 4, 1973, a total of 62 cases of hepatitis-A were discovered among military personnel, dependents, and civilian employees at the United States Air Force Incirlick Common Defense Installation (CDI) near Adana, Turkey (Figure 1). The incidence of the disease for the 4-month period, December 1972-February 1973, was 2.5 cases/1,000/month, 26 times greater than the incidence reported for the preceding 12 months. The diagnosis of hepatitis was based on characteristic symptomatology, including fever, malaise, fatigue, nausea, vomiting, right upper quadrant abdominal pain, jaundice or dark urine, and elevated bilirubin and SGOT levels. Twenty-one persons were hospitalized, and 27 were treated as outpatients. Over 54% of the patients were 15 years of age or younger. The peak incidence of the disease in this age group occurred between late January and early February 1973; the peak incidence in adults followed approximately 30 days later.

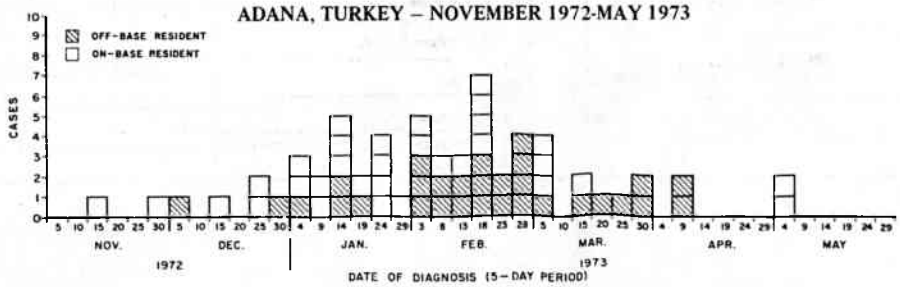
At the time of the investigation in February, 8 of the ill individuals represented secondary cases within families. The interval between diagnosis of hepatitis in 1 family member and subsequent onset of the disease in a second ranged from 9 to 26 days (mean 16.4 days).

Analysis of attack rates by age, marital status, and place of residence revealed that: 1) illness among school children both off and on base peaked at the same time in January and February, 2) unmarried on-base personnel were the least affected of all groups (incidence rate 0.9 cases/1,000/month), and 3) unmarried off-base personnel had the highest rate of illness (11.4 cases/1,000/month) of any group.

These data suggested that 2 groups were at high risk of acquiring infection: school children and off-base personnel. The clustering of cases among school children (both on and off base) during January and February 1973 suggested a common source of infection at the school with a large number

Figure 1

HEPATITIS-A CASES BY DATE OF DIAGNOSIS
INCIRLICK COMMON DEFENSE INSTALLATION
ADANA, TURKEY – NOVEMBER 1972-MAY 1973



HEPATITIS-A – Continued

of secondary cases among parents and siblings. There was no evidence of water or food impurity at the school; however, there were 3 episodes of raw sewage overflow near the school in the 6 weeks preceding the outbreak. On December 14, January 14, and January 27-28, raw sewage was diverted from a dysfunctioning pumping station to an open drainage ditch adjacent to the elementary school playground and was finally discharged off base. The school children played in the drainage ditch area and may have been infected by direct contact with raw sewage.

It appeared that the cases among off-base personnel, especially unmarried personnel, may have been related to another source. Thirteen of 19 municipal water samples collected from American residencies off base were positive for coliform organisms; measurable chlorine residuals were not detected at any sampling location.

Possibly, municipal water impurity accounted for ongoing cases among off-base personnel. Since the investigation was restricted to persons associated with the military installation, data concerning cases of hepatitis among other groups exposed to the municipal water supply could not be obtained.

Recommended control measures included a vigorous health education program, routine surveillance of the water supply, and complete repair or replacement of the sewage system at the installation.

(Reported by Lt. Col. Claude L. McFarlane, USAF, MC, Flight Surgeon, Lt. Col. Charles L. Darling, USAF, BSC, Microbiologist, Maj. Marlan J. Humerickhouse, USAF, BSC, Bioenvironmental Engineer, Maj. Allen Hall III, USAF, VC, Veterinary Pathologist, CMSgt Kenneth E. Gorrell, Preventive Med. Superintendent, MSgt Eugene D. Dinger, Laboratory Superintendent, MSgt John E. Kielty, Veterinary Technician, and Sgt. William S. Lehrer, Medical Administrative Specialist, Incirlick CDI, Turkey.)

FOLLOW-UP ON NOSOCOMIAL *PSEUDOMONAS SPP.* BACTEREMIAS

No additional cases of bacteremia have been documented as having been associated with infusion of albumin (Probumin-25%, Lederle Laboratories Division, American Cyanamid Company). Epidemiologic studies of other hospitals using this product continue. Separate cultures of albumin and stopper of 1 of 54 bottles on test for 9 days (MMWR, Vol. 22, No. 32) have shown a gram-negative rod that has been presumptively identified as *Pseudomonas cepacia* (previously known as *P. multivorans, P. kingii,* or EO-1). Both isolates are sensitive to tetracycline, chloramphenicol, and nalidixic acid and resistant to ampicillin, carbenicillin, gentamicin, kanamycin, streptomycin, nitrofurans, polymixins, and cephalothin.

(Reported by the Bacterial Diseases Branch, Bureau of Epidemiology, CDC.)

Erratum, Vol. 22, No. 32, p. 275

In the article, "Arthropod-borne Virus Disease and Surveillance – California, Southeastern United States," under the heading Southeastern United States, first paragraph, eighth line, correct the number of horse deaths reported by Florida from 56 to 46.

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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.

In addition to the established procedures for reporting morbidity and mortality, the editor welcomes accounts of interesting outbreaks or case investigations of current interest to health officials.

Address all correspondence to: Center for Disease Control, Attn: Editor, Morbidity and Mortality Weekly Report, Atlanta, Georgia 30333

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