CENTER FOR DISEASE CONTROL

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MORBIDITY AND MORTALITY WEEKLY REPORT

International Notes

Ebola Hemorrhagic Fever — Southern Sudan

An outbreak of Ebola hemorrhagic fever was recently reported in Southern Sudan (1). Surveillance measures rapidly instituted by the Sudanese Ministry of Health, with later cooperation from consultants from the World Health Organization, uncovered 69 suspected cases, including 27 deaths. All but 1 of these cases was investigated. Based on clinical, serologic, and epidemiologic data, the actual number of cases was determined to be 33; 22 were fatal. The outbreak was limited to the Yambio-Nzara District, the site where the first cases of this disease were identified in 1976 (Figure 1).

The present epidemic began in late July, when a 45-year-old man, who lived and worked in the Nzara area, had onset of fever, headache, sore throat, myalgia, vomiting, chest pain, and diarrhea. On August 2, he was admitted to the Nzara hospital, where he died in shock 3 days later after extensive gastrointestinal hemorrhage. A patient in the next bed, convalescing from an unrelated illness, and a visitor to another patient on that ward each developed a similar disease, 5 and 14 days, respectively, after the index patient died; these 2 patients also died. Two more cases occurred in hospital staff: a nurse and another hospital employee became ill after they came in contact with the index patient and other subsequently hospitalized patients. The last known case had onset on October 6.

Indirect fluorescent antibody tests on serum taken from suspected cases, performed in Sudan at the laboratory at Li-Rangu Sleeping Sickness Hospital, demonstrated the presence of Ebola virus antibody in the surviving patients and in some of those who eventually died. These results have been confirmed by CDC. Ebola virus has also been isolated from the blood of at least 1 of several patients from whom specimens were taken during the acute phase of the illness.

Preliminary evaluation of the epidemiologic and serologic data collected from this outbreak suggests that close physical contact in caring for patients or preparing bodies for burial resulted in a high risk of illness. Casual contact with patients did not appear to result in infection.

The source of infection for the index patient has not been determined. Ebola virus antibody was found in 3 of 51(6%) of asymptomatic contacts of hospitalized controls and in 11 of 152(7%) of asymptomatic workers in a large industrial and agricultural complex in Nzara. Both of these survey groups denied contact with cases during this epidemic, suggesting that the virus is endemic in the region.

The following measures were recommended to control the present epidemic and to reduce the potential for future epidemics:

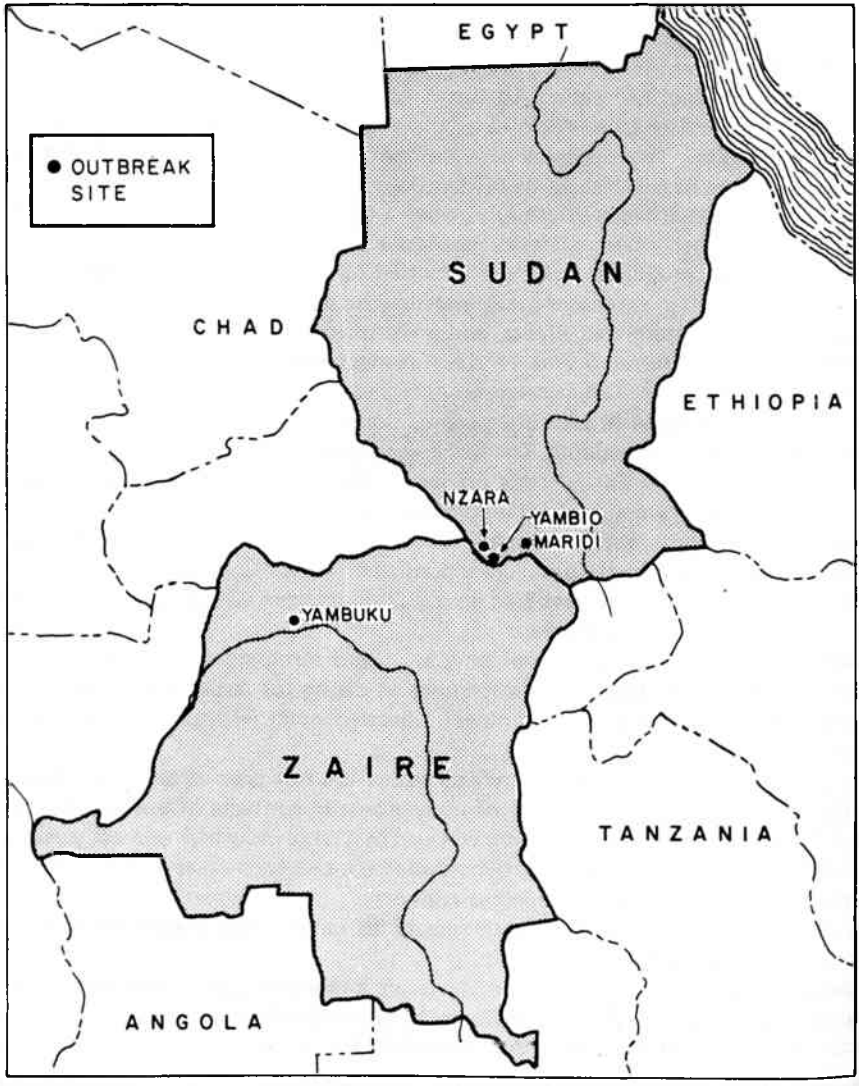
1. Because nosocomial transmission plays an important part in the amplification of the disease, rigid practice and supervision of isolation and barrier nursing techniques with suspected cases is essential. Hospital staff should be trained in decontamination techniques

Ebola Hemorrhagic Fever – Continued

and in specific techniques for the use of simple isolation equipment, including gloves, gowns, caps, and masks.

2. A basic surveillance system to detect and report suspected cases of hemorrhagic fever should be implemented. The hospital and dispensary-based physicians and primary health workers should be asked to report any suspected cases of hemorrhagic fever to the surveillance team. In addition 2 or 3 public health officers should be assigned to regular bicycle routes to question families and local chiefs about persons who may be known to have fever and hemorrhagic symptoms.

FIGURE 1. Foci of outbreaks of Ebola hemorrhagic fever, Sudan and Zaire, 1976 and 1979



Ebola Hemorrhagic Fever – Continued

Reported by the Regional Ministry of Health and Social Welfare, Juba, Sudan; the Sudanese Ministry of Health, Khartoum, Sudan; WHO Regional Office for the Eastern Mediterranean Region, Alexandria, Egypt; WHO Headquarters, Geneva, Switzerland; Virology Div, Bur of Laboratories, and Viral Diseases Div, Bur of Epidmiology, CDC.

Editorial Note: Two essential findings of this investigation need to be emphasized. First, the presence of Ebola antibody in persons unassociated with the current epidemic indicates that the disease is endemic and suggests that transmission occurs sporadically and possibly continuously from some natural source. Second, this outbreak, as with those that were well documented in 1976 in Maridi, Sudan, and in Yambuku, Zaire (*2*) (Figure 1), began with hospital spread which effectively amplified the transmission into the community. Because of cultural and social preferences, severely ill persons are rarely hospitalized. Thus, with infrequent, sporadic cases of hemorrhagic fever, transmission may be limited to a few family members living in compounds that are spread far apart in rural areas. Yet, it is the occasionally hospitalized, severely ill patient with hemorrhagic fever who may initiate transmission in the hospital; subsequently, the disease spreads throughout the community.

Continuous surveillance is essential in order to determine the frequency, location, and seasonal occurrence of sporadic cases, to recognize the potential threat of epidemic amplification of the virus, and to institute promptly hospital and community measures that will interrupt the chain of transmission.

References

1. World Health Organization: Viral haemorrhagic fever surveillance. Weekly Epidemiological Record 54:319, 1979
2. World Health Organization: Viral haemorrhagic fever – Zaire. Weekly Epidemiological Record 51:383, 1976

Epidemiologic Notes and Reports

Follow-up on Polychlorinated Biphenyls Exposure – Idaho, Montana

Laboratory and epidemiologic investigations into the polychlorinated biphenyl (PCB) contamination of food in the Northwest are nearly complete. The results indicate that although millions of pounds of food and animal feed were contaminated as a result of a PCB spill from a transformer into meat meal at a Montana slaughterhouse (*1*), the PCB levels in 2 different exposed study groups were found to be no higher than expected background levels.

The Food and Drug Administration (FDA) and the U.S. Department of Agriculture traced the PCB contamination through the food chain. It is believed that no more contaminated products are in the food chain. The products involved included the originally contaminated meat meal, animal feeds that used the meat meal as a protein supplement (for hogs, turkeys, ducks, chickens, minks, and other animals), meat and products from these animals (notably non-edible tallow), fresh eggs, and processed foods made from the eggs (including salad dressing and frozen cakes, among others).

The 2 groups studied for PCB exposure were workers at the slaughterhouse (the site of the PCB leak) and consumers of contaminated eggs in Franklin, Idaho. Mean serum levels for both groups fell within or lower than background PCB levels for the general population, i.e., 5-20 parts per billion (ppb). Breast milk PCB levels in 8 lactating mothers were found to be no higher than background levels for whole breast milk (*2*). The clinical

Polychlorinated Biphenyls — Continued

evaluation of the workers in Montana revealed no evidence of PCB-related illness.

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Editorial Note: This episode clearly points out that even a single PCB spill can cause vast disruption of the food industry as well as economic hardship. Although the production of PCBs has been banned by the Environmental Protection Agency (EPA), the federal regulations do not prohibit its use in existing enclosed containers. There are still thousands of transformers and capacitors in use that contain the substance in amounts varying from a few hundred milliliters to several hundred liters. The useful life of this equipment is about 10 to 20 years. Thus, surveillance for PCB contamination and appropriate environmental disposal of PCBs need to be continued.

References

1. MMWR 28:449-450, 1979
2. Health Effects Branch, Hazard Evaluation Division, Office of Pesticide Programs, EPA: Supplementary Report to the National Study to Determine Levels of Chlorinated Hydrocarbon Insecticides in Human Milk, 1975-1976. Springfield, Va., National Technical Information Service, 1978

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

[Cumulative totals include revised and delayed reports through previous weeks.]

DISEASE	47th WEEK ENDING		MEDIAN	CUMULATIVE, FIRST 47 WEEKS		
	November 24, 1979	November 25, 1978*	1974-1978**	November 24, 1979	November 25, 1978*	MEDIAN 1974-1978**
Aseptic meningitis	140	127	74	7,523	5,934	3,764
Brucellosis	1	2	8	144	155	206
Chickenpox	1,714	2,326	2,322	180,189	134,720	134,720
Diphtheria	–	1	4	65	65	136
Encephalitis: Primary (arthropod-borne & unspec.)	20	25	24	949	1,095	1,095
Post-infectious	4	7	5	203	215	232
Hepatitis, Viral: Type B	261	265	265	13,180	13,457	13,457
Type A	452	539	633	26,358	26,359	30,009
Type unspecified	214	171	184	9,709	7,620	7,511
Malaria	12	12	5	680	683	422
Measles (rubeola)	118	195	224	12,888	25,592	25,592
Meningococcal infections: Total	28	37	28	2,279	2,186	1,385
Civilian	28	36	28	2,267	2,159	1,366
Military	–	1	–	12	27	27
Mumps	159	216	349	12,600	15,027	35,687
Pertussis	12	21	21	1,215	1,899	1,572
Rubella (German measles)	43	123	100	11,197	17,663	15,673
Tetanus	1	1	1	65	73	74
Tuberculosis	343	421	471	24,997	26,115	27,541
Tularemia	2	3	3	183	120	128
Typhoid fever	5	11	7	457	480	378
Typhus fever, tick-borne (Rky. Mt. spotted)	13	4	6	1,017	1,023	866
Venereal diseases:						
Gonorrhea: Civilian	14,999	15,935	17,003	902,830	913,718	911,665
Military	579	368	368	24,902	23,496	24,134
Syphilis, primary & secondary: Civilian	366	369	351	22,460	19,518	19,518
Military	6	10	7	286	272	278
Rabies in animals	63	40	31	4,524	2,880	2,695

TABLE II. Notifiable diseases of low frequency, United States

	CUM. 1979		CUM. 1979
Anthrax	–	Poliomyelitis: Total	25
Botulism	28	Paralytic	22
Cholera	2	Psittacosis	90
Congenital rubella syndrome (La. 1)	41	Rabies in man	3
Leprosy	154	Trichinosis	130
Leptospirosis (Calif. 1)	43	Typhus fever, flea-borne (endemic, murine)	53
Plague	10		

*Delayed reports received for calendar year 1978 are used to update last year's weekly and cumulative totals.
**Medians for gonorrhea and syphilis are based on data for 1976-1978.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending November 24, 1979, and November 25, 1978 (47th week)

REPORTING AREA	ASEPTIC MENINGITIS	BRUCELLOSIS	CHICKENPOX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS (VIRAL), BY TYPE			MALARIA	
						Primary		Post-infectious	B	A	Unspecified		
	1979	1979	1979	1979	CUM. 1979	1979	1978*	1979	1979	1979	1979	1979	CUM. 1979
UNITED STATES	140	1	1,714	–	65	20	25	4	261	452	214	12	680
NEW ENGLAND	5	–	214	–	–	–	–	–	5	13	15	–	40
Maine	–	–	68	–	–	–	–	–	–	5	2	–	3
N.H.	–	–	–	–	–	–	–	–	–	–	–	–	1
Vt.	–	–	3	–	–	–	–	–	–	2	–	–	–
Mass.	2	–	41	–	–	–	–	–	1	3	13	–	12
R.I.	3	–	3	–	–	–	–	–	–	–	–	–	9
Conn.	–	–	99	–	–	–	–	–	4	3	–	–	15
MID. ATLANTIC	31	–	45	–	–	1	3	–	32	23	18	2	93
Upstate N.Y.	10	–	18	–	–	–	1	–	10	7	5	–	13
N.Y. City	3	–	26	–	–	–	1	–	12	7	4	1	43
N.J.	8	–	NN	–	–	–	–	–	10	9	9	–	16
Pa.†	10	–	1	–	–	1	1	–	NA	NA	NA	1	21
E.N. CENTRAL	31	–	763	–	2	5	7	–	55	64	13	–	47
Ohio†	–	–	29	–	–	3	3	–	1	34	–	–	12
Ind.	–	–	32	–	1	–	1	–	9	–	2	–	1
Ill.	1	–	61	–	–	–	1	–	23	13	2	–	20
Mich.	26	–	415	–	–	2	2	–	21	12	9	–	12
Wis.†	4	–	226	–	1	–	–	–	1	5	–	–	2
W.N. CENTRAL	10	1	326	–	1	1	–	–	12	26	7	1	33
Minn.†	–	–	1	–	–	–	–	–	2	3	–	–	13
Iowa†	3	–	222	–	–	–	–	–	1	6	–	–	2
Mo.	4	1	–	–	1	–	–	–	8	8	4	–	4
N. Dak.†	1	–	6	–	–	–	–	–	–	–	–	–	7
S. Dak.	–	–	38	–	–	–	–	–	–	–	–	–	1
Nebr.	–	–	4	–	–	–	–	–	–	1	2	–	2
Kans.	2	–	55	–	–	1	–	–	1	8	1	1	4
S. ATLANTIC	11	–	157	–	1	–	3	3	51	56	26	2	81
Del.	–	–	28	–	–	–	–	–	–	1	–	–	1
Md.	–	–	26	–	–	–	–	–	12	13	12	–	16
D.C.	–	–	–	–	–	–	–	–	1	1	1	–	6
Va.	3	–	–	–	1	–	2	–	10	7	–	–	24
W. Va†	–	–	83	–	–	–	–	–	1	1	–	–	3
N.C.	3	–	NN	–	–	–	1	–	3	4	3	–	6
S.C.	2	–	–	–	–	–	–	–	8	3	3	–	1
Ga.	–	–	–	–	–	–	–	–	4	4	–	1	4
Fla.	3	–	20	–	–	–	–	3	12	22	7	1	20
E.S. CENTRAL	8	–	5	–	–	3	5	–	23	30	8	1	12
Ky.	1	–	1	–	–	1	–	–	7	7	–	–	–
Tenn.	3	–	NN	–	–	1	3	–	11	10	4	–	–
Ala.	3	–	4	–	–	–	2	–	3	6	4	1	4
Miss.	1	–	–	–	–	1	–	–	2	7	–	–	8
W.S. CENTRAL	15	–	61	–	–	–	1	1	35	99	53	–	48
Ark.	1	–	–	–	–	–	1	–	–	8	1	–	–
La.	1	–	NN	–	–	–	–	–	6	17	8	–	5
Okla.†	2	–	–	–	–	–	–	–	6	8	3	–	8
Tex.	11	–	61	–	–	–	–	1	23	66	41	–	35
MOUNTAIN	3	–	32	–	1	5	–	–	8	45	42	–	18
Mont.	–	–	17	–	–	–	–	–	–	8	–	–	2
Idaho	–	–	2	–	–	–	–	–	1	–	–	–	–
Wyo.	–	–	–	–	–	–	–	–	–	–	–	–	1
Colo.	2	–	9	–	–	–	–	–	3	1	1	–	8
N. Mex.†	–	–	–	–	–	–	–	–	–	2	–	–	1
Ariz.	–	–	NN	–	1	–	–	–	2	25	37	–	5
Utah	1	–	4	–	–	5	–	–	–	1	1	–	–
Nev.	–	–	–	–	–	–	–	–	2	8	3	–	1
PACIFIC	26	–	111	–	60	5	6	–	40	96	32	6	308
Wash.†	4	–	107	–	56	1	5	–	1	11	2	3	15
Oreg.	2	–	–	–	–	–	–	–	6	13	3	–	13
Calif.†	19	–	–	–	4	2	1	–	33	71	21	3	274
Alaska	1	–	2	–	–	1	–	–	–	–	6	–	–
Hawaii	–	–	2	–	–	1	–	–	–	1	–	–	6
Guam													
P.R.	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	–
V.I.	2	–	2	–	–	–	–	–	4	11	14	–	3
Pac. Trust Terr.	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	–
	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	–

NN: Not notifiable. NA: Not available.

*Delayed reports received for 1978 are not shown below but are used to update last year's weekly and cumulative totals.

†The following delayed reports will be reflected in next week's cumulative totals: Asep. meng.: Pa. –2, Ohio +6, Wis. –1; Chickenpox: Wash. –2, Calif. +46; Enceph., primary: Pa. +1; Hep. B: Pa. +11, Iowa –1, W.Va. +1, Okla. –1; Hep. A: Pa. +9, Minn. +1, N.Dak. +1, W.Va. –1, N.Mex. +3, Wash. –1; Hep. unsp.: Okla. +1.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending November 24, 1979, and November 25, 1978 (47th week)

REPORTING AREA	MEASLES (RUBEOLA)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1979	CUM. 1979	CUM. 1978*	1979	CUM. 1979	CUM. 1978*	1979	CUM. 1979	1979	1979	CUM. 1979	CUM. 1979
UNITED STATES	118	12,888	25,592	28	2,279	2,186	159	12,600	12	43	11,197	65
NEW ENGLAND	–	292	2,035	3	121	122	39	623	–	3	1,436	5
Maine	–	19	1,319	1	8	9	7	248	–	3	65	1
N.H.	–	33	75	–	14	9	–	6	–	–	127	–
Vt.	–	119	52	1	8	3	–	9	–	–	407	–
Mass.	–	15	253	1	37	48	30	124	–	–	488	3
R.I.	–	102	8	–	9	18	1	46	–	–	93	–
Conn.	–	4	328	–	45	35	1	190	–	–	256	1
MID. ATLANTIC	8	1,539	2,227	4	369	337	8	1,194	1	13	1,993	9
Upstate N.Y.	1	633	1,415	2	124	107	5	181	1	2	1,114	2
N.Y. City	7	801	380	–	84	79	1	137	–	1	276	4
N.J.	–	58	74	2	93	72	2	577	–	10	337	1
Pa.	–	47	358	–	68	79	–	299	–	–	266	2
E.N. CENTRAL	12	3,338	11,212	6	246	320	40	5,271	4	11	2,624	4
Ohio	–	294	489	2	87	83	2	1,858	–	–	140	3
Ind.	1	225	215	–	44	51	3	323	1	5	767	–
Ill.	3	1,451	1,200	3	25	94	4	943	3	–	190	–
Mich.	6	846	7,826	1	73	74	19	972	–	6	1,242	1
Wis.	2	522	1,482	–	17	18	12	1,175	–	–	285	–
W.N. CENTRAL	21	1,826	432	2	68	87	2	703	1	2	493	2
Minn.†	–	1,218	40	2	16	25	–	23	–	–	43	–
Iowa	–	16	58	–	13	10	2	238	–	–	52	–
Mo.	4	424	32	–	29	34	–	197	–	2	69	1
N. Dak.	–	21	207	–	1	3	–	2	–	–	8	1
S. Dak.	–	2	–	–	2	3	–	7	–	–	5	–
Nebr.	16	70	5	–	–	–	–	7	–	–	202	–
Kans.	1	75	90	–	7	12	–	229	1	–	114	–
S. ATLANTIC	41	2,057	5,402	4	556	522	22	692	2	4	1,251	12
Del.†	–	1	7	–	3	2	3	64	–	–	5	–
Md.	–	16	52	–	58	37	4	176	–	–	28	1
D.C.	–	–	48	–	2	2	–	2	–	–	1	–
Va.†	6	282	2,833	1	80	66	–	92	–	–	204	2
W. Va.	–	61	1,065	1	10	16	1	112	–	–	109	–
N.C.	–	114	122	–	86	99	3	81	–	–	532	3
S.C.	5	182	199	–	61	37	–	3	–	–	65	–
Ga.	28	567	36	2	85	62	–	7	2	3	14	–
Fla.	2	834	1,040	–	171	201	11	155	–	1	293	6
E.S. CENTRAL	17	241	1,430	2	165	171	22	1,483	–	1	307	8
Ky.	–	39	122	–	34	30	18	1,232	–	1	71	1
Tenn.	–	76	961	1	47	44	–	104	–	–	100	–
Ala.	17	102	101	1	39	49	2	26	–	–	44	5
Miss.	–	24	246	–	45	48	2	121	–	–	92	2
W.S. CENTRAL	4	947	1,263	5	341	297	14	1,434	1	2	264	21
Ark.	–	9	16	2	29	22	1	531	–	–	7	4
La.	–	256	351	2	120	121	–	36	–	–	30	3
Okla.	–	22	18	–	35	18	–	–	1	–	24	2
Tex.	4	660	878	1	157	136	13	867	–	2	203	12
MOUNTAIN	2	331	267	–	93	51	1	318	1	1	544	–
Mont.	–	60	106	–	11	5	1	13	–	–	71	–
Idaho	–	18	1	–	10	4	–	9	–	1	206	–
Wyo.	–	36	–	–	1	–	–	–	–	–	–	–
Colo.	2	70	40	–	7	3	–	111	1	–	67	–
N. Mex.	–	39	–	–	6	12	–	13	–	–	11	–
Ariz.	–	77	56	–	36	15	–	62	–	–	145	–
Utah	–	19	44	–	9	6	–	96	–	–	41	–
Nev.	–	12	20	–	13	6	–	14	–	–	3	–
PACIFIC	13	2,317	1,324	2	320	279	11	882	2	6	2,285	4
Wash.†	–	1,140	339	1	59	45	–	226	–	–	193	–
Oreg.	–	66	382	–	24	29	2	105	1	–	112	–
Calif.	13	1,026	593	1	221	191	9	422	1	6	1,957	4
Alaska	–	17	1	–	6	10	–	13	–	–	4	–
Hawaii	–	68	9	–	10	4	–	116	–	–	19	–
Guam	NA	12	26	–	1	2	NA	11	NA	NA	4	–
P.R.	1	373	286	–	6	10	4	586	–	1	39	11
V.I.	NA	4	6	–	3	1	NA	20	NA	NA	–	–
Pac. Trust Terr.	NA	9	641	–	1	3	NA	45	NA	NA	1	–

NA: Not available.

*Delayed reports received for 1978 are not shown below but are used to update last year's weekly and cumulative totals.

†The following delayed reports will be reflected in next week's cumulative totals: Meng. inf.: Minn. +1, Wash. –2; Rubella: Del. +2, Va. –1.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending November 24, 1979, and November 25, 2978 (47th week)

REPORTING AREA	TUBERCULOSIS		TULAREMIA	TYPHOID FEVER		TYPHUS FEVER (Tick-borne) (RMSF)		VENEREAL DISEASES (Civilian)						RABIES (in Animals)
								GONORRHEA			SYPHILIS (Pri. & Sec.)			
	1979	CUM. 1979	CUM. 1979	1979	CUM. 1979	1979	CUM. 1979	1979	CUM. 1979	CUM. 1978*	1979	CUM. 1979	CUM. 1978*	CUM. 1979
UNITED STATES	343	24,997	183	5	457	13	1,017	14,999	902,830	913,718	366	22,460	19,518	4,524
NEW ENGLAND	10	733	3	1	22	–	9	454	22,231	23,348	6	440	528	47
Maine	–	52	–	–	1	–	–	31	1,561	1,925	–	10	9	29
N.H.	–	21	–	–	–	–	–	12	819	1,073	–	18	5	4
Vt.	–	28	–	–	–	–	1	21	582	573	–	2	3	–
Mass.	6	389	3	1	14	–	4	126	8,758	10,286	5	251	322	10
R.I.	1	65	–	–	2	–	–	18	1,787	1,701	1	20	24	2
Conn.†	3	178	–	–	5	–	4	246	8,724	7,790	–	139	165	2
MID. ATLANTIC	54	3,872	1	2	79	–	45	1,785	99,444	98,582	78	3,415	2,613	68
Upstate N.Y.	19	693	1	2	17	–	28	257	17,336	16,605	11	257	191	48
N.Y. City	20	1,439	–	–	34	–	1	800	38,950	37,164	50	2,314	1,807	–
N.J.	6	736	–	–	16	–	5	72	17,110	18,576	11	449	323	5
Pa.	9	1,004	–	–	12	–	11	656	26,048	26,237	6	395	292	15
E.N. CENTRAL	69	3,738	–	–	27	–	58	2,420	141,217	142,635	38	2,821	2,228	419
Ohio	9	664	–	–	3	–	21	587	38,938	37,211	5	564	417	38
Ind.	6	468	–	–	–	–	2	189	11,803	14,349	–	188	160	67
Ill.	27	1,520	–	–	8	–	31	868	44,910	45,253	27	1,589	1,394	201
Mich.†	20	907	–	–	12	–	3	776	33,210	33,139	6	407	199	14
Wis.†	7	179	–	–	4	–	1	NA	12,356	12,683	NA	73	58	99
W.N. CENTRAL	28	855	27	1	22	–	54	914	44,954	45,898	4	286	397	916
Minn.	4	134	1	–	4	–	2	128	7,355	7,698	1	78	145	154
Iowa	–	61	1	–	5	–	14	96	5,316	5,076	–	29	35	176
Mo.	20	470	22	–	8	–	25	504	19,554	20,286	3	131	129	275
N. Dak.	3	21	–	–	–	–	–	6	783	797	–	2	3	81
S. Dak.†	–	46	2	–	–	–	–	13	1,458	1,564	–	2	3	103
Nebr.	–	22	1	–	1	–	5	58	3,166	3,329	–	7	13	3
Kans.	1	101	–	1	4	–	8	109	7,322	7,148	–	37	69	124
S. ATLANTIC	58	5,537	11	–	44	13	587	3,732	217,930	222,012	110	5,325	5,164	626
Del.	–	52	–	–	–	–	3	70	3,576	3,150	–	27	10	–
Md.†	14	694	–	–	8	–	75	581	26,932	28,555	1	332	397	37
D.C.	–	255	2	–	1	–	2	209	14,426	14,945	16	416	389	–
Va.	NA	655	2	–	5	–	90	482	20,896	21,599	8	428	434	20
W. Va.	3	212	–	–	5	–	12	46	2,954	3,042	–	48	28	11
N.C.†	6	883	–	–	2	13	238	666	31,815	31,721	6	401	554	25
S.C.	12	427	1	–	3	–	78	418	20,440	21,794	14	282	266	169
Ga.	–	883	6	–	2	–	81	678	40,962	42,784	21	1,473	1,290	317
Fla.	23	1,476	–	–	18	–	8	582	55,929	54,422	44	1,918	1,796	47
E.S. CENTRAL	30	2,284	14	–	22	–	138	1,246	77,035	77,517	38	1,504	1,014	301
Ky.	–	589	2	–	7	–	20	186	10,339	10,355	4	148	134	128
Tenn.	19	678	12	–	3	–	76	471	27,927	28,406	20	627	336	100
Ala.	11	539	–	–	8	–	20	445	22,693	22,202	7	273	180	72
Miss.	–	478	–	–	4	–	22	144	16,076	16,554	7	456	364	1
W.S. CENTRAL	38	3,032	74	–	75	–	103	1,970	115,967	121,958	60	4,095	3,129	1,669
Ark.	6	276	47	–	5	–	22	240	9,143	9,056	2	142	67	305
La.	3	596	5	–	5	–	3	375	20,770	19,735	26	1,052	644	31
Okla.	–	322	14	–	–	–	62	209	11,466	11,498	–	80	87	263
Tex.	29	1,838	8	–	65	–	16	1,146	74,588	81,669	32	2,821	2,331	1,070
MOUNTAIN	10	754	43	1	28	–	17	698	36,334	35,153	4	447	404	141
Mont.	2	34	14	–	–	–	5	37	1,804	2,000	–	8	7	8
Idaho	–	15	1	1	2	–	3	46	1,606	1,446	–	25	13	8
Wyo.	–	9	–	–	1	–	–	–	1,029	872	–	8	9	–
Colo.	5	114	12	–	15	–	4	186	9,764	9,742	2	95	114	51
N. Mex.	2	139	4	–	5	–	1	86	4,502	5,032	2	81	82	41
Ariz.	–	362	–	–	3	–	–	186	10,002	9,081	–	125	91	23
Utah	1	30	10	–	–	–	1	49	1,870	1,895	–	4	13	10
Nev.	–	51	2	–	2	–	3	108	5,757	5,085	–	101	75	–
PACIFIC	46	4,192	10	–	138	–	6	1,780	147,718	146,615	28	4,127	4,041	337
Wash.†	2	256	5	–	8	–	–	254	12,581	12,171	NA	186	238	–
Oreg.	3	176	2	–	5	–	–	190	9,391	9,981	1	153	157	15
Calif.	37	3,404	3	–	116	–	6	1,203	118,319	117,362	27	3,678	3,595	320
Alaska†	–	68	–	–	2	–	–	63	4,560	4,536	–	24	11	2
Hawaii	4	288	–	–	7	–	–	70	2,867	2,565	–	86	40	–
Guam	NA	53	–	NA	–	NA	–	NA	94	133	NA	1	–	–
P.R.	1	271	–	–	6	–	–	49	1,992	2,010	9	520	449	22
V.I.	NA	4	–	NA	1	NA	–	NA	142	188	NA	8	16	–
Pac. Trust Terr.	NA	41	–	NA	–	NA	–	NA	429	398	NA	1	–	–

NA: Not available.
*Delayed reports received for 1978 are not shown below but are used to update last year's weekly and cumulative totals.
†The following delayed reports will be reflected in next week's cumulative totals: TB: Mich. –2, Md. –3, N.C. –1; GC: Conn. –1, Wis. +265, S. Dak. +1, Wash. +633; Syphilis Alaska +1.

TABLE IV. Deaths in 121 U.S. cities,* week ending November 24, 1979 (47th week)

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)					P&I** TOTAL
	ALL AGES	>65	45-64	25-44	<1	
NEW ENGLAND	619	426	130	30	15	36
Boston, Mass.	182	109	42	15	9	13
Bridgeport, Conn.	42	30	11	1	-	3
Cambridge, Mass.	20	13	7	-	-	1
Fall River, Mass.	29	22	7	-	-	1
Hartford, Conn.	45	27	9	3	2	-
Lowell, Mass.	28	23	5	-	-	2
Lynn, Mass.	20	14	3	3	-	1
New Bedford, Mass.	18	15	3	-	-	1
New Haven, Conn.	37	26	6	3	-	-
Providence, R.I.	58	38	13	2	2	3
Somerville, Mass.	7	7	-	-	-	-
Springfield, Mass.	46	36	8	1	1	4
Waterbury, Conn.	44	33	9	1	-	5
Worcester, Mass.	43	33	7	1	1	2
MID. ATLANTIC	2,410	1,570	555	142	63	85
Albany, N.Y.	49	31	10	2	5	-
Allentown, Pa.	20	17	3	-	-	-
Buffalo, N.Y.	71	44	21	4	1	5
Camden, N.J.	27	14	10	1	1	2
Elizabeth, N.J.	23	17	5	1	-	-
Erie, Pa.†	34	26	6	1	1	1
Jersey City, N.J.	41	33	6	1	-	1
Newark, N.J.	41	15	13	7	2	1
N.Y. City, N.Y.	1,256	808	290	90	30	42
Paterson, N.J.	32	19	7	3	1	2
Philadelphia, Pa.†	377	234	101	13	10	13
Pittsburgh, Pa.†	35	22	10	1	-	2
Reading, Pa.	31	26	3	1	1	-
Rochester, N.Y.	127	87	17	10	7	5
Schenectady, N.Y.	30	21	6	3	-	-
Scranton, Pa.†	37	24	9	1	1	3
Syracuse, N.Y.	103	79	16	3	3	2
Trenton, N.J.	28	17	10	-	-	1
Utica, N.Y.	16	11	5	-	-	4
Yonkers, N.Y.	32	25	7	-	-	1
E.N. CENTRAL	2,030	1,222	518	131	78	45
Akron, Ohio	51	36	14	-	1	-
Canton, Ohio	21	17	2	1	-	1
Chicago, Ill.	506	296	128	41	21	10
Cincinnati, Ohio	113	72	28	8	3	-
Cleveland, Ohio	169	89	51	15	4	5
Columbus, Ohio	140	85	28	9	11	5
Dayton, Ohio	70	38	27	2	1	3
Detroit, Mich.	236	139	61	17	10	5
Evansville, Ind.	46	29	11	1	2	2
Fort Wayne, Ind.	39	25	10	2	1	-
Gary, Ind.	33	12	12	7	1	-
Grand Rapids, Mich.	56	33	15	6	2	2
Indianapolis, Ind.	134	86	25	5	9	-
Madison, Wis.	34	18	9	-	4	4
Milwaukee, Wis.	102	65	24	4	6	2
Peoria, Ill.	30	21	5	1	-	-
Rockford, Ill.	33	20	10	2	1	2
South Bend, Ind.	64	43	16	2	-	1
Toledo, Ohio	87	54	24	7	-	3
Youngstown, Ohio	66	44	18	1	1	-
W.N. CENTRAL	652	431	141	36	24	20
Des Moines, Iowa	43	32	7	1	2	-
Duluth, Minn.	13	6	5	2	-	-
Kansas City, Kans.	28	15	9	2	2	1
Kansas City, Mo.	111	76	26	2	4	4
Lincoln, Nebr.	29	19	8	1	-	2
Minneapolis, Minn.	83	53	22	4	2	-
Omaha, Nebr.	74	54	13	2	-	4
St. Louis, Mo.	177	114	29	17	12	3
St. Paul, Minn.	48	33	9	2	2	1
Wichita, Kans.	46	29	13	3	-	5

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)					P&I** TOTAL
	ALL AGES	>65	45-64	25-44	<1	
S. ATLANTIC	1,103	652	285	67	55	35
Atlanta, Ga.	185	100	53	14	10	2
Baltimore, Md.	239	141	61	14	10	2
Charlotte, N.C.	56	29	16	4	3	1
Jacksonville, Fla.	75	50	18	1	5	3
Miami, Fla.	71	43	17	4	3	-
Norfolk, Va.	54	35	10	2	7	6
Richmond, Va.	72	41	20	7	-	4
Savannah, Ga.	21	13	6	-	2	3
St. Petersburg, Fla.	84	68	10	1	2	7
Tampa, Fla.	35	24	8	3	-	3
Washington, D.C.	153	75	52	14	8	2
Wilmington, Del.	58	33	14	3	5	2
E.S. CENTRAL	573	325	175	41	14	14
Birmingham, Ala.	102	61	31	6	2	-
Chattanooga, Tenn.	44	24	16	1	1	3
Knoxville, Tenn.	56	36	13	3	1	1
Louisville, Ky.	83	38	28	10	3	6
Memphis, Tenn.	122	71	38	12	-	-
Mobile, Ala.	69	38	21	4	3	1
Montgomery, Ala.	21	14	4	-	2	-
Nashville, Tenn.	76	43	24	5	2	3
W.S. CENTRAL	828	501	195	64	30	22
Austin, Tex.	62	43	9	2	2	1
Baton Rouge, La.	34	18	6	6	2	3
Corpus Christi, Tex.	56	30	22	1	2	3
Dallas, Tex.	141	80	36	12	8	-
El Paso, Tex.	30	19	7	1	-	-
Fort Worth, Tex.	78	47	20	4	-	2
Houston, Tex.	121	53	31	21	8	2
Little Rock, Ark.	38	26	7	3	-	4
New Orleans, La.	92	65	14	11	2	-
San Antonio, Tex.	73	46	20	3	3	1
Shreveport, La.	48	28	17	-	3	1
Tulsa, Okla.	55	46	6	-	-	5
MOUNTAIN	505	301	130	38	16	14
Albuquerque, N.Mex.	57	34	13	7	3	1
Colo. Springs, Colo.	31	21	7	2	-	3
Denver, Colo.	98	58	32	6	-	4
Las Vegas, Nev.	45	24	14	4	-	2
Ogden, Utah	17	13	-	2	1	-
Phoenix, Ariz.	114	63	31	5	6	3
Pueblo, Colo.	16	7	6	2	1	-
Salt Lake City, Utah	48	23	12	7	3	1
Tucson, Ariz.	79	58	15	3	2	-
PACIFIC	1,968	1,248	448	136	65	50
Berkeley, Calif.	14	13	1	-	-	-
Fresno, Calif.	58	39	12	3	2	4
Glendale, Calif.	16	11	3	2	-	-
Honolulu, Hawaii	53	31	17	2	2	3
Long Beach, Calif.	112	67	34	5	2	1
Los Angeles, Calif.	811	520	182	54	27	16
Oakland, Calif.	60	38	12	4	5	2
Pasadena, Calif.	26	17	4	2	1	-
Portland, Oreg.	142	97	31	5	6	2
Sacramento, Calif.	55	34	13	4	2	3
San Diego, Calif.	129	83	25	12	4	1
San Francisco, Calif.	121	80	21	12	3	2
San Jose, Calif.	139	81	33	14	4	4
Seattle, Wash.	137	79	38	9	3	4
Spokane, Wash.	50	31	12	4	1	6
Tacoma, Wash.	45	27	10	4	3	2
TOTAL	10,688	6,676	2,577	685	360	321

*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.

Epidemiologic Notes and Reports

Campylobacter Enteritis — Iowa

On August 13, 1979, the Microbiology Laboratory at Mercy Health Center in Dubuque, Iowa, in order to improve its diagnostic capabilities, began to culture routinely all diarrheal stool specimens for the presence of *Campylobacter fetus*. Through November 14, 11 isolates were made from 238 patients at this 525-bed community hospital—a rate of 4.6%. Ten cultures were ssp. *jejuni* and 1, ssp. *intestinalis*. During this time, 5 isolates of *Salmonella* and none of *Shigella* were made.

Isolates were from 9 males and 2 females; 7 patients were less than 7 years old, and 3 were infants. Six patients were hospitalized, although no extraintestinal complications occurred. Diarrhea (in 2 instances, bloody) occurred in all these patients. The following case reports illustrate some of the clinical and epidemiologic characteristics encountered.

On August 6, 4 days after plucking chickens at a farm, a 14-year-old boy developed watery diarrhea with mucus and abdominal pain. When admitted to the hospital on the fifth day of illness, the patient was afebrile but dehydrated. Intravenous fluids were administered, and the diarrhea slowly resolved over the ensuing 2 weeks. *C. fetus* ssp. *jejuni* was identified in the stool on the fourth day of hospitalization, but no antimicrobial therapy was administered. Fecal cultures from chickens and pigs from the farm yielded *C. fetus* ssp. *jejuni*.

On September 30, 11 or more persons attended a barbecue at which chicken was eaten. The following day, 1 of those attending, a 24-year-old man, developed watery diarrhea and abdominal pain. These symptoms persisted for more than 2 weeks, and treatment with oral doxycycline, after *C. fetus* ssp. *jejuni* was identified, was of little help. Two other persons also developed watery diarrhea within 4 days of the barbecue; stool cultures were not taken from them, however. Two of the 3 ill persons recalled eating chicken that was not well cooked. Although chicken was not available for culture, *C. fetus* ssp. *jejuni* has previously been cultured from dressed, refrigerated chickens from the distributor where these chickens were obtained.

On October 26, a 35-year-old man had onset of watery diarrhea with mucus and crampy abdominal pain. His illness began 2 days after the onset of a similar sickness in his 6-year-old son. Although the son had no extraintestinal symptoms, his father had severe anorexia, chills, mild fever, and arthralgia of the hips and lower back. Cultures taken on the third day of illness in the child and the sixth day of illness in the father yielded *C. fetus* ssp. *jejuni*. Both patients received oral erythromycin. Within several days, the stools had lessened in frequency, but remained loose, and the cramping had significantly abated. A potential source of infection was undercooked, barbecued chicken that had been served 4 days before the son became ill. Two other family members who ate the same meal did not become ill and had negative stool cultures; the mother, however, was taking cephalexin for another illness at the time.

Watery diarrhea, without blood or mucus, and a fever (up to 38.8 C) developed in an 8-month-old infant on August 7. Oral ampicillin was administered, but in the ensuing week symptoms persisted. Vomiting occurred, and the dehydrated infant was hospitalized on August 14. Intravenous fluids were administered, and in the next few days, the fever disappeared and the stools became normal. A stool culture taken on admission yielded *C. fetus* ssp. *intestinalis*. Three weeks after discharge the patient was asymptomatic, and a repeat stool culture was negative. This patient also lived on a farm. No other

Campylobacter Enteritis – Continued

family members had been ill, and all had negative stool cultures for *Campylobacter*. Cultures of a pet dog, raw milk, well water, frozen chicken, several cats kept in a barn, and several cows did not yield *Campylobacter*.

Reported by JR Schaefer, MS, SM (ASCP), EV Conklin, MD, DFM Bunce, DO, RD Storck, MD, FK Arnold, MD, JP Viner, MD, FB Merritt, MD, Dr. Krish, AJ Roth, MPH, Dubuque, Iowa; RW Currier, DVM, LA Wintermeyer, MD, State Epidemiologist, Iowa Dept of Health; JP Davis, MD, State Epidemiologist, Wisconsin Dept of Health and Social Services; Bacterial Zoonoses Br, Bacterial Diseases Div, Bur of Epidemiology, CDC.

Editorial Note: The importance of *C. fetus* as a human enteric pathogen has only been recognized in the past several years. Isolation rates of 1.9% and 7.1% from patients with diarrhea have been reported in Australia and Great Britain, respectively (*1,2*). In several recent studies, *C. fetus* ssp. *jejuni* was the most common bacterial pathogen isolated from stools from patients with diarrhea.

The epidemiology of diarrhea caused by *C. fetus* ssps. *jejuni* and *intestinalis* is still incompletely understood. Poultry (alive or dressed), dogs, raw milk, and contaminated water have all been implicated as sources of human infection due to *C. fetus* ssp. *jejuni*. Ssp. *jejuni* is commonly found in swine and poultry feces. In the absence of a reliable typing schema, transmission is difficult to prove. However, in the first report, the presence of infected poultry on the farm suggests these animals were the source of the boy's infection.

C. fetus ssp. *jejuni* can persist in carcasses during the preparation of chickens for commercial marketing (*3*). Thus, eating undercooked barbecued chicken may have been the source of infection for several of these patients. Person-to-person transmission probably occurs but has not been conclusively shown.

Illness due to *C. fetus* ssp. *intestinalis* is much less common than that due to ssp. *jejuni*. This may be due, in part, to culture techniques: a commonly used procedure to isolate ssp. *jejuni* includes the incubation of culture plates at 42 C, which markedly diminishes the yield of ssp. *intestinalis*.

As illustrated in this report, culturing for *Campylobacter* can be done in a community hospital at a minimum of expense. The additional cost of culturing for *Campylobacter* in this hospital is estimated to be $2.50 ($0.19 for materials and $2.31 for labor).

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