CENTERS FOR DISEASE CONTROL

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Epidemiologic Notes and Reports

Community Outbreak of Norwalk Gastroenteritis — Georgia

An outbreak of gastroenteritis caused by the Norwalk virus recently occurred in Tate, a rural community in north Georgia. An investigation implicated the community water system as the source of infection.

On January 2-3, 1982, Tate received approximately 4.5 inches of rainfall. On January 4, residents in homes served by the municipal water system noted their tap water appeared turbid. That evening, residents reported the first cases of gastrointestinal illness. A subsequent investigation by the Office of Epidemiology, Georgia Department of Human Resources, and the Environmental Protection Division, Georgia Department of Natural Resources, included interviews of affected persons, a community telephone survey, testing of serum and stool samples from patients, and evaluation of the water system. Twenty-seven typically-ill patients identified by local physicians were interviewed. Illness was generally mild and was characterized by abrupt onset of nausea, abdominal cramps, diarrhea and/or vomiting, headache, myalgias, and low-grade fever. Duration of illness for most persons ranged from 1 to 3 days.

Fifty-seven households, systematically selected from a local directory, were surveyed by telephone. An adult member of each household provided the following information: age and sex of each household member and the household's water source, as well as information on the occurrence of gastrointestinal illness. Cases of gastrointestinal illness (defined as vomiting or diarrhea in the period January 1-9) were reported for 59/193 (30.6%) persons in the 57 households. However, 48/76 (63.2%) persons living in 25 households served by the municipal water supply were ill, as compared with 11/117 (9.4%) persons living in 32 households served by wells and other water sources ($p<0.001$) (Figure 1). Attack rates did not vary among persons in different age groups. One or more cases of illness occurred in 20/25 (80.0%) households served by the municipal water supply, as compared with 5/32 (15.6%) households served by other sources ($p<0.001$). Based on an estimated 800 persons served by the water system, approximately 500 people may have been ill during the outbreak.

Stool cultures obtained from three acutely ill patients were negative for bacterial pathogens. Paired serum specimens obtained from 22 patients were tested by radioimmunoassay (RIA) for antibody to the Norwalk virus; a $\geq$4-fold rise in antibody titer was found for 20 (90.9%) persons. Virus particles were not detected by electron microscopic examination of the three stool specimens.

The municipal water system, constructed in 1920, was using water from four sources at the time of the outbreak—one well and three springs. The well casing was below ground level and had been flooded during the heavy rains. One of the springs was located inside a fenced hog lot behind several houses with septic tanks; moreover, the spring was unprotected. Testing of a water specimen collected on January 8 from this spring revealed a fecal coliform count of >16

Gastroenteritis — Continued

MPN/100 ml. Tap water from a church, one of five sites sampled on January 8, had an elevated fecal coliform count (5.1 MPN/100 ml) and undetectable residual free chlorine. However, fecal coliforms were not detected at four sites, where residual free chlorine levels ranged from 0.3 to 10.0 mg/L. RIA testing of serum specimens obtained from three pigs that had access to the contaminated spring did not detect antibody to Norwalk virus.

On January 7, 1982, use of the Tate water sources was discontinued, and water entering the distribution system was superchlorinated. Later that day, the system was flushed with water from the nearby community, which has since served as Tate's water source. For a limited time, Tate residents were advised to boil drinking water. There are no plans to reutilize the Tate water sources until the observed deficiencies are corrected.

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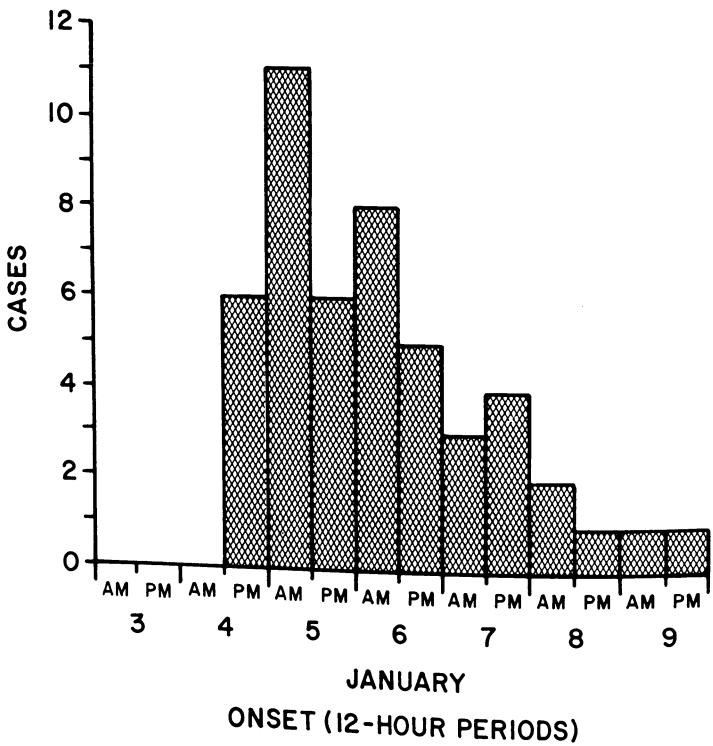
Editorial Note: The findings of this investigation strongly implicated the Tate water system as the source for Norwalk virus infection. Fecal contamination of tap water sampled on Friday, January 8, was observed at one of five sites tested, a church, where weekday water use was infrequent. Although data concerning water consumption by residents were not obtained, household residents served by the Tate system probably became infected after drinking water contaminated with Norwalk virus. Inspection of the four water sources for the system revealed

FIGURE 1. Gastrointestinal illness associated with a municipal water supply, Tate, Georgia, January 1982



Gastroenteritis — Continued

two possible sites of contamination, including the spring in which fecal coliforms were detected. That spring was subject to contamination for several reasons: the cover was damaged, and the spring was open to ground-water runoff from nearby homes with septic tanks and penned animals and to the excreta of pigs that had direct access to the spring. In addition, the casing of the single well was recessed below ground level and had been exposed to flooding by surface water during the unusually heavy rainfall. The possibility cannot be dismissed that inadequate chlorination of the water system contributed to the outbreak.

A variety of etiologic agents have been implicated in water-related disease outbreaks, including bacterial, viral, and parasitic pathogens and chemical toxins (*1*). The clinical and epidemiologic features of this outbreak were characteristic of Norwalk infection and resembled patterns observed in previous waterborne Norwalk-associated outbreaks involving general population groups (*2-5*). This episode illustrates the importance of promptly reporting and investigating community outbreaks of gastroenteritis. A prompt response to this outbreak made possible identification of the causative agent and implementation of measures designed to prevent future outbreaks of waterborne illness in this community.

References

1. CDC. Water-related disease outbreaks surveillance. Annual summary, 1980. Atlanta:CDC, 1982.
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3. Gunn RA, Terranova WA, Greenberg HB, et al. Norwalk virus gastroenteritis aboard a cruise ship: an outbreak on five consecutive cruises. Am J Epidemiol 1980:112:820-7.
4. Griffin MR, Surowiec JJ, McCloskey DI, et al. Foodborne Norwalk virus. Am J Epidemiol 1982;115:178-84.
5. Baron RC, Murphy FD, Greenberg HB, et al. Norwalk gastrointestinal illness: an outbreak associated with swimming in a recreational lake and secondary person-to-person transmission. Am J Epidemiol 1982;115:163-72.

International Notes

Dengue Type 2 Virus in East Africa

In the past year, the Virus Research Centre, Nairobi, Kenya, has received convalescent-phase serum samples from travelers or workers who became ill with dengue-like disease while working or visiting several areas in Somalia. More recently, acute- or convalescent-phase serum samples have been received from patients who lived near or visited the Kenya coast. Some of the sera reacted against the antigen of dengue type 2 by indirect fluorescence, but because of the serological overlapping within the flavivirus family, diagnosis could not be certain. Since the end of March 1982, 15 acute-phase serum samples have been obtained from people who developed signs of illness, and both cell lines developed slight cytopathic changes; after samples). Serum was inoculated into 1-day-old mice, LLC MK_2, and vero cell cultures. Mice developed signs of illness, and both cell lines developed slight cyopathic changes; after passaging, three virus strains were recovered: one from a tourist who visited Malindi, Kenya, in March and became ill upon returning to Nairobi, one from a Malindi resident who was hospitalized in late May, and one from a European who became ill while working in Mogadisho, Somalia, and returned to Nairobi on May 24.

Dengue — Continued

Indirect immunofluorescence on acetone fixed infected LLC MK_2 cells using NIH arbovirus grouping fluids were positive for NIH Group B (flaviviruses) and dengue 1, 2, 3, and 4 immune mouse ascitic fluids. Using dengue type-specific hybridoma-derived monoclonal antibodies, fluorescence was seen only with monoclonal antibody against dengue type 2. After the initial isolate was identified, subsequent isolates were made by testing with the dengue monoclonal antibodies directly after acetone fixation.

Outbreaks of dengue-like disease have occurred several times in East Africa, but when viral agents have been isolated, they have been unrelated to the four dengue serotypes. Chikungunya virus was implicated in an outbreak of febrile illness in Tanganyika in the 1950s, and a closely related alphavirus, o'nyong-nyong virus, was responsible for a large epidemic that swept through eastern Africa between 1959 and 1963. Dengue virus antibodies have been detected in human serum in East Africa, but cross-reactivity within the flaviviruses makes implicating specific virus serotypes difficult. The recent rate of dengue virus isolation, considering the small number of acute samples (three positive of 15 tested), suggests considerable virus activity in East Africa. No striking increase in the number of febrile cases seen at coastal hospitals has been noted, but the number of cases diagnosed as "clinical malaria" appears to be higher this year than previously, possibly due to increased mosquito populations caused by exceptionally heavy rainfall in 1982. A proportion of these fever cases are likely to be dengue infections.

(Continued on page 413)

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

Disease	30th Week Ending			Cumulative, First 30 Weeks		
	July 31, 1982	August 1, 1981	Median 1977-1981	July 31, 1982	August 1, 1981	Median 1977-1981
Aseptic meningitis	244	348	190	2,976	3,201	2,246
Brucellosis	4	3	3	89	85	105
Encephalitis: Primary (arthropod-borne & unspec.)	29	40	28	500	542	409
Post-infectious	2	1	6	44	61	126
Gonorrhea: Civilian	19,006	21,342	21,342	517,751	567,051	551,768
Military	387	443	494	14,457	16,767	15,560
Hepatitis: Type A	378	483	552	12,459	14,666	16,384
Type B	402	438	330	11,761	11,618	9,480
Non A, Non B	37	N	N	1,218	N	N
Unspecified	167	211	179	5,167	6,286	5,740
Legionellosis	5	N	N	230	N	N
Leprosy	4	10	3	115	155	99
Malaria	28	55	22	542	833	398
Measles (rubeola)	23	46	178	1,090	2,445	12,434
Meningococcal infections: Total	40	40	40	1,896	2,328	1,755
Civilian	40	40	40	1,884	2,320	1,743
Military	-	-	-	12	8	12
Mumps	36	41	63	3,972	2,964	10,616
Pertussis	41	35	50	648	621	734
Rubella (German measles)	24	38	87	1,837	1,605	10,309
Syphilis (Primary & Secondary): Civilian	712	557	510	18,565	17,153	13,661
Military	18	10	9	241	227	176
Tuberculosis	492	654	577	14,694	15,304	15,899
Tularemia	9	7	7	125	125	101
Typhoid fever	11	6	10	218	283	260
Typhus fever, tick-borne (RMSF)	54	60	59	596	769	632
Rabies, animal	107	122	96	3,595	4,417	2,790

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1982		Cum. 1982
Anthrax	-	Poliomyelitis: Total	3
Botulism (Colo. 1)	49	Paralytic	3
Cholera	-	Psittacosis (Tex. 1, Upst. N.Y. 2)	76
Congenital rubella syndrome	5	Rabies, human	-
Diphtheria	-	Tetanus (Ky. 1)	42
Leptospirosis (Ark. 1, Fla. 1)	33	Trichinosis	59
Plague	5	Typhus fever, flea-borne (endemic, murine) (Tex. 1)	20

TABLE III. Cases of specified notifiable diseases, United States, weeks ending July 31, 1982 and August 1, 1981 (30th week)

Reporting Area	Aseptic Meningitis	Brucellosis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	1982	Cum. 1982	Cum. 1982	Cum. 1982	Cum. 1982	Cum. 1981	1982	1982	1982	1982	1982	Cum. 1982
UNITED STATES	244	89	500	44	517,751	567,051	378	402	37	167	5	115
NEW ENGLAND	22	3	16	5	12,808	14,056	11	14	-	14	-	1
Maine	-	-	-	-	613	703	5	1	-	-	-	-
N.H.	7	-	-	-	360	502	-	1	-	-	-	-
Vt.	1	-	-	-	250	237	2	-	-	-	-	-
Mass.	7	-	6	-	5,956	5,818	3	8	-	14	-	-
R.I.	4	-	-	-	858	736	-	-	-	-	-	-
Conn.	3	3	10	5	4,771	6,060	1	4	-	-	-	1
MID. ATLANTIC	7	3	57	11	65,898	66,553	57	60	3	6	-	4
Upstate N.Y.	3	3	21	3	10,790	10,961	22	14	-	2	-	1
N.Y. City	-	-	11	-	27,734	27,860	25	8	-	-	-	1
N.J.	-	-	12	-	11,841	12,572	10	38	3	4	-	1
Pa.	4	-	13	8	15,533	15,160	-	-	-	-	-	1
E.N. CENTRAL	26	-	111	10	70,708	86,205	43	52	-	11	4	3
Ohio	4	-	36	4	21,283	28,721	16	20	-	8	2	-
Ind.	7	-	28	3	9,135	7,584	4	1	-	1	-	-
Ill.	-	-	7	1	15,341	23,921	13	7	-	-	-	3
Mich.	12	-	37	-	18,008	18,230	8	24	-	2	1	-
Wis.	3	-	3	2	6,941	7,749	2	-	-	-	1	-
W.N. CENTRAL	17	13	35	3	25,516	26,855	11	4	-	5	-	3
Minn.	5	-	11	1	3,860	4,293	3	2	-	-	-	1
Iowa	3	3	15	1	2,673	2,969	1	-	-	-	-	-
Mo.	1	4	4	-	12,050	12,235	2	2	-	4	-	1
N. Dak.	1	-	-	-	342	375	-	-	-	-	-	-
S. Dak.	-	1	-	1	682	738	-	-	-	-	-	1
Nebr.	-	2	2	-	1,541	2,062	2	-	-	-	-	-
Kans.	7	3	3	-	4,368	4,183	3	-	-	1	-	-
S. ATLANTIC	64	18	83	6	123,453	139,550	46	113	13	28	1	6
Del.	-	-	-	-	2,185	2,206	1	-	-	1	-	-
Md.	2	-	14	-	17,726	15,617	1	15	1	4	-	2
D.C.	-	-	-	-	7,737	8,476	-	4	-	-	-	-
Va.	9	7	19	1	11,427	12,802	2	16	5	2	1	1
W. Va.	-	-	2	-	1,569	2,130	-	2	-	-	-	-
N.C.	5	-	9	1	22,382	21,620	2	10	-	2	-	-
S.C.	1	2	-	-	13,678	13,417	6	18	3	9	-	-
Ga.	-	1	1	-	9,483	28,958	5	15	1	-	-	-
Fla.	47	8	38	4	37,266	34,324	29	33	3	10	-	3
E.S. CENTRAL	17	10	28	2	46,067	46,164	17	28	2	3	-	-
Ky.	-	-	-	-	6,176	5,978	7	11	-	1	-	-
Tenn.	1	6	14	-	17,909	17,682	4	9	1	2	-	-
Ala.	15	3	11	2	13,973	13,495	3	7	1	-	-	-
Miss.	1	1	3	-	8,009	9,009	3	1	-	-	-	-
W.S. CENTRAL	35	23	58	1	75,558	75,367	82	54	3	65	-	17
Ark.	-	4	3	-	6,064	5,510	2	6	2	6	-	-
La.	11	6	8	-	14,043	12,789	33	12	-	3	-	-
Okla.	5	3	15	-	8,246	7,947	18	12	1	5	-	-
Tex.	19	10	32	1	47,205	49,121	29	24	-	51	-	17
MOUNTAIN	6	-	18	3	18,453	22,153	33	10	1	6	-	2
Mont.	-	-	-	-	767	805	-	1	-	-	-	-
Idaho	3	-	-	-	873	935	-	-	1	-	-	1
Wyo.	-	-	-	-	540	515	-	-	-	-	-	-
Colo.	2	-	8	1	4,962	5,994	8	3	-	3	-	-
N. Mex.	1	-	-	-	2,343	2,414	21	2	-	-	-	-
Ariz.	U	-	6	-	4,870	6,740	U	U	U	U	U	-
Utah	-	-	-	2	869	1,045	2	3	-	3	-	1
Nev.	-	-	4	-	3,229	3,705	2	1	-	-	-	-
PACIFIC	50	19	94	3	79,290	90,148	78	67	15	29	-	79
Wash.	6	-	9	-	6,440	7,358	7	3	1	2	-	7
Oreg.	-	-	2	-	4,403	5,392	4	7	1	1	-	-
Calif.	37	18	79	3	65,082	73,441	65	53	13	26	-	50
Alaska	1	1	3	-	1,946	2,235	-	2	-	-	-	1
Hawaii	6	-	1	-	1,419	1,722	2	2	-	-	-	21
Guam	U	-	-	-	64	72	U	U	U	U	U	-
P.R.	1	-	1	-	1,722	1,863	8	5	-	7	-	-
V.I.	-	-	-	-	132	109	-	-	-	-	-	-
Pac. Trust Terr.	U	-	-	-	187	267	U	U	U	U	U	10

N: Not notifiable U: Unavailable

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending July 31, 1982 and August 1, 1981 (30th week)

Reporting Area	Malaria		Measles (Rubeola)			Meningococcal Infections (Total)		Mumps		Pertussis	Rubella		
	1982	Cum. 1982	1982	Cum. 1982	Cum. 1981	1982	Cum. 1982	1982	Cum. 1982	1982	1982	Cum. 1982	Cum. 1981
UNITED STATES	28	542	23	1,090	2,445	40	1,896	36	3,972	41	24	1,837	1,605
NEW ENGLAND	1	27	-	9	75	2	103	2	160	-	-	16	111
Maine	-	-	-	-	5	-	6	1	35	-	-	-	33
N.H.	-	-	-	2	6	-	14	-	12	-	-	8	43
Vt.	-	-	-	2	2	-	6	1	6	-	-	-	-
Mass.	1	21	-	2	54	1	27	-	77	-	-	4	23
R.I.	-	2	-	-	-	-	11	-	14	-	-	1	-
Conn.	-	4	-	3	8	1	39	-	16	-	-	3	12
MID. ATLANTIC	1	71	-	151	791	5	335	3	251	8	2	88	193
Upstate N.Y.	-	16	-	105	203	4	113	1	54	2	2	43	89
N.Y. City	-	21	-	38	68	-	58	1	42	-	-	31	48
N.J.	1	22	-	4	52	-	71	-	36	1	-	14	46
Pa.	-	12	-	4	468	1	93	1	119	5	-	-	10
E.N. CENTRAL	-	36	-	66	75	5	227	11	2,128	7	1	153	341
Ohio	-	9	-	1	15	3	86	5	1,552	5	-	-	3
Ind.	-	1	-	2	8	-	22	-	36	-	-	26	118
Ill.	-	4	-	23	23	-	62	2	167	1	-	55	81
Mich.	-	20	-	40	28	2	45	3	290	1	1	46	33
Wis.	-	2	-	-	1	-	12	1	83	-	-	26	106
W.N. CENTRAL	1	15	-	49	10	5	83	-	536	2	-	59	76
Minn.	-	2	-	-	3	-	20	-	412	-	-	9	7
Iowa	-	5	-	-	1	-	5	-	29	-	-	-	4
Mo.	1	4	-	2	1	2	25	-	15	2	-	38	2
N. Dak.	-	-	-	-	-	-	6	-	-	-	-	-	-
S. Dak.	-	-	-	-	-	1	4	-	1	-	-	1	-
Nebr.	-	3	-	3	4	-	9	-	-	-	-	-	1
Kans.	-	1	-	44	1	2	14	-	79	-	-	11	62
S. ATLANTIC	4	84	-	35	336	4	375	2	222	13	-	68	125
Del.	1	1	-	-	-	-	-	-	10	-	-	1	1
Md.	-	12	-	3	2	-	23	1	22	-	-	33	1
D.C.	-	3	-	1	1	-	2	-	-	-	-	-	-
Va.	-	26	-	14	6	-	42	1	31	1	-	13	4
W. Va.	-	6	-	2	9	-	7	-	81	-	-	1	22
N.C.	1	3	-	-	3	-	76	-	11	2	-	1	5
S.C.	1	4	-	-	-	1	42	-	13	-	-	1	8
Ga.	-	10	-	-	108	-	81	-	11	7	-	6	35
Fla.	1	19	-	15	207	3	102	-	43	3	-	12	49
E.S. CENTRAL	-	6	-	8	5	-	123	2	37	-	1	40	26
Ky.	-	4	-	1	1	-	20	2	12	-	-	22	17
Tenn.	-	-	-	6	2	-	52	-	14	-	1	2	8
Ala.	-	-	-	-	2	-	44	-	5	-	-	-	1
Miss.	-	2	-	1	-	-	7	-	6	-	-	16	-
W.S. CENTRAL	7	42	-	15	798	7	226	6	155	5	-	98	135
Ark.	-	3	-	-	1	-	12	-	6	-	-	1	3
La.	-	3	-	2	2	4	42	2	5	3	-	1	9
Okla.	1	6	-	-	5	1	24	-	-	-	-	3	-
Tex.	6	30	-	13	790	2	148	4	144	2	-	93	123
MOUNTAIN	-	15	-	5	32	1	92	-	66	1	2	63	76
Mont.	-	-	-	-	-	-	4	-	3	-	-	5	3
Idaho	-	1	-	-	1	-	6	-	3	1	-	3	3
Wyo.	-	-	-	-	-	-	5	-	2	-	-	7	3
Colo.	-	8	-	5	9	1	38	-	8	-	1	5	30
N. Mex.	-	2	-	-	8	-	14	-	-	-	-	5	5
Ariz.	U	3	U	-	4	U	15	U	32	U	U	8	19
Utah	-	1	-	-	-	-	7	-	13	-	-	20	4
Nev.	-	-	-	-	10	-	3	-	5	-	1	10	9
PACIFIC	14	246	23	752	323	11	332	10	417	5	18	1,252	522
Wash.	1	12	-	31	3	3	35	-	61	1	1	35	55
Oreg.	-	9	-	8	3	2	65	-	-	-	-	6	49
Calif.	13	223	23	709	315	6	219	10	342	4	17	1,202	405
Alaska	-	-	-	1	-	-	10	-	6	-	-	1	-
Hawaii	-	2	-	3	2	-	3	-	8	-	-	8	13
Guam	U	1	U	5	6	U	2	U	3	U	U	2	1
P.R.	-	4	1	81	247	-	8	-	46	-	1	7	3
V.I.	-	-	-	-	22	-	-	-	-	-	-	-	1
Pac. Trust Terr.	U	-	U	-	1	U	-	U	1	U	U	-	1

U: Unavailable

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending July 31,1982 and August 1, 1981 (30th week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Tuberculosis		Tula-remia	Typhoid Fever		Typhus Fever (Tick-borne) (RMSF)		Rabies, Animal
	Cum. 1982	Cum. 1981	1982	Cum. 1982	Cum. 1982	1982	Cum. 1982	1982	Cum. 1982	Cum. 1982
UNITED STATES	18,565	17,153	492	14,694	125	11	218	54	596	3,595
NEW ENGLAND	314	354	8	393	2	-	14	-	6	27
Maine	1	2	1	32	-	-	-	-	-	20
N.H.	1	12	-	11	-	-	-	-	1	-
Vt.	1	13	-	7	-	-	2	-	-	-
Mass.	210	238	7	263	2	-	10	-	3	4
R.I.	17	21	-	17	-	-	-	-	1	-
Conn.	84	68	-	63	-	-	2	-	1	3
MID. ATLANTIC	2,554	2,578	71	2,459	7	1	34	5	24	106
Upstate N.Y.	255	241	21	422	7	1	5	5	7	53
N.Y. City	1,534	1,545	20	895	-	-	20	-	1	-
N.J.	346	350	10	496	-	-	5	-	10	6
Pa.	419	442	20	646	-	-	4	-	6	47
E.N. CENTRAL	962	1,160	95	2,262	1	-	16	6	58	408
Ohio	182	149	20	390	-	-	8	6	56	59
Ind.	116	112	11	299	-	-	-	-	-	62
Ill.	448	657	46	926	-	-	3	-	2	205
Mich.	158	186	14	530	-	-	5	-	-	4
Wis.	58	56	4	117	1	-	-	-	-	78
W.N. CENTRAL	340	343	6	428	15	-	8	-	17	798
Minn.	65	118	-	71	-	-	5	-	-	134
Iowa	18	14	-	48	1	-	1	-	3	254
Mo.	207	184	5	204	10	-	1	-	5	73
N. Dak.	4	6	1	8	-	-	-	-	-	71
S. Dak.	-	2	-	19	-	-	-	-	3	61
Nebr.	11	4	-	19	2	-	-	-	1	98
Kans.	35	15	-	59	2	-	1	-	5	107
S. ATLANTIC	5,054	4,501	103	2,992	9	5	34	31	334	623
Del.	9	7	-	25	-	-	-	-	-	2
Md.	277	343	15	348	1	2	9	-	34	33
D.C.	279	363	-	114	-	-	-	-	-	-
Va.	355	412	U	315	2	1	3	8	45	317
W. Va.	20	15	2	88	-	-	3	1	6	32
N.C.	365	343	27	493	-	-	-	14	150	41
S.C.	278	300	4	281	5	-	3	8	73	34
Ga.	1,041	1,160	30	457	-	-	-	-	24	123
Fla.	2,430	1,558	25	871	1	2	16	-	2	41
E.S. CENTRAL	1,293	1,116	32	1,351	6	-	14	4	44	423
Ky.	72	60	10	344	-	-	-	-	-	85
Tenn.	346	425	12	450	4	-	2	3	29	265
Ala.	476	303	10	385	-	-	9	-	6	72
Miss.	399	328	-	172	2	-	3	1	9	1
W.S. CENTRAL	4,868	4,159	90	1,789	64	1	22	7	102	705
Ark.	121	79	7	188	40	-	2	1	17	99
La.	1,076	982	5	286	3	1	3	-	-	21
Okla.	109	98	7	234	20	-	2	4	55	132
Tex.	3,562	3,000	71	1,081	1	-	15	2	30	453
MOUNTAIN	476	459	10	415	15	-	8	1	8	136
Mont.	3	11	-	25	2	-	-	-	2	54
Idaho	22	15	2	19	1	-	-	-	1	5
Wyo.	11	7	-	2	1	-	-	-	1	11
Colo.	131	142	2	52	3	-	2	1	1	19
N. Mex.	114	87	6	84	1	-	-	-	1	11
Ariz.	106	105	U	170	-	U	4	U	-	27
Utah	13	16	-	23	7	-	1	-	-	6
Nev.	76	76	-	40	-	-	1	-	2	3
PACIFIC	2,704	2,483	77	2,605	6	4	68	-	3	369
Wash.	83	94	7	170	1	-	3	-	-	-
Oreg.	68	54	9	108	-	-	1	-	-	1
Calif.	2,472	2,282	57	2,102	4	4	61	-	3	295
Alaska	8	10	-	46	1	-	1	-	-	73
Hawaii	73	43	4	179	-	-	2	-	-	-
Guam	1	-	U	7	-	U	-	U	-	-
P.R.	369	388	-	195	-	-	2	-	-	31
V.I.	17	13	-	1	-	-	-	-	-	-
Pac. Trust Terr.	-	-	U	68	-	U	-	U	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending July 31, 1982 (30th week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	604	415	120	39	15	14	36
Boston, Mass.	175	104	39	19	6	7	15
Bridgeport, Conn.	47	31	12	2	-	2	2
Cambridge, Mass.	23	18	4	1	-	-	1
Fall River, Mass.	23	13	4	4	1	-	-
Hartford, Conn.	41	31	8	-	2	-	-
Lowell, Mass.	25	17	8	-	-	-	1
Lynn, Mass.	23	19	2	2	-	-	1
New Bedford, Mass.	31	26	4	1	-	-	1
New Haven, Conn.	47	35	7	3	1	1	-
Providence, R.I.	62	47	9	3	1	2	3
Somerville, Mass.	6	5	1	-	-	-	1
Springfield, Mass.	28	19	5	1	1	2	5
Waterbury, Conn.	33	19	10	2	2	-	4
Worcester, Mass.	40	31	7	1	1	-	2
MID. ATLANTIC	2,545	1,626	598	173	73	75	86
Albany, N.Y.	47	30	8	1	1	7	1
Allentown, Pa.	17	13	4	-	-	-	1
Buffalo, N.Y.	135	88	30	9	4	4	6
Camden, N.J.	42	35	3	1	2	1	-
Elizabeth, N.J.	34	23	11	-	-	-	2
Erie, Pa.†	43	30	8	2	2	1	3
Jersey City, N.J.	40	23	12	3	1	1	-
N.Y. City, N.Y.	1,425	907	320	113	46	39	34
Newark, N.J.	69	20	29	8	6	6	8
Paterson, N.J.	30	20	5	-	1	4	3
Philadelphia, Pa.†	242	140	71	22	3	6	10
Pittsburgh, Pa.†	76	56	18	-	-	2	1
Reading, Pa.	33	21	10	2	-	-	-
Rochester, N.Y.	105	77	18	5	3	2	8
Schenectady, N.Y.	32	17	11	2	2	-	2
Scranton, Pa.†	16	13	3	-	-	-	-
Syracuse, N.Y.	83	56	21	4	1	1	2
Trenton, N.J.	20	14	5	-	1	-	-
Utica, N.Y.	26	20	5	-	-	1	3
Yonkers, N.Y.	30	23	6	1	-	-	2
E.N. CENTRAL	2,219	1,421	503	143	73	79	59
Akron, Ohio	93	61	18	8	3	3	2
Canton, Ohio	47	31	12	2	2	-	2
Chicago, Ill	491	288	120	45	16	22	15
Cincinnati, Ohio	150	97	37	4	7	5	11
Cleveland, Ohio	148	85	43	12	4	4	1
Columbus, Ohio	142	93	32	12	2	3	-
Dayton, Ohio	87	50	19	4	7	7	-
Detroit, Mich.	261	154	67	23	8	9	8
Evansville, Ind.	57	38	14	2	2	1	2
Fort Wayne, Ind.	65	42	17	2	3	1	3
Gary, Ind.	13	7	3	1	2	-	-
Grand Rapids, Mich.	56	42	8	1	1	4	1
Indianapolis, Ind.	164	94	46	9	5	10	4
Madison, Wis.	37	22	10	1	3	1	1
Milwaukee, Wis.	123	92	24	5	2	-	1
Peoria, Ill.	37	22	6	2	4	3	2
Rockford, Ill.	45	34	4	3	1	3	2
South Bend, Ind.	46	35	9	2	-	-	2
Toledo, Ohio §	89	84	1	1	1	2	2
Youngstown, Ohio	68	50	13	4	-	1	-
W.N. CENTRAL	705	465	140	29	30	40	31
Des Moines, Iowa §	53	51	-	-	1	-	-
Duluth, Minn.	22	14	5	-	2	1	2
Kansas City, Kans.	38	26	6	1	1	2	1
Kansas City, Mo.	127	82	30	5	7	3	4
Lincoln, Nebr.	33	25	5	2	1	-	1
Minneapolis, Minn.	83	45	20	11	6	1	2
Omaha, Nebr.	73	45	22	-	2	4	8
St. Louis, Mo.	160	96	28	6	4	26	3
St. Paul, Minn.	66	43	15	2	3	3	2
Wichita, Kans.	50	38	7	2	3	-	8
S. ATLANTIC	1,081	662	266	82	31	37	59
Atlanta, Ga.	135	80	41	12	1	1	1
Baltimore, Md.	183	115	44	17	5	2	9
Charlotte, N.C.	82	53	15	4	4	3	9
Jacksonville, Fla.	96	56	24	8	5	3	2
Miami, Fla.	91	53	24	9	-	5	4
Norfolk, Va.	54	25	17	6	2	4	4
Richmond, Va.	76	50	17	3	2	4	5
Savannah, Ga.	38	25	9	1	-	3	3
St. Petersburg, Fla.	83	72	9	-	1	1	8
Tampa, Fla.	67	38	16	4	4	5	2
Washington, D.C.	127	69	40	10	6	2	6
Wilmington, Del.	49	26	10	8	1	4	6
E.S. CENTRAL	668	404	171	45	29	19	25
Birmingham, Ala.	104	64	27	8	3	2	-
Chattanooga, Tenn.	53	37	6	5	4	1	5
Knoxville, Tenn.	52	40	9	-	3	-	1
Louisville, Ky.	87	49	33	2	-	3	2
Memphis, Tenn.	174	106	44	13	4	7	8
Mobile, Ala.	45	29	6	3	7	-	2
Montgomery, Ala.	49	27	13	6	3	-	1
Nashville, Tenn.	104	52	33	8	5	6	6
W.S. CENTRAL	1,354	731	345	129	81	68	37
Austin, Tex.	55	30	16	6	3	-	-
Baton Rouge, La.	35	19	9	7	-	-	1
Corpus Christi, Tex.	47	28	10	6	2	1	-
Dallas, Tex.	194	105	57	11	9	12	1
El Paso, Tex.	66	30	19	7	6	4	2
Fort Worth, Tex.	81	46	14	11	1	9	2
Houston, Tex.	366	177	103	41	30	15	11
Little Rock, Ark.	75	48	20	3	1	3	7
New Orleans, La.	126	61	33	12	6	14	-
San Antonio, Tex.	158	90	32	13	16	7	5
Shreveport, La.	60	43	10	5	2	-	2
Tulsa, Okla.	91	54	22	7	5	3	6
MOUNTAIN	633	358	139	51	53	32	22
Albuquerque, N.Mex.	103	37	15	24	23	4	3
Colo. Springs, Colo.	39	26	8	-	3	2	5
Denver, Colo.	113	64	30	6	6	7	2
Las Vegas, Nev.	79	38	23	7	7	4	1
Ogden, Utah	35	21	7	2	2	3	2
Phoenix, Ariz.	128	82	31	4	4	7	2
Pueblo, Colo.	23	17	3	1	2	-	2
Salt Lake City, Utah	45	26	8	4	5	2	2
Tucson, Ariz.	68	47	14	3	1	3	3
PACIFIC	1,791	1,165	370	132	63	61	89
Berkeley, Calif.	23	15	4	4	-	-	1
Fresno, Calif.	83	49	21	3	3	7	6
Glendale, Calif.	38	31	5	1	-	1	1
Honolulu, Hawaii	62	40	15	1	5	1	8
Long Beach, Calif.	94	62	24	5	1	2	3
Los Angeles, Calif.	583	378	112	48	26	19	20
Oakland, Calif.	54	36	11	3	2	2	1
Pasadena, Calif.	36	26	5	3	1	1	5
Portland, Oreg.	119	78	27	8	3	3	5
Sacramento, Calif.	71	45	17	4	2	3	7
San Diego, Calif.	124	62	36	14	5	7	13
San Francisco, Calif.	135	93	21	16	3	2	2
San Jose, Calif.	145	91	32	9	7	6	12
Seattle, Wash.	137	96	26	8	4	3	3
Spokane, Wash.	51	37	9	2	-	3	2
Tacoma, Wash.	36	26	5	3	1	1	-
TOTAL	11,600††	7,247	2,652	823	448	425	444

* Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

** Pneumonia and influenza

† Because of changes in reporting methods in these 4 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

†† Total includes unknown ages.

§ Data not available. Figures are estimates based on average of past 4 weeks.

Dengue — Continued

Reported by BK Johnson, PhD, D Ocheng, A Gichogo, PM Tukei, MB, Virus Research Centre, S Musoke, MB, PH Rees, MRCP, The Nairobi Hospital, L Cartwright-Taylor, PhD, Medical School, University of Nairobi, A Githere, MB, Malindi District Hospital, Malindi, T arap Siongok, MD, Div of Disease Control and Epidemiology, Ministry of Health, Nairobi, Kenya; Vector-Borne Diseases Div, Virology Div, Center for Infectious Diseases, CDC.

Editorial Note: The first published clinical account of dengue in Africa is that of Christie (*1*), who observed an outbreak in 1870 in Zanzibar. Subsequent reports of dengue-like illness in East Africa, without laboratory confirmation, have been reported; confusion exists because of the presence of chikungunya and other viruses producing similar clinical illness. In fact, Carey (*2*) suggested that the original report in 1870 more closely described chikungunya virus than dengue fever. Dengue virus (types 1 and 2) has been isolated only in West Africa (Nigeria, Ivory Coast, Upper Volta, Senegal). However, documented dengue type 2 epidemics occurred in the Seychelles islands in 1976-1977 and 1978-1979 (*3,4*). The Seychelles outbreaks and the appearance of dengue type 2 in Somalia and Kenya in 1982 may be the result of the frequent trade among India (where dengue is endemic [*5*]), the islands of the Indian Ocean, and East Africa. Another possibility, however, is extension of dengue from an enzootic transmission cycle involving forest *Aedes* and nonhuman primates; "jungle dengue" (analagous to jungle yellow fever) is known to occur in Malaysia and Senegal.

Aedes aegypti, including domestic and peridomestic forms which feed readily on humans in and around houses, is abundant in coastal Somalia and Kenya, and is the most likely vector of dengue in this region. Water storage is common, providing breeding sites for *A. aegypti.* Other *Aedes* (*Stegomyia*) species (such as *simpsoni* and *metallicus*) are also prevalent and must be considered potential vectors. A better definition of the transmission cycle in this region is needed.

In addition to the cases of dengue reported above, CDC has made serologic diagnoses in several Americans who visited Mogadisho, Somalia, in early 1982. Travelers to Somalia and coastal Kenya should be aware of the possibility of acquiring dengue and should take precautions to avoid mosquito bites.

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Poliomyelitis Update — Jamaica

Since the first suspected case of paralytic poliomyelitis was recognized in Jamaica in late March 1982, a total of 56 suspected cases have been reported (Figure 2). Onset of symptoms in the last suspected case occurred on June 28, 1982. No additional cases have been reported since June 16, 1982, from St. James Parish, where the earliest and largest number of cases (44) occurred.

Poliomyelitis – Continued

The second round of oral poliovirus vaccine (OPV) immunizations for persons 6 weeks through 14 years of age, the group in which 88% of the disease occurred, is presently under way. A third immunization round in schools and clinics is scheduled for September 1982.

Reported by Ministry of Health, Jamaica; Div of Viral Diseases, Center for Infectious Diseases, Immunization Div, Quarantine Div, Center for Prevention Svcs, CDC.

Editorial Note: While active surveillance of poliomyelitis continues in Jamaica, no cases have been reported with onset dates more than 24 days after the initiation of the vaccination campaign in a given parish, and no new suspected cases of paralytic poliomyelitis have been reported during the past 5 weeks. Jamaica's Ministry of Health announced on July 29 that the outbreak of poliomyelitis was over.

The first poliomyelitis vaccine campaign delivered one dose of OPV per person to more than 80% of the population, ages 6 weeks through 14 years, between June 1 and June 21, 1982 (*1*). The high coverage reached during this brief period appears to have terminated the outbreak of type 1 poliomyelitis in Jamaica.

Travelers to any country in which vaccine-preventable diseases are or recently have been endemic or epidemic should be adequately protected. Recommendations for immunizations have been published in the *Morbidity and Mortality Weekly Report* (*2-5*).

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2. ACIP. Poliomyelitis prevention. MMWR 1982;31:22-6, 31-4.
3. ACIP. Measles prevention. MMWR 1982;31:217-24, 229-31.
4. ACIP. Rubella prevention. MMWR 1981;30:37-42, 47.
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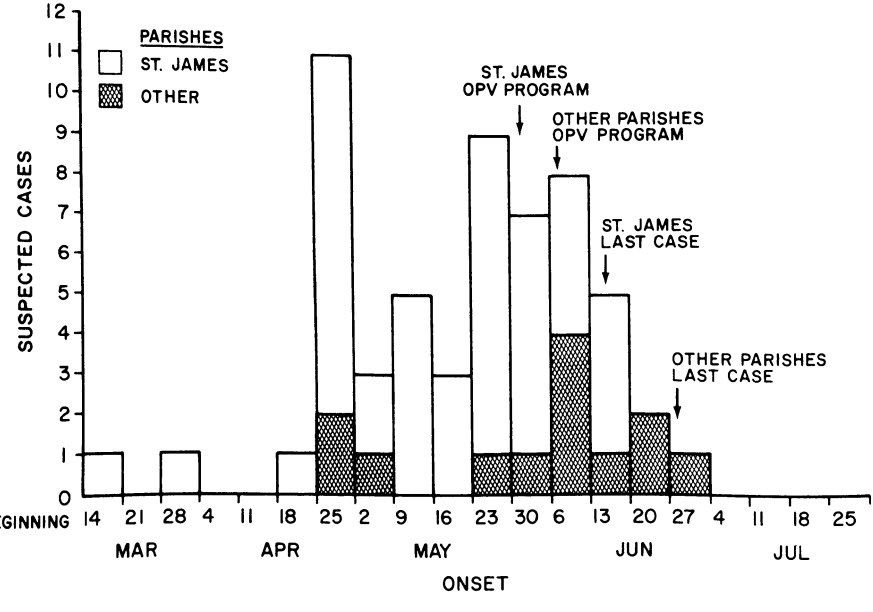
FIGURE 2. Suspected paralytic poliomyelitis cases, by date of onset of symptoms, Jamaica, March 14-August 1, 1982



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