REPORT NO. 28
November 1971

center for disease control

SHIGELLA

surveillance

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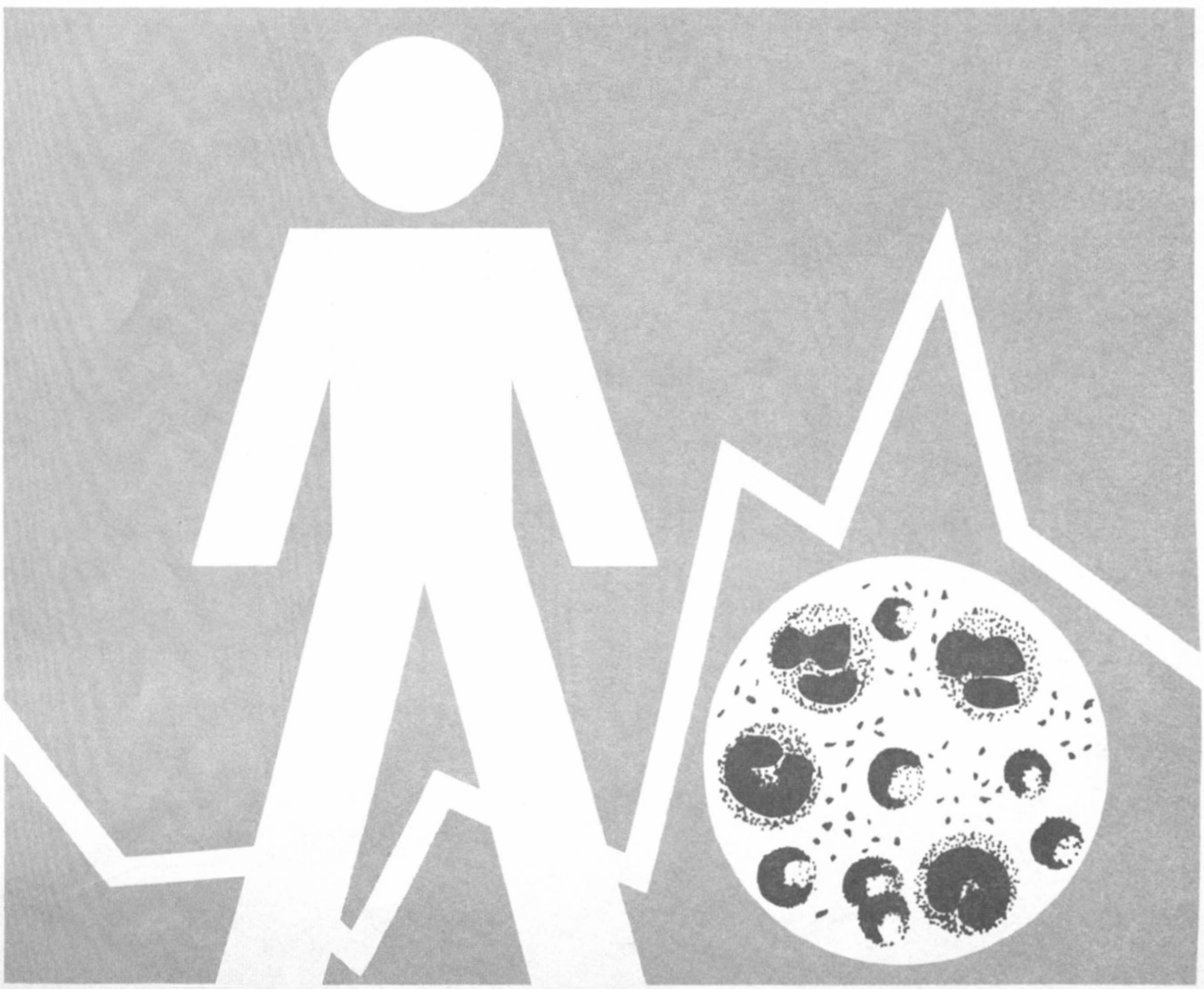
for the
Second Quarter 1971



U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE: PUBLIC HEALTH SERVICE
HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION

PREFACE

This report summarizes data voluntarily reported from participating state, territorial, and city health departments. Much of the information is preliminary.

Contributions to the surveillance report are most welcome. Please address to:

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I. Summary

In the second quarter of 1971, 2,564 isolations from humans were reported. This number represents a decrease of 673 (20.8 percent) from the 3,237 isolations in the first quarter 1971 and an increase of 728 (39.7 percent) over the 1,836 isolations in the second quarter of 1970 (Table I).*

II. Reported Isolations

A. Human

1. General Incidence

During the second quarter of 1971, 65.4 percent of isolations were from children under 10 years of age (Table II); this is consistent with previous quarters. The highest attack rate was in the age group 1-4 years.

2. Serotype Frequencies

Forty-seven of the 54 reporting centers participating in the Shigella Surveillance Program reported isolations of shigella. Twenty-one different serotypes were reported (Table I). The six most frequently reported serotypes during the 3-month period were the following (Table III):

Table I

Rank	Serotype	Number Reported	Calculated Number**	Calculated Percent**	Rank Last Quarter
1	S. sonnei	1,983	1,997	77.9	1
2	S. flexneri 2a	120	219	8.5	2
3	S. flexneri 3a	68	118	4.6	3
4	S. flexneri 2b	32	58	2.3	4
5	S. flexneri 6	34	44	1.7	6
6	S. flexneri 4a	24	43	1.7	5
Subtotal		2,261	2,479	96.7	
Total (all serotypes)		2,564	2,564		

**From Table III

Table III is calculated from data compiled during the second quarter of 1971. This table shows the relative frequency of isolations of the various serotypes; the isolations in each of the unspecified categories are distributed in their subgroups in the same proportions as the completely specified isolations of that group. The resulting distribution in the tables is called the "calculated number," and from this is derived a "calculated percent" for each serotype. These provide approximate indices of the relative frequencies of the more common shigella serotypes in the United States. S. sonnei accounted for approximately three-fourths of all isolations during the second quarter. Table IV shows the distribution of shigella serotypes reported from mental institutions.

3. Geographical and Seasonal Observations

All centers reporting shigella isolations during the second quarter except Illinois, West Virginia, Montana, South Dakota, Alabama, Arkansas, Tennessee, Arizona, and Oklahoma reported more S. sonnei than S. flexneri (Figure 1). The seasonal distribution is depicted in Figure 2. Figure 3 shows the number of reported isolations per million

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*No laboratory reports were received from California and the Virgin Islands

population by state for the second quarter, utilizing population estimates for July 1, 1969. Approximately 12.7 isolations per million population were reported during the second quarter of 1971. Table V shows the residence of those patients from whom shigella was isolated.

Figure 1 PERCENTAGE *S. flexneri* AND *S. sonnei* OF TOTAL SHIGELLA ISOLATIONS REPORTED FROM INDICATED REGIONS UNITED STATES, APRIL - JUNE 1971

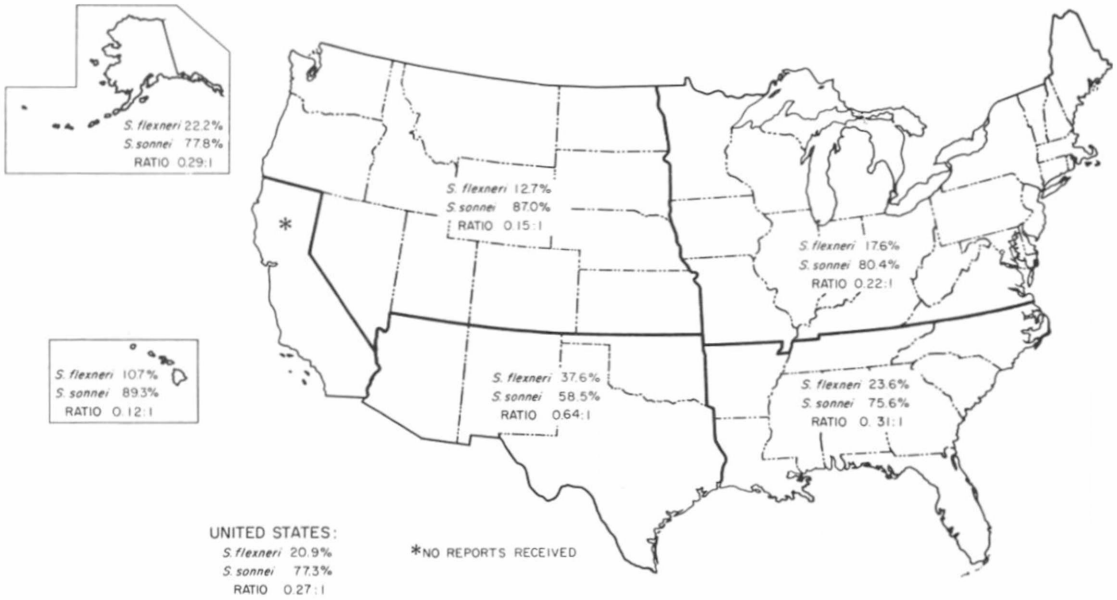
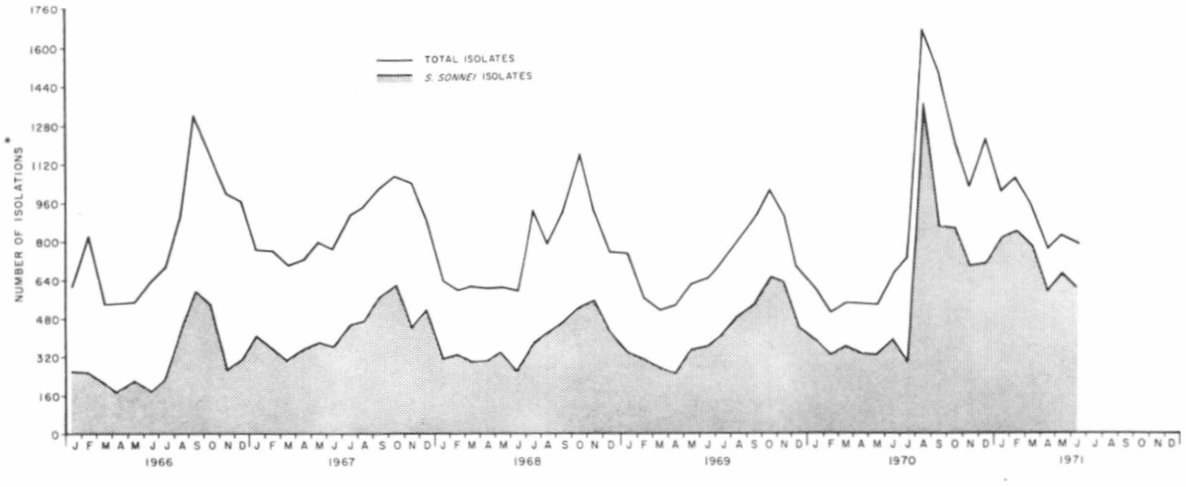
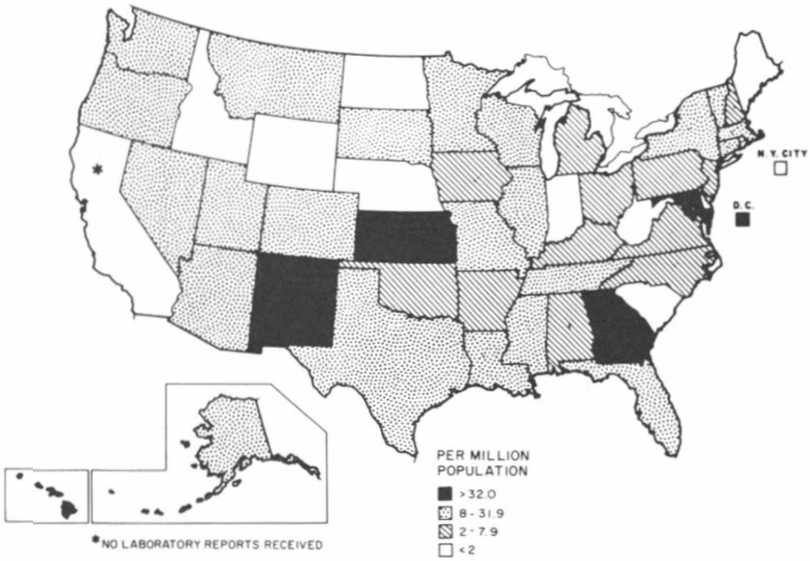


Figure 2 REPORTED ISOLATIONS OF SHIGELLA IN THE UNITED STATES



* ADJUSTED TO 4-WEEK MONTH

Figure 3 ATTACK RATES OF SHIGELLOSIS, BY STATE, APRIL - JUNE 1971



B. Nonhuman

During the second quarter 1971, 34 nonhuman isolations of shigella were reported:

Table 2

Serotype	Number	Source	State
S. flexneri (unspec.)	1	monkey	Georgia
S. flexneri 2a	5	unspec.	Texas
S. flexneri 2b	1	monkey	Louisiana
S. flexneri 3 (unspec.)	6	monkey	Georgia
S. flexneri 3a	1	unspec.	Texas
S. flexneri 4 (unspec.)	1	monkey	Maryland
	1	primate	Washington
S. flexneri 4a	1	monkey	Illinois
	1	gibbon	Texas
S. flexneri 4b	12	monkey	Illinois
	2	monkey	Louisiana
S. sonnei	2	gibbon	Texas

III. Current Investigation

Four-thousand five-hundred eight-two isolates of Shigella sonnei were reported during the first half of 1971 compared with 2,227 during the same period of 1970, and an average of 1,994 during the first half of 1966-1970. The rise in total shigella isolates during this period is attributable almost entirely to an increase in S. sonnei reports. The total isolates of other serotypes reported have decreased. These other serotypes, of which almost all are S. flexneri, have decreased to 1,219 versus a first 6 month's average of 1,964 isolates during 1966 through 1970.

Three states which have noted an even greater rate of increase of S. sonnei isolates are Georgia, Maryland, and New Mexico (Figure 4). These states together reported 1,025 such isolates in the first half of 1971. No large common source outbreaks were observed in these states to account for the increase. Most of the isolates were reported from the main metropolitan areas: Fulton and DeKalb Counties in Georgia, Baltimore City in Maryland, and Bernalillo County in New Mexico. The incidence of isolates reported in these urban areas was more than 10 times the incidence of isolates in the remaining areas of the respective states (Table 3)

Figure 4 *SHIGELLA SONNEI* ISOLATES, BY QUARTER, GEORGIA, MARYLAND, NEW MEXICO, 1965-1971

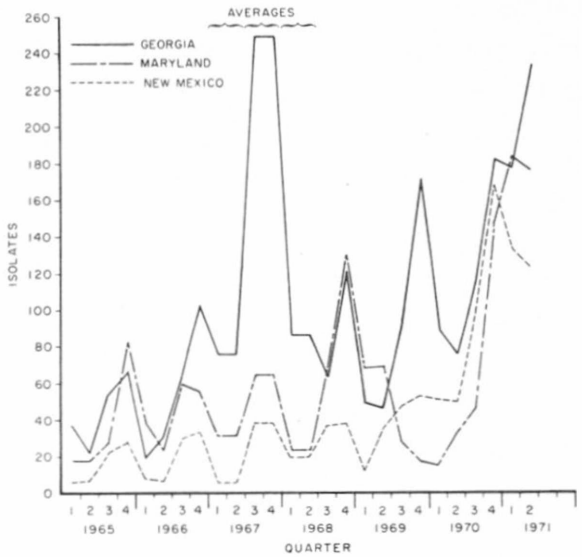


Table 3

Rate of S. sonnei Isolation in Three States January-June 1971

State	Area	Reported S. sonnei Isolates	Population/10^6 (1970 Census)	Rate Per 10^6 Population
Georgia	Total	409	4.59	89
"	Fulton and DeKalb Cos. (Atlanta)	357	1.02	350
"	All other areas	52	3.57	15
Maryland	Total	359	3.92	92
"	Baltimore City	290	0.91	320
"	All other areas	69	3.01	23
New Mexico	Total	257	1.02	252
" "	Bernalillo Co. (Albuquerque)	211	0.32	668
" "	All other areas	46	0.70	65

The Atlanta, Georgia, isolates have been examined in detail.* Of the Atlanta isolates, 257 were found to be from patients seen at Grady Hospital, the primary hospital administering to the poor people of the city. These isolates were not found to be related to any common source. The patients' residences were distributed evenly throughout the areas of Atlanta served by the hospital, and there was no sudden increase in patient visits during any week of the 6 months.

*Reported by W. Edmund Farrar, Jr., M.D., Director, Division of Infectious Diseases and Victor E. Del Bene, M.D., Fellow in Infectious Diseases, Department of Preventive Medicine, Emory University School of Medicine.

Age and sex for 144 of the Grady shigellosis patients are shown in Table 4.

Table 4

Age and Sex Distribution of Persons Infected with S. sonnei, Atlanta, Georgia, First Half, 1971

Age (Years)	Male	Female	Total	Cumulative Percent
<1	3	8	11	7
1-4	45	54	99	76
5-9	7	10	17	88
10-19	5	6	11	96
20-29	0	1	1	96
30-39	1	1	2	98
40-49	0	0	0	98
50-59	0	0	0	98
60-69	1	1	2	99
70-79	0	0	0	99
80+	0	1	1	100
Total	62	82	144	

The average age of these patients was lower than that observed for the United States as a whole (Table 4). Clinical histories were studied on a sample of 42 patients (Table 5).

Table 5

Clinical Histories on 42 Shigellosis Patients Atlanta, Georgia, First Half, 1971

Characteristics	Percent Affected
Diarrhea	100
Diarrhea with blood	28
Fever (rectal temperature 101° F (R))	79
Vomiting	22
Seizure noted	8
Hospitalized	5
Died	0

Only 5 percent required hospitalization, and there were no deaths. The distribution of symptoms and signs was not unusual when compared with other series of shigellosis patients seen at hospitals.[1]

Editorial comment: Reported isolates of S. sonnei in the United States have increased steadily during the past 5 years, but the greatest increase occurred during the first 6 months of 1971. Isolates of this serotype now account for 78 percent of all shigellae reported. There have been no remarkable changes during this period in bacteriologic or general surveillance techniques which might explain this increase. A distinctive property of S. sonnei, compared with other serotypes, is that it survives better in the extraintestinal environment. Its ability to survive on patients' hands or in foods could explain its numerical advantage over other shigella serotypes. Supporting this is the finding that all reported foodborne outbreaks of shigellosis in 1970 were caused by S. sonnei.[2] S. flexneri, which is the species most commonly reported in most underdeveloped countries, has followed a course of decreasing numbers in this country which is in inverse proportion to our improving standards of water supply and sewage disposal.

Three states, Georgia, Maryland, and New Mexico were noted to have a greater than average increase in S. sonnei isolates. They all experienced much greater attack rates in the largest urban areas. Further analyses will have to be undertaken to determine whether shigellosis in urban areas has increased out ot proportion to rural areas and whether S. sonnei is primarily responsible for this increase.

Whether the illness caused by S. sonnei is in any way different from that caused by other serotypes is another open question. It is generally accepted that S. dysenteriae type 1 (Shiga's bacillus) causes a distinctively severe illness; that organism is unusual in its elaboration of an enterotoxin which may play a role in pathogenesis. But S. sonnei and S. flexneri have not been shown to vary in the illness they cause. For instance, one hospital study of children showed no difference in either the clinical syndrome or its severity.[1] The sometimes severe morbidity and high mortality caused by S. flexneri in underdeveloped countries is different from the disease observed in this country, possibly because of the large differences in general health and nutrition. On the other hand, anecdotal information suggests that S. sonnei is a less virulent pathogen; an epidemic caused by S. sonnei in Hawaii affected over a thousand persons without a single death or even any significant increase in hospitalizations.[3]

Shigellosis due to S. sonnei is likely to continue as the predominate serotype in the United States. The reasons for the increasing importance of this serotype concomittant with the decrease in S. flexneri strains are not well understood, but the pattern in this country follows a well established trend reported in 1968 both in Japan[4] and in Europe.[5] Further studies and surveillance are necessary to better understand the factor or factors responsible for this trend.

IV. Reports From the States

A. Human Shigellosis Associated with Pet Spider Monkeys, Connecticut and Washington. Reported by Steven H. Lamm, M.D., EIS officer located at the Connecticut State Department of Health; Martin Nadel, M.D., Pathologist, Middlesex Memorial Hospital, Middletown Connecticut; R. M. Jakowski, D.V.M., Department of Animal Diseases, Storrs, Connecticut; James C. Hart, M.D., State Epidemiologist, Connecticut State Department of Health, Hartford, Connecticut; Herbert W. Anderson, R.S., Environmental Epidemiologist; Donald R. Peterson, M.D., Epidemiologist, and Ray B. Watkins, D.V.M., Chief, Veterinarian, Seattle-King County Department of Public Health, Washington.

The following two reports concern transmission of Shigella flexneri 2a from spider monkeys to humans in two widely separate states.

1. On September 17, 1970, the proprietor of a Connecticut hotel entered the room of a 75-year-old woman tenant because she had not been seen for 3 days. She was found in a semicomatose condition. The room showed evidence of profuse defecation. She was hospitalized but died 2 days later. Significant autopsy findings included colitis and bilateral pneumonia. S. flexneri 2a was recovered from a stool specimen. Fluorescent antibody examination using a specific S. flexneri 2a conjugate demonstrated definite invasion of the intestinal mucosa by this organism.*

The patient had lived alone in a single room. At the time her illness was discovered, a spider monkey (Ateles sp.) was found in her room. It was subsequently learned that the monkey had been given to her 1 month previously. The monkey had originally been purchased in June 1970 from a New Hampshire pet shop.

Subsequent to discovery of the patient's illness, the monkey was removed from the hotel and briefly passed through the care of two more people before it was located several days later by the State health department. The monkey was necropsied and found to have no pathological defects except for some minor parasitic lesions. However, S. flexneri 2a was isolated from the colon. The isolates from the monkey and from the patient shared the same antibiotic sensitivity pattern.

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*Fluorescent-antibody examination was performed by Mrs. B. M. Thomason, Bacterial Chemistry Unit, Laboratory Division, CDC.

2. Between November 12, 1970, and February 2, 1971, five out of eight children in a Seattle, Washington home experienced a diarrheal illness. The Seattle-King County Health Department Laboratory isolated S. flexneri 2a from stool specimens from three children and Salmonella oranienberg from one child. These shigella and salmonella serotypes were traced to an asymptomatic spider monkey in a local pet store managed by the children's mother. The children frequently assisted in cleaning the store and caring for the animals.

The mother recalled that the first serious illness occurred when the 9-year-old boy who had been cleaning animal cages in the store, including that of the spider monkey, experienced fever, vomiting, and diarrhea for 4 days in November. The illness was not diagnosed bacteriologically. Ten days later, his 14-year-old sister, who had not been working in the store, had onset of fever and diarrhea and was hospitalized for 11 days. S. flexneri 2a was isolated from her stool. In January 1971, the 12- and 16-year-old brothers who had also cleaned the monkey cage experienced gastroenteritis symptoms which were diagnosed after isolating S. flexneri 2a from their stools. The older boy was hospitalized for 4 days. On February 2, 1971, the mother disclosed that a fifth child, 13 years old, who was also exposed to the spider monkey was home from school with diarrhea. That same day, stool specimens were obtained from the spider monkey and the child. Salmonella oranienberg was isolated from both specimens. Sensitivity tests of the shigella isolates from the monkey and the children were identical. Stools obtained from other family members and employees of the store who were not ill were negative for both shigella and salmonella.

In June 1970, the spider monkey had been shipped to the Seattle store from a wholesaler in Miami, Florida. The monkey had no apparent illness while in the pet store. At the time of the outbreak, it was quarantined at the pet store. In early March 1971, it was treated orally with ampicillin, 100 mg per kg per day in three equal doses, for a total of 10 days. A stool specimen obtained 7 days after the last dose yielded S. flexneri 2a. For 3 weeks in May, the monkey received oral chloramphenicol, 500 mg per day in four equal doses. Another stool specimen obtained on June 3, however, still yielded S. flexneri 2a as well as Salmonella anatum. A total of seven stool specimens were obtained from the monkey from January 28 to June 14. All yielded S. flexneri 2a; Salmonella oranienberg and Salmonella anatum were isolated only once. S. flexneri 2a was also isolated from swabs obtained from the monkey's tail fur and a tin eating bowl in his cage. Stool specimens from five squirrel monkeys which were also in the store were negative for shigella and salmonella.

The mother was not convinced of the health department findings until she personally collected a stool specimen from the monkey and delivered it to a local hospital laboratory on June 14. When this laboratory reported that the specimen yielded S. flexneri 2a, she permitted a veterinarian to dispose of the monkey.

Editorial comment: The S. flexneri 2a isolates reported from Connecticut and Washington shared the same antibiotic sensitivity pattern; they were resistant to tetracycline, chloramphenicol, streptomycin, and sulfathiazole. This is an unusual pattern for shigella isolates in general. On the other hand, no direct link could be established between the two monkeys described. Importers and distributors for the two were entirely separate. The Connecticut monkey had come from Nicaragua and the Washington monkey from Peru. Both importers, however, handle monkeys from Nicaragua and Peru and cage them together upon their entry into the United States. It is theoretically possible, therefore, for a single source in either Nicaragua or Peru to have accounted for apparently identical organisms in these two outbreaks.

Yet another remarkable coincidence is noted here. The unusual antibiotic sensitivity pattern noted in these isolates is the same pattern observed in the pandemic strain of S. dysenteriae 1 which has caused severe epidemics of human dysentery in Central America during the past several years. There are no other data to link human S. dysenteriae with monkey S. flexneri isolates in Central America, but two possible relationships are worth considering. First, the unusual antibiotic resistance pattern of the S. dysenteriae strain could have been transferred by means of R factors to S. flexneri strains in either humans or monkeys. And second, the

resistance episome of the S. dysenteriae epidemic strain could have come originally from shigellae or other enterobacteriaceae in monkeys. Both hypotheses are, of course, purely speculative.

S. flexneri has been isolated from spider monkeys previously, and one fatal case of this infection in a spider monkey was reported to CDC in 1970. Shigellosis is a common problem among all nonhuman primates in laboratory primate colonies. Human shigellosis from infected monkeys is uncommon, though it has been reported previously.[6,7]

B. Shigellosis Following an Elementary School Lunch, Florida,
Reported by Eugene R. Greemore, R. S., Sanitarian Supervisor, Phillip H. Jones, R. S., Assistant Director, General Sanitation, Sean K. Burke, M.D., Assistant Director, Hillsborough County Health Department, Tampa, Florida; Justine L. McCurdy, Chief Microbiologist, Tampa Regional Laboratory, Florida; E. Charlton Prather, M.D., Chief, Bureau of Preventable Diseases, Florida State Division of Health; Paul B. Dean, M.D., EIS officer located at the Florida State Division of Health.

On May 12, 1971, an outbreak of shigellosis involving 667 persons occurred after a noon meal served at an elementary school in Turkey Creek, Florida. Of the 613 persons who returned questionnaires, approximately 440 reported having been ill, for an overall attack rate of 71.8 percent. Twenty-nine persons required hospitalization. There were no deaths. The mean incubation period was approximately 24 hours, and the mean duration of illness was about 56 hours. School absenteeism is shown in Figure 5. Cramps, diarrhea, fever, nausea, and vomiting were the predominate symptoms (Table 6). Out of 178 stool specimens cultured, 27 yielded S. sonnei.

Figure 5
ELEMENTARY SCHOOL ABSENTEEISM, BY DATE
TURKEY CREEK, FLORIDA – MAY 1971

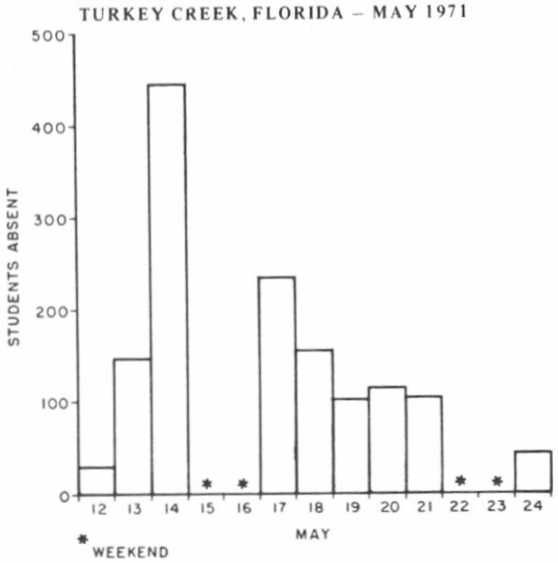

Table 6

Symptoms of 440 Patients
Turkey Creek, Florida--May 12, 1971

Symptom	Number	Percent
Cramps	369	83.9
Diarrhea	328	74.5
Fever	322	73.2
Nausea	264	60.0
Vomiting	247	56.1
Chills	203	46.1
Headache	86	19.5
Dizziness	26	5.9

Food specific attack rates implicated turkey salad as the vehicle of infection (Table 7). Five of the positive stool cultures were from food handlers in the school cafeteria. Four had eaten turkey salad, and one had eaten turkey before it had been chopped. Samples of all foods eaten on May 11-12 were cultured, and none revealed enteric pathogens. The turkey salad, however, did yield 102,000 coliforms per gram. Swabs of 19 environmental surfaces were cultured, and no pathogens were isolated.

Table 7

Food Specific Attack Rates of Persons Eating Noon Lunch at an Elementary School Turkey Creek, Florida, May 12, 1971

	ATE			DID NOT EAT		
Food Item	Ill	Not Ill	Attack Rate (Percent)	Ill	Not Ill	Attack Rate (Percent)
Turkey salad	389	91	81.0	51	82	38.3
Buttered corn	364	157	69.9	76	16	82.6
Mexican slaw	221	89	71.3	219	84	72.3
Peach dump	347	136	71.8	93	37	71.5
Rolls	371	154	70.7	69	19	78.4
Milk	380	149	71.8	60	24	71.4
Water	159	33	82.8	281	140	66.7

On May 7, the frozen turkeys were placed in a walk-in refrigerator at the school to thaw at less than 45° F until May 11. They were cooked in a steam jacketed cooker for 2½ hours and cooled for about 1 hour. They were then deboned, refrigerated, and chopped the next day. The turkey salad was prepared using chopped celery, boiled eggs, mayonnaise, and salad dressing. None of the food handlers had any evidence suggestive of prior diarrheal diseases.

Editorial comment: The investigation of this outbreak was made more difficult by the young age of the students affected. Whereas parents were able to assist with the data on symptoms, they could not identify the foods their children had eaten. Fifty-one persons who were ill denied eating turkey salad, but this could be explained by poor memory. It is also unfortunate that data is lacking regarding the onset of symptoms. It would be interesting to see whether these 51 persons were secondary cases with later onset, but these questions cannot be answered with the data available.

Past experience with foodborne shigellosis points out the importance of vehicles requiring extensive handling such as salads. It is interesting that one of the culture-positive food handlers ate turkey only before it had been chopped and made into salad; he also helped chop the turkey. It is possible that this food handler was the source of the outbreak. Turkey and other foods from animals, although they are common sources of human salmonellosis, are not commonly reported as sources of shigellosis.

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TABLE I

SHIGELLA SEROTYPES ISOLATED FROM HUMANS

SECOND QUARTER, 1971

SEROTYPE	NORTHEAST																										NORTHWEST												NORTH TOTAL
	CONN	DEL	DC	ILL	IND	IOWA	KY	ME	MD	MASS	MICH	MINN	MO	NH	NJ	NY-A	NY-BI	NY-C	OHIO	PA	RI	VT	VA	W VA	WISC	NORTHEAST TOTAL	COLO	IDAHO	KANSAS	MONT	NEB	NEV	ND	ORE	SD	UTAH	WASH	WYO	NORTHWEST TOTAL	
A. dysenteriae																																							
Unspecified																						1				1												0	1
1											1															1												0	1
2				2																						2												0	2
4																										0												0	0
Total	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
B. flexneri																																							
Unspecified			3	2					1	1			2	1		1	4	45		1			3			64	7				1	4			6		1		19	83
1 Unspecified										1										1						2										2	1		3	5
1A				1																						1												0	1
1B											1															1												0	1
2 Unspecified									2	5														2		9				4						1		5	14
2A	2			35							3	5	1		4				7							57			4	3								7	64
2B	1			20											1				2							24												0	24
3 Unspecified									4																1	5										2		2	7
3A	7			28								1			1											37												0	37
3B																										0												0	0
3C											2															2												0	2
4 Unspecified										1															1	2				1						1	1	3	5
4A												1														1				1								1	2
4B																										0												0	0
5				4																						4												0	4
6	1			3					1		2															7			3	4						1		8	15
Variant Y																										0												0	0
Total	11	0	3	93	0	0	0	0	8	8	8	7	3	1	6	1	4	45	9	2	0	0	3	2	2	216	7	0	7	13	1	4	0	0	6	4	6	0	48	264
C. boydii																																							
Unspecified																	1									1												0	1
1				1																						1												0	1
2				1																						1												0	1
4																										0											1	1	1
10																										0												0	0
14				2																						2												0	2
Total	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	1	0	1	6
D. sonnei	34		68	84	6	19	14		176	102	20	39	44	2	33	31	33	64	37	32	13	5	27	1	102	986	28	1	212	5		6		24	6	12	35		329	1315
Unknown			15			1																				16												0	16
TOTAL	45	0	86	183	6	20	14	0	184	110	29	46	47	3	39	32	38	109	46	34	13	6	30	3	104	1227	35	1	219	18	1	10	0	24	12	16	42	0	378	1605

TABLE I (CONTINUED)
SHIGELLA SEROTYPES ISOLATED FROM HUMANS
SECOND QUARTER, 1971

SOUTHEAST										SOUTHWEST					SOUTH TOTAL	OTHER					TOTAL	PERCENT OF TOTAL	PREVIOUS QUARTER		SEROTYPE
ALA	ARK	FLA	GA	LA	MISS	NC	SC	TENN	SOUTHEAST TOTAL	ARIZ	NM	OKLA	TEX	SOUTHWEST TOTAL		ALASKA	CALIF	HAWAII	VIRGIN ISLANDS	OTHER TOTAL			TOTAL	PERCENT OF TOTAL	
					1				1					0	1					0	2	0.1	0	—	*A. dysenteriae* Unspecified
									0					0	0					0	1	0.0	3	0.1	1
						2			2				3	3	5					0	7	0.3	3	0.1	2
									0				1	1	1					0	1	0.0	1	0.0	4
0	0	0	0	0	1	2	0	0	3	0	0	0	4	4	7	0	0	0	0	0	11	0.4	11	0.3	Total
																									B. flexneri
10				1	11				22		1	3	3	7	29	1		1		2	114	4.4	130	4.0	Unspecified
			1						1					0	1					0	6	0.2	13	0.4	1 Unspecified
								2	2	2			3	5	7					0	8	0.3	10	0.3	1A
									0					0	0					0	1	0.0	9	0.3	1B
		5	38			2			45		5			5	50					0	64	2.5	77	2.4	2 Unspecified
	3			3				7	13	18			23	41	54			2		2	120	4.7	114	3.5	2A
				1				1	2				6	6	8					0	32	1.2	33	1.0	2B
			11			1			12		9			9	21			1		1	29	1.1	32	1.0	3 Unspecified
	1			8				6	15	6			9	15	30			1		1	68	2.6	60	1.9	3A
								4	4	5			3	8	12					0	12	0.5	5	0.2	3B
									0					0	0					0	2	0.1	3	0.1	3C
		1							1		4			4	5					0	10	0.4	11	0.3	4 Unspecified
								1	1	9			12	21	22					0	24	0.9	36	1.1	4A
									0	1				1	1					0	1	0.0	0	—	4B
									0		1		5	6	6					0	10	0.4	5	0.2	5
		1	1	1				1	4	2	5		7	14	18	1				1	34	1.3	45	1.4	6
									0					0	0			1		1	1	0.0	0	—	Variant Y
10	4	7	51	14	11	3	0	22	122	43	25	3	71	142	264	2	0	6	0	8	536	20.9	583	18.0	Total
																									C. Boydii
														0	0					0	1	0.0	7	0.2	Unspecified
													1	1	1					0	2	0.1	1	0.0	1
													5	5	5					0	6	0.2	7	0.2	2
														0	0					0	1	0.0	0	—	4
													3	3	3					0	3	0.1	1	0.0	10
													1	1	1					0	3	0.1	0	—	14
0	0	0	0	0	0	0	0	0	0	0	0	0	10	10	10	0	0	0	0	0	16	0.6	17	0.5	Total
1	3	89	233	19	13	18		14	390	7	123	3	88	221	611	7		50		57	1983	77.3	2599	80.3	*D. sonnei*
					1				1				1	1	2						18	0.7	27	0.9	Unknown
11	7	96	284	33	26	23	0	36	516	50	148	6	174	378	894	9	0	56	0	65	2564		3237		TOTAL

Table II

Age and Sex Distribution of Individuals Infected With Shigella in the United States, Second Quarter, 1971

Age (Years)	Male	Female	Unknown	Total	Percent	Cumulative Percent	Number of Reported Isolations/ Million Population*
< 1	43	38	3	84	4.8	4.8	24.0
1-4	303	312	1	616	35.2	40.0	42.6
5-9	231	212	1	444	25.4	65.4	21.3
10-19	136	126		262	15.0	80.4	6.7
20-29	71	117		188	10.7	91.1	6.5
30-39	34	42		76	4.3	95.4	3.4
40-49	15	15		30	1.7	97.1	1.2
50-59	10	14		24	1.4	98.5	1.1
60-69	7	3		10	.6	99.1	0.7
70-79	3	9		12	.7	99.8	1.3
80 +	3	2		5	.3	100.1	1.4
Subtotal	856	890	5	1,751			
Child (unspec)	4	7		11			
Adult (unspec)	4	7	1	12			
Unknown	364	410	16	790			
TOTAL	1,228	1,314	22	2,564			
Percent	48.3	51.7					

*Based on provisional data from Population Estimates, Series P25, No. 428 (August 19, 1969) and No. 441 (March 19, 1970)

Table III

Relative Frequencies of Shigella Serotypes
Reported, Second Quarter, 1971

	Serotype	Number Reported	Calculated Number*	Calculated Percent	Rank
A.	S. dysenteriae				
	Unspecified	2			
	1	1	1	.04	14
	2	7	9	.35	10
	4	1	1	.04	14
B.	S. flexneri				
	Unspecified	114			
	1 unspecified	6			
	1a	8	17	.66	8
	1b	1	2	.08	13
	2 unspecified	64			
	2a	120	219	8.54	2
	2b	32	58	2.26	4
	3 unspecified	29			
	3a	68	118	4.60	3
	3b	12	21	.82	7
	3c	2	3	.12	12
	4 unspecified	10			
	4a	24	43	1.68	6
	4b	1	2	.08	13
	5	10	13	.51	9
	6	34	44	1.72	5
	Varient Y	1	1	.04	14
C.	S. boydii				
	Unspecified	1			
	1	2	2	.08	13
	2	6	6	.23	11
	4	1	1	.04	14
	10	3	3	.12	12
	14	3	3	.12	12
D.	S. sonnei	1,983	1,997	77.89	1
	Unknown	18			
	TOTAL	2,564	2,564		

*Calculated number is derived by distributing the unspecified isolation in each group to their subgroup in the same proportion as the distribution of the specified isolations of that group.

Table IV

Shigella Serotypes from Mental Institutions
Number of Isolations by State,
Second Quarter, 1971

State	dysenteriae 2	flexneri unspecified	flexneri 2 unspecified	flexneri 2a	flexneri 2b	flexneri 3a	flexneri 3b	flexneri 5	flexneri 6	sonnei	Total
Florida	0	0	0	0	0	0	0	0	0	9	9
Georgia	0	0	30	0	0	0	0	0	0	2	32
Illinois	2	0	0	24	18	0	0	4	3	0	51
Iowa	0	0	0	0	0	0	0	0	0	1	1
Kansas	0	0	0	0	0	0	0	0	0	138	138
Maryland	0	0	0	0	0	0	0	0	0	1	1
Massachusetts	0	0	1	0	0	0	0	0	0	17	18
Michigan	0	0	0	0	0	0	0	0	0	1	1
Minnesota	0	0	0	5	0	0	0	0	0	0	5
Missouri	0	0	0	0	0	0	0	0	0	9	9
New Jersey	0	0	0	1	1	1	0	0	0	11	14
New York	0	34	0	0	0	0	0	0	0	0	34
North Carolina	2	0	1	0	0	0	0	0	0	0	3
Tennessee	0	0	0	0	0	0	1	0	0	0	1
Wisconsin	0	0	0	0	0	0	0	0	0	55	55
TOTAL	4	34	32	30	19	1	1	4	3	244	372

Table V

Sources of Reported Isolations of Shigella
By Residence at Time of Onset
Second Quarter, 1971

Source	Apr	May	Jun	Total	Percent of Subtotal	Percent of Total
Mental Institutions	115	81	176	372	29	
Indian Reservations	3	14	3	20	2	
Other Residencies	260	311	324	895	70	
Subtotal	378	406	503	1,287		50
Residencies Unknown	385	411	469	1,277		50
Total	763	817	972	2,564		

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Key to all disease surveillance activities are the physicians who serve as State epidemiologists. They are responsible for collecting, interpreting, and transmitting data and epidemiological information from their individual States; their contributions to this report are gratefully acknowledged. In addition, valuable contributions are made by State Laboratory Directors; we are indebted to them for their valuable support.

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