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center for disease control

SHIGELLA

surveillance

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for the
Fourth Quarter 1971

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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. It is intended primarily for the use of those with responsibility for disease control activities. Anyone desiring to quote this report should contact the original investigator for confirmation and interpretation.

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

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I. Summary

In the fourth quarter of 1971, 3,994 shigella isolations from humans were reported. This number represents an increase of 784 (24.4 percent) over the 3,210 isolations in the third quarter of 1971, and a decrease of 443 (10.0 percent) from the 4,437 isolations reported in the fourth quarter of 1970 (Table I).*

II. Reported Isolations

A. Human

1. General Incidence

In the fourth quarter of 1971, 70.6 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

Fifty-one of the 54 reporting centers participating in the Shigella Surveillance Program reported isolations of shigella. Twenty-two different serotypes were reported (Table I). The six most frequently reported serotypes during the 3-month period were the following (Table 1):

Table 1

Rank	Serotype	Reported	Calculated Number✱	Calculated Percent✱	Rank Last Quarter
1	*S. sonnei*	3,077	3,106	77.8	1
2	*S. flexneri* 2a	135	275	6.9	2
3	*S. flexneri* 3a	95	222	5.6	3
4	*S. flexneri* 6	70	91	2.3	4
5	*S. flexneri* 4a	47	72	1.8	5
6	*S. flexneri* 2b	27	55	1.4	6
Subtotal		3,451	3,821	95.7	
Total (all serotypes)		3,994	3,993		

✱From Table III

Table III is calculated from data compiled during the fourth 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. *Shigella sonnei* accounted for approximately three-fourths of all isolations.

3. Geographical and Seasonal Observations

More isolations of *S. sonnei* than *S. flexneri* were reported from every reporting center except eight states: Arizona, Montana, Hawaii, Wyoming, South Dakota, Nebraska,

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*No laboratory reports were received from California or the Virgin Islands.

West Virginia, South Carolina (Figure 1). The seasonal distribution of shigella is depicted in Figure 2. Figure 3 shows the number of reported isolations per million population by state for the fourth quarter, 1971, utilizing population estimates for July 1, 1971. Approximately 19.6 isolations per million population were reported for the fourth quarter of 1971.

Figure I PERCENTAGE *S. flexneri* AND *S. sonnei* OF TOTAL SHIGELLA ISOLATIONS REPORTED FROM INDICATED REGIONS UNITED STATES, OCTOBER – DECEMBER 1971

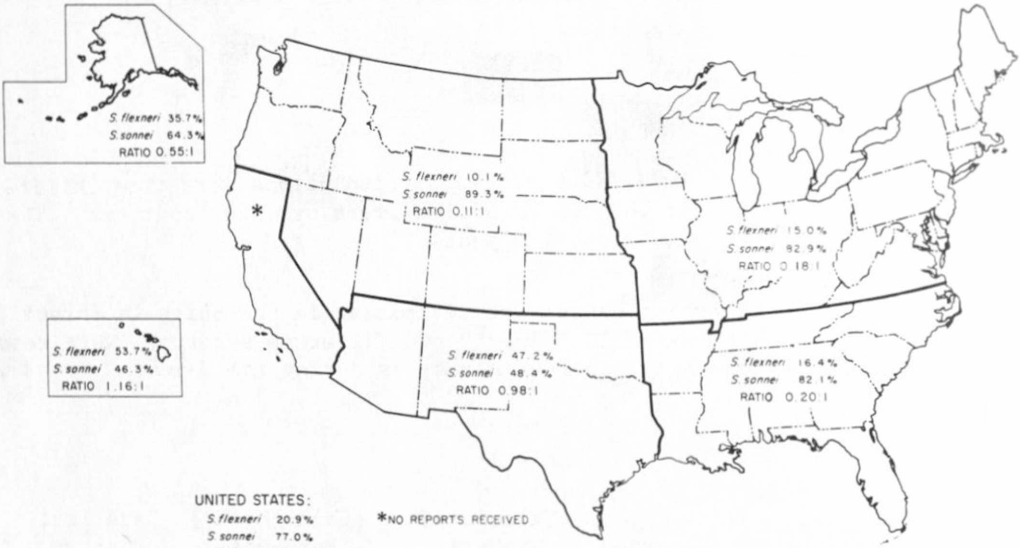


Figure 2 REPORTED ISOLATIONS OF SHIGELLA IN THE UNITED STATES

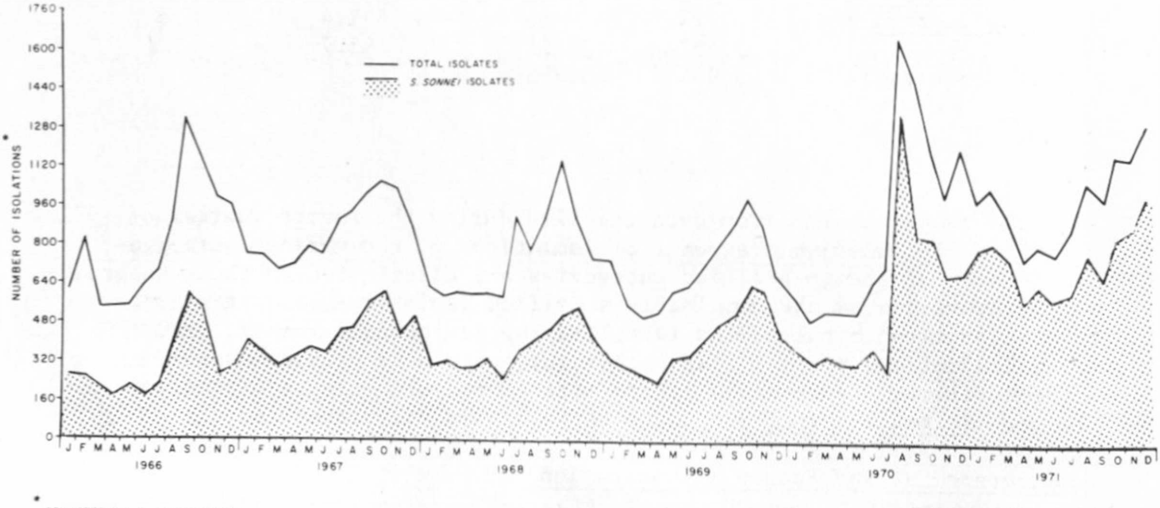
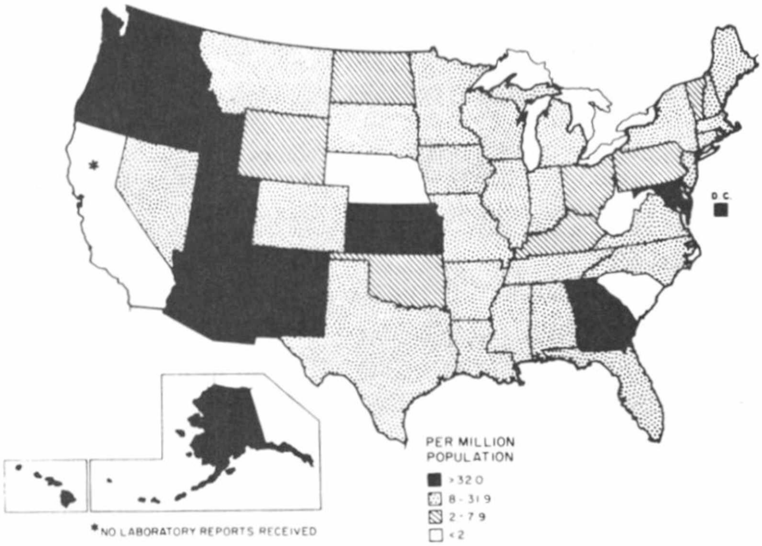


Figure 3 ATTACK RATES OF SHIGELLOSIS, BY STATE, OCTOBER – DECEMBER 1971



B. Nonhuman

During the fourth quarter of 1971, 38 nonhuman isolations of shigella were reported:

Table 2

Serotype	Number	Source	Reporting Center
S. dysenteriae (unspec.)	7	primates	USAFASM
S. flexneri (unspec.)	22	primates	USAFASM
S. flexneri 2a	1	monkey	Arkansas
S. flexneri 3	1	monkey	Georgia
S. flexneri 4 (unspec.)	1	monkey	Georgia
S. flexneri 4a	2	monkeys	Illinois
	1	gibbon	Texas
S. flexneri 4b	1	monkey	Illinois
S. sonnei	1	orangutan	Georgia
	1	dog	Idaho

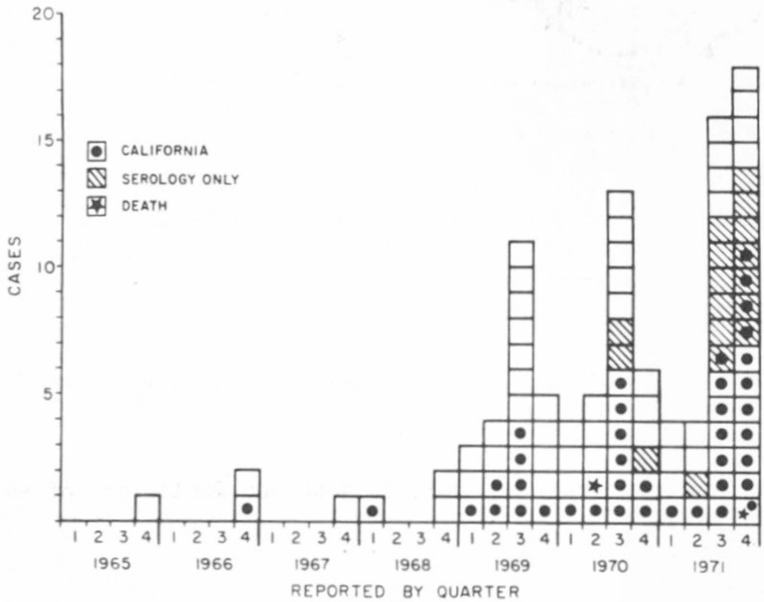
III. Current Investigations

A. Cases of Shiga's Bacillus Infection

From late 1968 til early 1971, the epidemic of dysentery caused by S. dysenteriae 1 or Shiga's bacillus was a major public health problem in most Central American countries. Surveillance of this severe variety of shigellosis imported into the United States has been the subject of previous articles in Shigella Surveillance Reports numbers 22, 23, and 26.

In 1971, 42 cases of infection with Shiga's bacillus in the United States were reported to CDC. Included as cases are persons with a positive culture and anyone who had close contact with another case and was found to have a positive serologic titer against Shiga's bacillus by the indirect hemagglutination test. Using Dr. Leonardo Mata's criterion that a titer of 1:40 or greater is positive, the epidemiology laboratory at CDC has found a close correlation between elevated titers and epidemiologic and clinical histories. Reported cases in this country since 1965 are shown in Figure 4. The increase at the end of 1968 corresponded to the first epidemics in Guatemala. Forty-two cases occurred in 1971 compared with 28 in 1970.

FIGURE 4 PERSONS WITH SHIGA'S BACILLUS INFECTION, UNITED STATES, JANUARY 1965-DECEMBER 1971



Along with the increase in total cases in 1971, there was a distinct change in the geographic and socioeconomic distribution of these cases (Table 3). Cases in the border states nearly tripled in 1971, while those in other states decreased.

Widespread epidemics of Shiga's bacillus infection have not been reported in Mexico, but these data suggest that the disease has been widely endemic in Mexico. Persons infected while visiting in Mexico increased to 19 in 1971 (Table 4). The greatest increase was in persons (20) who were infected by secondary spread within the United States in 1971 versus only 2 in 1970 (Table 4). Thirteen of the 20 had prior contact with infected family members. Seven remain unexplained in spite of careful investigation, and are referred to as "cryptic" cases. Figure 5 shows this change in type of exposure.

Table 3

Cases of Shiga Infection, by Place of Residence, United States, 1970-1971

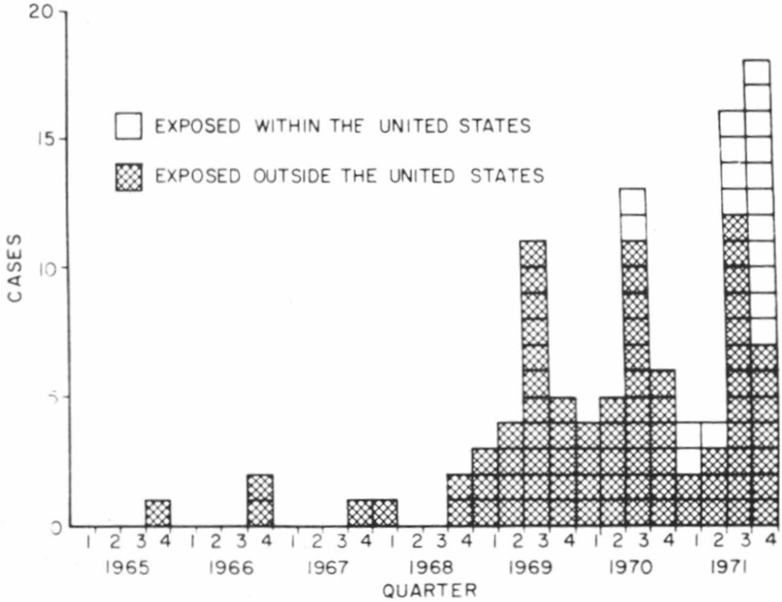
Place of Residence	Number of Cases 1970	1971
California	10	20
(Los Angeles County)	(4)	(14)
Arizona	0	9
Texas	1	8
New Mexico	2	1
TOTAL (all border states)	13	38
Other states	15	4
TOTAL (all states)	28	42

Table 4

Cases of Shiga Infection by Exposure History, United States, 1970-1971

Exposure History	Number of Cases 1970	1971
History of travel:		
Mexico	16	19
Central America	7	1
Secondary cases:		
Family contact	2	13
Cryptic	0	7
Total number investigated	25	40
History not known	3	2
TOTAL cases	28	42

FIGURE 5 PERSONS WITH SHIGA'S BACILLUS INFECTION, UNITED STATES, JANUARY 1965 - DECEMBER 1971



Among the U.S. cases age and sex distribution was interesting in that adult female cases for the period 1969 through 1971 outnumbered adult males 20 to 14 (Table 5). Adult female preponderance in reported enteric diseases is usually attributed to secondary spread within families, with women having more contact with small children. The excess of adult female cases over adult male is entirely accounted for by women of Spanish surname.

Table 5

Cases of Shiga Infection, by Age and Sex
United States, 1969-1971

	Male	Female	Unknown	Total
Child	17	16	2	35
Adult	14	20	0	34
Unknown	8	4	0	12
Total	39	40	2	81

Cases in persons of Spanish surname are enumerated in Table 6 with 16 such cases in 1971 as opposed to only four secondary cases among persons of non-Spanish name in that year. Those referred to here are specifically persons of lower socio-economic status, of Mexican-American or American-Indian background, living in areas not far from the Mexican border, who frequently had contact with persons who traveled to and from Mexico.

Table 6

Surnames of Persons with Shiga Infection,
by Year, United States, 1969-1971

Surname of Infected Person	Year 1969	1970	1971
Spanish	2	12	32
Non-Spanish	10	16	10
Unknown	11	0	0

As has been previously seen in the Central American epidemics caused by this strain of Shiga's bacillus, the illness is more severe than shigellosis commonly seen in the United States. Table 7 shows the percent affected in 1971 by common symptoms. Although not listed, tenesmus is also common in this illness. Eighty-eight percent had grossly bloody diarrhea, whereas patients with Shigella sonnei infection in this country rarely have blood in their stools. Shiga dysentery may be a severe illness with very frequent and painful passage of bloody-mucoid stools of small quantity. Fever is often not prominent after dysentery develops. This may explain why cases are sometimes diagnosed as ulcerative colitis or amebiasis. There may be a prolonged downhill progression until appropriate treatment is given, ideally ampicillin in a dose of 50 mg/kg/day. Confusion in diagnosis has occurred in the past because patients have been unresponsive to tetracycline, chloramphenicol, streptomycin, and sulfa drugs to which the organism is resistant.

Table 7

Percentage of Persons with Shiga Infection by Clinical Manifestation, United States, 1971

Clinical Manifestation	Percent Affected
Diarrhea	96
Bloody diarrhea	88
Abdominal pain	87
Fever	64
Vomiting	40
Hospitalization	54
Death	2

There was only one death among these patients in the United States in 1971, probably because all of them had access to hospitals and antibiotics, and ampicillin was used for most of them.

Two case reports serve to illustrate some of the points made here:

Case 1 - A 19-year-old male traveled by car from Pasadena, Texas, to Mexico on the Gulf of California. Four days after entering Mexico he developed diarrhea, abdominal cramps, severe tenesmus, and anorexia. His bowel movements increased to one or more per hour and subsequently (after about 1 week) contained blood and mucus. At no time did he feel febrile. Occasionally he felt "constipated" (due to the tenesmus) and even took laxatives at one time. His illness continued throughout his 2-week stay in Mexico, and he experienced marked weight loss and fatigue. He returned to the United States 11 days after onset of symptoms and sought medical attention the following day. A stool culture obtained that day revealed S. dysenteriae 1. He was treated symptomatically and gradually improved.[(1)]

Dysentery occurring in travelers, as in this patient, constituted the most commonly reported cases of Shiga infection prior to 1971. More recently, cases with no history of travel have been reported with increasing frequency. An example of such a case is illustrated in the next case report.

Case 2 - A 14-month-old Mexican-American male had onset of bloody diarrhea. The next day he developed fever, vomiting, and lethargy and that night had convulsions. He was taken to hospital, given a prescription, and sent home. The next day the child returned to the same hospital and was hospitalized for a period of 11 days. After that he was transferred to Children's Hospital of Los Angeles. During his stay at the first hospital he received several blood transfusions because of massive bloody diarrhea as well as epistaxis and hematuria. The child recovered at Children's Hospital and was finally sent home free of complications. A stool specimen was positive for S. dysenteriae type 1.[(2)]

In case 2, the patient was born in Los Angeles and had never been outside of California. The family knew of no visitors to the home from Mexico and recalled no illness among the boy's playmates, neighbors, or relatives. No other members of the family remembered having diarrhea, but the 24-year-old mother was found to have a strongly positive serologic titer against Shiga's bacillus.

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1. Case report submitted by Thomas R. Fashinell, M.D., EIS Officer located at the Texas State Health Department.

2. Case report submitted by Claude T. H. Friedmann, M.D., EIS Officer located at the California State Health Department in Los Angeles.

This case illustrates some of the diagnositc problems and complications. As with six other cases in 1971, the patient's illness was not related to travel outside of the United States. His bleeding diathesis was thought to be secondary to a consumption coagulopathy.

Summary:

Prior to 1971, most cases of infection with Shiga's bacillus were in tourists of above average socioeconomic status from all parts of the United States; the number of secondary cases was very low. In 1971, there was an increase in the total number of cases and in the number of cases in lower-socioeconomic areas near the Mexican border. There was often a history of repeated contact with Mexico through family or friends, and the number of secondary cases was higher than in 1970. In some cases, there was no history of travel to Latin America by either the patient or any of the patient's known contacts.

These changes in the geographic and socioeconomic distribution of Shiga's bacillus, as well as the increased number of secondary and cryptic cases, suggest that some transmission of this disease has occurred within the United States.

IV. Reports from the States

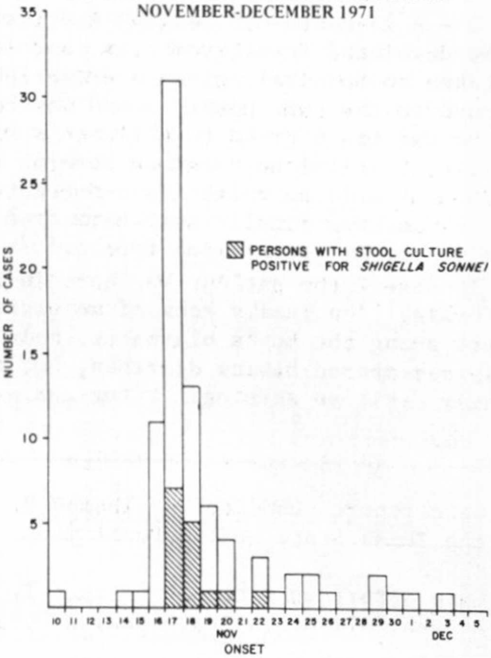
A. Gastroenteritis Among Residents of a Trailer Court, Alaska.

Reported by Ronni Kinneen, Supervisor, Public Facilities Sanitarian; Rolf Strickland, R.S., Assistant Director; C.P. Judkins, R.S., Director, Department of Environmental Quality; A.B. Colyar, M.D., Medical Director, Greater Anchorage Area Borough Health Center; Kyle Cherry, R.S., Regional Sanitary Engineer, Department of Environmental Conservation; James Allen, R.S., Regional Supervisor, Department of Health and Social Services, Environmental Health Section, Alaska State Department of Health and Social Services; and Paul D. Steer, M.D., EIS Officer assigned to Alaska State Department of Health and Social Services.

Between November 10 and December 5, 1971, an outbreak of gastroenteritis occurred in residents at a trailer court in Anchorage, Alaska. Eighty-nine of the 114 residents became ill, for an attack rate of 78.1 percent. The illness was characterized by acute onset with non-specific symptoms preceding diarrhea by 0-48 hours (mean 10.6 hours, median 5 hours). The date of onset was known for 82 patients (Figure 6). A total of 62 percent became ill between November 16-18 with symptoms including nausea, vomiting, abdominal pain, fever, and diarrhea. Eighty-one cases had diarrhea that lasted from 1-25 days, with a median duration of 7 days. Age and sex distribution showed no significant differences in specific attack rates. One person was hospitalized; there were no deaths.

Figure 6

GASTROENTERITIS CASES AT A TRAILER COURT BY DATE OF ONSET – ANCHORAGE, ALASKA NOVEMBER-DECEMBER 1971



Shigella sonnei was recovered from stools from 17 patients living in six different trailers. No specimens were obtained from persons not clinically ill.

Fourteen persons in four families not residing at the trailer court also experienced gastroenteritis after social contact with affected residents of the trailer court. Stools were obtained from nine of these persons, and all were positive for S. sonnei.

The residents reported that on November 16 the water from all the household taps was "dirty" and had a bad odor. Water used at the trailer court had been subjected to periodic coliform analysis prior to this outbreak and had been consistently negative: the last negative sample was collected on November 15, 1971.

The trailer court water system consisted of two 240-foot deep wells, 25 feet apart, enclosed in a cinder block well-house. The well-house floor was 3 feet below the ground, and the well casings extended to 1 foot above the well-house floor. The pumps on the well filled a 2,500 gallon pressure tank in the well-house from which water was distributed to the trailers. There was no chlorination apparatus in the system. A gravity flow system drained the sewage from the trailer court and was connected to the borough sewerage system. A floor drain in the well-house was connected to the main sewerage system.

Investigation revealed that a blockage in the borough sewerage system had caused a backup of sewage through the well-house floor drain into the trailer court water system. Sewage filled the well-house to a 1-foot depth and drained into the two wells; subsequently, the contaminated well water was pumped into the water distribution system of the trailer court.

Attempts to decontaminate the water system began on November 16, and in the meantime, residents were told to use the water only for flushing toilets; drinking water was supplied from trucks. After the well-house floor was decontaminated, 5 pounds of 70 percent chlorine were placed in each well for 3 hours; this chlorine-treated water was then distributed through the whole system for 16 hours. Essentially the same procedure was repeated on November 21 and 24. After a retention and flushing period, the water continued to have unacceptable coliform levels. Water specimens were not cultured for specific pathogens. Since the wells could not be adequately decontaminated, they were closed down. The trailer court water system was then connected to the borough water system. The system was then flushed with 8,000 gallons of water with 200 ppm chlorine flowing for 8 hours. Subsequent specimens were negative for coliforms, and normal use of water was restored on December 15.

EDITORIAL NOTE:

The isolation of S. sonnei from 17 ill residents of the trailer court suggested that shigella was the etiologic agent in all cases; the clinical features and incubation periods were also compatible with shigellosis.

Of 10 previous waterborne outbreaks of shigellosis reported to CDC since the beginning of 1967, eight were caused by S. sonnei and two by S. flexneri. A total of 850 persons were affected, and attack rates ranged from 8 to 86 percent. Shigella (S. sonnei) was recovered from the incriminated water in only one instance. All of the previous outbreaks occurred in the warmer months, May through October. None of the water supplies involved were chlorinated, and when chlorination was instituted, it was effective in blocking this route of transmission.

In all outbreaks of gastroenteritis due to contaminated water that have been reported in the United States it is uncommon to isolate shigellae or other known pathogens from patients or water. Outbreaks in which no known pathogen is isolated are generally referred to as "sewage poisoning" outbreaks. In some of these cases a careful search has eventually disclosed a toxin producing E. coli as the etiologic agent.[1] In others, viral agents appear to have been responsible, though they have not been isolated.[2] Non-cholera vibrios and Yersinia enterocoliticus are other agents which should be looked for.

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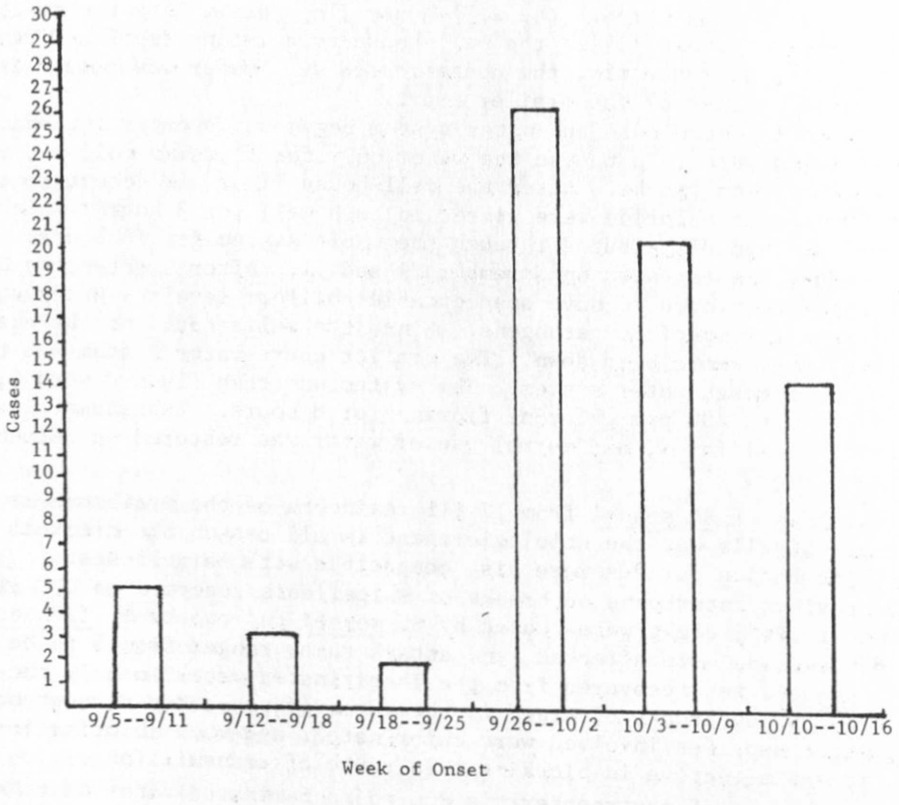
1. Schroeder SA, Caldwell JR, Vernon, et al: A waterborne outbreak of gastroenteritis in adults associated with Escherichia coli. Lancet i(7545):737-740, 1968.

2. Dolin R: Transmission of acute infectious nonbacterial gastroenteritis to volunteers by oral administration of stool filtrates. J Infect Dis 123:307-312, 1971.

B. Shigellosis and hepatitis in a nursery, North Carolina.
Reported by Benjamin M. Drake, M.D., Health Director; Anne Rollins, R.N., Public Health Nurse, Boyce Hunt, R.S., Gaston County Health Department; North Carolina; Nancy King, M.S., Bacteriologist, Laboratory Division; Martin P. Hines, D.V.M., Director, Division of Epidemiology, North Carolina State Board of Health; and by Stephen A. Gehlbach, EIS Officer assigned to the North Carolina State Board of Health.

In September and October 1971, an outbreak of shigellosis occurred in a nursery in Gastonia, North Carolina. The week of onset was known for 70 cases (Figure 7). Of approximately 110 children in the nursery, 80 were affected, for an attack rate of 91 percent. Four out of eight employees were also affected. Six secondary cases were reported in family contacts. Symptoms included diarrhea (100 percent), fever (75 percent), and vomiting (60 percent). Several younger children required hospitalization; there were no deaths.

FIGURE 7 Seventy Cases of Shigellosis by Date of Onset, Gastonia, North Carolina



Shigella sonnei was isolated from 37 of 72 stool specimens submitted; one of these was from an asymptomatic child.

On October 11, a 3-year-old girl who had had diarrhea for 10 days had onset of jaundice and was diagnosed as having hepatitis. The following week, another child and a nursery employee became ill with hepatitis. All three had stool cultures positive for S. sonnei. A total of 65 children at the nursery were subsequently given prophylactic gamma globulin.

The nursery operates a daytime and evening session 6 days a week. It provides and prepares all meals except infant formulas. The manager and most of the employees share in meal preparation. The nursery contracts with a local diaper service and offers diaper changes for the children. Although total enrollment is about 110 children, attendance at each session varies from approximately 25 to 60. Inspection of the nursery revealed overcrowding as well as inadequate kitchen facilities, hand-washing, and toilet facilities, and soiled diaper storage facilities were grossly inadequate. Person-to-person transmission was thought to be the mode of spread.

Control measures included instructing the nursery management to make several corrections in order to continue operation. Included in these instructions were improved toilet and handwashing facilities and a significant reduction in enrollment.

EDITORIAL NOTE:

Outbreaks of shigellosis involving day-care centers and nurseries are frequently reported to CDC. They are especially a problem when small children, not yet toilet trained, are involved. Because spread of shigellosis within families occurs so commonly, it is not surprising that centers caring for small children can also have a problem with this infection. Close contact among small children and with their parents provides a means for easy spread of shigellae, if children's stools are infected. Day-care centers, nurseries, and also some of the communes present in this country show a frequency of contact between small children and others closely parallel to that within families, and in all of these settings spread of shigellosis has been a problem. Though rigid attention to environmental cleanliness, handwashing, and avoidance of crowding does not always prevent shigellosis in nurseries, it can prevent the disease in most cases and is vitally important.

Hepatitis, as described in this report, probably follows the same person-to-person route of spread as shigellosis within nurseries, families, and the like. This is undoubtedly the reason that the two diseases are occasionally reported simultaneously or in the same groups.

V. Current Trends and Developments

S. sonnei is by far the most common shigella species isolated in the U.S., with most of the other isolates being *S. flexneri*. Isolates of two other shigella species, *dysenteriae* and *boydii* accounted for less than 2 percent of all isolates in 1971. These uncommon types are rarely the cause of endemic or epidemic shigellosis in this country, and they are observed to be widely scattered throughout the United States, with sporadic reports being the rule. It seems likely, then, that cases of these infections are more often imported from other countries than are those with *S. sonnei* and *S. flexneri*. Cases of *S. dysenteriae* 1 infection and their relationships to importation are discussed separately under Current Investigations in this report. In 1971, 32 persons infected with other *dysenteriae* and *boydii* types were questioned about any history of recent travel.

Table 8 shows the travel history of the 32 persons questioned. Fourteen or 44 percent had recently traveled outside of the United States. Seven of these had been to Mexico, and this large proportion may reflect the large numbers of tourists traveling to that country. Europe, on the other hand, was not implicated in any of the imported cases in spite of a large exchange of tourists with that area. Among the persons who had not traveled, two patients with *S. dysenteriae* 2 were patients in a mental hospital and four with *S. boydii* 2 lived on an Indian reservation.

These very limited data support the hypothesis that infections with the uncommon *dysenteriae* and *boydii* species are frequently found to have been imported.

Table 8

Travel History of 32 Persons with Shigellosis Due to Rare Serotypes, United States, 1971

Serotype	Mexico	Peru	Ecuador	Puerto Rico	Iran	India	Near East	Africa	Total Who Traveled	No Travel
dysenteriae unclass.*									0	1
dysenteriae 2	1	1	1					1	4	5**
dysenteriae 3	1								1	5
dysenteriae 4	1								1	1
dysenteriae 9	1								1	
boydii unclass.*				1					1	1
boydii 1							1		1	
boydii 2	2				1				3	4
boydii 4						1			1	
boydii 10									0	1
boydii 14	1								1	
TOTAL	7	1	1	1	1	1	1	1	14	18

*Unclassified
**Two cases had recent exposure to a traveler from Mexico

VI. Summary for 1971

In 1971, a total of 12,988 isolations of shigella was reported to CDC. This was an increase of 19.1 percent over the 10,903 isolations reported in 1970. Utilizing the population estimates for July 1, 1971, the overall United States attack rate was 63.6 reported isolations per million population in 1971, compared to 54.0 and 44.8 reported isolations in 1970 and 1969, respectively. Attack rates by state are depicted in Figure 8.

The age and sex distribution of individuals from whom shigella was isolated in 1971 is presented in Table V. Children 1-4 years of age were at greatest risk with an attack rate of 238.4 per million during 1971.

The seasonal distribution persisted; the greatest number of isolates have been reported each autumn (Figure 2).

The six most frequently reported serotypes during 1971 are shown in Table 9.

Table 9

Six Most Frequently Reported Shigella Serotypes During 1971

Rank	Serotype	Reported Number	Calculated Number	Calculated Percent	Rank in 1970
1	S. sonnei	9,900	9,989	76.9	1
2	S. flexneri 2a	536	1,046	8.1	2
3	S. flexneri 3a	312	615	4.7	3
4	S. flexneri 4a	154	291	2.2	5
5	S. flexneri 6	217	276	2.1	4
6	S. flexneri 2b	126	246	1.9	6

Figure 8 ATTACK RATES OF SHIGELLOSIS BY STATE, 1971

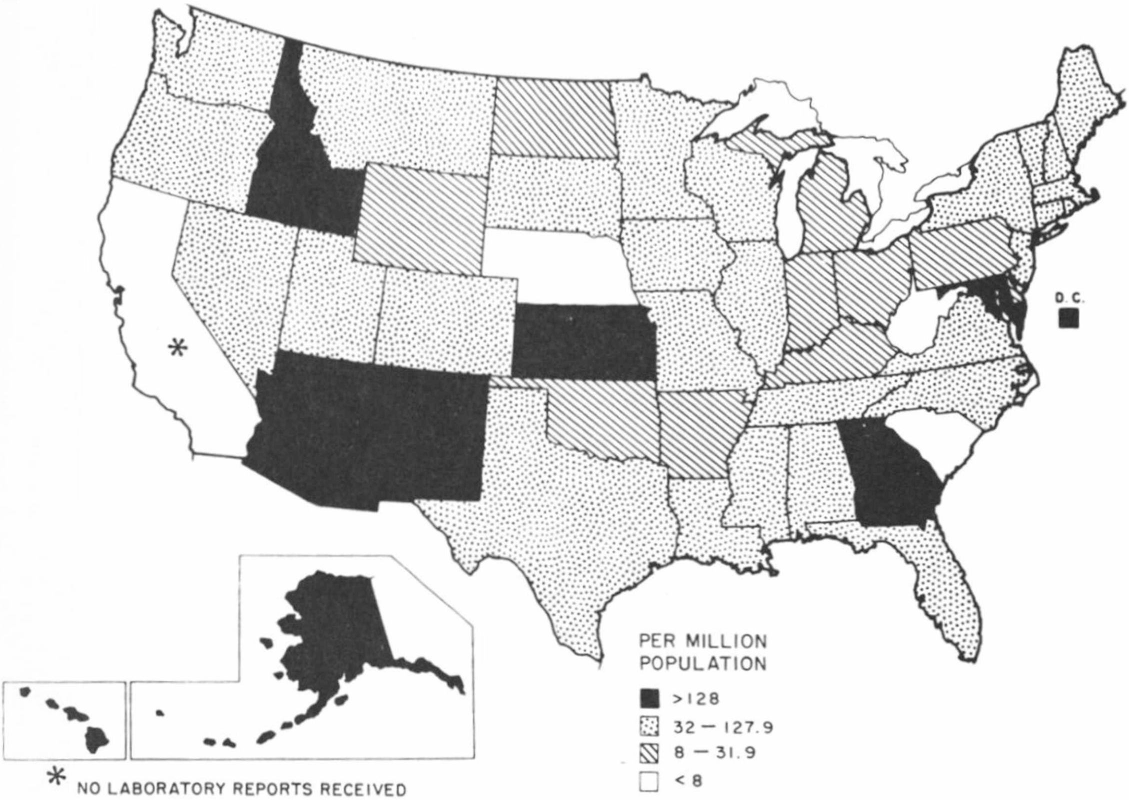


Table VI shows the relative frequency of all shigella serotypes reported in 1971. The trend toward an increasing proportion of all isolates being S. sonnei continues as it has since the fourth quarter of 1966. In 1971, 76.2 percent of all reported shigella isolations were S. sonnei versus 71.8 in 1970 and 60.9 in 1969. Concomitantly, S. flexneri has progressively decreased in proportion of total isolations.

TABLE I
SHIGELLA SEROTYPES ISOLATED FROM HUMANS
FOURTH QUARTER, 1971

SEROTYPE	NORTHEAST																										NORTHWEST													
	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	KANS	MONT	NEB	NEV	ND	ORE	SD	UTAH	WASH	WYO	NORTHWEST TOTAL	NORTH TOTAL
A. dysenteriae																																								
Unspecified														1												1								1			1		2	3
1																										0													0	0
2											2															2													0	2
3																										0													0	0
4																										0													0	0
9									1																	1													0	1
TOTAL	0	0	0	0	0	0	0	0	1	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	1	0	0	1	0	2	6
B. flexneri																																								
Unspecified			5		6	1				2	1		16		4	3	2	30		1			9			80	11					1		1	8		3	1	25	105
1 Unspecified																									3	3				1							1		2	5
1A				1						1	1															3		1											1	4
1B				1																						1													0	1
2 Unspecified									5	3			1						2						1	12				3						9	5		17	2[illegible]
2A	6			12							1	4			2				3							28				2			1						3	31
2B	1			4															3						1	9													0	9
3 Unspecified									2	1	2		4		12										9	30										1			1	31
3A	4			34								9			16											63													0	63
3B																										0													0	0
3C											1															1													0	1
4 Unspecified									4		1		1													6													0	6
4A	1			3					3																	7										3			3	10
4B																										0										3			3	3
5				14																						14													0	14
6	1			3			1				1	1														7		1	2	1							1		5	12
Variant Y																										0		1											1	1
TOTAL	13	0	5	72	6	1	1	0	14	7	8	14	22	0	34	3	2	30	8	1	0	0	9	0	14	264	11	3	2	7	0	1	1	1	8	16	10	1	61	325
C. boydii																																								
Unspecified																										0					1				1				2	2
1												1													1	1													0	1
2																									1	1													0	0
4																										0													0	0
10																																							0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	1	0	0	0	1	0	0	0	2	4
D. sonnei	69	2	80	245	54	71	22	9	157	65	105	39	68	12	57	20	32	167	27	39	4	3	35	0	81	1463	42	67	158	3	0	6	2	121	0	35	105	1	540	2003
Unknown			25	1										2				1			2					31													0	31
TOTAL	82	2	110	318	60	72	23	9	172	72	115	54	90	15	91	23	34	198	35	40	6	3	44	0	96	1764	53	70	160	10	1	7	3	123	9	51	116	2	605	2369

TABLE 1 (CONTINUED)
SHIGELLA SEROTYPES ISOLATED FROM HUMANS
FOURTH QUARTER, 1971

SOUTHEAST										SOUTHWEST						OTHER							PREVIOUS QUARTER		
ALA	ARK	FLA	GA	LA	MISS	NC	SC	TENN	SOUTHEAST TOTAL	ARIZ	NM	OKLA	TEX	SOUTHWEST TOTAL	TOTAL SOUTH	ALASKA	CALIF	HAWAII	VIRGIN ISLAND	OTHER TOTAL	TOTAL	PERCENT OF TOTAL	TOTAL	PERCENT OF TOTAL	SEROTYPE
																									A. dysenteriae
	3		1						4					0	4					0	7	0.2	5	0.2	Unspecified
									0	2			1	3	3					0	3	0.1	5	0.2	1
									0	4			3	7	7					0	9	0.2	9	0.3	2
									0	2			2	4	4					0	4	0.1	3	0.1	3
									0				3	3	3					0	3	0.1	5	0.2	4
									0					0	0					0	1	0.0	1	0.0	9
0	3	0	1	0	0	0	0	0	4	8	0	0	9	17	21	0	0	0	0	0	27	0.7	28	0.9	TOTAL
																									B. flexneri
9	1				7				17		56	2		58	75	16				16	196	4.9	144	4.5	Unspecified
		2							2		10		1	11	13					0	18	0.5	22	0.7	1 Unspecified
								1	1	4			5	9	10					0	14	0.4	20	0.6	1A
				1					1				5	5	6					0	7	0.2	7	0.2	1B
		9	39			5			53	1	1		3	5	58					0	87	2.2	124	3.9	2 Unspecified
	2			4				12	18	54			28	82	100			4		4	135	3.4	167	5.2	2A
				4					4	3			11	14	18					0	27	0.7	34	1.1	2B
	1	6	4						11		11		4	15	26	12		17		29	86	2.2	54	1.7	3 Unspecified
	1			1				8	10	10			12	22	32					0	95	2.4	89	2.8	3A
								2	2	1			4	5	7					0	7	0.2	12	0.4	3B
									0	9				9	9					0	10	0.3	5	0.2	3C
									0		2			2	2					0	8	0.2	49	1.5	4 Unspecified
	1								1	25		1	10	36	37					0	47	1.2	47	1.5	4A
									0					0	0					0	3	0.1	4	0.1	4B
				1				1	2	3	1		2	6	8	1				1	23	0.6	27	0.8	5
		3	1	1				4	9	6	18		12	36	45	12		1		13	70	1.8	68	2.1	6
									0					0	0					0	1	0.0	0	0.0	Variant Y
9	6	20	44	12	7	5	0	28	131	116	99	3	97	315	446	41	0	22	0	63	834	20.9	873	27.2	TOTAL
																									C. boydii
									0					0	0					0	2	0.1	2	0.1	Unspecified
									0					0	0					0	1	0.0	1	0.0	1
									0	1	1		5	7	7					0	8	0.2	11	0.3	2
									0	1				1	1					0	1	0.0	5	0.2	4
									0	4				4	4					0	4	0.1	2	0.1	10
0	0	0	0	0	0	0	0	0	0	6	1	0	5	12	12	0	0	0	0	0	16	0.4	22	0.7	TOTAL
50	13	122	232	55	13	102	0	71	658	60	104	6	153	323	981	74	0	19	0	93	3077	77.0	2256	70.3	*D. sonnei*
					3		5		8				1	1	9					0	40	1.0	31	1.0	Unknown
59	22	142	277	67	23	107	5	99	801	190	204	9	265	668	1469	115	0	41	0	156	3994	0	3210	0	TOTAL

Table II

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

Age (Years)	Male	Female	Unknown	Total	Percent	Cumulative Percent	Number of Reported Isolations/ Million Population*
< 1	77	73	2	152	5.8	5.8	43.6
1-4	539	540		1,079	41.2	47.0	78.9
5-9	321	296	1	618	23.6	70.6	31.0
10-19	159	137		296	11.3	81.9	7.4
20-29	86	171		257	9.8	91.7	8.6
30-39	41	61		102	3.9	95.6	4.5
40-49	21	27		48	1.8	97.4	2.0
50-59	13	11		24	.9	98.3	1.1
60-69	7	14		21	.8	99.1	1.3
70-79	5	10		15	.6	99.7	1.6
80 +	1	5		6	.2	99.9	1.6
Subtotal	1,270	1,345	3	2,618			
Child (unspec.)	6	11	2	19			
Adult (unspec.)	5	3	1	9			
Unknown	660	672	16	1,348			
TOTAL	1,941	2,031	22	3,994			
Percent	48.9	51.1					

*Based on 1970 Census of Population, General Population Characteristics, United States Summary, Issued January 1972.

Table III

Relative Frequencies of Shigella Serotypes
Reported, Fourth Quarter, 1971

Serotype	Number Reported	Calculated Number*	Calculated Percent*	Rank
A. *S. dysenteriae*				
unspecified	7			
1	3	4	.10	14
2	9	12	.30	11
3	4	5	.13	13
4	3	4	.10	14
9	1	1	.03	15
B. *S. flexneri*				
Unspecified	196			
1 unspecified	18			
1a	14	39	.98	7
1b	7	16	.40	10
2 unspecified	87			
2a	135	275	6.89	2
2b	27	55	1.38	6
3 unspecified	86			
3a	95	222	5.56	3
3b	7	16	.40	10
3c	10	23	.58	9
4 unspecified	8			
4a	47	72	1.80	5
4b	3	5	.13	13
5	23	30	.75	8
6	70	91	2.28	4
Variant Y	1	1	.03	15
C. *S. boydii*				
Unspecified	2			
1	1	1	.03	15
2	8	9	.23	12
4	1	1	.03	15
10	4	5	.13	13
D. *S. sonnei*	3,077	3,106	77.79	1
Unknown	40			
TOTAL	3,994	3,993		

*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, Fourth Quarter, 1971

State	flexneri (unspecified)	flexneri 1 (unspecified)	flexneri 2 (unspecified)	flexneri 2a	flexneri 2b	flexneri 3 (unspecified)	flexneri 3a	flexneri 3c	flexneri 4a	flexneri 5	flexneri 6	sonnei	Total
Alabama	0	0	0	0	0	0	0	0	0	0	0	4	4
Florida	0	1	0	0	0	0	0	0	0	0	13	1	15
Georgia	0	1	10	0	0	0	0	0	0	0	0	3	14
Illinois	0	0	0	12	3	0	28	0	0	1	6	3	53
Iowa	0	0	0	0	0	0	0	0	0	0	0	4	4
Kansas	0	0	0	0	0	0	0	0	12	0	0	101	113
Massachusetts	0	0	1	0	0	0	0	0	0	0	0	0	1
Michigan	0	0	0	0	0	1	0	0	0	0	0	0	1
Minnesota	0	0	0	1	0	0	0	1	0	0	0	0	2
Mississippi	1	0	0	0	0	0	0	0	0	0	0	0	1
New Jersey	1	0	0	0	1	11	5	0	0	0	0	1	19
New York	15	0	0	0	0	0	0	0	0	0	0	2	17
Oregon	0	0	0	0	0	0	0	0	0	0	0	7	7
Wisconsin	0	0	0	0	0	0	0	0	0	0	0	5	5
Total	17	2	11	13	4	12	33	1	12	1	19	131	256

Table V

Age and Sex Distribution of Individuals Infected
with Shigella in the United States, 1971

Age (Years)	Male	Female	Unknown	Total	Percent	Cumulative Percent	No. of Reported Isolations/ million pop.*
<1	249	234	8	491	5.7	5.7	140.9
1 - 4	1667	1588	4	3259	37.6	43.3	238.4
5 - 9	1049	946	4	1999	23.1	66.4	100.2
10 - 19	713	622		1335	15.4	81.8	33.5
20 - 29	284	558	1	843	9.7	91.5	28.2
30 - 39	146	201		347	4.0	95.5	15.4
40 - 49	63	88		151	1.7	97.2	6.3
50 - 59	40	53		93	1.1	98.3	4.4
60 - 69	29	43		72	.8	99.1	4.6
70 - 79	18	29		47	.5	99.6	5.1
>79	10	13		23	.3	99.9	6.1
Sub-Total	4268	4375	17	8660			
Child (unspec)	23	34	6	63			
Adult (unspec)	15	24	2	41			
Unknown	1981	1975	268	4224			
Total	6287	6408	293	12988			
Percent	49.5	50.5					

*Based on 1970 Census of Population, General Population Characteristics, United States Summary, Issued January 1972

Table VI

Relative Frequencies of Shigella Serotypes Reported, 1971

Serotype	Number Reported	Calculated Number	Calculated Percent	Rank
A. *S. Dysenteriae*				
Unspecified	14			
1	12	15	.12	13
2	28	35	.27	12
3	11	14	.11	14
4	10	12	.09	15
9	2	2	.02	20
B. *S. Flexneri*				
Unspecified	582			
1 Unspecified	59			
1A	52	118	.91	7
1B	24	54	.42	10
2 Unspecified	352			
2A	536	1046	8.05	2
2B	126	246	1.89	6
3 Unspecified	201			
3A	312	615	4.73	3
3B	36	71	.55	9
3C	20	39	.30	11
4 Unspecified	78			
4A	154	291	2.24	4
4B	8	15	.12	13
5	65	83	.64	8
6	217	276	2.12	5
Varient Y	2	3	.02	19
C. *S. Boydii*				
Unspecified	12			
1	5	6	.05	17
2	32	39	.30	11
4	7	9	.07	16
9	1	1	.01	21
10	10	12	.09	15
14	4	5	.04	18
D. *S. Sonnei*	9900	9989	76.86	1
Unknown	116			
TOTAL	12988	12996		

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The State Epidemiologists are the key to all disease surveillance activities. They are responsible for collecting, interpreting, and transmitting data and epidemiologic 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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