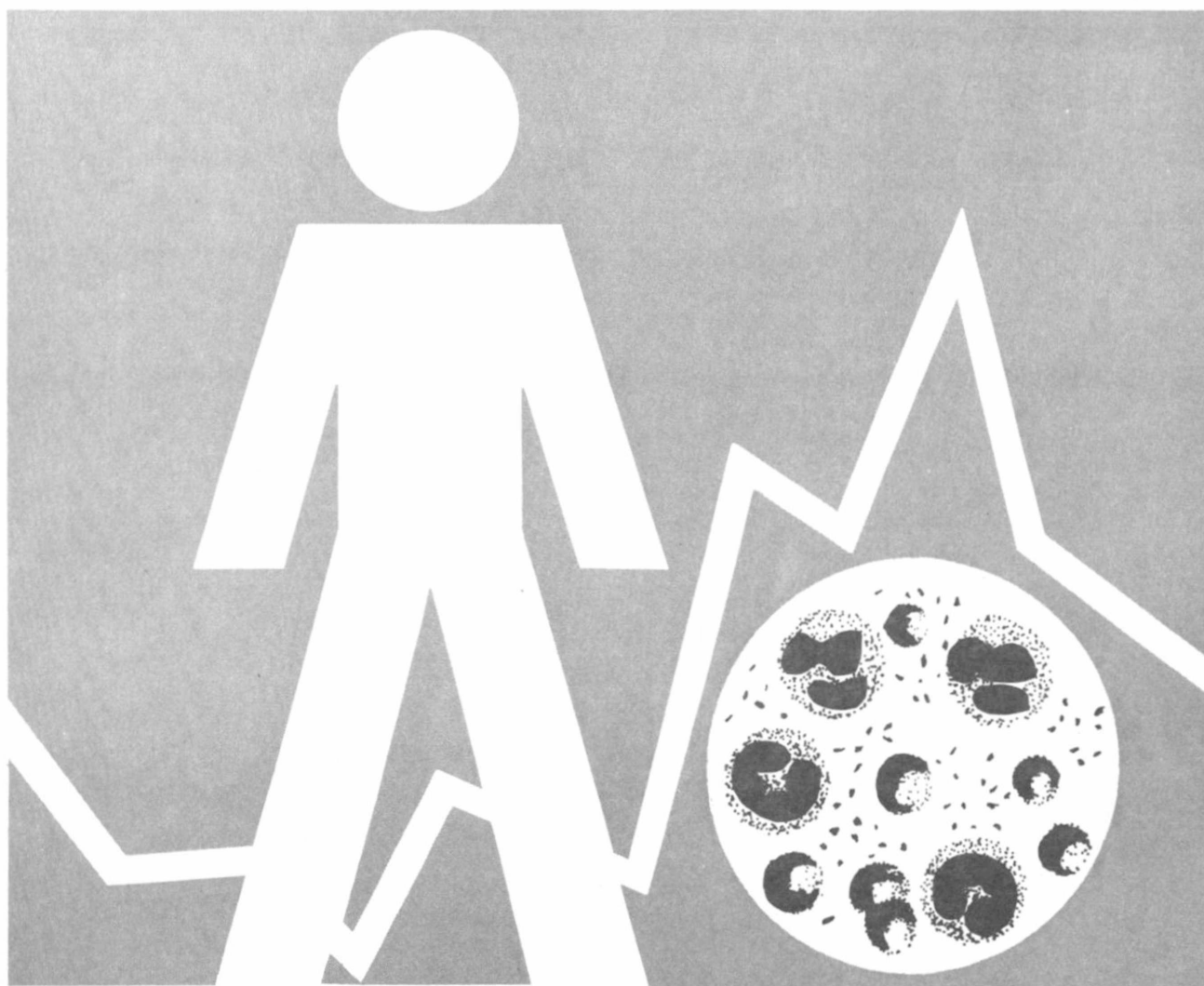


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SHIGELLA
surveillance

TABLE OF CONTENTS
for the
Third Quarter 1968

- I. Summary
- II. Reported Isolations
- III. Current Investigations
- IV. Reports from the States
- V. Current Trends and Developments



PREFACE

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

National Communicable Disease Center	Dr. David J. Sencer, Director
Epidemiology Program	Dr. Alexander D. Langmuir, Chief
Bacterial Diseases Section	Dr. Philip S. Brachman, Chief Dr. John V. Bennett, Deputy Chief
Enteric Diseases Unit	Dr. Eugene J. Gangarosa, Chief Dr. L. Barth Reller Dr. Joseph A. Donadio
Statistics Section	Mrs. Ida L. Sherman, Chief Mr. Arthur L. Michelson Mr. Theodore P. Feury, Jr.
Epidemiologic Services Laboratory Section	
Salmonella - Shigella Unit	Dr. George K. Morris, Chief

Collaborators

Laboratory Division	
Bacteriology Section	
Enteric Bacteriology Unit	Dr. William H. Ewing, Chief Dr. William J. Martin, Assistant Chief

TABLE OF CONTENTS

	Page
I. <u>Summary</u>	1
II. <u>Reported Isolations</u>	1
A. <u>Human</u>	1
1. General Incidence	1
2. Serotype Frequencies	1
3. Geographical Observations	2
B. <u>Nonhuman</u>	2
III. <u>Current Investigations</u>	2
Follow-up analysis of data from the National Survey of Shigellosis Experience in Mental Institutions	2
IV. <u>Reports from the States</u>	4
A. Shigellosis acquired outside of the United States	4
B. Isolation of shigella from unusual sites	5
C. Shigellosis outbreak originating at a campground	5
D. <u>Shigella sonnei</u> in Danbury, Connecticut	5
E. Shigellosis in a New Jersey garden apartment complex	6
F. Shigellosis in Norfolk, Virginia	6
V. <u>Current Trends and Developments</u>	7

I. Summary

In the third quarter of 1968, 2,612 isolations were reported from humans. This number represents an increase of 31.6 percent from the 1,919 isolations in the second quarter of 1968, and an increase of 6.1 percent from the 2,461 isolations in the third quarter of 1967 (Table I).

II. Reported Isolations

A. Human

1. General Incidence

During the second half of 1968, 67.9 percent of isolations were from children under 10 years of age (Table II); this is consistent with previous patterns. The highest attack rate was in the age group 1-4 years.

2. Serotype Frequencies

Fifty of the 54 reporting centers participating in the Shigella Surveillance Program reported isolations of shigella. Seventeen different serotypes were reported.

The six most frequently reported serotypes during the 6-month period were the following (from Table III):

<u>Rank</u>	<u>Serotype</u>	<u>Reported</u>	<u>Calculated Number*</u>	<u>Calculated Percent</u>	<u>Rank Last Half</u>
1	S. sonnei	1,336	1,349	51.59	1
2	S. flexneri 2a	163	487	18.62	2
3	S. flexneri 3a	102	298	11.40	3
4	S. flexneri 6	128	164	6.27	5
5	S. flexneri 4a	24	88	3.37	6
6	S. flexneri 2b	20	60	2.29	4
Subtotal		1,773	2,446	93.54	
Total (all serotypes)		2,612	2,615		
*from Table III					

Tables III and IV, calculated from data compiled during the third quarter of 1968 and from data compiled since the beginning of the Shigella Surveillance Program in October 1963, respectively, show the relative importance of the various serotypes. In these tables the isolations in each of the unspecified categories have been distributed in their subgroups in the same proportions as the completely specified isolations of that group. The resulting distributions in these tables are called the "calculated number," and from these are 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 now accounts for slightly over half of all isolations, and S. flexneri 2a and b combined for slightly less than a quarter.

3. Geographical Observations

In the Northern United States there are proportionately more reported cases of S. sonnei than S. flexneri, while the opposite is true in the rest of the United States (Figure 1).

Figure 4 portrays attack rates by states for July-September 1968, utilizing population estimates for July 1, 1968. The overall United States attack rate was 1.3 cases per 100,000 for the third quarter of 1968, as compared to 1.0 cases per 100,000 for the second quarter of 1968, and 1.2 cases per 100,000 for the third quarter of 1967.

B. Nonhuman

For the third quarter of 1968 no isolations from nonhuman sources were reported.

III. Current Investigations

Follow-up analysis of data from the National Survey of Shigellosis Experience in Mental Institutions.

Background: Late in 1967 a survey of shigellosis experience in mental institutions was begun in collaboration with State epidemiologists. A preliminary analysis of the survey was presented in the Shigella Surveillance Report No. 15, July-December 1967. The follow-up analysis is presented below.

Results: Questionnaires were sent to 245 institutions, public and private, listed in the 1965 edition of the Directory of Residential Facilities for the Mentally Retarded, published by the American Association on Mental Deficiency. Prior to the survey three facilities had ceased operating. Of the remaining 242 institutions, 146 replies were received for a response rate of 60.3 percent. Those facilities which responded accounted for 146,424 residents or 76.1 percent of an estimated aggregate population of 192,500.

All replies were first separated into two groups according to whether or not the institutions queried felt that shigellosis was enough of a problem in their respective facilities to warrant a mass vaccination effort, assuming an effective vaccine were available. Responses to all other questions were then compared for these groups (Table A).

TABLE A

Summary of Response of 146 Institutions
to National Shigellosis Survey 1967

Shigellosis is a problem warranting vaccination	Number institu- tions	Pop. Size	Shigella outbreaks in past 3 years		Shigella is a continuing problem		Shigellosis in 1967		Have lab. facilities to isolate shigella		Attack rate 1967 (%)
			Yes	No	Yes	No	Cases	Deaths	Yes	No	
Yes	29	45,246	23	6	20	9	1,734	4	18	11	3.83
No	<u>117</u>	<u>101,178</u>	<u>6</u>	<u>111</u>	<u>1</u>	<u>116</u>	<u>236</u>	<u>0</u>	<u>35</u>	<u>82</u>	<u>0.23</u>
Total	146	146,424	29	117	21	125	1,970	4	53	93	1.35

During 1967 a total of 1,052 isolates of shigella were reported from mental institutions on weekly reporting forms (Table V, Shigella Surveillance Reports No. 14 and No. 15, January-December 1967). In contrast, the national survey of shigellosis experience in mental institutions during 1967, presented here, which at best included 76.1 percent of those at risk, reported 1,384 isolations of shigella (Table B). Obviously, shigellosis is under reported through the state health department surveillance programs.

TABLE B
Reported Frequency of Shigella Serotypes
Isolated by Institutions Surveyed

	Shigellosis is a problem warranting vaccination					
	Yes	(%)	No	(%)	TOTAL	(%)
S. flexneri	941	71.3	11	17.2	952	68.8
S. flexneri or S. sonnei	257	19.5	34	53.1	291	21.0
S. sonnei	122	9.2	19	29.7	141	10.2
Total	1,320	100.0	64	100.0	1,384	100.0

Although not necessarily representative, pertinent observations can be made about institutional shigellosis from these survey data.

Among institutions where shigellosis was thought to be of such magnitude as to warrant mass vaccination, 79.3 percent had actual outbreaks between 1964 and 1967; the attack rate in 1967 was 3.83 percent. Sixty-nine percent of institutions indicated that shigellosis was a serious endemic or epidemic problem.

Laboratory competence to isolate shigella was present at 62.1 percent of institutions where shigellosis was thought to be a problem; such facilities were available at only 29.9 percent of institutions where shigellosis was not considered a problem warranting vaccination.

At those institutions where shigellosis was considered to be a serious problem, 1,320 isolations of shigella were obtained from 1,734 patients ill with dysentery, i.e., a 76.1 percent bacteriological confirmation rate was achieved. Of these isolations 71.3 percent were S. flexneri, 19.5 percent S. flexneri or S. sonnei, and 9.2 percent S. sonnei. S. flexneri 2a was the most commonly reported serotype. This data is of great relevance since the shigella vaccine development programs emphasize a streptomycin-dependent, non-propagating mutant strain of S. flexneri 2a and a hybrid-mutant strain of the same serotype.

Summary: Despite obvious under reporting, the data obtained showed shigellosis to be a problem of considerable magnitude in many mental institutions. The lack of adequate laboratory facilities to isolate shigella could explain why shigellosis is not considered a problem at some institutions. Surveillance of diarrheal disease based on laboratory confirmation is a prerequisite for the evaluation of efficacy of a shigella vaccine.

IV. Reports from the States

A. Shigellosis acquired outside of the United States.

1. Importation from Mexico: Reported by George H. Agate, M.D., State Epidemiologist, Michigan Department of Public Health, Lansing, Michigan.

A family of Mexican ancestry, presently residing in Michigan, spent the month of May 1968 in Mexico. Several days before returning to the United States they all developed diarrhea. Five of the eight family members had stool cultures positive for shigella. Three isolates of S. flexneri 1b and one each of S. flexneri 5 and 2a were made.

While in Mexico they visited in rural Mexican villages, where the family members drank unpasteurized milk, but they claimed to have boiled both milk and water before use. Three different serotypes in the same family would suggest contact with a grossly unsanitary environment.

After unspecified antibiotic therapy, three follow-up fecal specimens during the ensuing month were all negative for shigella. No secondary cases occurred outside the family.

2. Importation from Iran: Reported by D. S. Fleming, M.D., Director of Disease Prevention and Control, Minnesota State Department of Health, Minneapolis, Minnesota.

A 61-year-old Minnesota man developed acute diarrhea during his visit to Iran. He did not seek medical treatment until his return home to Minnesota. There, S. boydii 11 was isolated from a fecal specimen. He recovered without sequelae, and no secondary cases were detected. Details concerning treatment were not available.

3. Importation from Turkey: Reported by Lowell A. Glasgow, M.D., Associate Professor of Microbiology and Associate Director Clinical Microbiology Laboratories, School of Medicine and Dentistry; and John Flynn, M.D., Head, Student Health Service, University of Rochester, Rochester, New York.

In mid-August 1968, a 21-year-old university coed vacationing in Turkey spent 3 days on a small island in the Sea of Marmara. Sanitary facilities were primitive and squalor obvious. Flies were abundant. Six days after arrival she developed severe diarrhea, abdominal cramps, tenesmus, and fever. Within 2 days she had flown home to New York, where S. boydii was isolated from a fecal specimen.

Disk sensitivity studies showed the organism to be sensitive to tetracycline, and symptoms abated with complete recovery soon after treatment with this drug. Careful hygiene was observed within the family; no secondary cases occurred.

Editor's comment: These three reports emphasize the value of an awareness of unusual shigella serotypes as epidemiological markers in the United States. During 1967, no isolations of S. boydii 11 were made; in 1966 this serotype accounted for only 2 of 10,403 isolates reported. S. flexneri 1b comprised 0.8 percent and 0.5 percent of all shigella isolates in 1966 and 1967, respectively. Physicians and public health officials alike should be alert for further instances of the importation of such cases.

B. Isolation of shigella from unusual sites.

1. Texas: Reported by M. S. Dick Dickerson, M.D., Director, Division of Communicable Disease Control, and J. Justin Older, M.D., EIS Officer, Texas State Department of Health, Austin, Texas.

In July 1968, a culture of lung tissue obtained at postmortem examination of an infant grew S. flexneri 2a. The debilitated child died of pneumonitis after developing vomiting and severe bloody diarrhea. The illness was acquired after exposure to two siblings, ages 4 and 5 years, who were convalescing from moderately severe diarrhea caused by S. flexneri 2a. Person-to-person spread in this impoverished family was felt to be responsible for the transmission of shigella to the infant who subsequently died.

2. Illinois: Reported by Norman J. Rose, M.D., Chief, Bureau of Epidemiology, and M. Louise Brown, M.S., Chief, Bureau of Diagnostic Services, Division of Laboratories, Illinois Department of Public Health, Chicago, Illinois.

a. A throat culture obtained in a hospital emergency room from a small girl complaining of a sore throat grew S. flexneri 1a. No fecal specimens were cultured.

b. In July 1968, a 47-year-old chronic alcoholic was admitted to a Veterans Administration hospital because of 5 days of bloody diarrhea. Although stool cultures were reported as negative, S. flexneri 3a was grown from blood cultures. A liver biopsy revealed fatty degeneration without portal fibrosis. The man recovered after ampicillin treatment.

Editor's comment: These three uncommon sources of shigella isolations illustrate several features of shigellosis. The fecal-oral route of transmission is poignantly documented in the isolation of a fecal organism from the throat of a child and an infant with aspiration pneumonitis. Secondly, debilitated persons, particularly infants, are more apt to have serious illness.

- C. Shigellosis outbreak originating at a campground. Reported by Donald R. Peterson, M.D., Director, Division of Epidemiology and Communicable Disease Control, Seattle-King County Department of Public Health, Seattle, Washington.

An outbreak of shigellosis occurred in a neighborhood after a child, presumably the index case, returned home from camp with acute diarrhea. Fourteen persons in his and eight neighboring families became ill with diarrhea. S. flexneri 6 was isolated from fecal specimens. Symptoms responded to tetracycline and ampicillin therapy.

No common source could be implicated. Primitive sanitary facilities existed where he camped. Person-to-person transmission was felt to account for the intra- and inter-family spread once he returned to the low socioeconomic area of the city.

- D. Shigella sonnei in Danbury, Connecticut. Reported by James C. Hart, M.D., Director, Division of Preventable Diseases, and Barbara Christine, M.D., Chief, Epidemiology Section, Division of Preventable Diseases, Connecticut State Department of Health, Hartford, Connecticut.

Between June 4 and August 21, 1968, 11 isolates of S. sonnei were reported to state officials from Danbury; this was a marked increase over the previous summer. As a result, an intensive investigation was undertaken in which 31 known and probable cases of shigellosis were uncovered. Symptoms consisted of diarrhea,

fever, abdominal cramps, and occasionally vomiting. Six patients required hospitalization. Details of treatment were not known.

Analysis of the age distribution showed the majority of cases were in the 0-4-year age group. All adult cases were relatives of children who became ill in their respective households. A careful survey of food, milk, and water sources failed to incriminate a common vehicle. The pattern of intra-family spread substantiated the impression that person-to-person transmission probably accounted for this outbreak.

- E. Shigellosis in a New Jersey garden apartment complex. Reported by Ronald Altman, M.D., State Epidemiologist; Howard Rosenfeld, V.M.D.; Richard N. Edelson, M.D., EIS Officer; and Charles M. Janeway, M.D., EIS Officer, New Jersey State Department of Health, Trenton, New Jersey.

In July 1968, the report of an infant with bloody diarrhea precipitated an investigation which disclosed an outbreak consisting of 86 cases of diarrhea from whom 15 isolates of S. sonnei were cultured. Two additional isolates of S. sonnei were obtained from asymptomatic persons.

The outbreak occurred in a northern New Jersey garden apartment complex. An estimated 1,687 people lived in the complex including 213 children less than 5 years of age and 135 who were 5-18 years old. The highest age-specific attack rates were for those 1-4 years of age. Diarrhea, at times, bloody, was uniformly present in all those ill. Many had marked abdominal cramps, fever, and less frequently, nausea and vomiting.

Despite a meticulous household survey and cultures of food, water, and swimming pools, a common source could not be found. The epidemic curve showed the cases to be evenly distributed throughout the month of July, suggesting person-to-person spread. There was ample opportunity for fecal-oral contact among the young children as they played together in wading pools, sand boxes, and other play areas. In 36 percent of the families with the illness, the first person ill was a child under 5 years of age.

Group play by the small children was discouraged until the outbreak abated. Scrupulous personal hygiene was stressed. Those with positive cultures were treated with appropriate antibiotic therapy.

In summary, 86 cases of diarrhea occurred in a garden apartment complex. Altogether 17 isolates of S. sonnei were obtained. The mode of spread was thought to be person-to-person, although the source of the index patient's infection was not discovered. Control measures appeared to halt the epidemic.

- F. Shigellosis in Norfolk, Virginia. Reported by Paul C. White, Jr., M.D., Director, Bureau of Epidemiology, and Richard Rothenberg, M.D., EIS Officer, Virginia State Department of Health, Richmond, Virginia.

During late August and early September, 12 persons living in a city housing project for low income families had cultures positive for S. sonnei. Among the 489 individuals surveyed in the project, an additional 78 persons also had fever, headache, malaise, and diarrhea of at least 3 days duration. Thus, an estimated probable attack rate for shigellosis of 18.4 percent was obtained. Preschool children had the highest attack rates. A total of 25 families were affected; the index case was usually a preschool child.

The proximity of known cases to dump sites for sewage from a large excavation plot initially raised the possibility of a common source. However, after a thorough epidemiologic investigation, person-to-person spread was considered to

be the mode of transmission under conditions of crowding and poverty. Control measures included cultures of household contacts, treatment of those ill with shigellosis, and increased emphasis on personal hygiene.

V. Current Trends and Developments

Comparison of orally absorbable and nonabsorbable antibiotics in shigellosis. Kenneth C. Haltalin, M.D., John D. Nelson, M.D., Lulu V. Hinton, B.S., Helen T. Kusmiesz, R.N., and Mildred Sladoje, B.S., R.N., J. Pediat. 72:708-720, 1968.

Reported is a double-blind study comparing neomycin and ampicillin in the treatment of acute shigellosis in 30 hospitalized infants and children. Previous work had shown ampicillin to be superior to sulfadiazine or a placebo in hastening clinical improvement and culture reversion.¹ On the other hand, the nonabsorbable antibiotics, i.e., neomycin, kanamycin, and colistin had been shown to be most effective against shigellae in vitro with fewer than 1 percent of strains resistant to these drugs.²

The current study clearly demonstrated the superiority of ampicillin over neomycin in shortening the duration of diarrhea and fever and the excretion of shigella. The authors emphasize the efficacy of the absorbable drug over the nonabsorbable neomycin regardless of in vitro susceptibility testing.

Effect of treatment during the acute attack of gastrointestinal symptoms after shigellosis. Cornelius J. O'Connell, M.D., Marie L. Kunz, M.D., and Paul J. Hoffman, M.D. Current Therapeutic Research 9:468, 1967.

After partaking of S. flexneri contaminated food, 145 previously healthy college students acquired shigellosis of sufficient severity to require inpatient care. The patients and a control group of equal number were followed for gastrointestinal complaints for 3 to 8 months following the epidemic.

The incidence of gastrointestinal symptoms in patients receiving absorbable antibiotics, viz., ampicillin, chloramphenicol, or tetracycline was 8 percent, 9 percent, or 13 percent respectively, which did not differ significantly from the 9 percent incidence in the control group.

In contrast, symptomatic therapy only or treatment with sulfa drugs was followed by a 24 percent and 25 percent incidence of residual symptoms respectively. The apparent benefit of treatment with absorbable antibiotics as compared to treatment with sulfa drugs is significant at the $p < 0.05$ level ($\chi^2 = 4.35$).

Editor's comment: The Shigella Surveillance Report No. 13, October-December 1966, pp. 1-2, discussed the antibiotic treatment of shigellosis with an appropriate bibliography. Report No. 14, January-June 1967, pp. 5-7, similarly reviewed the carrier state in shigellosis and its treatment. The journal articles reviewed in this current report emphasize the importance of treating shigellosis with an antimicrobial agent which is absorbed by the gut. The choice of a specific agent from the group of acceptable absorbable antibiotics should, of course, be dictated by in vitro sensitivity tests.

1. Haltalin, K. C., Nelson, J. D., Ring, R., III., Sladoje, M., and Hinton, L. V.: Double-blind treatment study of shigellosis comparing ampicillin, sulfadiazine and placebo, J. Pediat. 70:970, 1967.
2. Haltalin, K. C., and Nelson, J. D.: In vitro susceptibility of shigellae to sodium sulfadiazine and to eight antibiotics, JAMA 193:705, 1965.

TABLE 1
SHIGELLA SEROTYPES ISOLATED FROM HUMANS
THIRD QUARTER 1968

SEROTYPE	NORTHEAST																								NORTHWEST										North Total					
	Conn	Del	DC	Ill	Ind	Iowa	Ky	Me	Md	Mass	Mich	Minn	Mo	NH	NJ	NY-A	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	
A. <u>S. dysenteriae</u> Unspecified																									0														0	
2				5																					5														0	5
3																									0													0	0	
4																									0	1												1	1	
9																									0													0	0	
Total	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	1	6	
B. <u>S. flexneri</u> Unspecified		4	3		14	5			4	1	1		23				19	81					10	10	175	2	5		2			1	10	11		1	1		33	208
1 Unspecified									4				1					1						3	9											5		5	14	
1A	1			5							1				1										8													2	10	
1B				1							2													3	7	6			1		1							13	16	
2 Unspecified									15		2							5	2						24					3							1	3	7	31
2A	1			24							7				3				2						37	2				9								20	57	
2B				6							1								2						7	3		2	1			6		1				4	11	
3 Unspecified									4	2		2						2	1						9											6	6	12	21	
3A				67																					71													0	71	
3B																									0													0	0	
3C	1										2														3													0	3	
4 Unspecified									1		1	6	1												9														1	10
4A				7							1				1										9	3		1											4	13
4B											3														3														0	3
5	1			1							1														3	1	1												2	5
6				8					9		2	3	3						1						26	12		1			9						1	20	42	68
Total	4	4	3	119	14	5	0	0	37	3	26	9	28	0	7	19	81	8	6	0	0	10	0	13	396	30	12	4	24	0	1	7	10	12	10	35	0	145	541	
C. <u>S. boydii</u> Unspecified																									0														0	0
2				3								1													4	1													1	5
5																									0														0	0
Total	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	1	5
D. <u>S. sonnei</u>	38	0	23	114	8	13	9	0	67	69	32	19	27	1	25	22	62	20	56	14	2	11	1	52	685	88	7	16	9	0	0	0	14	7	1	61	0	203	888	
Unknown			5			3																		9	17				1			1						2	19	
TOTAL	42	4	31	241	22	21	9	0	104	72	58	29	55	1	32	41	143	28	62	14	2	21	1	74	1,107	120	19	20	34	0	1	7	25	19	11	96	0	352	1,459	

TABLE 1 (CONTINUED)
SHIGELLA SEROTYPES ISOLATED FROM HUMANS
THIRD QUARTER 1968

SOUTHEAST										SOUTHWEST					South Total	OTHER					Total	Percent of Total	PREVIOUS QUARTER		SEROTYPE
Ala	Ark	Fla	Ga	La	Miss	NC	SC	Tenn	South-east Total	Ariz	NM	Okla	Tex	South-west Total		Alaska	Calif	Hawaii	Virgin Islands	Other Total			Total	Percent of Total	
									0		2			2					0	2	0.1	1	0.1	A. <u>S. dysenteriae</u> Unspecified	
		4							4 0 0				2 1 0	2 1 0	6 1 0				0 0 0	11 1 1	0.4 0.0 0.0	31 0 0	1.6 - -	2 3 4	
									0				1 1	1	1				0	1	0.0	0	-	9	
0	0	4	0	0	0	0	0	0	4	0	2	0	4	6	10	0	0	0	0	16	0.6	32	1.7	Total	
7		2			11	6	3	1	30		11		1	12	42	6			6	256	9.8	186	9.7	B. <u>S. flexneri</u> Unspecified	
	1 2	6	3	3 1				5	14 4 3		3		3 1	3 2	17 7 5	5	1		6 0 0	37 17 21	1.4 0.7 0.8	29 8 15	1.5 0.4 0.8	1 Unspecified 1A 1B	
3	11 2	40 2	44	9	2	54		20	171 16 5	9 1	42	7	56 3	42 72 4	213 88 9			18	0 18 0	244 163 20	9.3 6.2 0.8	177 123 40	9.2 6.4 2.1	2 Unspecified 2A 2B	
	1 1	9	49	4		1		24	84 5 0		31	1	2 26 3	34 26 3	118 31 3			1	1 0 0	140 102 3	5.4 3.9 0.1	108 68 1	5.6 3.5 0.1	3 Unspecified 3A 3B	
		4	4	1 2				3	1 11 2	1 2	32			0 33 7	1 44 9		2		0 0 2	4 54 24	0.2 2.1 0.9	6 28 33	0.3 1.5 1.7	3C 4 Unspecified 4A	
		6	6	1				1	0 0 14	2 2 3			1	2 2 38	2 2 52				0 0 8	5 7 128	0.2 0.3 4.9	2 3 62	0.1 0.2 3.2	4B 5 6	
10	18	69	106	26	13	61	3	54	360	21	144	9	109	283	643	21	1	19	0	41	1,225	46.9	889	46.3	Total
									0		1			1	1				0	1	0.0	4	0.2	C. <u>S. boydii</u> Unspecified	
		1							1 0				2 0	2 0	3 0				0 0	8 0	0.3 -	0 1	- 0.1	2 5	
0	0	1	0	0	0	0	0	0	1	0	1	0	2	3	4	0	0	0	0	9	0.3	5	0.3	Total	
3	3	119	62	31	3	16	3	12	252	18	36	10	123	187	439	5	0	4	0	9	1,336	51.1	972	50.7	D. <u>S. sonnei</u>
					3		3		6		1			1	7				0	26	1.0	21	1.1	Unknown	
13	21	193	168	57	19	77	9	66	623	39	184	19	238	480	1,103	26	1	23	0	50	2,612		1,919		TOTAL

Table II

Age and Sex Distribution of Individuals Infected with Shigellae
in the United States Third Quarter, 1968

<u>Age (Years)</u>	<u>Male</u>	<u>Female</u>	<u>Sex Unknown</u>	<u>Total</u>	<u>Percent</u>	<u>Cumulative Percent</u>	<u>Attack Rate/Million Population*</u>
< 1	90	60	1	151	8.2	8.2	42.6
1 - 4	369	342	3	714	38.8	47.0	45.6
5 - 9	177	205	2	384	20.9	67.9	18.4
10 - 19	105	116	1	222	12.1	80.0	5.9
20 - 29	65	108	4	177	9.6	89.6	6.7
30 - 39	27	44		71	3.9	93.5	3.2
40 - 49	12	26		38	2.1	95.6	1.6
50 - 59	8	16		24	1.3	96.9	1.2
60 - 69	10	24		34	1.8	98.7	2.3
70 - 79	2	17		19	1.0	99.7	2.1
80 +	3	3		6	.3	100.0	1.8
Subtotal	868	961	11	1,840			
Child (unspec)	5	3	1	9			
Adult (unspec)	6	7	1	14			
Unknown	324	313	112	749			
Total	1,203	1,284	125	2,612			
Percent of Total	48.4	51.6					

* Based on provisional data from Population Estimates, Series P25, No. 380, November 24, 1967.

Table III

Relative Frequencies of *Shigella* Serotypes
Reported Third Quarter, 1968

Serotype	Number Reported	Calculated Number*	Calculated Percent	Rank
A. <u>S. dysenteriae</u>				
2	11	13	0.50	10
3	1	1	0.04	13
4	1	1	0.04	13
9	1	1	0.04	13
unspecified	2			
B. <u>S. flexneri</u>				
1a	17	43	1.64	8
1b	21	53	2.03	7
1 unspecified	37			
2a	163	487	18.62	2
2b	20	60	2.29	6
2 unspecified	244			
3a	102	298	11.40	3
3b	3	9	0.34	12
3c	4	12	0.46	11
3 unspecified	140			
4a	24	88	3.37	5
4b	5	18	.69	9
4 unspecified	54			
5	7	9	0.34	12
6	128	164	6.27	4
unspecified	256			
C. <u>S. boydii</u>				
2	8	9	0.34	12
unspecified	1			
D. <u>S. sonnei</u>	1,336	1,349	51.59	1
Unknown	26			
Total	2,612	2,615		

* Calculated Number is derived by distributing the unspecified isolations in each group to their subgroups in the same proportions as the distribution of the specified isolations of that group.

Table IV

Relative Frequencies of Shigella Serotypes
Cumulated from October 1963 to Present

Serotype	Number Reported	Calculated Number*	Calculated Percent	Rank
A. <u>S. dysenteriae</u>				
1	7	9	0.02	21
2	183	236	0.55	12
3	34	44	0.10	15
4	1	1	0.00	31
6	1	1	0.00	31
9	4	5	0.06	23
unspecified	64			
B. <u>S. flexneri</u>				
1a	368	708	1.64	8
1b	307	714	1.65	7
1 unspecified	503			
2a	4,316	9,830	22.75	2
2b	751	1,711	3.96	6
2 unspecified	4,495			
3a	1,044	4,383	10.14	3
3b	76	319	.74	10
3c	83	348	.81	9
3 unspecified	2,981			
4a	1,073	2,425	5.61	5
4b	51	115	.27	14
4 unspecified	980			
5	187	226	.52	13
6	2,145	2,589	5.99	4
variant x	1	1	0.00	31
variant y	17	21	0.05	17
unspecified	3,826			
C. <u>S. boydii</u>				
1	10	15	0.03	19
2	162	248	0.57	11
3	1	2	0.00	27
4	29	44	0.10	15
5	7	11	0.03	20
6	2	3	0.01	25
7	3	5	0.01	23
8	1	2	0.00	27
9	2	3	0.01	25
10	11	17	0.04	18
11	1	2	0.00	27
12	1	2	0.00	27
14	4	6	0.01	22
unspecified	121			
D. <u>S. sonnei</u>	19,018	19,169	44.36	1
unknown	341			
TOTAL	43,212	43,214		

* see footnote Table III

Table V

Sources of Reported Isolations of Shigella
by Residence at Time of Onset

<u>Source</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>Total</u>	<u>Percent of Subtotal</u>	<u>Percent of Total</u>
Mental Institutions	96	35	100	231	21	
Indian Reservations	9	4	24	37	3	
Other Residences	273	303	268	851	76	
Subtotal	378	342	392	1,119	0	42.8
Residences Unknown	543	440	509	1,493	0	57.2
Total	921	782	901	2,612	0	

Table VI

Shigella Serotypes from Mental Institutions
 Number of Isolations by State
 Third Quarter 1968

State	dysenteriae 2	flexneri unspecified	flexneri 1 unspecified	flexneri 2 unspecified	flexneri 2a	flexneri 2b	flexneri 3 unspecified	flexneri 3a	flexneri 3c	flexneri 4 unspecified	flexneri 5	flexneri 6	sonnei	TOTAL
Del		2												2
Fla	3											2	36	41
Ill	5				13	4	19				1		1	43
Md		3	3	2								2	1	11
Mass													1	1
Mich								2	2				8	12
Minn										4				4
Miss		2												2
NY		68											2	70
NC		1		39										40
Okla													2	2
Oreg													1	1
Tenn							2							2
Total	8	76	3	41	13	4	2	21	2	4	1	4	52	231

Figure 1

PERCENTAGE *S. flexneri* AND *S. sonnei* OF TOTAL SHIGELLA ISOLATIONS REPORTED FROM INDICATED REGIONS

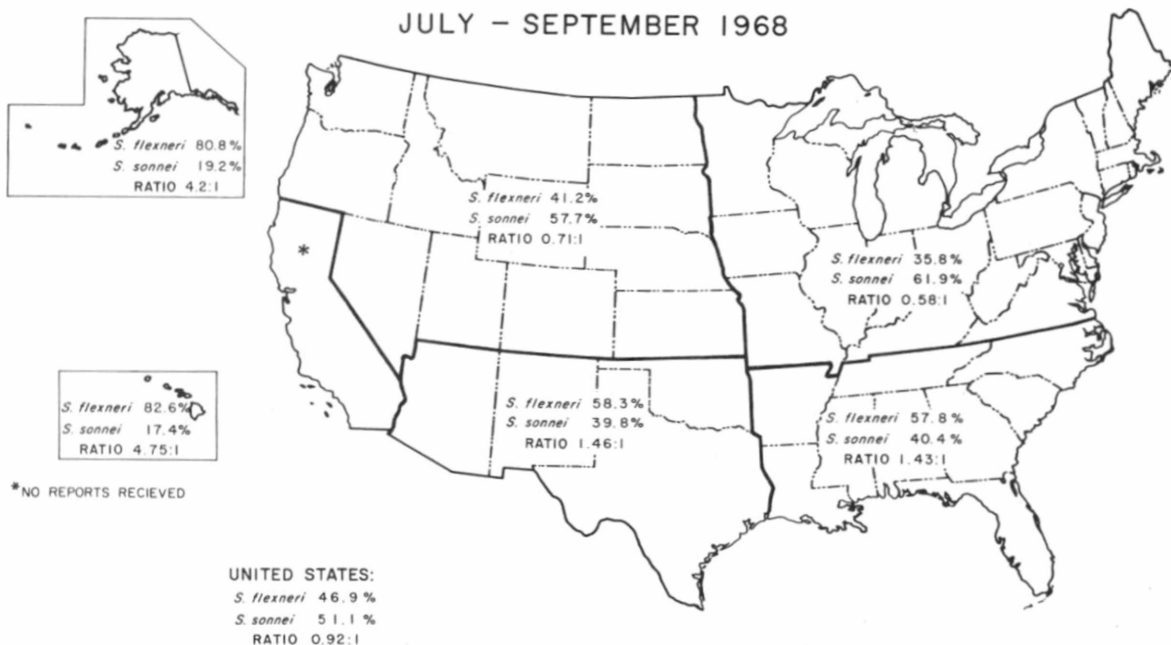
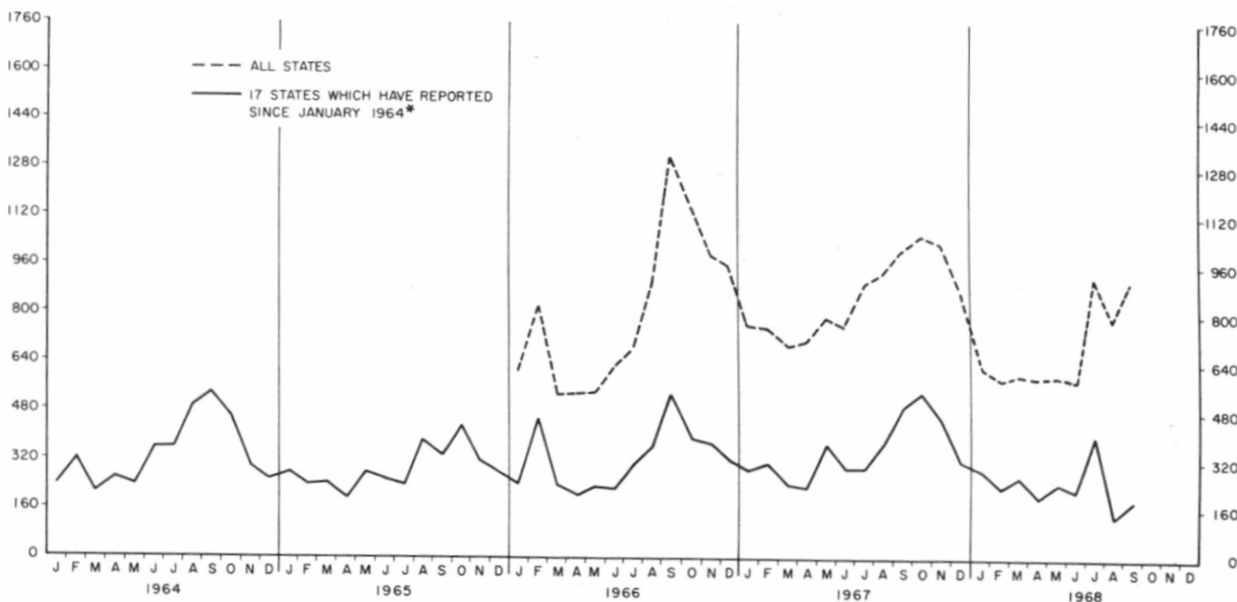


Figure 2

REPORTED ISOLATIONS OF SHIGELLA IN THE UNITED STATES



*ALASKA, ARIZONA, HAWAII, ILLINOIS, KANSAS, MARYLAND, NEW JERSEY, NEW MEXICO, NORTH CAROLINA, NORTH DAKOTA, OHIO, OKLAHOMA, OREGON, SOUTH DAKOTA, TENNESSEE, TEXAS AND VERMONT.

**ADJUSTED TO FOUR-WEEK MONTHS.

Figure 3

SEASONAL DISTRIBUTION OF SHIGELLA ISOLATIONS
BY SEROTYPE AND REGION
15 STATES WHICH HAVE REPORTED SINCE JANUARY 1964

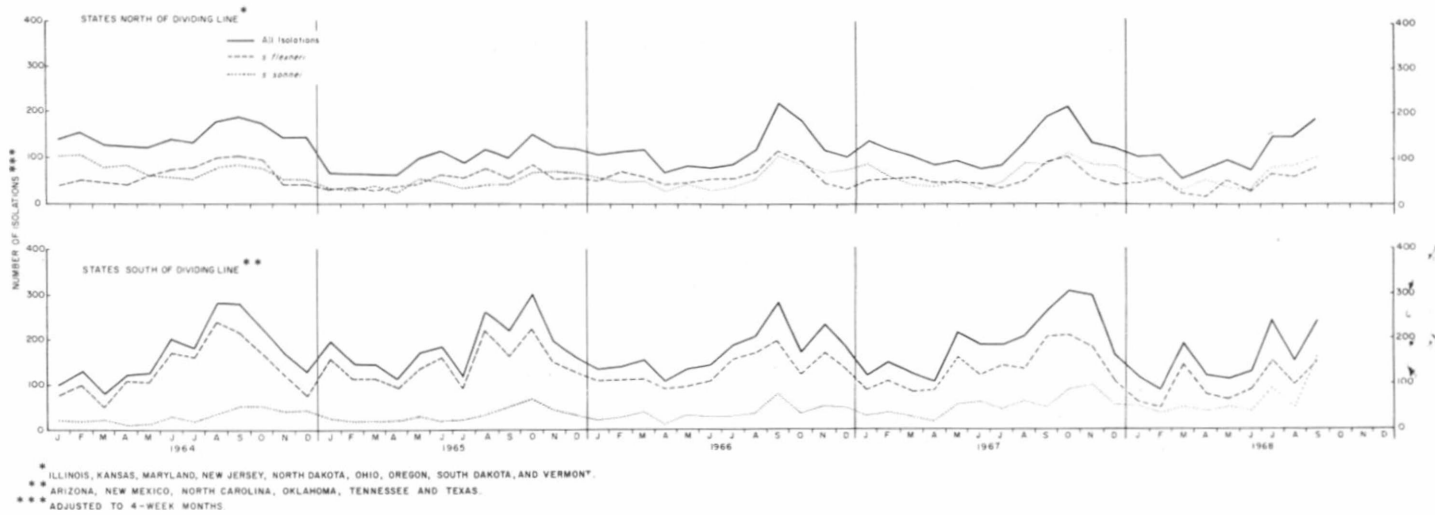
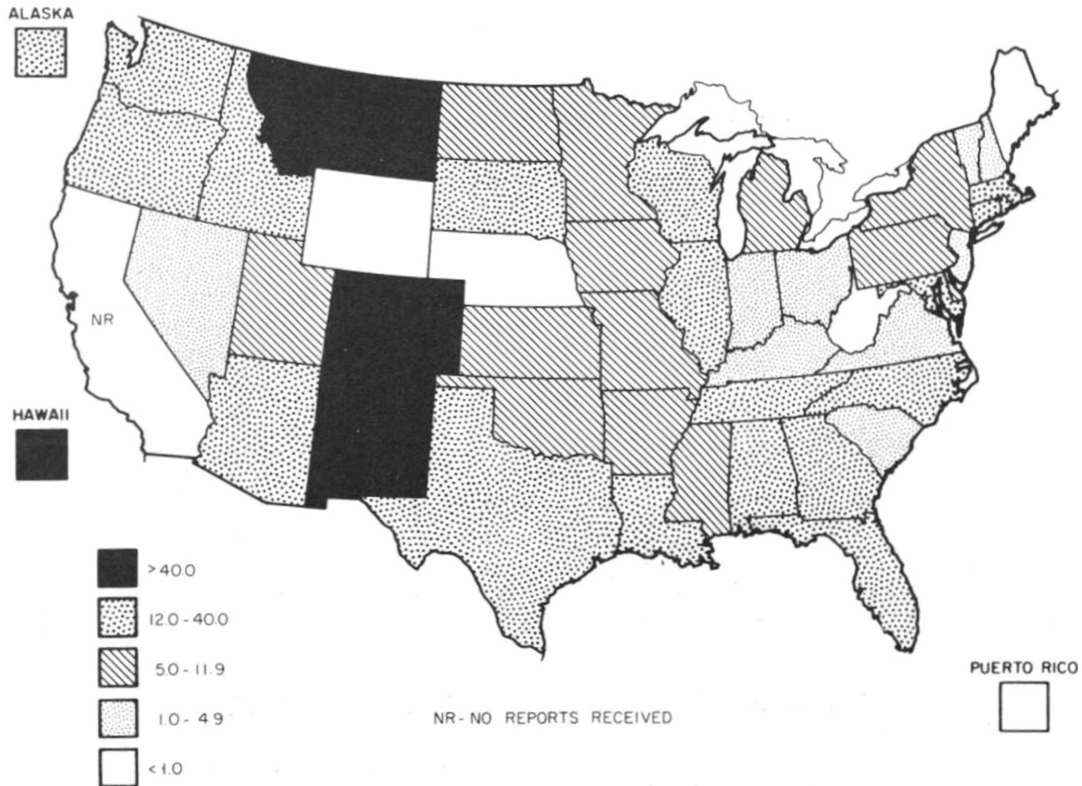


Figure 4 ATTACK RATES OF SHIGELLOSIS BY STATE
JULY - SEPTEMBER 1968



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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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Arizona
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California
Colorado
Connecticut
Delaware
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Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
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New York State
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