NATIONAL
COMMUNICABLE DISEASE CENTER

SALMONELLA

SURVEILLANCE

CONTENTS. . .

Annual Summary 1968

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE / PUBLIC HEALTH SERVICE
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I. INTRODUCTION

This report summarizes the results of the sixth year (December 30, 1967 - January 6, 1969) of the Salmonella Surveillance Program established jointly by the National Communicable Disease Center (NCDC) and the Association of State and Territorial Epidemiologists and Laboratory Directors. The bulwark of the program is the weekly reporting of isolations of salmonellae submitted by the 50 states, New York City, the District of Columbia, the Salmonella Reference Center-Beth Israel Hospital (New York City), the U.S. Department of Agriculture, National Animal Disease Laboratory (USDA), and the U.S. Food and Drug Administration.

II. MATERIALS AND METHODS

The data analyzed are collected by the Salmonellosis Unit and represent laboratory identifications of salmonellae, without distinction as to whether the isolate came from a clinical case or a carrier. Clinical cases of salmonellosis not confirmed by culture are excluded.

Interpretations are limited by the bias inherent in the data analyzed. For example, geographical prevalence and age of patients may reflect "interest factors." In addition, such factors as the seriousness of the disease and a lack of adequate laboratory facilities in some areas are an influence on the results presented.

Despite these limitations, certain observations are justified, and the data herein provide the basis for comparison with past and future results.

III. SUMMARY

In 1968, 19,740 isolations of salmonellae from humans were reported, representing a 0.1 percent increase from the 19,723 reported for 1967 and a 1.5 percent decrease from the 20,040 reported in 1966. *Salmonella typhi-murium* and *S. typhi-murium var. copenhagen*, as in previous years, were the most common serotypes, accounting for 27.7 percent of all isolations.

A total of 8,877 recoveries of salmonellae from nonhuman sources were reported during 1968, an increase of 0.9 percent over 1967 and 15.2 percent over 1966.

IV. REPORTS FROM THE STATES

A. HUMAN

Incidence

Since the first full year of operation of the present salmonella surveillance system (1963), the incidence of reported isolations of salmonellae has remained essentially constant (Figure 1).

The seasonal distribution of salmonella isolations from humans from 1963 through 1968 shows a consistent seasonal pattern, with the greatest number of isolations being reported from July through October for each year and the lowest number from January through April (Figure 2).

Serotype Frequency

A total of 154 different salmonella serotypes were reported in 1968, compared with 155 in 1967 (Tables I and II). This number (154) represents approximately 12 percent of the more than 1,200 known salmonella serotypes.

The 10 most frequently reported serotypes appear in the table below. These 10 serotypes accounted for 14,152 (71.7 percent) of the 19,740 isolates reported in 1968. The frequency of isolation of S. enteritidis showed the greatest increase with a rise of 36 percent over 1967. S. javiana was the only new serotype to appear on the list. This table also demonstrates the close correlation between human and nonhuman sources of salmonellae, with five serotypes appearing on both lists. The similarities demonstrate the importance of the nonhuman reservoirs of salmonellae in the epidemiology of human salmonellosis.

The Ten Most Frequently Isolated Serotypes From Human and Nonhuman Sources - 1968

	HUMAN				NONHUMAN		
	Serotype	Number	Percent	Rank Last Year	Serotype	Number	Percent
1	typhi-murium*	5,463	27.7	1	typhi-murium*	1,357	15.3
2	enteritidis	1,740	8.8	3	heidelberg	691	7.8
3	heidelberg	1,326	6.7	2	anatum	487	5.5
4	newport	1,248	6.3	4	montevideo	448	5.0
5	saint-paul	1,143	5.8	6	infantis	421	4.7
6	infantis	945	4.8	5	saint-paul	392	4.4
7	thompson	673	3.4	9	senftenberg	311	3.5
8	typhi	609	3.1	7	thompson	301	3.4
9	javiana	518	2.6	>10	derby	295	3.3
10	blockley	487	2.5	8	cubana	269	3.0
	Total	14,152	71.7		Total	4,972	56.0
	TOTAL (all serotypes)	19,740			TOTAL (all serotypes)	8,877	
	*Includes var. copenhagen	316	1.6		*Includes var. copenhagen	295	3.3

Geographic Patterns

The geographic distribution of salmonella isolations in 1968 showed New York reporting the largest number, 1963. Other states reporting over 1,000 isolations were California, Illinois, Florida, Massachusetts, Pennsylvania and Texas (Figure 3).

The incidence of salmonella infection for the entire country was 9.9 per 100,000 population. As in past years, Hawaii reported the highest incidence, with 75.9 isolations per 100,000. Other areas reporting incidence rates higher than 20 per 100,000 were District of Columbia, New Mexico, and Massachusetts.

Geographic variations among specific serotypes are seen in Tables I and II. Several serotypes continued to exhibit definite regional patterns. For example, Hawaii, which accounted for only 3.0 percent of the national salmonella isolations, reported 95 percent (74 of 78) of all isolations of S. weltevreden. Salmonella javiana again was isolated primarily in the central and southern states, and three states, Texas, Louisiana, and Florida, accounted for 54 percent of the 518 total isolations. All 10 S. atlanta isolations were made in Georgia and all 20 S. saphra isolations were made in Texas. Appropriately, 73 of 118 (62 percent) of all S. miami isolations were reported from Florida. These geographic patterns have been remarkably consistent from year to year.

Outbreaks

In 1968, 25 outbreaks involving 1,105 individuals were reported in the Salmonella Surveillance Reports (see table on page 4). Of 13 foodborne outbreaks, 11 were traced to a specific contaminated food, including five caused by turkey, three by eggs, two by pork, and one by beef. In two foodborne outbreaks, the specific food could not be identified. Seven outbreaks involving 27 individuals were traced to household pets. Although it could not be firmly established in all instances that the pets caused the human illness and not vice versa, the circumstances of these outbreaks favor the former explanation.

Four outbreaks involving 65 individuals occurred in hospitals or nursing homes. Person-to-person contact was thought to be the primary mode of spread in all.

Although the etiology of all outbreaks was confirmed bacteriologically, many of the 1,105 ill individuals were never cultured and are not included as reported isolations for the national surveillance data. Thus only a very small fraction of the total of 19,740 isolations of salmonellae in 1968 were from reported outbreaks. This suggests that many outbreaks are never investigated.

Age and Sex Distribution

Of the 13,991 individuals reported by age in 1968, 9,405 (67.2 percent) were less than 20 years of age. This is almost the same proportion as in 1967. The number of isolations per 100,000 population in various age groups in 1968 closely approximates those for the years 1963 through 1967. However, the rates in the age group less than 10 appear to be increasing over the past 5 years. This is particularly true in the less-than-1-year age groups where the rates per 100,000 have been 43, 53, 63, 69, 74, and 84, respectively, for the years 1963 through 1968 (Figure 4 and Table IV).

Salmonella Outbreaks Reported in the Salmonella Surveillance Reports, 1968

Vehicle of Infection	Number Persons Ill	Location	Serotype
Turkey	39	Banquet	S. saint-paul
	48	Restaurant	S. bredeney
	98	Church supper	S. saint-paul
	17	Home	S. enteritidis
	34	Restaurant	S. reading
Eggs	10	Home	S. thompson
	17	Home	S. typhi-murium
	13	Home	S. enteritidis
Pork	37	Banquet	S. infantis
	4	Home	S. typhi-murium
Beef	~400	College dining hall	S. derby
Foodborne, vehicle undetermined	245	Industrial cafeteria	S. typhi-murium and S. typhi-murium var. copenhagen
	25	Restaurant	S. orion
Pets			
Easter chicks	13	Home	S. typhi-murium
Dog	5	Home	S. typhi-murium, S. san-diego, & S. infantis
	1	Home	S. typhi-murium
	1	Home	S. typhi-murium
Turtle	1	Home	S. typhi-murium
	3	Home	S. typhi-murium
Kitten	3	Home	S. typhi-murium
Human Carrier	26	Church camp	S. typhi
Contact-spread	16	Hospital-pediatric ward	S. typhi-murium and S. typhi-murium var. copenhagen
	18	Hospital-pediatric ward	S. newport
	23	Hospital-pediatric ward	S. indiana
	8	Nursing home	S. infantis

TOTALS: Outbreaks 25
Cases 1,105

Of the 19,024 individuals for whom sex was reported during 1968, 9,629 (50.6 percent) were males, and 9,395 (49.4 percent) were females (Table IV). Although there was no overall sex predilection, it is interesting to note that for the age groups under 20 years there was a significant preponderance of males and the opposite was true for age groups over 20 years. The same distribution has been seen for the past 5 years and has been noted with certain other bacterial enteric diseases. It is thought to be related to an inherent increased susceptibility of males, especially in infancy, and a higher degree of exposure of adult females because of their more intimate contact with sick children. This age-sex distribution for 1968 is presented in the following table.

	Male		Female		
Age (Years)	Number	Percent	Number	Percent	Total
Less than 20	5,162	55.3	4,166	44.7	9,328
20 and over	1,876	41.0	2,699	59.0	4,575
TOTAL	7,038	50.6	6,865	49.4	13,903

(Unknown and unspecified ages not included)

Mortality

An accurate assessment of the number of deaths related to salmonella infections is not possible. Reporting officials are not always provided information concerning the clinical status of the individual from whom an isolation has been made. Also, since fatal cases of salmonellosis often occur in patients with severe underlying illness, it can be difficult to assess the role of salmonella infection in the final outcome. Finally, cases in which isolates are reported prior to death would not be reported as fatalities. The best available measure of the case fatality ratio of clinical salmonellosis can be obtained by studying investigated outbreaks. In the 25 outbreaks reported in the Salmonella Surveillance Reports in 1968, three deaths occurred among 1,105 cases, representing a death to case ratio of 0.27 percent. In the years 1962-1967, 50 deaths occurred among 18,033 persons involved in 194 epidemics reported in the Salmonella Surveillance Reports giving a case fatality ratio of 0.28 percent.

Uncommon and Rare Serotypes

One hundred-fourteen serotypes are classified as uncommon or rare (Table II). Eighty serotypes, representing 52 percent of the 154 reported serotypes had five or less isolations each, accounting for only 145 (0.7 percent) of the 19,740 isolations reported during 1968.

Typhoid Fever - Cases and Carriers

Of 609 isolations of *S. typhi* reported in 1968, 109 were from cases of typhoid fever and 151 from asymptomatic carriers; for the remaining 349, the clinical classification was not reported. The sex distribution of typhoid cases showed no significant sex predilection (F:M = 1.1:1); however, for carriers, females predominated (F:M = 2.8:1). Most cases occurred in the younger age groups, with 70.7 percent of cases occurring in persons less than 30 years of age. In contrast, most carriers were in the older age groups, with 88.5 percent 50 years of age or older.

B. NONHUMAN

In 1968, 8,877 salmonella isolations from nonhuman sources were reported (Tables V, VI, VII, and VIII). This represents a 0.9 percent increase over the 8,794 isolations reported in 1967. The number of nonhuman isolations has increased each year since 1963, but this probably reflects increasing surveillance. The sources of these isolations are given in Figure 5 and Tables VI, VII, and VIII. The number and percent of isolations by source demonstrate the importance of poultry and poultry products as vehicles of salmonellosis. Turkey, chicken, eggs and egg products, which together were responsible for 32 percent of the foodborne outbreaks reported in 1968, accounted for 33.1 percent of all nonhuman isolations. Swine and cattle accounted for 14.1 percent of all nonhuman recoveries, and dried milk and other human food for 13.7 percent.

Isolations from animal feedstuffs accounted for 23.1 percent of nonhuman isolations during 1968. This represents a sizeable increase over 1967 and reflects increased interest in the surveillance of animal feeds.

The 10 most common salmonella serotypes isolated from nonhuman sources during 1968 are listed in the table on page 2. These 10 serotypes accounted for 56.0 percent of all nonhuman isolates.

Sources (Table VI)

Domestic Fowl and Their Products

In 1968, there were 2,657 isolations (29.9 percent of nonhuman isolations) from domestic fowl and 284 isolations (3.2 percent) from eggs and egg products. As in 1967, S. heidelberg was the most common serotype isolated from chickens, with 361 isolations (21.3 percent of the isolations from that source), and was followed by S. typhi-murium including var. copenhagen with 277 (16.3 percent), S. thompson with 182 (10.7 percent), S. infantis with 136 (8.0 percent), and S. blockley with 135 (8.0 percent).

The five most common serotypes isolated from turkeys were S. heidelberg with 175 isolations (18.2 percent), S. saint-paul with 152 (15.8 percent), S. typhi-murium including var. copenhagen with 130 (13.5 percent), S. anatum with 51 (5.3 percent), and S. san-diego with 40 (4.2 percent).

The five most common serotypes isolated from eggs and egg products were S. thompson with 47 isolations (16.5 percent), S. typhi-murium including var. copenhagen with 44 (15.5 percent), S. montevideo with 23 (8.1 percent), S. infantis with 22 (7.7 percent), and S. tennessee and S. siegburg with 15 isolations each (5.3 percent).

Domestic Animals

In 1968, the five most common serotypes isolated from swine were S. cholerae-suis var. kunzendorf with 193 isolations (24.2 percent), S. typhi-murium including var. copenhagen with 123 (15.4 percent), S. derby with 98 (12.3 percent), S. infantis with 77 (9.6 percent) and S. newport with 39 (4.9 percent). In 1967, S. derby accounted for 26.8 percent of isolations from swine and S. cholerae-suis var. kunzendorf for only 7.7 percent.

The five most common serotypes isolated from cattle in 1968 were S. typhi-murium including var. copenhagen with 249 isolations (54.6 percent), S. dublin with 66 (14.5 percent), S. newport with 35 (7.7 percent), S. saint-paul with 22 (4.8 percent), and S. anatum and S. heidelberg with 10 each (2.2 percent). S. dublin, a host adapted serotype in cattle, accounted for only 4.3 percent of isolations from cattle in 1967.

Animal Feed and Feed Ingredients

In 1968, there were 2,055 salmonella isolations (23.1 percent of nonhuman isolations) reported from animal feed and feed ingredients as compared with 1,541 isolations (17.5 percent) during 1967. Of the 2,055 salmonella isolations, only six were obtained from vegetable protein supplements. The most common serotypes isolated from animal feeds were S. montevideo with 205 isolations (10.0 percent), S. eimsbuettel with 170 (8.3 percent), S. senftenberg with 163 (7.9 percent), S. anatum with 143 (7.0 percent), and S. livingstone with 112 (5.4 percent).

V. SPECIAL REPORTS

Summary of Salmonella Isolations from Humans, 1963-1968

During the 6-year period 1963-1968, 261 different salmonella serotypes have been recovered from humans. A list of these serotypes with the numbers of isolations per year is presented in Table IX.

A number of interesting patterns are apparent. S. typhi-murium isolations increased in frequency until 1965; since 1965, however, the frequency of isolations has gradually decreased (the frequency in 1968 was 27 percent below that of 1965). On the other hand, the frequency of isolations of S. enteritidis, S. thompson, and S. saint-paul have increased approximately 100 percent since 1963. Generally, these increases have been experienced in all sections of the country. No explanations for these changes in serotype frequency have been demonstrated.

The frequency of isolation of S. javiana has increased from a low of 168 in 1963 when recoveries were reported from 18 states to a high of 518 in 1968 when 33 states reported isolations. In 1963, Florida, Georgia, Louisiana, and Texas accounted for 82 percent of these isolations; in 1968, the same four states accounted for only 58 percent. Although a number of investigations into outbreaks due to S. javiana have been carried out in an attempt to discover the causes for these changes, no satisfactory explanations have been documented.

TABLE I. COMMON SALMONELLAE REPORTED FROM HUMAN SOURCES DURING 1968

SEROTYPE	GEOGRAPHIC DIVISION AND REPORTING CENTER																													
	NEW ENGLAND						MIDDLE ATLANTIC					EAST NORTH CENTRAL					WEST NORTH CENTRAL							SOUTH ATLANTIC							
	ME	NH	VT	MAS	RI	CON	NYA	NYB	NYC	NJ	PA	OHI	IND	ILL	MIC	WIS	MIN	IOW	MO	ND	SD	NEB	KAN	DEL	MD	DC	VA	WVA	NC	SC	GA	FLA
anatum				14			1	2	7	1	17	6	3	17	3	7	3		4				2		7		2		5		17	17
bareilly				6				6	5	3	11	4		3			4	1	2			1		29			3		1			1
blockley			1	19	1	13		8	24	10	36	22	7	47	29	12	5	1	13				10		7		7		10		18	21
braenderup				25		9	1	2	6		13	2	2	2	2		1		1				44						3		2	2
bredeney				5				2	5	3	71	7		7	5	2	5			1				1	4		1		1		1	3
chester						1			3	2	2			3	15	2			5						3		2		1			1
cholerae-suis kun										1	1			2	2				1						2		5		4		4	3
cubana				6		2		3	1	1	2	5	1	10	1	2			1						3		1				2	2
derby			1	19		2	4	15	22	33	20	6	2	45	11	5	4		4				2		25	2	4		19		13	14
enteritidis	13	2	7	263		31	12	63	110	68	164	83	33	193	64	39	39	11	18	22	2		10	2	80	17	39	1	35	2	76	24
give				1				1	1	2	4		2	3		3	5								2						3	1
heidelberg	5	1	1	64	8	11	7	33	75	41	121	56	37	134	59	15	21	4	15				10	9	67	15	25	2	48		53	39
indiana				1		1		2	2		4			8	1										8						54	
infantis	4			46	2	15	5	21	39	24	55	35	21	71	30	27	8	4	18	1			38	2	19	4	18		12		44	45
java				6	2	6			13	10	20	5	1	10		14	7		4				1		4		1		4		5	22
javiana				3	2	3			1	1	6	6	17	12	5	6	13		6	1	1		6		5				2		23	120
litchfield						4		1	4	2	3			14	4	2	1		1	1	1		1		5		4		4		4	18
livingstone				3		2			2		3	2				1							2								2	
manhattan				2			1	6	8	3	13	9		12	7	2	1		1		2			1	15		6		3		9	22
miami								1	2		3			1		1									9		1				10	73
mississippi																1											1				11	1
montevideo	2			22		2	1	6	14	2	13	10	2	16	8	5	9		1				2	1	8	4	9		4		10	23
muenchen	1			8		1		10	9	7	6	3		10	5	3	4		8			1	8	1	7		8	2	4		11	35
newington						1			1	1				3		3			2				1				6		2		4	4
newport				29	4	9	6	57	86	13	7	22	8	61	30	23	15	8	7				23	1	8	1	16	1	22		47	216
oranienburg	1			13	3	7		11	10	21	12	8	1	8	5	18	5	1	11				1		1		3		1		13	32
panama				8		3			12	3	14			8	8	10	1	2	3					1	4				1			
paratyphi B				34				6				11	2	2	9				1						6		2	1				3
reading	2			2	1	1			1	1	2													1						5		
saint-paul	1	1	2	46	3	16	1	36	46	39	100	68	11	99	87	34	21		6		2		11	3	48	5	39		24		32	85
san-diego				13		1		6	8	7	6		1	4	3	2							4			2			1		1	2
schwarzengrund				1				1		3	4		1	6			1		1				2				3				5	6
senftenberg				4		3		1	1	3	4			5	1	1	1								2		1		2		5	3
tennessee	1	1		6				1	2	2	5	6	1	7	3	5	2								2		4		1		3	6
thompson	1			45	2	14	3	24	33	23	42	27		60	30	14	6	1	14	1	1		15	6	29	4	40	4	22		44	22
typhi	6	1		18		9	14	5	14	9	12	33	11	19	4	3	3		32	1	2	2	6	2	23	6	3	1	24	4	19	36
typhimurium	13	4	14	332	15	92	13	231	368	179	283	129	79	359	169	161	74	49	98	5	10	1	115	15	158	30	109	13	123	7	186	214
typhimurium cop	2			60		47	1			31					54			2		1				1					3			
weltevreden														1			1														1	
worthington				1							2		1	3			1															
TOTAL	52	10	26	1125	43	306	70	561	935	549	1081	565	244	1265	654	423	261	84	278	34	21	5	314	76	561	90	363	25	386	13	737	1116
ALL OTHER*	1	63	–	36	15	12	359	15	23	16	27	14	11	56	36	44	5	22	17	14	1	11	5	2	5	146	22	–	15	12	40	80
TOTAL	53	73	26	1161	58	318	429	576	958	565	1108	579	255	1321	690	467	266	106	295	48	22	16	319	78	566	236	385	25	401	25	777	1196

Note: NYA – New York, Albany; NYB – Beth Israel Hospital; NYC – New York City.

*See Table II.

TABLE I – Continued

GEOGRAPHIC DIVISION AND REPORTING CENTER																					1968 TOTAL	% OF 1968 TOTAL	1967 TOTAL	% OF 1967 TOTAL	SEROTYPE
EAST S. CENTRAL				WEST S. CENTRAL				MOUNTAIN								PACIFIC									
KY	TEN	ALA	MIS	ARK	LA	OKL	TEX	MON	IDA	WYO	COL	NM	ARI	UTA	NEV	WAS	ORE	CAL	ALK	HAW					
2	1	6		1	14				1		1		4	1				21		22	209	1.1	297	1.5	*anatum*
1				1	3		4				1					1		4			95	0.5	81	0.4	*bareilly*
	4	4		1	20	6	16				4		4		2	2	9	90	2	2	487	2.5	519	2.6	*blockley*
					2		2				1					1		5		11	139	0.7	83	0.4	*braenderup*
	1	3	2	4	11	2	2		1					1	4		1	12		4	172	0.9	120	0.6	*bredeney*
5						1			1					1			2	8			58	0.3	100	0.5	*chester*
		2																2			29	0.1	20	0.1	*cholerae-suis kun*
	3	3			1		2											7			59	0.3	66	0.3	*cubana*
1	5		2	2	13		15			1	3	2	2	2		3	4	41		43	411	2.1	326	1.7	*derby*
4	17	9		3	19	5	11	8	5		9	1	1	5		10	11	48		51	1,740	8.8	1,277	6.5	*enteritidis*
1	1	1			17		2						1					6		8	65	0.3	61	0.3	*give*
9	29	24		6	56	4	34	2			7	2	13	19	2	9	8	113	1	12	1,326	6.7	1,648	8.4	*heidelberg*
1					1		1														84	0.4	49	0.2	*indiana*
21	21	8		4	29	9	20	3	6	1	15	2	6	4		9	1	86		92	945	4.8	980	5.0	*infantis*
	1	3		1	15				1			1					3	38	1		199	1.0	309	1.6	*java*
	6	4		27	46	11	112				7	2	4			1	5	53		1	518	2.6	373	1.9	*javiana*
2	3	1			2	1	1											9			93	0.5	81	0.4	*litchfield*
						1	7				1	1	3		1			5		8	44	0.2	55	0.3	*livingstone*
2	4	4		1	11		7									6	1	27		14	200	1.0	284	1.4	*manhattan*
2	6			7														2			118	0.6	69	0.3	*miami*
	2	2			23		6											3			50	0.3	58	0.3	*mississippi*
	3	3		1	17	4	19				10	1	2	1				31		5	271	1.4	398	2.0	*montevideo*
	1	5		1	9	4	11	1					2	1		2	1	20		1	211	1.1	217	1.1	*muenchen*
		2			2												1	10		1	44	0.2	43	0.2	*newington*
5	12	12		32	86	13	171		1		8	9	13	1		4	2	123		36	1,248	6.3	1,263	6.4	*newport*
2	1	2		2	7	8	28	1			2	1	6		2	2	2	40	1	2	295	1.5	406	2.1	*oranienburg*
1	5	1		2	6	4	17				2		4			1	1	33		75	230	1.2	182	0.9	*panama*
		1					13	1	2		7					7	1	5			114	0.6	173	0.9	*paratyphi B*
		1				1	2	1					2			39	2	10			74	0.4	54	0.3	*reading*
1	28	9		5	18	1	27		2	1	11	4	1	7		36	15	85	1	25	1,143	5.8	907	4.6	*saint-paul*
					2						6		1	1		4	2	28		1	106	0.5	149	0.8	*san-diego*
					2	1			1					1		2	2	7		5	55	0.3	72	0.4	*schwarzengrund*
	3	1		2	5		3				1				2	4	1	3		3	65	0.3	58	0.3	*senftenberg*
	2	2			5	1	4					1				1	1	6		4	85	0.4	63	0.3	*tennessee*
4	11	17		4	17		16		4			6	1	1		3	5	56		1	673	3.4	508	2.6	*thompson*
21	17		1	24	36	14	29		2	2	4	9	5		1	4	12	95	11		609	3.1	690	3.5	*typhi*
16	52	45	4	32	145	62	243	9	10	1	65	19	15	24		87	22	569	7	72	5,147	26.1	5,530	28.0	*typhimurium*
	9		1	9	39		1	1	12			9	9		5	1	18				316	1.6	273	1.4	*typhimurium cop*
																		1		74	78	0.4	61	0.3	*weltevreden*
					2		1				2		3					3		3	22	0.1	24	0.1	*worthington*
101	248	175	10	172	681	153	827	27	49	6	167	70	102	70	19	239	133	1705	24	576	17,827	90.3	17,927	90.9	TOTAL
2	15	13	42	43	55	11	235	9	2	1	15	185	13	2	8	13	16	90	2	16	1,913		1,796		ALL OTHER*
103	263	188	52	215	736	164	1062	36	51	7	182	255	115	72	27	252	149	1795	26	592	19,740		19,723		TOTAL

TABLE II. OTHER SALMONELLAE REPORTED FROM HUMAN SOURCES DURING 1968

SEROTYPE	REPORTING CENTER																									
	ALA	ALK	ARI	ARK	CAL	COL	CON	DEL	DC	FLA	GA	HAW	IDA	ILL	IND	IOW	KAN	KY	LA	ME	MD	MAS	MIC	MIN	MIS	MO	MON
aberdeen														1													
accra																											
adelaide														1													
agona																			1								
ahuza														1													
alabama															1												
alachua					10									3									1				
albany	1						1							6					4								
amager														1													
amersfoort																											
arechavaleta																											
atlanta											10																
berlin																											
bern											1																
berta	1	1	3		2					5			1														1
binza					1							1															
blegdam						1																					
bovis-morbificans										1									1								
bradford						1										1											
brandenburg														1		1			1								
california	2				2						4			2					1				8				
carrau										2																	
cerro										2		4		2	1												
cholerae-suis	1		1		1				2						1												
coeln																											
coleypark					1																						
concord																											
daytona																			1								
decatur																						1					
drypool											1			1					4								
dublin					6							1										2	1				
duesseldorf			1							1																	
durban														1									1				
eastbourne																						1					
elmabuettel																			3								
essen				1												1											
fayed																											
florida										1																	
fresno														2													
gallinarum																											
gaminara			2		2					2									10								
gatow																											
gatuni											1																
georgia																	1										
glostrup							1																				
good														1													
grumpensis															2												
habana										1																	
hader																							1				
hagenbeck																										1	
hartford	2									9	1											1					
heilbron						1																					
hvittingfoss							1																				
ibadan																										1	
inverness																							2				
irumu																										1	
johannesburg										2											1	3				1	
kaapstad										1						2											
kentucky					3							2				1								2			
kintambo																											
kottbus					1	1																					
lanka												2															
lawndale																			1								
lindenburg																	2										
llandoff																											
loma-linda					4																						
lomita																											
london											1																
luciana										2																	
madelia				3						3																	
manchester																											
manila							1																				
meleagridis										1									2		1						
minnesota						1				1	1			1					7			1				1	
mission																		1									
missouri																											
muenster				1	2	1				6	4			1	1				1			2		1			
nachahonim					1									5					1								
nchanga										1																	
new-brunswick																											
norwich			2	6	2					2	2			1					4						1	10	
ohio	1																										
onderstepoort						5											1										
orion																											
oritamerin																											
oslo					3							6										1	1				
paratyphi A					5			2						1								1					
paratyphi B v odense																						2	2				
paratyphi C					1																						
pensacola							3				3								1			3					
pharr																			1								
pomona					2																						
poona	3		2		11					9	4			4				1	3	1	1	3	3			1	2
portsmouth																											
potsdam																											
pullorum										1																	
rubislaw			2	1	2					6	1			5					5			2					
saphra																											
schoeneberg																											
siegburg											1			1					2								
simsbury											1											3					
stanley					2	1																1					
takony																											
tallahassee										6												1					
thomasville																											
uganda										1																	
urbana					5					2	1				1						1		5	1		1	
victoria																											
virchow						1								2									1				
wandsworth					1																						
wassenaar														1													
westhampton					1												1										
willemstad																											
zanzibar																			1								
TOTAL	11	1	13	12	71	13	7	2	2	68	37	16	1	45	7	6	5	2	55	1	4	27	27	4	1	17	3
NOT TYPED*	2	1	–	31	19	2	5	–	144	12	3	–	1	11	4	16	–	–	–	–	1	9	9	1	41	–	6
TOTAL	13	2	13	43	90	15	12	2	146	80	40	16	2	56	11	22	5	2	55	1	5	36	36	5	42	17	9

*See Table III.

TABLE II – Continued

REPORTING CENTER																							1968 TOTAL	1967 TOTAL	SEROTYPE
NEB	NEV	NH	NJ	NM	NYA	NYB	NYC	NC	ND	OHI	OKL	ORE	PA	RI	SC	SD	TEN	TEX	UTA	VA	WAS	WIS	WYO			
											1													1	–	*aberdeen*
																								1	–	*accra*
																								1	4	*adelaide*
																								1	1	*agona*
																								1	–	*altuga*
																								1	1	*alabama*
	6											1									2			23	13	*alachua*
								2		1			2							1				18	5	*albany*
																								1	2	*amager*
																					1			1	–	*amersfoort*
											1													1	–	*arechavaleta*
													5											10	11	*atlanta*
																								5	13	*berlin*
																								1	–	*bern*
								2				1					6	1		6				30	37	*berta*
										1			2			1								6	14	*binza*
																								1	–	*blegdam*
																								2	6	*bovis-morbificans*
																								2	1	*bradford*
																		2						5	2	*brandenburg*
					1	1															1			22	16	*california*
				1		1												1						2	3	*carrau*
						5	2			1							1							12	9	*cerro*
						1	2																	15	6	*cholerae-suis*
																								3	–	*coeln*
																					1			2	–	*coleypark*
																				3				3	2	*concord*
																								1	–	*daytona*
																								1	–	*decatur*
																								6	1	*drypool*
							1											1						11	8	*dublin*
																								3	1	*duesseldorf*
																								2	2	*durban*
								1									1							1	1	*eastbourne*
																								5	26	*eimsbuettel*
								1																2	4	*essen*
																								1	1	*fayed*
																								1	2	*florida*
																								2	–	*fresno*
										1														1	1	*gallinarum*
																		3						16	7	*gaminara*
																								3	1	*gatow*
																								1	1	*gatuni*
																								1	3	*georgia*
																								1	1	*glostrup*
																								1	–	*good*
						1	2																	2	1	*grumpensis*
																					3			7	15	*habana*
																								1	–	*hadar*
																								1	–	*hagenbeck*
								1					2											16	22	*hartford*
																								1	3	*heilbron*
																								1	–	*hvittingfoss*
																								1	2	*ibadan*
																								2	4	*inverness*
								1					1					1						2	12	*irumu*
												1												9	15	*johannesburg*
			1	1		1	3			1	1							1						4	1	*kaapstad*
																								17	40	*kentucky*
																					1			1	–	*kintambo*
																		1		2				5	3	*kottbus*
																								2	–	*lanka*
																								1	–	*lawndale*
											1													2	2	*lindenburg*
																								1	–	*llangoff*
						1						1						4		1				5	6	*loma-linda*
																								6	4	*lomita*
																								1	3	*london*
																								2	2	*luciana*
																								6	8	*madelia*
										4	1													4	2	*manchester*
																								2	–	*manila*
							1			1			1					3							4	7	*meleagridis*
																								19	22	*minnesota*
																								1	19	*mission*
			3		1			3			2		1				1			1		1		1	1	*missouri*
																					1			32	25	*muenster*
																								1	–	*nachshonim*
						1												2		1				7	–	*nchanga*
																								5	1	*new-brunswick*
										1	1						3	7						41	13	*norwich*
																								1	5	*ohio*
																								1	–	*onderstepoort*
													1											6	6	*orion*
																								1	1	*oritamerin*
												1	2											14	19	*oslo*
			1							1			2											13	7	*paratyphi A*
														1										4	–	*paratyphi B v odense*
													3											2	1	*paratyphi C*
																								13	5	*pensacola*
	1																							1	1	*pharr*
			6	2			2	3		1							1	3		1		8		3	1	*pomona*
																				1				75	58	*poona*
																				1				1	–	*portsmouth*
													1											1	–	*potsdam*
																								1	3	*pullorum*
								1										8						33	24	*rubislaw*
											1							20						20	11	*saphra*
																								1	–	*schoeneberg*
			1				1										1			1				8	10	*siegburg*
						1	1																	6	4	*simsbury*
			2			1							1											7	7	*stanley*
																								1	1	*taksony*
																					1			8	6	*tallahassee*
																		1						1	3	*thomasville*
																								1	1	*uganda*
			2			1	1						2									6		29	18	*urbana*
													1						2					2	–	*victoria*
																						1		6	4	*virchow*
																								1	–	*wandsworth*
																								1	–	*wassenaar*
																		2			1			3	–	*westhampton*
																								2	–	*willemstad*
																								1	–	*zanzibar*
–	7	–	16	4	2	15	16	15	–	13	9	5	27	1	–	1	14	61	2	18	13	15	–	712	635	TOTAL
11	1	63	–	181	357	–	7	–	14	1	2	11	–	14	12	–	1	174	–	4	–	29	1	1201	1107	NOT TYPED*
11	8	63	16	185	359	15	23	15	14	14	11	16	27	15	12	1	15	235	2	22	13	44	1	1913	1742	TOTAL

TABLE III. SALMONELLAE FROM HUMAN SOURCES REPORTED BY GROUP IDENTIFICATION ONLY DURING 1968

REPORTING CENTER	GROUP													TOTAL
	B	C	C1	C2	D	E	E4	F	G	H	O	UNK		
ALABAMA	2													2
ALASKA	1													1
ARKANSAS	14		7	5	2	1				1		1		31
CALIFORNIA	10					1					1	7		19
COLORADO												2		2
CONNECTICUT	2											3		5
DISTRICT OF COLUMBIA	76	6	11	8	21	1	2					19		144
FLORIDA	6			1		1			1		1	2		12
GEORGIA	1			1	1									3
IDAHO												1		1
ILLINOIS	5		2		1						1	2		11
INDIANA	3				1									4
IOWA	5	1	1		1							8		16
MARYLAND	1													1
MASSACHUSETTS	8											1		9
MICHIGAN	7		1		1									9
MINNESOTA			1											1
MISSISSIPPI	25	2	2	6	1							5		41
MONTANA	4			1								1		6
NEBRASKA												11		11
NEVADA	1													1
NEW HAMPSHIRE	41		6	1	14							1		63
NEW MEXICO	135		18	16	5	2			3	2				181
NEW YORK-A												357		357
NEW YORK-C	4	1				1						1		7
NORTH DAKOTA												14		14
OHIO	1													1
OKLAHOMA			1									1		2
OREGON	2				6	3								11
RHODE ISLAND	8	1	2	2	1									14
SOUTH CAROLINA	3	2		3								4		12
TENNESSEE												1		1
TEXAS	33		6	28	13	2		2	3			87		174
VIRGINIA	2				2									4
WISCONSIN	1											28		29
WYOMING												1		1
TOTAL	401	13	58	72	70	12	2	2	7	3	3	558		1201
VIRGIN ISLANDS					1	1						1		3

TABLE IV. AGE AND SEX DISTRIBUTION OF INDIVIDUALS FROM WHOM ISOLATIONS OF SALMONELLAE WERE REPORTED DURING 1968

AGE (YEARS)	MALE	FEMALE	UNKNOWN	TOTAL	PERCENT	CUMULATIVE PERCENT
< 1	1594	1244	46	2,884	20.6	20.6
1–4	1923	1595	25	3,543	25.3	45.9
5–9	833	676	3	1,512	10.8	56.7
10–19	812	651	3	1,466	10.5	67.2
20–29	451	734	3	1,188	8.5	75.7
30–39	299	506	2	807	5.8	81.5
40–49	282	411	2	695	5.0	86.4
50–59	307	392	3	702	5.0	91.5
60–69	271	301	1	573	4.1	95.6
70–79	176	224	0	400	2.9	98.4
>79	90	131	0	221	1.6	100.0
SUBTOTAL	7038	6865	88	13,991		
CHILD (UNSPECIFIED)	102	81	23	206		
ADULT (UNSPECIFIED)	54	123	5	182		
UNKNOWN	2435	2326	600	5,361		
TOTAL	**9629**	**9395**	**716**	**19,740**		
PERCENT	50.6	49.4				

TABLE V. COMMON SALMONELLAE REPORTED FROM NONHUMAN SOURCES (BY STATE) DURING 1968

SEROTYPE	GEOGRAPHIC DIVISION																												
	NEW ENGLAND						MIDDLE ATLANTIC			E. NORTH CENTRAL					W. NORTH CENTRAL							SOUTH ATLANTIC								
	ME	NH	VT	MAS	RI	CON	NY	NJ	PA	OHI	IND	ILL	MIC	WIS	MIN	IOW	MO	ND	SD	NEB	KAN	DEL	MD	DC	VA	WVA	NC	SC	GA	FLA
anatum						5	1	5	5	6	18	105	4	5	137	7	11				13		1		1		2	2	3	20
bareilly							1	3	7	2	1	3			1	1	1								3				1	1
blockley		2				3	1	8	2	2	38	4			22		5						3		1		1	1	48	4
braenderup				3		12			1	1	1				1														4	
bredeney		4				6	1	8	3	3	3	33	1	3	15	6	1				9				5				5	3
chester									1		5	3			9		1											1	2	
cholerae-suis kun				1				3	1	3	35	5	6			2	2			3			2		5		37	24	1	23
cubana				1		6	6	8	2	2	4	101	8		66	8	10				5				2		2		2	1
derby							1	11	19	3	13	10	36	6	6	5	5			1					1		12	2	1	6
enteritidis		10		1		3	1	8	9	3	20	25	3		5	1	1		2								1		20	3
give		1				1	3	16	1	1	1	1			2					5			2			1	1	3	1	1
heidelberg	2	8		3		38	3	8	9	10	24	3	7	1	85	17	7			4	3		19		7		11	5	228	5
indiana							1				1	1			1												1		5	1
infantis	1	9				17	43	2	9	8	28	38	11	3	19	4	13			3	2	1	6		6		1	1	25	8
java								1		1	1	2			9		1				1		1							6
javiana										1	3						1										1			
litchfield																													1	
livingstone								4		7	3		69				2								2				1	1
manhattan								2	1			1		1	6														1	
miami												1													2					9
mississippi																														
montevideo	3	7		1		9	13	27	14	7	25	38	8	1	96	3	5			1	9	1	11		3		1	2	59	6
muenchen						1	53		1	3	5	2		1	4													1		1
newington				2			1	3	16	3		21	1		3	2					17		1		1					2
newport		3		4		1		10	2	2	2	3	2		5		1			2	34							1	1	5
oranienburg	2			1		2		9		26	11	13	2	8	19	5	1				2		1		5		1		4	5
panama		1							1			3	1	1	2						2									
paratyphi B										2		3																		
reading						1				1	1	7		1	3	1									1		1			1
saint-paul		1		1		19		13	12	5	25	8	11	10	56	6	4			5	16		6		12		4	3	38	9
san-diego											3				8		3		1									2		
schwarzengrund						3	14	1	1		3	1			8	2	2			1	1				1			1		2
senftenberg						31	20	39	12	4	19	30	15	7	46		2				2		7		6		2	1	4	2
tennessee						1	4	13	3	1	9	45	2	1	50	2	4						2		2					2
thompson	1	8		2		5		7	1	3	11	6	2	3	11	2	2				29	1	15		1	1	3		89	17
typhi																														
typhimurium		37		4	2	35	2	48	13	21	36	34	35	1	153	33	23		4	5	36	1	18		15		14	8	8	33
typhimurium cop		5		5		38	2	10	3		15	5	2		7	4	3		1	1		7	4		1		14	3	64	6
weltevreden																														
worthington						1	16	10	5	1	22	5	1	1	6	1					3		3					2	3	
TOTAL	9	96	–	29	2	238	187	277	154	132	386	560	227	54	861	112	111	–	8	31	184	11	102	–	83	2	110	63	619	183
ALL OTHER	2	2	–	6	–	76	53	58	90	73	115	117	80	25	183	9	21	–	1	19	24	–	33	–	30	–	5	4	51	45
TOTAL	11	98	–	35	2	314	240	335	244	205	501	677	307	79	1044	121	132	–	9	50	208	11	135	–	113	2	115	67	670	228

TABLE V – Continued

GEOGRAPHIC DIVISION																					1968 TOTAL	1967 TOTAL	SEROTYPE
EAST S. CENTRAL				WEST S. CENTRAL				MOUNTAIN								PACIFIC							
KY	TEN	ALA	MIS	ARK	LA	OKL	TEX	MON	IDA	WYO	COL	NM	ARI	UTA	NEV	WAS	ORE	CAL	ALK	HAW			
3	4	6	4	3			30			2			2	8		2	2	50		20	487	521	*anatum*
		1			2													5		2	35	51	*bareilly*
1		4	2	6			11		1					2		1		43		13	229	115	*blockley*
		1																1			25	84	*braenderup*
1				1			1						2	5		1		12			132	174	*bredeney*
							1											21			44	52	*chester*
14	21	5	7	1																	201	78	*cholerae-suis kun*
		1	3					1			2							29			269	243	*cubana*
1		4		3			6			16			2	20		4		31		70	295	458	*derby*
		3		4				2								2	3	18			148	128	*enteritidis*
1		1									3							8		2	56	55	*give*
1		29	2	18			1		6				6	37		5		78		1	691	665	*heidelberg*
			6																		17	30	*indiana*
2	2	4	1	6			7		1	1	3		3	8		4	6	45		70	421	424	*infantis*
													2					1			26	28	*java*
			1		2		2						1								12	32	*javiana*
		2																			3	4	*litchfield*
															1			45		9	144	71	*livingstone*
		3		9														3		6	33	38	*manhattan*
																					12	13	*miami*
			1															1			2	4	*mississippi*
		6	17	5	1		6	4	3				3	18	4	1		30			448	335	*montevideo*
1		2		2			3						1	1				13			95	96	*muenchen*
	1	4	1	1			1		4		4			1				10		11	111	153	*newington*
1	2	1	2	5	1	2	12	1			7						1	38		39	190	154	*newport*
		2	1	1		1	4						1					30			157	260	*oranienburg*
				2			7											8		36	64	62	*panama*
							1				1										7	3	*paratyphi B*
																1		6			25	100	*reading*
	2	1		6	2		35	1	4		4			16		8	7	41		1	392	381	*saint-paul*
							4							9			5	13			48	91	*san-diego*
		1												8				28		7	85	152	*schwarzengrund*
4	1	5	20	5			2			1							1	23			311	274	*senftenberg*
			1	1	1				1		2		9	1			2	13		1	173	322	*tennessee*
		21	6	8	9	2	3		2					7			1	22			301	209	*thompson*
																					–	3	*typhi*
6	9	1	4	18	13	16	14	2	4	1	11		4	2		3	9	263		63	1062	896	*typhimurium*
2	1	4	3	48	3		3		3				4	2	2	2	7	11			295	250	*typhimurium cop*
							3													7	10	2	*weltevreden*
		1			1		3						1	11				22		11	130	127	*worthington*
38	43	113	82	153	35	21	160	10	29	21	37	–	41	156	7	34	44	962	–	369	7186	7138	TOTAL
6	4	18	45	20	4	2	64	4	–	2	17	2	7	104	2	6	6	235	–	21	1691	1656	ALL OTHER
44	47	131	127	173	39	23	224	14	29	23	54	2	48	260	9	40	50	1197	–	390	8877	8794	TOTAL

TABLE VI. COMMON SALMONELLAE REPORTED FROM NONHUMAN SOURCES (BY CATEGORY) DURING 1968

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
anatum	26	51	33	10	15	12	147	120		23	143
bareilly	4	2	5			1	12	5		9	14
blockley	135	16	13		1	12	177	25		1	26
braenderup	4	1					5	5		6	11
bredeney	19	18	5	1		1	44	28		6	34
chester	6	30	1				37	1			1
cholerae-suis kun	1	1	193	1	1		197			1	1
cubana	3	1				1	5	89	1	20	110
derby	19	34	98	7	1	2	161	55		15	70
enteritidis	73	5	11	8		15	112	4		1	5
give	7	7	1	1		1	17	6		2	8
heidelberg	361	175	21	10		16	583	22	1	17	40
indiana	4	1	3	1		1	10			4	4
infantis	136	24	77	3	1	13	254	23		16	39
java			5			2	7	7			7
javiana				1		3	4				—
litchfield			1			1	2			1	1
livingstone	8	3	4			2	17	75		37	112
manhattan	13	8	8			1	30				—
miami	3		2	2	1	4	12				—
mississippi			1				1				—
montevideo	82	14	3	1		10	110	129	1	75	205
muenchen	1	10	3	2		1	17	3		2	5
newington	5	7	15	1	17		45	8		8	16
newport	8	10	39	35	30	12	134	8			8
oranienburg	8		6			2	16	64		35	99
panama	1	6	38			1	46	2			2
paratyphi B							—				—
reading	1	13	1				15	4			4
saint-paul	87	152	16	22	13	15	305	20		3	23
san-diego	1	40				2	43	1			1
schwarzengrund	9	17	9			3	38	15		3	18
senftenberg	9	38	7	3		3	60	72		91	163
tennessee	2	20	1	1		4	28	43		20	63
thompson	182	8	3			15	208	4		8	12
typhi							—				—
typhimurium	127	119	110	220	46	96	718	53		10	63
typhimurium cop	150	11	13	29	3	35	241	5		2	7
weltevreden			3			2	5	1			1
worthington	23	10		1		4	38	35		10	45
TOTAL	1518	852	749	360	129	293	3901	932	3	426	1361
ALL OTHER*	179	108	49	96	3	86	521	432	3	259	694
TOTAL	**1697**	**960**	**798**	**456**	**132**	**379**	**4422**	**1364**	**6**	**685**	**2055**

*See Table VII

TABLE VI – Continued

WILD ANIMALS AND BIRDS	REPTILES AND ENVIRON-MENT	HUMAN DIETARY ITEMS						MISCEL-LA-NEOUS	1968 TOTAL	1967 TOTAL	SEROTYPE
		EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL				
19	1	2	2	46	85	13	148	29	487	521	*anatum*
	1	3		2		2	7	1	35	51	*bareilly*
10		2	1			3	6	10	229	115	*blockley*
		4				3	7	2	25	84	*braenderup*
4	3	1		6	21		28	19	132	174	*bredeney*
3				1		1	2	1	44	52	*chester*
2								1	201	78	*cholerae-suis kun*
	1	13		11	89	10	123	30	269	243	*cubana*
9	1			8	18	8	34	20	295	458	*derby*
13	2	8			1	3	12	4	148	128	*enteritidis*
17	1			1	5		6	7	56	55	*give*
20		12	1	2	1	6	22	26	691	665	*heidelberg*
1		2					2		17	30	*indiana*
10		22	6	1	13	43	85	33	421	424	*infantis*
2	8				1		1	1	26	28	*java*
2	2						–	4	12	32	*javiana*
							–		3	4	*litchfield*
		2		1			3	12	144	71	*livingstone*
2							–	1	33	38	*manhattan*
							–		12	13	*miami*
	1							–	2	4	*mississippi*
5	3	23	2	17	17	33	92	33	448	335	*montevideo*
3	11	1		1		53	55	4	95	96	*muenchen*
3	3				36	2	38	6	111	153	*newington*
20	14				1	2	3	11	190	154	*newport*
4	1	10		5	11	1	27	10	157	260	*oranienburg*
2	2					3	3	9	64	62	*panama*
1	3						–	3	7	3	*paratyphi B*
	1						–	5	25	100	*reading*
12	10	4	6	1		2	13	29	392	381	*saint-paul*
				2			2	2	48	91	*san-diego*
3	1	1		2	1	5	9	16	85	152	*schwarzengrund*
6		2		18	11	26	57	25	311	274	*senftenberg*
3		15		8	31	6	60	19	173	322	*tennessee*
11	5	47	3			1	51	14	301	209	*thompson*
							–		–	3	*typhi*
104	22	36	8	6	4	9	63	92	1062	896	*typhimurium*
16	3	8	3		1		12	16	295	250	*typhimurium cop*
1						2	2	1	10	2	*weltevreden*
1	1	3		11	5	7	26	19	130	127	*worthington*
309	101	221	32	150	352	244	999	515	7186	7138	TOTAL
81	46	63	2	45	52	57	219	130	1691	1656	ALL OTHER*
390	**147**	**284**	**34**	**195**	**404**	**301**	**1218**	**645**	**8877**	**8794**	**TOTAL**

TABLE VII. OTHER SALMONELLAE REPORTED FROM NONHUMAN SOURCES (BY CATEGORY) DURING 1968

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
alachua	1	1				1	3	19		8	27
albany	5	3					8	2			2
amager	8					1	9	1			1
amsterdam							—	5		5	10
aqua		1					1				—
arkansas							—	1		1	2
atlanta				1			1				—
bere							—	5			5
berlin							—				—
bern							—				—
berta	1			1			2				—
binza	2	4	3			2	11	23		12	35
bolton							—				—
bornum	8						8	1			1
california	13	1	2				16	15		9	24
cerro	12	23	6	6		7	54	28		21	49
chameleon							—				—
champaign							—				—
cholerae-suis			15				15				—
concord	1						1				—
corvallis		1					1				—
denver							—				—
drypool							—	33		12	45
dublin			2	66		3	71				—
eimsbuettel	18	2	4			5	29	101	1	68	170
eppendorf							—				—
essen							—				—
fresno							—	1			1
gallinarum	7	2					9				—
gaminara		1				1	2				—
gatuni							—				—
georgia							—			9	9
gojenberg	1						1				—
good			1				1				—
grumpensis							—	2		1	3
habana	1						1			1	1
halmstad							—	2		1	3
hartford							—				—
heilbron							—				—
horsham							—				—
hvittingfoss							—				—
illinois							—	7		5	12
johannesburg	1	1				4	6	4		4	8
kentucky	18	10	1			1	30	26		13	39
kottbus	4	2					6				—
lexington		2					2	2		2	4
lille							—	1			1
london			1				1				—
madelia							—				—
manila	3					4	7	4		7	11
marina							—				—
meleagridis	2	2	2	3		2	11	6	2	6	14
minneapolis		2				1	3	1		27	28
minnesota	4	36				17	57	17		5	22
mission			2				2				—
monschaui							—				—
muenster	1	1	1				3	3		2	5
narashino						2	2				—
new-brunswick							—			2	2
norwich				1			1				—
ohio	3						3	2		3	5
orientalis							—				—
orion	1	2	1			2	6	22			22
oslo						2	2				—
pomona							—	5			5
poona	1						1				—
pullorum	33	2				6	41			1	1
rubislaw				1	1		2			1	1
saphra						2	2				—
seremban						1	1				—
siegburg	14	1	1			1	17	21		10	31
simsbury	2						2			1	1
singapore							—	1			1
stanley						1	1				—
sundsvall							—			1	1
taksony	3					1	4	13		2	15
tallahassee					1		1				—
thomasville		2	2			12	16	20		6	26
typhi-suis			4				4				—
uganda							—				—
urbana							—	3		2	5
vejle							—				—
wassenaar							—				—
westerstede	1						1				—
westhampton	1	3					4	8			8
zanzibar							—			2	2
TOTAL	170	105	48	79	2	79	483	405	3	250	658
NOT TYPED*	9	3	1	17	1	7	38	27	—	9	36
TOTAL	**179**	**108**	**49**	**96**	**3**	**86**	**521**	**432**	**3**	**259**	**694**

*See Table VIII.

TABLE VII – Continued

WILD ANIMALS AND BIRDS	REPTILES AND ENVIRONMENT	HUMAN DIETARY ITEMS						MISCELLANEOUS	1968 TOTAL	1967 TOTAL	SEROTYPE
		EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL				
		4		1	2		7	10	47	123	*alachua*
3		1					1		14	30	*albany*
							–		10	8	*amager*
				3			3		13	–	*amsterdam*
							–		1	–	*aqua*
							–		2	1	*arkansas*
							–		1	–	*atlanta*
							–		5	–	*bere*
	1						–		1	1	*berlin*
3							–		3	–	*bern*
2							–		4	13	*berta*
2				4	13	1	18	3	69	142	*binza*
1							–		1	–	*bolton*
							–		9	1	*bornum*
2		8	1	8	1		18	10	70	22	*california*
	5	10		4	1	1	16	25	149	120	*cerro*
2	3						–		5	–	*chameleon*
							–	2	2	3	*champaign*
1							–		16	14	*cholerae-suis*
						1	–		1	–	*concord*
							–		1	3	*corvallis*
2							–		2	–	*denver*
							–		45	25	*drypool*
1							–	2	74	22	*dublin*
3		10		1	3	31	45	3	250	308	*eimsbuettel*
							–	1	1	–	*eppendorf*
							–	4	4	–	*essen*
							–		1	–	*fresno*
							–		9	12	*gallinarum*
1						1	1		4	9	*gaminara*
1							–		1	–	*gatuni*
							–		9	1	*georgia*
							–		1	–	*gojenberg*
							–		1	–	*good*
				1			1		4	3	*grumpensis*
						5	5		7	8	*habana*
							–		3	16	*halmstad*
1							–		1	1	*hartford*
		1					1		1	–	*heilbron*
1							–		1	–	*horsham*
						1	1		1	5	*hvittingfoss*
							–	1	13	9	*illinois*
2				1			1		17	17	*johannesburg*
2				10	7	1	18	5	94	91	*kentucky*
2							–		8	3	*kottbus*
					2	5	7	10	23	20	*lexington*
							–		1	–	*lille*
							–		1	2	*london*
3	5						–	1	9	6	*madelia*
							–		18	4	*manila*
	3						–		3	4	*marina*
1					6	1	7	5	38	53	*meleagridis*
					2		2		33	34	*minneapolis*
	2				3		3	17	101	54	*minnesota*
1					2		2		5	1	*mission*
1							–		1	–	*monschaui*
		1		2			3		11	11	*muenster*
	1						–		3	–	*narashino*
4							–	1	7	2	*new-brunswick*
1	2						–		4	6	*norwich*
1					1		1	1	11	2	*ohio*
	1						–		1	–	*orientalis*
				3	2		5		33	26	*orion*
	1						–	1	4	2	*oslo*
6	2						–		13	2	*pomona*
	4	7			5	1	13	4	22	18	*poona*
5		1	1				2	4	53	42	*pullorum*
14	2						–	2	21	15	*rubislaw*
							–		2	1	*saphra*
							–		1	–	*seremban*
1		15		3	2	6	26	1	76	51	*siegburg*
						2	2	7	12	5	*simsbury*
							–		1	–	*singapore*
2							–		3	1	*stanley*
							–		1	2	*sundsvall*
							–	2	21	3	*taksony*
							–		1	–	*tallahassee*
				3			3	3	48	30	*thomasville*
							–		4	9	*typhi-suis*
	1						–		1	–	*uganda*
1	8			1			1		15	20	*urbana*
1							–		1	1	*vejle*
	2						–		2	–	*wassenaar*
							–		1	1	*westerstede*
							–		12	29	*westhampton*
							–		2	3	*zanzibar*
74	43	58	2	45	52	56	213	125	1596	1544	TOTAL
7	3	5	–	–	–	1	6	5	95	112	NOT TYPED*
81	46	63	2	45	52	57	219	130	1691	1656	TOTAL

TABLE VIII. SALMONELLAE FROM NONHUMAN SOURCES REPORTED BY GROUP IDENTIFICATION ONLY DURING 1968

SOURCES	GROUP												TOTAL
	B	C1	C2	E	E3	E4	G	H	J	M	O	UNK	
DOMESTIC ANIMALS AND THEIR ENVIRONMENT	23			2		1						12	38
ANIMAL FEEDS		3	2	2	1		1	1	1	3	3	19	36
WILD ANIMALS AND BIRDS	2		3									2	7
REPTILES AND ENVIRONMENT	2		1										3
HUMAN DIETARY ITEMS	2											4	6
MISCELLANEOUS	1											4	5
UNKNOWN													—
TOTAL	**30**	**3**	**6**	**4**	**1**	**1**	**1**	**1**	**1**	**3**	**3**	**41**	**95**

TABLE IX. SALMONELLA ISOLATIONS FROM HUMAN SOURCES BY SEROTYPE AND YEAR, 1963–1968

SEROTYPE	1963	1964	1965	1966	1967	1968	SEROTYPE	1963	1964	1965	1966	1967	1968
abaetetuba	1						*bovis-*						
aberdeen		1		1		1	*morbificans*	4	7	31	12	6	2
abony	1	1		1			*bradford*		2		4	1	2
abortus-bovis				2	2		*braenderup*	56	102	85	111	83	139
accra						1	*brancaster*		1			1	
adelaide		6	1		4	1	*brandenburg*	4	4	1	2	2	5
agama				3			*bredeney*	153	220	160	159	120	172
agona					1	1	*bristol*		1				
ahuza						1	*butantan*			1			
alabama					1	1							
alachua	10	5	5	6	13	23	*california*	11	31	22	15	16	22
albany	3	6	6	14	5	18	*cambridge*	2	1	3		1	
allandale			1				*caracas*		1				
amager	39	10	1	3	2	1	*carno*	1					
amersfoort						1	*carrau*	1	3	7	6	3	2
amsterdam		1					*cerro*	6	9	13	12	9	12
anatum	224	279	300	333	297	209	*chailey*			1	6		
ardwick		1					*chameleon*			1			
arechavaleta		1		1		1	*champaign*			1			
arkansas			1	1			*chester*	190	75	115	109	100	58
atlanta	11	5	8	19	11	10	*chingola*			2			
austin				1			*cholerae-suis*	20	15	10	10	6	15
							cholerae-suis						
							var kunzendorf	54	31	36	26	20	29
babelsberg	1						*claibornei*					1	
ball				2	1								
banana	1						*clifton*	1		1			
bareilly	59	99	104	78	81	95	*coeln*						3
belem			1		2		*coleypark*				2		2
							colorado	3	2	3	1	3	
berlin				2	13	5	*concord*	1	2		1	2	3
bern						1							
berta	64	48	47	34	37	30	*coquilhatville*		3				
bilthoven			3				*corvallis*	2		1	1		
binza	6	22	20	24	14	6	*cubana*	40	63	145	131	66	59
birkenhead		1											
blegdam		1	1			1	*daytona*	3		2	3		1
blockley	360	427	401	603	519	487	*decatur*	3	2				1
bonaire				1			*denver*		1	1	2	3	
bonariensis	1	1		1			*derby*	1,610	2,360	632	404	326	411
							drypool				2	1	6

TABLE IX. – continued

SEROTYPE	1963	1964	1965	1966	1967	1968
dublin	2	3	3	4	8	11
duesseldorf	3	4	5	6	1	3
duisberg			1	4	1	
durban					2	2
durham				3	8	
eastbourne		2	4		1	1
eimsbuettel			4	17	26	5
elisabethville	1					
emek		1	3		1	
enteritidis	801	801	1,065	1,237	1,277	1,740
eppendorf					1	
essen		6	3		4	2
fayed	3	3		9	1	1
florida		8	2		2	1
fresno			1			2
frintrop					1	
galiema		1		1		
gallinarum		3		1	1	1
gaminara	3	3	13	10	7	16
garoli				1	1	
gatow	1				1	3
gatuni	1	1	3		1	1
georgia	2	1			3	1
give	65	79	116	78	61	65
glostrup			1	2	1	1
goettingen		1				
good						1
grumpensis	3	8		2	1	2
guinea			1			
haarlem					1	
habana	1			3	15	7
hadar						1
hagenbeck						1
haifa	1		1	4		
halle		1				
halmstad		1			1	
hartford	16	11	22	33	22	16
hato		1	1			
heidelberg	1,533	1,717	1,621	1,622	1,648	1,326
heilbron			1		3	1
horsham	1		1			
hvittingfoss	1					1
ibadan				2	2	1
illinois	7	1			1	
indiana	14	54	66	65	49	84
infantis	970	1,523	1,145	1,315	980	945
inverness	4		7	2	4	2
irenea					1	
irumu	78	5	23	8	12	2
israel					1	
java	175	231	199	367	309	199
javiana	168	256	361	312	373	518
johannesburg	2	2	2	1	15	9
kaapstad			2	1	1	4
kentucky	63	21	19	38	40	17
kintambo						1
kottbus	4	1	9	1	3	5
kunduchi					2	
lanka				1		2
larochelle			2			
lawndale						1
leeuwarden			3			
lexington	2	1	2		3	
lindenburg	2		2		2	2
litchfield	67	69	96	97	81	93
livingstone	17	15	33	31	55	44
llandorff	1					1
loma-linda	6	5	2	7	6	5
lomita		4	3	2	4	6
london	1	3	1	1	3	1
luciana		1	1	1	2	2
maastricht			1			
madelia	1	1	3	3	8	6
manchester	2	3		3	2	4
manhattan	192	181	125	134	284	200
manila		1				2

TABLE IX. – continued

SEROTYPE	1963	1964	1965	1966	1967	1968
maricopa	1					
meleagridis	82	48	140	8	7	4
memphis					1	
menston	1		11	2		
miami	65	49	95	83	69	118
michigan		2	1			
minneapolis			1	1		
minnesota	13	13	14	8	22	19
mishmar-haemek		1	2			
mission	2	2	16	6	19	1
mississippi	27	41	38	55	58	50
missouri					1	1
mjimwema				1		
molade				1		
montevideo	490	524	458	337	398	271
muenchen	265	261	219	229	217	211
muenster	5	7	12	27	25	32
nachshonim						1
nagoya			1	1	1	
narashino					1	
nchanga						7
new-brunswick	6	4	21	53	1	5
new-haw	1	1		9	2	
newington	47	71	57	53	43	44
newlands				1		
newport	1,080	1,036	1,257	1,319	1,263	1,248
nienstedten				1		
nigeria					1	
norwich	13	12	24	28	13	41
nottingham			1	1	1	
nyborg			1			
ohio		4	9	12	5	1
onderstepoort						1
oranienburg	539	550	591	399	406	295
orion	3	3		3	6	6
oritamerin				1	1	1
os				3		
oslo	5	9	14	26	19	14
othmarschen		1				
panama	141	189	229	274	182	230
papuana				1		
paratyphi A	8	7	12	7	7	13
paratyphi B	155	175	177	153	173	114
paratyphi B var odense			1	2		4
paratyphi C	4		1	1	1	2
pensacola	6	9	4		5	13
pharr					1	1
phoenix				1		
pomona	1		3	4	1	3
poona	47	45	48	40	58	75
portland			1	1		
portsmouth						1
potsdam	1			3		1
pullorum	1	1		10	3	1
reading	46	33	21	105	54	74
redlands		1				
remo			2	1		
richmond	5	3	2		1	
rubislaw	11	18	11	30	24	33
saint-paul	586	645	767	737	907	1,143
salinatis		1				
san-diego	120	178	229	122	149	106
saphra	5	1	13	13	11	20
sarajane			1	2		
schoeneberg						1
schwarzengrund	147	155	114	71	72	55
senftenberg	33	108	74	72	58	65
sendai				6		
seremban				2		
shipley		1				
siegburg		2	16	14	10	8
simsbury	6	6	2	5	4	6
singapore					1	
soahanina				1		
solna				1		
stanley	13	9	7	6	7	7
stockholm				1		
sundsvall	2	1	1	3	1	

TABLE IX. – continued

SEROTYPE	1963	1964	1965	1966	1967	1968
takoradi			3		2	
taksony		1	1		1	1
tallahassee	6	3	4	7	6	8
tamale	1		1			
tennessee	164	332	173	133	63	85
texas				1		
thomasville	11	3	3	5	3	1
thompson	321	421	562	579	508	673
travis		2				
typhi	706	703	719	654	690	609
typhimurium	5,435	5,656	6,526	5,744	5,530	5,147
typhimurium var copenhagen	173	206	203	178	273	316
uganda		5	2		1	1
urbana	31	25	33	28	18	29
vejle					2	
victoria						2
virchow	1	4	2	4	4	6
wagenia					1	
wandsworth						1
wassenaar				2		1
weltevreden	46	23	35	45	61	78
weslaco	1	1		1		
westerstede	1	1	2	6	1	
westhampton	1	1	7	1		3
willemstad						2
worcester					1	
worthington	34	48	46	44	24	22
yalding			1			
zanzibar						1
Group A	4	6	2	1	1	
Group B	280	276	293	312	493	401
Group C					2	13
Group C_1	68	71	91	140	138	58
Group C_2	43	40	57	61	132	72
Group D	72	37	47	54	77	70
Group E	15	30	50	13	36	9
Group E_4						4
Group F					1	2
Group G		2	4	6	7	8
Group H		1		2	9	3
Group I			1		1	
Group J	1					
Group K					1	
Group L			1			
Group M					1	
Group O	3	4	9	3	3	3
Unknown	88	96	115	81	205	558
TOTAL	**18,649**	**21,113**	**20,865**	**20,040**	**19,723**	**19,740**

Figure 1 REPORTED HUMAN AND NONHUMAN ISOLATIONS OF SALMONELLAE UNITED STATES, 1963 – 1968

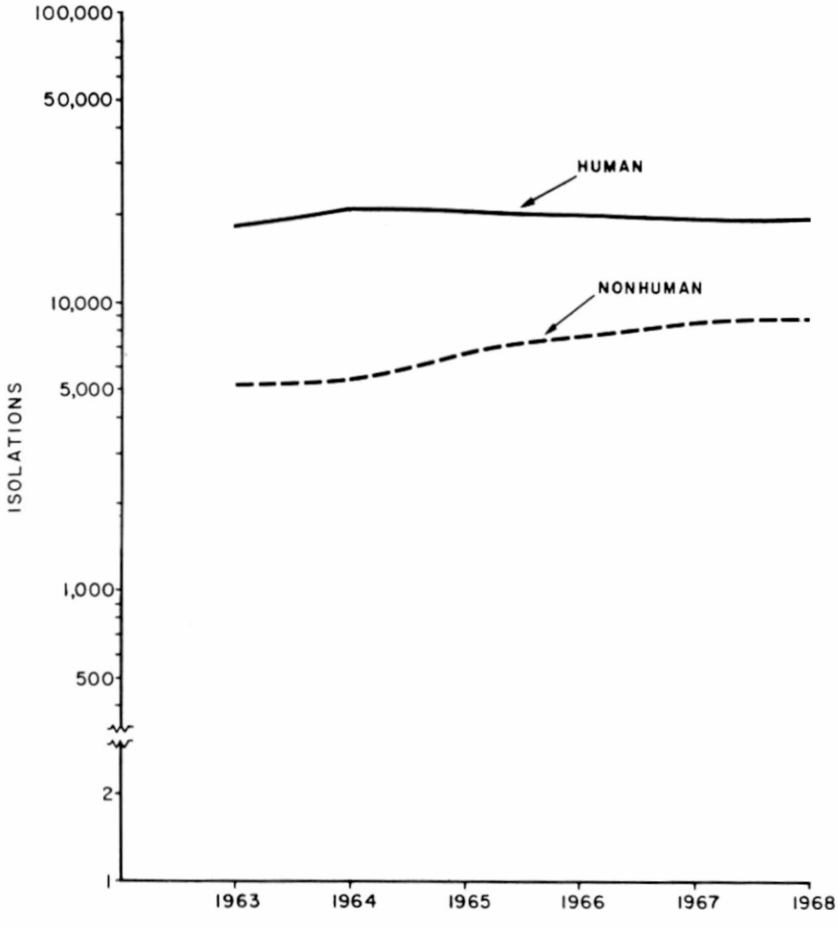


Figure 2 REPORTED HUMAN ISOLATIONS OF SALMONELLAE IN THE UNITED STATES

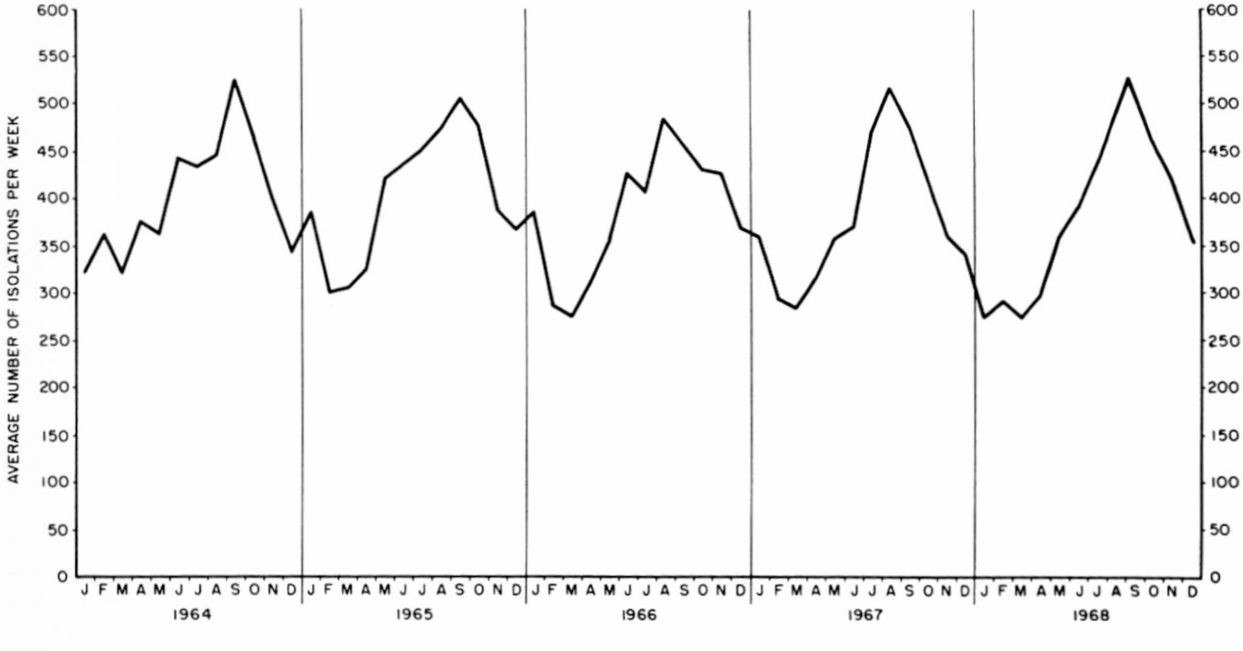
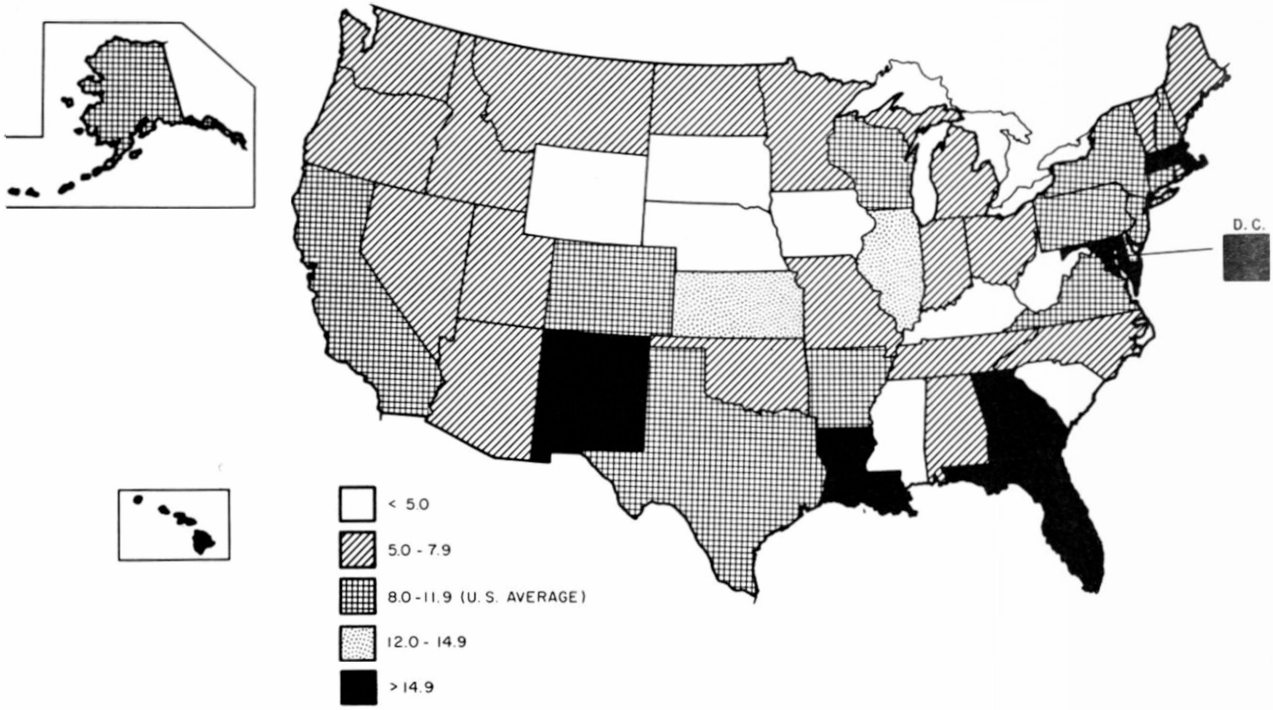


Figure 3 NUMBER OF HUMAN ISOLATIONS OF SALMONELLA PER 100,000 POPULATION IN THE UNITED STATES, 1968

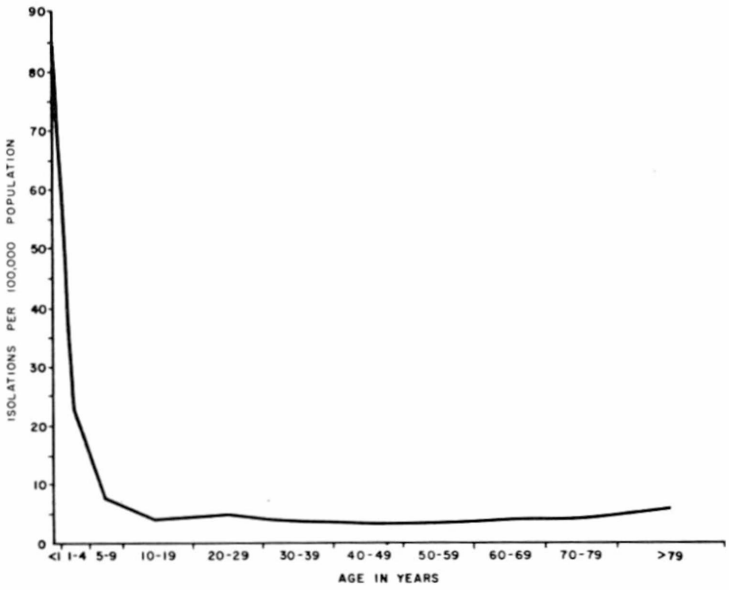


SOURCE: CURRENT POPULATION REPORT'S SERIES P-25, NO. 414

Name	Number of Isolations	Rate Per 100,000		Name	Number of Isolations	Rate Per 100,000	
Alabama	188	5.3	(+)	Montana	36	5.2	(-)
Alaska	26	9.5	(+)	Nebraska	16	1.1	(-)
Arizona	115	6.9	(-)	Nevada	27	6.0	(+)
Arkansas	215	10.8	(-)	New Hampshire	73	10.4	(+)
California	1,795	9.3	(-)	New Jersey	565	8.0	(+)
Colorado	182	8.9	(-)	New Mexico	255	25.3	(-)
Connecticut	318	10.7	(-)	New York	1,963	10.9	(+)
Delaware	78	14.6	(+)	North Carolina	401	7.8	(-)
Dist. of Col.	236	29.2	(+)	North Dakota	48	7.7	(+)
Florida	1,196	19.4	(-)	Ohio	579	5.5	(-)
Georgia	777	17.0	(+)	Oklahoma	164	6.5	(-)
Hawaii	592	75.9	(-)	Oregon	149	7.4	(-)
Idaho	51	7.3	(+)	Pennsylvania	1,108	9.4	(+)
Illinois	1,321	12.0	(+)	Rhode Island	58	6.3	(-)
Indiana	255	5.0	(+)	South Carolina	25	0.9	(+)
Iowa	106	3.8	(-)	South Dakota	22	3.4	(+)
Kansas	319	13.9	(+)	Tennessee	263	6.6	(+)
Kentucky	103	3.2	(+)	Texas	1,062	9.7	(-)
Louisiana	736	19.8	(-)	Utah	72	7.0	(-)
Maine	53	5.4	(-)	Vermont	26	6.1	(+)
Maryland	566	15.1	(+)	Virginia	385	8.4	(-)
Massachusetts	1,161	21.2	(-)	Washington	252	7.7	(-)
Michigan	690	7.9	(-)	West Virginia	25	1.4	(-)
Minnesota	266	7.3	(0)	Wisconsin	467	11.1	(+)
Mississippi	52	2.2	(-)	Wyoming	7	2.2	(+)
Missouri	295	6.4	(-)	Total	19,740	9.9	(-)

(+) Increase over 1967 (-) Decrease from 1967 (0) Unchanged from 1967

Figure 4 RATE OF HUMAN ISOLATIONS OF SALMONELLAE BY AGE GROUP, 1968*



* POPULATION DATA OBTAINED FROM CURRENT POPULATION REPORTS, SERIES P-25, NO. 416

Figure 5 NONHUMAN SALMONELLA ISOLATIONS FROM THE INDICATED SOURCES IN THE UNITED STATES, 1968