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SALMONELLA
SURVEILLANCE

CONTENTS...

**Annual
Summary
1969**

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE/PUBLIC HEALTH SERVICE
Health Services and Mental Health Administration

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July 31, 1970

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I. INTRODUCTION

This report summarizes the results of the seventh year (January 7, 1969 - January 2, 1970) of the Salmonella Surveillance Program established jointly by the Center for Disease Control (formerly National Communicable Disease Center) 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 1969, 21,413 isolations of salmonellae from humans were reported, representing a 8.5 percent increase from the 19,740 reported for 1968 and a 8.6 percent increase from the 19,723 reported in 1967. Salmonella typhi-murium and S. typhi-murium var. copenhagen, as in previous years, were the most common serotypes, accounting for 27.0 percent of all isolations.

A total of 9,453 recoveries of salmonellae from nonhuman sources were reported during 1969, an increase of 6.5 percent over 1968 and 7.5 percent over 1967.

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 1965 through 1969 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 165 different salmonella serotypes were reported in 1969, compared with 154 in 1968 (Tables I and II). This number (165) represents approximately 12 percent of the more than 1,400 known salmonella serotypes.

The 10 most frequently reported serotypes appear in the table below. These 10 serotypes accounted for 15,457 (72.2 percent) of the 21,413 isolations reported in 1969. The frequency of isolation of S. thompson showed the greatest increase with a rise of 57 percent over 1968. The same 10 serotypes were most frequently reported in 1968, but with minor differences in rank. 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 - 1969

HUMAN				NONHUMAN		
Serotype	Number	Percent	Rank Last Year	Serotype	Number	Percent
1 <u>typhi-murium</u> *	5,773	27.0	1	<u>typhi-murium</u> *	1,476	15.6
2 <u>enteritidis</u>	1,988	9.3	2	<u>heidelberg</u>	966	10.2
3 <u>newport</u>	1,611	7.5	4	<u>cholerae-suis</u>	680	7.2
4 <u>heidelberg</u>	1,428	6.7	3	<u>var. kunzendorf</u>		
5 <u>infantis</u>	1,096	5.1	6	<u>anatum</u>	534	5.6
6 <u>thompson</u>	1,056	4.9	7	<u>saint-paul</u>	463	4.9
7 <u>saint-paul</u>	986	4.6	5	<u>thompson</u>	315	3.3
8 <u>typhi</u>	549	2.6	8	<u>montevideo</u>	304	3.2
9 <u>blockley</u>	505	2.4	10	<u>infantis</u>	279	3.0
10 <u>javiana</u>	465	2.2	9	<u>senftenberg</u>	257	2.7
				<u>derby</u>	245	2.6
Total	15,457	72.2		Total	5,519	58.4
TOTAL (all serotypes)	21,413			TOTAL (all serotypes)	9,453	
*Includes <u>var. copenhagen</u>	259	1.2		*Includes <u>var. copenhagen</u>	272	2.9

Geographic Patterns

The geographic distribution of salmonella isolations in 1969 showed California reporting the largest number, 2,239. Other states reporting over 1,000 isolations were New York, Massachusetts, Florida, Illinois, and Texas (Figure 3).

The incidence of salmonella infection for the entire country was 10.6 per 100,000 population. As in past years, Hawaii reported the highest incidence, with 57.0 isolations per 100,000. Other areas reporting incidence rates higher than 20 per 100,000 were Alaska, Massachusetts, District of Columbia, and Florida. The high incidence in Alaska can be attributed to a single large outbreak of salmonellosis.

Geographic variations among specific serotypes are seen in Tables I and II. Several serotypes continued to exhibit definite regional patterns which have been remarkably consistent in recent years. For example, Hawaii, which accounted for only 2.1 percent of the national salmonella isolations, reported 93 percent (50 of 54) of all Salmonella weltevreden isolations. Four southern states, Florida, Texas, Georgia, and Louisiana, accounted for 77 percent of the 465 total S. javiana isolations. All 15 S. atlanta isolations were reported from Georgia. Texas reported 13 of the 15 S. lomita isolations, and 13 of the 14 S. saphra isolations. Appropriately, 86 of 106 (81 percent) S. miami isolations were made in Florida.

Outbreaks

In 1969, 19 outbreaks involving 1,023 individuals were reported in the Salmonella Surveillance Reports (see table on page 4). Of nine foodborne outbreaks, seven were traced to a specific contaminated food, including three caused by turkey, one by chicken, one by beef, one by spaghetti and meatballs, and one by muktuk (whale skin and blubber). In two foodborne outbreaks, the specific food could not be identified. Three outbreaks involving 4 individuals were traced to household pets infected with the same serotypes. 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.

Six outbreaks involving 137 individuals occurred in hospitals or nursing homes. Person-to-person contact was the primary mode of spread in one of these outbreaks. The source of infection in the five S. infantis outbreaks could not be determined.

An outbreak of typhoid fever involving four individuals was traced to a S. typhi carrier employed by a restaurant.

Although the etiology of all outbreaks was confirmed bacteriologically, many of the 1,023 ill individuals were never cultured and are not included as reported isolations in the national surveillance data. Thus only a very small fraction of the total of 21,413 isolations of salmonellae in 1969 were from reported outbreaks. This suggests that many outbreaks are never investigated.

Age and Sex Distribution

Of the 15,749 individuals reported by age in 1969, 10,729 (68.1 percent) were less than 20 years of age. This is almost the same proportion as in 1968. The number of isolations per 100,000 population in various age groups in 1969 closely approximates those for the years 1963 through 1968. However, the rates in the age group less than 10 appear to be increasing over the past 6 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, 84, and 97, respectively, for the years 1963 through 1969 (Figure 4 and Table IV).

Salmonella Outbreaks Reported in the Salmonella Surveillance Reports - 1969

Vehicle of Infection	Number Persons Ill	Location	Serotype
Turkey	11	Home	<u>S. infantis</u>
Turkey	28	Banquet	<u>S. infantis</u>
Turkey	~ 500	Banquet	<u>S. panama</u>
Chicken	24	Home	<u>S. berta</u>
Beef	33	Banquet	<u>S. welikada</u>
Spaghetti and Meatballs	13	Banquet	<u>S. typhi-murium</u>
Muktuk	103	Community	<u>S. enteritidis</u>
Unknown Food	38	Girls' Camp	<u>S. enteritidis</u>
Unknown Food	128	Catered Parties	<u>S. san-diego</u>
Human Carrier	4	Restaurant	<u>S. typhi</u>
Contact Spread	11	Hospital Pediat. Ward	<u>S. indiana</u>
Undetermined*	13	Nursing Home	<u>S. infantis</u>
Undetermined*	9	Hospital	<u>S. infantis</u>
Undetermined*	10	Hospital Nursery	<u>S. infantis</u>
Undetermined*	7	Hospital Nursery	<u>S. infantis</u>
Undetermined*	87	Hospital	<u>S. infantis</u>
Pet Dog	1	Home	<u>S. heidelberg</u>
Pet Turtle	1	Home	<u>S. java</u>
Pet Turtle	2	Home	<u>S. java</u>
TOTALS: Outbreaks	19		
Cases	1,023		

*Reported in detail in Salmonella Surveillance Report No. 87.

Of the 21,137 individuals for whom sex was reported during 1969, 10,663 (50.4 percent) were males, and 10,474 (49.6 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 6 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. The following table presents this age-sex distribution of the 15,701 individuals for whom both age and sex were reported in 1969.

Age (Years)	Male		Female		Total
	Number	Percent	Number	Percent	
Less than 20	5,786	54.1	4,904	45.9	10,690
20 and over	<u>2,111</u>	<u>42.1</u>	<u>2,900</u>	<u>57.9</u>	<u>5,011</u>
TOTAL	7,897	50.3	7,804	49.7	15,701

(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. Although no deaths occurred in the 19 outbreaks reported in the Salmonella Surveillance Reports in 1969, 53 deaths were reported among 19,138 persons involved in 219 outbreaks in the years 1962 - 1968, giving a case fatality ratio of .28 percent.

Uncommon and Rare Serotypes

One hundred twenty-five serotypes are classified as uncommon or rare (Table II). Eighty-three serotypes, representing 50 percent of the 165 reported serotypes had five or less isolations each, accounting for only 153 (0.7 percent) of the 21,413 isolations reported during 1969.

Typhoid Fever - Cases and Carriers

Of 549 isolations of S. typhi reported in 1969, 92 were from cases of typhoid fever and 158 from asymptomatic carriers; for the remaining 299, the clinical classification was not reported. The sex distribution of typhoid cases showed no significant sex predilection (F:M = 1.04:1); however, for carriers, females predominated (F:M = 3.65:1). Most cases occurred in the younger age groups, with 74.3 percent of cases occurring in persons less than 30 years of age. In contrast, most carriers were in the older age groups, with 85.7 percent 50 years of age or older.

B. NONHUMAN

In 1969, 9,453 salmonella isolations from nonhuman sources were reported (Tables V, VI, VII, and VIII). This represents a 6.5 percent increase over the 8,877 isolations reported in 1968. 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 44 percent of the foodborne outbreaks reported in 1969, accounted for 40.0 percent of all nonhuman isolations. Swine and cattle accounted for 21.2 percent of all nonhuman recoveries, and dried milk and other human food for 6.4 percent.

Isolations from animal feedstuffs accounted for 20.7 percent of nonhuman isolations during 1969. This reflects continued interest in the surveillance of animal feeds.

The 10 most common salmonella serotypes isolated from nonhuman sources during 1969 are listed in the table on page 2. These 10 serotypes accounted for 58.4 percent of all nonhuman isolates.

Sources (Table VI)

Domestic Fowl and Their Products

In 1969, there were 3,500 isolations (37.0 percent of nonhuman isolations) from domestic fowl and 279 isolations (3.0 percent) from eggs and egg products. Salmonella typhi-murium including var. copenhagen replaced S. heidelberg as the most common serotype isolated from chickens, with 298 isolations (19.0 percent of the isolations from that source), and was followed by S. heidelberg with 285 (18.2 percent), S. thompson with 159 (10.1 percent), S. infantis with 113 (7.2 percent), and S. blockley with 106 (6.8 percent).

The five most common serotypes isolated from turkeys were S. heidelberg with 495 isolations (25.6 percent), S. saint-paul with 272 (14.1 percent), S. anatum with 169 (8.7 percent), S. san-diego with 128 (6.6 percent), and S. typhi-murium including var. copenhagen with 101 (5.2 percent).

The five most common serotypes isolated from eggs and egg products were S. thompson with 39 isolations (14.0 percent), S. montevideo with 32 (11.5 percent), S. heidelberg with 24 (8.6 percent), S. infantis with 22 (7.9 percent), and S. senftenberg with 21 (7.5 percent). Whole eggs accounted for only 27 (9.7 percent) of the 279 isolations in this category.

Domestic Animals

In 1969, the five most common serotypes isolated from swine were S. cholerae-suis var. kunzendorf with 677 isolations (47.1 percent), S. typhi-murium including var. copenhagen with 227 (15.8 percent), S. derby with 133 (9.2 percent), S. anatum with 62 (4.3 percent), and S. heidelberg with 43 (3.0 percent). The 1,438 total isolations from swine represent an increase of 80.2 percent from the 798 isolations reported in 1968. Most of this increase was probably due to increased laboratory surveillance for S. cholerae-suis var. kunzendorf which requires atypical isolation techniques.

The five most common serotypes isolated from cattle in 1969 were S. typhi-murium including var. copenhagen with 343 isolations (60.6 percent), S. dublin with 121 (21.4 percent), S. newport with 21 (3.7 percent), S. saint-paul with 16 (2.8 percent),

and S. heidelberg with 9 (1.6 percent). S. dublin, a host adapted serotype in cattle, accounted for 4.3 percent of bovine isolations in 1967 and for 14.5 percent of the isolations in 1968.

Reptiles and Their Environment

In 1969, there were 270 salmonella isolations (2.9 percent of nonhuman isolations) from reptiles and their environment. Turtles and turtle water, which accounted for 241 (89.3 percent) of the reptile recoveries, constituted a significant source of infection to children keeping these animals as pets. The most common serotypes isolated from reptiles were S. newport with 35 isolations (13.0 percent), S. urbana with 31 isolations (11.5 percent), S. typhi-murium with 21 isolations (7.8 percent), S. java with 16 isolations (5.9 percent), and S. muenchen and S. saint-paul with 12 isolations each (4.4 percent).

Animal Feed and Feed Ingredients

In 1969, there were 1,953 salmonella isolations (20.7 percent of nonhuman isolations) reported from animal feed and feed ingredients as compared with 2,055 isolations (23.1 percent) during 1968. Of the 1,953 salmonella isolations, only one was obtained from vegetable protein supplements. The most common serotypes isolated from animal feeds were S. anatum with 182 isolations (9.3 percent), S. montevideo with 159 (8.1 percent), S. livingstone with 127 (6.5 percent), S. senftenberg with 98 (5.0 percent), and S. kentucky with 96 (4.9 percent).

V. SPECIAL REPORTS

Summary of Salmonella Isolations from Humans, 1963-1969

During the 7-year period 1963-1969, 276 different salmonella serotypes have been recovered from humans. Sixty-seven of these serotypes were isolated only once during the 7 years. A list of the reported serotypes with the numbers of isolations per year is presented in Table IX.

Several interesting patterns are apparent. S. enteritidis isolations steadily increased in frequency from 801 in 1963 to 1,988 in 1969. The number of S. thompson isolations more than tripled in the same time period. On the other hand, the frequency of S. oranienburg isolations has decreased by 55 percent since 1965. The frequency of S. derby isolations has remained at relatively low levels since reaching a peak of 2,360 in 1964.

TABLE I. COMMON SALMONELLAE REPORTED FROM HUMAN SOURCES DURING 1969

SERO TYPE	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	OH	IND	ILL	MIC	WIS	MIN	IOU	MO	ND	SD	NEB	KAN	DEL	MD	DC	VA	WVA	NC	SC	GA	FLA	
<i>anatum</i>				6	1	5	2		10	1	7		4	1	10	5		1					3	1	5	1	5		4		15	27	
<i>bareilly</i>	1			2				1	4	1	4			2	4			1	1					6	2	1	5		6			9	
<i>blockley</i>	1		1	48	8	15	2	14	22	9	28	23	6	33	8	16	8	4	10	2	2			3	7	6	13	2	6	1	28	23	
<i>braenderup</i>				21	1	6		3	5	4	2	1		1	4	2		1	2			2									3	5	
<i>bredeney</i>				2		1		3	12	3	3	4	1	7	5	1	1		1			1		1	12	1	2		9		4	21	
<i>chester</i>				6					2	1	2			1	2	2	3	2	2	1								1		1		3	
<i>cholerae-suis v kun</i>						1							2	3	3		1								1		1					1	
<i>cubana</i>			1	16	2	5	1	2		2	7	5	5	18	11	4	5		3			2		2	1		6		1		5	16	
<i>derby</i>				12		3	1	7	18	6	34	8	5	43	8	2	2		3			1		1	2	17	6	5		2	11	9	
<i>enteritidis</i>			16	395	18	33	5	84	130	65	162	57	21	148	38	53	48	5	29	5	4		21	6	60	19	20	8	26		64	57	
<i>give</i>				4				1	1	3	7		1	3		1								1			2		9		1	6	
<i>heidelberg</i>	8		1	98	12	43	2	39	71	37	104	44	34	121	78	15	21	1	19	4	1		13	4	48	17	40		33		59	65	
<i>indiana</i>						3		2	3	2	1		1	5	3	1	1									2	1	5		1		44	9
<i>infantis</i>	2		4	84	5	62		28	31	30	31	44	46	75	19	30	16	1	16	2		3	15	3	33	5	32	2	8	1	30	65	
<i>java</i>	2					7		1	4	3	2	1		23		3	7	3	3	1			3		3		2		1		10	26	
<i>javana</i>				5		1			1	1	1	10	2	6	4	2	1		3				14		1		5		1	1	37	178	
<i>litchfield</i>				8		6	1	4	4		6	2		9	4		2				1				11		4		12		9	19	
<i>livingstone</i>									3	1	1								1					1								1	
<i>manhattan</i>				4	2	4		3	16	3	17	14	2	21	7	12	7	1	2						12	3	12		7	1	11	14	
<i>miami</i>				1		1		1	2		2														1	2			2	1	3	86	
<i>mississippi</i>						1					1																				15		
<i>montevideo</i>				29	5	3		10	11	8	15	10	3	16	2	4	2		5	1			6	1	7		6		3		17	22	
<i>muenchen</i>				14	1		3	17	25	4	7	9		15	7	9	2		1	1	1		2		5	3	5	2	2		12	35	
<i>newington</i>			1	2		2		1	1		5			3		1			3				1		1		1				2	2	
<i>newport</i>				40	9	40		21	33	29	25	36	12	121	33	54	6	17	16	2			25	3	21		16		31	1	56	263	
<i>oranienburg</i>				13	4	6		6	19	4	4	10		7	9	5	8	1	6	2	3		2	1	4		2		1		25	14	
<i>panama</i>				11		3	2	4	8	8	50	1		13	15	5		12	2	1					2	1	3		8		5	2	
<i>paratyphi B</i>				41			1	4	5			9	4	7	16	1	1		2					1	7	1	8		1	2		11	
<i>reading</i>				13		3			1		6			2					1						2				1	4		2	4
<i>saint-paul</i>			3	44	2	15	1	37	63	35	49	41	6	69	40	32	8	5	11	1	1		4	7	46	3	21		36	1	30	136	
<i>san-diego</i>				7					4	3	2			6	1	4			1					1		1	1		4		3	3	
<i>schwarzengrund</i>				3		4		1	1				9	9	2	1	4		2								3		11		3		
<i>senftenberg</i>	1		1	17		1		1	2	1	1	1		3	1	6								1	5	1		1	1		4	6	
<i>tennessee</i>				1		3			2	3	1	3		4	1	2			2				2	2							1	3	
<i>thompson</i>	90	2	1	148	3	12	1	20	40	25	12	36	6	56	32	55	16	2	7	1	1		15	2	20	4	26	10	45	2	31	46	
<i>typhi</i>	3			19	3	15	7	9	14	4	9	22	4	24	9	1	4		21				2		19	2	2	7	25		12	49	
<i>typhimurium</i>	30		39	451	51	119	9	188	328	135	327	188	88	373	223	191	93	40	86	7	9	8	57	15	123	38	125	11	83	15	162	270	
<i>typhimurium v cop</i>	4			61		31				18	1			4	41			12		3	1		1						13				
<i>welltevreden</i>										2	1			1																			
<i>worthington</i>				4								1	3				1						2								3	1	
TOTAL	142	2	68	1630	127	454	38	512	896	451	937	580	265	1263	640	520	268	109	261	33	24	12	194	61	478	116	379	44	397	26	720	1507	
ALL OTHER *	—	84	14	51	22	15	341	17	67	28	41	26	7	52	30	20	13	24	12	12	—	2	6	2	28	92	19	3	46	17	47	143	
TOTAL	142	86	82	1681	149	469	379	529	963	479	978	606	272	1315	670	540	281	133	273	45	24	14	200	63	506	208	398	47	443	43	767	1650	

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

* See Table II.

TABLE I - Continued

GEOGRAPHIC DIVISION AND REPORTING CENTER																					1969 TOTAL	% OF 1969 TOTAL	1968 TOTAL	% OF 1968 TOTAL	SERO TYPE
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		3			5						2		3	1		7	2	25		8	182	0.8	209	1.1	anatum
1		1		1	5	1	10										3			2	74	0.3	95	0.5	bareilly
4	6	5	1	2	17	2	24	1			10			3		1	4	64	1	11	505	2.4	487	2.5	blockley
					3		1									1		7		3	78	0.4	139	0.7	braenderup
					2		5										2	16		11	130	0.6	172	0.9	bredeney
		1			2						2		1	2			1	11			52	0.2	58	0.3	chester
	1				1																15	0.1	29	0.1	cholerae-suis v kun
1		1			2		5				7		1					10			145	0.7	59	0.3	cubana
1	6		1		19	1	7				4		2	1	1	6		60		21	335	1.6	411	2.1	derby
7	24	7	2	1	9	7	24	12	5		13			9	1	36	14	95	74	51	1,988	9.3	1,740	8.8	enteritidis
		1			14						1							12		6	74	0.3	65	0.3	give
5	39	23	1	7	57	2	30	1	2		5		40	8		32	4	119		21	1,428	6.7	1,326	6.7	heidelberg
1	1	7																			93	0.4	84	0.4	indiana
7	46	19		1	64	6	50	6	5		20		6	5		21	5	97	1	14	1,096	5.1	945	4.8	infantis
	2	5		2	10						1		1	2			6	38	1		173	0.8	199	1.0	java
		5	5	14	36	3	109						2					16	1		465	2.2	518	2.6	javana
	2	5	1		6		3						2					3			124	0.6	93	0.5	litchfield
					1	1					2							17		6	35	0.2	44	0.2	livingstone
2	5	1		1	6		4				2		1	1	1	2	1	41		10	253	1.2	200	1.0	manhattan
1		2																1			106	0.5	118	0.6	miami
	1	3			20		3										1				45	0.2	50	0.3	mississippi
2	5	1		3	27	4	23				2		13	1			3	39	2	3	314	1.5	271	1.4	montevideo
	1	7			10		10				1		2	1			2	25		1	242	1.1	211	1.1	muenchen
1																		4		1	32	0.2	44	0.2	newington
4	28	17	1	51	102	11	242	1	1	1	25		12		1	7	4	179		14	1,611	7.5	1,248	6.3	newport
	1	8		1	17	4	25		1		3		3	2		1	1	43			266	1.2	295	1.5	oranienburg
2	3	2		1	4	2	33		1				3			24	2	36		62	331	1.6	230	1.2	panama
	3			1	1	1	21		1		2		1			7	1	5			166	0.8	114	0.6	paratyphi B
2							1				1		2			16	2	5			68	0.3	74	0.4	reading
4	5	17		2	17	1	68	2			4		3	3		10	9	86	1	7	986	4.6	1,143	5.8	saint-paul
1	1	1		1	2						1		1			1	2	66			118	0.6	106	0.5	san-diego
1	1	4									3		1	2	1		3	19		1	89	0.4	55	0.3	schwarzengrund
		6			2		4				1			1		2	1	5		1	78	0.4	65	0.3	senftenberg
	*1	1			4		1										1	2		3	43	0.2	85	0.4	tennessee
11	19	34		5	59	6	30	3	4		6			3		11	2	83	2	11	1,056	4.9	673	3.4	thompson
12	21			21	17	7	26	1		1		11	5			5	12	110	2	12	549	2.6	609	3.1	typhi
36	61	57	11	22	113	24	172	27	34	3	78		28	19	3	78	40	728	5	93	5,514	25.8	5,147	26.1	typhimurium
	15		1	5	23		1	2	6				2		1	1	11		1		259	1.2	316	1.6	typhimurium v cop
																				50	0.3	78	0.4	weltevreden	
	1	1					5						1	1		1		7		3	35	0.2	22	0.1	worthington
108	300	244	24	142	677	83	937	56	60	5	196	11	136	65	9	270	139	2074	91	426	19,207	89.7	17,827	90.3	TOTAL
1	11	16	73	41	60	5	230	12	2	3	8	175	16	—	9	35	15	165	21	27	2,206	X	1,913	X	ALL OTHER *
109	311	260	97	183	737	88	1167	68	62	8	204	186	152	65	18	305	154	2239	112	453	21,413				19,740

TABLE II - Continued

[illegible]

TABLE III. SALMONELLAE REPORTED BY GROUP IDENTIFICATION ONLY
FROM HUMAN SOURCES DURING 1969

REPORTING CENTER	GROUP															TOTAL
	A	B	C	C1	C2	D	E	E1	G	H	I	O	V	O58	UNK	
ALABAMA		1													1	2
ALASKA		10		1	1	5				1					3	21
ARKANSAS		5		5	6	3			2						2	23
CALIFORNIA		29		1		1		1	1			2	1	1	9	46
COLORADO		1														1
CONNECTICUT				1	1										1	3
DISTRICT OF COLUMBIA		48		6	5	18	1								9	87
FLORIDA		6				2									4	12
GEORGIA															2	2
HAWAII															1	1
ILLINOIS		3													6	9
INDIANA		1			1										1	3
IOWA		15		2	2										2	21
LOUISIANA					2										1	3
MASSACHUSETTS		4				2									4	10
MICHIGAN		3				1			1						2	7
MINNESOTA															3	3
MISSISSIPPI		34	3	6	14	8	1		4						2	72
MISSOURI		1														1
MONTANA		1				1									2	4
NEBRASKA									1							1
NEVADA		6			1		1									8
NEW HAMPSHIRE		46		8	1	23	1								4	83
NEW MEXICO	2	58		39	50	15	3		5	3						175
NEW YORK - A															339	339
NEW YORK - BI		1													1	2
NEW YORK - C	1	15	4			3	1								10	34
NORTH CAROLINA		1		9	11										2	23
NORTH DAKOTA															10	10
OREGON		3				2			1						2	8
RHODE ISLAND		10		4	3	1	2								2	22
SOUTH CAROLINA		3		1	3	1						1			6	15
TEXAS		23		16	27	11	6		2		1				57	143
VERMONT		6	1			1									2	10
WASHINGTON															3	3
WEST VIRGINIA			1													1
WISCONSIN		6													3	9
WYOMING			1												2	3
TOTAL	3	340	10	99	128	98	16	1	17	4	1	3	1	1	498	1220

TABLE IV. AGE AND SEX DISTRIBUTION OF INDIVIDUALS FROM WHOM ISOLATIONS OF
SALMONELLAE WERE REPORTED DURING 1969

AGE (YEARS)	MALE	FEMALE	UNKNOWN	TOTAL	PERCENT	CUMULATIVE PERCENT
< 1	1,786	1,591	28	3,405	21.6	21.6
1-4	2,161	1,753	8	3,922	24.9	46.5
5-9	954	798	1	1,753	11.1	57.6
10-19	885	762	2	1,649	10.5	68.1
20-29	574	836	1	1,411	8.9	77.0
30-39	371	489	2	862	5.5	82.5
40-49	297	437	2	736	4.7	87.2
50-59	332	395	3	730	4.6	91.8
60-69	253	334	0	587	3.7	96.5
70-79	188	260	1	449	2.9	98.4
> 79	96	149	0	245	1.6	100.0
SUBTOTAL	7,897	7,804	48	15,749		
CHILD (UNSPECIFIED)	105	90	26	221		
ADULT (UNSPECIFIED)	74	113	8	195		
UNKNOWN	2,587	2,467	194	5,248		
TOTAL	10,663	10,474	276	21,413		
PERCENT	50.4	49.9				

TABLE V. COMMON SALMONELLAE REPORTED FROM NONHUMAN SOURCES (BY STATE) DURING 1969

SERO TYPE	GEOGRAPHIC DIVISION AND REPORTING CENTER																													
	NEW ENGLAND					MIDDLE ATLANTIC			E. NORTH CENTRAL					W. NORTH CENTRAL					SOUTH ATLANTIC											
	ME	NH	VT	MA	RI	CON	NY	NJ	PA	OH	IND	ILL	MIC	WIS	MIN	IOW	MO	ND	SD	NEB	KAN	DEL	MD	DC	VA	WVA	NC	SC	GA	FLA
<i>anatum</i>		1		3		11	1	3		1	13	15	8	7	152	1	6				5		6		2		6	8	10	5
<i>bareilly</i>							1		1		4	2	3	1	3								2		2					
<i>blockley</i>				2		5			3		16			2	10		4					6	8		1		1	3	33	4
<i>braenderup</i>				2				1									1												1	
<i>bredeney</i>				1		1	2	1	2		4	5	15		22		1						1						1	2
<i>chester</i>												2		2	23	1	3						3					2		
<i>cholerae-suis kun</i>								6	2	31	169	25	2		2	3	2		2	1	1	1	21	1	1		126	93		2
<i>cubana</i>						1	13	10	2	4	2	1	4	1	30	1	2			11		3			1		1	2	2	
<i>derby</i>				1		1		1	2	5	12	5	9	8	9	2	3					3	3				1	3	17	3
<i>enteritidis</i>		3		5	3			1	6		13	8		3	20	1						4	1				6	2	27	2
<i>give</i>										2		1	8		3		2						1				3	2		1
<i>heidelberg</i>				10		3	1	3	1	6	19	7	10	88	157	8	11			11	11	26		6			24	3	110	6
<i>indiana</i>										2	9		1									3							2	
<i>infantis</i>		1		3	1	15			3	4	8	20	11	8	15		13		3		3	1	3				2	2	32	4
<i>java</i>						3			1			4		1	1															1
<i>javiana</i>				1	1	1							1							1										2
<i>litchfield</i>									2				1																	1
<i>livingstone</i>						2		1		9			58	6			1										1			
<i>manhattan</i>											2		1		4									2			1	6	1	
<i>miami</i>				1		1							1																	4
<i>mississippi</i>																														
<i>montevideo</i>						3	6	5	5	4	5	38	6	4	75	1	12		2		2	2	27		1			2	15	3
<i>muenchen</i>				6		1	4				6	6	1		1												1			2
<i>newington</i>				1		1		3			1	2		2	8					1					1			1		1
<i>newport</i>				1		8		2	2	3	5	5	12	1	5	1	2		1	2	4	1		1		1	1	1		8
<i>oranienburg</i>						4	3	8	2	8	1	5	6	2	16		14						3					1	3	5
<i>panama</i>								1	1														2					1		
<i>paratyphi B</i>													1										1							
<i>reading</i>				3						1	1	9		1	11	2			1									1		1
<i>saint-paul</i>				13		2		1		4	16	10	9	66	79	4			5		2	15	10		1		6	7	32	2
<i>san-diego</i>				1							2	3	1	1	81		3										2			1
<i>schwarzengrund</i>						1			1	1		3	1	2	8		1		2											
<i>senftenberg</i>			1			5	11	10	2	4	4	5	3	4	112		1	1		30	4	6		6				8	4	
<i>tennessee</i>				1				3		1		12	1	1	70		7	1				1	23					3		
<i>thompson</i>				2		11		1	10	1	11	6	5	3	5		9			1	6	13			1	6	1	44	8	
<i>typhi</i>															1															
<i>typhimurium</i>		5		12		18	1	10	12	23	65	39	71	38	99	21	12	3	3	18	13	3	14		2	1	16	13	16	15
<i>typhimurium cop</i>		1		8		8	1	7	6		19	4	17	1	4	1	1					9	11				3	6	48	
<i>weltevreden</i>																														
<i>worthington</i>				5		1	5		3	3	29		4	1	13		1				4		3				2	3	5	5
TOTAL	-	11	1	82	5	107	49	78	69	117	436	242	271	254	1039	47	112	3	19	22	89	67	194	1	27	2	211	155	417	101
ALL OTHER	-	4	-	23	1	29	37	32	17	37	41	69	104	18	275	1	52	1	3	7	23	49	108	-	23	8	12	8	50	54
TOTAL	-	15	1	105	6	136	86	110	86	154	477	311	375	272	1314	48	164	4	22	29	112	116	302	1	50	10	223	163	467	155

TABLE V - Continued

GEOGRAPHIC DIVISION AND REPORTING CENTER																					1969 TOTAL	1968 TOTAL	SERO TYPE
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	2	11		17			30				1	1	1	115		3	9	45		32	534	487	<i>anatum</i>
1	2	2	2															1		4	31	35	<i>bareilly</i>
		13	2	16			3							2		4	10	15		4	167	229	<i>blockley</i>
							2														7	25	<i>braenderup</i>
			3	1		3	8					1	1	57		2		17		15	174	132	<i>bredeney</i>
		1					2											4		2	45	44	<i>chester</i>
43	41	3	31	23	5	12	25						1					6			680	201	<i>cholerae-suis kun</i>
1		1	1	1	1	4	1							2				10		1	114	269	<i>cubana</i>
5	1	4	8	4	8	3	20			1	1	1	4	10		1	1	43		42	245	295	<i>derby</i>
		7	2	4							2			7		7	1	8	1	2	146	148	<i>enteritidis</i>
			1	1	1		2										5	10		1	44	56	<i>give</i>
	4	77	12	33	1		7					1	1	199		5	9	88		8	966	691	<i>heidelberg</i>
																					17	17	<i>indiana</i>
3	3	4	3	18			14		3			1		26		9	8	31		4	279	421	<i>infantis</i>
	2						1										4	2			20	26	<i>java</i>
			1				9											2			19	12	<i>javana</i>
		1					2						1					1			9	3	<i>litchfield</i>
							2	1						16		1		52		17	167	144	<i>livingstone</i>
1		4		3			1									2		19		15	62	33	<i>manhattan</i>
	1																				8	12	<i>miami</i>
	1																						
1		5	14				7					3		20				34		2	—	2	<i>mississippi</i>
2							11							2		1		7			304	448	<i>montevideo</i>
	1	1					5							6			1	11		15	51	95	<i>muenchen</i>
	2		2	9	1	2	29				1	1	4	2		2	4	31		4	62	111	<i>newington</i>
																					160	190	<i>newport</i>
1			2				7		1									10			102	157	<i>oranienburg</i>
							6										2	5		10	30	64	<i>panama</i>
					3		1										4	1			11	7	<i>paratyphi B</i>
1				1										3		10	1	21			68	25	<i>reading</i>
6		5	2	6	2		47		1					23		10	17	46		14	463	392	<i>saint-paul</i>
				8			5							23			8	48			187	48	<i>san-diego</i>
		2		2			2							16				18		4	64	85	<i>schwarzengrund</i>
1		3	4		2		10		1			1		3				9		2	257	311	<i>senftenberg</i>
1		3		1			1					5		10		1		11		1	158	173	<i>tennessee</i>
2	3	34	18	21	8	3	5		1					26		7	6	35		2	315	301	<i>thompson</i>
55	5	37	6	35	8	10	27	4	6	1	4	1	8	2		28	13	351		60	1204	1062	<i>typhi</i>
5	2	9	6	39	2	1	7	1	3		1	1		1	1	7	16	15			272	295	<i>typhimurium</i>
																				3	3	10	<i>typhimurium cop</i>
2		4	1	1			4					2		39			1	11		5	157	130	<i>weltevreden</i>
																							<i>worthington</i>
133	70	231	121	244	39	41	303	6	16	2	10	19	21	610	1	106	114	1018	1	269	7603	7186	TOTAL
10	4	61	41	22	4	2	90	—	12	2	—	9	5	162	4	25	19	268	1	23	1850	1691	ALL OTHER
143	74	292	162	266	43	43	393	6	28	4	10	28	26	772	5	131	133	1286	2	292	9453	8877	TOTAL

TABLE VI. COMMON SALMONELLAE REPORTED FROM NONHUMAN SOURCES (BY CATEGORY) DURING 1969

SERO TYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
<i>anatum</i>	36	169	62	7	5	9	288	179		3	182
<i>bareilly</i>	2		4	1		3	10	17			17
<i>blockley</i>	106	22	9	1		2	140	5		1	6
<i>braenderup</i>			1				1			1	1
<i>bredeney</i>	8	60	26	4	6	11	115	39		7	46
<i>chester</i>	1	33				1	35	3			3
<i>cholerae-suis v kun</i>			677		2		679				—
<i>cubana</i>	2	5	2			1	10	59		17	76
<i>derby</i>	6	26	133	2	1	6	174	27		15	42
<i>enteritidis</i>	73	12	11	2	2	18	118	4			4
<i>give</i>	2	12	6	1		3	24	2			2
<i>heidelberg</i>	285	495	43	9	6	6	844	41		6	47
<i>indiana</i>	5					5	10	6			6
<i>infantis</i>	113	38	13	2	2	5	173	33		10	43
<i>java</i>			1			1	2	1			1
<i>javana</i>			2	1		5	8				—
<i>litchfield</i>	1			2			3				—
<i>livingstone</i>	7	12	8			3	30	75		52	127
<i>manhattan</i>	22	8	17	1		3	51	2			2
<i>miami</i>			2			5	7				—
<i>mississippi</i>							—				—
<i>montevideo</i>	37	18	4			10	69	119		40	159
<i>muenchen</i>	4	8	11			1	24	6			6
<i>newington</i>	6	6	18		6	2	38	10			10
<i>newport</i>	9	23	18	21	4	17	92	4		1	5
<i>oranienburg</i>	5	5	2	1	5	1	19	31		13	44
<i>panama</i>		9	10			5	24	1			1
<i>paratyphi B</i>							—	2			2
<i>reading</i>	3	52	1		1	3	60	2		1	3
<i>saint-paul</i>	87	272	13	16	4	12	404	9		3	12
<i>san-diego</i>	2	128		1		4	135	42			42
<i>schwarzengrund</i>	5	28	2			3	38	14		8	22
<i>senftenberg</i>	18	97	5			1	121	55		43	98
<i>tennessee</i>	12	33	2				47	56		12	68
<i>thompson</i>	159	28	15	3		7	212	21		3	24
<i>typhi</i>							—				—
<i>typhimurium</i>	159	89	205	319	92	105	969	24		11	35
<i>typhimurium v cop</i>	139	12	22	24	9	41	247	3			3
<i>weltevreden</i>			1			2	3				—
<i>worthington</i>	36	47	4	1		1	89	45		8	53
TOTAL	1350	1747	1350	419	145	302	5313	937	—	255	1192
ALL OTHER *	218	185	88	147	10	67	715	593	1	167	761
TOTAL	1568	1932	1438	566	155	369	6028	1530	1	422	1953

* See Table VII

TABLE VI - Continued

WILD ANIMALS AND BIRDS	REPTILES AND ENVIRON- MENT	HUMAN DIETARY ITEMS						MISCEL- LA- NEOUS	1969 TOTAL	1968 TOTAL	SEROTYPE
		EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL				
3	3	12		2	1	3	18	40	534	487	<i>anatum</i>
	2	1					1	1	31	35	<i>bareilly</i>
		2	5	3		3	13	8	167	229	<i>blockley</i>
	1	3				1	4		7	25	<i>braenderup</i>
1	2	5				2	7	3	174	132	<i>bredeney</i>
		3		2			5	2	45	44	<i>chester</i>
							—	1	680	201	<i>cholerae-suis v kun</i>
2					15	11	26		114	269	<i>cubana</i>
2		2		7	1	10	20	7	245	295	<i>derby</i>
9	2	7		1			8	5	146	148	<i>enteritidis</i>
10		1	1	4			6	2	44	56	<i>give</i>
10	3	24	1	1		1	27	35	966	691	<i>heidelberg</i>
1							—		17	17	<i>indiana</i>
5	4	22	3	1		7	33	21	279	421	<i>infantis</i>
	16						—	1	20	26	<i>java</i>
	5					6	6		19	12	<i>javana</i>
	6						—		9	3	<i>litchfield</i>
		3		2			5	5	167	144	<i>livingstone</i>
4	5						—		62	33	<i>manhattan</i>
	1						—		8	12	<i>miami</i>
							—		—	2	<i>mississippi</i>
2	3	32	1		1	17	51	20	304	448	<i>montevideo</i>
2	12	5				1	6	1	51	95	<i>muenchen</i>
	1				1	8	9	4	62	111	<i>newington</i>
5	35	5	1			10	16	7	160	190	<i>newport</i>
2	4	12		1	1	15	29	4	102	157	<i>oranienburg</i>
2	1						—	2	30	64	<i>panama</i>
	8						—	1	11	7	<i>paratyphi B</i>
	2		1				1	2	68	25	<i>reading</i>
7	12	3	7			2	12	16	463	392	<i>saint-paul</i>
	2	1	1	2		2	6	2	187	48	<i>san-diego</i>
		1				1	2	2	64	85	<i>schwarzengrund</i>
2		21			2		23	13	257	311	<i>senftenberg</i>
		6	1		6	20	33	10	158	173	<i>tennessee</i>
4	10	39	7		1	10	57	8	315	301	<i>thompson</i>
							—	1	1	—	<i>typhi</i>
92	21	14	1	2	2	5	24	63	1204	1062	<i>typhimurium</i>
14		1					1	7	272	295	<i>typhimurium v cop</i>
							—		3	10	<i>weltevreden</i>
3	6	2			2		4	2	157	130	<i>worthington</i>
182	167	227	30	28	33	135	453	296	7603	7186	TOTAL
35	103	52	9	9	37	41	148	88	1850	1691	ALL OTHER*
217	270	279	39	37	70	176	601	384	9453	8877	TOTAL

TABLE VII. OTHER SALMONELLAE REPORTED FROM NONHUMAN SOURCES (BY CATEGORY) DURING 1969

SERO TYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
abertub							1				1
agbeni							3				3
agona		3					3				3
alachua	5	19	3	2			29	20		8	28
alagbon							1				1
alibeny	4	5			1		10	5		1	6
alsterdorf			1				1	2			2
amager	1						1			1	1
amsterdam							1				1
austin							1				1
belem							1				1
bere	2						2				2
bern							1				1
berta	4	2				1	7				7
binza	1	4	3		2		17	46		11	57
bonum							1				1
bovis-morbificans						2	2	11		7	18
california	16	3	2				21	12		7	19
caracas							1				1
carrau							1				1
cerro	2	12	5	1	1	3	24	49		19	68
chameleon							1				1
cholerae-suis			21	1			22				22
christiansborg							1				1
corvallis							1				1
drypool	5	9	2			1	17			1	42
dublin		1		121			121	41			162
dueseldorf							1				1
duval							1				1
eimsbuetfel	16	38	3	2		6	65	67		17	84
flint	1			1		1	1				2
florida	6				2	2	10				18
gallinarum							1				1
gaminara							1				1
getow							1				1
godesberg							1	5			5
good							1	1			2
grumpensis							1	3			3
habana	1					1	2	5		4	9
halmstad							1	1			2
harmelen							1			3	3
hartford	1						1				1
heilbron							1				1
houten						1	1				1
illinois							1	3			3
johannesburg	1	1					2	18		2	20
kasanyi		1					1				1
kentucky	18	28	1			8	55	88		8	96
kentucky-jerusalem							1	1			2
kottbus	4	1	2				7				7
lexington			1			2	3	3		2	5
lille							1	4	1		5
lindenburg					1		1				1
lomita			1				1				1
london		1					1			4	4
madelia				1			1				1
manila							1	3		2	5
marina							1				1
matopeni							1	1			2
meleagridis	1	3	2	1	1		8	5			13
memphis							1				1
michigan							1				1
mikawashima							1				1
minneapolis							1	5		1	6
minnesota	3	14	2	1		3	23	63		7	70
molade							1	4		1	5
muenster							6	3			9
new-brunswick	4	2					2	19			21
ohio			2				2	19			21
orion	2	6					8	13		2	18
oslo						8	8			5	13
paratyphi A							1			6	6
paratyphi C							1			5	5
poona			2				2	1			3
potsdam						2	2				2
pullorum	42	1				1	44				44
putten						1	1				1
roterberg						1	1				1
rubislaw	2						2				2
saphra							1				1
shomron		1					1				1
siegburg	7	4	1				12	16		20	36
simsbury	37	1				3	41	19		1	20
sinstorf		1					1				1
stanley							1				1
suzat							1				1
tekony	1	6	1				8	5			13
thomasville	4	1	1	2			8	17		6	23
treforest	1						1				1
tuindorp							1				1
typhi-suis			12		1		13				13
uganda							1				1
urbana		3		1		1	4	7		1	8
virchow							1				1
wassenaar							1				1
welikada							1				1
westaco							1				1
westersede	4					1	4	1			5
westhampton							1	6			6
zaga							1				1
TOTAL	196	172	68	134	9	58	637	576	1	156	733
NOT TYPED*	22	13	20	13	1	9	78	17	—	11	28
TOTAL	218	185	88	147	10	67	715	593	1	167	761

* See Table VIII.

TABLE VII - Continued

[illegible]

TABLE VIII. SALMONELLAE FROM NONHUMAN SOURCES
REPORTED BY GROUP IDENTIFICATION ONLY DURING 1969

SOURCES	GROUP												TOTAL
	A	B	C1	C2	D	E	G	J	M	O	Z	UNK	
DOMESTIC ANIMALS AND THEIR ENVIRONMENT		14	2		5	2				4		51	78
ANIMAL FEEDS	2	2		1		2	1	1	2		1	16	28
WILD ANIMALS AND BIRDS												2	2
REPTILES AND ENVIRONMENT		1	2			1						9	13
HUMAN DIETARY ITEMS		3	3		1	1						5	13
MISCELLANEOUS			2	1			1					1	5
UNKNOWN													—
TOTAL	2	20	9	2	6	6	2	1	2	4	1	84	139

TABLE IX. SALMONELLA ISOLATIONS FROM HUMAN SOURCES BY SEROTYPE AND YEAR, 1963-1969

SEROTYPE	1963	1964	1965	1966	1967	1968	1969	SEROTYPE	1963	1964	1965	1966	1967	1968	1969
<i>aba</i>							3	<i>bovis-</i>							
<i>abaetetuba</i>	1						1	<i>morbificans</i>	4	7	31	12	6	2	10
<i>aberdeen</i>		1		1		1	1	<i>bradford</i>		2		4	1	2	2
<i>abony</i>	1	1		1				<i>braenderup</i>	56	102	85	111	83	139	78
<i>abortus-bovis</i>				2	2			<i>brancaster</i>		1			1		2
<i>accra</i>						1		<i>brandenburg</i>	4	4	1	2	2	5	4
<i>adelaide</i>		6	1		4	1		<i>bredeley</i>	153	220	160	159	120	172	130
<i>agama</i>				3				<i>bristol</i>		1					
<i>agona</i>					1	1		<i>brunei</i>							1
<i>ahuza</i>						1		<i>bukavu</i>							2
<i>alabama</i>					1	1		<i>businga</i>							1
<i>alachua</i>	10	5	5	6	13	23	15	<i>butantan</i>			1				
<i>albany</i>	3	6	6	14	5	18	16	<i>california</i>	11	31	22	15	16	22	13
<i>albuquerque</i>							1	<i>cambridge</i>	2	1	3		1		1
<i>allandale</i>			1				1	<i>canastota</i>							3
<i>amager</i>	39	10	1	3	2	1	29	<i>caracas</i>		1					
<i>amersfoort</i>						1		<i>carno</i>	1						1
<i>amsterdam</i>		1						<i>carrara</i>	1	3	7	6	3	2	3
<i>anatum</i>	224	279	300	333	297	209	182	<i>cerro</i>	6	9	13	12	9	12	25
<i>ardwick</i>		1						<i>chailey</i>			1	6			
<i>arechavaleta</i>		1		1		1	2	<i>chameleon</i>			1				1
<i>arkansas</i>			1	1			1	<i>champaign</i>			1				
<i>atlanta</i>	11	5	8	19	11	10	15	<i>chester</i>	190	75	115	109	100	58	52
<i>austin</i>				1				<i>chingola</i>			2				
<i>azteca</i>							1	<i>cholerae-suis</i>	20	15	10	10	6	15	12
<i>babelsberg</i>	1							<i>cholerae-suis</i>							
<i>ball</i>				2	1			<i>var kuzendorf</i>	54	31	36	26	20	29	15
<i>banana</i>	1							<i>clabornei</i>					1		1
<i>bareilly</i>	59	99	104	78	81	95	74	<i>clifton</i>	1		1				
<i>belem</i>			1		2		3	<i>coeln</i>						3	1
<i>berlin</i>				2	13	5	2	<i>coleypark</i>				2		2	1
<i>bern</i>						1		<i>colorado</i>	3	2	3	1	3		1
<i>berta</i>	64	48	47	34	37	30	40	<i>concord</i>	1	2		1	2	3	
<i>bilthoven</i>			3					<i>coquilhatville</i>		3					
<i>binza</i>	6	22	20	24	14	6	9	<i>corvallis</i>	2		1	1			
<i>birkenhead</i>		1						<i>cubana</i>	40	63	145	131	66	59	145
<i>blegdam</i>		1	1			1		<i>daytona</i>	3		2	3		1	2
<i>blockley</i>	360	427	401	603	519	487	505	<i>decatun</i>	3	2				1	
<i>bonaire</i>				1			1	<i>degania</i>							1
<i>bonariensis</i>	1	1		1			1	<i>denver</i>		1	1	2	3		
								<i>derby</i>	1,610	2,360	632	404	326	411	335

TABLE IX.—Continued

SEROTYPE	1963	1964	1965	1966	1967	1968	1969	SEROTYPE	1963	1964	1965	1966	1967	1968	1969
<i>drypool</i>				2	1	6	12	<i>halle</i>		1					
<i>dublin</i>	2	3	3	4	8	11	7	<i>halmstad</i>		1			1		
<i>duesseldorf</i>	3	4	5	6	1	3	6	<i>hartford</i>	16	11	22	33	22	16	41
<i>duisberg</i>			1	4	1			<i>hato</i>		1	1				2
<i>durban</i>					2	2		<i>heidelberg</i>	1,533	1,717	1,621	1,622	1,648	1,326	1,428
<i>durham</i>				3	8			<i>heilbron</i>			1		3	1	2
<i>eastbourne</i>		2	4		1	1	5	<i>horsham</i>	1		1				
<i>eimsbuetel</i>			4	17	26	5	33	<i>hvittingfoss</i>	1					1	
<i>elisabethville</i>	1							<i>ibadan</i>				2	2	1	5
<i>elmorane</i>							1	<i>illinois</i>	7	1			1		
<i>emek</i>		1	3		1			<i>indiana</i>	14	54	66	65	49	84	93
<i>enteritidis</i>	801	801	1,065	1,237	1,277	1,740	1,988	<i>infantis</i>	970	1,523	1,145	1,315	980	945	1,096
<i>eppendorf</i>					1			<i>inverness</i>	4		7	2	4	2	6
<i>essen</i>		6	3		4	2	1	<i>irenea</i>					1		
<i>layed</i>	3	3		9	1	1	1	<i>irumu</i>	78	5	23	8	12	2	5
<i>florida</i>		8	2		2	1	2	<i>israel</i>					1		
<i>fresno</i>			1			2		<i>jangwani</i>							1
<i>frintrop</i>					1			<i>java</i>	175	231	199	367	309	199	173
<i>galiema</i>		1		1				<i>javana</i>	168	256	361	312	373	518	465
<i>gallinarum</i>		3		1	1	1	3	<i>johannesburg</i>	2	2	2	1	15	9	9
<i>gaminara</i>	3	3	13	10	7	16	14	<i>kaapstad</i>			2	1	1	4	
<i>garoli</i>				1	1		2	<i>kentucky</i>	63	21	19	38	40	17	30
<i>gatow</i>	1				1	3	2	<i>kintambo</i>						1	
<i>gatuni</i>	1	1	3		1	1	2	<i>kottbus</i>	4	1	9	1	3	5	14
<i>georgia</i>	2	1			3	1	3	<i>kunduchi</i>					2		
<i>give</i>	65	79	116	78	61	65	74	<i>lanka</i>				1		2	1
<i>glostrup</i>			1	2	1	1		<i>larochelle</i>			2				
<i>goettingen</i>		1						<i>lawndale</i>						1	1
<i>good</i>						1		<i>leeuwarden</i>			3				
<i>grumpensis</i>	3	8		2	1	2	3	<i>lexington</i>	2	1	2		3		2
<i>guinea</i>			1					<i>lindenburg</i>	2		2		2	2	2
<i>haarlem</i>					1			<i>litchfield</i>	67	69	96	97	81	93	124
<i>habana</i>	1			3	15	7	15	<i>livingstone</i>	17	15	33	31	55	44	35
<i>hadar</i>						1		<i>llandorff</i>	1					1	
<i>hagenbeck</i>						1		<i>loma-linda</i>	6	5	2	7	6	5	1
<i>haifa</i>	1		1	4				<i>lomita</i>		4	3	2	4	6	15
								<i>london</i>	1	3	1	1	3	1	16
								<i>los angeles</i>							1
								<i>luciana</i>		1	1	1	2	2	

TABLE IX.—Continued

SEROTYPE	1963	1964	1965	1966	1967	1968	1969	SEROTYPE	1963	1964	1965	1966	1967	1968	1969
<i>seremban</i>				2				<i>worthington</i>	34	48	46	44	24	22	35
<i>shipley</i>		1					1								
<i>siegburg</i>		2	16	14	10	8	25	<i>yalding</i>			1				
<i>simsbury</i>	6	6	2	5	4	6	19	<i>zanzibar</i>						1	
<i>singapore</i>					1		1								
<i>soahanina</i>				1				<i>58a</i>							1
<i>solna</i>				1											
<i>stanley</i>	13	9	7	6	7	7	13	<i>Group A</i>	4	6	2	1	1		3
<i>stanleyville</i>							1	<i>Group B</i>	280	276	293	312	493	401	340
<i>stockholm</i>				1			5	<i>Group C</i>					2	13	10
								<i>Group C₁</i>	68	71	91	140	138	58	99
<i>sundsvall</i>	2	1	1	3	1			<i>Group C₂</i>	43	40	57	61	132	72	128
<i>takoradi</i>			3		2			<i>Group D</i>	72	37	47	54	77	70	98
<i>taksony</i>		1	1		1	1		<i>Group E</i>	15	30	50	13	36	9	16
<i>tallahassee</i>	6	3	4	7	6	8	12	<i>Group E₁</i>							1
<i>tamale</i>	1		1					<i>Group E₄</i>						4	
<i>tel-el-kebir</i>							1	<i>Group F</i>					1	2	
<i>tennessee</i>	164	332	173	133	63	85	43	<i>Group G</i>		2	4	6	7	8	17
<i>texas</i>				1				<i>Group H</i>		1		2	9	3	4
<i>thomasville</i>	11	3	3	5	3	1	4	<i>Group I</i>			1		1		1
<i>thompson</i>	321	421	562	579	508	673	1,056	<i>Group J</i>	1						
<i>travis</i>		2						<i>Group K</i>					1		
<i>typhi</i>	706	703	719	654	690	609	549	<i>Group L</i>			1				
<i>typhi-murium</i>	5,435	5,656	6,526	5,744	5,530	5,147	5,514	<i>Group M</i>					1		
<i>typhi-murium</i>								<i>Group O</i>	3	4	9	3	3	3	3
<i>var copenhagen</i>	173	206	203	178	273	316	259	<i>Group V</i>							1
								<i>Group O58</i>							1
<i>uganda</i>		5	2		1	1	1								
<i>urbana</i>	31	25	33	28	18	29	49								
<i>vejle</i>					2										
<i>victoria</i>						2									
<i>virchow</i>	1	4	2	4	4	6	7								
<i>wagenia</i>					1										
<i>wandsworth</i>						1									
<i>wassenaar</i>				2		1	2								
<i>welikada</i>							3								
<i>weltevreden</i>	46	23	35	45	61	78	54								
<i>weslaco</i>	1	1		1			1								
<i>westersfede</i>	1	1	2	6	1			Unknown	88	96	115	81	205	558	498
<i>westhampton</i>	1	1	7	1		3	2								
<i>willemstad</i>						2	2								
<i>worcester</i>					1			TOTAL	18,649	21,113	20,865	20,040	19,723	19,740	21,413

Figure 1 REPORTED HUMAN AND NONHUMAN ISOLATIONS OF SALMONELLAE
UNITED STATES, 1963 - 1969

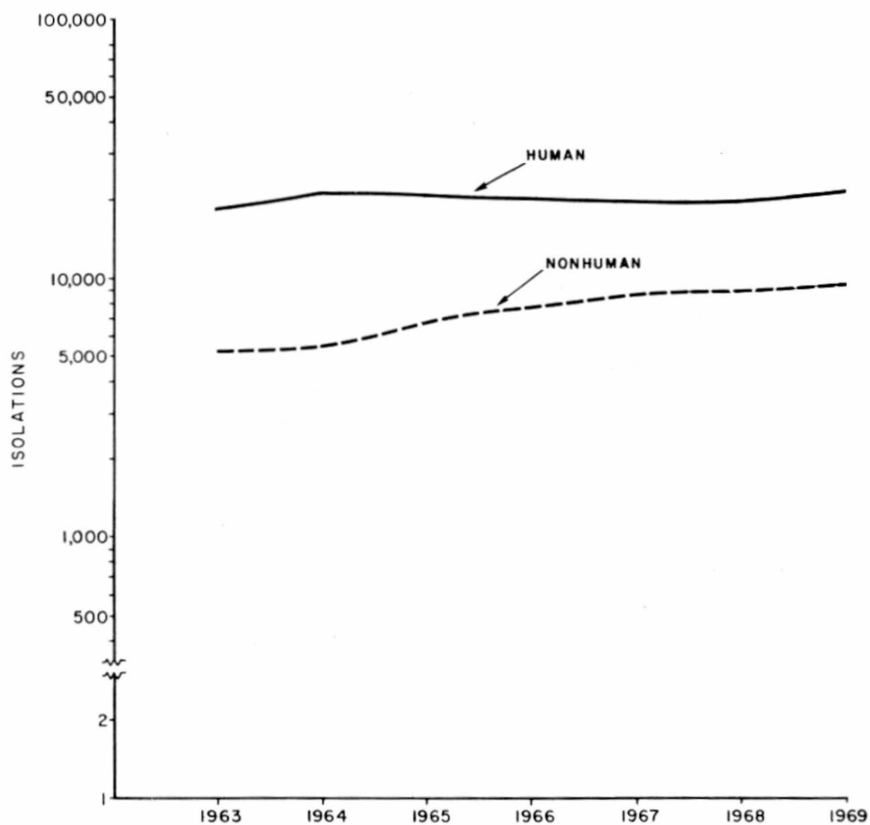


Figure 2 REPORTED HUMAN ISOLATIONS OF SALMONELLAE, UNITED STATES
1965 - 1969

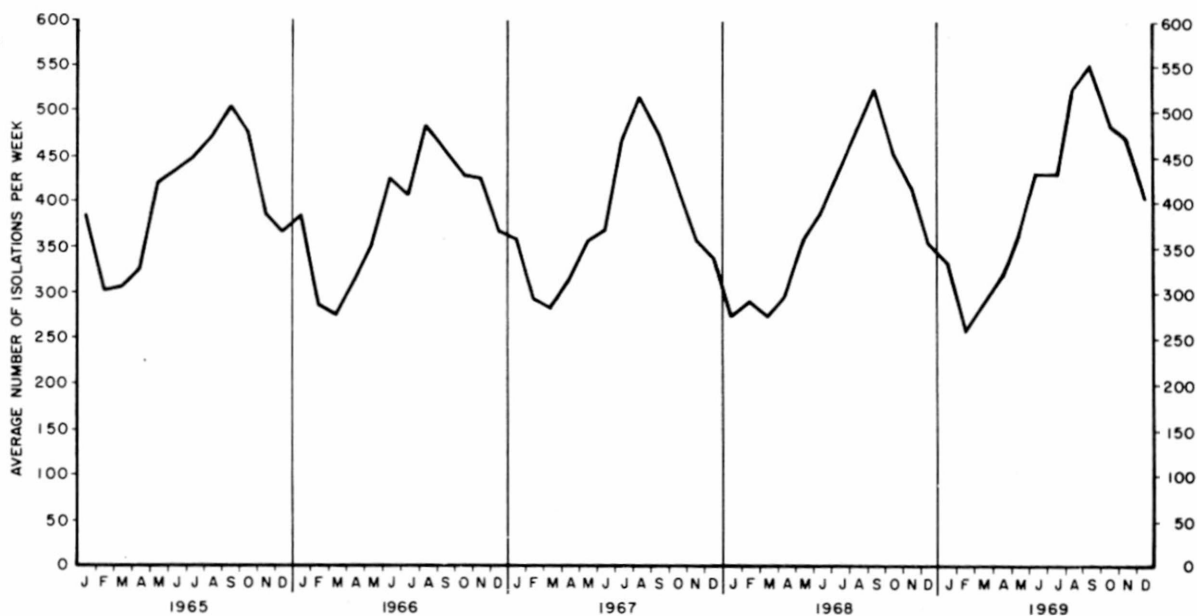
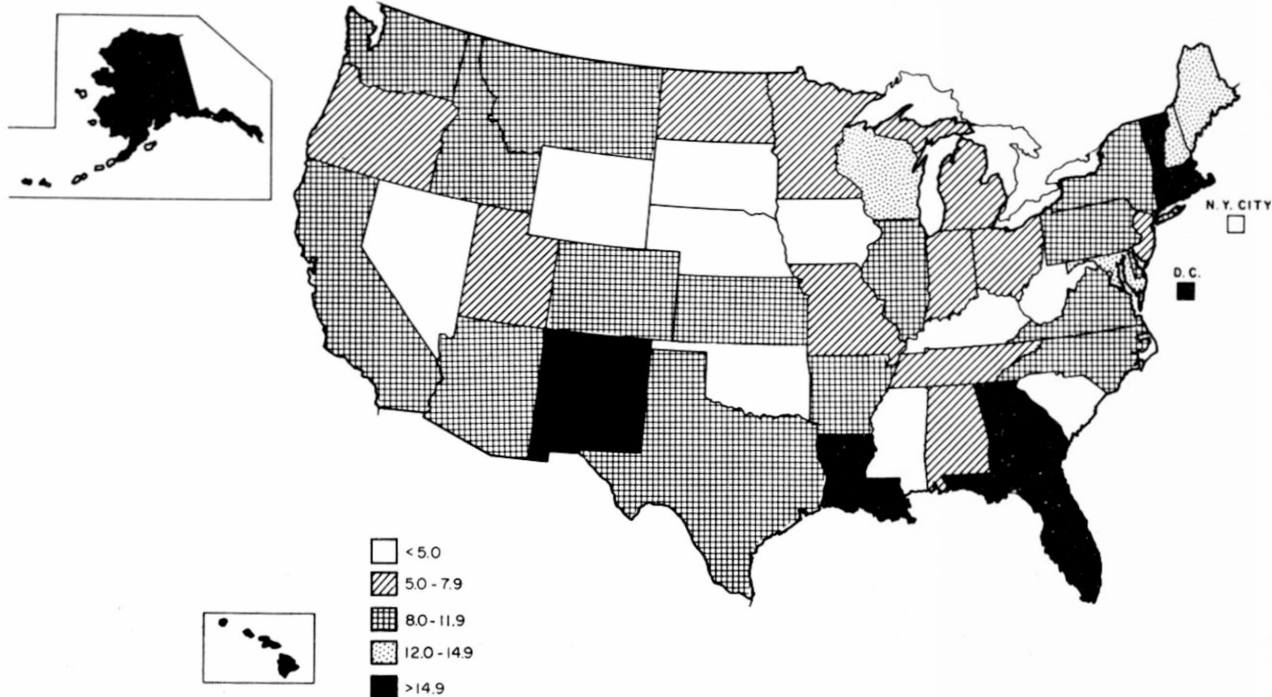


Figure 3 NUMBER OF HUMAN ISOLATIONS OF SALMONELLA PER 100,000 POPULATION IN THE UNITED STATES, 1969

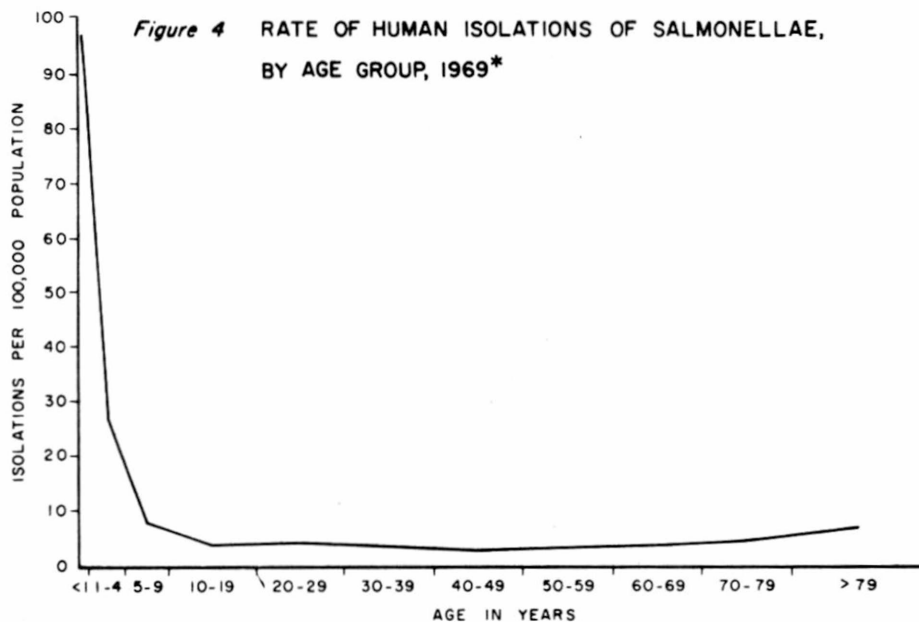


SOURCE: CURRENT POPULATION REPORTS, SERIES P-25, NO. 430, AUGUST 29, 1969

State	Number of Isolations	Rate Per 100,000		State	Number of Isolations	Rate per 100,000	
Alabama	260	7.4	(+)	Montana	68	9.8	(+)
Alaska	112	39.7	(+)	Nebraska	14	1.0	(-)
Arizona	152	9.0	(+)	Nevada	18	3.9	(-)
Arkansas	183	9.2	(-)	New Hampshire	86	12.0	(+)
California	2,239	11.5	(+)	New Jersey	479	6.7	(-)
Colorado	204	9.7	(+)	New Mexico	186	18.7	(-)
Connecticut	469	15.6	(+)	New York	1,871	10.2	(-)
Delaware	63	11.7	(-)	North Carolina	443	8.5	(+)
Dist. of Col.	208	26.1	(-)	North Dakota	45	7.3	(-)
Florida	1,650	26.0	(+)	Ohio	606	5.6	(+)
Georgia	767	16.5	(-)	Oklahoma	88	3.4	(-)
Hawaii	453	57.0	(-)	Oregon	154	7.8	(+)
Idaho	62	8.6	(+)	Pennsylvania	978	8.3	(-)
Illinois	1,315	11.9	(-)	Rhode Island	149	16.4	(+)
Indiana	272	5.3	(+)	South Carolina	43	1.6	(+)
Iowa	133	4.8	(+)	South Dakota	24	3.6	(+)
Kansas	200	8.6	(-)	Tennessee	311	7.8	(+)
Kentucky	109	3.4	(+)	Texas	1,167	10.4	(+)
Louisiana	737	19.7	(-)	Utah	65	6.2	(-)
Maine	142	14.5	(+)	Vermont	82	18.7	(+)
Maryland	506	13.4	(-)	Virginia	398	8.5	(+)
Massachusetts	1,681	30.7	(+)	Washington	305	9.0	(+)
Michigan	670	7.6	(-)	West Virginia	47	2.6	(+)
Minnesota	281	7.6	(+)	Wisconsin	540	12.8	(+)
Mississippi	97	4.1	(+)	Wyoming	8	2.5	(+)
Missouri	273	5.9	(-)	TOTAL	21,413	10.6	(+)

(+) Increase over 1968

(-) Decrease from 1968



*POPULATION DATA OBTAINED FROM CURRENT POPULATION REPORTS, SERIES P-25, NO. 428, AUGUST 19, 1969

Figure 5 NONHUMAN SALMONELLA ISOLATIONS FROM THE INDICATED SOURCES IN THE UNITED STATES, 1969

