

REPORT NO. 119
Fourth Quarter 1973
issued June 1974



CENTER FOR DISEASE CONTROL

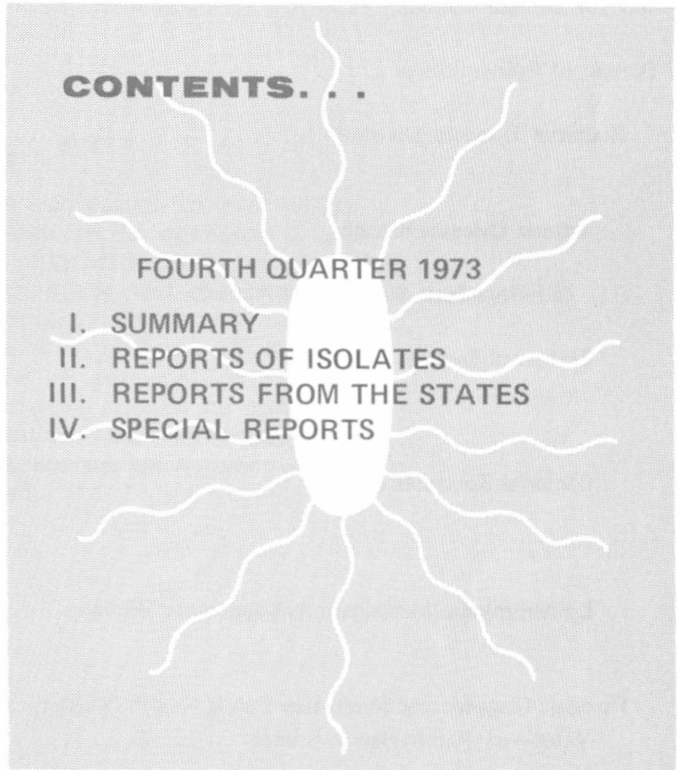
SALMONELLA

SURVEILLANCE

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FOURTH QUARTER 1973

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PREFACE

Summarized in this report is information received from state and city health departments, university and hospital laboratories, the U.S. Food and Drug Administration, and other pertinent sources, domestic and foreign. Much of the information is preliminary. It is intended primarily for the use of those with responsibility for disease control activities. Anyone desiring to quote this report should contact the original investigator for confirmation and interpretation.

Contributions to the Surveillance Report are most welcome. Please address:

Center for Disease Control
Attn: Salmonellosis Surveillance Activity, Bureau of Epidemiology
Atlanta, Georgia 30333

SUGGESTED CITATION

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NOTE

The data contained in the tables and summarized in sections I and II deal only with isolates reported to CDC by state and other reference laboratories. Extrapolation from these data to aspects of the total incidence of salmonellosis in the United States should be made only with caution, and reference to the data should be appropriately qualified.

I. SUMMARY

In the fourth quarter of 1973, 7,686 isolations of salmonella were reported from humans, an average of 591 isolations per week (Tables I, II, and V-A). This number represents a decrease of 63 (9.6%) from the weekly average during the third quarter of 1973 and an increase of 64 (12.1%) over the weekly average for the fourth quarter of 1972. The average number of human isolations reported per week for each month and for the quarter are provided below for the last 3 years:

	<u>1971</u>	<u>1972</u>	<u>1973</u>
October	562	607	710
November	562	534	546
December	452	437	488
Fourth quarter	519	527	591

Reports of 365 nonhuman isolates of salmonella were received during the fourth quarter of 1973 (Tables III, IV, and V-B).

II. REPORTS OF ISOLATIONS

The 10 most frequently reported serotypes during the fourth quarter:

HUMAN				NONHUMAN		
Serotype	Number	Percent	Rank last quarter	Serotype	Number	Percent
<u>typhimurium*</u>	2,437	31.7	1	<u>typhimurium*</u>	88	24.1
<u>newport</u>	716	9.3	2	<u>newport</u>	20	5.5
<u>infantis</u>	430	5.6	4	<u>anatum</u>	17	4.7
<u>enteritidis</u>	386	5.0	3	<u>oranienburg</u>	15	4.1
<u>saint-paul</u>	301	3.9	5	<u>senftenberg</u>	15	4.1
<u>heidelberg</u>	277	3.6	6	<u>urbana</u>	11	3.0
<u>agona</u>	274	3.6	7	<u>infantis</u>	10	2.7
<u>javiana</u>	236	3.1	10	<u>saint-paul</u>	10	2.7
<u>thompson</u>	221	2.9	13	<u>enteritidis</u>	9	2.5
<u>typhi</u>	167	2.2	8	<u>rubislaw</u>	9	2.5
Total	5,445	70.8			204	55.9
TOTAL (all serotypes)	7,686	100.0		TOTAL (all serotypes)	365	100.0
*Includes var. <u>copenhagen</u>	86	1.1		*Includes var. <u>copenhagen</u>	1	0.3

III. REPORTS FROM THE STATES

A. Reports of Salmonella Outbreaks Received During the Fourth Quarter, 1973

This table lists investigated outbreaks of salmonellosis reported to CDC from various sources. Definitions of cases and numbers at risk are not uniform from report to report. This listing should be considered neither comprehensive nor representative of all outbreaks in the United States, as most outbreaks are probably not reported to CDC.

State	Month of outbreak	Location	Serotype	NUMBER				Deaths	Mode of transmission	Comments
				Ill	At risk	With positive cultures	Hospital-ized			
California	March	San Francisco	<u>S. typhimurium</u>	4	27	4	4	1	person to person	Nursery outbreak.
Missouri	June	Kansas City	<u>S. typhi</u>	3	6	2	3	0	not identified	Family outbreak.
Alaska } Idaho }	August	{ Boise }	<u>S. typhi</u>	3	?	?3	≥1	0	not identified	Outbreak involving Idaho man +2 Alaskan house guests returning from Mexican vacation.
Kansas	September	Wichita	<u>S. typhimurium</u> var. <u>copenhagen</u>	20	?	20	5	0	not identified	
Louisiana	"	New Orleans	<u>S. agona</u>	≥5	?	30	?	?	?mayonnaise (culture-positive)	Outbreak among restaurant patrons. Positive cultures from 25 employees.
Puerto Rico	"	central Puerto Rico	<u>S. typhi</u>	2	?	1	2	0	not identified	
Tennessee	"	Clarksville	<u>S. infantis</u>	19	33	?	?	?	ice cream	Outbreak at church supper.
South Carolina	September-October	Richland Co.	<u>S. typhimurium</u>	5	?	5	?	0	not identified	Cluster of cases related to an elementary school.
Alabama	October	Huntsville	<u>S. typhi</u>	2	4	1	2	0	not identified	
Florida	"	Miami	<u>S. thompson</u>	≥17	≥115	7	2	0	in-flight breakfast	Outbreak among passengers on a Denver to Dallas to Miami flight.
Illinois	"	Cook Co.	<u>S. enteritidis</u>	10	~350	10	?	?	food	Outbreak among motel guests.
Maryland	"	Baltimore	<u>S. infantis</u>	9	250	7	9	0	?person to person	Outbreak in geriatric home.
Rhode Island	"		<u>S. bareilly</u> , <u>S. senftenberg</u>	16	45	7	1	0	?food	Passengers on Caribbean cruise ship.
New Jersey	November	Burlington	<u>S. typhi</u>	19	>100	22	~9	0	whiting	Church dinner.
Virginia	November-	Grundy	<u>S. reading</u>	~468	891	10	~70	0	turkey salad	School outbreak. Leftover Thanksgiving turkey used in a salad.
Florida	December	Miami	<u>S. bareilly</u> , <u>S. senftenberg</u> , <u>S. typhimurium</u>	54	740	16	1	0	not identified	Outbreak on Caribbean ship.
North Carolina	"	Franklin	Salmonella	3	3	1	1	0	?chicken livers	

B. Laboratory-Acquired Typhoid Fever in Los Angeles. Reported by John Z. Montgomerie, M.D., Associate Chief, Division of Infectious Diseases, Harbor General Hospital; Ralph R. Sachs, M.D., Deputy Director, Los Angeles County Community Health Services; and James Chin, M.D., State Epidemiologist, California State Department of Health.

In October 1972, 2 technicians from a Los Angeles bacteriology laboratory were hospitalized with typhoid fever. The first, a 25-year-old woman was admitted with fever and abdominal pain of 3 days' duration. Salmonella typhi, phage type E₁, was isolated from her blood. She was treated with ampicillin and made an uneventful recovery. The second technician, a 26-year-old woman, was hospitalized with a 5-day history of fever, malaise, and myalgias. Her temperature on admission was 105°F. S. typhi, also phage type E₁, was cultured from her blood, and she was treated with ampicillin with a satisfactory response.

A third technician from the same laboratory had a stool culture positive for S. typhi, phage type E₁. Stool and urine cultures from 38 other laboratory personnel were negative for S. typhi.

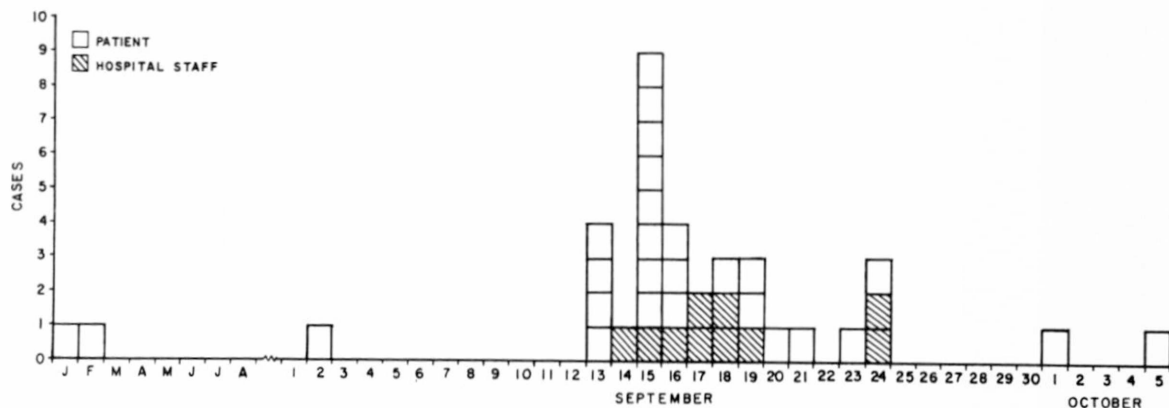
Epidemiologic investigation revealed no history of a laboratory accident and no history of a common meal to explain the cases. However, 2 weeks earlier the 3 technicians had worked with a blood culture from a patient recently arrived from Mexico from which S. typhi, phage type E₁, was isolated. Each of the technicians who were later found to be infected had handled the culture tubes containing this isolate on 1 of 3 different days. No other typhoid cultures had been processed in the laboratory since the preceding May, and the isolates in May had been phage typed as degraded Vi(A).

Editorial Note: In the absence of other evidence to explain the 3 cases, it is likely that these were laboratory-acquired infections. Possibly the outside of the original blood-culture flask or its holding rack was contaminated and exposed the technicians to the organism.

C. Foodborne Nosocomial Salmonella typhimurium Outbreak in Maine. Reported by Douglas Walker, M.D., Medical Director, William Hall, M.D., Infectious Diseases Consultant, Nicholas Leotsakis, Hospital Epidemiologist, Maine Medical Center, Portland; Peter J. Leadley, M.D., Director, Bureau of Health, Maine State Department of Health and Welfare; and Allen C. Steere, Jr., M.D., EIS Officer, Hospital Infections Branch, Bacterial Diseases Division.

In September 1973, 34 patients and staff members at a 513-bed community hospital in Maine developed diarrhea caused by Salmonella typhimurium (Figure 1). There were 2 deaths in patients with severe underlying illnesses. Nineteen of the cases were in patients who developed diarrhea and fever in the period September 13-20. These 19 cases were in every part of the hospital except the nursery.

FIG. 1 DIARRHEAL ILLNESS CAUSED BY SALMONELLA GROUP B IN PATIENTS AND STAFF, BY DATE OF ONSET, PORTLAND, MAINE, JANUARY - OCTOBER 1973



Epidemiologic investigation revealed that 18 of the 19 patients had been served eggnog approximately 24 hours before becoming ill; 15 of these had been under a physician's diet order for nourishing liquids (a high-calorie diet that could include eggnog with every meal). Twenty-one other patients who had had a physician's diet order for nourishing liquids sometime during the period September 13-19 were available for questioning; only 1 had been served eggnog, and none had developed diarrhea and fever. The association between eggnog consumption and the subsequent development of febrile diarrhea in patients with diet orders for nourishing liquids on September 13-19 was highly significant ($p = 0.000000003$). S. typhimurium was recovered from eggnog prepared on September 12.

The hospital kitchen prepared 12 quarts of eggnog every day from farm-fresh eggs and pasteurized milk. None of the 5 kitchen workers who had made eggnog in September gave a history of diarrhea or fever, and stool cultures from each were negative for salmonella. However, 4 of 140 kitchen workers had developed diarrhea, fever, and positive stool cultures for S. typhimurium at the time of the outbreak. Two of these had tasted eggnog in the kitchen. In addition in September eggnog was prepared by a kitchen worker who was unfamiliar with the usual method of preparation and who cracked the eggs on the side of the mixing bowl instead of on a separate surface.

The farm that supplied eggs to the hospital washed the eggs only if they were grossly dirty. S. typhimurium of the same phage type as the strains isolated from hospital patients and personnel and from the eggnog was recovered from chicken feces and an environmental swab taken at the farm. This phage type (pattern 441 631 211 141 111) had not previously been observed at CDC in 135 S. typhimurium isolates tested from 19 different outbreaks.

Control measures included discontinuing eggnog preparation, recalling existing supplies, purchasing only USDA-certified eggs, cooking all dishes prepared with fresh eggs, and serving only commercially prepared, pasteurized eggnog. Six patients and 8 staff members developed clinical salmonellosis after all kitchen-prepared eggnog had been recalled. Several of the 6 patients with late cases had underlying illnesses predisposing to salmonella infection. Some of the hospital staff who developed salmonellosis were known to have had close contact with infected patients.

Editorial Note: Eggs have frequently been incriminated as the vehicles for S. typhimurium outbreaks in the past.^{1,2} Salmonella contamination is usually superficial, with penetration into the egg through cracks in the shell. Current USDA regulations prohibit the sale of cracked eggs to institutions; eggs must be washed in disinfectant soap for USDA certification, and USDA certification requirements for liquid whole-egg products include pasteurization at 140°F for $3\frac{1}{2}$ minutes.³ Since adoption of these measures, institutional outbreaks of salmonellosis traced to egg vehicles have become a rarity.⁴

The occurrence of cases after hospital-prepared eggnog was no longer in use probably represented fomite- or contact-mediated transmission.⁵⁻⁷

References:

1. Armstrong WR, Fodor T, Curlin GT, et al: Epidemic salmonella gastroenteritis due to contaminated imitation ice cream. *Am J Epidemiol* 91:300-307, 1970
2. Philbrook RF, MacCready RA, Van Roekel H, et al: Salmonellosis spread by a dietary supplement of ovarian source. *N Engl J Med* 263:713-718, 1960
3. U.S. Department of Agriculture: Regulations Governing the Inspection of Eggs and Egg Products (7 CFR Part 59.570B, Table 1). Washington, D.C., GPO, July 1, 1972
4. Center for Disease Control: Salmonella Surveillance, Nos. 80-118, issued January 1969-February 1974
5. Baine WB, Gangarosa EJ, Bennett JV, Barker WH, Jr.: Institutional salmonellosis. *J Infect Dis* 128:357-360, 1973
6. Sanders E, Sweeney FJ, Jr., Friedman EA, et al: An outbreak of hospital-associated infections due to Salmonella derby. *JAMA* 186:984-986, 1963
7. Gotoff SP, Boring JR, Lepper MH: An epidemic of Salmonella saint-paul infections in a convalescent home. *Am J Med Sci* 251:16-22, 1966

IV. SPECIAL REPORTS

A. Bacteriophage Typing of Salmonella typhi in the United States: 1966-1973
 Reported by J. J. Farmer III, Ph.D. and Janet V. Sikes, National Salmonella Typing Center, Enteric Section, Enterobacteriology Branch, Bacteriology Division, Bureau of Laboratories, CDC.

Bacteriophage typing is the most useful laboratory method for evaluating a possible epidemiologic association among strains of Salmonella typhi. Table 1 shows the relative frequency with which various S. typhi phage types were encountered by CDC and regional laboratories in 1966-1973 in typhoid isolates from the United States or recovered from U. S. citizens returning from abroad. Epidemiologists can use this table to evaluate the significance of the results of phage typing.

The strength of the inference that typhoid isolates of the same phage type are epidemiologically related depends in part on the relative prevalence of the phage type involved. For example, if a typhoid fever patient and a carrier are both found to be infected with a strain of phage type E₁, the identity of the phage types provides relatively little additional strength to any epidemiologic association already demonstrated between the case and this carrier. This is because phage type E₁ comprises $\frac{1}{4}$ of all isolates typed in the United States. The source of the case might well be another case or carrier infected with a strain of this common phage type.

In contrast, the discovery of a carrier or patient harboring an S. typhi strain of phage type G₁ would strongly suggest an epidemiologic link with any other case of infection with an organism of this phage type since G₁ is extremely rare, accounting for only 1 of over 2,000 isolates typed at CDC and regional laboratories in 1970-1973.

Table 1. Relative prevalence of bacteriophage types of Salmonella typhi observed in the United States: 1966-1973

Phage type	Percent of 628 cultures typed during 1966-1969	Percent of 2,138 cultures typed during 1970-1973
degraded Vi	18.4	26.5*
E ₁	23.8	24.8
C ₁	12.5	8.6
A ₁	6.5	6.2
Untypable Vi	4.3	5.1
W Form	3.7	3.5
F ₁	4.6	2.7
D ₁	4.5	1.7
B ₁	2.6	1.7
38	0.8	1.7
K ₁	-	1.7
46	3.0	1.6
M ₁	1.0	1.5
N ₁	-	1.3
D ₉	0.8	0.9
D ₂	-	0.9
35	0.6	0.8
D ₇	1.8	0.7
B ₂	-	0.7
J ₁	-	0.7

Table 1. Continued

Phage type	Percent of 628 cultures typed during 1966-1969	Percent of 2,138 cultures typed during 1970-1973
D ₈	0.5	0.4
E ₃	0.3	0.4
28	0.3	0.4
C ₄	0.6	0.3
T ₄	0.5	0.3
D ₄	-	0.3
F ₂	-	0.3
C ₂	0.5	0.2
D ₉	0.5	0.2
F ₆	0.5	0.2
F ₄	0.5	0.2
C ₂	-	0.2
F ₂	-	0.2
F ₆	-	0.2
H ₈	-	0.2
0	-	0.2
29	-	0.2
E ₉	0.6	0.1
C ₃	0.3	0.1
26	0.3	0.1
E ₃	0.2	0.1
25	0.2	0.1
27	0.2	0.1
C ₅	-	0.1
D ₁₀	-	0.1
E ₇	-	0.1
E ₁₀	-	0.1
J ₂	-	0.1
37	-	0.1
43	-	0.1
40	0.3	0.05
50	0.3	0.05
G ₁	0.2	0.05
C ₁	-	0.05
F ₈	-	0.05
K ₅	-	0.05
K ₃	-	0.05
L ₁	-	0.05
34	-	0.05

*Includes 85 cultures with the degraded Vi (approaching A) phage type that was epidemic in Mexico in 1972-73.

TABLE I. COMMON SALMONELLAE REPORTED FROM HUMAN SOURCES, FOURTH QUARTER, 1973

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	OH	IND	ILL	MIC	WIS	MIN	IOW	MO	ND	SD	NEB	KAN	DEL	MD	DC	VA	WVA	NC	SC	GA	FLA		
<i>anatum</i>				4	1		4	2	2	3	4	1	5	6		2		2							1					1	3			
<i>bareilly</i>					1	2		2		3															1		5			4	4			
<i>blockley</i>	2			2		5		13	6	1	4	2		4	3	2	1		2				1	1	5		2		3	1	2			
<i>braenderup</i>				2	1	1		2	1				1		3	2	2								4		1			2				
<i>bredeney</i>				2			1	1	4	1	4				2	4	1										1							
<i>chester</i>				8						5	7								1								1	1	4	1				
<i>cholerae-suis v kun</i>																																		
<i>cubana</i>						1							1				1																	
<i>derby</i>						2		2	3	9	9	4	8	16	1	1		5						2	5		7		2	6	2			
<i>enteritidis</i>	2			15	5	10		40	22	3	26	16	4	88	19	9	2	13	5	1	1	3	1	10		3	2	4	2	12	2			
<i>give</i>				1					1				1				1										1			1				
<i>heidelberg</i>				14	3	2		7	4	17	9	9	2	36	20	8	7	2	4		1			8	3	11		2	6	2	9	5		
<i>indiana</i>										1				1			2	1							1									
<i>infantis</i>	1			17		4		9	8	7	13	10	6	33	23	21	20	2	4	2	1		7		27	3	9	10	2	10	8			
<i>java</i>				3				2	1	4	3			8		1	1	2	5											2	1			
<i>javiana</i>						1					1	2			1	1			6					6	1	3		2		1	41	25		
<i>litchfield</i>			2					2	1			2	5	1	4	1	1						1				1		2	1	2			
<i>livingstone</i>														2																				
<i>manhattan</i>								2	1		1	2		8	2		2	1						4		1		1						
<i>miami</i>											2																			10	4			
<i>mississippi</i>																																		
<i>montevideo</i>								4	3	8	5	3	3	3	2									2		3		3		1	2	7	5	
<i>muenchen</i>		1	6	2		1		2	2	5	3		1	9	5	2		2			1			10				4		8	6			
<i>newington</i>				1		2				1																								
<i>newport</i>			2	10		2		12	9	9	13	10		15	23	14	9	4	5					8		2	5	1	15	10	71	28		
<i>oranienburg</i>				2		1			7	2	5	4	8	6	7	1			2					4	1	4		1		3	12	2		
<i>panama</i>						4		1		1					2															3		1		
<i>paratyphi B</i>								1	1				4	1	1	3			1								4	1		3				
<i>reading</i>				1							13			4										1			14	1	1					
<i>saint-paul</i>	1			5		1		7	8	3	9	9	5	34	31	16	6	2	10	1				1		10	4	3	4	2	11	7		
<i>san-diego</i>				1		1		2						3	2		2											2			1			
<i>schwarzengrund</i>				1						3	2			3	2	8	1									1				2				
<i>senftenberg</i>				1				1			2			4			2	1									1				2	1		
<i>tennessee</i>								1	1		1																			1				
<i>thompson</i>	1			13		2		2	2	1	48	1	6	6	7	1	2	1	5		1			1		8	4	4		2	2	1	3	
<i>typhi</i>				4		4	2	4	9	5	2	6		5	2	2			3								1	2	1	4	1	1	3	2
<i>typhimurium</i>	6	2	6	73	17	42		62	27	125	105	77	27	129	95	175	35	29	37	3	9		46	6	45	2	38	12	46	12	58	66		
<i>typhimurium v cop</i>				4		2				3					7				10	1				17										
<i>weltevreden</i>															1																			
<i>worthington</i>				2										2																				
TOTAL	13	3	16	188	27	91	3	185	123	219	290	166	69	423	290	268	99	70	97	7	14	3	114	14	146	11	113	25	119	40	289	173		
ALL OTHER*	-	12	7	17	16	12	82	23	11	22	33	12	11	54	42	28	20	13	7	1	1	26	6	1	27	37	10	1	22	5	19	19		
TOTAL	13	15	23	205	43	103	85	208	134	241	323	178	80	477	332	296	119	83	104	8	15	29	120	15	173	48	123	26	141	45	308	192		

Note: NYA—New York, Albany; NYB—Beth Israel Hospital; NYC—New York City.
Beth Israel Hospital is a reference laboratory and this quarter serotyped a total of 257 cultures.
*See Table II.

Table 1 - Continued

GEOGRAPHIC DIVISION AND REPORTING CENTER																			TOTAL	% OF TOTAL	CUMU-LATIVE TOTAL	% OF CUMU-LATIVE TOTAL	SEROTYPE		
EAST S. CENTRAL				WEST S. CENTRAL				MOUNTAIN						PACIFIC											
KY	TEN	ALA	MS	ARK	LA	OKL	TEX	MON	IDA	WYO	COL	NM	ARI	UTA	NEV	WAS	ORE	CAL	ALK	HAW					
	1		1	1	4		19							2				21		2	92	1.2	339	1.3	<i>anatum</i>
	4			1	3		1											1		1	29	0.4	113	0.4	<i>bareilly</i>
	1	1	1		7		2							1				6			81	1.1	316	1.2	<i>blockley</i>
					3	1												5		1	33	0.4	108	0.4	<i>braenderup</i>
	2			1	7		3										1	10			45	0.6	148	0.6	<i>bredeney</i>
	1															2	2	24			56	0.7	258	1.0	<i>chester</i>
	1																				1	0.0	25	0.1	<i>cholerae-suis v kun</i>
	4	1	4		6		20							5				1			5	0.1	28	0.1	<i>cuhana</i>
3	5	1		4	3	1	4	2	4		7		3			4		16		10	154	2.0	558	2.1	<i>derby</i>
																4		25			386	5.0	1,462	5.5	<i>enteritidis</i>
		1	1		5		7											9			29	0.4	81	0.3	<i>give</i>
1	7	3	3	6	15	2	8	1					4	1		1	1	29		4	277	3.6	1,152	4.3	<i>heidelberg</i>
	2				1																9	0.1	74	0.3	<i>indiana</i>
7	28	6	2	2	21	3	23		2		6		10	1		1	19	38		4	430	5.6	1,373	5.1	<i>infantis</i>
2	5	1	6	2	6						2							16			73	0.9	323	1.2	<i>java</i>
	5	6	4	14	22		87											7			236	3.1	548	2.1	<i>javana</i>
	2		1		1								2					5		1	38	0.5	167	0.6	<i>litchfield</i>
1		1					1									1		2			6	0.1	26	0.1	<i>livingstone</i>
							1									1	1	6			35	0.5	186	0.7	<i>manhattan</i>
																					17	0.2	61	0.2	<i>miami</i>
	2	1	2		19		2														40	0.5	130	0.5	<i>mississippi</i>
	2			2	5		40		1		1							23			128	1.7	464	1.7	<i>montevideo</i>
2		5	1	1	10		11				1		2		1			13			117	1.5	430	1.6	<i>muenchen</i>
																		3			8	0.1	24	0.1	<i>newington</i>
	14	8	9	38	67	17	196	3			7		18			4		54	1	3	716	9.3	2,053	7.7	<i>newport</i>
3		5	5		4	7	32		4		5		5	1		1		12			156	2.0	439	1.6	<i>oranienburg</i>
1	2				2	5	13		3		3				1	4		18		14	78	1.0	338	1.3	<i>panama</i>
						1	25									2		6			54	0.7	161	0.6	<i>paratyphi B</i>
3	10	8	4	3	14	2	5		1		1			3		8	1	14		2	51	0.7	112	0.4	<i>reading</i>
									1		4							43			301	3.9	1,196	4.5	<i>saint-paul</i>
					1				1				3					23		2	44	0.6	166	0.6	<i>san-diego</i>
					2				1									4			30	0.4	102	0.4	<i>schwarzengrund</i>
		2					2											5			26	0.3	161	0.6	<i>senftenberg</i>
				1			1											2		2	10	0.1	57	0.2	<i>tennessee</i>
				4	10		8				11		1			4		54		5	221	2.9	530	2.0	<i>thompson</i>
4	8			1	3	1	17					2	1					67			167	2.2	680	2.5	<i>typhi</i>
24	66	45	57	27	59	27	167	3	11		41		13	8	3	43	7	320	2	16	2,351	30.6	8,335	31.2	<i>typhimurium</i>
4	10			3		1	1		1		5		11		1		3			2	86	1.1	258	1.0	<i>typhimurium v cop</i>
											1					1					26	0.3	118	0.4	<i>weltevreden</i>
				1								1	1					4		1	15	0.2	55	0.2	<i>worthington</i>
55	182	96	101	111	301	68	696	9	30	-	96	2	82	14	6	82	35	886	5	92	6,657	86.6	23,155	86.7	TOTAL
4	32	13	6	21	69	8	72	1	-	8	-	88	3	-	2	6	2	78	7	12	1,029		3,543		ALL OTHER*
59	214	109	107	132	370	76	768	10	30	8	96	90	85	14	8	88	37	964	12	104	7,686		26,698		TOTAL

TABLE II. OTHER SALMONELLAE REPORTED FROM HUMAN SOURCES, FOURTH QUARTER, 1973

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	
<i>abony</i>																												
<i>agona</i>	3			3	16		5	1			3	3		21	6	2	5	2	32		17	3	32	10		4		
<i>alachua</i>			1		8																							
<i>albany</i>							1				1			4					1		1							
<i>amager</i>																												
<i>amsterdam</i>					1														1						1			
<i>austin</i>					1																							
<i>bedford</i>					1																							
<i>berta</i>																			3									
<i>binza</i>	2				1																							
<i>bovis-morbificans</i>					3																	1						
<i>brandenburg</i>					1																							
<i>brunei</i>																												
<i>california</i>											1								1				2					
<i>canada</i>	1																											
<i>cerro</i>					1						1	2			1							1						
<i>challey</i>																												
<i>cholerae-suis</i>											1																	
<i>christianborg</i>		1																										
<i>corvallis</i>																									1			
<i>daytona</i>																												
<i>drypool</i>																												
<i>dublin</i>		1			7																							
<i>duesseldorf</i>										1									1									
<i>duisburg</i>				1																								
<i>durban</i>					1																							
<i>eastbourne</i>					1																							
<i>eimsbuettel</i>					1									2									1	1				
<i>florida</i>				1										1														
<i>frintrop</i>	1																											
<i>gaminara</i>	1						1																					
<i>good</i>																			8		1							
<i>habana</i>					2						3								1				1	1		1		
<i>haifa</i>																						1						
<i>hartford</i>										2	1									3								
<i>hvittingfoss</i>																						1						
<i>ibadan</i>										2																		
<i>inverness</i>														1							2							
<i>johannesburg</i>					1					2																		
<i>kaapstad</i>																												
<i>kentucky</i>		1			1					1	1			1					2			4		4		1		
<i>kottbus</i>					1		2															1						
<i>lexington</i>																												
<i>lindenbug</i>																												
<i>loma-linda</i>					2																							
<i>lomita</i>																												
<i>london</i>	1			1	5					1	2			7	3				4		2							
<i>luciana</i>											1								1									
<i>madella</i>																												
<i>manchester</i>																												
<i>manila</i>																												
<i>meleagridis</i>					2							2		1			1											
<i>menston</i>																												
<i>minnesota</i>					1										1		1											
<i>mission</i>						1																						
<i>molade</i>																												
<i>muenster</i>								1			2															1		
<i>ness-ziona</i>																				2		1						
<i>new-brunswick</i>																											1	
<i>new-mexico</i>																												
<i>norwich</i>				2																								
<i>ohio</i>					1																							
<i>ordonez</i>																							1	1		2		
<i>oslo</i>												4																
<i>paratyphi A</i>																												
<i>pensacola</i>					5																							
<i>poona</i>			1		4						1	1												1	1			
<i>richmond</i>					1																							
<i>rubislaw</i>					1					1	1																	
<i>saphra</i>																												
<i>siegburg</i>						2																						
<i>simsbury</i>																												
<i>singapore</i>						1														1								
<i>sinstorf</i>										1															2			
<i>stanley</i>																												
<i>sundsvall</i>					2										2													
<i>tallahassee</i>	1				1																							
<i>thomasville</i>	1																											
<i>uganda</i>	1													3								1						
<i>urbana</i>																												
<i>vejle</i>																												
<i>virchow</i>											1																	
TOTAL	12	3	3	7	75	-	10	1	1	19	18	12	-	48	11	4	6	4	69	-	26	12	42	20	3	7	1	
NOT TYPED*	1	4	-	14	3	-	2	-	36	-	1	-	-	6	-	9	-	-	-	-	1	5	-	-	3	-	-	
TOTAL	13	7	3	21	78	-	12	1	37	19	19	12	-	54	11	13	6	4	69	-	27	17	42	20	6	7	1	

*See TABLE V-A

TABLE II - Continued

REPORTING CENTER																				TOTAL	CUML. TOTAL	SEROTYPE							
NEB	NEV	NH	NJ	NM	NYA	NYB	NYC	NC	ND	OHI	OKL	ORE	PA	RI	SC	SD	TEN	TEX	UTA				VT	VA	WAS	WVA	WIS	WYO	
	1		17			21	2	11		4	2		16		2	1	13	1					1		14		1	1	abony
							1											1									1	2	agama
																			1								274	864	agana
							1						1					1									10	19	alachua
										2			1				2										15	46	albany
																			1								1	3	amager
																			1								2	3	amsterdam
																											2	2	austin
																											1	1	bedford
																											3	24	berta
																											3	5	binza
																											5	19	bovis-morbificans
																											2	5	brandenburg
																											1	2	brunei
																											4	18	california
								1					1														1	1	canada
																											7	25	cerro
																											1	1	challey
																											1	10	cholerae-suis
																											1	1	christianborg
																											2	2	corvallis
																											1	2	daytona
													1			1											1	19	drypool
																											10	29	dublin
								1																			3	23	duesseldorf
																											1	1	duisburg
																											1	3	durban
																											5	9	eastbourne
													1														5	23	eimsbuettel
																											1	1	florida
																											1	1	frintrop
																											13	36	gaminara
																											1	1	good
																											14	23	habana
																											1	2	haifa
																											8	42	hartford
																											1	6	hvittingfoss
																											5	8	ibadan
																											7	15	inverness
																											1	16	johannesburg
																											5	11	kaapstad
																											15	35	kentucky
																											16	64	kotthus
																											2	4	lexington
																											1	1	lindenburg
																											2	9	loma-linda
																											1	3	lomita
																											43	177	london
																											1	4	luciana
																											1	7	madelia
																											2	5	manchester
																											1	2	manila
																											6	18	meleagris
																											2	2	menston
																											5	23	minnesota
																											2	3	mission
																											1	5	molade
																											6	25	muenster
																											1	2	ness-ziona
																											3	7	new-brunswick
																											1	1	new mexico
																											18	34	norwich
																											4	15	ohio
																											1	1	ordonez
																											5	60	oslo
																											8	20	paratyphi A
																											2	12	pensacola
																											28	141	poona
																											1	3	richmond
																											26	58	rubislaw
																											3	12	saphra
																											18	51	stiegburg
																											2	11	simsbury
																											3	4	singapore
																											1	3	sinstorf
																											4	18	stanley
																											1	2	sundsvall
																											1	1	tallahassee
																											2	2	thomasville
																											5	13	uganda
																											1	14	urbana
																											1	3	vefle
																											6	47	virchow
-	1	-	22	-	-	23	10	22	1	12	8	-	33	-	5	1	30	63	-	-	10	6	1	14	-	677	2,341	TOTAL	
26	1	12	-	88	82	-	1	-	-	-	-	2	-	16	-	-	2	9	-	7	-	-	-	14	8	353	1,202	NOT TYPED*	
26																													

TABLE III. COMMON SALMONELLAE REPORTED FROM NONHUMAN SOURCES, FOURTH QUARTER, 1973

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
<i>anatum</i>	2			4	1		7	2		1	3
<i>bareilly</i>							-			1	1
<i>blockley</i>							-				-
<i>braenderup</i>						1	1				-
<i>bredeney</i>	1			1		1	3	2			2
<i>chester</i>						1	1				-
<i>cholerae-suis v kun</i>							-				-
<i>cubana</i>			1				1				-
<i>derby</i>			1			1	2				-
<i>enteritidis</i>				1		5	6				-
<i>give</i>							-				-
<i>heidelberg</i>							-				-
<i>indiana</i>							-				-
<i>infantis</i>	1						1			1	1
<i>java</i>						1	1				-
<i>javiana</i>							-				-
<i>litchfield</i>							-				-
<i>livingstone</i>							-	1		3	4
<i>manhattan</i>							-	1			1
<i>miami</i>							-				-
<i>mississippi</i>							-				-
<i>montevideo</i>							-			2	2
<i>muenchen</i>						1	1				-
<i>newington</i>							-				-
<i>newport</i>				3		1	4	1			1
<i>oranienburg</i>	1						1	4		8	12
<i>panama</i>						4	4				-
<i>paratyphi B</i>							-				-
<i>reading</i>							-				-
<i>saint-paul</i>	1		1	1		2	5				-
<i>san-diego</i>						1	1				-
<i>schwarzengrund</i>						1	1				-
<i>senftenberg</i>			2	1	1		4	6		2	8
<i>tennessee</i>							-				-
<i>thompson</i>	1						1				-
<i>typhi</i>							-				-
<i>typhimurium</i>			1	39	3	17	60			4	4
<i>typhimurium v cop</i>							-				-
<i>weltevreden</i>						3	3				-
<i>worthington</i>							-	1			1
TOTAL	7	-	6	50	5	40	108	18	-	22	40
ALL OTHER*	3	-	7	2	-	5	17	6	-	12	18
TOTAL	10	-	13	52	5	45	125	24	-	34	58

*See Table IV.

TABLE III - Continued

WILD ANIMALS AND BIRDS	FISH, REPTILES, AND ENVIRONMENT	HUMAN DIETARY ITEMS						MISCELLANEOUS	TOTAL	CUMULATIVE TOTAL	SEROTYPE
		EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL				
	2			5			5	2	17	39	<i>anatum</i>
							5		8	17	<i>bareilly</i>
							-		-	10	<i>blockley</i>
							-		1	15	<i>braenderup</i>
							-	1	6	24	<i>bredency</i>
							-		1	3	<i>chester</i>
							-		-	-	<i>cholerae-suis v kun</i>
1							1		2	6	<i>chubana</i>
3			3				2		8	31	<i>derby</i>
							5		9	28	<i>enteritidis</i>
	1						-		1	10	<i>give</i>
1			1	1			2		3	36	<i>heidelberg</i>
1							-		1	13	<i>indiana</i>
1	1		2	4			6		10	45	<i>infantis</i>
	3						-		4	22	<i>java</i>
							-		2	8	<i>javiana</i>
1	5			1			1		6	48	<i>litchfield</i>
							1		4	12	<i>livingstone</i>
							-		1	27	<i>manhattan</i>
							-		-	2	<i>miami</i>
							-		-	-	<i>mississippi</i>
3				1			1	1	7	32	<i>montevideo</i>
	1						1	1	3	28	<i>muenchen</i>
							-	1	1	3	<i>newington</i>
5	3						2	2	20	65	<i>newport</i>
							-	2	15	55	<i>oranienburg</i>
							-		4	10	<i>panama</i>
	1						-	1	2	7	<i>paratyphi B</i>
			1	1			2	4	4	6	<i>reading</i>
4			1	1			1	1	10	45	<i>saint-paul</i>
	2						-		3	6	<i>san-diego</i>
							1	1	2	7	<i>schwarzengrund</i>
							-	3	15	87	<i>senftenberg</i>
							-		-	7	<i>tennessee</i>
	1		1				1	2	5	14	<i>thompson</i>
							-		-	-	<i>typhi</i>
4	7						3	3	87	330	<i>typhimurium</i>
							-	1	1	15	<i>typhimurium v cop</i>
							-		3	16	<i>weltevreden</i>
							-		1	7	<i>worthington</i>
24	27	-	5	17	-	19	41	27	267	1,136	TOTAL
9	28	2	2	3	-	16	23	3	98	362	ALL OTHER
33	55	2	7	20	-	35	64	30	365	1,498	TOTAL

TABLE IV. OTHER SALMONELLAE REPORTED FROM NONHUMAN SOURCES, FOURTH QUARTER, 1973

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
<i>agona</i>							-	1		1	2
<i>alachua</i>						1	1				-
<i>albany</i>							-			1	1
<i>binza</i>							-				-
<i>cerro</i>							-				-
<i>cholerae-suis</i>			6				6				-
<i>dublin</i>				1			1				-
<i>duesseldorf</i>							-				-
<i>eastbourne</i>							-				-
<i>gaminara</i>				1			1				-
<i>jangwani</i>							-				-
<i>johannesburg</i>							-				-
<i>kaapstad</i>							-				-
<i>lexington</i>						3	3			2	2
<i>london</i>	1						1			1	1
<i>manila</i>							-	1			1
<i>matopeni</i>							-				-
<i>mission</i>							-				-
<i>norwich</i>							-				-
<i>orion</i>							-			1	1
<i>pomona</i>							-				-
<i>poona</i>							-				-
<i>pramiso</i>							-				-
<i>pullorum</i>	1						1				-
<i>rubislaw</i>							-				-
<i>siegburg</i>			1				1			3	3
<i>thomasville</i>							-	4		3	7
<i>urbana</i>							-				-
<i>virchow</i>							-				-
<i>westerstede</i>	1						1				-
TOTAL	3	-	7	2	-	4	16	6	-	12	18
NOT TYPED*	-	-	-	-	-	1	1	-	-	-	-
TOTAL	3	-	7	2	-	5	17	6	-	12	18

*SEE TABLE V-B

TABLE IV - Continued

WILD AMINALS AND BIRDS	FISH, REPTILES, AND ENVIRON- MENT	HUMAN DIETARY ITEMS						MISCEL- LA- NEOUS	TOTAL	CUMU- LATIVE TOTAL	SEROTYPE
		EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL				
2				1			1		5	25	<i>agona</i>
2							-		1	10	<i>alachua</i>
							-		3	6	<i>albany</i>
							1		1	13	<i>binza</i>
				1			1		1	5	<i>cerro</i>
							-		6	20	<i>cholerae-suis</i>
							-		1	13	<i>dublin</i>
	2						-	1	1	2	<i>duesseldorf</i>
							-		2	2	<i>eastborne</i>
1							-		2	2	<i>gaminara</i>
	1						-		1	1	<i>jangwani</i>
		1					1		1	1	<i>johannesburg</i>
							3		3	3	<i>kaapstad</i>
							-		5	8	<i>lexington</i>
							-		2	10	<i>london</i>
							-		1	4	<i>manila</i>
							1		1	1	<i>matopeni</i>
							3		3	4	<i>mission</i>
	3						-		3	4	<i>norwich</i>
							-		1	3	<i>orion</i>
				1			1		1	2	<i>pomona</i>
1							-		1	5	<i>poona</i>
1							-		1	1	<i>pramiso</i>
1							-		2	4	<i>pullorum</i>
	8						1		1	15	<i>rubislaw</i>
		1					1		6	28	<i>siegburg</i>
							-		7	8	<i>thomasville</i>
	11						-		11	27	<i>urbana</i>
							1		1	3	<i>virchow</i>
							-		1	1	<i>westerstede</i>
9	25	2	-	3	-	10	15	1	84	328	TOTAL
-	3	-	2	-	-	6	8	2	14	34	NOT TYPED*
9	28	2	2	3	-	16	23	3	98	362	TOTAL

TABLE V. SALMONELLAE REPORTED BY GROUP IDENTIFICATION ONLY,
FOURTH QUARTER, 1973

A. HUMAN SOURCES

REPORTING CENTER	GROUP									TOTAL
	B	C	C1	C2	D	E	F	Y	UNK	
ALABAMA						1				1
ALASKA	3	1								4
ARKANSAS	10		2	2						14
CALIFORNIA	1								2	3
CONNECTICUT	1								1	2
DISTRICT OF COLUMBIA	13		9	1	8	1			4	36
GEORGIA									1	1
ILLINOIS	4			1					1	6
IOWA	4			2	2				1	9
MARYLAND			1							1
MASSACHUSETTS	3								2	5
MISSISSIPPI									3	3
NEBRASKA	16		5	3	1		1			26
NEVADA	1									1
NEW HAMPSHIRE	7		1	1	1				2	12
NEW MEXICO	56		7	14	5	4			2	88
NEW YORK - A	67		6	2	3	2			2	82
NEW YORK - C									1	1
OREGON		1							1	2
RHODE ISLAND	8		6						2	16
TENNESSEE	1								1	2
TEXAS			1	5	2				1	9
VERMONT									7	7
WISCONSIN	1		1						12	14
WYOMING	2	1		5						8
TOTAL	198	3	39	36	22	8	1	-	46	353

B. NON-HUMAN SOURCES

REPORTING CENTER	GROUP									TOTAL
	B	C	C1	C2	D	E	F	Y	UNK	
DOMESTIC ANIMALS AND THEIR ENVIRONMENT				2						1
ANIMAL FEEDS										-
WILD ANIMALS AND BIRDS										-
FISH, REPTILES, AND THEIR ENVIRONMENT	2							1		3
HUMAN DIETARY ITEMS	3		5							8
MISCELLANEOUS			1						1	2
TOTAL	5	-	6	1	-	-	-	1	1	14

**STATE EPIDEMIOLOGISTS AND
STATE LABORATORY DIRECTORS**

The State Epidemiologists are the key to all disease surveillance activities. They are responsible for collecting, interpreting, and transmitting data and epidemiologic information from their individual States. Their contributions to this report are gratefully acknowledged. In addition, valuable contributions are made by State Laboratory Directors; we are indebted to them for their valuable support.

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