REPORT NO. 70
April 15, 1968

NATIONAL
COMMUNICABLE DISEASE CENTER

SALMONELLA

SURVEILLANCE

CONTENTS. . .

FOR THE MONTH OF JANUARY 1968

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE/PUBLIC HEALTH SERVICE
Bureau of Disease Prevention and Environmental Control

PREFACE

Summarized in this report is information received from State and City Health Departments, university and hospital laboratories, the National Animal Disease Laboratory (USDA, ARS), Ames, Iowa, 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

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MILDRED M. GALTON

In Memoriam

On Tuesday, March 19, 1968, Mrs. Mildred Galton died of a pulmonary malignancy.

Mildred, as she was known to thousands of microbiologists, epidemiologists, food sanitarians, veterinarians, and public health administrators, was world renowned. During her 20 years with the Communicable Disease Center Veterinary Public Health Program, she established a reputation as an authority in the diagnosis and identification of the bacterial zoonoses. Her extensive writings on leptospirosis and salmonellosis include more than 200 publications. The last papers to receive her scrutiny were the

revised "Perspective of Salmonellosis" used in all NCDC training seminars and short courses on salmonellosis and the handbook "Salmonellae in Foods--A Review of Methods for Isolation and a Suggested Procedure."

Mrs. Galton was to be the recipient of the K. F. Meyer Gold Headed Cane Award at the Biennial Veterinary Conference in May. Due to the gravity of her illness, Dr. Martin M. Kaplan, WHO, Geneva, last year's recipient, presented the award to her on March 8. Dr. K. F. Meyer in extending his congratulations wrote:

"It will remain an unforgettable occasion in my life when I was advised that you have joined the exclusive club of the 'Gold-Headed Cane Awardees.' I trust you grant me the privilege to offer you my heartfelt congratulations to this well deserved recognition.

"As a member and then as Chief of the Veterinary Research Section for many years, you made solid unrefutable contributions to Veterinary Public Health and to present-day newer knowledge on many diseases. Sophisticated diagnostic laboratory procedures developed by you and associates you trained have simplified and expedited the recognition and identification of causative agents of leptospirosis and salmonella infections. The findings unraveled by your examinations and tests invariably broadened the epidemiologic aspect of the diseases and placed the concept of latent infections on a firm foundation. Your indefatigable and critical work in the laboratory wisely supported by observations in the field are pillars in present-day veterinary epidemiology and research. Without your devoted research, training and teaching efforts, Veterinary Public Health would have remained a descriptive inductive discipline. Thanks to you it is a respected science.

"I bow in deep respect before your great achievements."

Mrs. Galton had truly become an international public health figure. She was a consultant and advisor to the Pan American Health Organization, the World Health Organization, Leptospira Subcommittee of Microbiology of the Committee on Nomenclature of the International Congress, International Atomic Energy Commission, International Food Hygiene Committee and was constantly sought after as a speaker, panelist, advisor to foreign universities, health services and veterinary associations. She was a member of many scientific organizations. Her friends and acquaintances included all who were concerned with the salmonella problem, leptospirosis, food hygiene, and the bacterial zoonoses. There is hardly a worker in these fields who had not studied with or profited from contact with her. She gave Veterinary Public Health a microbiological base for which we are all deeply indebted. We shall all miss her scientific advice and commentary, her generous friendship and loyalty. I personally have lost an invaluable colleague and friend.

James H. Steele

I. SUMMARY

In January 1968, 1,362 isolations of salmonellae were reported from humans, an average of 272 isolations per week (Tables I, II, and V-A). This number represents a decrease of 70 (20.5 percent) from the weekly average of December 1967 and a decrease of 87 (24.2 percent) from the weekly average of January 1967.

Reports of 579 nonhuman isolations of salmonellae were received during January, a decrease of 218 (27.4 percent) from December 1967 (Tables III, IV, and V-B).

After 2 years as a member of the Salmonellosis Unit, Dr. Michael Treger has resigned from the Public Health Service to begin a private practice of veterinary medicine. We wish him further success in his new career.

II. REPORTS OF ISOLATIONS

The ten most frequently reported serotypes during January:

HUMAN				NONHUMAN		
Serotype	Number	Percent	Rank Last Month	Serotype	Number	Percent
typhi-murium*	392	28.8	1	heidelberg	103	17.8
heidelberg	96	7.0	2	typhi-murium*	95	16.4
saint-paul	90	6.6	4	anatum	32	5.5
infantis	86	6.3	5	montevideo	27	4.7
newport	82	6.0	5	blockley	26	4.5
enteritidis	79	5.8	3	infantis	21	3.6
derby	40	2.9	10	thompson	20	3.5
typhi	40	2.9	7	saint-paul	18	3.1
blockley	38	2.8	9	cerro	16	2.8
thompson	35	2.6	8	enteritidis	15	2.6
Total	978	71.8		Total	373	64.4
TOTAL (all serotypes)	1362			TOTAL (all serotypes)	579	
*including var. copenhagen	20			*including var. copenhagen	21	

III. CURRENT INVESTIGATIONS

Salmonella Contamination of Enzymatic Drain Cleaners

Reported by Samuel L. Andelman, M.D., Commissioner of Health, Olga Brolnitsky, M.D., Chief Epidemiologist, Herbert L. Slutsky, Ph.D., Epidemiologist, and Hyman Orbach, Ph.D., Epidemiologist, Chicago Board of Health; Barbara Christine, M.D., and James Hart, M.D., Connecticut State Department of Health; the U.S. Department of Agriculture; the U.S. Food and Drug Administration; and the Epidemiological Services Laboratory Section, Epidemiology Program, NCDC.

Enzymatic cleaners are products containing dried enzyme preparations, desiccated bacterial cultures, and dry fillers or carriers. These products are used to decongest and clean drains, septic tanks, grease pits, waste ponds, dishwashers, potato peelers, wash sinks, and other kitchen and bathroom equipment. They are recommended for use in schools, hospitals, sanitariums, hotels, creameries, and food processing plants, and are claimed to be nonpathogenic.

In the fall of 1967, the Chicago Board of Health reported the isolation of salmonellae from an enzymatic drain cleaner; this finding was confirmed by the Epidemiological Services Laboratory Section, NCDC. In early 1968, the Connecticut State Department of Health notified the Salmonellosis Unit that it had isolated six salmonella serotypes from another brand of enzymatic drain cleaner. To assess the extent and source of salmonella contamination of these products, the Consumer and Marketing Service, U.S. Department of Agriculture, and the Epidemiological Services Laboratory, NCDC, performed bacteriological examinations on samples of drain cleaners. The USDA survey included 68 samples of cleaners from 28 firms. Twenty-six (38 percent) of the 68 samples examined contained salmonellae. The 26 positive samples represented nine different firms; 19 firms had products that did not yield salmonellae. Salmonella O groups from positive samples included B, C, C_1, C_2, E_1, E_2, E_4, and G. Some of the enzymatic cleaners included in the survey were from reserve samples that had been stored at the USDA laboratory. Positive samples were obtained from these stored products, indicating the viability of salmonella in these compounds when stored at ambient temperatures.

The Epidemiological Services Laboratory examined both finished product and constituent ingredients of the drain cleaner previously found to contain salmonella by the Connecticut State Department of Health. Twelve samples of the product and samples of 11 different constituents were provided by the U.S. Food and Drug Administration. All 12 of the product samples examined were found to contain salmonellae, yielding a total of seven serotypes. Only two of the constituent ingredients, cellulase and lipase, were found to contain salmonellae. Both enzyme preparations had been manufactured by the same firm. The serotypes found in the drain cleaner were Salmonella california, S. infantis, S. lexington, S. meleagridis, S. montevideo, S. oranienburg, and S. senftenberg. The cellulase was positive for S. california, S. montevideo, and S. senftenberg, and the lipase for S. california, S. lexington, and S. montevideo. Constituent ingredients found negative for salmonellae included bacterial mix, anhydrous disodium phosphate, anhydrous monosodium phosphate, propylene oxide, propylene glycol, sodium thiosulphate, protease, amylase, urea, and nitrilio sodium acetate.

The results of these studies show a high level of salmonella contamination of enzymatic drain cleaners. As a result of the USDA survey, the following policy concerning use of enzymatic cleaners in federally inspected meat and poultry establishments was adopted by the Technical Services Division, Consumer and Marketing Service, USDA:

"1) All firms manufacturing cleaners containing bacterial cultures will be required to provide to the Compound Evaluation Laboratory taxonomic identification of the cultures used. The presence of pathogenic bacteria will not be permitted.

2) Firms manufacturing enzymic cleaners will provide the Compound Evaluation Laboratory with records of salmonellae analysis for each lot produced. Testing will be conducted by a qualified microbiologist.

3) Enzymic cleaners submitted for evaluation to determine their acceptibility for use in federally inspected plants will be examined by C&MS for the presence of salmonellae and/or other pathogenic microorganisms. Compounds containing salmonellae or other pathogenic microorganisms will not be approved.

4) Authorization for enzymic cleaners currently listed as accepted and found to be free of salmonellae and/or other pathogenic microorganisms will be continued. Manufacturers of currently accepted products will be informed of current policy and will be required to comply with Parts 1 and 2 of this section. If future analysis of products from accepted firms shows the presence of salmonellae and/or other pathogenic microorganisms, authorization will be canceled.

5) Upon finding enzymic cleaners to be contaminated, an instructional directive shall be issued to all federally inspected meat and poultry plants to cease immediately the use and purchase of the incriminated brand.

6) Authorization for enzymic drain cleaners found to contain pathogenic microorganisms will be revoked. Manufacturers will be advised that compounds may not be used or stored within the official establishment, nor may they be handled by employees having other duties within the establishment.

7) Manufacturers desiring reinstatement of an enzymic cleaner for which authorization has been revoked because of presence of pathogens must follow this procedure:

   a) The original source of contamination must be identified and removed. A report giving details of the successful solution of this problem must be furnished.

   b) The manufacturer of the cleaner must provide to the Compound Evaluation Laboratory taxonomic identification of the bacterial cultures contained in the revised product.

   c) A 6- to 8-oz. sample of the revised product must be sent to the Compound Evaluation Laboratory for examination.

   d) The supplier of the enzymic cleaner must provide the Compound Evaluation Laboratory with a record of salmonellae analysis for each lot of enzymic cleaner prepared for use in officially inspected establishments. Analyses must be conducted by a qualified microbiological laboratory."

EDITOR'S COMMENT: To date, no cases of salmonellosis due to enzymatic drain cleaners have been documented. However, in view of the high degree of salmonella contamination and apparent widespread use of these compounds in schools, hospitals, restaurants, and homes, it would seem advisable to recommend that use of these products be discontinued and that nonenzymatic drain cleaners be substituted in these institutions.

TABLE I. COMMON SALMONELLAE REPORTED FROM HUMAN SOURCES, JANUARY 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									3	1	4	1	1																	3	1
bareilly				1						1		1										1									
blockley				1					3	2	4	1	1	5	2	1	1		1				3		2				1		1
braenderup				1		1	1				3												5						1	1	
bredeney											2	2			1														1		2
chester														2																	
cholerae-suis v kun										1				1															1	1	
cubana											1				1	2															
derby						1		3	2	2	3		2	12											4				5		2
enteritidis	1			3		4		1	7	1	8	5	1	16	1	3							3		3	1	3		2	5	1
give											2														1						
heidelberg				5	2	1	5	1	4	4	5	5	3	11	4	2	2	2							3		1		7	8	1
indiana																														1	
infantis	2			5		2	1	1	3	2	3	4		7	2	1	1		3						1		2		4	2	5
java									1	1	2	2				2	1		1						1						
javiana										1		1	4												1						10
litchfield										1	1			1																	
livingstone				1				1																							
manhattan														1	1																2
miami																														3	5
mississippi																															
montevideo	1							1	1		1			1			2										1				2
muenchen									1			1		2		1			2				1				1			1	1
newington														1																	
newport				1	1			3	5	3	1	1		1	1		1	1								1		1	2	1	16
oranienburg				1				1	1	6				1					2						1					5	2
panama									1	2	4				1																
paratyphi B				2								1		1											1		2				
reading					1						1																				
saint-paul	1			3		2		8	3	2	8	8		7	15	4	3								2	1			3	3	2
san-diego				4				1	1							2															
schwarzengrund								1						1																	
senftenberg																															
tennessee								1		1	1						1														
thompson				3			1		2	1	6	6		2	1								1	2	2		2		3			
typhi				1		3	1		4		3	4		3	1									1	1	1			2			2
typhimurium				23	3	3		17	32	6	25	13	1	29	12	8	2	3	10		2		14		16	1	7	1	2		12	13
typhimurium v cop				2		7				4					4																
weltevreden																															
worthington											1																				
TOTAL	5	–	–	57	7	24	9	40	74	42	89	56	13	105	47	26	14	6	19	–	2	1	27	3	39	5	19	2	34	–	46	68
ALL OTHER*	–	–	–	1	2	1	13	3	1	–	1	1	–	5	2	4	–	1	–	–	–	–	–	1	–	10	2	–	2	–	2	2
TOTAL	5	–	–	58	9	25	22	43	75	42	90	57	13	110	49	30	14	7	19	–	2	1	27	4	39	15	21	2	36	–	48	70

Note: NYA – New York, Albany; NYB – Beth Israel Hospital; NYC – New York City. Beth Israel Hospital laboratory is a reference laboratory and this month serotyped a total of 116 cultures.

* See Table II.

TABLE I – Continued

GEOGRAPHIC DIVISION AND REPORTING CENTER																				TOTAL	% OF TOTAL	CUMULATIVE TOTAL	% OF CUMULATIVE 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					
													1					2		6	23	1.7	23	1.7	*anatum*
																		1			5	0.4	5	0.4	*bareilly*
					1		1											7			38	2.8	38	2.8	*blockley*
																					13	1.0	13	1.0	*braenderup*
		1																1			10	0.7	10	0.7	*bredeney*
																					2	0.1	2	0.1	*chester*
																					4	0.3	4	0.3	*cholerae-suis v kun*
	1																				5	0.4	5	0.4	*cubana*
					2		1											1			40	2.9	40	2.9	*derby*
	2				1				3									4			79	5.8	79	5.8	*enteritidis*
																		1		2	6	0.4	6	0.4	*give*
					6		1									1	1	10		1	96	7.0	96	7.0	*heidelberg*
																					1	0.1	1	0.1	*indiana*
11						1	2			1	1							10		9	86	6.3	86	6.3	*infantis*
																		2			13	1.0	13	1.0	*java*
				1	2								1								21	1.5	21	1.5	*javiana*
																		2			5	0.4	5	0.4	*litchfield*
							1											1			4	0.3	4	0.3	*livingstone*
	1															1		5			11	0.8	11	0.8	*manhattan*
																					8	0.6	8	0.6	*miami*
					2																2	0.1	2	0.1	*mississippi*
						1	4											3			18	1.3	18	1.3	*montevideo*
						1												4			16	1.2	16	1.2	*muenchen*
																		1			2	0.1	2	0.1	*newington*
1	1	1			4		6							1				14		14	82	6.0	82	6.0	*newport*
					1		3								1			3			28	2.1	28	2.1	*oranienburg*
	1					3	3													11	26	1.9	26	1.9	*panama*
																1					8	0.6	8	0.6	*paratyphi B*
																		3			5	0.4	5	0.4	*reading*
					3		1		1							1	3	4		2	90	6.6	90	6.6	*saint-paul*
											2							1			11	0.8	11	0.8	*san-diego*
														1							3	0.2	3	0.2	*schwarzengrund*
																				1	1	0.1	1	0.1	*senftenberg*
																					4	0.3	4	0.3	*tennessee*
				1	2																35	2.6	35	2.6	*thompson*
1	6			1	1								1					3			40	2.9	40	2.9	*typhi*
1	5		1	3	10	1	15		2		7			1		14	1	43	3	10	372	27.3	372	27.3	*typhimurium*
					1								1		1						20	1.5	20	1.5	*typhimurium v cop*
																				7	7	0.5	7	0.5	*weltevreden*
													2							1	4	0.3	4	0.3	*worthington*
14	17	2	1	6	36	7	38	–	6	1	10	–	6	3	2	18	5	126	3	64	1244	91.3	1244	91.3	TOTAL
–	2	–	1	6	1	3	19	1	–	–	–	19	2	–	–	–	–	8	–	2	118		118		ALL OTHER*
14	19	2	2	12	37	10	57	1	6	1	10	19	8	3	2	18	5	134	3	66	1362		1362		TOTAL

TABLE II. OTHER SALMONELLAE REPORTED FROM HUMAN SOURCES, JANUARY 1968

SEROTYPE	REPORTING CENTER																					
	ARI	ARK	CAL	CON	DEL	DC	FLA	GA	HAW	ILL	IOW	LA	MAS	MIC	MIS	MON	NM	NYA	NYB	NYC
ahuza										1										
alachua			1																	
albany										1		1								
berta																				
california														1					2	
cholerae-suis																			1	
dublin			2						1											
durban														1						
essen											1									
gaminara	1																			
gatow																				
hartford							1	1												
hvittingfoss				1																
kentucky									1											
llandoff																				
manila																				
minnesota																				1
muenster							1													
paratyphi A					1															
poona			1																	
rubislaw	1												1							
stanley			1																	
urbana			1																	
TOTAL	2	—	6	1	1	—	2	1	2	2	1	1	1	2	—	—	—	—	3	1
NOT TYPED*	—	6	2	—	—	10	—	1	—	3	—	—	—	—	1	1	19	13	—	—
TOTAL	2	6	8	1	1	10	2	2	2	5	1	1	1	2	1	1	19	13	3	1

* See Table V-A

TABLE II – Continued

REPORTING CENTER													TOTAL	CUMULATIVE TOTAL	SEROTYPE
	NC	OHI	OKL	PA	RI		TEN	TEX	VA	WIS					
													1	1	*ahuza*
													1	1	*alachua*
													2	2	*albany*
							1		1				2	2	*berta*
													3	3	*california*
													1	1	*cholerae-suis*
													3	3	*dublin*
													1	1	*durban*
													1	1	*essen*
													1	1	*gaminara*
								2					2	2	*gatow*
	1												3	3	*hartford*
													1	1	*hvittingfoss*
			1										1	1	*kentucky*
													1	1	*llandoff*
			1										1	1	*manila*
		1											2	2	*minnesota*
			1										2	2	*muenster*
													1	1	*paratyphi A*
													1	1	*poona*
	1												3	3	*rubislaw*
													1	1	*stanley*
				1						1			3	3	*urbana*
	2	1	3	1	–		1	2	1	1			38	38	TOTAL
	–	–	–	–	2		1	17	1	3			80	80	NOT TYPED*
	2	1	3	1	2		2	19	2	4			118	118	TOTAL

Cumulative Totals include isolations of all serotypes (except those listed in Table I) reported this year.

TABLE III. COMMON SALMONELLAE REPORTED FROM NONHUMAN SOURCES, JANUARY 1968

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
anatum	1	5			1		7	2			2
bareilly							—				—
blockley	20	4				1	25	1			1
braenderup							—				—
bredeney		2					2	1			1
chester	2	5					7				—
cholerae-suis v kun			11				11				—
cubana							—	4	1		5
derby	2	7	1				10	1			1
enteritidis	12	1	1				14				—
give		3					3			1	1
heidelberg	55	38	4	2		1	100	1			1
indiana			1				1				—
infantis	11	5				1	17	1			1
java							—				—
javiana							—				—
litchfield							—				—
livingstone	3					1	4	1		3	4
manhattan							—				—
miami							—				—
mississippi							—				—
montevideo	2	1					3	6		7	13
muenchen		1					1				—
newington	2						2				—
newport	1	1	2	4			8				—
oranienburg							—	2		2	4
panama	1						1	2			2
paratyphi B							—				—
reading		3					3				—
saint-paul	10	1				1	12				—
san-diego		1					1				—
schwarzengrund							—			1	1
senftenberg		2					2	1		2	3
tennessee	1						1	3			3
thompson	13		1				14	1		3	4
typhi							—				—
typhimurium	11	2	6	19	1	5	44				—
typhimurium v cop	18		1				19			1	1
weltevreden							—				—
worthington	1					1	2	5			5
TOTAL	166	82	28	25	2	11	314	32	1	20	53
ALL OTHER*	11	5	5	4	—	3	28	28	—	4	32
TOTAL	**177**	**87**	**33**	**29**	**2**	**14**	**342**	**60**	**1**	**24**	**85**

* See Table IV

TABLE III – Continued

WILD ANIMALS AND BIRDS	REPTILES AND ENVIRONMENT	HUMAN DIETARY ITEMS						MISCELLANEOUS	TOTAL	CUMULATIVE TOTAL	SEROTYPE
		EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL				
4			1	2	13	2	18	1	32	32	*anatum*
							–		–	–	*bareilly*
							–		26	26	*blockley*
							–		–	–	*braenderup*
							–		3	3	*bredeney*
							–		7	7	*chester*
							–		11	11	*cholerae-suis v kun*
				2	2	2	6		11	11	*cubana*
1				1			1	1	14	14	*derby*
							–	1	15	15	*enteritidis*
							–		4	4	*give*
							–	2	103	103	*heidelberg*
							–		1	1	*indiana*
				1	1		2	1	21	21	*infantis*
	4						–		4	4	*java*
							–		–	–	*javiana*
							–		–	–	*litchfield*
				1			1		9	9	*livingstone*
							–		–	–	*manhattan*
							–		–	–	*miami*
							–		–	–	*mississippi*
	1	1		5		1	7	3	27	27	*montevideo*
	6						–		7	7	*muenchen*
					3		3		5	5	*newington*
	2						–		10	10	*newport*
				1	1	1	3	1	8	8	*oranienburg*
							–		3	3	*panama*
							–	1	1	1	*paratyphi B*
							–		3	3	*reading*
4						1	1	1	18	18	*saint-paul*
				1			1		2	2	*san-diego*
				1		1	2		3	3	*schwarzengrund*
							–		5	5	*senftenberg*
1		1		1	4	2	8	1	14	14	*tennessee*
	1						–	1	20	20	*thompson*
							–		–	–	*typhi*
25				1			1	4	74	74	*typhimurium*
1							–		21	21	*typhimurium v cop*
							–		–	–	*weltevreden*
							–		7	7	*worthington*
36	14	2	1	17	24	10	54	18	489	489	TOTAL
2	1	6	–	7	3	3	19	8	90	90	ALL OTHER*
38	**15**	**8**	**1**	**24**	**27**	**13**	**73**	**26**	**579**	**579**	**TOTAL**

TABLE IV. OTHER SALMONELLAE REPORTED FROM NONHUMAN SOURCES, JANUARY 1968

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
alachua							–	1			1
albany							–	1			1
atlanta				1			1				–
binza							–	1			1
california							–	2			2
cerro			3	2			5	4			4
champaign							–				–
corvallis		1					1				–
drypool							–	1			1
dublin				1			1				–
eimsbuettel	1						1	1		1	2
essen							–				–
gallinarum	1						1				–
grumpensis							–				–
halmstad							–	2			2
hartford							–				–
illinois							–			1	1
johannesburg							–	1			1
kentucky	1	1					2	2		1	3
kottbus	2	1					3				–
lexington							–				–
lille							–	1			1
manila	1						1				–
minnesota							–	1			1
mission			2				2				–
muenster		1					1				–
new-brunswick							–			1	1
orion							–				–
pullorum	1	1				2	4				–
seremban						1	1				–
siegburg							–				–
simsbury							–				–
thomasville							–	2			2
urbana							–				–
vejle							–				–
westhampton							–	8			8
TOTAL	7	5	5	4	–	3	24	28	–	4	32
NOT TYPED*	4	–	–	–	–	–	4	–	–	–	–
TOTAL	11	5	5	4	–	3	28	28	–	4	32

*See Table V-B

TABLE IV – Continued

WILD ANIMALS AND BIRDS	REPTILES AND ENVIRONMENT	HUMAN DIETARY ITEMS						MISCELLANEOUS	TOTAL	CUMULATIVE TOTAL	SEROTYPE
		EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL				
		1			1		2		3	3	*alachua*
							–		1	1	*albany*
							–		1	1	*atlanta*
				1			1	1	3	3	*binza*
							–		2	2	*california*
		5		2			7		16	16	*cerro*
							–	2	2	2	*champaign*
							–		1	1	*corvallis*
							–		1	1	*drypool*
							–		1	1	*dublin*
				1			1		4	4	*eimsbuettel*
							–	4	4	4	*essen*
							–		1	1	*gallinarum*
				1			1		1	1	*grumpensis*
							–		2	2	*halmstad*
1							–		1	1	*hartford*
							–		1	1	*illinois*
							–		1	1	*johannesburg*
				2			2		7	7	*kentucky*
							–		3	3	*kottbus*
						3	3		3	3	*lexington*
							–		1	1	*lille*
							–		1	1	*manila*
							–		1	1	*minnesota*
							–		2	2	*mission*
							–		1	1	*muenster*
							–		1	1	*new-brunswick*
					1		1		1	1	*orion*
							–		4	4	*pullorum*
							–		1	1	*seremban*
					1		1		1	1	*siegburg*
							–	1	1	1	*simsbury*
							–		2	2	*thomasville*
	1						–		1	1	*urbana*
1							–		1	1	*vejle*
							–		8	8	*westhampton*
2	1	6	–	7	3	3	19	8	86	86	TOTAL
–	–	–	–	–	–	–	–	–	4	4	NOT TYPED*
2	1	6	–	7	3	3	19	8	90	90	TOTAL

TABLE V. SALMONELLAE REPORTED BY GROUP IDENTIFICATION ONLY, JANUARY 1968

A. HUMAN SOURCES

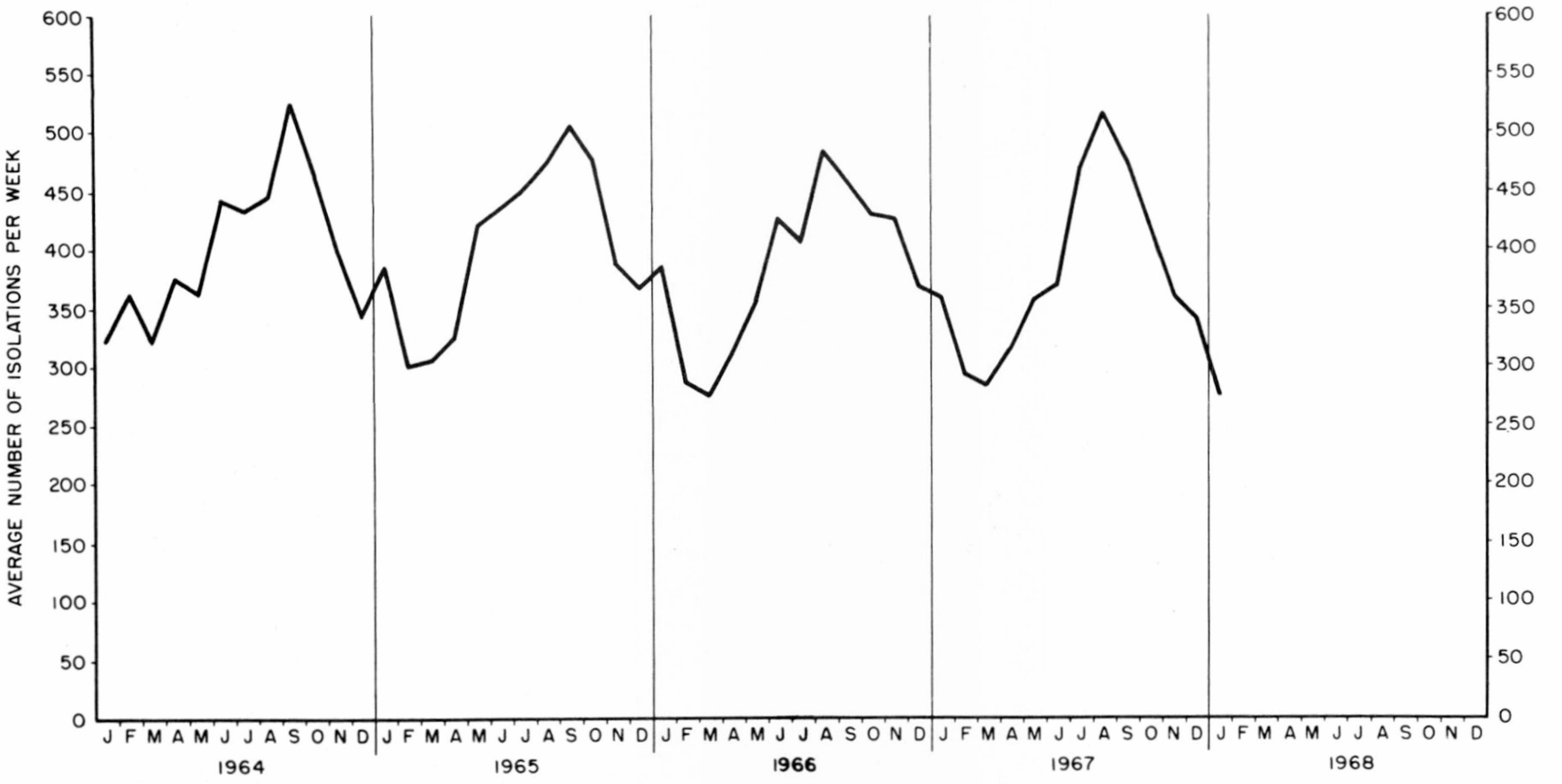
REPORTING CENTER	GROUP														TOTAL
				B	C_1			C_2	D			H		UNK		
ARKANSAS				2	1			1	1			1				6
CALIFORNIA				1										1		2
D.C.				7					1					2		10
GEORGIA								1								1
ILLINOIS				1										2		3
MISSISSIPPI								1								1
MONTANA				1												1
NEW MEXICO				16	1			2								19
NEW YORK – A														13		13
RHODE ISLAND				2												2
TENNESSEE														1		1
TEXAS				7				2						8		17
VIRGINIA				1												1
WISCONSIN														3		3
TOTAL				**38**	**2**			**7**	**2**			**1**		**30**		**80**

B. NONHUMAN SOURCES

SOURCES	GROUP														TOTAL
				B	C_1			C_2	D			H		UNK		
DOMESTIC ANIMALS AND THEIR ENVIRONMENT														4		4
ANIMAL FEEDS																–
WILD ANIMALS AND BIRDS																–
REPTILES AND ENVIRONMENT																–
HUMAN DIETARY ITEMS																–
MISCELLANEOUS																–
TOTAL				**–**	**–**			**–**	**–**			**–**		**4**		**4**

Figure I

REPORTED HUMAN ISOLATIONS OF SALMONELLAE
IN THE UNITED STATES



STATE EPIDEMIOLOGISTS AND STATE LABORATORY DIRECTORS

Key to all disease surveillance activities are the physicians who serve as State epidemiologists. They are responsible for collecting, interpreting, and transmitting data and epidemiological information from their individual States; their contributions to this report are gratefully acknowledged. In addition, valuable contributions are made by State Laboratory Directors; we are indebted to them for their valuable support.

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