REPORT NO. 19
DECEMBER 9, 1963

CDC

COMMUNICABLE DISEASE CENTER

SALMONELLA

SURVEILLANCE

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For Month of October 1963

U. S. Department of Health, Education, and Welfare / Public Health Service

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 to: Chief, Salmonella Surveillance Unit, Communicable Disease Center, Atlanta, Georgia, 30333.

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I. SUMMARY

During October, reports of 2,462 isolations of salmonella from humans were submitted for an average weekly total of 492, the highest figure tabulated for 1963. A total of 492 nonhuman isolations were reported during the same period, representing a slight increase over September.

No single outbreak accounts for the increased incidence of human isolations. This may be accounted for by increased awareness of salmonellosis or by a seasonal trend, or both. A seasonal increase is suspected; however, confirmation must await a longer period of surveillance.

Included in this month's Reports from States are an outbreak of S. newport gastroenteritis involving 300 persons attending a Christmas banquet last December, a follow-up report of outbreaks of gastroenteritis due to S. bredeney traced to beef jerky, a hospital associated outbreak of S. montevideo, human deaths due to S. pullorum and S. cholera-suis, and an outbreak of gastroenteritis in an institution for the elderly. A follow-up on the investigation of S. branderup and S. infantis gastroenteritis in Kansas is reported.

II. REPORTS OF ISOLATIONS FROM THE STATES

A. Human

During October, 2,462 isolations of salmonella were reported, representing the largest number of recoveries during any one month period since the inception of the surveillance program for salmonella. In addition, the average weekly total number of salmonella isolations for October (492) is the largest figure for 1963 (See Figure 1).

The seven most frequently recovered serotypes during October were:

No.	Serotype	Number	Per Cent	Standing Last Month
1	S. typhimurium	633	25.7	1
2	S. derby	228	9.3	2
3	S. heidelberg	190	7.7	3
4	S. enteritidis	154	6.3	10
5	S. infantis	125	5.1	7
6	S. newport	115	4.7	5
7	S. montevideo	84	3.4	8
		1,529	62.1	

Total Salmonellae Isolated (Oct.) 2,462

The seven most frequently isolated serotypes accounted for 1,529 (62.1 per cent) of the 2,462 recoveries reported during October, while they represented only 9.2 per cent of the 76 different types reported. The prominent position held by S. enteritidis may be explained by three separate outbreaks of gastroenteritis due to this serotype occurring in Florida and Massachusetts. The outbreak in Florida is currently under investigation as is one of two outbreaks in Massachusetts. The other outbreak in Massachusetts is described in this report (See Reports From States - Massachusetts).

Of the 2,462 individuals reported as harboring salmonellae this month, 380 (15.4 per cent) had other members of their family simultaneously positive for the same serotype. The family attack rate for October is consistant with those computed for antecedent months.

The modal age group for individuals reported during October was once again 1-4 years. The tabulation of isolations by sex indicates no sex predilection during October (See Table IV). This is consistent with past experience.

B. Nonhuman

During October 492 salmonella isolations were reported from nonhuman sources of which all but 5 were identified serologically. There were 49 serotypes and 2 of these, S. bonariensis and S. tel-el-kebir, appeared for the first time.

The seven most commonly reported serotypes for October were:

		No.	Per Cent	Standing Last Month
1.	S. typhimurium S. typhimurium var. copenhagen	117	23.8	1
2.	S. heidelberg	37	7.5	4
3.	S. saint paul	31	6.3	(not listed)
4.	S. schwarzengrund	28	5.7	2
5.	S. infantis	22	4.5	(not listed)
6.	S. newport	21	4.3	3
7.	S. anatum	18	3.7	7
	S. thompson	18	3.7	(not listed)
	Total	292		

These 7 types comprise 59.5 per cent of the 492 reported isolations. Although S. infantis and S. saint paul were not among this group last month, they rank second and sixth respectively, in frequency during the 10 months of 1963.

The most common sources in order of frequency were turkeys, 175 (35.2 per cent), chickens, 95 (19.3 per cent), cattle, 64 (13.8 per cent), and swine, 27 (5.5 per cent). The total isolated from these 4 sources represent 73 per cent of the cultures reported from all nonhuman sources during the month. Nine food and feed sources contributed another 51 (10.3 per cent) of the isolations of 22 different serotypes.

The 217 isolations obtained from animal feeds or feed ingredients in the past 10 months represents 4.9 per cent of the total isolations by

source. It is perhaps significant that when it is considered that 26 per cent of the total isolations from other sources are S. typhimurium or S. typhimurium var. copenhagen, one would expect more isolations of this type from feed. Several probable reasons for this may be insufficient numbers of feed products sampled to obtain a true ratio of serotypes present; the selectivity of an animal host for S. typhimurium, a highly pathogenic serotype resulting in a higher frequency of isolation from diseased animals; and contact spread from animal to animal as the most important source of animal salmonellosis due to this serotype.

Mention was made in the previous report of an increased number of bovine isolations of S. newport, principally from California. Information received from Dr. Graham Kemp, California State Health Department, indicated that the isolations were from feeder cattle from one area of the state. The isolates were obtained by a veterinary diagnostic laboratory involved in the investigations of disease problems in the herds. Additional cultures from the same area are reported this month.

III. CURRENT INVESTIGATIONS

A. Kansas

Follow-up Investigation on an Outbreak of Hospital-Acquired Salmonellosis Due to S. braenderup and S. infantis, Presumably Traced to Raw Eggs (Initially reported in SSR No. 18, September, 1963). Dr. Rosemary Harvey and Dr. Leon Bauman, Wichita-Sedgwick County Department of Public Health, Dr. Donald Wilcox, Kansas State Department of Public Health; and Dr. Palmer Beasley, EIS Officer.

As previously reported, S. braenderup and S. infantis were recovered from nursing home patients suffering from diarrhea. Epidemiological evidence implicated raw eggs as the vehicle if infection. S. braenderup, a rare serotype, serves as an ideal tracer for the source of such an epidemic. Eggs from the farms supplying the hospital were cultured in slurries representing three farms per slurry. S. braenderup was recovered from four of the 86 slurries. At least three of the slurries represented farms in widely separated areas.

Six farms represented in two of the positive slurries were investigated in an effort to determine the following information: (1) Could S. braenderup be isolated from the chickens? (2) Was there a concommitant salmonella infestation of other farm animals? (3) Could S. braenderup be isolated from the chicken feed? (4) Was there a common animal feed source used by the farms in question that could account for the wide dissemination of this rare serotype?

Methods: Swabs of pooled droppings were taken from each farm animal. Feed samples were taken from storage bins and feeding troughs.

Results: (1) S. braenderup was recovered from chicken droppings on two farms. Four other salmonella serotypes were also recovered from chicken droppings. (2) Salmonellae were recovered from the feces of pigs, sheep and sparrows, but not cattles or horses. S. braenderup was recovered from both pigs and chickens on one farm. Most droppings

were salmonella free, but salmonellae were found in the droppings of at least one animal on each of the six farms. (3) Chicken and pig feed samples were obtained. One of seven feed samples yielded two salmonella serotypes, neither of which was isolated from the farm animals. In all instances feed had been mixed, used, and replaced a number of times since the epidemic. In no case were unmixed animal renderings available. (4) The numerous components involved in chicken feed made correlation of a possible common source difficult, even when only six farms were studied. It is still possible that only one ingredient from a common source was involved.

Discussion: The recovery of S. braenderup from the chicken droppings from some of the farms known to have eggs contaminated with the same rare serotype is presumptive epidemiological evidence that these farms were among the sources of the epidemic. The source of introduction of the organism on to the farms remains unelucidated, but the occurrence in farms widely spaced would suggest a common product used by these farms. Since animal and fish meals used in chicken feeds are very common sources of salmonella, this seems to be the most reasonable explanation. Whether eggs are contaminated internally (during formation in the oviduct or later across the intact shell) or by small pieces of fecally contaminated shell falling into contents during food preparation, is not clear. Existing evidence would suggest that either may be operative, the latter perhaps more frequently (1).

Meat and fish meals are common sources of salmonella and several studies would suggest they have been the sources of human and animal diseases. The organisms recoverable from a farm will vary in both kind and number over relatively short periods of time, but whether the farm will maintain salmonella without constant reintroduction is not known.

(1) Boyer, C. I. Jr., Narotaky, S., Bruner, D. W., and Brown, J. A. Salmonellosis in Turkeys and Chickens Associated with Contaminated Feed. Avian Dis., 6:43, 1962.

IV. REPORTS FROM STATES

A. Alabama

Follow-up of Salmonella newport Gastroenteritis Related to a Shirt Factory Banquet. Dr. W. H. Y. Smith, Director, Bureau Preventable Diseases, Alabama Department of Public Health.

A large textile plant in southern Alabama gave a noon Christmas part on four successive days, beginning Monday, December 17, 1962 (See SSR #9). About 435 employees were fed on Monday, 440 on Tuesday, 430 on Wednesday and 330 on Thursday.

No illnesses resulted from Monday or Tuesday's meals, but twelve hours after ingestion of food at noon Wednesday, signs of gastroenteritis, with fever, nausea, vomiting and diarrhea, began to appear in rapidly increasing numbers of persons until 300 of the 430 were involved in a 24-hour-period. Of these, 166 required hospitalization.

The Thursday banquet was held before the epidemic resultant from Wednesday's dinner became known to health authorities. A few became

ill after Thursday's meal, but in all probability this was psychological and not actual infection since no salmonella could be grown from any of that day's food, or "ill" patients.

Since it was the practice of the caterer to divide up all the left-over food among the employees after each meal, no food was available for culture from Wednesday's banquet.

However, one employee was found who had taken his portion of turkey and dressing home and no other food. He and four others in the family became ill following consumption of this food. Stool cultures from all four revealed Salmonella newport. The total number of S. newport recoveries from affected banquet guests is uncertain, but probably exceeded 100. The caterer ate only a white meat turkey sandwich on Wednesday between 1 and 2 PM, and he became ill Thursday between 9 and 10 AM. The personnel manager of the plant ate all four days and developed a mild case of diarrhea at 6 PM on Friday. He readily admitted this could have been psychologic.

No raw broth was added to the dressing after cooking and no knife was used for trimming the turkeys. There were 10 to 11 turkeys used each day and each turkey weighed 18 to 22 pounds. All food was transported from the caterer to the plant in 15 gallon National Guard pots.

All turkeys were sliced cold with a clean knife, but the carver's hand was used to hold the turkey in place. The caterer said that some of the sliced meat, at times, was pink but all slices were mixed.

All food handlers and all the employees of the store where the turkeys were purchased had negative stool cultures.

Although no turkey or other foods served Wednesday were cultured, on the basis of epidemiologic evidence, the presumptive cause was infected turkeys contaminated with Salmonella newport.

B. Arizona

Isolated Occurrence of Severe Gastroenteritis Due to S. derby in an Indian Infant. Arizona Department of Public Health, and Dr. R. G. Warner, Phoenix Field Station, Communicable Disease Center.

A four-month-old Indian baby was admitted to a U. S. Public Health Service Indian Hospital, Sacaton, Arixona on August 24, 1963. Admission diagnosis was "brease-fed malnourishment". Fever and diarrhea developed 36 hours following admission. Dehydration developed promptly. A stool culture obtained shortly thereafter grew Salmonella derby. Treatment with chloramphenicol was begun, and the patient was transferred to the Phoenix Indian Hospital. At the time of this report (October 17), diarrhea was continuing and the patient's condition was still considered critical.

Because of the recent interstate outbreak of S. derby induced gastroenteritis, an epidemiological investigation was begun. The patient resided with his parents and seven siblings at a labor camp on an Arixona ranch. The residence dwelling is supplied with a privy,

badly in need of repair. Two feet of seepage area about the privy was exposed and lacking recent lime application. Flies were abundant, covering the entire bottom surface of the privy, and doorways of the cabin dwelling. Water was supplied by a well, which was "presumably uncontaminated". Milk supplied the family was commercially pasteurized and the family used only fresh intact eggs purchased locally. Rectal swab specimens were obtained from each family member and from the only household pet, a dog. All were negative for salmonellae on culture. Despite the lack of adequate waste disposal facilities, no source of the organism could be uncovered at the infant's residence.

The possibility of hospital-acquired infection was considered; however, lack of other similar cases makes assessment of the role of the hospital extremely difficult.

Editor's Comment:

This case history again emphasizes the severity and protracted course of salmonellosis in infants, that may occur even in the presence of presumably adequate specific antimicrobial therapy.

C. California

Follow-up Report of Outbreaks of Illness Due to Salmonella bredeney Traced to Beef Jerky (SSR No. 17). Dr. Rebecca L. Proctor, Dr. Philip K. Condit, Chief, Communicable Diseases, California State Department of Public Health, and Dr. D. M. Bissell, City Health Officer, Santa Clara Health Department, California.

On August 16, 1963 the Santa Clara County Health Department reported that Salmonella bredeney had been isolated from 4 members of a local family who had become ill on July 30, 1963, after eating beef jerky. Diarrhea and vomiting were prominent symptoms. The incubation period was unknown. One child was hospitalized and another was not ill. S. bredeney was isolated at the County Hospital from all members of the family after recovery, including the asymptomatic child. The suspect sample of beef jerky, taken to the San Jose City Health Department, was positive for the same organism.

On August 7 the San Jose City Health Department reported that three members of another family became ill following the consumption of beef jerky. S. bredeney was isolated from each family member on August 2, 1963.

Subsequently, State Food and Drug inspectors impounded 30 pounds of beef jerky samples, some of which yielded S. bredeney.

On August 12, 1963, another outbreak of S. bredeney diarrhea was reported from Santa Clara County. Three persons among 4 eating beef jerky became ill between August 12 and August 14. Jerky, presumed to be of the same lot consumed in this outbreak, has recently been traced and was found to be positive for S. bredeney. This lot was impounded and destroyed by the State Food and Drug Bureau.

Because of these outbreaks, a list of statewide S. bredeney isolations were reviewed. Retrospective investigations of these by the Los Angeles City Health Department revealed that only one other case of S. bredeney gastroenteritis reported a possible relation to jerky. A sample of jerky similar to that consumed was reported to be negative for salmonella by the State Department of Agriculture.

All beef jerky samples positive for S. bredeney on culture have been destroyed. No further outbreaks have occurred through October 21.

D. Hawaii

Hospital Associated Outbreak Due to Salmonella montevideo. Dr. W. F. Lyons, Chief, Epidemiology Branch and Dr. H. Matsura, Communicable Disease Investigator, Department of Health, Hawaii.

On July 24, 1963, a 55-year-old male, who entered the hospital on June 29 for gastrointestinal bleeding, underwent gastric resection for peptic ulcer. Five days following surgery a stool specimen was positive for Salmonella montivideo. No other cases of diarrhea were noted in the hospital at that time.

On September 15, a cook's helper became ill with symptoms of gastroenteritis, her stool culture yielding S. montevideo. Investigation revealed that the cook had suffered mild diarrhea on September 9 and her stool culture submitted on September 30 was positive for S. montevideo. She was asymptomatic at this time.

Subsequent to this, stool specimens were cultured from all hospital employees, their families, and patients in or entering the hospital. There were no gastrointestinal symptoms among this group at the time. A total of 142 people were cultured, some 14 of whom were positive for S. montevideo. This included 12 of 35 employees and 2 of 14 in-patients. None of the 93 home contacts were harboring S. montevideo. Employees with positive cultures were from no common locale within the hospital or community. Breakdown of the positive isolations by position revealed that there were 2 typists, 4 nurses, 1 orderly, 1 cook's helper, 1 cook, 1 dishwasher, 1 janitress, and 1 housekeeper. Of the 14 positive cultures, 3 were obtained from people working in the hospital kitchen.

In spite of the small number of overtly ill people, the problem was handled as a hospital-associated outbreak of Salmonella montevideo of unknown etiology. All bulk foods in the hospital were cultured and found to be negative. Investigation of the eggs used in the hospital revealed that they were all Grade A, cleaned by the magnetic automatic cleaner or by hand before their use. The farms supplying the eggs are presently under investigation.

All employees with positive stool cultures were not allowed to work in the nursery or kitchen. All food handled by employees with positive cultures was discarded. Weekly stool cultures are being submitted from the kitchen employees. General hygiene and sanitation has been stressed throughout the hospital. Except for repeat

isolations from two employees, new cases have not been found since October 14. A survey of the community, physicians, school, restaurants, and military installations yielded no evidence of a community-wide epidemic.

Editor's Comment:

An investigation well done. This study illustrates how the investigation of only two or three symptomatic cases of salmonellosis may uncover a much larger problem. The symptomatic attack rate from this organism was fortunately low. Investigation and control of this outbreak may well have prevented cases of more serious import in patients predisposed to the infection.

E. Massachusetts

Outbreak of Gastroenteritis Due to Consumption of Contaminated Bakery Products. Dr. Joseph P. Reardon, Epidemiologist, and Dr. Nicholas J. Fiumara, Director, Division of Communicable Diseases, Massachusetts Department of Public Health.

Eight persons in an urban neighborhood became ill on October 8 and 9, after eating either tarts or eclairs from the same local bakery. Symptoms were chills, fever, headache, abdominal pain, vomiting and diarrhea. The incubation periods in most instances appeared to be within 24 hours of consumption of the bakery products.

The cream fillings for the pastries are made by the baker daily and are used up each day. The cream filling is prepared by boiling milk for 5 minutes and then adding a batter of cracked egg, flour, sugar, and flavoring. The whole mixture is stirred throughout the boiling period for another 5 minutes. The cream filling is put into or onto pastries already baked. There is no further baking. According to the baker, this finished product is stored in the refrigerator, but an investigator stated that he "did not see a refrigerator big enough to hold all this material."

The baker stated that he became ill on October 9 with gastroenteritis (no diarrhea). Salmonella typhimurium var. copenhagen was found in his stools as in each of the eight customers who were ill. His wife, who also works at the bakery, was not ill and stool specimen was negative. One of their children became ill on October 8 with fever and abdominal pain (no diarrhea). Her stools were positive for the same organism, as were those from the two other children in the family. One of the latter was not ill, but the other became ill on October 13 with bloody diarrhea. Three additional non-family workers in the bakery reported no recent illness. Stool specimens from two of these were negative.

To date, no information is available to permit identification of the mode of introduction of the organism into the bakery products.

Editor's Comment:

Since the involved foodhandlers were either ill simultaneous to the outbreak or symptom free and culture negative, a source of contamination other than a human carrier appears likely.

F. Massachusetts

Outbreak of Salmonellosis Among Prospective Student Nurses Following a Welcoming Banquet. Dr. Geoffrey Edsall, Superintendent, Institute of Laboratories, Dr. Nicholas J. Fiumara, Director, Division Communicable Diseases and Dr. Arthur N. Wilder, EIS Officer assigned to the Massachusetts Department of Public Health.

Thirteen of 60 persons attending a picnic welcoming student nurses to a Massachusetts hospital became ill following the outing. Incubation periods ranged from 12 hours to 7 days. Illness was characterized by fever and diarrhea and lasted approximately 48 hours. All symptomatic patients were either student nurses or nursing instructors. Salmonella enteritidis was isolated from the stools of two of the 13 symptomatic cases. Stool cultures were not obtained from asymptomatic picnic guests.

The picnic meal consisted of processed meat spread, American cheese, lettuce, tomatoes, egg salad, corn, and hot chocolate. All guests consumed sandwiches made from one or more of the above items. No food was available for culture and no epidemiologic pattern could be ascertained from examination of food histories. All food handlers submitted fecal specimens for culture. None were found to contain salmonellae. Symptomatic nurses were confined to quarters.

Editor's Comment:

The occurrence of salmonellosis other than typhoid fever in patients 7 days following exposure to a presumed common source vehicle suggests secondary spread of infection. However, examples of apparently "bona fide" incubation periods of up to 10 days associated with primary illness have been reported (Sanders, E. et al. Food Poisoning, J. Kansas Med. Soc. 64: 293-298, July, 1963; and Salmonella Surveillance Report No. 7).

Outbreak of Salmonella muenchen in an Institution. Dr. Nicholas Fiumara, Director, Division of Communicable Diseases, Massachusetts State Department of Health.

Between May 7 and May 9, 1963, seventeen patients at an institution maintained for the elderly became ill with fever and diarrhea. Stool specimens from all 17 patients yielded Salmonella muenchen.

The symptomatic patients were confined to two wards in the institution, Wards A and B. Meals for the entire institution were prepared in the central kitchen and investigators therefore considered a supplementary food item to be more likely. It was found that one ward received a special eggnog which was sugar-free and prepared separately from that distributed throughout the balance of the hospital. This eggnog was prepared in one quart units daily and served to the patients on that ward. It was learned that the other ward upon depleting their regular eggnog supply, would use any of the special preparation left over from the first ward. No specific history as to the possibility that this might have happened on May 6 or May 7 could be obtained. Of a population of 49 patients on Ward A, seven consumed eggnog and of these, five

yielded S. muenchen organisms. Three patients on this ward, positive for salmonella, supposedly were not consuming eggnog, but it was found that these patients would frequent the refrigerator where the eggnog was kept. On Ward B, seven of the ten patients receiving eggnog became ill and were positive for S. muenchen. One salmonella positive on this ward was not receiving eggnog and one patient's status is unknown.

Upon inspection of the kitchen, it was found that the eggs used in making this eggnog were contaminated with droppings, feed, and feathers. Some of these eggs were cracked, and prior to use, they were given only a superficial rinse.

G. Minnesota

Human Death Due to Salmonella pullorum. Dr. Leslie Williams, Jr. and Dr. D. S. Flemming, Director, Division of Disease Prevention and Control, Minnesota Department of Public Health.

On August 23, a 2½-year-old male was admitted to a Minnesota Hospital for anorexia and fever. The boy had a past history of multiple hospitalizations for infection and hepatosplenomegaly of unknown etiology. Two of the admissions had been for moniliasias of the trunk and the groin.

A blood culture shortly after admission grew out Salmonella pullorum. Fecal samples were negative for salmonellae and shigellae. The patient's course was progressively downhill and he died on August 28, 1963. Autopsy specimens of the adrenal gland, skin, and mouth lesions contained Candida albicans and cultures of the spleen were positive for both Candida albicans and Salmonella pullorum. Acid fast bacilli were found on glass slide preparations made from skin and adrenal gland tissue. A dysgammaglobulinemia apparently was never proven.

Investigation revealed that the family had fortified their milk for many years with raw eggs. As a result they used four dozen eggs a week, all eggs coming from one farm. This farm had approximately 300 birds in production, 100 of these being carry-over hens from the previous year and 200 being pullets that began laying about July 1, 1963. Check tests of the two hatcheries from which these birds were obtained have been negative for S. pullorum the past two years. Twenty-two of the older hens were examined by the plate agglutination test for Salmonella pullorum. Ten of these were positive. As there were no abnormal losses of baby chicks, the authors concluded that it was doubtful that a fowl S. pullorum infection was the cause of the high rate of reaction in this flock. They felt that the source of pullorum infection was probably the barnyard environment.

There were over one million hens tested in Minnesota breeding flocks during the past fiscal year. Only 15 reactors were found. A total of 1,664 show chickens, originating from flocks not under test, were also pullorum tested. Twenty of these birds were positive.

Editor's Comment:

Salmonella pullorum is considered a rather infrequent cause of human disease and some have been reluctant in the past to consider it as an etiologic agent in cases of human gastroenteritis (See Salmonella Surveillance Report No. 5). When Salmonella pullorum has been incriminated in human disease, the symptoms were often mild. The presence of Candida albicans and Salmonella pullorum septicemia and possibly tuberculosis in one patient certainly suggests an underlying chronic disease problem, probably involving an immune mechanism.

H. Pennsylvania

Primary Mycotic Aneurysm Due to Salmonella cholera-suis. Dr. S. M. Fish, Chief, Communicable Disease Section; Dr. Alfred S. Bogucki, Director of the Division of Epidemiology, City of Philadelphia Department of Health; and Dr. W. D. Schrack, Jr., Director, Division of Communicable Diseases, Pennsylvania State Department of Health.

A 58-year-old female died on June 1, 1963, of Salmonella cholera-suis var. kunzendorf infection. The patient had been operated on for a mycotic aneurysm of the aorta. Aspirates from the aneurysm before and at the time of the operation were cultured. Salmonella cholera-suis was found in both specimens. Secretions from a bronchoscopic examination performed two days prior to death revealed the same organism.

Editor's Comment:

Salmonella cholera-suis seems to be the most frequent offender in primary mycotic aneurysms due to the salmonella species (1). It also has been responsible for infection in pre-existing arterioslerotic aneurysms. It is important to recognize that an aneurysm may be primarily or secondarily infected with salmonella organisms for corrective surgery may be possible in some instances (1).

(1) Sower, N. D. and Whelan, D. J. Suppurative Arteritis Due to Salmonella. Surgery, 52: 851-859, 1962.

Three Salmonella Serotypes in One Family. Dr. W. D. Schrack, Jr., Epidemiologist, Pennsylvania State Department of Health and Dr. Michael Lane, EIS Officer assigned to the Allegheny County Health Department, Pennsylvania.

On September 10, 1963, a twelve-year-old boy became ill with fever, chills and diarrhea. Salmonella bredeney was isolated from stool and blood specimens taken on September 18. Three of four remaining members of the family were also positive for salmonella. All were asymptomatic. One sibling harbored Salmonella panama, another Salmonella heidelberg, and the father a group D salmonella as yet untyped. The mother was free of salmonella on three separate occasions.

The family had purchased two small pet turtles from a supermarket seven days prior to the onset of the boy's illness. The boy with

symptoms performed the duty of changing the water every day which was done by handling the turtles and pouring out the water, which fell upon his hands in the process. He would then immediately eat breakfast without washing his hands. Cultures of the water in which the turtles lived have grown out several group B salmonellae and one group C_1. Rectal swabs from the turtles have also grown out numerous group B salmonellae. No group D organisms have as yet been found, but a second set of cultures have been taken in an effort to find a source of the father and one sibling's infection. Serotypes of these cultures will be reported at a later date. Turtles and turtle feed at the store where the family's turtles were purchased are being investigated.

I. Wisconsin

Summary of Salmonella Isolations for September and October 1963. Dr. A. S. Evans, Director, State Laboratory of Hygiene, Wisconsin.

The following table gives the age distribution of salmonella serotypes identified in the Wisconsin State Laboratory during September and October 1963:

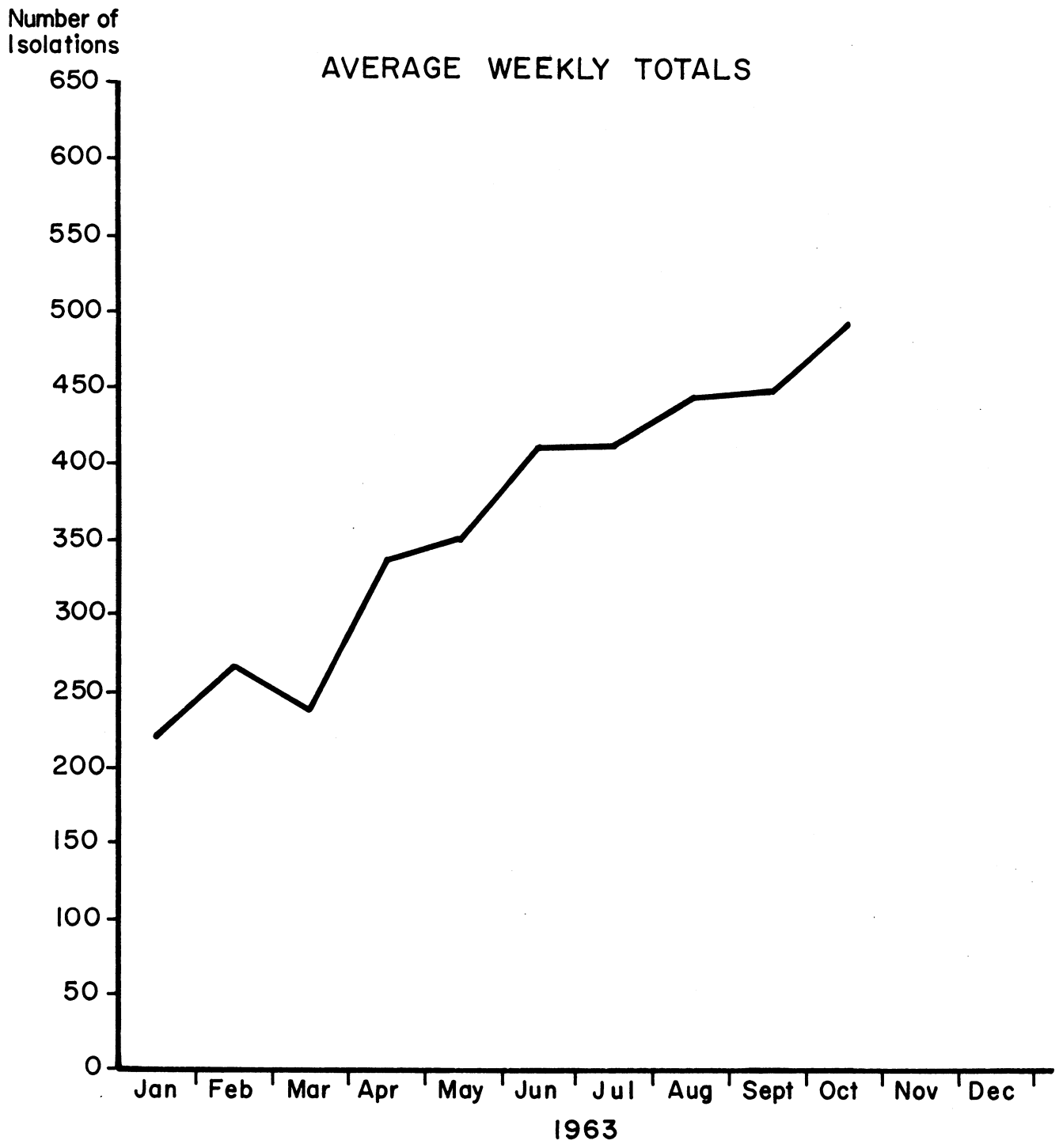
	Age							
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	Over 70
S. cubana					1			
S. derby						2		
S. enteritidis	2		1					1
S. flexnerii	1							
S. heidelberg	12	1	1	2				
S. infantis				1		1		
S. java	6	1	1					
S. litchfield	1							
S. muenchen				1				
S. manhattan	1							
S. oranienberg	1							
S. poona	6			1				
S. st. paul	1							
S. thompson					1		1	
S. typhi		1	6			1		
S. typhimurium	15	2	1		1	2		
S. worthington							1	
Totals	46	5	10	6	3	6	2	1

Editor's Comment:

Tables such as the one above are an important tool for recognizing changes in the general pattern of salmonellosis within a state.

Figure I.

REPORTED HUMAN ISOLATIONS OF SALMONELLAE in the United States



Note: Average weekly totals rather than monthly totals are presented because some months have 5 instead of 4 weeks.

TABLE I
SALMONELLA SEROTYPES ISOLATED FROM HUMANS DURING OCTOBER,* 1963

SEROTYPE	REGION AND REPORTING CENTER																	
	NEW ENGLAND							MIDDLE ATLANTIC						EAST NORTH CENTRAL				
	MAINE	NH	VT	MASS	RI	CONN	TOTAL	NY-A	NY-BI	NY-C	NJ	PA	TOTAL	OHIO	IND	ILL	MICH	WIS	TOTAL
albany												2	2			1	4		5
anatum																			
atlanta									1				1						
bareilly										2			2	1					1
berta																			
binza														1					1
blockley				1			1					1	1	2			3		5
bovis-morbificans																			
braenderup									1		2	1	4			2			2
bredeney				2			2					5	5			2			2
california												1	1						
carrau																			
cerro																			
chester								1			3	24	28						
cholerae-suis									1				1						
cholerae-suis var. kunzendorf												2	2						
colorado																			
concord																			
corvallis									1				1						
cubana								1			2		3				1		1
daytona																			
derby	1	1	2	18	2	9	33	12	29	13	14	68	136	8	1	22	1	3	35
enteritidis				48		1	49	10	7	4	4	4	29	2	1	8	3	6	20
fayed																			
give												1	1						
habana																			
haifa																			
hartford																			
heidelberg	1			12	2	7	22	2	10	6	9	3	30	6	2	8	3	14	33
heves																			
indiana																3			3
infantis	3			7		1	11	4	3		1	14	22	3	6	5	3	2	19
inverness																			
irumu																			
javiana				1			1												
kentucky						1	1					3	3						
litchfield				1			1										1	1	2
livingstone																1			1
loma-linda																			
madelia																			
manhattan									1	1		2	4	1		1	1	1	4
meleagridis											2	9	11	1					1
miami												2	2						
minnesota																			
mission																			
mississippi																			
montevideo				1		1	2	4	7	1	2	4	18	3		3	2		8
muenchen				1		1	2		2		1	2	5		1				1
muenster																			
newington		1					1					3	3						
newport	1			4		1	6			1		3	4	7	1	6	3		17
norwich																			
oranienburg				8		2	10		2	1	4	6	13	3		6	2		11
orion																			
panama				1		1	2					2	2			1	2		3
paratyphi B var. java				1			1	6					6			1		4	5
paratyphi B				10			10		2			3	5		1				1
pensacola																			
poona												1	1						
pullorum																			
reading																1	1		2
rubislaw																			
saint-paul				1		4	5	2	3	6		4	15	7	1	4	8	6	26
san-diego									1	1			2	1					1
schwarzengrund				1			1		2				2			2			2
senftenberg			1				1					1	1	1					1
stanley											1		1						
tennessee				4			4	4		1	1	3	9	1	1	3			5
thompson					1	1	2	1	7	2	4	6	20	4	2	3	2	3	14
typhi						1	1	4	5		1	3	13	3		2	1	2	8
typhimurium	3			25		8	36	22	29	26	10	33	120	21	10	38	15	22	106
typhimurium var. copenhagen				24			24										2		2
urbana																			
weltevreden																			
weslaco																			
westhampton																			
worthington														1				2	3
untypable Group B		2			2		4	1					1	1					1
untypable Group C_1		1		1			2							2					2
untypable Group C_2									1				1						
untypable Group D																			
untypable Group E		1		1			2							1					1
untypable																			
unknown														1			1		2
TOTAL	9	6	3	173	7	39	237	74	115	65	61	216	531	82	27	120	62	66	357

New York (A-New York State, BI-New York Beth Israel Hospital, C-New York City

*Includes late September reports.

TABLE I
BY SEROTYPE AND REPORTING CENTER

REGION AND REPORTING CENTER																		
WEST NORTH CENTRAL								SOUTH ATLANTIC										
MINN	IOWA	MO	ND	SD	NEBR	KAN	TOTAL	DEL	MD	DC	VA	WV	NC	SC	GA	FLA	TOTAL	SEROTYPE
						3	3		1		1		3		3	1	1	albany
															1		5	anatum
																1	3	atlanta
															1		1	bareilly
															1	1	2	berta
1							1						1		2	1	1	binza
																	3	blockley
						4	4									2		bovis-morbificans
															1	1	2	braenderup
																	2	bredeney
															1		1	california
											1						1	carrau
											1		1				1	cerro
			1				1								1		2	chester
																	1	cholerae-suis
													1			2	3	cholerae-suis var kunzendorf
											2					1	1	colorado
																	2	concord
																		corvallis
															1		1	cubana
																2	2	daytona
								1	3						1	1	6	derby
1						1	2		8		1				1	40	50	enteritidis
											1						1	fayed
																		give
																		habana
																		haifa
																1	1	hartford
6		2	1			1	10			2	3		9		4	4	22	heidelberg
																		heves
																		indiana
1		1				4	6				1		6		5	10	22	infantis
																1	1	inverness
		1					1						42				42	irumu
		1					1								4	11	15	javiana
									1							3	4	kentucky
											1				1		2	litchfield
																		livingstone
																		loma-linda
																1	1	madelia
											1						1	manhattan
									1							1	2	meleagridis
									1						2	5	8	miami
																		minnesota
															1		1	mission
															3		3	mississippi
1		1					2		1		2		2		6	9	20	montevideo
									1		1		1			2	5	muenchen
																		muenster
										1							1	newington
4		1				3	8		3				2		7	14	26	newport
									1						1		2	norwich
		2				6	8				4		1			21	26	oranienburg
																1	1	orion
									1								1	panama
													1			2	3	paratyphi B var. java
									1								1	paratyphi B
											2						2	pensacola
1							1											poona
																		pullorum
																		reading
																		rubislaw
1	1						2		5		2		2		2	4	15	saint-paul
1							1											san-diego
																		schwarzengrund
																		senftenberg
1							1								3	2	5	stanley
																		tennessee
1		4				2	7						2				2	thompson
		1					1	1	2			1	3			3	10	typhi
5	3	6		1		17	32	1	12	4	10	1	7		7	25	67	typhimurium
	1						1											typhimurium var. copenhagen
															1		1	urbana
																		weltevreden
																		weslaco
																1	1	westhampton
																		worthington
										5							5	untypable Group B
																		untypable Group C1
										1				1			2	untypable Group C2
										5							5	untypable Group D
																		untypable Group E
																		untypable
																		unknown
24	5	20	2	1	0	41	93	3	42	18	34	2	84	1	60	173	417	TOTAL

TABLE I

SEROTYPE	EAST SOUTH CENTRAL					WEST SOUTH CENTRAL					MOUNTAIN								
	KY	TENN	ALA	MISS	TOTAL	ARK	LA	OKLA	TEX	TOTAL	MONT	IDA	WYO	COLO	NM	ARI	UTAH	NEV	TOTAL
albany																			
anatum							8		3	11						1			1
atlanta																			
bareilly				1	1				3	3									
berta							6			6									
binza																			
blockley			1		1		2			2									
bovis-morbificans							1			1									
braenderup							1			1									
bredeney																			
california																			
carrau																			
cerro																			
chester														1					1
cholerae-suis	1				1														
cholerae-suis var. kunzendorf		1			1														
colorado																			
concord																			
corvallis																			
cubana																			
daytona																			
derby			1		1	1	5		1	7						1			1
enteritidis											1								1
fayed																			
give							7			7									
habana									1	1									
haifa																			
hartford																			
heidelberg		3			3	2	2			4	3			5			1		9
heves																			
indiana																			
infantis	1	3	2		6		3	4	2	9						4	1		5
inverness																			
irumu																			
javiana						2	13		3	18									
kentucky							3		2	5						2			2
litchfield							4			4				1		1			2
livingstone									2	2									
loma-linda																			
madelia																			
manhattan							1			1									
meleagridis																			
miami			1		1														
minnesota									1	1									
mission																			
mississippi							1		1	2									
montevideo			1		1		3		1	4				5					5
muenchen			1		1	1	3	1	1	6	1					4			5
muenster							3			3									
newington																			
newport		3			3	5	10		19	34				1		2			3
norwich																			
oranienburg							2		3	5				1		2			3
orion																			
panama									2	2							3		3
paratyphi B var. java							5			5									
paratyphi B		1			1		1		3	4			1	1					2
pensacola																			
poona		1			1				1	1									
pullorum																			
reading									1	1									
rubislaw							2		1	3									
saint-paul							3			3	1			2					3
san-diego							1			1									
schwarzengrund																			
senftenberg			1		1														
stanley																			
tennessee		1			1		1		2	3									
thompson		1	1		2		2		3	5		1							1
typhi						4			7	11				4	1	1			6
typhimurium	1	8	4	2	15	4	31	5	19	59	5	2		19		2	4		32
typhimurium var. copenhagen							6			6		1				2	1		4
urbana																			
weltevreden																			
weslaco							1			1									
westhampton																			
worthington																			
untypable Group B															18	1	3		22
untypable Group C_1	1			2	3	2				2					1				1
untypable Group C_2						1				1					2				2
untypable Group D						3				3									
untypable Group E				1	1	1				1									
untypable																			
unknown						1				1									
TOTAL	4	22	13	6	45	27	131	10	82	250	11	4	1	40	22	23	13	0	114

TABLE I

REGION AND REPORTING CENTER						OTHER VI	TOTAL	PERCENT OF TOTAL	TEN MONTH TOTAL	% TEN MONTH TOTAL	CDC TOTAL	PERCENT OF TOTAL	SEROTYPE
PACIFIC													
WASH	ORE	CAL	ALASKA	HAWAII	TOTAL								
				3	3		1		2		1		albany
							30	1.2	187	1.2	4	1.7	anatum
							3		11				atlanta
							7		50		1		bareilly
		4			4		14		57				berta
							2		7				binza
1		5		1	7		21	0.9	300	1.9			blockley
							1		3		1		bovis-morbificans
							13		48		2		braenderup
1		8		3	12		23		123				bredeney
							1		8				california
							1		1				carrau
							1		4		2		cerro
		1			1		32	1.3	178	1.1	1	0.4	chester
							4		16				cholerae-suis
							6		52		3		cholerae-suis var. kunzendorf
							1		3				colorado
							2		2				concord
							1		1				corvallis
							5		32				cubana
							2		3		1		daytona
		5		4	9		228	9.3	1,318	8.3	11	4.9	derby
						3	154	6.3	658	4.1	23	10.2	enteritidis
							1		3				fayed
		1			1		9		54		1		give
							1		1				habana
		1			1		1		1				haifa
1					1		2		16		1		hartford
40	1	15		1	57		190	7.7	1,325	8.3	19	8.4	heidelberg
							3		13		1		heves
1		21		3	25		125	5.1	798	5.0	11	4.9	indiana
							1		4	0.5			infantis
							43	1.7	76				inverness
													irumu
		2			2		35	1.4	143	0.9	12	5.3	javiana
3					3		17		51		2		kentucky
							14		48		1		litchfield
							3		14				livingstone
	1				1		1		6				loma-linda
		4			7		1		1		1		madelia
	1	1		2	1		17		150		1		manhattan
							15		78		1		meleagridis
							11		57		3		miami
							1		12				minnesota
							1		2				mission
							5		25				mississippi
1	2	5		16	24		84	3.4	414	2.6			montevideo
		2			2		27		237		1		muenchen
							3		5				muenster
		1			1		6		40				newington
	1	13			14		115	4.7	928	5.8	8	3.5	newport
							2		10				norwich
1		4			5		81	3.3	455	2.9	2	0.9	oranienburg
							1		4		1		orion
				6	6		19		118		1		panama
			1		1		21		116		6		paratyphi B var. java
3					3		27		134		2		paratyphi B
							2		6				pensacola
							3		45		1		poona
							1		1				pullorum
		1			1		4		43				reading
							3		11				rubislaw
1		6		2	9		78	3.2	492	3.1	4	1.8	saint-paul
		3			3		8		99				san-diego
		9			9		14		129				schwarzengrund
							4		30		2		senftenberg
							1		13				stanley
				1	1		29		120		2		tennessee
		7			7		60	2.4	276	1.7	9	4.0	thompson
2		14			16		66	2.7	644	4.1	32	14.2	typhi
23	15	107		21	166		633	25.7	4,686	29.5	41	18.1	typhimurium
			1		1		38	1.5	143	0.9	2	0.9	typhimurium var. copenhagen
				1	1		1		25		1		urbana
							1		42				weltevreden
							1		1		1		weslaco
							1		1				westhampton
				1	1		4		25				worthington
	2	2			4		37		259				untypable Group B
	1	1	1		3		13		56				untypable Group C_1
							6		41				untypable Group C_2
	1				1		9		63				untypable Group D
	1				1		6		16				untypable Group E
							3		63		6		untypable unknown
78	26	243	3	65	415	3	2,462		15,881		226		TOTAL

VI - VIRGIN ISLANDS

TABLE II

Number of Salmonella Isolates From Two or More Members of the Same Family
October, 1963

Reporting Center	Total Number of Isolates Reported	Number of Isolates from Family Outbreaks	Per Cent of Total
Alabama	13	0	0
Alaska	3	0	0
Arizona	23	0	0
Arkansas	27	0	0
California	243	47	19.3
Colorado	40	12	30.0
Connecticut	39	7	17.9
Delaware	3	0	0
District of Columbia	18	0	0
Florida	173	27	15.6
Georgia	60	5	8.3
Hawaii	65	14	21.5
Idaho	4	3	75.0
Illinois	120	10	8.3
Indiana	27	5	1.9
Iowa	5	0	0
Kansas	41	10	24.4
Kentucky	4	0	0
Louisiana	131	25	19.1
Maine	9	2	22.2
Maryland	42	16	38.1
Massachusetts	173	35	20.2
Michigan	62	9	14.5
Minnesota	24	7	29.2
Mississippi	6	0	0
Missouri	20	0	0
Montana	11	4	36.4
Nebraska	0	0	0
Nevada	0	0	0
New Hampshire	6	0	0
New Jersey	61	7	11.5
New Mexico	22	5	22.7
New York-Albany	74	7	9.5
New York-Beth Israel	115	14	12.2
New York City	65	5	7.7
North Carolina	84	12	14.3
North Dakota	2	0	0
Ohio	82	10	12.2
Oklahoma	10	0	0
Oregon	26	10	38.5
Pennsylvania	216	24	11.1
Rhode Island	7	2	28.6
South Carolina	1	0	0
South Dakota	1	0	0
Tennessee	22	0	0
Texas	82	0	0
Utah	13	3	23.1
Vermont	3	0	0
Virginia	34	1	2.9
Virgin Islands	3	2	66.7

Table II (continued)

Reporting Center	Total Number of Isolates Reported	Number of Isolates From Family Outbreaks	Per Cent of Total
Washington	78	10	12.8
West Virginia	2	0	0
Wisconsin	66	30	45.5
Wyoming	1	0	0
	2462	380	15.4

TABLE III

Infrequent Serotypes

Serotype	Center	October	10-Month Total*	CDC**	Comment
S. albany	VA	1	2	6	Four of 6 CDC isolations from humans in D.C. Other CDC isolates from turkeys in Minnesota.
S. atlanta	GA	3	11	21	Sixth isolation from GA this year. Seventeen of 21 CDC isolations from Fla. & Ga.
S. binza	FLA. & OHIO	2	7	17	Seventeen CDC isolations scattered geographically: 7 from humans, 7 from turkeys, 1 from a dog and 2 from food products.
S. bovis-morbificans	LA	1	3	15	One of first salmonella serotypes defined (1894). Rare cause of human illness.
S. california	PA	1	8	143	Forty-three of 143 CDC isolation from humans; 66 from turkeys and chickens.
S. carrau	GA	1	1	22	Second human isolate reported to Salmonella Surveillance Unit. First isolated 1936 from mesenteric gland of a pig.
S. cerro	VA	1	4	35	Previous isolates from NY, LA and TEX.
S. colorado	FLA	1	3	0	Very rare type. Previously isolated from HAI & FLA in March & April this year.
S. concord	VA	1	1	17	Fifteen of 17 CDC isolations from humans (1 each from a chicken and a turkey).

Serotype	Center	October	10-Month Total*	CDC**	Comment
S. corvallis	NY-BI	1	1	0	Second human isolation reported to this unit. Initially discovered in pooled cecal contents of poults with enteritis (1949).
S. daytona	FLA	2	3	0	Previous 2 isolations from FLA & VA. First isolation in 1945 from blood of a German prisoner of war in Egypt, who subsequently died of endocarditis due to this organism.
S. habana	TEX	1	1	5	Five CDC isolations from humans. Rarely isolated organism.
S. haifa	CAL	1	1	0	Only previous isolation November 1963 from a 42-year-old woman who experienced severe diarrhea and temperature elevation shortly after departing Haifa, Israel, while on a one month's Mediterranean Cruise.
S. loma-linda	ORE	1	5	8	All previous isolations in Salmonella Surveillance experience either originated in or illness was traceable to California.
S. madelia	FLA	1	1	44	Only third isolation in Salmonella Surveillance experience. First isolation from a seven-month-old infant in GA who experienced a mild illness.
S. mission	GA	1	2	1	Two previous isolations reported this Unit (one each from N.C. and MD).

Serotype	Center	October	10-Month Total*	CDC**	Comment
S. muenster	LA	3	5	2	Extremely rare serotype in U.S. Reports from Great Britian indicate recoveries are becoming more frequent there.
S. norwich	GA & MD	2	10	25	Recent recoveries from swine, pork products and dogs.
S. orion	FLA	1	3	29	Originally isolated from a sailor who suffered gastroenteritis while in Pacific waters on a ship called Orion.
S. pensacola	VA	2	6	28	Twenty-five of 28 CDC isolations from Southeastern States.
S. pullorum	MINN	1	1	1796	Two reported human isolations in 1962 from individuals with severe illnesses. Extremely rare cause of human illness. See Reports from States - Minnesota - this report.
S. rubislaw	LA	2	9	239	Confined almost exclusively to Southeastern United States.
S. westhampton	FLA	1	1	1	Extremely rare serotype. CDC isolation from a dog in VA.

* Represents 15,881 human isolations of salmonellae reported to the Salmonella Surveillance Unit - January 1 - November 1, 1963.

** Represents approximately 28,000 isolations of salmonellae from all sources between 1947 and 1958.

TABLE IV

Age and Sex Distribution of 2,312 Individuals From Whom Salmonellae Were Isolated - October, 1963

Age (Years)	Male	Female	Total
Under 1	102	106	208
1-4	191	134	325
5-9	85	80	165
10-19	73	76	149
20-29	35	80	115
30-39	51	73	124
40-49	57	55	112
50-59	38	51	89
60-69	37	28	65
70-79	24	22	46
80+	5	15	20
Unknown	445	449	894
Total	1143	1169	2312
% of Total	49.4	50.6	

TABLE V

NON-HUMAN ISOLATES REPORTED BY THE NATIONAL ANIMAL DISEASE LABORATORY AND STATE REPORTING CENTERS BY SEROTYPE AND SOURCE OCTOBER,* 1963

SEROTYPE	Chicken	Turkey	Ducks	Pigeon	Goose	Pheasant	Quail	Flower Pecker	Avian	Equine	Bovine	Porcine	Canine	Feline	Lab. Mouse	Lab. Rat	Guinea Pig	Lab. Monkey	Beaver	Rhesus Monkey	Animal Unk.	Meat Culture	Frozen Egg Whites	Egg Yolk	Beef Jerky	Poultry bi-product	Food Mix	Chicken Feed	Meat Scraps and Bone Meal	Feed Unknown	Snake	Lizard	Fly	Tankage	Food Mixing Equip.	Toilet Bowl	Unknown	TOTAL	10 MO. TOTAL	SEROTYPE
alachua		3																																				3	5	alachua
albany		1																																				1	2	albany
anatum	3	6	1									3		1	1															1	1						1	18	248	anatum
binza																1																						2	25	binza
blockley	1	1																									1					4	1				7	96	blockley
bonariensis																1								1													1	1	bonariensis
bredeney		10																							1													11	102	bredeney
california		1																																				1	20	california
cerro																												1		1			2				4	22	cerro
chester		11																																				11	85	chester
cholerae-suis var. Kunzendorf											1	12																										13	116	cholerae-suis var. Kunzendorf
cubana																						1							1									2	21	cubana
derby	1	2							1			1												1					1							1		8	92	derby
dublin											7																											7	38	dublin
enteritidis	1	3					1																										1			1	7	61	enteritidis
gallinarum	2																																				2	49	gallinarum
give								1																													1	46	give
heidelberg	14	21							1									1										1									37	268	heidelberg
illinois																																					1	2	illinois
indiana	1																																				1	22	indiana
infantis	16	3											1														1									1	22	272	infantis
javiana								1																													1	5	javiana
johannesburg																												1									1	2	johannesburg
kentucky	1	1														1													1								4	26	kentucky
lexington																														1							1	7	lexington
livingstone									2																			1	1				1				5	32	livingstone
manhattan																																	1				1	27	manhattan
meleagridis		2																																			2	13	meleagridis
minnesota																																	1				1	7	minnesota
montevideo	1																3							1				1	1					5			12	196	montevideo
muenchen	1	12																													1							14	65	muenchen
new-brunswick											1																											1	9	new-brunswick
newington		3																																	1			4	58	newington
newport		6									10	3	1																				1				21	184	newport
oranienburg	1	1											1			1							2					4	1				1			1	13	56	oranienburg
orion		1																										1					1				3	9	orion
paratyphi B var. java																																	2				2	3	paratyphi B var. java
pullorum	12																																				12	162	pullorum
reading		1																																			1	35	reading
saint-paul	7	23																										1									31	172	saint-paul
san-diego	3	2																			1																6	56	san-diego
schwarzengrund		16			1							1											3					2	1				1			1	28	163	schwarzengrund
senftenberg		1																						1				1									3	38	senftenberg
tel-el-kebir																															1						1	1	tel-el-kebir
tennessee		2	1																					1	1		4	1	2				1				1	13	80	tennessee
thompson	13	4																										1									18	71	thompson
typhimurium	7	31	3	1		2					44	2	1						3	1													1			2	97	874	typhimurium
typhimurium var. copenhagen	8	2	2	2			1			1	1	3														1				1							20	233	typhimurium var. copenhagen
worthington	2	3										2																									11	91	worthington
Untypable Group C_1													1																								1	4	Untypable Group C_1
Untypable Group E													1																								1	2	Untypable Group E
Untypable Group F																																1					1	1	Untypable Group F
Unknown													1																								2	4	Unknown
TOTAL	95	173	7	3	1	2	2	2	4	1	64	27	7	1	1	4	3	1	3	1	1	2	5	3	3	1	5	11	16	5	2	2	5	15	6	1	7	492	4,457	TOTAL

Source: National Animal Disease Laboratory, Ames, Iowa, and Weekly Salmonella Surveillance Reports from California, Colorado, Connecticut, Illinois, Kansas, Louisiana, Michigan, Mississippi, New Jersey, New York, Ohio, Oklahoma, Rhode Island, Texas, Virginia, and Washington.

*Includes late September reports for Colorado, Mississippi and North Carolina

TABLE VI

NON-HUMAN ISOLATES REPORTED BY THE NATIONAL ANIMAL DISEASE LABORATORY AND STATE REPORTING CENTERS BY SEROTYPE AND STATE OCTOBER,* 1963

SEROTYPE	STATE																																	10 MO. TOTAL	SEROTYPE
	ALA	ALASKA	ARK	CALIF	COLO	CONN	DEL	FLA	GA	ILL	IND	IOWA	KANS	LA	MAINE	MD	MICH	MINN	MONT	N.J.	N.Y.-A	N.C.	OHIO	ORE	PA	S.C.	TENN	TEXAS	UTAH	VA	WASH	W.VA.	WISC	TOTAL		
alachua				1							2																							3	5	alachua
albany								3	1								1	2					1											1	2	albany
anatum				4						2	3																							10	248	anatum
binza																1												1		1				2	25	binza
blockley							1			4				1												1								7	96	blockley
bonariensis																												1						1	1	bonariensis
bredeney				7														1						2				1						11	102	bredeney
california											1																							1	20	california
cerro																1							3											4	22	cerro
chester				2														4				1											4	11	85	chester
cholerae-suis var. Kunzendorf								1			1	1														3	1			3			3	13	116	cholerae-suis var. Kunzendorf
cubana										1								1			1		2							1			1	2	21	cubana
derby				2							1																							8	92	derby
dublin				7																														7	38	dublin
enteritidis											1							5					1											7	61	enteritidis
gallinarum																		1												1				2	49	gallinarum
give																	1																	1	46	give
heidelberg			1	13		2		1	3	1	5	1			1	1		6						1						1			37	268	heidelberg
illinois																1																	1	2	illinois
indiana											1																							1	22	indiana
infantis			1					2	1		12		1					1					1					1		1	1			22	272	infantis
javiana																	1																	1	5	javiana
johannesburg																1																		1	2	johannesburg
kentucky				1							1												1					1						4	26	kentucky
lexington																							1											1	7	lexington
livingstone										1	2					1							1											5	32	livingstone
manhattan														1																				1	27	manhattan
meleagridis																																	2	2	13	meleagridis
minnesota										1																								1	7	minnesota
montevideo					3					1						1							1							1	5			12	196	montevideo
muenchen			1	1							2						1	9																14	65	muenchen
new-brunswick																		1																1	9	new-brunswick
newington				1							1							1																4	58	newington
newport				11	2			1			2			1			2	1								1				1				21	184	newport
oranienburg										3	1						1	1					3					1			2		1	13	56	oranienburg
orion											1							2																3	9	orion
paratyphi B var. java														2																						paratyphi B var. java
pullorum			2						3		2							1							1				3				2	3	pullorum
reading																								1										12	162	reading
saint-paul				2					1		4					1		4						7				2		1			9	1	35	saint-paul
san-diego								1			2							2										1						31	172	san-diego
schwarzengrund				17								2				1	1	3				1												6	56	schwarzengrund
senftenberg				1						1													1							3				28	163	senftenberg
tel-el-kebir																	1																	3	38	tel-el-kebir
tennessee				2						1	1		4			1							4											1	1	tennessee
thompson	1		2						1		11					1		2					1											13	80	thompson
typhimurium			2	42	6	2					15						3	11				2	1	3		1			3				6	97	874	typhimurium
typhimurium var. copenhagen											3	3				1	1	3	1	1		2			1		1		1				1	20	233	typhimurium var. copenhagen
worthington											2	2						1					3											3	11	91	worthington
Untypable Group C_1		1																																1	4	Untypable Group C_1
Untypable Group E		1																																1	2	Untypable Group E
Untypable Group F																	1	1																1	1	Untypable Group F
Unknown		1								1																								2	4	Unknown
TOTAL	1	3	9	114	11	4	1	9	10	17	77	9	5	5	1	12	12	63	1	1	1	6	24	14	2	6	2	9	5	13	12	1	30	492	4,457	TOTAL

Source: National Animal Disease Laboratory, Ames, Iowa and Weekly Salmonella Surveillance Reports from California, Colorado, Connecticut, Illinois, Kansas, Louisiana, Michigan, Mississippi, New Jersey, New York, Ohio, Oklahoma, Rhode Island, Texas, Virginia, and Washington.

*Includes late September reports for Colorado, Mississippi and North Carolina.