REPORT NO. 17
SEPTEMBER 30, 1963

COMMUNICABLE DISEASE CENTER

SALMONELLA

SURVEILLANCE

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For Month of August, 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 August, 1,770 isolations of 64 salmonellae serotypes from humans were reported (Table I). During the same period, 480 nonhuman isolations of 54 different salmonellae serotypes were reported from 34 States (Tables V and VI). The average weekly total of human isolations reported during August was 442, which represents a notable increase over last month's figure of 411. Prior to August, the July average weekly total was the highest for 1963.

Among a few of the state reports reviewed in this issue are: (1) an outbreak of typhoid fever in Kentucky, (2) a preliminary report of an epidemic of typhoid-like illness in Washington, (3) an outbreak of Salmonella irumu gastroenteritis traced to a restaurant.

A review of six month's experience with salmonella isolations is reported from Florida. The order of frequency, as noted, differs from that of the Communicable Disease Center.

International reports include a common source outbreak of typhoid fever in Jamaica.

II. REPORTS OF ISOLATIONS FROM THE STATES

A. Human

A total of 1,770 human isolations of salmonella were reported to the Salmonella Surveillance Unit for the month of August. While this figure represents a drop from the 2,054 isolations reported in July, the average weekly isolations increased from 411 in July to 442 in August. Since this is the first year of nationwide surveillance, it is not known whether the increase is due to seasonal influences or increased awareness and interest in salmonellosis, or both.

The seven serotypes reported most frequently during August were:

No.	Serotype	Number	Per Cent	Standing Last Month
1	S. typhimurium	545	30.8	1
2	S. derby	155	8.8	2
3	S. heidelberg	119	6.7	4
4	S. newport	118	6.7	5
5	S. infantis	89	5.0	6
6	S. saint-paul	75	4.2	8
7	S. typhi	70	4.0	7

Although S. derby maintained second position on the above list, the percentage of total isolations represented by S. derby dropped from 14.0 last month to 8.8 this month, indicating a possible downward trend in the outbreak of hospital-associated infections due to this organism. This outbreak has been the subject of much discussion in recent Salmonella Surveillance Reports and intensive investigation in recent months. An outbreak due to S. saint-paul in Pennsylvania, which is currently under investigation, is probably responsible for

promoting this serotype into 6th position on the above list. The remaining salmonella serotypes in the most common list hold positions which would be expected based upon past experience.

Of the 1,770 individuals reported as harboring salmonella organisms during August, 311 (17.6 per cent) had other members of their immediate family simultaneously positive for the same serotype. The family attack rate for this month is consistent with those computed for antecedent months.

The modal age group for reported isolations of salmonellae this month is 1-4 years, as was true in each of the previous months of surveillance. Of those individuals reported by sex, 852 were male and 854 were female. The hypothesis that there is no sex predilection among individuals harboring salmonellae gained further credence from the 50-50 per cent distribution computed from data compiled this month.

B. Nonhuman

The salmonella isolations from nonhuman sources totaled 480 for the month of August. This is similar to July (477), but presents an increase over the month of June (275).

There were 54 serotypes reported from 34 States, four types appearing for the first time in nonhuman data reported in 1963.

The seven most common serotypes during August were:

No.	Serotype	No.	Per Cent	Standing Last Month
1	S. typhimurium S. typhimurium, var. copenhagen	124	25.8	1
2	S. newport	48	10.0	(6)
3	S. infantis	44	9.2	3
4	S. anatum	28	5.8	(2)
5	S. blockley	26	5.4	(6)
6	S. saint paul	17	3.5	(6)
7	S. heidelberg	13	2.7	4
	S. montevideo	13	2.7	(2)

With the exception of S. blockley, the serotypes above appeared among the seven most common types reported for the previous eight months. Five of these types are among the seven most common types isolated from man this month.

The sources of salmonella reported with greatest frequency for the month were chickens 172 (35.8 per cent); turkeys 91 (19 per cent);

cattle 79 (16.4 per cent); and swine 27 (5.6 per cent). The total isolations from these sources represent 76.9 per cent of the cultures from all nonhuman sources, which is similar to the frequency in July.

The number of cattle isolations has exceeded swine for the second consecutive month; whereas, in the previous months of 1963, the reverse was true. S. typhimurium in cattle has previously been the most common type, but in August, S. newport isolations were greater. Most of the isolations were obtained from cattle in California. S. dublin continues to be isolated from cattle in California with 28 reported for 1963. The only human isolation of S. dublin during the year was likewise made in this State. Over the years, this organism has been isolated only rarely in states east of the Rocky Mountains.

Infrequent Nonhuman Types

Serotype	Source	August	State
S. albany	Chicken	1	Iowa
S. braenderup	Chicken	1	Indiana
S. champaign	Dog	1	Alaska
S. weltevreden	Canned Salmon	1	Hawaii

III. CURRENT INVESTIGATIONS

None

IV. REPORTS FROM STATES

A. California

Preliminary Report on Salmonella bredeney Traced to Dried Beef Jerky. Dr. D. M. Bissell, City Health Officer, Santa Clara County Health Department, California.

Salmonella bredeney gastroenteritis has been traced to dried beef jerky in two separate families in Santa Clara County.

On July 30, 1963, three out of four members of a family became ill with diarrhea and vomiting after eating dried beef jerky. Stool cultures were positive for Salmonella bredeney and although no sample of the dried beef jerky was available in the home, cultures of jerky from the market were positive for Salmonella bredeney.

Salmonella bredeney gastroenteritis, occurring in three out of five members of another household between August 12, 1963 and August 14, 1963 was also traced to dried beef jerky which was positive for Salmonella bredeney. The dried beef jerky was not purchased from the same store as that responsible for the gastroenteritis in the first family.

Further investigations are underway to ascertain whether the outbreak is more wisespread and to trace the dried beef jerky to its processing plant.

Epidemic Gastroenteritis Due to Salmonella poona and Salmonella newington. Dr. D. M. Bisell, City Health Officer, San Jose City Health Department, San Jose, California.

Between 12 and 96 hours following a wedding reception in San Jose, California, 88 of 129 persons became ill with gastroenteritis. Characteristic symptoms included nausea, vomiting, diarrhea, fever, and in a few cases blood and mucous in the stools. Forty-three persons who were ill submitted specimens for culture and thirty-one of these were positive for Salmonella poona and Salmonella newington.

The guests consumed a completely catered dinner which was served buffet style. Case analysis could reveal no common food eaten by those ill, indicating that perhaps more than one food was incriminated in the outbreak. The only food remaining that could be cultured was one of the two turkeys served at the meal. A sample of this turkey was positive for Salmonella poona and Salmonella newington.

The two turkeys were cooked a day prior to the party and were then immediately refrigerated. No dressing was prepared. The turkeys were sliced on the morning of the dinner and were again immediately refrigerated. That afternoon the turkeys were transported to the party in an unrefrigerated van, the trip taking approximately 15 minutes. The turkeys were then served to the guests within 3 hours after their arrival.

All five food-handlers were cultured and found to be positive for salmonella. Each had consumed various types of food at the party, but none were symptomatic. All five voluntarily removed themselves from duty as food handlers and the catering operation was suspended June 28, 1963. Follow-up stool samples of all food handlers involved will be taken 28 days after the first negative stool sample.

Editor's Comment

It is probable that multiple infections involving more than one type of salmonella are quite common, but remain undetected because most laboratories find it impractical to completely identify every colony picked from isolation plates

Salmonella thompson Gastroenteritis Traced to Homemade Ice Cream. Dr. M. W. Slitor, Kern County Health Department and Dr. Philip K. Condit, California State Department of Public Health.

Nineteen of twenty-two persons attending a little league baseball team party on August 9, 1963, subsequently became ill with gastroenteritis. Incubation period ranged from a minimum of 15 hours to a maximum of 7 days following the party and the average duration of the symptoms was 1 to 7 days. Two of the patients required hospitalization. Characteristic symptoms included severe diarrhea, vomiting, chills, temperature elevation, abdominal cramps, and nausea. Salmonella thompson was recovered from two of four ill individuals from whom stool cultures were obtained. Two persons with negative stool cultures had received previous

antibiotic therapy.

Investigation revealed that the food served at the party included cake, cookies, punch, coffee, brownies and homemade ice cream. All 19 persons who became ill had eaten homemade ice cream while 3 individuals who did not eat ice cream remained well. This ice cream had been made from commercial milk, canned milk, sugar and a commercial vanilla junket, and fresh eggs which included both commercial eggs and eggs from a pet chicken. Salmonella thompson was obtained from cultures of both the homemade ice cream and from a fresh egg layed by the pet hen.

B. Florida

Six Months' Salmonella Surveillance in Florida. Dr. C. M. Sharp, Acting Director, Bureau of Preventable Diseases, Florida State Board of Health.

Between January 1 and July 12, 1963, there were 320 human salmonella isolates reported to the Florida State Board of Health. Thirty-three different serotypes, including S. typhi were represented. S. typhimurium headed the list with 22 per cent of the total human isolates (Table A). Age and sex distribution patterns are represented in Table B and conform to the national experience.

Table A

Human Salmonella Isolates by Serotype
Florida State Board of Health Laboratory, January 1-July 12, 1963

Serotype	Number	Per Cent
typhimurium	72	22
typhi	35	11
miami	28	9
newport	26	8
javiana	17	6
montevideo	12	4
infantis	11	3
oranienburg	11	3
heidelburg	10	3
others*	98	31
Totals	320	100

* Includes 24 additional serotypes isolated less than 10 times each

Table B

Human Salmonella Isolates by Age and Sex
Florida State Board of Health Laboratory, Jan. 1 - July 12, 1963

Age	Male	Female	Total	Per Cent
Under - 1	28	17	45	14
1 - 4	35	35	70	22
5 - 9	8	14	22	7
10 - 19	13	7	20	6
20 - 29	10	2	12	4
30 - 39	4	6	10	3
40 - 49	7	6	13	4
50 - 59	4	8	12	4
60 - 69	5	7	12	4
70 - 79	1	3	4	1
80 and over	2	4	6	2
Unknown age	39	40	79	25
Unk. age & sex	-	-	15	4
Totals	156	149	320	100

Editor's Comment

The third most common type, S. miami (9 per cent) has been observed continuously since salmonella surveillance began, with rare exceptions in a limited geographic area (Florida and Georgia). This type was first isolated in Florida in 1943 from Chimpanzees. During the next 8 years it was the 7th most common type in man and 12th most common from animals.

Salmonella typhi represents 11 per cent of isolations in Florida, as compared with 4.4 per cent of CDC's isolations for the first six months in 1963.

C. Illinois

Foodborne Epidemic of Salmonella chester. Dr. S. L. Andelman, Commissioner of Health, Chicago, Illinois.

Fifty-four of fifty-six persons attending a buffet dinner on June 9, 1963, became ill with gastrointestinal symptoms ranging from mild to severe nausea, cramps, and diarrhea. All cases became symptomatic within 48 hours after attending the buffet dinner. Thirteen of 31 stool specimens collected from the patients were found to be positive for Salmonella chester.

Investigation of the restaurant's staff disclosed three additional isolations of Salmonella chester among kitchen employees. Two of them had experienced gastrointestinal symptoms approximately 15 to 24 hours after the buffet, but the third employee, a pantry girl, was asymptomatic.

A summary of the foods eaten by the 31 symptomatic patients revealed that chicken salad was the suspected vehicle. This food had been prepared by the asymptomatic pantry girl. The investigators, therefore, concluded that the chicken salad had been contaminated by a food handler who was a carrier of Salmonella chester.

D. Kentucky

Possible Common Source Outbreak of Typhoid Fever.
J. Clifford Todd, MPH, Chief Epidemiologist, Kentucky State Health Department.

Seven cases of typhoid fever were reported to the Kentucky State Health Department during the month of July. Although these cases appeared geographically unrelated, it was found that all cases attended a church camp ground meeting in Flemming County, Kentucky between July 18 and July 28. It was estimated by the camp's ministers that more than 700 people attended this meeting over the ten-day period. These people lived in 10 surrounding Kentucky counties, Indiana and Ohio.

An epidemiological investigation of the camp ground was made and it was found that the overall sanitary conditions were extremely poor. Two systems maintained the water supply of the camp ground and one of these systems was built under a motel room, with an opening inside the motel room. This was located about 30 feet from a septic tank and as nearly as could be determined, the sewer lines were lying against the cistern wall. During the camp meeting the septic tank overturned and had to be cleaned. On August 30, fluorescein dye was placed in the commodes in the motel and 24 hours later the dye had appeared in the cistern. The Kentucky State Health Department and the Flemming County Health Department requested that the camp ground be closed and the search continues for a possible carrier who may have attended the meeting.

E. North Carolina

An Outbreak of Salmonella irumu Traced to a Restaurant.
Dr. Jacob Koomen, Assistant State Health Director, North Carolina State Board of Health and Dr. Ronald Levine, EIS Officer assigned to North Carolina State Board of Health.

An anonymous call reporting that five persons and three families had become ill following a turkey dinner in a local restaurant prompted an epidemiological investigation by the North Carolina State Board of Health. Illness was characterized by fever, headache, abdominal cramps, diarrhea and vomiting. A case finding investigation revealed that 45 persons had eaten the turkey dinner at that restaurant, twenty-three of whom had become ill with gastroenteritis. Statistical analysis of the food histories indicated that the turkey and/or turkey dressing was the vehicle of infection. Stool cultures yielded Salmonella irumu in 20 of the affected individuals. One of the food handlers was positive for Salmonella irumu. All turkey and turkey dressing had been consumed, but cultures of the eggs used in preparation of the turkey dressing were negative for salmonella. The chef was interviewed and it was probable that neither the turkey or turkey dressing was adequately cooked. An attempt is being made to trace the turkey back to the flock or farm and county health officials are investigating the farm from which the eggs used by the restaurant were obtained.

Editor's Comment

It is often difficult to ascertain whether a food handler has been infected by a food product or whether this handler has actually contaminated a food product. Further investigation such as the one listed above is the only way to attempt to solve this dilemma.

F. Ohio

Follow-up on Salmonellosis Probably Acquired from Infected Parakeet. Dr. T. A. Cochran, Assistant Commissioner of Health, Dr. H. Decker, Ohio Department of Health, and Dr. Samuel A. Andelman, Commissioner of Health, City of Chicago Board of Health.

Investigation of Salmonella typhimurium gastroenteritis in a child, traceable to parakeet droppings taken from a store where the bird was purchased, has been continued (See Salmonella Surveillance Report No. 16). Fifteen other stores that received parakeets from the same Illinois distributing center were investigated. No further salmonella isolations were made. The Chicago Board of Health visited the distributing center and found no evidence of salmonellosis. The birds were fed dehulled millet seed, impregnated with aureomycin for fifteen days prior to shipment. The investigators feel that the source of contamination was local and may well have been parakeet seed contaminated with mouse droppings.

Typhoid Fever Surveillance in 1962. Disease Control Information, Ohio Department of Health.

Twenty-six cases of typhoid fever were confirmed in Ohio during 1962. Twenty-four additional reports were investigated, but were not confirmed as typhoid. There were no deaths recorded from typhoid fever. In 20 of the confirmed cases, Salmonella typhi organisms were isolated from a stool specimen and in another six cases diagnosis was made solely on the basis of clinical symptoms. The age and sex distribution, all represented in table below, indicate a male to female ratio of greater than 3 to 1. Almost two-thirds of the cases occurred in persons under 20 years of age.

Typhoid Fever Cases by Sex and Age
1962

Age Group	Male	Female
0 - 9	8	1
10 - 19	6	2
20 - 29	1	0
30 - 39	1	1
40 and over	3	1
Unknown	1	1
Total	20	6

The source of the illness in 10 of the cases was traced to typhoid carriers residing in Ohio and two additional cases probably acquired their disease in other States. In 13 cases a source was

not determined. Seven of the ten carriers were newly discovered and three were previously known.

Phage typing was performed on 20 of the reported cases and the results are listed below:

Predominant Phage Types from 1962 Cases

Phage Type	Number of Cases
C-1	6
E-1	4
Degraded V-1	2
D-8	2
B-2	2
All Others	4
Total	20

C-1 was the most common phage type isolated which is the reversal from 1961 when E-1 was the most common phage type.

Editor's Comment:

E-1 is the most common phage type in the United States, followed by C, A, and F. (Felix, A., World Survey of Typhoid and Paratyphoid B phage types. Bull. Wld. Hlth. Org. 13:109-170, 1955)

Family Outbreak of Salmonella typhimurium Traced to Homemade Ice Cream. Dr. H. Decker and Dr. Peter Greenwald, Ohio Department of Health.

Between the hours of 12:00 a.m. and 6:00 p.m. on May 31, 1963, all seven members of an Ohio family experienced abdominal pain, diarrhea and vomiting. Two members of the family were hospitalized. Salmonella typhimurium was isolated from stool specimens of six of the seven family members.

On May 30, a day prior to illness, all family members had eaten together at two meals. Of the food served, only a sample of home-made ice cream, which was served at both meals and eaten by all, could be obtained for laboratory analysis. This ice cream was made from raw milk and eggs produced on the farm; cultures were positive for Salmonella typhimurium. Specimens of chicken manure, eggs from the chicken coop and home grown oats and corn used for chicken feed were all cultured. The chicken manure contained Salmonella typhimurium.

G. South Dakota

Salmonella typhimurium Outbreak in Calves. Dr. G. S. Harshfield, Veterinary Department, South Dakota State College.

The problem of Salmonellosis in cattle has been cited in previous reports (Refer to Report No. 7, November 30, 1962), indicating that it is an acute disease with a high mortality rate in young calves. The following report again emphasizes this point.

The problem arose in the operation of a feeding enterprise in South Dakota, where calves 4 days old are purchased periodically and placed in pens for fattening. Approximately 600 animals were on the premise when the disease occurred. During a period of 8 weeks the owner lost 60 calves, most of which were very young. Salmonella typhimurium was isolated as the etiologic agent.

Even under good sanitary conditions, transmission occurred with ease among calves held in close confinment. The control program advised was complete depopulation and thorough cleansing of the premises. This type of feeding operation for calves, at least on this scale, is considered unusual in South Dakota, but the problem of Salmonellosis in dairy cattle operations which house and feed young calves is frequently recognized.

H. Washington

Typhoid Fever in a Merchant Seaman. Dr. Ken Nelson, EIS Officer assigned to Washington State Health Department.

A merchant seaman was hospitalized on August 27 at the Public Health Service Hospital in Seattle, Washington with a high fever, delirium, and typical signs and symptoms of typhoid fever. The diagnosis was confirmed by three positive blood cultures. On questioning the patient, it was found that early in August he had become ill, was taken off his ship in Calcutta and hospitalized from August 2 to August 19. On August 22 he was flown out of Calcutta and told to report to the Health authorities in the United States when he arrived. Apparently he was still symptomatic at the time of his departure from Calcutta. On arriving in the United States he felt moderately well until August 27 when he was hospitalized.

Although the history and details are somewhat clouded, the patient reported that 20 other men from the same ship were flown back from Calcutta at the same time he was with similar symptoms. Their present locale and names are unknown.

In an effort to track down the possibility of other cases, the Division of Foreign Quarantine was immediately informed of the circumstances and appropriate contacts were made. The Division of Quarantine reported no evidence of typhoid among the other seamen.

Editor's Comment

The above case may well represent a case of typhoid fever in relapse. The ease with which this patient apparently entered the country is of concern. This demonstrates that the increasing mobility of the world's population often creates a more difficult problem in communicable disease control.

Preliminary Report on an Outbreak of Salmonellosis Occurring in a College in Washington. Dr. Ernest A. Ager, Chief, Division of Epidemiology, Washington State Department of Health, Dr. Roger Kennedy, EIS Officer assigned to University of Washington, and Dr. Ken Nelson, EIS Officer assigned to Washington State Department of Health.

On Monday, September 16, the Section of Communicable Disease Control, Washington State Department of Health, was notified of an outbreak of Salmonellosis among 1,150 students of a college in Washington State. On September 12 and 13, 60 students reported to the Student Infirmary with symptoms of acute gastroenteritis. Some of the students were very ill with fevers as high as 106°. Subsequently, cultures from two of the students revealed the presence of a salmonella group B organism.

Thus far, preliminary investigation points to lemon pie as the probable source of the outbreak. A domitory survey is underway to accumulate both positive and negative data, and physicians in hospitals are being questioned for the possibility of a citywide epidemic.

This college was also involved in the community wide outbreak of Salmonellosis that was reported in October, 1962 (Salmonella Surveillance Report Number 7), which was epidemiologically associated with contaminated cream pies prepared at a commercial bakery. A repetition of the 1962 problem is feared.

Salmonellosis from Pet Turtles. Dr. Ernest A. Ager, Chief, Division of Epidemiology, Washington State Department of Health.

On June 21, 1963 a two-year-old child developed gastroenteritis. Salmonella newport was recovered from a rectal swab obtained from the patient. Two pet turtles had been brought into the home three days prior to the onset of the patient's illness. Culture of the water in the turtle bath yielded Salmonella newport.

Pet turtles, likened to pet chicks and parakeets, are becoming an increasing problem in the transmission of salmonella infection (See Salmonella Surveillance Reports Number 10 and 13). Investigations have revealed that pet turtles are generally not fed prior to sale and the probable infection of young turtles occurs through contamination of the surface of the egg in the oviduct or cloaca of the parent turtle. Cloacal swabs of adult turtles have been positive for salmonella, a fact which is not surprising in view of the fact that adult turtle breeding stock is fed rendered meat scraps, commonly known to be contaminated with a variety of serotypes of salmonella.

Below is a summary of a turtle water survey recently completed in Washington.

Culture Site	No. Samples Taken	No. Samples Positive for Salmonella	Type
Alligator water	1	0	-
Turtle water	29	7	1 S. paratyphi B 1 S. paratyphi B and S. litchfield 1 type pending 4 Arizona group
Turtle food	7	0	-

Editor's Comment

It is through investigations such as this that the epidemiology of salmonellosis in the United States is being more adequately defined.

V. INTERNATIONAL REPORTS

Common Source Outbreak of Typhoid Fever in Jamaica. Dr. A. A. Peat, Chief Medical Officer, Jamaica Ministry of Health, Dr. D. Luck, Kingston Saint Andrews Corporate Area, and Dr. Charles E. McCall, EIS Officer.

On August 9, 1963 three cases of typhoid fever were reported to the Kingston-Saint Andrews Corporate Health Center from a small mountain village in St. Andrews parish, Jamaica. The occurrence of a cluster of cases in such a small and relatively isolated community prompted the Health Center to an investigation. This was initiated on August 12 and included an environmental study, follow-up blood and stool cultures from suspicious cases, and referral of clinically ill patients to the hospitals of Kingston and Morant Bay. Mass typhoid vaccination of between 600 and 1000 people of all ages was completed within a few days, and educational films were shown to the people in the area. This rapid, efficient program coincided with a methodical epidemiological investigation.

The Dallas Area: Dallas is a township of approximately 1000 persons located 8 miles east of Kingston in the mountains. Households are situated for about 2 miles along a small stream fed by mountain springs, eventually emptying into the Caribbean Sea. A dirt road passes along the stream through the middle of the township, but many of the houses considered a part of the Dallas township are accessible only by foot. The center of the area consists of a post office, a primary school, a health center, and several stores.

The people lead a fairly isolated life. The language is Jamaican patois and communication is by a rapid "grape vine". Agriculture on a small personal basis maintains a barely self-sufficient existance. Government aide is available to some.

The methods of transportation are by foot, donkey, and a truck which is used to transport people to Kingston or surrounding areas.

The health problems of the area are handled at a Health Clinic, located in the center of the community. A nurse appointed by the Ministry of Health sees the routine cases and a physician visits the clinic every week to handle the more difficult problems. If hospitalization is deemed necessary, the patients are sent to Kingston Public Health Hospital, University College Hospital in Kingston, or St. Margarets Hospital, located 20 miles east in Morant Bay. A mid-wife is available for delivery and education of expectant mothers.

Sanitary conditions are periodically checked by a health inspector who is assigned to the general geographical area. These are conscientious and competent men who know the people in the area personally. Each house must maintain certain standards. A pit latrine, which is built by digging a hole 6 to 8 feet deep, must be available to each household. It must be kept clean and covered. There are no septic tanks, and excreta is filtered through soil which is rich in limestone.

Water is provided by standpipes located at intervals along the road. There are 8 of these along a 2 mile stretch (Figure 2). The water is collected at an uncovered catchment in the mountains above the village, being fed by springs and rainwater. It is chlorinated by dropping halozone tablets in a receptacle just below the catchment, then it runs by pipe to various standpipes (faucets) located along the road. Many of the houses are more than 100 yards from a pipe and therefore more accessible river water is frequently used for drinking and bathing.

The existence is basically one of poverty, relative isolation, and minimal education.

Investigation: After the rapid educational, vaccination and sanitation programs were launched, a more meticulous epidemiological investigation was performed. The case finding survey involving the Dallas area and hospitals of Kingston and Morant Bay, brought the total number of cases to 32. Twenty-three of these were diagnosed by positive cultures, eight by fever and elevated O and H titers, and one case by fever, headache and contact with a known case. The epidemic curve (Figure III)pointed to a common source epidemic with the index case occurring in May. The mother of this index case probably had typhoid fever in November, 1962, and her stool cultures were positive for Salmonella typhi at the time of the epidemic. The primary cases spread over two weeks, the differences in listed onset being attributed to variations in incubation period and inability to obtain a reliable date of onset. The secondary case occurred on August 22, and was easily explained by contact with a primary case. No cases have been reported since August 22.

The age incidence (Figure 4) conforms to that which is usually seen in areas where typhoid fever is endemic. There was no mortality, no toxic crises, and thus far there have been no relapses. All patients were treated for 13 to 21 days with chloramphenicol and all had three negative cultures before discharge from the hospital. The only major complication was gross

lower gastrointestinal bleeding, which occurred in one case.

On questioning the cases, it was found that 30 definitely drank river water and two most probably drank river water during the critical period. Twenty-seven also had definitely drunk pipe water during the critical period. Bacteriological studies revealed that both river and pipe water were contaminated with coliform organisms, and the pipe water was unchlorinated at the time of the outbreak. There were no common food items and no communal gathering of any type during the critical period.

Phage typing is underway on all culture positive cases and thus far four have been reported as phage type E_1 which is the most common phage type in the area (1).

Summary:

It was concluded that this represented a waterborne, common-source epidemic due to phage type E_1 Salmonella typhi. The mother of the index case probably suffered from typhoid fever in November, 1962, became a carrier and transmitted the disease to her child in May of 1963. In July, the river or the pipe water was contaminated - probably by the mother since the child had three negative cultures before her discharge from the hospital. The method of contamination was most likely direct in that the latrine at this home was about 200 yards from the river and it was located below the catchment. Although contamination of the river via an underwater stream was possible, it appeared less likely. However, being unable to test this hypothesis by fluorescein dye dissemination studies, the precise mode of spread remains speculative. The fact that the cases occurred along a two mile course of the stream which runs rapidly over limestone rocks does not rule the river out as the common source, if heavy direct fecal contamination occurred.

Since 100 per cent of the cases probably had used river water and 2 of the cases definitely denied using the pipe water, the river water appears the more likely source. In absence of the recovery of the typhoid bacillus from either water source, a definitive answer cannot be given.

Since the outbreak, four more standpipes have been added along the course of the water which is now adequately chlorinated. The educational and vaccination programs are continuing and money has been appropriated for fitting a cover over the water catchment. All cases are to be followed up in six months and a year with Vi serology and stool cultures in order to uncover possible chronic carriers.

(1) Grant, L. S. A Review of Salmonella, Shigella, Pathogenic E. coli, and Typhoid Phage Types in Jamaica. The West Indies Medical Journal XII, 90, 1963.

Editor's Comment:

This epidemic and its investigation is most interesting in its classical pattern. It may typify the epidemiology of typhoid

fever as it exists throughout many areas in the world today. As can readily be seen, preventive medicine is still the answer to problems such as this.

VI. SPECIAL REPORT

Previous Salmonella derby Infections in Poland

The experience with Salmonella derby in Poland has recently been brought to our attention. The first reported isolations of Salmonella derby in Poland occurred in 1950 (1). In June of that year, Salmonella derby was isolated from stool cultures taken from workers in varying occupations. Most of these workers were employed in a meat slaughter plant, and, upon questioning, admitted consumption of raw meat. Slaughtered animals were examined and Salmonella derby was recovered from the lymph nodes of two out of 105 swine. In early August of the same year, 8 children, all under 2 years of age, became ill with gastroenteritis which was caused by Salmonella derby. Three of the children died. Despite a most careful investigation, the source of the infection could not be determined; however, the investigators felt that human carriers seem to be the most logical source.

Another Polish report revealed the occurrence of 21 cases of Salmonella derby infection in a children's clinic (2). Only three of these cases manifested significant clinical symptoms, and these three responded well to chloromycetin and aureomycin. No mention was made as to the source of the outbreak.

(1) Herevsg, J. Sedlak and Rische, H. Leipzig. Enterobacteriaceae-Infektima, 1961.

(2) Bocheska, J. et al. Intrahospital Epidemic Caused by S. derby Bacteria. Pediatria Polska Nr 4/54, 1953.

TABLE I

SALMONELLA SEROTYPES ISOLATED FROM HUMANS DURING AUGUST, 1963

SEROTYPE	REGION AND REPORTING CENTER																	
	NEW ENGLAND							MIDDLE ATLANTIC						EAST NORTH CENTRAL					
	ME	NH	VT	MASS	RI	CONN	TOT.	NY-A	NY-BI	NY-C	NJ	PA	TOT.	OHIO	IND	ILL	MICH	WIS	TOT.
abaetetuba																			
alachua																			
albany																			
anatum																1	4		5
atlanta																			
banana																			
bareilly								1				2	3						
berta												1	1			2	1		3
blockley				3		2	5				1	3	4	1		2	1	1	5
bovis-morbificans											1		1						
braenderup								1					1		2				2
bredeney																1			1
california																			
cerro																			
chester												1	1			3			3
cholerae-suis var. kunzendorf																			
cubana				1			1	1			1		2						
derby				5	2	10	17	14	17	5	14	53	103	1	1	4	3	1	10
enteritidis				13		4	17	3				4	7	3		4	7	5	19
give												1	1						
horsham																			
heidelberg	2			16	4		22	1	10	2	2	8	23	4	1	3	6	1	15
illinois																			
indiana																			
infantis	1			2	1		4	3	1	2	1	3	10	1	5	6	3		15
irumu																			
javiana																			
kentucky												2	2			1			1
lexington																			
lindenburg																			
litchfield																			
livingstone																			
manhattan																			
meleagridis						1	1											1	1
menston																			
miami																			
minnesota																	1		1
mission																			
mississippi																			
montevideo				1		3	4	3			1	3	7	2		5		1	8
muenchen					1		1					3	3						
newington												1	1						
new-mexico																			
newport				4		1	5		2	1		7	10	3	1	3	3		10
norwich																1			1
oranienburg			1	1		1	3					6	6	2		5		1	8
panama								1	1				2						
paratyphi B var. java						1	1	3					3			2		2	4
paratyphi B				3	1		4										2		2
paratyphi C																		1	1
pensacola																			
poona																			
reading								2				1	3			2			2
rubislaw																			
saint-paul	1			1	1		3		10	2		21	33	9		3	1		13
san-diego				1			1												
saphra																			
schwarzengrund															1	1			2
senftenberg																			
sundsvall																			
tennessee				1			1					5	5				1	1	2
thomasville																			
thompson				10		3	13		3	1		5	9	1			6	1	8
typhi	4					1	5		3			20	23	5	1	4			10
typhimurium	3		4	46	4	11	68	22	23	8	8	47	108	28	5	17	18	16	84
typhimurium var. copenhagen	1			4			5										2		2
urbana																	1	1	2
weltevreden																			
westerstede																			
worthington																			
untypable																			
untypable, Group B		2					2												
untypable, Group C_1																		1	1
untypable, Group C_2																			
untypable, Group D		1					1												
untypable, Group E																			
untypable, Group J																	1		1
unknown								1		1			2				2	1	5
TOTAL	12	3	5	112	14	38	184	56	70	22	29	197	374	60	17	72	63	35	247

TABLE I

BY SEROTYPE AND REPORTING CENTER

REGION AND REPORTING CENTER																		
WEST NORTH CENTRAL								SOUTH ATLANTIC										SEROTYPE
MINN	IOWA	MO	ND	SD	NEBR	KAN	TOT.	DEL	MD	DC	VA	W VA	NC	SC	GA	FLA	TOTAL	
																1	1	abaetetuba
																1	1	alachua
																	1	albany
						1	1		1								1	anatum
															5		5	atlanta
																1	1	banana
																	1	bareilly
															1		1	berta
2							2		1						6		7	blockley
																		bovis-morbificans
		1					1											braenderup
1							1											bredeney
															1	1	2	california
																		cerro
											1				1		2	chester
																		cholerae-suis var. kunzendorf
															1		1	cubana
1							1	4	5							3	12	derby
2							2		2		1				3		6	enteritidis
																		give
																		harsham
1			3		1		5		4	2			2		2	2	12	heidelberg
															3		3	illinois
																1	1	indiana
4		3				1	8		6		1		2		4	7	20	infantis
		1					1						20				20	irumu
															2	5	7	javiana
										1							1	kentucky
																		lexington
																		lindenburg
															2		2	litchfield
															1		1	livingstone
																		manhattan
															1		1	meleagridis
									1								1	menston
																7	7	miami
																		minnesota
									1								1	mission
															6		6	mississippi
		2					2		2			1			2		5	montevideo
																3	3	muenchen
																		newington
																		new-mexico
1	1					2	4		3				5		14	8	30	newport
																		norwich
		3				5	8				1				3	2	6	oranienburg
1		1				2	4		1								1	panama
																		paratyphi B var. java
													1				1	paratyphi B
													1			1	2	paratyphi C
																		pensacola
																		poona
																		reading
		2					2											rubislaw
4							4		1	1	1		1		1	6	11	saint-paul
																		san-diego
																		saphra
																		schwarzengrund
																		senftenberg
																		sundsvall
																		tennessee
																		thomasville
									6		1		1		2		10	thompson
		4					4		4				4	1		3	12	typhi
7		4	5	1	1	9	27	3	12	1	8	2	13		23	33	95	typhimurium
															1		1	typhimurium var. copenhagen
																		urbana
																		weltevreden
																		westerstede
																		worthington
																		untypable
										4							4	untypable, Group B
										1							1	untypable, Group C_1
									1	3							4	untypable, Group C_2
										1							1	untypable, Group D
																		untypable, Group E
																		untypable, Group J
																		unknown
24	1	21	8	1	2	20	77	7	51	14	14	3	50	1	85	85	310	TOTAL

TABLE 1 (Continued)

SEROTYPE	EAST SOUTH CENTRAL					WEST SOUTH CENTRAL					MOUNTAIN								
	KY	TENN	ALA	MISS	TOT.	ARK	LA	OKLA	TEXAS	TOTAL	MONT	IDA	WYO	COLO	NM	ARI	UTAH	NEV	TOTAL
abaetetuba																			
alachua																			
albany																			
anatum							3		2	5									
atlanta																			
banana							1			1						1			1
bareilly																			
berta							2			2									
blockley							8			8									
bovis-morbificans																			
braenderup									1	1									
bredeney									1	1				1					1
california																			
cerro									1	1									
chester																			
cholerae-suis var. kunzendorf	1				1														
cubana																			
derby						1	3			4				2					2
enteritidis							4		2	6		1					1		2
give							5		2	7									
horsham																			
heidelberg		1	1		2		5		1	6				5		3			8
illinois																			
indiana																			
infantis	1		1		2		4		4	8						5			5
irumu																			
javiana							5		3	8									
kentucky							1			1									
lexington																			
lindenburg								1		1									
litchfield																			
livingstone							2			2									
manhattan									1	1									
meleagridis									1	1									
menston																			
miami																			
minnesota						1				1									
mission																			
mississippi						1	1			2									
montevideo			1		1				3	3									
muenchen							2		2	4						2			2
newington																			
new-mexico																			
newport						3	29		12	44						1			1
norwich																			
oranienburg							5		5	10				2		1			3
panama			1		1		3			3									
paratyphi B var. java							7			7	1								1
paratyphi B									2	2									
paratyphi C																			
pensacola							1			1									
poona																			
reading														1					1
rubislaw							3			3									
saint-paul						1	1		1	3				1		1			2
san-diego																			
saphra																			
schwarzengrund																			
senftenberg							3			3									
sundsvall									1	1									
tennessee	1				1														
thomasville																			
thompson				1	1		6			6						2			2
typhi	3				3				4	4		1		1	3				5
typhimurium	4	1	2	1	8	1	41	1	15	58		2		17		1	3		23
typhimurium var. copenhagen							5			5									
urbana																			
weltevreden																			
westerstede									1	1									
worthington																			
untypable																			
untypable, Group B						2				2		2			6		4		12
untypable, Group C_1															3				3
untypable, Group C_2						1		1		2					2				2
untypable, Group D															1				1
untypable, Group E															2				2
untypable, Group J																			
unknown											1						2		3
TOTAL	10	2	6	2	20	11	150	3	65	229	2	6	0	30	17	17	10	0	82

TABLE I (Continued)

REGION AND REPORTING CENTER						OTHER	TOTAL	PERCENT OF TOTAL	EIGHT MONTH TOTAL	% EIGHT MONTH TOTAL	CDC TOTAL	PERCENT OF TOTAL	SEROTYPE
PACIFIC													
WASH	ORE	CAL	ALASKA	HAWAII	TOTAL	VI							
							1		8		1		abaetetuba
							1		1				alachua
													albany
	1	1		2	4		16		135		1		anatum
							5		7				atlanta
							1		1				banana
							5		40		2		bareilly
							7		38				berta
		3		1	4		35	2.0	252	2.2	5	2.0	blockley
							1		2				bovis-morbificans
							5		29		1		braenderup
		13			13		17		78		3		bredeney
							2		6				california
							1		2		1		cerro
		1			1		7		134		1		chester
							1		42		2		cholerae-suis var. kunzendorf
							4		24		1		cubana
		4		2	6		155	8.8	926	7.8	10	4.0	derby
		1		2	3		62	3.5	445	3.8	2	0.8	enteritidis
				1	1		9		39				give
											1		horsham
6	1	19			26		119	6.7	1,003	8.6	20	8.1	heidelberg
							3		7				illinois
							1		10				indiana
4		11		2	17		89	5.0	598	5.1	11	4.5	infantis
							21		26		1		irumu
							15		84		3		javiana
							5		23				kentucky
											1		lexington
							1		2				lindenburg
							2		32		2		litchfield
							3		7		1		livingstone
	5			3	8		10		116		4		manhattan
							3		49		1		meleagridis
							1		1				menston
							8		40				miami
							1		9		3		minnesota
							1		1				mission
							8		19		4		mississippi
	1	5		1	7		37	2.1	262	2.3	5	2.0	montevideo
	1	3			4		17		195		3		muenchen
		2			2		3		34				newington
											2		new-mexico
		14			14		118	6.7	722	6.2	9	3.6	newport
							1		6				norwich
	1				1		45	2.5	268	2.3	3	1.2	oranienburg
				1	1		12		81		3		panama
													paratyphi B var. java
		2			2		19		84		4		
1		1			2		12		89		5		paratyphi B
							1		3				paratyphi C
							1		3				pensacola
											1		poona
	1				1		9		25		1		reading
							3		8		2		rubislaw
1	3	2			6		75	4.2	348	3.0	10	4.0	saint-paul
		1			1		2		86		3		san-diego
													saphra
1		10			11		13		101				schwarzengrund
							3		22				senftenberg
							1		2				sundsvall
		3		2	5		14		80				tennessee
											1		thomasville
	1	1			2		51	2.9	175	1.5	6	2.4	thompson
		4			4		70	4.0	500	4.3	47	19.0	typhi
12	4	52		6	74		545	30.8	3,559	30.6	43	17.4	typhimurium
							13		89		11		typhimurium var. copenhagen
							2		24				urbana
		1		18	19		19		36				weltevreden
							1		1				westerstede
		1			1		1		18				worthington
											2		untypable
	1				1		22		202		3		untypable, Group B
							4		36		1		untypable, Group C_1
			1		1		9		31				untypable, Group C_2
	5				5		8		42				untypable, Group D
							2		10				untypable, Group E
							1		1				untypable, Group J
							10		50				unknown
25	25	155	1	41	247		1,770		11,633		247		TOTAL

TABLE II

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

Reporting Center	Total Number of Isolates Reported	Number of Isolates from Family Outbreaks	Per Cent of Total
Alabama	6	0	0.0
Alaska	1	0	0.0
Arizona	17	0	0.0
Arkansas	11	0	0.0
California	155	29	18.7
Colorado	30	2	6.7
Connecticut	38	7	18.4
Delaware	7	0	0.0
District of Columbia	14	2	14.3
Florida	85	12	14.1
Georgia	85	20	23.5
Hawaii	41	1	2.4
Idaho	6	0	0.0
Illinois	72	14	19.4
Indiana	17	2	11.7
Iowa	1	0	0.0
Kansas	20	4	20.0
Kentucky	10	0	0.0
Louisiana	150	35	23.3
Maine	12	3	25.0
Maryland	51	10	19.6
Massachusetts	112	30	26.8
Michigan	63	10	15.9
Minnesota	24	1	4.2
Mississippi	2	0	0.0
Missouri	21	0	0.0
Montana	2	0	0.0
Nebraska	2	0	0.0
New Hampshire	3	0	0.0
New Jersey	29	4	13.8
New Mexico	17	2	11.8
New York-Albany	56	3	5.3
New York-Beth Israel	70	5	7.1
New York City	22	0	0.0
North Carolina	50	8	16.0
North Dakota	8	0	0.0
Ohio	60	16	26.7
Oklahoma	3	0	0.0
Oregon	25	10	40.0
Pennsylvania	197	69	35.0
Rhode Island	14	2	14.3
South Carolina	1	0	0.0
South Dakota	1	0	0.0
Tennessee	2	0	0.0
Texas	65	0	0.0
Utah	10	0	0.0
Vermont	5	2	40.0
Virginia	14	3	21.4
Washington	25	3	12.0
West Virginia	3	0	0.0
Wisconsin	35	2	5.7
Total	1770	311	17.6

TABLE III
Infrequent Serotypes

Serotype	Center	August	8-Month Total*	CDC**	Comment
S. alachua	FLA	1	8	14	Rare cause of human illness. First recovered from stool of swine-holding pen, Alachua County, Florida.
S. albany	FLA	1	1	6	
S. atlanta	GA	5	7	21	Closely related antigenically to S. mississippi. 17 of 21 isolations in CDC experience originated in Florida and Ga.
S. banana	LA	1	1	1	Extremely uncommon isolation. Only previous U.S. isolation known to CDC from a turkey in Idaho 1952. First isolated from a "serpent" in the Belgian Congo 1951.
S. bovis-morbificans	NJ	1	2	15	Rare cause human illness, though one of first salmonella serotypes defined (1894).
S. california	FLA & GA	2	6	143	Infrequent cause human illness, though a more common isolate from turkeys.
S. cerro	TEX	1	2	35	Only previous isolation in 1963 from the urinary tract of a 70 year old man, whose stool cultures were repeatedly negative for the same organism.
S. illinois	GA	3	7	30	Only 2 of 30 isolations in CDC experience originated from instances of human illness.
S. indiana	FLA	1	10	29	Occasionally isolated from poultry in recent years. Sporadic cause human illness.
S. lindenburg	GA	1	2	0	Three previous human isolations in recent years. All occurred in Colorado.
S. livingstone	GA & FLA	3	7	0	Infrequent cause human disease.

Serotype	Center	August	8-Month Total*	CDC**	Comment
S. menston	MD	1	1	0	Only previous isolation known to Salmonella Surveillance Unit from Mexican itinerant laborer in Colorado, December, 1962.
S. minnesota	ARK	1	9	81	A common isolation from poultry, since its discovery in a turkey, 1936. Rare cause human illness.
S. mission	MD	1	1	1	Only previous reported recovery from a case of gastroenteritis in North Carolina.
S. norwich	ILL	1	6	25	Recent recoveries from swine, pork products, and dogs.
S. paratyphi C	WIS	1	4	6	Host-adapted organism. Four of six previous isolations from Maryland.
S. pensacola	LA	1	3	28	Reported in past only from Atlantic Coast States.
S. rubislaw	LA	3	6	239	Confined almost exclusively to Southeastern United States.
S. sundsvall	TEX	1	2	3	Three previous isolations in CDC experience from humans; one from Florida, 2 from Mexico.
S. westerstede	TEX	1	1	0	Extremely rare serotype.

* Represents 11,633 human isolations of salmonellae reported to the Salmonella Surveillance Unit - January 1 to August 30, 1963.

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

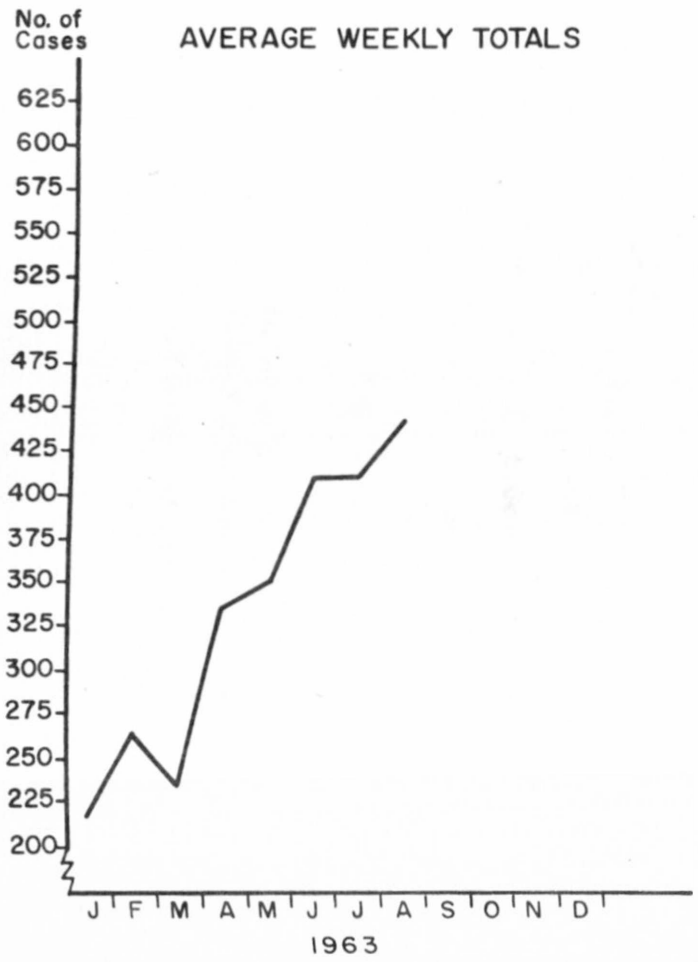
TABLE IV

Age and Sex Distribution of 1707 Individuals from Whom Salmonellae were Isolated - August, 1963

Age (Years)	Male	Female	Total
Under 1	96	88	184
1-4	119	84	203
5-9	73	55	128
10-19	64	67	131
20-29	41	44	85
30-39	28	44	72
40-49	28	39	67
50-59	33	48	81
60-69	25	29	54
70-79	25	23	48
80+	3	11	14
Unknown	317	322	640
Total	852	854	1707
% of Total	50.0	50.0	

FIGURE I.

REPORTED HUMAN ISOLATIONS OF SALMONELLAE IN THE UNITED STATES
1963



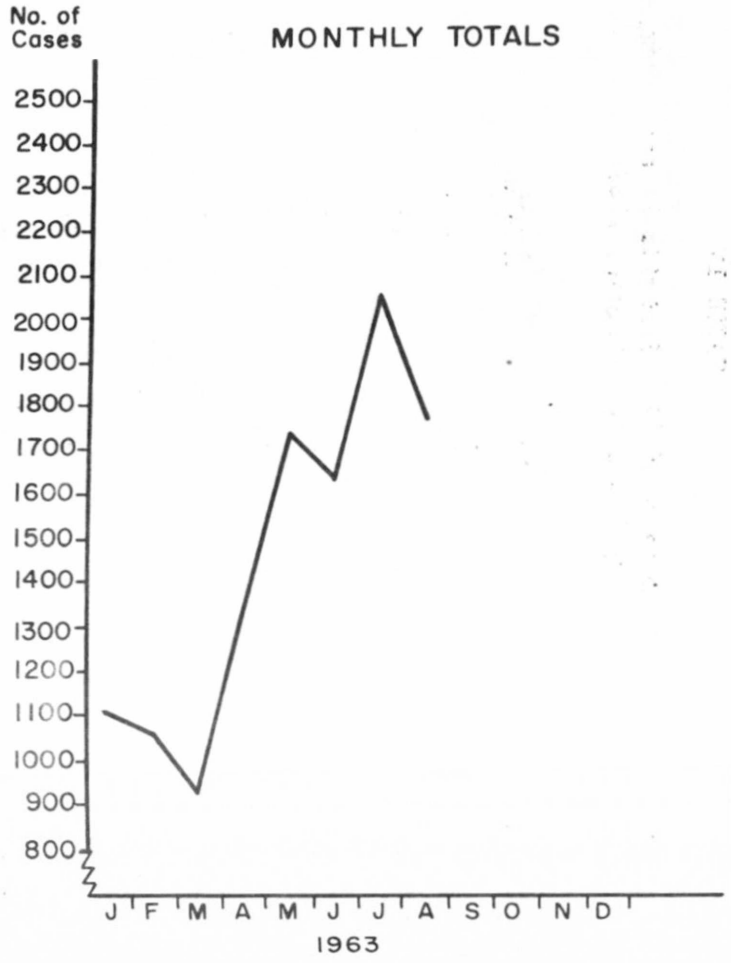


TABLE V

NON-HUMAN ISOLATES REPORTED BY THE NATIONAL ANIMAL DISEASE LABORATORY AND STATE REPORTING CENTERS – AUGUST, 1963

SEROTYPE	SOURCE																																						SEROTYPE
	CHICKEN	TURKEY	PIGEON	GOOSE	MACAW	QUAIL	GAME HEN	PEAFOWL	AVIAN	EQUINE	BOVINE	OVINE	PORCINE	CANINE	MOUSE	RAT	GUINEA PIG	RABBIT	MONKEY	MINK	FOX	HOME MADE ICE CREAM	LOCAL RESTAURANT	CANNED SALMON	EGG-WHOLE	EGG-YOLK	SAUSAGE	BEEF JERKY	HIGH PROTIEN CONCENTRATE POULTRY FEED	FEATHER MEAL	MEAT SCRAPS AND BONE MEAL	FEED UNKNOWN	SNAKE	CHAMELEON	TANKAGE	TURTLE WATER	UNKNOWN	TOTAL	8 MO. TOTAL	
alachua	1	1																																				2	2	alachua
albany	1																																					1	1	albany
amager	2	1																																				3	6	amager
anatum	9	12		1		2																									3					1	28	204	anatum
binza	1																												1					1				3	21	binza
blockley	24	2																																				26	78	blockley
braenderup	1																																					1	1	braenderup
bredeney	4																						1					3										8	89	bredeney
california	3																														2						5	18	california
champaign														1																								1	1	champaign
chester	1	2																																				3	71	chester
cholerae-suis Var. kunzendorf													10																	1							11	100	cholerae-suis Var. kunzendorf
cubana		1																														1						2	16	cubana
derby		2									1		2						1								1					2					1	10	76	derby
dublin											4																											4	28	dublin
enteritidis	4								6				1		1		1																					13	44	enteritidis
gallinarum	4	1																																				5	37	gallinarum
give						1																																1	44	give
heidelberg	12	1																																				13	202	heidelberg
indiana	3													1																								4	19	indiana
infantis	39	1				2							1	1																								44	229	infantis
inverness																																			1			1	2	inverness
javiana													3																									3	4	javiana
kentucky						1																																1	22	kentucky
litchfield																																				1		1	11	litchfield
livingstone																																2						2	26	livingstone
manhattan		2																																				2	21	manhattan
meleagridis		2												1																								3	11	meleagridis
miami													1																									1	14	miami
minnesota	1																																					1	5	minnesota
montevideo	9	1																				1			1												1	13	155	montevideo
muenchen	1																																					1	48	muenchen
newington	1	4							7																													12	50	newington
newport		3								3	41		1																									48	132	newport
oranienburg											1								1							1					1							4	36	oranienburg
orion													2																									2	6	orion
panama		1																																				1	10	panama
paratyphi B																																				1		1	3	paratyphi B
pullorum	5						1																															6	121	pullorum
reading	4																																					4	31	reading
saint-paul	2	12											1						1														1					17	134	saint-paul
san-diego	2	4																																				6	45	san-diego
schwarzengrund		5																														1						6	85	schwarzengrund
senftenberg	1					1																										1	3					6	32	senftenberg
simsbury	1																																					1	6	simsbury
stanley																			4																			4	5	stanley
tennessee	1								1																													2	62	tennessee
thomasvide																																	2					2	2	thomasville
thompson	4	1						1			1																											7	49	thompson
typhimurium	14	20							6	1	30	1	4	1		1		1		2														1			1	83	665	typhimurium
typhimurium Var. copenhagen	14	9	9	4	2						1		1								1				1													41	191	typhimurium Var. copenhagen
vieuten																								1														1	2	vieuten
weltevreden																																						1	1	weltevreden
worthington	3	3																														1						7	73	worthington
unknown																																		1				1	1	unknown
TOTAL	172	91	9	5	2	7	1	1	20	4	79	1	27	5	1	1	1	1	7	2	1	1	1	1	2	1	1	3	1	1	9	11	2	1	1	2	4	480	3,480	TOTAL

SOURCE: NATIONAL ANIMAL DISEASE LABORATORY, AMES, IOWA AND WEEKLY SALMONELLA SURVEILLANCE REPORTS RECEIVED FROM CALIFORNIA, COLORADO, CONNECTICUT, ILLINOIS, KANSAS, LOUISIANA, MICHIGAN, MISSISSIPPI, NEW JERSEY, NEW YORK, OHIO, OKLAHOMA, RHODE ISLAND, TEXAS, VIRGINIA, AND WASHINGTON.

TABLE VI

NON-HUMAN ISOLATES REPORTED BY THE NATIONAL ANIMAL DISEASE LABORATORY AND STATE REPORTING CENTERS – AUGUST, 1963 (Continued)

STATE																		SEROTYPE
N.H.	N.J.	N.M.	N.C.	OHIO	PA	R.I.	S.C.	S.D.	TENN	TEXAS	VA	WASH	W. VA	WIS	TOTAL	8 MO. TOTAL	
														1	2	2	alachua
															1	1	albany
															3	6	amager
		1	1							4	1			3	28	204	anatum
						1									3	21	binza
															26	78	blockley
															1	1	braenderup
															8	89	bredeney
															5	18	california
															1	1	champaign
														1	3	71	chester
																	cholerae-suis
											1			1	11	100	Var. kunzendorf
										1					2	16	cubana
										2	1				10	76	derby
															4	28	dublin
					1										13	44	enteritidis
															5	37	gallinarum
															1	44	give
1															13	202	heidelberg
															4	19	indiana
											1				44	229	infantis
															1	2	inverness
									3						3	4	javiana
															1	22	kentucky
												1			1	11	litchfield
										2					2	26	livingstone
											1				2	21	manhattan
															3	11	meleagridis
															1	14	miami
															1	5	minnesota
															13	155	montevideo
															1	48	muenchen
					1								1		12	50	newington
							1								48	132	newport
															4	36	oranienburg
															2	6	orion
										1					1	10	panama
												1			1	3	paratyphi B
							1		1	1				1	6	121	pullorum
															4	31	reading
							1			1				9	17	134	saint-paul
							2								6	45	san-diego
														1	6	85	schwarzengrund
							1			3				1	6	32	senftenberg
															1	6	simsbury
				1											4	5	stanley
															2	62	tennessee
															2	2	thomasville
															7	49	thompson
				1			1	1	2	2		2		3	83	665	typhimurium
	1	4			3			1		1			1	3	41	191	typhimurium Var. copenhagen
															1	2	vieuten
															1	1	weltevreden
														3	7	73	worthington
															1	1	unknown
1	1	5	1	2	5	1	7	2	6	18	5	4	2	27	480	3,480	TOTAL

TABLE VI

NON-HUMAN ISOLATES REPORTED BY THE NATIONAL ANIMAL DISEASE LABORATORY AND STATE REPORTING CENTERS – AUGUST, 1963

SEROTYPE	STATE																		
	ALA	ALASKA	ARK	CAL	COL	CONN	DEL	FLA	GA	HAWAII	ILL	IND	IOWA	MD	MASS	MICH	MINN	MO	MONT
alachua				1															
albany													1						
amager									2				1						
anatum				3								7	5				3		
binza												1					1		
blockley			1	1					8			12		3	1				
braenderup												1							
bredeney				5					3										
california									3		2								
champaign		1																	
chester				1								1							
cholerae-suis Var. kunzendorf												7	2						
cubana				1															
derby				1							3	3							
dublin				4															
enteritidis			1						1		1	4		6					
gallinarum							2					1	1						
give				1															
heidelberg	1			1					6		1	1						2	
indiana	1			3															
infantis		1		4		4			7			25					2		
inverness																1			
javiana																			
kentucky				1															
litchfield																			
livingstone																			
manhattan																	1		
meleagridis		1		2															
miami								1											
minnesota									1										
montevideo				2					9		1							1	
muenchen									1										
newington													1	7			2		
newport				38	3							3				3			
oranienburg									1		2						1		
orion											2								
panama																			
paratyphi B																			
pullorum	2																		
reading												4							
saint-paul			1								1		1	1		1	1		
san-diego												4							
schwarzengrund	1			2													2		
senftenberg									1										
simsbury								1											
stanley											4								
tennessee								1											
thomasville													2						
thompson				1								2				3	1		
typhimurium				20	10			1	3		2	7	1	9	1	6	3	7	1
typhimurium Var. copenhagen	1						1		7		1	4		3	6	1	3		
vieuten																1			
waltevreden										1									
worthington												2					2		
unknown																1			
TOTAL	6	3	3	92	13	4	3	4	53	1	20	89	15	29	8	17	22	10	1

SOURCE: NATIONAL ANIMAL DISEASE LABORATORY, AMES, IOWA AND WEEKLY SALMONELLA SURVEILLANCE REPORTS RECEIVED FROM CALIFORNIA, COLORADO, CONNECTICUT, ILLINOIS, KANSAS, LOUISIANA, MICHIGAN, MISSISSIPPI, NEW JERSEY, NEW YORK, OHIO, OKLAHOMA, RHODE ISLAND, TEXAS, VIRGINIA AND WASHINGTON.

Figure 2.

DALLAS AREA

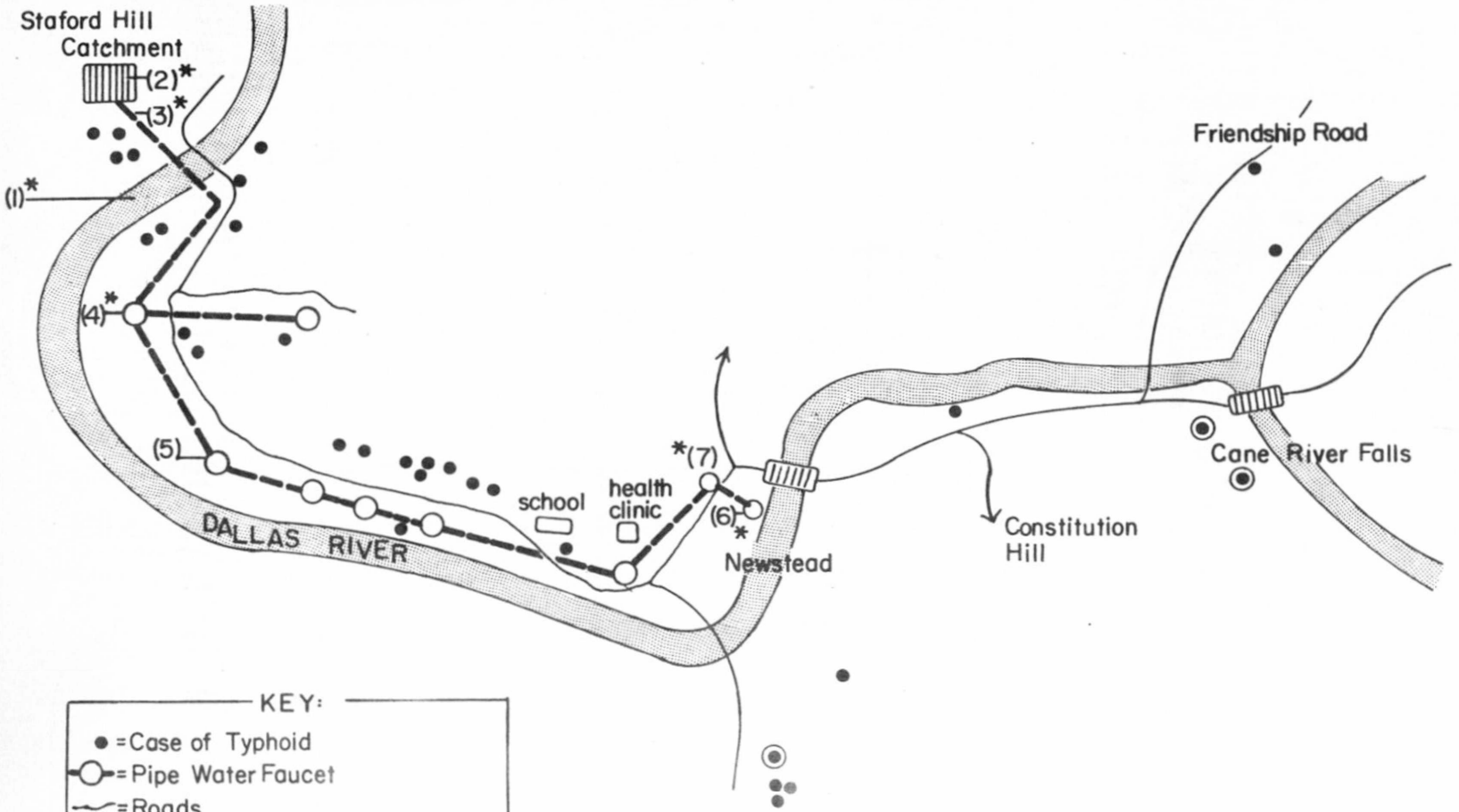


FIGURE 3.

TYPHOID FEVER IN DALLAS AREA

BY WEEK

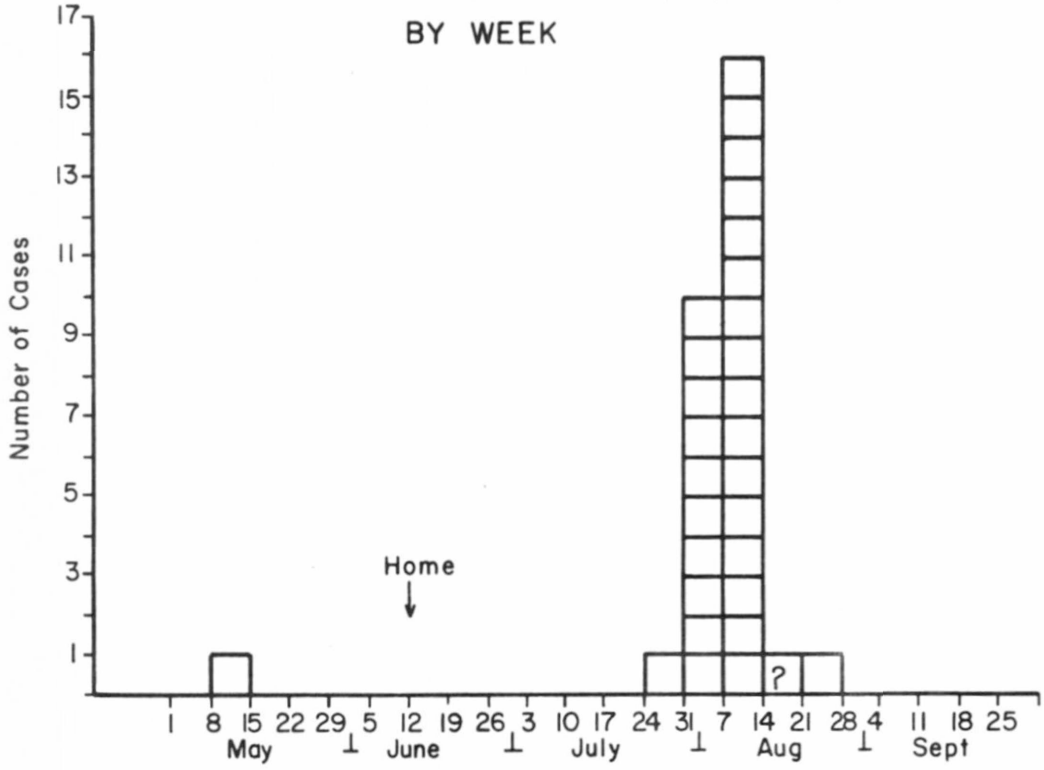


FIGURE 4.

TYPHOID FEVER IN DALLAS AREA

BY AGE GROUP