1959 Summary of Disease Outbreaks

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THE NUMBER of reported outbreaks of waterborne and foodborne diseases was slightly higher in 1959 than in 1958 (table 1). There was a considerable increase in number of reported outbreaks and cases of staphylococcal food poisoning as compared with the previous year, but this was largely offset by smaller numbers in some other categories (table 2).

While it seems improbable that outbreaks of foodborne diseases were more completely reported in 1959 than in previous years, there is evidence that more extensive laboratory investigations were being carried out in some areas.

The number of outbreaks in which phage typing of staphylococci was done increased in 1959. In a few instances, the same phage type of organism was recovered from specimens of food as from persons who were handling or preparing foods. Phage types 7 and 47 were more commonly reported than any others. Phage type 80/81 was recovered from ham in one outbreak and from milk in another. A few reports indicated that phage typing was being done but the results of tests were not received.

Introduction of coagulase-positive strains of staphylococci of human origin into herds of dairy cattle is receiving more attention. In one State antibiotic-resistant strains of phage type 80/81 were recovered from superficial lesions on the udders of cattle in a herd owned by a carrier of this type of staphylococcus. Two other adults in the family also were carriers of this type. When the animals were moved to new premises and their human contacts changed, their lesions disappeared. A similar situation was reported recently by Wallace (*1*). Phage type 80/81 was recovered from four cattle in a dairy herd and also from lesions on one worker at the dairy farm. One State is now conducting an intensive study of staphylococcal infections in cattle and their relationship to human infections and disease.

Several outbreaks of foodborne diseases were reported in 1959 in which *Clostridium perfringens* (*welchii*) was considered or suspected as the etiological agent. This spore-forming organism, of which one type (A) causes gas gangrene, has been recognized as the etiological agent in outbreaks in England for a number of years. Its association with disease outbreaks in the United States had been suspected but was not proved until recently. Failure to recognize the role of this organism in foodborne diseases in this country has been due partly to the fact that it can be recovered only when incubated anaerobically. The procedures required for identification of the organism are complicated, and few laboratories are equipped to perform them. *C. perfringens* is widely distributed in nature in feces, sewage, and soil. Outbreaks due to this bacterium are usually associated with meat, including fowl, that has been cooked and allowed to cool slowly at room temperature. The incubation period of illnesses is about 8 to 12 hours but may be as long as 22 hours. According to Dack (*2*), the characteristic symptoms are acute abdominal pain and diarrhea, usually of short duration.

In 1959, there were 75 outbreaks of foodborne diseases, affecting more than 1,200 persons, in which poultry or other meat was thought to be the vehicle of infection but no etiological agent was identified. Possibly some of these were caused by *C. perfringens*. It has

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been suggested that when specimens of food, especially meat dishes, are examined bacteriologically, provision should be made for culturing them anaerobically if the common pathogens associated with food poisoning or infections are not readily isolated in substantial numbers. Anaerobic culturing is especially important when abdominal pain and diarrhea are predominant symptoms following an incubation period of about 10 to 12 hours.

Another spore-forming organism, *Bacillus cereus*, was presumably associated with an outbreak in 1959 for the first time in the United States. This organism has been implicated in several outbreaks in Scandinavian countries during the past decade. Since it is widely distributed in soil, dust, milk, and on plant surfaces, it may possibly be a more frequent etiological agent in foodborne disease than is generally recognized. However, further study is required to assess its importance in such illnesses.

These experiences indicate the importance of laboratory procedures in the investigation of foodborne disease. When these procedures are combined with more complete epidemiological investigation and more complete reporting of outbreaks, the foundation will be laid for reducing appreciably the amount of these illnesses. Estimating the amount for the country as a whole on the basis of reports from one or two States that appear to have reasonably complete reporting, there would be at least 1 million cases annually instead of the present 10,000.

Waterborne Outbreaks

Seven reports of waterborne outbreaks were received during 1959. These consisted of three reports of typhoid fever and one each of amebiasis, hepatitis, chemical poisoning, and an outbreak in which *Escherichia coli* and enterococci were isolated from the water source.

One of the outbreaks of typhoid fever was traced to a small city's public water supply obtained from a creek, which was contaminated by a typhoid carrier who lived upstream. Slow sand filtration was the only treatment given the community's water. Prior to onset of the outbreak, the filters were being cleaned and their efficiency was reduced for a few days. A heavy rain flooded the creek, and for several days the

Table 1. Foodborne and waterborne disease outbreaks reported in 1959, by vehicle of infection

Area	Water		Milk and milk products		Other foods [1]	
	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases
Total	7	206	11	49	322	10,595
New England:						
Maine	----	----	1	3	7	306
New Hampshire	1	14	----	----	2	10
Vermont	----	----	----	----	1	40
Massachusetts	----	----	----	----	6	342
Rhode Island	----	----	----	----	2	30
Connecticut	----	----	----	----	2	46
Middle Atlantic:						
New York	1	4	1	3	26	1,220
New Jersey	----	----	----	----	1	23
Pennsylvania	----	----	----	----	3	61
East North Central:						
Ohio	----	----	1	3	14	1,499
Indiana	----	----	----	----	2	1,333
Illinois	1	11	----	----	14	494
Michigan	1	160	----	----	1	4
Wisconsin	----	----	1	3	3	122
West North Central:						
Minnesota	----	----	----	----	5	447
Iowa	----	----	----	----	1	68
Missouri	----	----	----	----	1	22
Kansas	----	----	1	5	----	------
South Atlantic:						
Maryland	----	----	----	----	1	57
Dist. of Columbia	----	----	----	----	2	301
Virginia	1	9	----	----	3	197
West Virginia	----	----	----	----	5	27
North Carolina	----	----	----	----	1	36
Georgia	----	----	1	14	2	33
Florida	----	----	----	----	1	155
East South Central:						
Kentucky	----	----	----	----	2	27
Tennessee	----	----	----	----	1	261
Alabama	----	----	----	----	2	290
Mississippi	1	5	----	----	2	19
West South Central:						
Arkansas	----	----	----	----	1	2
Texas	----	----	----	----	3	525
Mountain:						
Idaho	----	----	----	----	2	18
Wyoming	----	----	----	----	1	91
Colorado	----	----	----	----	5	295
New Mexico	----	----	----	----	2	21
Arizona	----	----	----	----	1	35
Pacific:						
Washington	----	----	3	11	42	185
Oregon	----	----	----	----	9	115
California	1	3	2	7	137	1,702
Noncontiguous:						
Alaska	----	----	----	----	2	7
Hawaii	----	----	----	----	3	113
Puerto Rico	----	----	----	----	1	16
United States, 1958	4	445	13	441	236	9,925
United States, 1957	4	131	8	67	250	11,085

[1] Includes outbreaks among military personnel.

Table 2. Foodborne, waterborne, and other disease outbreaks reported in 1959, by type of infection

Area	Typhoid fever		Salmonellosis		Shigellosis		Trichinosis		Botulism		Staphylococcal food poisoning [1]		Gastroenteritis, etiology unknown [1]		Toxic agents		Other	
	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases
Total	5	43	19	1, 428	6	228	6	38	10	24	89	4, 138	182	4, 285	14	74	9	592
New England:																		
Maine	---	---	3	11	---	---	---	---	---	---	2	6	3	292	---	---	---	---
New Hampshire	1	14	---	---	---	---	---	---	---	---	2	10	---	---	---	---	---	---
Vermont	---	---	---	---	---	---	---	---	---	---	---	---	1	40	---	---	---	---
Massachusetts	---	---	---	---	---	---	---	---	---	---	2	143	4	199	---	---	---	---
Rhode Island	---	---	---	---	---	---	---	---	---	---	1	17	1	13	---	---	---	---
Connecticut	---	---	---	---	---	---	1	7	---	---	---	---	1	39	---	---	---	---
Middle Atlantic:																		
New York	1	4	---	---	---	---	2	17	---	---	7	434	16	734	1	2	[2] 1	36
New Jersey	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	23	---	---
Pennsylvania	---	---	---	---	1	21	1	4	---	---	1	36	---	---	---	---	---	---
East North Central:																		
Ohio	---	---	1	374	---	---	---	---	---	---	6	943	6	166	1	16	[3] 1	3
Indiana	---	---	---	---	---	---	---	---	---	---	2	1, 333	---	---	---	---	---	---
Illinois	---	---	2	57	---	---	---	---	---	---	3	22	10	426	---	---	---	---
Michigan	---	---	---	---	---	---	---	---	1	4	---	---	---	---	---	---	[4] 1	160
Wisconsin	---	---	---	---	---	---	---	---	---	---	4	125	---	---	---	---	---	---
West North Central:																		
Minnesota	---	---	---	---	---	---	---	---	---	---	4	22	1	425	---	---	---	---
Iowa	---	---	---	---	---	---	---	---	---	---	1	68	---	---	---	---	---	---
Missouri	---	---	---	---	1	22	---	---	---	---	---	---	---	---	---	---	---	---
Kansas	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	[5] 1	5
South Atlantic:																		
Maryland	---	---	---	---	---	---	---	---	---	---	1	57	---	---	---	---	---	---
District of Columbia	---	---	---	---	---	---	---	---	---	---	---	---	1	103	---	---	[3] 1	198
Virginia	1	9	---	---	1	100	---	---	---	---	1	72	1	25	---	---	---	---
West Virginia	---	---	---	---	---	---	---	---	---	---	3	14	2	13	---	---	---	---
North Carolina	---	---	---	---	---	---	---	---	---	---	1	36	---	---	---	---	---	---
Georgia	---	---	1	14	1	30	---	---	---	---	---	---	---	---	---	---	[3] 1	3
Florida	---	---	---	---	---	---	---	---	---	---	---	---	1	155	---	---	---	---
East South Central:																		
Kentucky	---	---	---	---	---	---	---	---	---	---	2	27	---	---	---	---	---	---
Tennessee	---	---	---	---	---	---	---	---	---	---	---	---	1	261	---	---	---	---
Alabama	---	---	---	---	---	---	---	---	---	---	1	134	1	156	---	---	---	---
Mississippi	---	---	---	---	---	---	---	---	---	---	1	16	1	3	---	---	[6] 1	5
West South Central:																		
Arkansas	---	---	---	---	---	---	1	2	---	---	---	---	---	---	---	---	---	---
Texas	---	---	1	400	---	---	---	---	---	---	1	85	1	40	---	---	---	---
Mountain:																		
Idaho	---	---	---	---	---	---	---	---	1	6	---	---	1	12	---	---	---	---
Wyoming	---	---	---	---	---	---	---	---	---	---	1	91	---	---	---	---	---	---
Colorado	---	---	1	130	---	---	---	---	2	2	1	2	---	---	---	---	[7] 1	161
New Mexico	1	12	---	---	---	---	---	---	---	---	1	9	---	---	---	---	---	---
Arizona	---	---	1	35	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Pacific:																		
Washington	1	4	---	---	---	---	---	---	1	2	1	4	42	186	---	---	---	---
Oregon	---	---	---	---	1	7	---	---	---	---	4	37	2	64	2	7	---	---
California	---	---	8	322	1	48	---	---	3	3	33	359	85	933	9	26	[3] 1	21
Noncontiguous:																		
Alaska	---	---	---	---	---	---	---	---	2	7	---	---	---	---	---	---	---	---
Hawaii	---	---	1	85	---	---	1	8	---	---	1	20	---	---	---	---	---	---
Puerto Rico	---	---	---	---	---	---	---	---	---	---	1	16	---	---	---	---	---	---
United States, 1958	1	30	27	1, 043	3	392	7	68	3	4	62	2, 291	134	6, 216	14	169	---	---
United States, 1957	4	70	30	1, 607	11	754	1	14	6	12	58	1, 660	135	6, 065	8	68	---	---

[1] Includes outbreaks among military personnel. [2] Streptococcal infections. [3] *Clostridium perfringens* infections. [4] Infectious hepatitis. [5] Brucellosis. [6] Amebiasis. [7] *Bacillus cereus* infections.

number of *E. coli* organisms from water samples was much higher than usual. Since the carrier's campsite had no privy, fecal material probably was carried to the creek during the rainstorm. The city has recently installed a chlorinator and has introduced certain protective measures on the watershed.

A few cases of chemical poisoning resulted from copper carbonate which had formed in the copper tubing in a water fountain. A communitywide outbreak of hepatitis was thought to be due to contamination of wells by spring runoff water. In the other outbreaks private wells or springs were the sources of water.

Milkborne Outbreaks

Eight of the eleven outbreaks considered to be milkborne were traced to contaminated milk products rather than to milk itself. A few cases of brucellosis found during a countywide survey for brucellosis in a midwestern State were attributed to raw milk from a dairy, but other cases in this county were not specifically linked to the dairy. Several cows in the dairy herd gave positive reactions to *Brucella* antigen. Two outbreaks of staphylococcal food poisoning were attributed to raw milk in private homes. Of the 11 outbreaks, 6 were confirmed as staphylococcal, 1 was brucellosis, and 1 was *Salmonella typhimurium* infection following ingestion of homemade ice cream. The etiological agent for three was not determined.

An outbreak of some 200 cases of gastroenteritis occurring simultaneously in three schools was first thought to be due to a milkborne agent since milk was the only food used in common. However, investigation revealed that perhaps the infection was spread by person-to-person contact. This outbreak is included in the category "gastroenteritis, etiology unknown," in tables 2 and 3.

Typhoid Fever

Water was considered the vehicle of infection in three of the five outbreaks of typhoid fever reported during 1959. The sources of water were a well at a resort, a well used by migrant laborers, and a public water supply (described under waterborne outbreaks). The outbreak at the resort involved four persons who visited the cabin of a woman later found to be a chronic carrier or who rented or visited the cabin after she left. Typhoid bacilli, type E1, were isolated from the patients and from the well. The sewage from the cabin was discharged into a cesspool.

During the investigation of an outbreak following a wedding reception, *Salmonella typhosa*, type E1, was isolated from one of the women foodhandlers as well as from some of the patients. The foodhandler had not been ill. The suspect food was ham sandwiches. The other outbreak occurred among members of a family traveling by automobile part way across the country. The source of infection was not determined.

Salmonellosis

Although outbreaks of salmonellosis reported in 1959 were fewer than in 1958, they resulted in more cases. During 1959, as in 1958, poultry and other meats were the most common foods involved. They were the vehicle in 10 of the 19 outbreaks. The most common sources of food were social gatherings and private homes, although the largest number of cases resulted from outbreaks in institutions. Eight species of *Salmonella* were recovered from patients or from food. These were: *S. typhimurium* in 7 instances, *S. blockley* in 3 instances, *S. bredeney* and *S. oranienburg* in 2 instances each, and *S. taksony*, *S. saint-paul*, *S. newington*, and *S. heidelberg* in one each. One report identified the organisms only as group C. In one of the outbreaks only a few clinical cases were reported, but on the basis of laboratory study of stool specimens it was estimated that the infection rate was as high as 50 percent of the 1,000 persons exposed. In this outbreak, *S. newington* was found in frozen eggs produced in another State. It was thought that a foodhandler became infected from the eggs and contaminated the meat. *S. newington* was recovered from the meat and from the block on which the meat was cut. In a laboratory study of an outbreak on an institutional farm in another State, *S. typhimurium* of the same phage type was isolated from inmates and three hogs.

Shigellosis

In none of the six reported outbreaks of shigellosis was a particular vehicle identified,

although food was suspected in two. Two of the outbreaks occurred among school children; one was a community outbreak thought to be due to poor sanitation, and the other three occurred in a youth guidance group, in a day nursery, and among children attending a school party. *Shigella sonnei* was recovered from patients in five of the outbreaks. The organism isolated from children attending the school party was *Shigella flexneri.*

Another report, not included in our tabulations, stated that an unusual number of *S. sonnei* infections occurred during the last half of 1959 in an eastern city. Cases were distributed equally among white and nonwhite persons living in a low socioeconomic area. The majority of the nonwhite patients were children under 10 years of age, whereas the white patients were older. Many possible chains of transmission were noted.

Trichinosis

The meats involved in the six outbreaks of trichinosis were raw pork, raw ground lamb, cooked pork, a spiced bacon roll resembling salami, rare hamburger, and smoked sausage. In the last outbreak, various types of pork were eaten, but the smoked sausage was considered the most likely source of infection. The ground lamb and hamburger were purchased from commercial establishments. It was thought they were contaminated from pork residue in the meat grinders. Although the commercially prepared bacon roll was labeled to be cooked, it was eaten raw. The other pork products were home processed.

Botulism

Epidemiological reports were received of 24 cases of botulism occurring in 10 outbreaks. In two of the outbreaks six cases were reported.

Table 3. Outbreaks of certain foodborne diseases reported in 1959, by type and source of food

Food	Salmonellosis		Shigellosis		Staphylococcal food poisoning		*Clostridium perfringens* infections		Gastroenteritis, etiology unknown	
	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases
Type of food										
Poultry	5	109			7	1,050	2	201	23	887
Other meat	5	895			31	1,912	2	24	52	395
Fish									9	86
Custard-filled dessert					19	131			10	163
Salad	1	32			15	613			14	539
Other	3	109			16	420			27	208
Not determined	5	283	2	37	1	12			46	1,996
Total	19	1,428	2	37	89	4,138	4	225	181	4,274
Source of food										
Public eating establishments	2	99			14	214	1	3	72	724
Private clubs	1	130			2	194			9	160
Schools	1	35	2	37	5	419			10	776
Colleges					2	83			1	425
Hospitals and institutions	3	777			7	1,104			11	641
Labor camps					1	66			3	138
Social gatherings	6	310			8	255	1	21	14	456
Private homes	5	40			32	163			47	181
Transportation	1	37			5	45	1	198	2	51
Picnics					4	1,496				
Other					8	97			8	591
Not stated					1	2	1	3	4	131
Total	19	1,428	2	37	89	4,138	4	225	181	4,274

Seven of the twenty-four cases resulted in death. Beans were implicated in three outbreaks, beets in three, and mushrooms, whale flipper, fish eggs, and corn in one each. All the food was home processed. The corn, which had been discarded because it looked and smelled bad, was added to a mash for chickens. A child ate the mixture and became ill. Before the child was stricken, however, some 30 chickens that ate the mash had died. *Clostridium botulinum*, type A, was recovered from the suspect food in two outbreaks and type E in one. The type was not reported for another outbreak, and in the remaining outbreaks the particular food was not available for analysis.

Staphylococcal Food Poisoning

About one-third of the 89 outbreaks of staphylococcal food poisoning reported during 1959 were attributed to meats other than poultry, most often ham. Custard-filled pastries were linked to 19 outbreaks. Most of the outbreaks occurred following meals in private homes, but most of the cases resulted from outbreaks among picnickers and in institutions. In some of the outbreaks occurring in private homes, the food was obtained from sources outside the home, especially the custard-filled desserts, which were often purchased from bakeries and consumed in the home. All but one of the staphylococcal food poisoning attacks listed in the transportation category occurred in airplanes. The State in which the plane landed was listed as the location of the outbreak.

Gastroenteritis

The total of 182 outbreaks of gastroenteritis of undetermined etiology includes several outbreaks of only a few cases or of single cases which might possibly not have been due to the ingestion of food or water, but contaminated food or water (usually food) was considered the most likely cause. All outbreaks for which there was no laboratory evidence of a particular agent, either in the suspect food or water or from patients, are included in this group. The most frequent sources of food were public eating establishments (40 percent) and private homes (26 percent). Meats other than poultry were the foods most often involved or considered suspect. In many instances, no suspect food was reported. Shellfish eaten in a restaurant was considered the food vehicle in one small outbreak. Investigation revealed that the shellfish, obtained from an authorized source, was probably leftover from a previous meal.

Chemical Poisoning and Noxious Foods

A variety of agents were involved in incidents of chemical and noxious food poisoning. Two outbreaks were traced to meat additives, four to metals from beverage containers, two to foods inadvertantly contaminated with chemicals, one to fish, three to mushrooms, and two to leaves of tree tobacco plants and night shade plants. One outbreak due to nitrites used in preserving fish occurred among persons living in two States. Fish from the same source was eaten in both restaurants and private homes. Three deaths were reported, but not all were attributed directly to the nitrite poisoning itself.

Clostridium perfringens Infections

In 1959, for the first time in the United States, epidemiological reports were received of outbreaks in which *Clostridium perfringens* was determined to be the etiological agent. The first of four outbreaks occurred among passengers of an interstate train. One occurred at a family reunion and another in a restaurant. In one report, the place was not stated. *C. perfringens* was recovered from turkey in two of the outbreaks, from roast beef in one, and from salami in the other.

Other Disease Outbreaks

One outbreak of streptococcal infection, at a college, was reported. Streptococci were isolated from a tuna-macaroni-mushroom dish. An outbreak in another State was found to be due to *Bacillus cereus*. The organisms were found in stool specimens from some of the patients and in samples of turkey.

REFERENCES

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(2) Dack, G. M.: Food poisoning. Chicago, University of Chicago Press, 1956.