1955 Summary of Disease Outbreaks

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ONE OF THE characteristic features in the pattern of disease in man has been a constant change from one predominant type of illness to another. This is true even if one limits his consideration to infectious diseases. Some of the acute infections have receded with respect to incidence and others with respect to severity. Certain diseases, especially viral infections, have appeared to increase in frequency or have become relatively more important because of recession of bacterial infections. These changes may have resulted from alteration in the biology of infecting agents, different host-parasite relationships, the development of immunizing agents, improvement or deterioration in social conditions or in the environment.

The pattern of diseases in which food and water have acted as vehicles of infection has also changed. The number of waterborne outbreaks of typhoid fever and dysentery, and of milkborne outbreaks of enteric infections, diphtheria, and streptococcal infections has been reduced from several score each year to an average of less than 10. Even though reporting is far from complete there is no reason to believe that this is not a real decrease in waterborne and milkborne illness.

As these types of disease have decreased, the number of outbreaks in which foods other than milk and milk products have been vehicles of infection has become proportionately greater and possibly some types have increased in frequency. It is probable that changes in eating habits have been responsible in part for the relative increase in outbreaks of staphylococcal food poisoning and undifferentiated gastroenteritis. Mass preparation and dispensing of foods in a greater number of public eating places and schools have increased the chances of exposure to contaminated foods. It appears that the solution of human problems has not kept pace with improvements in processing and equipment and provisions for sanitation of equipment. The human problems most frequently mentioned are poor food-handling practices and failure to use adequate refrigeration of foods susceptible to contamination.

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Waterborne Disease Outbreaks

During the last 3 years there has been a continuous reduction in the number of outbreaks attributed to water—from 14 in 1952 to 7 in 1954. In 1955, there were only two outbreaks in which water was definitely incriminated. Although the exact number of cases is unknown, it is by far the smallest in recent years. In 1954, the total, 452 cases, was less than that for previous years. During 1955 one outbreak occurred among fire fighters in the mountains. They had filled their canteens from a water tank previously used to pump cesspools. The number of cases is unknown because none was very ill, and all continued with their duties. The other outbreak was among school children whose water supply was from a well contaminated by a nearby septic tank. Twenty-two cases were reported, and the investigation revealed *Escherichia coli* in the well water. Al-

though not proven, water was a possible vehicle of shigella infection in two children in a summer camp. It was also a possible source of nine cases of infectious hepatitis among school children at a camp.

Milkborne Disease Outbreaks

The number of outbreaks associated with milk and milk products has not been large (fewer than 10) in each of the last 5 years. In 1955, there were 302 cases in 3 outbreaks compared with 200 cases in 9 outbreaks in 1954. While there were only 6 outbreaks in 1952, the number of cases was about 800. Most of the cases (278) reported during 1955 resulted from 1 outbreak in which commercial milk was the vehicle. An investigation revealed a salmonella organism, group B.

The other 2 outbreaks reported in 1955 resulted from milk products contaminated with *Staphylococcus aureus* during the manufacturing process. In one, 15 cases developed after eating ice cream made in an old freezer which apparently had not been thoroughly cleaned. Contaminated cheddar cheese was associated with nine cases. Since staphylococci were found in the center of cheese from unopened samples, it was concluded that contamination occurred during the manufacturing process.

Other Foodborne Outbreaks

With only a few outbreaks in which milk and milk products were associated, naturally, a great majority have been from other foods. The total outbreaks associated with other foods reported in 1955 was 193 with 9,633 cases compared with 234 outbreaks and 11,704 cases in 1954. Reports for 1955 were received from 27 States, Hawaii, and military establishments compared with those from 35 jurisdictions in 1954.

As in 1954, foods most frequently incriminated were turkey and chicken (including eggs), custard filled pastries, ham, and beef. However, unlike previous years when potato salad was the vehicle in a number of outbreaks, there were only two associated with this food in 1955. Various other foods were associated with the remainder. In one outbreak the vehicle appeared to have been contaminated by a food handler who had hepatitis. No foodborne hepatitis was reported in 1954.

During the year only two shigella outbreaks

Table 1. Foodborne and waterborne disease outbreaks reported in 1955 by vehicle of infection

Area	Water		Milk and milk products		Other foods	
	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases
United States	2	22	3	302	[1] 193	[1] 9,633
New England:						
Maine	---	---	---	---	2	127
Massachusetts	---	---	---	---	5	250
Middle Atlantic:						
New York	---	---	---	---	12	433
New Jersey	---	---	---	---	1	145
Pennsylvania	---	---	1	278	2	7
East North Central:						
Ohio	---	---	---	---	5	275
Indiana	---	---	---	---	3	89
Illinois	1	22	1	15	5	146
West North Central:						
Minnesota	---	---	---	---	3	180
Iowa	---	---	---	---	1	6
Missouri	---	---	---	---	3	120
South Dakota	---	---	---	---	---	---
South Atlantic:						
Delaware	---	---	---	---	1	21
Maryland	---	---	---	---	2	355
Virginia	---	---	---	---	2	52
West Virginia	---	---	---	---	3	104
Georgia	---	---	1	9	---	---
Florida	---	---	---	---	1	181
East South Central:						
Tennessee	---	---	---	---	---	---
Mississippi	---	---	---	---	1	5
West South Central:						
Arkansas	---	---	---	---	5	178
Louisiana	---	---	---	---	3	54
Texas	---	---	---	---	2	78
Mountain:						
Idaho	---	---	---	---	4	17
Colorado	---	---	---	---	1	5
New Mexico	---	---	---	---	5	992
Utah	---	---	---	---	3	154
Pacific:						
Washington	---	---	---	---	5	31
Oregon	---	---	---	---	5	44
California	1	[2]	---	---	71	2,491
Hawaii	---	---	---	---	1	14
United States 1954	7	452	9	200	234	11,704
United States 1953	11	719	4	97	194	9,914

[1] Includes outbreaks among military personnel not listed in any State. [2] Not available.

Table 2. Foodborne, waterborne, and other disease outbreaks by type of infection, reported in 1955

Area	Typhoid fever		Salmonellosis		Shigellosis		Trichinosis		Botulism		Staphylococcal food poisoning		Gastroenteritis		Toxic agents and toxic foods	
	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases	Outbreaks	Cases
United States	5	36	[1] 16	[1] 971	10	475	5	92	5	14	[1] 102	[1] 4, 130	[1] 66	[1] 5, 160	[1] 5	[1] 99
New England:																
Maine	---	---	---	---	1	16	---	---	---	---	---	---	2	127	---	---
Massachusetts	---	---	1	16	---	---	---	---	---	---	4	234	---	---	---	---
Middle Atlantic:																
New York	---	---	2	97	1	30	1	3	---	---	5	105	4	228	---	---
New Jersey	---	---	---	---	---	---	---	---	---	---	1	145	---	---	---	---
Pennsylvania	1	3	1	278	---	---	---	---	1	2	1	5	---	---	---	---
East North Central:																
Ohio	---	---	---	---	---	---	1	10	---	---	2	251	2	14	---	---
Indiana	---	---	---	---	1	219	1	69	---	---	1	14	1	6	---	---
Illinois	---	---	1	6	---	---	---	---	---	---	3	119	3	58	---	---
West North Central:																
Minnesota	---	---	---	---	---	---	---	---	---	---	2	59	1	121	---	---
Iowa	---	---	---	---	---	---	1	6	---	---	---	---	---	---	---	---
Missouri	---	---	---	---	---	---	---	---	---	---	2	103	1	17	---	---
South Dakota	1	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---
South Atlantic:																
Delaware	---	---	---	---	---	---	---	---	---	---	1	21	---	---	---	---
Maryland	---	---	1	250	---	---	---	---	---	---	1	105	---	---	---	---
Virginia	---	---	---	---	---	---	---	---	---	---	1	12	1	40	---	---
West Virginia	---	---	---	---	---	---	---	---	---	---	2	19	1	85	---	---
Georgia	---	---	---	---	---	---	---	---	---	---	1	9	---	---	---	---
Florida	---	---	---	---	---	---	---	---	---	---	---	---	1	181	---	---
East South Central:																
Tennessee	---	---	1	3	---	---	---	---	---	---	---	---	---	---	---	---
Mississippi	---	---	---	---	---	---	---	---	---	---	1	5	---	---	---	---
West South Central:																
Arkansas	---	---	---	---	---	---	---	---	---	---	5	178	---	---	---	---
Louisiana	1	21	---	---	---	---	---	---	---	---	2	44	---	---	1	10
Texas	---	---	---	---	---	---	---	---	---	---	---	---	2	78	---	---
Mountain:																
Idaho	---	---	---	---	---	---	---	---	---	---	4	17	---	---	---	---
Colorado	---	---	---	---	---	---	---	---	1	5	---	---	---	---	---	---
New Mexico	---	---	---	---	---	---	---	---	1	4	3	900	1	88	---	---
Utah	---	---	---	---	---	---	1	4	---	---	---	---	2	150	---	---
Pacific:																
Washington	---	---	---	---	---	---	---	---	---	---	5	31	---	---	---	---
Oregon	---	---	---	---	2	16	---	---	---	---	2	7	1	10	---	---
California	2	4	6	51	5	194	---	---	2	3	35	510	28	2, 478	3	64
Hawaii	---	---	---	---	---	---	---	---	---	---	1	14	---	---	---	---
United States 1954	16	92	26	1, 164	19	1, 471	6	53	8	18	100	4, 868	103	5, 914	10	279
United States 1953	12	75	21	533	23	2, 230	13	134	7	10	81	4, 045	67	4, 226	15	606

[1] Includes outbreaks among military personnel, not listed in any State.

were reported, both of which resulted from a carrier. Of the outbreaks from salmonella infections, two were definitely associated with carriers, and it is believed that many more resulted from unknown carriers. In many instances, the source of outbreaks was not determined, but evidence of improper handling and lack of adequate refrigeration was found to be a contributing factor in most of the outbreaks.

Typhoid Fever

The number (5) of typhoid fever outbreaks reported in 1955 was relatively small compared

with the 16 in 1954, 12 in 1953, and higher numbers in previous years. One outbreak involved 21 cases in 5 related families that had contact with a carrier. Two other outbreaks were traced to carriers, one of whom was a domestic in a private home and may have contaminated food. The source of the other outbreak was not found. It occurred on an Indian reservation where a number of possible modes of spread were found, but sufficient evidence was lacking to incriminate any of these.

Salmonellosis

Thirteen outbreaks of salmonellosis were reported in seven States during 1955. This is half the number reported in 12 States and 1 Territory for 1954. Three additional outbreaks among military personnel were reported in 1955 compared with none in 1954. The total (971) cases was 17 percent less than the 1,164 cases for last year, but it is about 82 percent greater than the 533 reported in 1953.

All except one outbreak were associated with food. The exception was among persons who attended Pan American games in Mexico, and the source was not determined. In one outbreak at least 278 people supplied by one dairy were affected. Another large outbreak with 250 cases resulted from rice patties served in an institution. *Salmonella montevidio* was isolated from the rice patties, but the source of contamination was not found. In a second institution 6 persons became ill from the ingestion of frozen eggs. *Salmonella pullorum*, commonly associated with eggs, was isolated from the frozen product.

Of the remaining outbreaks, 6 were in private households, 1 in a restaurant, 1 in a club, and 1 in a hospital's newborn nursery. In only 3 of the outbreaks was a carrier found, 1 in the dairy, 1 in the hospital nursery, and 1 in a local store which sold fishcakes to the general public.

Other than those mentioned above, the *Salmonella* organisms isolated were *alachua*, *anatum*, *chester*, *enteriditis*, *newington*, *newport*, *thompson*, and *typhimurium*, and also group B. Three organisms were isolated in connection with one outbreak, and no specific etiology was assigned to it.

Shigellosis

During 1955 half (5) as many States reported outbreaks of shigellosis as in 1954. This is reflected in the number (10) of outbreaks compared with that (19) for last year. The number of cases (475) is considerably less than the 1,471 reported in 1954, probably because of the distribution of the outbreaks.

In 1955, only 2 outbreaks among children were in institutions, 1 among children in a hospital, and none among school children compared with 17 in these organizations during 1954. The majority of the outbreaks this year were in rural or substandard housing areas. Two cases developed in children in a camp and followed fecal contamination of soil or water, or both.

One outbreak involved 45 persons who attended a wedding reception. An investigation revealed that this was a catered reception, and all food items probably were contaminated by the caterer who was found to be a carrier. One other outbreak resulted from food and the remainder was considered person-to-person transmission.

Six of the outbreaks were from sonne types of organisms and 4 were flexner types. Only 3 outbreaks were traced to carriers, the source of the other 7 being unknown.

Botulism

Five outbreaks of botulism were reported in four States during 1955. Of these, 2 were of type A organisms and 2 were of type B. The other was based on clinical evidence and was not confirmed by laboratory tests. Home canned foods, olives, chili peppers, spinach, wild mushrooms, and chayote were incriminated. In one outbreak 5 individuals became ill after eating chili peppers while at work. The person who prepared the food was accustomed to canning various foods and had canned chili peppers many times before without incident. All five of the victims recovered after receiving botulinus antitoxin. However, of the other 9 cases reported, 7 resulted in death.

Staphylococcal Food Poisoning

For the last several years increases have been noted in the number of outbreaks of staphylo-

coccal food poisoning. However, the 102 reported in 1955 indicate little change as compared with the 100 for 1954. A number of these outbreaks were confirmed by bacteriological examination, *S. aureus* being isolated in 15 instances. No reports of the isolation of *Staphylococcus albus* were received. In 1954, there were 23 isolations of *S. aureus* and 3 of *S. albus*.

Epidemiological investigation in most instances failed to determine the source, but inadequate refrigeration and improper food handling were usually found. An infected food handler was found in a large number of the outbreaks associated with poor handling procedures. Unsanitary conditions were found to be contributing factors in several outbreaks. About a fourth of the outbreaks were attributed to public eating places and another fourth to private households. A smaller number of outbreaks were associated with bakeries, schools, and field lunches. Hospitals, church gatherings, and picnics were sources of only a few outbreaks.

Streptococcal Infections

A total of 353 cases of streptococcal food poisoning was reported in 4 outbreaks. One outbreak was among employees and student nurses in a hospital. About 54 hours after egg salad was served in 2 dining rooms, 116 persons became ill with streptococcal sore throat. A streptococcus was isolated from the salad and from the kitchen helper who prepared it. The helper was ill prior to reporting to work on the day he prepared the egg salad.

Another outbreak involving 181 school children developed 3 days after they had eaten ham in the school cafeteria. Bacteriological examination of the ham revealed *Streptococcus faecalis*. The meat was found to have been improperly handled. One outbreak not associated with food occurred among employees of a restaurant. No secondary cases resulted from this source, indicating none of the food was contaminated by the employees.

Chemical and Other Noxious Agents

Five outbreaks involving 99 cases resulted from noxious agents. One was from *Nicotiana glauca* mistaken for polk weed, and the other four were attributed to chemicals. One involving 50 children resulted from a dye (now prohibited) used to color popcorn. Another was from nicotine sulfate used as a spray on mustard greens. The third was from nitrite in wieners because of faulty processing. Cadmium was incriminated in the fourth and affected 25 persons.

Trichinosis

Ninety-two cases of trichinosis were reported in 5 outbreaks during 1955. Of these cases, 69 were in one outbreak among 111 members of two fraternities. Each maintained its own dining room and served "rare" pork to the members, who preferred this type of meat. No large outbreaks occurred in 1954, thus fewer cases were reported that year. However, in 1953, the case total was 134 including an outbreak affecting 73 persons in an institution. Two of the 1955 outbreaks were associated with bakeries, schools, fed hogs. Rats seen on the farms supplying the meat were a possible source of infection of the swine.

Gastroenteritis

Numerous outbreaks of gastroenteritis were reported in 1955. Epidemiological investigations of these failed to determine the etiology in all but a few. The majority were believed to have resulted from food; 2 were traced to water, and 1 to a beverage. The method of contamination was not found but improper handling of food was associated with many of the outbreaks. Inadequate refrigeration was a contributing factor in many instances. The accompanying table shows these and miscellaneous outbreaks, such as the 4 of streptococcal food poisonings with 353 cases. Also, included in the table are 2 outbreaks from paracolon organisms which affected 90 persons and 5 outbreaks probably of viral origin. A total of 922 cases was reported in these viral outbreaks.

For 16 outbreaks, although food was suspected to be the vehicle of infection, no specimens were available for bacteriological examination, and no specific item was incriminated. In other outbreaks there was sufficient evidence that a particular food was involved but in many instances none was available for laboratory

tests, or, on testing, no pathogenic organisms were found. The average incubation period was found to be much longer than the 4 to 6 hours usually found in staphylococcal food poisoning. This suggests food infection, some of which may have been salmonella infections. As suspected vehicles, poultry meat was mentioned almost twice as often as any other food, followed by beef, and a few each of creamed filled pastries, fish, and creamed meat or salads.

Five outbreaks probably of viral origin were reported, 2 in schools, 2 in institutions, and 1 in a mountain camp. Viral studies were done in at least two but in none was the etiology definitely established. However, investigations did rule out food and water as vehicles of infection. One large outbreak not listed in the table occurred among the general population in Ohio and was spread by personal contact to approximately 3,000 persons.

Animals as Sources of Human Disease

Animals are important factors in diseases of man in several respects. They may be reservoirs of infection which may be transmitted to man by direct or indirect contact. Animal products in the form of food (meat, milk, and eggs) may also be sources or vehicles of infection. Some animal products (hides, hair, and wool) may harbor pathogenic organisms which can infect man.

The importance of animals as sources of infection for man is shown by the fact that 80 different diseases may be transmitted to man. Nearly one-half of the diseases listed for reporting by States to the Public Health Service are in this category. The wide distribution of some of these infections is shown by the following figures: 48 States reported human cases of brucellosis in 1954, 41 reported tularemia, 38 reported Rocky Mountain spotted fever, and 32 reported one or more cases of psittacosis.

Animal food products such as meat, milk, and eggs may not only serve as vehicles of infection from the animal to man but they also are excellent media for the growth of bacterial agents. Poultry meat and eggs are occasionally sources of infection, mostly salmonella infections, or are contaminated during the period of preparation by organisms causing food intoxication or food infection.

In 1955, there were 30 such outbreaks reported in which about 1,600 cases of illness occurred. Of these, 25 were associated with meat and 5 resulted from eggs. Seven outbreaks, 4 from poultry meat and 3 from eggs, involving 162 cases resulted from salmonella infections. Of those associated with meat, the sources were unknown but epidemiological investigations revealed lack of adequate refrigeration. In one the meat was probably contaminated by a carrier. However, this was not definitely established because three organisms were isolated, none being from the meat itself.

S. pullorum was isolated from frozen eggs associated with one outbreak. In another, the organism was not isolated from eggs but there was good evidence that they were contaminated with *S. thompson*. In the third outbreak, there was insufficient evidence of contamination in the eggs although they were eaten by all those affected.

Fourteen outbreaks were from staphylococcal enterotoxin, 1 from streptococcus, and 7 were of unknown etiology. As would be expected in the staphylococcal poisonings, improper food handling was a common finding. Many of those with unknown etiology probably were salmonella infections because the incubation periods were longer than is usually associated with staphylococcal poisoning.

Miscellaneous Outbreaks

Three outbreaks of meningitis were reported. One was among preschool and school children in western North Carolina. Another affected two children in a family in Utah. The other occurred among Indians on a reservation and involved eight persons during a 2-week period.

Although two outbreaks of encephalitis occurred among pheasants, no outbreaks of infectious encephalitis were reported in humans during 1955. The prevalance of the disease in California, where it is endemic during the summer months, was markedly lower in 1955 than in 1954. A few laboratory confirmed cases of arthropod-borne infections were received from various parts of the country. Eastern equine encephalitis virus was isolated from pheasants

in two outbreaks. One of these outbreaks was in Florida, but cold weather set in and no mosquitoes could be collected for laboratory tests. The other outbreak was in North Carolina where several hundred horses and mules died as a result of the disease. The virus was also found in mosquitoes.

Outbreaks of diarrhea among newborn infants were reported by three States. Thirty-seven infants in six hospital nurseries developed the disease from contact with a carrier or improper sterilization procedures or both. *E. coli* was found in specimens of patients in two outbreaks and other coliform organisms were found in specimens collected in another. No reports of laboratory examination were given for the other outbreaks.

Unusual occurrences of diphtheria were reported, particularly during the latter half of 1955. For the entire year, six outbreaks of the disease were reported. Most of the cases associated with these outbreaks were among people in the lower socioeconomic group. Immunization levels in the affected areas were found to be dangerously low.

Reports of 13 outbreaks of infectious hepatitis were received from five States and Alaska. The mode of spread in most of these was given as personal contact, but some spread probably resulted from fecal contamination. Poor personal habits were given as a possible mode of spread in a few instances.

Food was determined to be the vehicle of infection in 13 cases in one outbreak. Water was suspected in two outbreaks, but there was insufficient evidence to incriminate it. In one, use of unsanitary buckets by members of a football team was considered the source; in the other, polluted water from a stream in a picnic area, used in making a cold beverage, was a possible source.

Five of the outbreaks occurred in hospitals or institutions. Four were among students. The other four were among general populations in localized areas. Although not an outbreak, 201 cases were reported in one city. Of these, 45 were diagnosed as serum hepatitis, or there was a recent history of contaminated needles and instruments.

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