

1958 Summary of Disease Outbreaks

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THE PATTERN of foodborne and waterborne disease outbreaks in 1958 did not differ greatly from that of the previous years (table 1). However, a closer inspection should be made of some aspects of the pattern. For instance, there is no convincing evidence that staphylococcal food poisoning and foodborne *Salmonella* infections are becoming less frequent.

The decline in number of outbreaks and cases of staphylococcal food poisoning reported in 1958 and in 1957 compared with previous years is more likely to be due to failure in reporting than to a reduction in this type of illness (table 2). Two outbreaks involving cheese were among the reports received in 1958. In one outbreak cases occurred in two adjoining States receiving shipments of cheese processed in another State. Staphylococci were isolated from samples of the cheese obtained from the distributor and the factory. Furthermore, the organism was found in milk from dairy herds supplying milk to the cheese factory. Some strains of staphylococci isolated from samples of milk were resistant to certain antibiotics. The second outbreak occurred in an institutional population that had been supplied with cheese manufactured in the same State.

A review of reports received in past years shows that staphylococcal food poisoning associated with fluid milk, dried milk, and cheese is not uncommon. It is also known that bovine mastitis caused by staphylococci is common. Furthermore, the indiscriminate use of some

antibiotics in the treatment of mastitis has favored the development of strains of staphylococci that are resistant to the antibiotics. Therefore, there is need to investigate more thoroughly many aspects of the whole problem of staphylococci in milk and milk products and to study the relationship between staphylococcal infections in man and animals. More intensive studies of outbreaks should also be made when milk or milk products appear to be vehicles of infection.

Fewer cases as well as fewer outbreaks of foodborne *Salmonella* infection were reported in 1958 than in 1957. The numerous sources of infection reported emphasize the wide distribution of these organisms, particularly in animals and animal products, such as meat and eggs (table 3). In one outbreak caused by *Salmonella dublin*, infection was traced to a certified raw milk dairy. Laboratory examination revealed the presence of this organism in specimens of feces of a dairy farm employee, but *Salmonella* organisms were also isolated from three cows in the dairy herd. In another State, employees on a dairy farm presumably were infected by contact with cows that had diarrhea. *Salmonella typhimurium* was isolated from both cattle and men that were ill.

Salmonellae were isolated from shell eggs and frozen egg whites in several epidemics and from packages of a powdered scrambled egg product. Numerous outbreaks were reported following the eating of chicken and turkey meat, especially the latter. In others, food handlers were the probable source of infection. A number of cases of salmonellosis were traced to contaminated well water, seldom reported as a source. The wide distribution of *Salmonella* and the possibilities for spread in a community are indi-

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cated by a summary prepared by the health department laboratory service of a large western city. Twenty-seven different subtypes of the organism were isolated from 209 persons in 1958. These subgroups included 10 in group B, 11 in group C, 3 in group D, 2 in group E, and 1 in group G. Seventy-two strains of *S. typhimurium* were isolated, 23 of *Salmonella saint-paul*, 16 of *Salmonella oranienburg*, 14 of *Salmonella newport*, 13 of *Salmonella montevideo*, 11 of *Salmonella infantis*, and 10 of *Salmonella give*. The same variety of types has been reported where laboratory diagnostic services are extensively utilized.

Since only a fraction of the outbreaks caused by staphylococci and salmonellae and by other organisms appear to be reported, the real extent of the foodborne diseases is unknown. Year after year the same few States report the majority of the outbreaks summarized in these annual reports. Other States report a moderate number, and some report none. The reports from certain large cities are conspicuous by their absence. More complete reporting is needed not only for measuring the magnitude of the problem but also to show what is needed for improvement in food handling facilities and practices and for planning more effective control programs. Furthermore, the food industry is fourth largest of all industries in the United States, and the quality of its products is the direct concern of all persons.

The various categories of foodborne and waterborne disease outbreaks reported in 1958 are discussed and tabulated in the same manner as in the report for 1957.

Waterborne Outbreaks

Only four outbreaks were demonstrated to be due to contaminated water. An outbreak of shigellosis followed failure to chlorinate the public water supply of a small city for several days while the water inspector was out of town because of illness in his family. Another outbreak of shigellosis occurred in a group of campers who drank inadequately treated water from a livestock watering tank. The other two outbreaks included salmonellosis resulting from the use of a polluted well and gastroenteritis due to contamination of a public water supply,

Table 1. Foodborne and waterborne disease outbreaks reported in 1958, by vehicle of infection

| Area ¹ | Water | | Milk and milk products ² | | Other foods ² | |
|-----------------------|-----------|--------|-------------------------------------|-------|--------------------------|---------|
| | Outbreaks | Cases | Outbreaks | Cases | Outbreaks | Cases |
| United States... | 4 | 445 | 13 | 441 | 236 | 9, 925 |
| New England: | | | | | | |
| Maine..... | | | | | 5 | 183 |
| Massachusetts..... | | | | | 13 | 425 |
| Rhode Island..... | | | | | 2 | 101 |
| Connecticut..... | | | | | 2 | 43 |
| Middle Atlantic: | | | | | | |
| New York..... | 1 | 11 | | | 17 | 747 |
| New Jersey..... | | | | | 4 | 470 |
| Pennsylvania..... | | | | | 3 | 947 |
| East North Central: | | | | | | |
| Ohio..... | | | | | 1 | 45 |
| Indiana..... | | | 3 | 124 | 7 | 694 |
| Illinois..... | | | | | 5 | 223 |
| Michigan..... | | | 1 | 21 | 3 | 342 |
| Wisconsin..... | | | | | 1 | 43 |
| West North Central: | | | | | | |
| Minnesota..... | | | | | 3 | 36 |
| Iowa..... | | | 1 | 200 | 1 | 60 |
| Missouri..... | 1 | 61 | | | 3 | 85 |
| South Dakota..... | | | | | 2 | 16 |
| Nebraska..... | | | 1 | 5 | | |
| South Atlantic: | | | | | | |
| Maryland..... | | | | | 1 | 61 |
| Virginia..... | | | | | 1 | 16 |
| West Virginia..... | | | | | 6 | 17 |
| North Carolina..... | | | | | 3 | 347 |
| South Carolina..... | | | | | 2 | 391 |
| Georgia..... | | | | | 3 | 196 |
| East South Central: | | | | | | |
| Kentucky..... | | | | | 3 | 60 |
| Mississippi..... | | | | | 2 | 234 |
| West South Central: | | | | | | |
| Louisiana..... | | | 1 | 31 | 2 | 23 |
| Oklahoma..... | | | | | 2 | 141 |
| Mountain: | | | | | | |
| Idaho..... | | | | | 1 | 32 |
| Colorado..... | 1 | 350 | | | 1 | 5 |
| New Mexico..... | 1 | 23 | | | | |
| Pacific: | | | | | | |
| Washington..... | | | | | 2 | 64 |
| Oregon..... | | | | | 5 | 120 |
| California..... | | | 6 | 60 | 130 | 3, 758 |
| United States 1957... | 4 | 131 | 8 | 67 | 250 | 11, 085 |
| United States 1956... | 9 | 1, 719 | 31 | 873 | 210 | 11, 133 |

¹ States not listed submitted no reports.

² Includes outbreaks among military personnel.

Table 2. Foodborne, waterborne, and other disease outbreaks reported in 1958, by type of infection

| Area ¹ | Typhoid fever | | Salmonellosis ² | | Shigellosis | | Trichinosis | | Botulism | | Staphylococcal food poisoning ² | | Streptococcal infections | | Gastroenteritis, etiology unknown ² | | Toxic agents | |
|-------------------------|---------------|-------|----------------------------|-------|-------------|-------|-------------|-------|-----------|-------|--|-------|--------------------------|-------|--|-------|--------------|-------|
| | Outbreaks | Cases | Outbreaks | Cases | Outbreaks | Cases | Outbreaks | Cases | Outbreaks | Cases | Outbreaks | Cases | Outbreaks | Cases | Outbreaks | Cases | Outbreaks | Cases |
| United States..... | 1 | 30 | 27 | 1,043 | 3 | 392 | 7 | 68 | 3 | 4 | 62 | 2,291 | 2 | 598 | 134 | 6,216 | 14 | 169 |
| New England: | | | | | | | | | | | | | | | | | | |
| Maine..... | | | | | | | 1 | 4 | | | 1 | 5 | | | 3 | 174 | | |
| Massachusetts..... | | | 3 | 177 | | | | | | | 2 | 142 | 1 | 12 | 7 | 94 | | |
| Rhode Island..... | | | 1 | 4 | | | | | | | | | | | 1 | 97 | | |
| Connecticut..... | | | 1 | 3 | | | | | | | | | | | 1 | 40 | | |
| Middle Atlantic: | | | | | | | | | | | | | | | | | | |
| New York..... | | | 5 | 164 | | | | | | | 3 | 130 | | | 9 | 458 | 1 | 6 |
| New Jersey..... | | | | | | | | | | | | | | 4 | 470 | | | |
| Pennsylvania..... | | | | | | | 1 | 7 | | | | | | 1 | 840 | 1 | 100 | |
| East North Central: | | | | | | | | | | | | | | | | | | |
| Ohio..... | | | | | | | 1 | 45 | | | | | | | | | | |
| Indiana..... | | | | | | | | | | | 6 | 749 | | | 4 | 69 | | |
| Illinois..... | | | | | | | | | | | 2 | 108 | | | 3 | 115 | | |
| Michigan..... | | | 2 | 277 | | | | | | | 2 | 86 | | | | | | |
| Wisconsin..... | | | 1 | 43 | | | | | | | | | | | | | | |
| West North Central: | | | | | | | | | | | | | | | | | | |
| Minnesota..... | | | | | | | 1 | 9 | | | 1 | 20 | | | | | 1 | 7 |
| Iowa..... | | | | | | | | | | | 2 | 260 | | | | | | |
| Missouri..... | | | | | 1 | 19 | | | | | | | | | 3 | 127 | | |
| South Dakota..... | | | 1 | 7 | | | | | | | | | | 1 | 9 | | | |
| Nebraska..... | | | 1 | 5 | | | | | | | | | | | | | | |
| South Atlantic: | | | | | | | | | | | | | | | | | | |
| Maryland..... | | | | | | | | | | | 1 | 61 | | | | | | |
| Virginia..... | | | | | | | | | | | 1 | 16 | | | | | | |
| West Virginia..... | | | | | | | 3 | 3 | | | 1 | 5 | | | 2 | 9 | | |
| North Carolina..... | | | 1 | 140 | | | | | 1 | 1 | 1 | 206 | | | | | | |
| South Carolina..... | | | | | | | | | | | | | | 2 | 391 | | | |
| Georgia..... | | | 1 | 58 | | | | | | | | | | 2 | 138 | | | |
| East South Central: | | | | | | | | | | | | | | | | | | |
| Kentucky..... | | | | | | | | | 1 | 2 | | | | | 1 | 38 | 1 | 20 |
| Mississippi..... | | | | | | | | | | | 1 | 34 | | | 1 | 200 | | |
| West South Central: | | | | | | | | | | | | | | | | | | |
| Louisiana..... | | | 1 | 31 | | | | | | | | | | | 1 | 22 | 1 | 1 |
| Oklahoma..... | | | | | | | | | | | | | | 2 | 141 | | | |
| Mountain: | | | | | | | | | | | | | | | | | | |
| Idaho..... | | | | | | | | | | | | | | | 1 | 32 | | |
| Colorado..... | | | | | 1 | 350 | | | | | 1 | 5 | | | | | | |
| New Mexico..... | | | | | 1 | 23 | | | | | | | | | | | | |
| Pacific: | | | | | | | | | | | | | | | | | | |
| Washington..... | | | | | | | | | | | 2 | 64 | | | | | | |
| Oregon..... | | | | | | | | | | | 2 | 6 | | | 3 | 114 | | |
| California..... | 1 | 30 | 9 | 134 | | | | | 1 | 1 | 33 | 394 | 1 | 586 | 82 | 2,638 | 9 | 35 |
| United States 1957..... | 4 | 70 | 30 | 1,607 | 11 | 754 | 1 | 14 | 6 | 12 | 58 | 1,660 | 4 | 1,030 | 135 | 6,065 | 8 | 68 |
| United States 1956..... | 7 | 52 | 23 | 1,999 | 8 | 1,107 | 11 | 98 | 11 | 22 | 111 | 4,313 | | | 88 | 6,688 | 9 | 160 |

¹ States not listed submitted no reports.

² Includes outbreaks among military personnel.

Table 3. Outbreaks of certain foodborne diseases reported in 1958, by type and source of food

| Source | Salmonellosis | | Shigellosis | | Staphylococcal food poisoning | | Streptococcal infections | | Gastroenteritis, etiology unknown | |
|------------------------------------|---------------------|----------------------------|---------------------|----------------------------|-------------------------------|----------------------------|--------------------------|----------------------------|-----------------------------------|----------------------------|
| | Number of outbreaks | Number of persons affected | Number of outbreaks | Number of persons affected | Number of outbreaks | Number of persons affected | Number of outbreaks | Number of persons affected | Number of outbreaks | Number of persons affected |
| Type of food | | | | | | | | | | |
| Poultry | 8 | 162 | 0 | ----- | 6 | 214 | 0 | ----- | 28 | 1, 672 |
| Other meat | 1 | 58 | 0 | ----- | 31 | 651 | 1 | 586 | 44 | 975 |
| Custard-filled dessert | 1 | 23 | 0 | ----- | 6 | 40 | 0 | ----- | 5 | 234 |
| Salad | 0 | ----- | 1 | 19 | 8 | 825 | 0 | ----- | 6 | 204 |
| Other | 6 | 442 | 0 | ----- | 9 | 471 | 1 | 12 | 17 | 438 |
| Not determined | 10 | 347 | 0 | ----- | 2 | 90 | 0 | ----- | 33 | 2, 632 |
| Total | 26 | 1, 032 | 1 | 19 | 62 | 2, 291 | 2 | 598 | 133 | 6, 155 |
| Source of food | | | | | | | | | | |
| Public eating establishments | 10 | 117 | 0 | ----- | 17 | 214 | 1 | 12 | 30 | 346 |
| Private clubs | 1 | 40 | 0 | ----- | 1 | 141 | 0 | ----- | 4 | 68 |
| Schools | 1 | 140 | 0 | ----- | 3 | 840 | 0 | ----- | 8 | 516 |
| Colleges | 0 | ----- | 0 | ----- | 1 | 65 | 1 | 586 | 5 | 326 |
| Hospitals and institutions | 4 | 191 | 0 | ----- | 4 | 321 | 0 | ----- | 8 | 2, 418 |
| Recreation camps | 0 | ----- | 0 | ----- | 0 | ----- | 0 | ----- | 4 | 162 |
| Labor camps | 0 | ----- | 0 | ----- | 0 | ----- | 0 | ----- | 7 | 432 |
| Social gatherings | 4 | 185 | 0 | ----- | 7 | 285 | 0 | ----- | 9 | 273 |
| Bakery caterers | 1 | 24 | 0 | ----- | 1 | 8 | 0 | ----- | 3 | 235 |
| Private homes | 2 | 28 | 0 | ----- | 16 | 215 | 0 | ----- | 34 | 234 |
| Transportation | 0 | ----- | 0 | ----- | 1 | 2 | 0 | ----- | 1 | 10 |
| Other | 2 | 39 | 1 | 19 | 10 | 180 | 0 | ----- | 16 | 880 |
| Not stated | 1 | 268 | 0 | ----- | 1 | 20 | 0 | ----- | 4 | 255 |
| Total | 26 | 1, 032 | 1 | 19 | 62 | 2, 291 | 2 | 598 | 133 | 6, 155 |

although the manner in which the supply was contaminated was not determined.

Milkborne Outbreaks

Milk and milk products were considered the source of infection for 13 outbreaks. Cheese and cheese spreads were implicated in five outbreaks, several of which occurred only among members of individual families. The outbreaks involving Cheddar cheese have been described.

Thirty cases of salmonellosis were traced to raw milk from a certified dairy. In this episode a bottle washer continued to work at his job while he was ill. About a week after the onset of his illness, a stool specimen was found to be positive for *S. dublin*. In another State,

five cases of salmonellosis were thought to be due to milk from a small uninspected dairy. An outbreak of salmonellosis in a hospital was traced to malted milk, but raw eggs used in the preparation of the milk drinks may have been the primary source of infection. Another outbreak in a hospital, not included in the milkborne category, was thought to be due to eggs used in making eggnog. Investigation revealed the flock which supplied the eggs was infected.

Reconstituted dried, nonfat milk was the source of infection for 15 cases of gastroenteritis in a labor camp. Not included in the milkborne category was an outbreak of 75 to 80 cases of gastroenteritis, thought to be due to milk served from dispensers in a university dining room. But this could not be proved, and milk

obtained several days later from the dispensers did not show evidence of contamination.

Typhoid Fever

Only one outbreak of typhoid fever was reported during 1958 in which food or drinking water was incriminated. The organisms recovered from the ill persons were phage type E₁. However, several other episodes of typhoid fever were reported. Three boys became ill with typhoid fever after swimming in a stream which carried untreated sewage. The organism in this instance was also phage type E₁. In another instance, six cases with one death occurred over several weeks in a slum community which did not have public water and sewerage facilities.

Salmonellosis

Twenty-seven outbreaks of salmonellosis were reported in which laboratory confirmation was made either by isolation of organisms from the food, from the stools of the ill persons, or from food handlers. Four of the outbreaks were related to ingestion of chicken meat and four to turkey meat. The source of the food for 10 of the outbreaks was public eating establishments. Eleven species of *Salmonella* organisms were isolated. Among these were *S. typhimurium* in seven instances and *S. dublin*, *Salmonella sandiego*, and *S. saint-paul* in two outbreaks each.

Several other outbreaks were reported, but no foods were thought to be involved. *Salmonella reading* was isolated from a package of powdered egg product which was served at a Boy Scout ranch, but no cases resulted.

Shigellosis

Three outbreaks of shigellosis were reported. Two resulted from contaminated water supplies and the other from a tossed salad. The responsible organism in each instance was *Shigella sonnei*.

Shigella flexneri 2a was found to be responsible for a number of cases of shigellosis which occurred over a 2-week period in an unsanitary labor camp. And *S. flexneri* 4 was responsible

for an outbreak in a boarding home for children, but no common source of infection was found in either episode.

Trichinosis

In two of the seven outbreaks of trichinosis reported during 1958, the source of infection was homemade pork sausage. In another, it was pork sausage prepared by a local butcher. In a fourth outbreak, dietary histories indicated that ham had been eaten. Investigation revealed that the ham itself probably was free of viable *Trichinella* and that contamination could have taken place by the addition of raw pork. In this outbreak 78 persons developed symptoms of trichinosis, and about 45 of these gave definite laboratory evidence of recent infection.

Botulism

Four cases of botulism were reported. Two persons became ill after eating home-canned string beans which had been discarded by another family because they looked spoiled. The beans were heated in a skillet before serving. *Clostridium botulinum* was identified morphologically and culturally from the original jar of beans. One other case resulted from eating home-canned mushrooms, and no particular food was incriminated in the illness of the fourth person.

Staphylococcal Food Poisoning

Most of the 62 outbreaks of staphylococcal food poisoning occurred following meals in public eating establishments and private homes. The foods most often involved were meats other than poultry. Eclairs and custard-filled desserts were proved by laboratory tests to be the vehicle of infection in only six outbreaks.

Gastroenteritis, Etiology Unknown

More than one-half of the total waterborne and foodborne outbreaks were of unknown etiology. Poultry and other meats were the suspected vehicles in 72 of them. The two most frequent sources of infected foods were public

eating establishments and private homes. Usually food samples were not available for laboratory examination, and, when specimens were obtained either from the food or from the ill persons, the results were negative or inconclusive for food-poisoning organisms.

Chemical Poisoning and Noxious Foods

Five reports of chemical or noxious food poisoning, each affecting only a few persons, were related to the ingestion of wild mushrooms. Another report stated that 20 children became ill when a dining room was sprayed with an insecticide while the group was eating. Several other outbreaks of chemical poisoning

resulted from contamination of punch drinks with metals from the containers in which the drinks were stored. Zinc, antimony, and copper were the metals involved.

In two instances beef and French doughnuts were found to be contaminated, and in another instance a number of persons became acutely ill while eating soup in a restaurant. Investigators thought the illness was due to chemical poisoning, although there was no definite evidence of such contamination. One case of lead poisoning resulted from ice used in alcoholic drinks. The ice was stored in a chest which had a lead slab lining the bottom, and chips of the lead were scooped up along with the ice.

Drugs and the Newborn

Newborn mammals lack the ability to alter drugs into inactive products, investigations at the National Heart Institute, Public Health Service, indicate.

Dr. Bernard B. Brodie, Dr. W. Robert Jon-dorf, and Dr. Roger P. Maickel of the Institute's Laboratory of Chemical Pharmacology found that the enzymes located in the liver microsomes which are required to inactivate drugs are absent in newborn mammals during the first week of life. They also found that the central nervous system of the newborn is extraordinarily sensitive to barbiturates.

The researchers compared the ability of mice and guinea pigs of various ages to metabolize several commonly used drugs. Guinea pig livers were homogenized and incubated with various test drugs, including aminopyrine, phenacetin, hexobarbital, phenolph-thalein, and monomethyl-4-aminoantipyrene. The experiments showed that the drug-destroy-

ing enzyme systems are absent in fetal and newborn guinea pigs, but appear during the first week of life and require about 8 weeks to develop fully. The liver incubation studies were confirmed by demonstrations that live, newborn mice are unable to metabolize aminopyrine, phenacetin, or hexobarbital.

An additional potential danger of giving drugs to the newborn was observed in studies of hexobarbital action. Very small doses (10 mg./kg.) put 1-day-old mice to sleep for 360 minutes, and 7-day-old mice for 107 minutes. Adult mice napped for less than 5 minutes under the drug's influence.

"That newborn mammals are unable to metabolize these compounds is of obvious importance in considering the use of drugs in childbirth and for newborn infants," the scientists said. They also stressed the importance of making detailed studies of drug action in newborn infants.