Food Poisoning Statistics, 2009

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Ministry of Health Labour and Welfare

HISTORICAL ACCOUNT

Recent improvement of the standard of life in Japan is associated with diversification of food needs including those of processed foods and ready-to-eat foods. Use of catering system is expanding and becoming more popular. New and novel foods from different countries and the new food cultures have affected life style in Japan. The environment surrounding Japanese food is changing.

Such changes may have affected food poisoning pattern in Japan, such as, frequency of incidents, number of patients involved, and mortalities. The trends until 1995 could be summarized as follows. From middle 1950's to middle 1960's, the number of annual food incidents was around 2,000. From middle 1960's on, the number gradually decreased, and towards the end of 1990's it became less than 1,000 incidents. The sharp rise from 1997 to 1998 followed by gradual decline is caused by an artifact of the data collection, i.e., food poisoning involving only one person that had not been reported as food poisoning before suddenly started to be reported as food poisoning between 1997 and 1998.

The total number of incidents with two or more patients in 2009 was 995, and the number has remained almost unchanged since 1998. This level is almost the same as the level of incidents since late 1960's till 1996, which mainly consisted of incidents with two or more patients. Therefore, taking the artificial nature of the peak of the food poisoning from1997 to 1998 into account, the food poisoning in Japan has retained its level since late 1960's (Fig. 1). As for food poisoning deaths, the annual deaths exceeded 100 till late 1960's, but the number decreased gradually and since middle 1980's it hardly exceeded 10 (Fig. 1, Table 1).

The large peak in patient number in 1955 is due to a large scale intoxication of infants caused by the arsenic-contaminated prepared infant milk, which intoxicated 12,344 infants. Aside from this accident, the annual number of persons affected by food poisoning was 30,000 - 40, 000 in the past sixty years. Though there was no decreasing tendency in number of persons affected, the number of incidents and death cases has decreased during the period (Fig. 1).

A large scale food poisoning outbreak caused by Enterohemorrhagic *Escherichia coli* O157 and the one caused by *Staphylococcus aureus* occurred in 1996 and 2000, respectively.

In 1950's, among the food preparing facilities that were responsible for food poisoning incidents, the most frequent was the home, which occupied 40% of all the incidents. However, in mid-1950s, the restaurant came to the top of the list, and it now occupies nearly half of the incidents and the home occupies less than 20% since mid-1980s. Such changes probably reflect social changes in Japan, such as large scale production of prepared foods and increased chance of eating out (Fig.2-1, 2-2) .

Till early 1960's, the causative agents were unknown for 30% of the incidents. However, owing to the technological and other advancement of laboratory diagnosis, the causative agents are now known for more than 90% of the incidents (Fig.3).

From early 1970's to late 1980's, among incidents whose causative agents were identified, *Vibrio parahaemolyticus, Salmonella* species and *Staphylococcus aureus* were the most frequent causative agents, and in 1998 – 1999 the incidents caused by the former two were in their peak. Though these three agents are now in decline, since 1997 *Campylobacter jejuni/coli* became prevalent. Food poisoning caused by norovirus started to increase in 2000 and peaked in 2006; it still continues to be reported in significant numbers though less than before (Fig. 4).

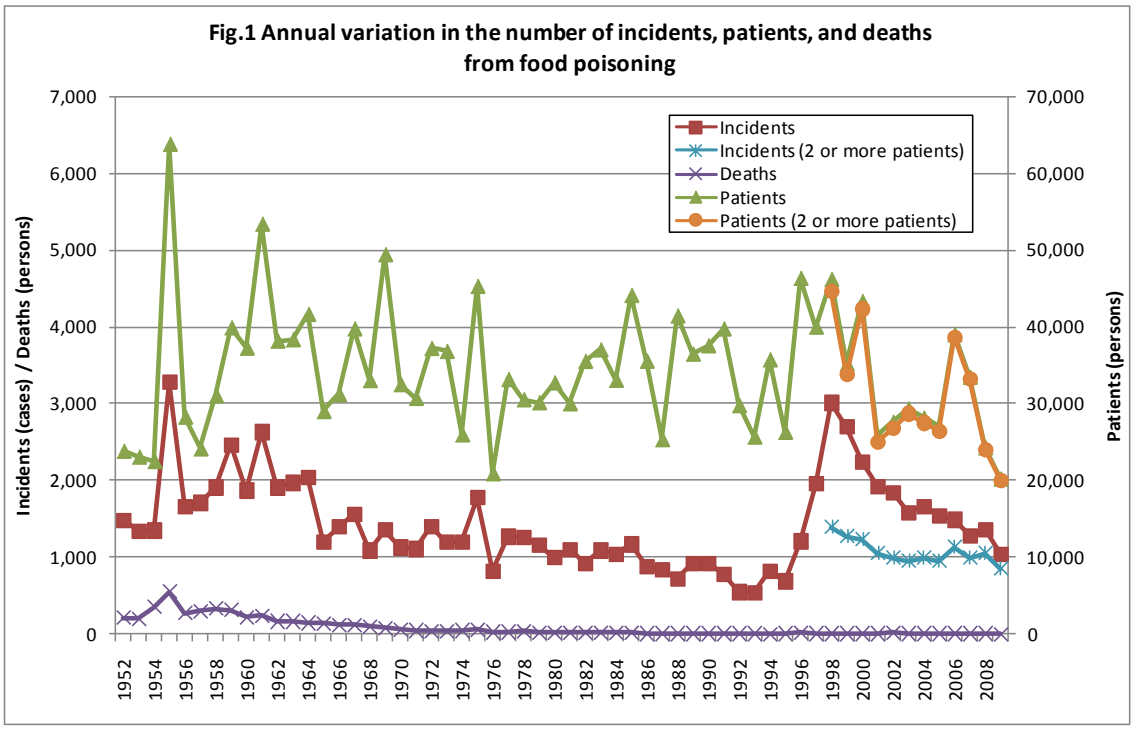


Fig.2-1 Annual variation in the percentage of incidents from food poisoning by serving place and preparing facility

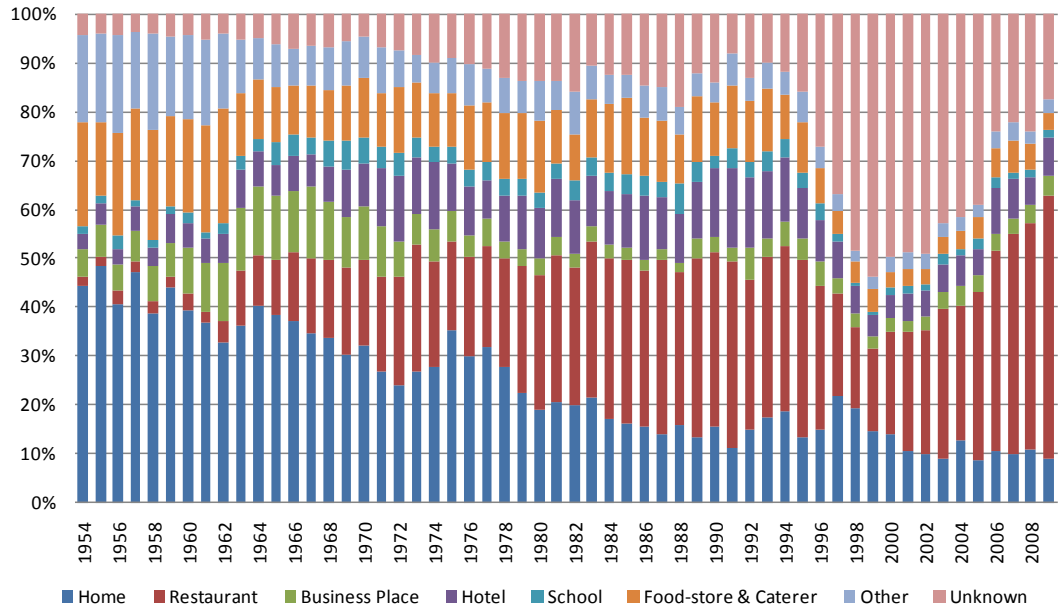


Fig.2-2 Annual variation in the percentage of incidents from food poisoning by serving place and preparing facility (excluded unknown)

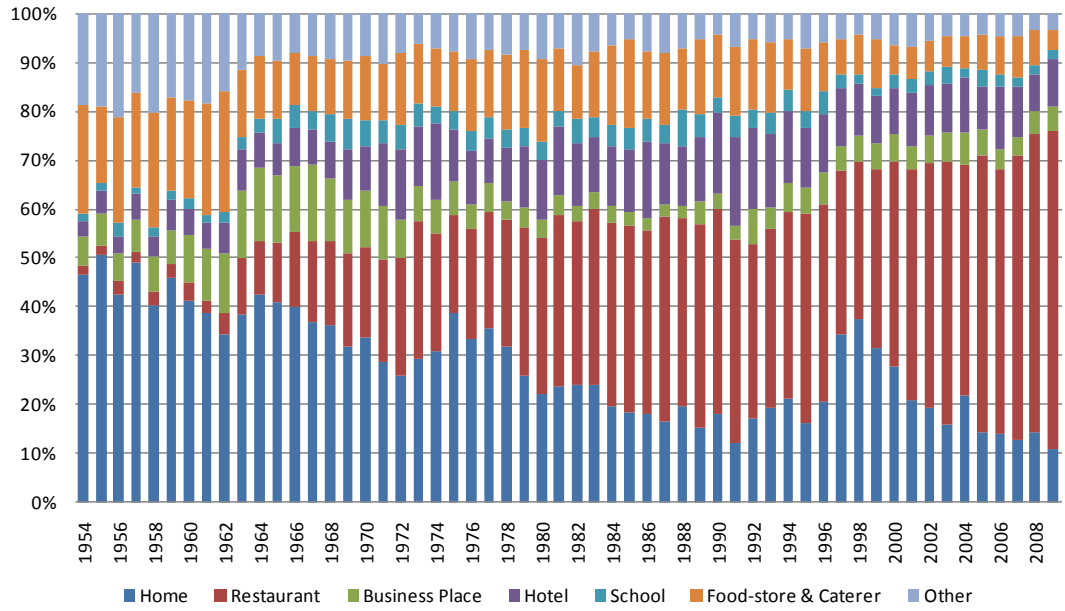


Fig.3 Annual variation in the percentage of incidents from food poisoning by Pathogenic substance

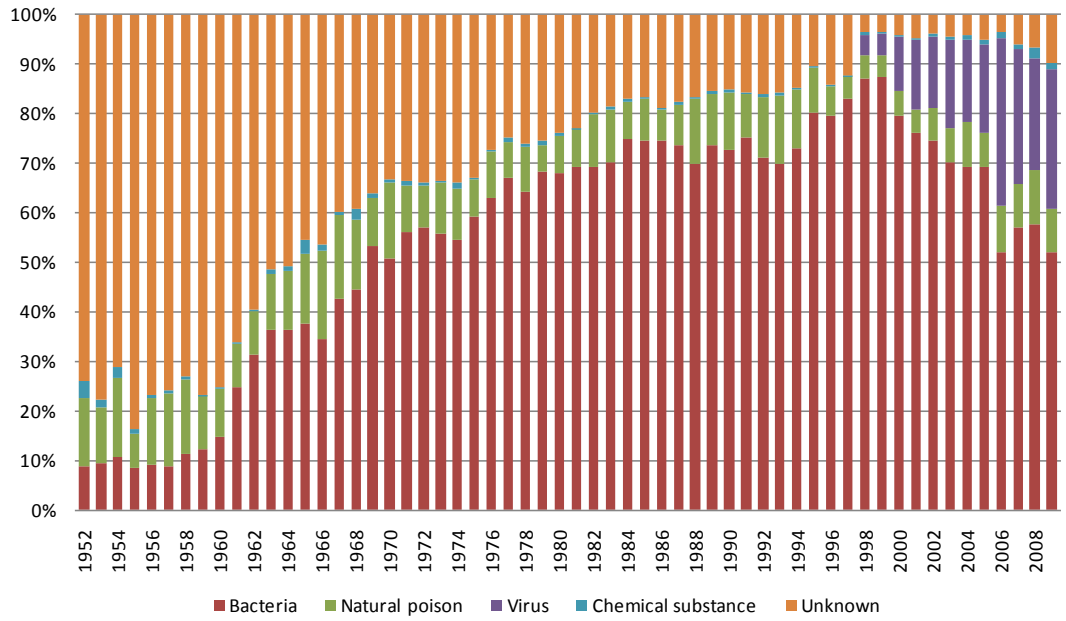
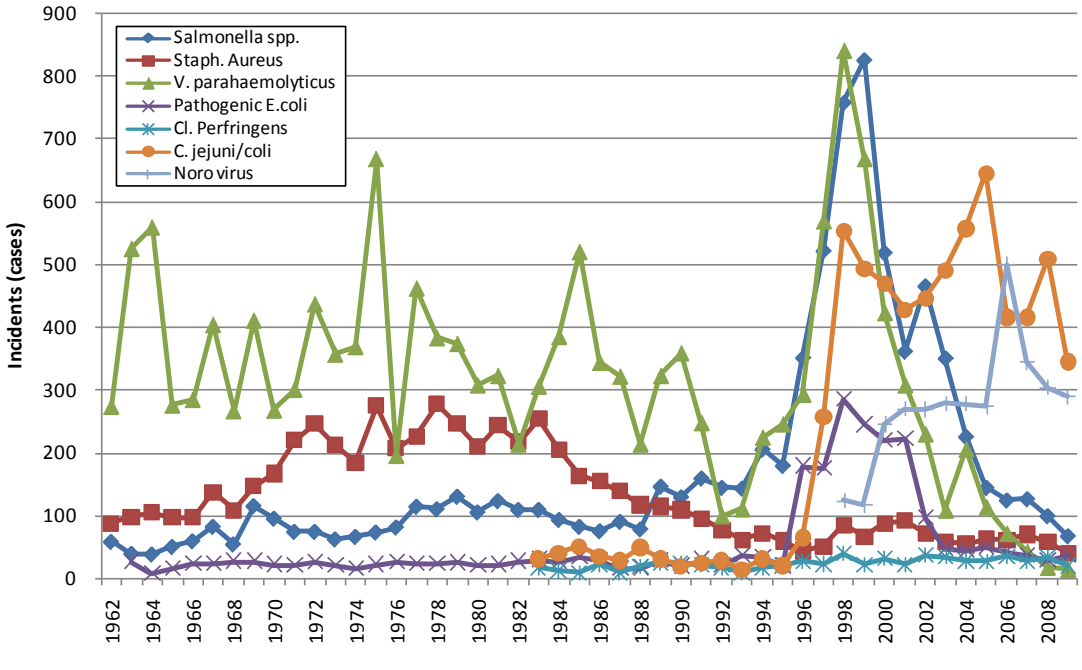


Fig.4 Annual variation in the number of incidents from food poisoning by major bacterial and viral pathogenic substances



Statistics 2009

The following is the summary of the information on food poisoning cases gathered by Inspection and Safety Division, Department of Food Safety, Pharmaceutical and Food Safety Bureau, Ministry of Health Labour and Welfare Japan from January to December of 2009. It is based on the reports sent in compliance with the Food Sanitation Act (1947, Act number 233) from governors of prefectures and municipalities, the mayors of cities that have public health centers, and the chiefs of special wards.

Since the present reporting system started, there have been several changes in reporting practices, which should be taken into account when inspecting the past food poisoning data. Firstly, in the latter half of 1997, reports of food poisoning involving only one person that had been generally excluded till then increased in large numbers. As a consequence, since 1999 the data of food poisonings involving only one person and the data of those involving two persons or more are separated and reported in addition to the data of the all food poisoning cases. Secondly, in August 2004 when Ordinance for Enforcement of the Food Sanitation Act was revised, classification of causative agents listed in the report form of food poisoning incidents was amended. As a consequence, since 2005, the previously used box of "small round virus" was divided into two, "norovirus" and "other viruses", the latter including small round viruses other than norovirus and sapovirus.

1. Trends of Food Poisoning in Year 2009 (Table 1 ~ 2)

1-1: Number of incidents

Total number of food poisoning incidents in 2009 was 1,048, which was 321 less (i.e., 23.4% less) than in 2008 (1,369). Incidents with only one person were 196 (4.2% less than in 2008), which occupied 18.7% of the total cases.

1-2: Number of patients

Total number of food poisoning patients in 2009 was 20,249 and the morbidity rate was 15.9 per 100,000. The corresponding figures for the previous year were respectively 4,303 and 19.0. The number of patients and the morbidity rate were reduced by 4,054 and 3.1, respectively from 2008 to 2009. There were two food poisoning incidents involving more than 500 persons in contrast to one incident in the last year.

1-3: Mortality

There was no mortality due to food poisoning in 2009 (4 cases in 2008)

2. Food Poisoning incidents by Prefectures and Municipalities (Table 3)

When compared in terms of number of incidents, Hiroshima Prefecture reported the

largest number (155 incidents, 124 among which were in Hiroshima City), followed by Tokyo Metropolis (118 incidents, 92 among which occurred within the 92 wards), Osaka Prefecture (67), Kanagawa Prefecture (48) and Fukuoka prefecture (41). When compared in number of patients, Tokyo reported the largest number (1,877, 1,415 among which were within the 92 wards), followed by Shiga Prefecture (1,330), Fukuoka Prefecture (1,272) and Osaka (1,025).

3. Seasonal Trends (Table 4 ~ 6)

The month when the largest number of food poisoning incidents was reported was December (129 cases, 12.3%) followed by September (108 cases, 10.3%) and January (107 cases, 10.2%). The month when the largest number of patients was reported was February (3,618, 17.9%) followed by January (3,223, 15.9%) and December (3,067, 15.1%). The number of patients in the above three months was 9,908, which was about a half (48.9%) of the total number of the patients of the year.

4. Causative agents (Table 8)

The causative agents are classified into 6 categories, bacteria, virus, chemical substance, natural poison, others and unknown.

The food poisoning caused by **bacteria** most frequently occurs from June to August. In 2009, 216 cases of bacterial food poisoning occurred during this season, accounting for 40.3% of the total incidents of the year. In June, in particular, bacterial food poisoning occupied 82.6% (72/85) of all the food poisoning incidents.

Food poisoning due to **norovirus** is most frequent during the winter. In 2009, 156 incidents were in January to March and 82 incidents in December, which altogether accounted for 82.6% of all the norovirus food poisoning incidents of the year (288).

Food poisoning caused by ***Campylobacter jejuni/coli*** was reported throughout the year with a small peak in June (51 cases), which accounted for 14.8% of all the reported *Campylobacter* incidents of the year (345 cases).

Food poisoning caused by the **natural plant toxin** was clustered in September (21 incidents) and October (14 incidents), which accounted for 66.0% of all the plant toxin-related incidents of the year (53 incidents). Food poisoning caused by the poisonous animal was clustered in January (7 incidents) and in December (7 incidents), which accounted for 35.9% of all the animal toxin-related incidents of the year (39 cases).

Among the causative agents encountered in the food poisoning involving only one person, *Campylobacter jejuni/coli* was the most frequent (34 incidents); such incidents occurred throughout the year.

5. Implicated Foods

Implicated foods are categorized into 11 categories, fish and shellfish, products of fish and shellfish, meat and its product, egg and its product, milk and its product, grain and its products, vegetable and its product, confectionery, compound dish, others, and unknown. During the winter seasons, **fish and shellfish** is implicated most frequently (19 incidents in January and 20 incidents in December among total 94 incidents in 2009). From spring to summer, food poisoning caused by meet and its product is frequent (53 incidents from May to September among total 91 incidents in 2009). Food poisoning caused by vegetables and their products, particularly due to **mushrooms**, is clustered in autumn (21 incidents in September and 14 incidents in October among total 54 incidents in 2009).

With respect to the foods implicated, the monthly incidence was not significantly different between the food poisoning involving only one person and that involving two persons or more (Tables 6-1, 6-2 and 6-3). For food poisoning involving only one person, intoxication by consumption of ***fugu*** (swell fish) was the most frequent, and it occurred during the winter (4 incidents from January to February and 5 incidents from November to December among the total 14 cases).

6. Food Categories implicated in Food Poisoning (Table 7)

Foods that caused food poisoning were identified in 805 food poisoning incidents (76.8% of the total incidents), which involved total 17,833 persons (88.1% of all the intoxicated persons).

When the implicated foods were compared in terms of number of food poisoning incidents, the most frequent was the **products of fish and shellfish** (94 incidents, 11.7%) followed by **meat and its products** (91 incidents, 11.3%), **compound dish** (food that is produced from two or more ingredients but the responsible ingredient could not be identified) (59 incidents, 7.3%) and **vegetable and its processed product** (54 cases, 6.7%).

When implicated foods are compared in terms of number of patients, the food that affected the largest number of people was the compound dish (1,318 persons, 7.4%) followed by the meat and its products (852 persons, 4.8%) and the vegetable and its product (788 persons, 4.4%) (Table 7-1).

Among food poisoning incidents involving two or more persons, implicated foods were identified in 89.2% (760/852), which involved 17,788 persons (88.7%). The foods that caused the largest number of incidents were meat and its product (88 cases, 11.6%) followed by products of fish and shellfish (69 cases, 9.1%). The food that involved the largest number of persons was the compound dish (1,318 persons, 7.4%) followed by meat and its product (849 persons, 4.8%) (Table 7-2).

Among food poisoning incidents involving only one person, the responsible foods were identified in 23.0% (45/196). Among them, the food that caused the largest number of incidents was the products of fish and shellfish (25 incidents, 55.6%) followed by the vegetable and its product (9 incidents, 20.0%). The most frequent cause among fish and shellfish was *fugu* (14 incidents, 31.1%) and that among vegetables was the mushroom (6 incidents, 13.3%) (Table 7-3).

7. Causative Agents that Caused Food Poisoning (Table 8)

Causative agents were identified for 948 incidents (90.5% of the total incidents) that involved 18,514 persons (91.4% of the total food poisoning patients). Bacteria occupied 56.6% (288 incidents) of all the food poisoning cases, and norovirus 30.4% (288 incidents). There were 92 incidents of food intoxication caused by the natural poison (9.7%).

Among individual agents, the most frequent was *Campylobacter jejuni/coli* (345 incidents, 36.4%) followed by norovirus (288 incidents, 30.4%), *Salmonella* species (67 incidents, 7.1%), and the poisonous plant (53 incidents, 5.6%). Agents that involved the largest number of people were norovirus (10,874 persons, 58.7%), *Campylobacter jejuni/coli* (2,206 persons, 11.9%), *Clostridium perfringens (Cl. welchii)* (1,566 persons, 8.5%), and *Salmonella* species (1,518 persons, 8.2%).

The number of patients per incident was the largest in food poisoning caused by *Clostridium perfringens*, (78.3 persons/incident in total 20 incidents) followed by that caused by chemicals (42.5 persons/incident in total 13 incidents) and that caused by norovirus (37.8 persons/incidents in total 288 incidents). There were 26 food poisoning incidents caused by Enterohemorrhagic *Escherichia coli* serotype O157 in 2009 (2.7% of all the incidents), which affected 181 patients (1.0% of all the food poisoning patients) (Table 8-1).

Among incidents involving two persons or more, causative agents were identified in 758 incidents (89.0%), which involved 18,324 persons (91.4%). The agents that caused the largest number of incidents were norovirus (288 incidents, 38.0%) followed by *Campylobacter jejuni/coli* (211 incidents, 27.8%), *Salmonella* species (63 incidents, 8.3%) and the poisonous plant (43 incidents, 5.7%). The agent that involved the largest number of persons was norovirus (10,874 persons, 59.3%) followed by *Campylobacter jejuni/coli* (2,072 persons, 11.3%), *Clostridium perfringens* (1,566 persons, 8.5%) and *Salmonella* species (1,514 persons, 8.3%) (Table 8-2) .

Among incidents involving only one person, causative agents were identified in 190 incidents (96.9%). Among them, the agent that caused the largest number of incidents was *Campylobacter jejuni/coli* (134 incidents, 70.5%) followed by the natural poison (total 27 incidents among which 17 were caused by the poisonous animal and 10 by the poisonous plant,

14.2%), Enterohemorrhagic *Escherichia coli* (VT production +) (5 incidents, 2.6%) and *Salmonella* species (incidents, 2.6%) (Table 8-3).

8. Food Preparing Facilities Responsible for Food Poisoning (Table 9)

Food preparing facilities responsible for the food poisoning are categorized into 12 categories, home, work place, school, hospital, hotel, restaurant, food-store, food-manufactory, caterer, natural environment, others, and unknown.

Responsible facilities were identified in 864 incidents (82.4%) that affected total 19,859 persons (98.1%). The most frequently implicated facilities were the restaurant (562 incidents, 65.0%) followed by the home (95 incidents, 11.0%) and the hotel (84 incidents, 9.7%).

In terms of total number of patients, the most frequent responsible facilities were the restaurant (10,336 persons, 52.0%) followed by the hotel (3,749 persons, 18.9%) and the caterer (1,683 persons, 8.5%). **In terms of number of persons implicated per incident**, the caterer was at the top (25 incidents with average 67.3 persons/incident), and then the school (15 incidents with average 48.7 persons/incident) and the hotel (84 incidents with 44.6 persons/incident) (Table 9-1).

Among incidents that involved two or more persons, the responsible facilities were identified for 819 incidents (96.1%), in which 19,814 persons were involved (98.8%). Among these cases, the most frequent facilities were the restaurant (551 incidents, 67.3%), the hotel (84 incidents, 10.3%) and the home (64 incidents, 7.8%). In terms of number of patients, the restaurant (10,325, 52.1%) was at the top followed by the hotel (3,749, 18.9%) and the caterer (1,683, 8.5%) (Table 9-2).

Among incidents consisting of only one person, the responsible facilities were identified for 45 incidents (23.0%), and most frequent of them was the home (31 incidents, 68.9%) (Table 9-3).

9. Serving Places Where Food Poisoning Occurred (Table 10)

The serving place is defined as the place where the food that caused food poisoning was served and consumed. It is categorized into 8 categories, home, work place, school, hospital, hotel, restaurant, others, and unknown. When a food is consumed in more than one place, the place with the largest number of patients is selected as the responsible serving place. When number of the patients are the same in two places, the place more epidemiologically significant is selected.

Among total 1,048 incidents, the responsible serving place was identified for 867 incidents (82.7%), which affected 19,920 persons (98.4% of the total). The most frequent place was the restaurant (470 incidents, 54.2%) followed by the home (140 incidents, 16.1%). In

terms of number of patients, the restaurant (7,324 persons, 36.8%) and the hotel (3,803 persons, 19.1%) were the most frequent. In terms of number of patients per incident, the school (53.4 persons/incident), the hotel (45.3 persons/incident) and the work place (40.1 persons/incident) were the commonest (Table 10-1).

Among incidents involving two or more persons, the serving places were identified in 822 incidents (822/852, 96.5%) that involved 19,875 persons. The most frequent place was the restaurant (460 incidents, 56.0%) followed by the home (106 incidents, 12.9%) and the work place (91 incidents, 11.1%). In terms of number of patients, the restaurant (7,314 persons, 36.8%), the hotel (3,803 persons, 19.1%) and the work place (3,689 persons, 18.6%) were frequent (Table 10-2). **Among incidents involving only one person**, the serving places were identified for 45 incidents (45/196, 23.0%), and the majority was the home (34 incidents, 75.6%) (Table 10-3).

10. Relation between the Causative Agent and Foods involved in Food Poisoning in Terms of Foods (Table 11)

Different agents were responsible for different kinds of foods. In case of products of fish and shellfish (94 incidents), natural poison (39 incidents consisting of 6 incidents with shellfish, 24 incidents with *fugu* and 9 with other fish or shellfish), norovirus (33 incidents) were the most frequent. For meat and its product (91 incidents), *Campylobacter jejuni/coli* was the most frequent (74 incidents). For the compound dish, frequent were norovirus (17 incidents), *Salmonella* species (13 incidents), *Staphylococcus* (9 incidents) and *Clostridium perfringens* (6 incidents).

In terms of number of patients, the most frequently implicated food was the compound dish (1,318 persons); the frequent causative agents implicated in this food were norovirus (418 persons), *Salmonella* species (339 persons), *Clostridium perfringens* (234 persons), *Staphylococcus* (162 persons), and *Vibrio parahaemolyticus* (39 persons). The next frequent food was the meat and its product (852 persons); *Campylobacterjejuni/coli* (608 persons) and *Clostridium perfringens* (134 persons) were major causative agents in this food. The third was the vegetable and its product (788 persons); here, major causative agents implicated were norovirus (423 persons), the poisonous plant (180 persons) and *Clostridium perfringens* (169 persons).

There were, however, 27 incidents involving 400 patients whose responsible foods and/or causative agents remained unknown.

In food poisoning incidents involving only one person, when products of fish and shellfish were involved (25 incidents), intoxication by the poisonous animal was the most frequent (17 incidents), and when vegetable and its product were involved (9 incidents), all were

due to ingestion of the poisonous plant.

11. Causative Agents in Terms of Preparing Facilities Responsible for Food Poisoning (Table 12)

The following is the list of the most frequent causes of food poisoning incidents according to the facilities responsible for the incidents.

- Home (95 incidents, 248 persons)
  - Poisonous plant (46 incidents, 124 persons)
  - Poisonous animal (30 incidents, 63 persons)
  - *Salmonella* species (4 incidents, 13 persons)
- Work place (43 incidents, 1,596 persons)
  - Norovirus (16 incidents, 698 persons)
  - *Campylobacter jejuni/coli* (5 incidents, 228 persons)
  - *Clostridium perfringens* (4 incidents, 698 persons)
- School (15 incidents, 731 persons)
  - Norovirus (5 incidents, 582 persons)
  - *Campylobacter jejuni/coli* (4 incidents, 78 persons)
- Hospital (8 incidents, 255 persons)
  - Norovirus (5 incidents, 184 persons)
  - *Salmonella* species (2 incidents, 55 persons)
- Hotel (84 incidents, 3,749 persons)
  - Norovirus (34 incidents, 2,616 persons)
  - *Staphylococcus* (8 incidents, 150 persons)
  - *Campylobacter jejuni/coli* (5 incidents, 146 persons)
- Restaurant (562 incidents, 10,336 persons)
  - Norovirus (191 incidents, 4,964 persons)
  - *Campylobacter jejuni/coli* (173 incidents, 1,418 persons)
  - *Salmonella* species (46 incidents, 1,209 persons)
- Food-store (10 incidents, 119 persons)
  - Poisonous animal (4 incidents, 8 persons)
  - Chemical substance (2 incidents, 75 persons)
- Food-manufactory (9 incidents, 239 cases)
  - Norovirus (3 incidents, 89 persons)
  - *Staphylococcus* (3 incidents, 16 persons)
  - Chemical substances (2 incidents, 117 persons)
- Caterer (25 incidents, 1,683 persons)

- Norovirus (20 cases, 1,493 persons)
- *Staphylococcus* (1 incident, 102 persons)
- *Clostridium perfringens* (1 incident, 57 persons)

12. Foods Implicated in Food Poisoning in Terms of Responsible Facilities (Table 13)

Facilities causing the largest number of incidents were the restaurant and the home. The following list shows the foods implicated in each instance;

- Restaurant (562 incidents)
  - Meat and its product (85 incidents)
  - Fish and fish products (43 incidents)
  - Compound dish (42 incidents)
- Home (95 incidents)
  - Vegetables and its product (43 incidents)
  - Products of fish and shell (36 incidents)

The facilities that were responsible for the largest number of patients were the restaurant and the hotel. The following list shows responsible foods implicated in each case;

- In the restaurant (10,336 persons)
  - Compound dish (945 persons)
  - Meat and its product (798 persons)

In the hotel (3,749 persons)

- Compound dish (73 persons)
- Products of fish and shellfish (65 persons)

Among food poisoning incidents involving only one person, the incidents in the home were the most frequent, and the most frequent responsible foods was products of fish and shellfish (19 incidents) followed by vegetable and its product (8 incidents).

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