Food and Waterborne Illness Surveillance and Investigation
Annual Report, Florida, 2004

Bureau of Community Environmental Health
Division of Environmental Health
Department of Health

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Overview

2004 continued to be active for food and waterborne outbreak reporting and investigation: a total of 2,174 foodborne illness complaints were reported in Florida. Foodborne outbreaks numbered 173 with 1,911 cases. Two waterborne outbreaks were reported in 2004, with a total of 43 cases. A total of 175 outbreaks with 1,954 cases were reported, compared to 188 outbreaks and 1,648 cases for 2003, and 243 outbreaks and 1,469 cases for 2002. Investigators were able to laboratory confirm 48 of the outbreaks (including 9 *Vibrio vulnificus* cases) associated with 1,184 cases. Norovirus, *Staphylococcus*, and *Salmonella* were implicated in the largest percentage of the total reported outbreaks (21%, 7%, and 5%, respectively). Norovirus was identified in the largest percentage of cases in total reported outbreaks (58%) followed by *Salmonella* (4%) and *B. cereus* (5 %). Restaurants were the source site in 73% of the outbreaks reported and in 52% of the cases. Multiple items (35%) and multiple ingredients (16%) accounted for a total of 41% of all outbreaks, followed by poultry (12%), molluscan shellfish (11% - this includes all single *Vibrio vulnificus* cases), and fish (10%). Multiple ingredients (15%) and multiple items (41%) accounted for 57% of all outbreak-associated cases, followed by vegetables (9%), crustacean (other) shellfish (6%) and poultry (4%). The month with the largest percentage of outbreaks reported was March (14%) with the largest percentage of cases also in March (14%). Large (greater than 10 cases) outbreaks accounted for 19% (33) of the total reported outbreaks and 76% (1,494) of the total cases. Selected significant outbreaks are briefly described below. Each outbreak can have up to three factors under the current surveillance system. There are also categories for none reported, other and unknown. Aside from unknown and none reported, the eight most frequent contributing factors are as follows:

Table 1: Eight Most Prevalent Contributing Factors in Foodborne Outbreaks (n=173), Florida, 2004

Contributing Factor[1]	# Outbreaks	# Cases
Contamination Factor		
Cross contamination with food of animal origin	30	457
Bare hand contact	28	380
Proliferation/amplification factor		
Inadequate cold holding	41	161
Food at room T°	15	90
Survival factor		
Insufficient time/T° during reheating	2	61
Insufficient thawing	1	2
Method of preparation factor		
Cook/serve foods	39	228
Multiple foods	21	284

The contributing factors listed in Table 1 are areas where food worker educators and public health professionals may want to concentrate their education efforts.

[1] Each outbreak can have at least three of each of the four types of factor, thus the outbreaks and outbreak-related cases will not add up to the actual number. See Tables 27-47 and last two pages of Appendix for more detailed information.

Table 2: Summary of Food and Waterborne Illness Outbreaks Reported to Florida DOH, 1989–2004[2]

Year	# Outbreaks	# Cases
1989	11	72
1990	7	314
1991	17	331
1992	40	1048
1993	136	890
1994	**258**	**1526**
1995	**296**	**2908**
1996	**305**	**2777**
1997	**439**	**2744**
1998	**315**	**3290**
1999	**286**	**1544**
2000	**288**	**1757**
2001	**303**	**2052**
2002	**243**	**1469**
2003	**188**	**1648**
2004	**175**	**1954**

[2] The current surveillance and investigation program data began in 1994.

Table 3: Confirmed Suspected, and Total Food and Waterborne Outbreaks Reported to Florida DOH, 1995-2004

1995	# Outbreaks	# Cases
Confirmed	79	2127
Suspected	215	779
Total	294	2906

2000	# Outbreaks	# Cases
Confirmed	50	812
Suspected	238	945
Total	288	1757

1996	# Outbreaks	# Cases
Confirmed	81	2097
Suspected	226	759
Total	307	2856

2001	# Outbreaks	# Cases
Confirmed	68	1057
Suspected	232	988
Total	300	2045

1997	# Outbreaks	# Cases
Confirmed	80	1345
Suspected	353	1400
Total	433	2745

2002	# Outbreaks	# Cases
Confirmed	47	641
Suspected	199	835
Total	246	1476

1998	# Outbreaks	# Cases
Confirmed	59	1937
Suspected	257	1356
Total	316	3293

2003	# Outbreaks	# Cases
Confirmed	58	795
Suspected	130	853
Total	188	1648

1999	# Outbreaks	# Cases
Confirmed	52	532
Suspected	234	1012
Total	286	1544

2004	# Outbreaks	# Cases
Confirmed	58	1498
Suspected	117	456
Total	175	1954

Figure 1: Number of Confirmed and Suspected Food and Waterborne Outbreaks by Year, Florida, 1995-2004

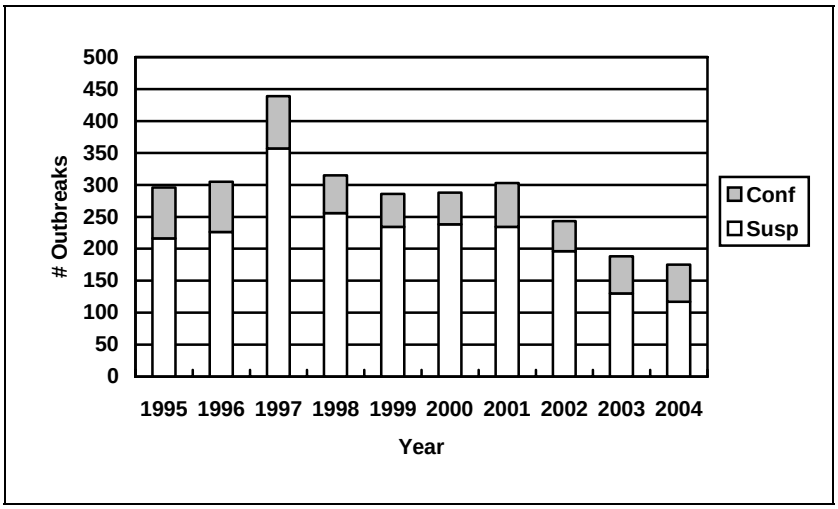
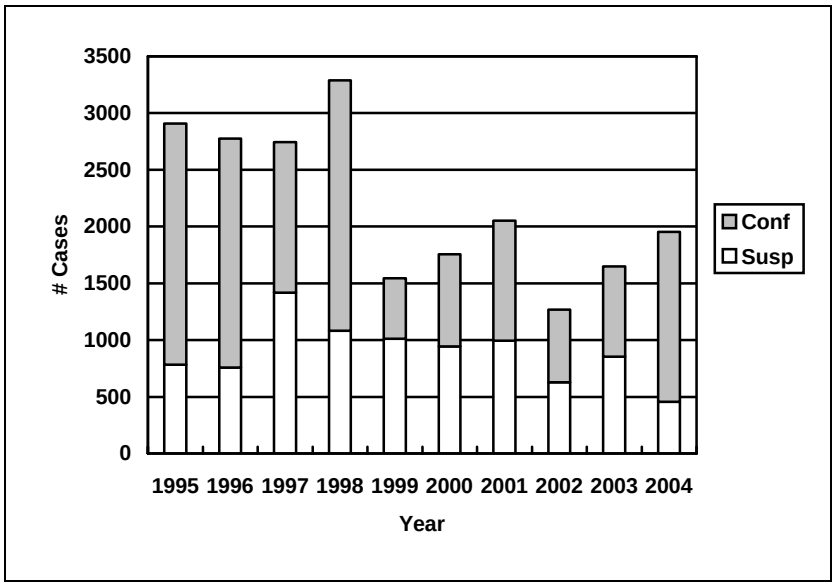


Figure 2: Number of Confirmed and Suspected Food and Waterborne Outbreak-related Cases by Year, Florida, 1995-2004



Training and Continuing Education

In 2004, 26 training sessions were held around the state specifically targeting Department of Health staff and 23 sessions were presented to other audiences. Training presentations included new environmental health employee orientation, and statewide overviews on food and waterborne disease outbreak disease data. Other special topics included Norovirus, *Vibrio vulnificus*, recreational waterborne diseases, a general overview of all waterborne diseases, foodborne marine toxins and an overview of Creutzfeldt-Jacob and Bovine Spongiform Encephalopathy.

Besides county health department environmental health, nursing and epidemiology staff, audiences included members of the Florida Environmental Health Association, the National Environmental Health Association and local chapters of the Florida Association of Food Protection and Northwest Florida infection control practitioners. In a cooperative effort with other agencies, training was presented to staff of the Department of Business and Professional Regulation and to members of the Food Safety and Security Advisory Council. Trainers also presented three guest lectures at the University of Florida to Food Safety and Sanitation, Food Science and Food Microbiology classes and an inservice to statewide county extension agents, a guest lecture at the University of North Florida to student dieticians and a guest lecture to health students at Florida Agricultural and Mechanical University.

Preparedness Training 2004

The Food and Waterborne Disease Preparedness Program provided training to several Regional Domestic Security Task Forces (RDSTFs) in 2004. On April 8, an intentional food contamination tabletop training was offered to members of the RDSTF 6. The training included detailed instructions on how to respond to a foodborne outbreak,[3] perform the investigation and which agency and other entity partners will work together and their responsibilities during an outbreak of intentional contamination. On May 20, we offered the same training to members of RSDTF 7. There was a very positive response to both trainings. The program also provided speakers for several conferences around the state on foodborne illness issues. Presentations were given at the Florida Nurses Association and Florida Environmental Health Association annual meetings. As part of ongoing efforts to provide the local county health departments with supplies for foodborne disease investigations, supplies totaling $33,948.98 were purchased to restock foodborne outbreak investigation kits. These kits are provided to each county to aid in the outbreak investigation process.[4]

Training modules currently under development:

1) *Salmonella*
2) Florida Food and Waterborne Diseases: Ten Years of Data
3) *E. coli O157:H7*

[3] Note: intentional contamination of food or water will initially exhibit the same characteristics as a routine food or waterborne outbreak. Department of Health preparedness efforts focus on conducting thorough outbreak investigations, with environmental assessments, sample collection, data analysis and interagency collaboration.

[4] Kit lists can be found in the Environmental Health Program Manual, Chapter G, Appendix A.

Outbreak Definitions

Foodborne illness outbreak: An outbreak is an incident in which two or more people have the same disease, have similar symptoms, or excrete the same pathogens; and there is a time, place, and/or person association between these people. A single case of suspected botulism, mushroom poisoning, ciguatera or paralytic shellfish poisoning, other rare disease, or a case of a disease that can be definitely related to ingestion of a food, is considered as an incident of foodborne illness and warrants further investigation.

Confirmed outbreak: A confirmed foodborne outbreak is an outbreak that has been thoroughly investigated and the results include strong epidemiological association of a food item or meal with illness. A thorough investigation is documented by

- diligent case finding,
- interviewing of ill cases and well individuals,
- collecting clinical and food lab samples where appropriate and available,
- confirmation of lab samples where possible,
- field investigation of the establishment(s) concerned, and
- statistical analysis of the information collected during the investigation.

The summary report of all of the information collected in an investigation in a confirmed outbreak will indicate a strong association with a particular food and/or etiologic agent and a group of two or more people, or single incidents as described above.

Suspected outbreak: A suspected foodborne outbreak is one for which the sum of the epidemiological evidence is not strong enough to consider it a confirmed outbreak.

Selected Foodborne Outbreaks

Foodborne Outbreak Attributed to Solanine Poisoning from Susumber Berries, Broward County, February 2004

On February 10, 2004 the Broward County Health Department received a report from an infection control nurse of a local hospital that three patients presented to the emergency room with similar neurological symptoms implicating a common meal eaten on February 9, 2004 at 5:00 pm. A fourth member of the family was admitted to another local hospital with similar neurological symptoms.

From Friday, February 6 to February 8, 2004, common meals were shared by family members and friends. On Saturday, February 7, over 200 people ate a meal partly prepared by family members along with some catered foods. There were no reported illnesses among any other attendees of the multiple meals shared together prior to the meal eaten on February 9, 2004.

Nine people ate the meal served on Monday, February 9, consisting of a purchased whole red snapper of approximately 10 pounds, broccoli, cauliflower, string beans, rice, peas, salad (lettuce, tomato, cucumber) and salted cod fish with susumber. The meal was prepared by the hostess except for the codfish/susumber dish, which was brought to her home by one of the family members.

An interview with the ill patient who prepared the cod fish/susumber berries revealed that he received the berries on Wednesday as a gift from Jamaica. He placed them in the refrigerator until Sunday morning when he took them out of the refrigerator to clean them for preparation but was distracted and subsequently left the berries for 28 hours prior to cooking them in a plastic

bag, on the porch where the berries were subjected to sunlight. According to the patient, the berries are harvested in different stages of size and plumpness, without differentiation to size or "mature or immature, ripe or unripe" berries. The entire stems with berries are cut off the plant; the berries are picked off the stem in various stages of development and washed and boiled in water to a tender-crisp state. The cooked berries were then added to sautéed salted codfish, onion, peppers, and tomatoes as prepared in the traditional manner.

Nine interviews were conducted and four (44%) of the nine guests were ill with similar symptoms. The patients presented to the emergency room with symptoms of ataxia, slurred speech, facial paralysis, numbness and tingling of the fingers, weakness in legs and arms and altered mental state. No gastrointestinal symptoms were reported. The onset of symptoms ranged from 10.5 hours to 16 hours after ingestion of the implicated meal, with a median incubation of 14 hours. The four individuals (3 females, 1 male) were admitted to the hospitals on February 10, 2004 and released on February 14, 2004. The patients were treated with IV fluid and electrolyte replacement, and three of the four received mannitol. The duration of symptoms varied by symptom and individual but all reported feeling well by Saturday, February 14, 2004.

The initial report of suspected foodborne illness on February 10, 2004 was thought to be ciguatera implicating the red snapper, however the interviews revealed that the snapper served on the February 9 meal was a whole fish of approximately 10 pounds bought from a local fish market the day of the meal. Two non-ill family members ate leftover snapper the following day (the day the four ill individuals presented to ER) with no ill effects. But food histories revealed that only the four who ate susumber berries became ill. Further, one ill person only ate about 3-4 tablespoons of susumber/codfish over rice. He did not eat any red snapper at all. The three others who became ill ate about 1-2 tablespoons of the susumber/codfish over rice and some portions of other foods served and as well.

The susumber berry plant, a member of the Solanaceae/ Nightshade Family includes numerous species and the berries are referred to by different names such as turkey berry, soda apple, thai eggplant, and susumber, among other names. The plant was federally listed on the U.S. noxious weed list in 1995.[5] It is an evergreen, widely branched shrub, which grows from shrub-like pepper plant size to 16 feet tall usually with long prickles on midveins, bright white flowers followed by small grape-sized green berries. It is cultivated in the tropics for its sharp-tasting, bitter fruits. It has been found cultivated in Florida, and documented in 6 south Florida counties. The plant is reportedly found in natural areas of Broward and Collier counties. The literature search was unclear as to which phase of the fruit is toxic to humans, the unripe or the mature fruits, and toxicity level has not been determined. An abstract published in the North American Congress of Clinical Toxicology describing a similar case study of susumber berry consumption and illness attributable to solanine ascribed the toxin to the unripe berry.[6] However, anecdotally, the berries are eaten in various stages of development without regard to size, ripeness, mature or phase of maturity.

The appearances of the berries differ with the species of berry plant. The berry frequently consumed by the West Indian population is described as a small solid green berry without striations, and the size of a small grape. It is a favorite food among the peoples of the West Indies and is often eaten prepared in traditional manner as an accompaniment to salted codfish.

[5] Agricultural Research April 1997 "Nothing but a Wasteful Weed" Linda Cooke.
[6] Thompson, M., Thornton M., Verjee, Z. Abstract #209 of the 2003 North American Congress of Clinical Toxicology Annual Meeting, Aug.4, 2003.

One patient in this case professes to eat the berries frequently without incident. However, the fact that the berries were left out for a long period of time in the sun may have accelerated the formation and accumulation of the solanine toxin in the berries before consumption, thus leading to the toxic effect.

The toxicity level of solanine is not known, and whether the exposure to sunlight made the berries more toxic would also be a subject for further investigation. There were no samples left for testing for the solanine toxin and the level of toxicity was not determined. However based on the small quantities consumed (1-3 tablespoons) by the patients, is suggestive of significant neurologic toxicity.

A Norovirus Outbreak Associated with a Restaurant, Bay County, May 2004

On Wednesday, May 26, 2004, a telephone call was received by the Bay County Health Department (BCHD), describing the occurrence of gastrointestinal (GI) illness among patrons who had eaten at a local restaurant on May 24, 2004. The caller indicated that he was one of a group of 13 people who had eaten there, and that everyone in his party had become ill. By noon, not only had several persons from the original group contacted the CHD, but several calls from other individuals who had eaten at the restaurant on the same day also reported illnesses. A formal outbreak investigation was initiated.

Interviews of 104 persons, 100 of whom ate at the restaurant during the period in question (May 21-27, 2004) were conducted. A case was defined as a person who ate at the restaurant between May 21-27, 2004 and who subsequently developed nausea, vomiting, and/or diarrhea. Of the 100 persons interviewed, 83 persons met the case definition. A joint inspection/investigation was conducted at the restaurant by the Department of Business and Professional Regulation and the Bay CHD on May 26 and again on June 2. Stool specimens were obtained from 19 employees and 11 patrons. No food specimens were available.

No bacterial pathogens were identified. Testing for viral pathogens resulted in 10 specimens from patrons and 3 specimens from employees positive for Norovirus G2. The incubation period ranged from 2 hours to 79.5 hours, with a median incubation of 32.25 hours. Crosstab contingency table analysis of the foods consumed was calculated and statistical analysis indicated that the house salad was the most likely source of the outbreak.

The results of the inspection by DBPR and BCHD revealed numerous violations which included: bare hand contact with ready to eat foods (i.e. not using gloves/utensils and no hand hygiene protocol in place for situations in which gloves/utensils were not used), the absence of a Certified Food Manager, and incomplete training of employees.

Norovirus causes a disease that is self-limiting, and characterized by nausea, vomiting, diarrhea, and abdominal pain. Headache and low-grade fever may occur. The incubation period is 24-48 hours, with a duration of 24-48 hours. The infectious dose is unknown but presumed to be low. Norovirus is transmitted via fecal-oral mode through contaminated water and foods. Secondary person-to-person transmission has been documented. Shellfish and salad ingredients are the foods most often implicated in Norovirus outbreaks. Ingestion of raw or insufficiently steamed clams and oysters poses a high risk for infection with Norovirus. Proper handwashing after going to the bathroom, changing diapers, or working with sick people can help prevent the spread of this illness.

***Vibrio parahaemolyticus* Outbreak, Palm Beach County, September 2004**

On September 20, 2004, the Palm Beach County Health Department (PBCHD) was informed of individuals becoming ill with gastrointestinal symptoms after attending a party at a local resort on September 18, 2004. The case definition was: a guest or worker at the September 18 party who had at least two of the following symptoms: diarrhea, abdominal cramps, nausea, or vomiting. A total of 189 persons attended the party, with only 120 (63.5%) interviewed. Ninety-five (79.2%) reported being ill. The median age of ill persons was 47 years. Forty-eight (50.5%) of the ill persons were male. Symptoms included diarrhea (92), abdominal cramps (81), loss of appetite (80), chills (72), nausea (70), fatigue (65), headache (56), and vomiting (47). The median incubation period was 25 hours. The median duration of symptoms was 24 hours. Nine stool samples were submitted for analysis. Four stool samples were positive for *Vibrio parahaemolyticus*. A retrospective cohort analysis was done to calculate the food specific attack rates. The risk ratio (RR) for the appetizer, the implicated food, was 3.32 (95% CI .99-11.08, p-value < .05).

The PBCHD Environmental Health Division and the Department of Business and Professional Regulation conducted an onsite investigation of the food preparation areas of the resort and to collect food samples. Kitchen workers were asked about the timing and methods of food preparation. The investigation team observed cross-contamination of foods and no hand washing. The available leftover foods served at the party were collected, with the exception of scallops and seaweed used in the appetizer. Leftover shrimp (also used in the appetizer) and lobster were sent to the Bureau of Laboratories in Tampa for analysis. The presence of *Vibrio parahaemolyticus* was confirmed from shrimp leftovers. Laboratory tests also confirmed the shrimp had several other contaminants, with one identified as *Vibrio metschnikovii.* A traceback investigation of the shrimp and scallops was made, but the source of the contamination was not able to be determined.

Vibrio parahaemolyticus enteritis is characterized by watery diarrhea and abdominal cramps, and usually with nausea, vomiting, fever, and headache. Typically, it is a disease of moderate severity lasting 1-7 days. Death rarely occurs. Sporadic cases and common-source outbreaks have been reported from many parts of the world, particularly Japan, Southeast Asia, and the United States. Several foodborne outbreaks have occurred in the United States in which undercooked seafood was the food vehicle; consumption of raw or undercooked clams or oysters is often implicated in individual cases. Cases occur primarily in warm months. Marine coastal environs are the natural habitat. During cold season, organisms are found in marine silt; during warm season, they are found free in coastal waters and in fish and shellfish. The incubation period for *V. parahaemolyticus* enteritis is usually between 12-24 hours, yet can range from 4-30 hours. Most persons are probably susceptible, especially in case of liver disease, decreased gastric acidity, diabetes, peptic ulcer or immunosuppression.[7]

[7] Control of Communicable Diseases Manual, 18th Edition, 2004, David L. Heymann, MD, Editor

A Case of Chemical Poisoning Associated with the Consumption of Bottled Water, Brevard County, October 2004

On October 19, 2004 the regional environmental epidemiologist for the Central Florida area was contacted by a 48 year old female citizen of Brevard County who described symptoms consistent with a chemical exposure immediately after consuming bottled water. The complainant had purchased three one gallon plastic containers of bottled water on September 19, 2004. Upon opening and drinking the water on October 19, 2004 the patient immediately experienced oral tingling, numbness and nausea. She also noticed a gas odor and taste in the water.

Additional surveillance was performed via Florida Poison Control Centers and county health department foodborne illness logs. A case was defined as a person who experienced tingling or numbness in the mouth and/or lips following consumption of bottled water purchased from grocery stores. The standard food and waterborne illness surveillance form was used to obtain detailed clinical and exposure history. The case patient had one unopened gallon water product in addition to the opened container. Both of these containers were obtained by the Brevard Environmental Health Division staff on October 21, 2004 for chemical analysis at the Florida Bureau of Laboratories. An inspection of the store in Melbourne was conducted by the Department of Agriculture and Consumer Services (DACS) on October 20, 2004.

The 48 year old female described nausea, tingling and numbness of the oral cavity immediately following taking a small drink of water poured from a 1 gallon bottled water container on October 19, 2004 at 12:30 pm. She immediately prevented a friend from taking a drink from a glass of water from the same bottled water container. She also reported a very distinct odor of gasoline and taste in the bottled water container as well as the glass. She described experiencing chills, heartburn and eventually peeling skin inside her oral cavity in addition to the immediate symptoms. She received medical care from a physician. Duration of some of the symptoms was at least several weeks. The product was described as Sodium Free Drinking Water in 1 gallon containers. She stated that she purchased the product on September 19 from a pallet located in the garden center area of a large discount store located in Melbourne.

The inspection on October 20, 2004 by DACS disclosed that the Sodium Free Drinking Water in 1 gallon containers was bottled in Greenville, Tennessee. The product being investigated was packaged in a box with 3 one gallon containers per box. The implicated lot was packed on August 28, 2004 and had an expiration date of August 28, 2005. At the time of the inspection there was not any product from the September 19 stock in the store. The operators of the store stated that they had stored the pallet of bottled water in the garden center among fertilizers, herbicides, pesticides and charcoal lighter fluid during the period of time in September that the case patient had purchased the bottled water. This action was a result of a lack of sufficient space due to activities during the hurricanes that impacted the area during August 13, September 3 and September 25, 2004. The manufacturer of the bottled water product stated that the plastic used for the bottled water would be pervious to chemicals found in fertilizers, herbicides, pesticides and charcoal lighter fluid.

The laboratory analysis by the Florida Department of Health Bureau of Laboratories revealed several chemical compounds associated with gasoline or gasoline by-products in both the opened and unopened one gallon containers of bottled water. Table 4 depicts the details of pertinent levels of chemical compounds in the samples.

Table 4: Levels of Chemical Compounds in Bottled Water Samples Associated with Illness, Brevard County, October, 2004

Chemical Compound	Opened 1 Gallon Bottle	Unopened 1 Gallon Bottle
Dimethlylphthalate	1.0 µg/L	1.0 µg/L
Diethylphthalate	1.0 µg/L	1.0 µg/L
Pentachlorophenol	1.4 µg/L	1.4 µg/L
Butyl Benzyl Phthalate	2.0 µg/L	2.0 µg/L
Di (2-Ethylhexyl) Adipate	2.0 µg/L	2.0 µg/L
Di (2-Ethylhexyl) Phthalate	2.0 µg/L	2.0 µg/L
Benzene	26 µg/L	0.84 µg/L
Toluene	93 µg/L	3.4 µg/L
Ethylbenzene	16 µg/L	0.42 µg/L
1,3,4-Trimethylbenzene	21 µg/L	0.23 µg/L
1,2,4-Trimethylbenzene	47 µg/L	0.78 µg/L
Naphthalene	120 µg/L	1.1 µg/L
M, P-Xylenes	51 µg/L	1.5 µg/L
O-Xylene	43 µg/L	0.81 µg/L
Xylenes (Total)	94 µg/L	2.3 µg/L
Choloroform	16 µg/L	14 µg/L
Total THMS	18 µg/L	16 µg/L

This single incident of illness appears to be associated with the consumption of commercially bottled water. The illness onset was immediately after drinking the water from a bottled container. The water in the container had a noxious odor. The water from this container and an unopened container of the same water had levels of chemicals associated with gasoline or gasoline by-products. These chemicals are not supposed to be in water for human consumption at any levels. The symptoms described are consistent with other documented chemical poisonings.

The storage of food or drink must be in areas that are protected from hazardous chemicals and other deleterious substances. This is especially important during the harried activities leading up to and following an impending disaster such as a hurricane. Bottled water supplies are often relied upon as a sole source of hydration when local water distribution systems are compromised by a disaster or hazardous event. It is important for business concerns to follow good manufacturing practices for the storage of all food and water products to be used for human consumption. These good manufacturing practices need to be adhered to in order to prevent contamination of a wholesome product regardless of circumstances.

Outbreak of Gastrointestinal Illness Associated with a Catered Event, Collier County, November 2004

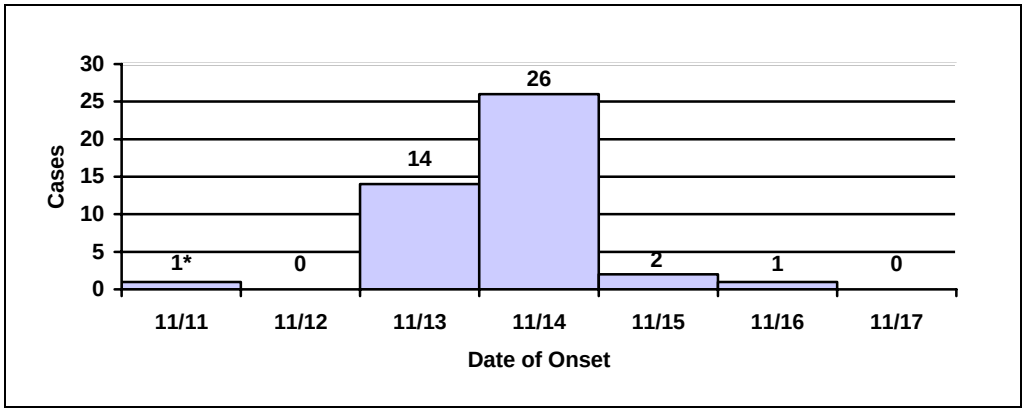
On November 15, 2004, the Collier County Health Department (CCHD) received a phone call from the Florida Poison Information Center Network (FPICN) reporting a possible food poisoning from a catered event at a condo gathering in Naples, Florida. A woman reported that at least 36 of 60 people were ill. Symptoms reported included vomiting, diarrhea, headache, and chills. Based on the incubation period and symptoms reported, Norovirus was suspected.

On November 15, the CCHD began an investigation. Sample menus were obtained from the caterer, along with detailed preparation and serving procedures. A list of attendees was also acquired and a questionnaire was developed and administered via telephone to all attendees of the condo gathering on November 12, 2004. The caterer is licensed by the Department of Health and the food was prepared at a cultural center, which had another event that same night

supplied by the same caterer (~800 people attended, no illnesses reported). A case was defined as a person who consumed the catered food at the condo gathering on November 12, 2004 and subsequently experienced vomiting or diarrhea or any three of the following: nausea, abdominal cramps, chills, fever, headache, weakness or dizziness. No leftover foods were available for laboratory analysis. Cases were not hospitalized nor did they seek medical care. Two stool specimens were collected for laboratory analysis. The resulting data were analyzed using Epi Info, version 3.2.2 statistical software.

A total of 60 people who attended the event were interviewed. Four individuals were excluded from the study: 3 did not eat any of the food and were not ill, and the fourth was the caterer. He and his baby were ill with gastrointestinal symptoms within 10 days prior to this event. The caterer's date of onset was November 11, 2004 and his duration of symptoms was 24 hours. Of the 56 people in this study, 43 reported illness that met the case definition for an attack rate of 76.8%. Symptoms reported included in descending order of importance: nausea (93%), diarrhea (81.4%), weakness (81.4%), headache (76.7%), abdominal cramps (72.1%), chills (60.5%), vomiting (58.1%), fever (41.9%) and dizziness (23.3%). The incubation period ranged from 6 – 96 hours, median 32 hours. Duration of illness ranged from 4 – 96 hours, median 48 hours. The cases ranged in age from 39 to 77 years, median age 66 years; 25 females (58.1%), and 18 males (41.9%). The 2 stool specimens submitted for laboratory analysis were negative for enterics. One stool specimen was tested for Norovirus at the Department of Health, Bureau of Laboratories Jacksonville lab and the result was positive G2 Norovirus. The number of cases was plotted by date of symptom onset to graph the following epidemic curve (Figure 3).

Figure 3: Number of Gastrointestinal Illness Cases by Date of Onset, Catered Event, Collier County, 2004



*11/11 – Caterer onset

Table 5 displays the food specific attack rates and risk factors for selected food items consumed. Multiple foods are shown to be statistically significant, which include the Cajun shrimp with pineapple/mango salsa, tomato, basil and fresh mozzarella skewers and the domestic and imported cheeses. For example, people who ate the Cajun shrimp with pineapple/mango salsa were 2.24 times more likely to become ill as those who did not eat the Cajun shrimp with pineapple mango salsa.

Table 5: Food-Specific Attack Rate Table, Catered Event, Collier County, 2004

Food	# of persons who ate specified food				# of persons who did not eat specified food				RR	95% CI	p-value
	Ill	Well	Total	% Ill	Ill	Well	Total	% Ill			
Cajun Shrimp w/ pineapple/ mango salsa	**36**	**3**	**39**	**92.3**	**7**	**10**	**17**	**41.2**	**2.24**	**1.26-3.99**	**0.00010**
Chicken Saté	39	7	46	84.8	4	6	10	40.0	2.12	0.98-4.57	0.007
Tomato/cheese	**23**	**1**	**24**	**95.8**	**20**	**12**	**32**	**62.5**	**1.53**	**1.16-2.03**	**0.003**
Havarti	**15**	**0**	**15**	**100**	**28**	**13**	**41**	**68.3**	**1.46**	**1.19-1.80**	**0.009**
Pineapple/ mango/salsa	**15**	**0**	**15**	**100**	**28**	**12**	**40**	**70.0**	**1.43**	**1.17-1.75**	**0.01**
Brie	**13**	**0**	**13**	**100**	**30**	**13**	**43**	**69.8**	**1.43**	**1.18-1.75**	**0.02**
Cheddar	**20**	**2**	**22**	**90.9**	**23**	**11**	**34**	**67.6**	**1.34**	**1.03-1.76**	**0.04**

***Statistically significant foods bolded**

An environmental investigation was conducted along with detailed preparation and serving procedures. Food was received frozen and stayed frozen until ready to use. The shrimp was defrosted under running water, skewered, refrigerated, then cooked and served. The frozen foods were assembled on sheet pans, cooked in a rented oven and moved directly to a hot box, which was kept at 180° F. The food was transferred to hotel pans which were placed over portable heat sternos. The pineapple/mango salsa was prepared by the caterer, who cut up the fruit and added rice wine vinegar. The tomato basil and mozzarella skewers were prepared by a cook and placed on platters by the servers. The cheese and fruit platter was arranged by the cook from pre-cut fruit and cheeses. The cold food was transported in insulated boxes, and then put on platters at room temperature for the entire event which was 3-4 hours. Tongs were provided for all guests to help themselves. Interviews with the caterer revealed that gloves were not worn when preparing foods. Since the business was not in operation at the time of the investigation, hand washing could not be observed. Gloves were worn by the servers to refill food on buffets. The caterer had 2 events on the same day and he prepared all foods for both events. The foods for both events were prepared and kept separately except for the roast beef. The events occurred simultaneously and the caterer stayed at the cultural center while his cook handled the condo event. No illnesses were reported at the cultural center event.

Based on the findings of this investigation, this outbreak of gastrointestinal illness appears to be associated with the consumption of multiple foods, which include the Cajun shrimp with pineapple/mango salsa, tomato, basil and fresh mozzarella skewers and the domestic and imported cheeses at the catered event in Naples on November 12, 2004. The onset of symptoms was chronologically clustered indicating a common source exposure. No other epidemiological associations were identified. The caterer reported that he and his baby had been ill with gastrointestinal symptoms within 10 days prior to the event. His onset was November 11, 2004. It is possible to shed Norovirus up to 3 weeks after symptoms subside. Although employees may comply with good hygienic practices and wear gloves while handling food, the possibility exists that a food worker(s) who prepared the food(s) may have been asymptomatic and a breach in personal hygiene practices may have caused the agent to be transmitted intermittently. Viruses cannot multiply in foods (they only reproduce within living cells in the body of the host). However, some viruses are transmitted through food(s) because they remain infectious in the environment, therefore fomite transmission may have also played a

role in this outbreak. Failure to exercise good hygienic practices is usually the cause of many of these outbreaks.[8]

The incubation period, symptomatology, duration of illness and the confirmed lab result indicates Norovirus to be the cause of this gastrointestinal outbreak. Norovirus is usually a self-limited, mild to moderate disease that often occurs in outbreaks, with clinical symptoms of nausea, vomiting, diarrhea, abdominal pain, headache, low-grade fever, malaise or a combination of these symptoms. Symptoms characteristically last 24 - 48 hours. The incubation period is usually 24 - 48 hours with a range of 10 - 50 hours. The period of communicability is during the acute phase of disease and up to 72 hours after diarrhea stops. The mode of transmission is probably fecal-oral route, although person-to-person contact or airborne transmission from fomites has been suggested to explain the rapid spread in-group environments. Secondary transmission to family members and other close group environments are common occurrences. The viruses are passed in the stool of infected persons, and then spread to others who consume contaminated food or water. The infection most often affects adults and older children, although anyone can get it. Outbreaks of Norovirus infections are often linked to eating raw or undercooked oysters, sandwiches or salad ingredients. Foods that require no subsequent cooking constitute the greatest risk. Contaminated water in municipal supplies, wells, lakes, swimming pools or storage tanks can also cause outbreaks.[9,10]

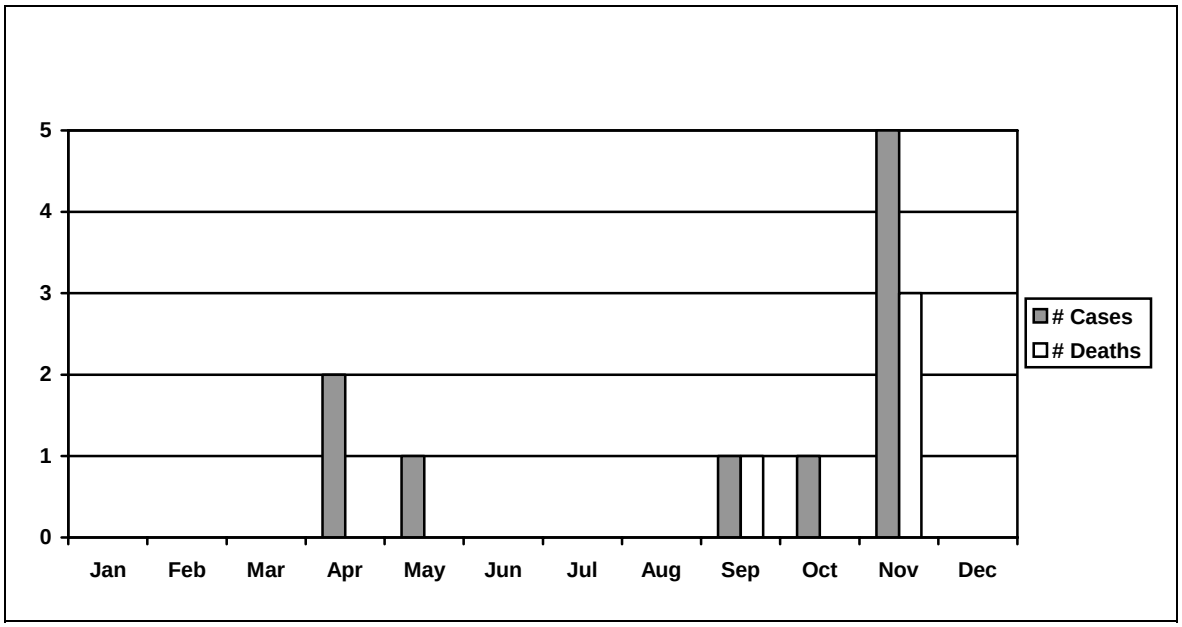
The illness can be avoided by thoroughly washing hands with soap and warm water after using the restroom, before handling food, by thoroughly cooking food and by thoroughly washing raw fruits and vegetables. Clean and sanitize all food contact surfaces frequently. Persons who are infected with the Norovirus should not prepare food while symptomatic and for at least 3 days after becoming symptom free. [11]

An Overview of Foodborne*Vibrio vulnificus*, Florida, 2004

For 2004, there was a total of 36 *Vibrio vulnificus* cases reported in the State of Florida, less than the previous year. Of these, the largest number included 22 wound-related cases and 5 from an unknown exposure. The other 9 cases were associated with the consumption of raw oysters. [12] There were 4 oyster-consumption-related deaths, 3 deaths from unknown exposures and 3 wound-related deaths reported from *Vibrio vulnificus* (see Figure 7). In 2003 there were 28 wound-related cases of *Vibrio vulnificus* (2 death), 5 from unknown exposures (4 deaths) and 14 cases associated with the consumption of raw oysters (4 deaths).

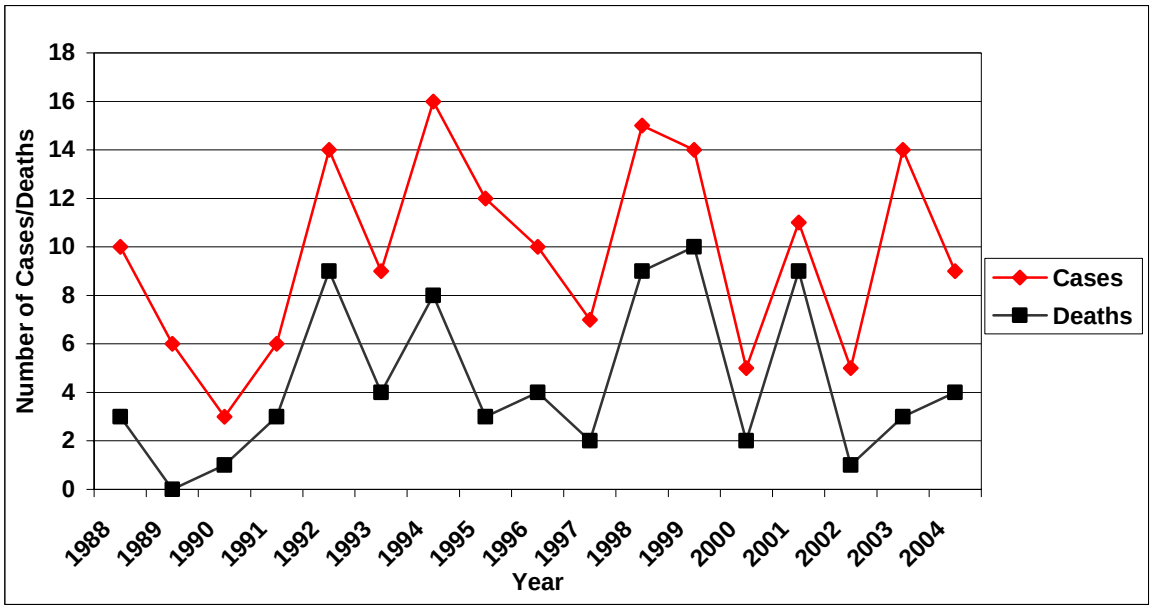
[8] Hale A. BMJ 1999; 318:1433-1434 (29 May), Editorials, Foodborne viral infections.
[9] Control of Communicable Diseases Manual,,Chin, James MD, MPH 2000, 17th Ed., American Public Health Association.
[10] Food and Drug Administration, Foodborne Pathogenic Microorganisms and Natural Toxins Handbook, Web page: http://www.cfsan.fda.gov/~mow/intro.html, 01/07/05.
[11] Center for Disease Control (CDC) Respiratory and Enteric Viruses Branch: Viral Gastroenteritis, , August 20, 2001, http://www.cdc.gov/ncidod/dvrd/revb/gastro/Norovirus.htm.
[12] *Vibrio vulnificus* cases are also counted as outbreaks because of the virulence of the disease.

Figure 4: *Vibrio vulnificus* Cases and Deaths Due to Shellfish Consumption by Month, Florida, 2004



The Florida Department of Health is collaborating in a statewide *Vibrio vulnificus* Education Project with the Florida Department of Agriculture and Consumer Services and with the Interstate Shellfish Sanitation Conference. Targeted audiences include high risk groups, health care practitioners and the general public. On April 13, 2004, a train-the-trainer workshop was conducted in New Orleans by the Florida *Vibrio vulnificus* Education Coordinator and the Department of Agriculture and Consumer Services Molluscan Shellfish Program. Trainees included participants from Georgia, Alabama, Mississippi, Louisiana, Texas and California. Other project elements included poster displays in the public areas of several County Health Deparments including Duval, Baker, Clay and Nassau CHDs. In addition, liver disease support groups all over Florida were contacted and mailed educational brochures when they requested them. Press releases emphasizing the risk of raw oyster consumption by high risk groups were distributed in May and again twice in November. *Vibrio vulnficus* displays and educational brochures were present at the annual meeting of the Florida Dietetic Association, the Florida Public Health Association, the Florida Environmental Health Association, the Academy of Florida Physician Assistants and the Florida Student Nurse Association. Figure 5 shows oyster-related*Vibrio vulnificus* cases and deaths in Florida, from 1988-2003.

Figure 5: *Vibrio vulnificus* Cases and Deaths Associated With Oyster Consumption, Florida, 1988-2004



An Overview of Foodborne Hepatitis A in Florida, 1995-2004

Nationwide estimates are that hepatitis A accounts for 0.8% of total foodborne outbreaks and for less than 0.8% of total foodborne outbreak-related cases .[13] Florida estimates that hepatitis A accounts for 0.6% of total foodborne outbreaks (1994-2003 trend: flat - no increase or decrease) and for .95% of total foodborne outbreak-related cases (1994-2003 trend: upward a little less than 1%).[14,15]

Table 6: Comparison of National and Florida Percentages of Foodborne Hepatitis A

	% Total foodborne outbreaks	% Total outbreak-related cases
Nationwide (1993-1998)	0.8%	0.8%
Florida (1994- 2003)	0.6%	.95%

[13] Sonja Olsen, et al. Surveillance for Foodborne-Disease Outbreaks – United States, 1993-1997, Morbidity and Mortality Weekly Report, CDC Surveillance Summaries (49)SS-1, March 17, 2000.
[14] Source: Bureau of Community Environmental Health, Food and Waterborne Disease Program
[15] Source: Bureau of Community Environmental Health, Food and Waterborne Disease Program

Figure 6: Foodborne Hepatitis A: Percent Total Foodborne Outbreaks and Outbreak-related Cases, 1995-2004, Florida

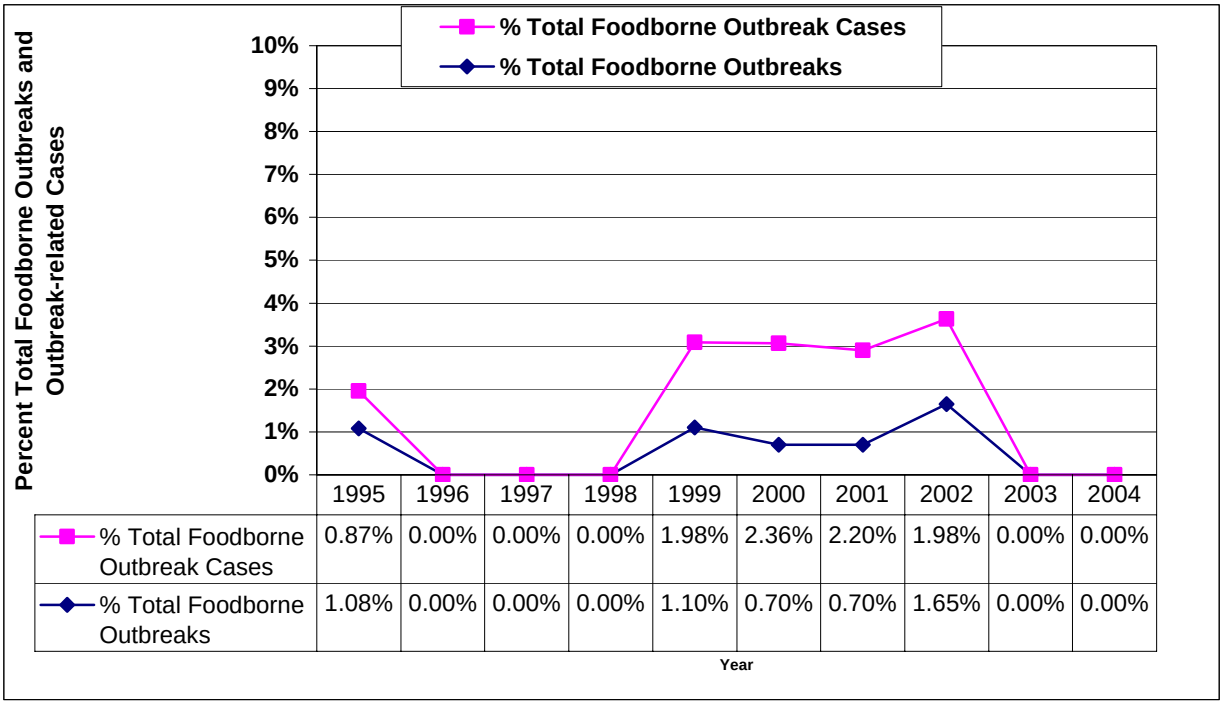


Table 7: Number of Reported Foodborne Hepatitis A Outbreaks in Florida, 1995-2004[16]

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Confirmed Foodborne Hepatitis A Outbreaks	2	0	0	0	1	2	2	4	0	0
Suspected Foodborne Hepatitis A Outbreaks	1	0	0	0	2	0	0	0	0	0
Total	3	0	0	0	3	2	2	4	0	0
Total # Foodborne Outbreaks	**278**	**300**	**428**	**299**	**272**	**268**	**290**	**243**	**185**	**173**
% Outbreak-related Hepatitis A	**1.1%**	**0%**	**0%**	**0%**	**1.1%**	**0.7%**	**0.7%**	**1.6%**	**0%**	**0%**

[16] Source: Bureau of Community Environmental Health, Food and Waterborne Disease Program

Table 8: Number of Foodborne Outbreak-related Hepatitis A Cases in Florida, 1995- 2004[17]

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Cases in Confirmed Foodborne Hepatitis A Outbreaks	21	0	0	0	17	23	40	29	0	0
Cases in Suspected Foodborne Hepatitis A Outbreaks	3	0	0	0	12	0	0	0	0	0
Total	**24**	**0**	**0**	**0**	**29**	**23**	**40**	**29**	**0**	**0**
Total # Foodborne Outbreak-related Cases	**2755**	**2224**	**2677**	**3194**	**1463**	**1527**	**1921**	**1466**	**1564**	**1911**
% Foodborne Hepatitis A Cases	**0.8%**	**0%**	**0%**	**0%**	**2%**	**1.5%**	**2%**	**1.98%**	**0%**	**0%**

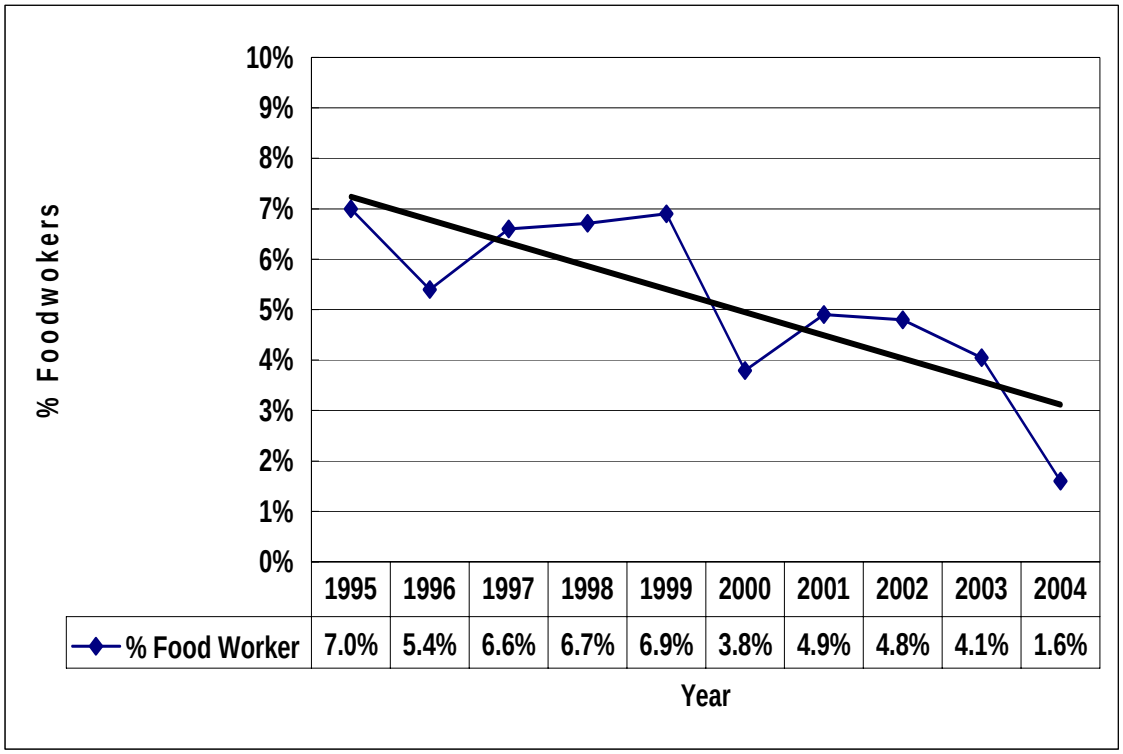
An examination of the total number of reported hepatitis A cases in Florida shows that foodworkers with hepatitis A account for 5.5% of the total confirmed hepatitis A cases statewide (1995- 2004).[18] The percentage of foodworker hepatitis A in Florida shows a slight downward trend of about 3% from 1995-2004.

Table 9: Percentage of Foodworker Hepatitis A Cases of Total Reported Hepatitis A Cases, Florida, 1995-2004

Statewide Confirmed Hepatitis A Cases	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**Total**
# Confirmed Cases	663	720	812	611	855	659	990	1,016	368	512	7,206
# Foodworker Cases	46	39	54	41	59	25	49	63	15	8	399
% Food Worker	**7.0%**	**5.4%**	**6.6%**	**6.7%**	**6.9%**	**3.8%**	**4.9%**	**4.8%**	**4.1%**	**1.6%**	**5.5%**

[17] Source: Bureau of Community Environmental Health, Food and Waterborne Disease Program
[18] Source: DOH Merlin Reportable Disease System

Figure 7: Hepatitis A in Florida, Percent Foodworkers of Total Cases, 1995-2004



It is easy to find a job in the foodworker industry and the workforce is very transient and mobile. Possible contributing factors to hepatitis A in foodworkers include an increase in the immigrant population who may have cultural and socio-economic differences in food safety standards, hygiene and language barriers, generating challenges in foodworker training. An increase in hepatitis A in the groups with the most cases including drug users and men who have sex with men might also be reflected in the food industry (these groups like all others can easily find work in the food industry). Younger people entering the food service industry also present a training challenge as many have little knowledge of food safety and hygiene.

All of the above factors point to a need for better training of the food industry particularly where proper hygiene and handwashing are concerned. This is an ongoing effort on the part of inspectors, epidemiologists and health care practitioners.

Current efforts include:

- The national FightBac! campaign sponsored by FDA (website provides materials for educators, the public, media, materials also available in Spanish),
- Food worker training by DBPR, DOH and DACS, to county health departments, interested community groups, university classes,
- Refresher training by DBPR, DOH and DACS when outbreaks occur or when food workers are confirmed for hepatitis A,
- Development of exclusion form letter to notify other agencies of foodworker exclusions,
- Hepatitis A training by the Food and Waterborne Disease Program,
- Newsletter articles for the Hepatitis Program newsletter,

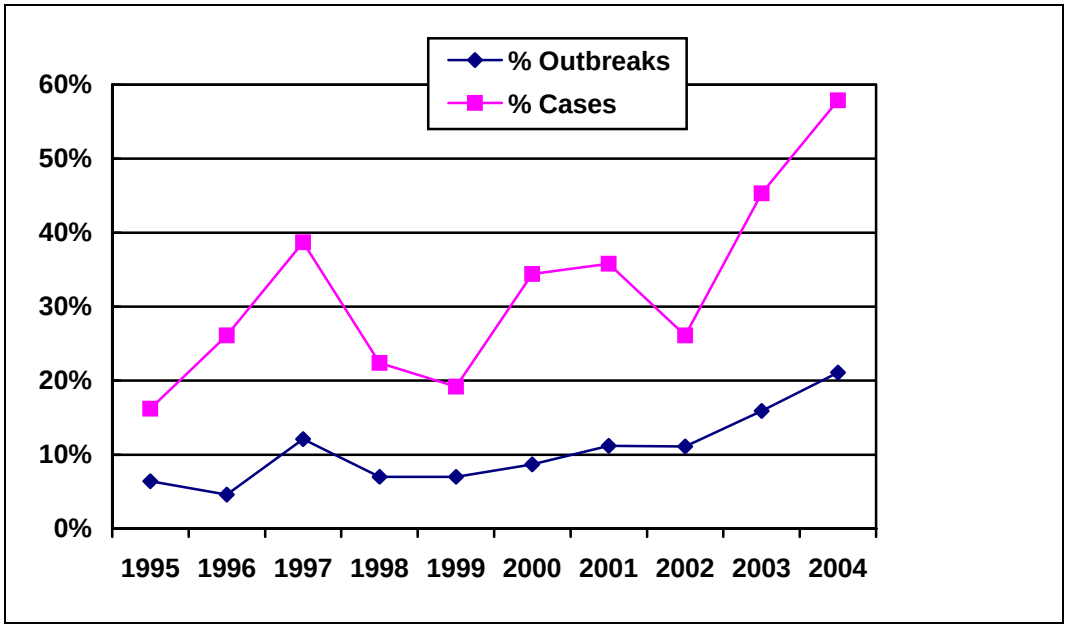
- Handwashing magnets developed and distributed through 9 Regional Food and Waterborne Disease Epidemiolgists to targeted community populations and groups. These magnets are currently being redeveloped to include magnets in Spanish and Haitian Creole as well as visual arts that are more culturally diverse,
- Adults at increased risk (men who have sex with men, intravenous drug users) vaccinated based on behavioral risk factor rather than employment.

Proposed activities for further foodborne hepatitis A prevention include:

- Bureau of Community Environmental Health Foodborne Hepatitis A WebPage:
  - How you get it
  - How to prevent it
  - Basic charts
  - Links to other websites
- More community training, discuss with the Florida Department of Education possibilities of handwashing training in classrooms, perhaps reapply for grant funding.

An Overview of Foodborne *Norovirus* Reported in Florida, 1995-2004

Figure 8: Trends of *Norovirus* in Reported Outbreaks and Outbreak Cases, Florida, 1995-2004



Of the estimated 23 million cases of *Norovirus* each year, foodborne *Norovirus* accounts for an estimated 9.2 million cases (67% of the total foodborne illness cases) per year nationally. It is estimated that 20,000 (32.9% total) hospitalizations and 124 (6.9% total) deaths can be attributed to foodborne *Norovirus* infections.[19]

[19] Food Related Illness and Death in the United States, Mead, Paul et al. Emerging Infectious Diseases (5) 5:607-625, http://www.cdc.gov/ncidod/eid/vol5no5/mead.htm (as of 01/19/05)

In Florida, 10.5% of total food and waterborne outbreaks or 28% total food and waterborne cases can be attributed to *Norovirus* infections (no data are available on hospitalizations or deaths). Reported food and waterborne *Norovirus* outbreaks and cases show a slight upward trend over time. From 1994-2004, there has been a total of 283 food or waterborne *Norovirus* outbreaks with 6,896 associated cases (see Tables 12 and 13). Vehicles of transmission include sandwiches, salads, meal garnishes, oysters, recreational water and ice. The primary contributing factors are the lack of good personal hygiene and handwashing in addition to bare hand contact with food, as well as overboard dumping of raw sewage causing oyster-related outbreaks. Control of the outbreaks involves excluding the ill foodworker(s) where possible and appropriate, handwashing education and education of sport and commercial fishermen.

Table 10: Number of Reported Foodborne *Norovirus* Outbreaks, Florida, 1995-2004

Outbreaks	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**Total**
Suspected	6	6	30	15	14	15	17	18	16	15	152
Confirmed	13	8	23	7	6	10	17	9	14	22	129
Total	**19**	**14**	**53**	**22**	**20**	**25**	**34**	**27**	**30**	**37**	**281**
% Total Outbreaks	**6.4%**	**4.6%**	**12.1%**	**7.0%**	**7.0%**	**8.7%**	**11.2%**	**11.1%**	**15.9%**	**21.1%**	**8.2%**

Table 11: Number of Reported Foodborne *Norovirus* Outbreak-related Cases, Florida, 1995-2004

Outbreak-related cases	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**Total**
Suspected	51	92	377	296	136	154	212	212	438	136	1576
Confirmed	419	633	686	442	160	450	522	170	311	995	3592
Total	**470**	**725**	**1063**	**738**	**296**	**604**	**734**	**382**	**749**	**1131**	**5168**
% Total Outbreak-related cases	**16.2%**	**26.1%**	**38.7%**	**22.4%**	**19.2%**	**34.4%**	**35.8%**	**26.1%**	**38.3%**	**57.8%**	**23.8%**

Laboratory confirmation has been obtained in 69 (24.4%%) of these outbreaks. Since the development of the Department of Health Bureau of Laboratories ability to test stools for *Norovirus*, food and waterborne outbreak investigations have focused on collecting both enteric and viral stool samples for ruling out/confirmation of *Norovirus*. The Food and Waterborne Disease Program has been working with county health departments to encourage proper sampling procedures. Regional food and waterborne disease epidemiologists have also presented *Norovirus* training to County Health Departments in several regions around the state (St. Augustine, Orlando, Ft. Myers, Live Oak, Panama City and Port St. Lucie). The training has also been given to a cruise line who requested it.

Appendix: Statewide Data Tables and Figures

Table 12: Number of Reported Food and Waterborne Outbreaks With Laboratory-Confirmed Etiologic Agents and Number of Cases Associated With These Outbreaks, Florida, 2004

# Outbreaks	Pathogen	# Cases
1	B. cereus	56
2	C. perfringens	36
1	Campylobacter	2
1	Chemical	1
2	Ciguatera	2
1	E. coli O157:H7	3
20	Norovirus	926
5	Salmonella	44
3	Saxitoxin	5
3	V. parahaemolyticus	100
9	V. vulnificus	9
48	Total	1184

Figure 9: Percent Reported Outbreaks With Laboratory-Confirmed Etiologic Agents and Percent Cases Associated With These Outbreaks, Florida, 2004

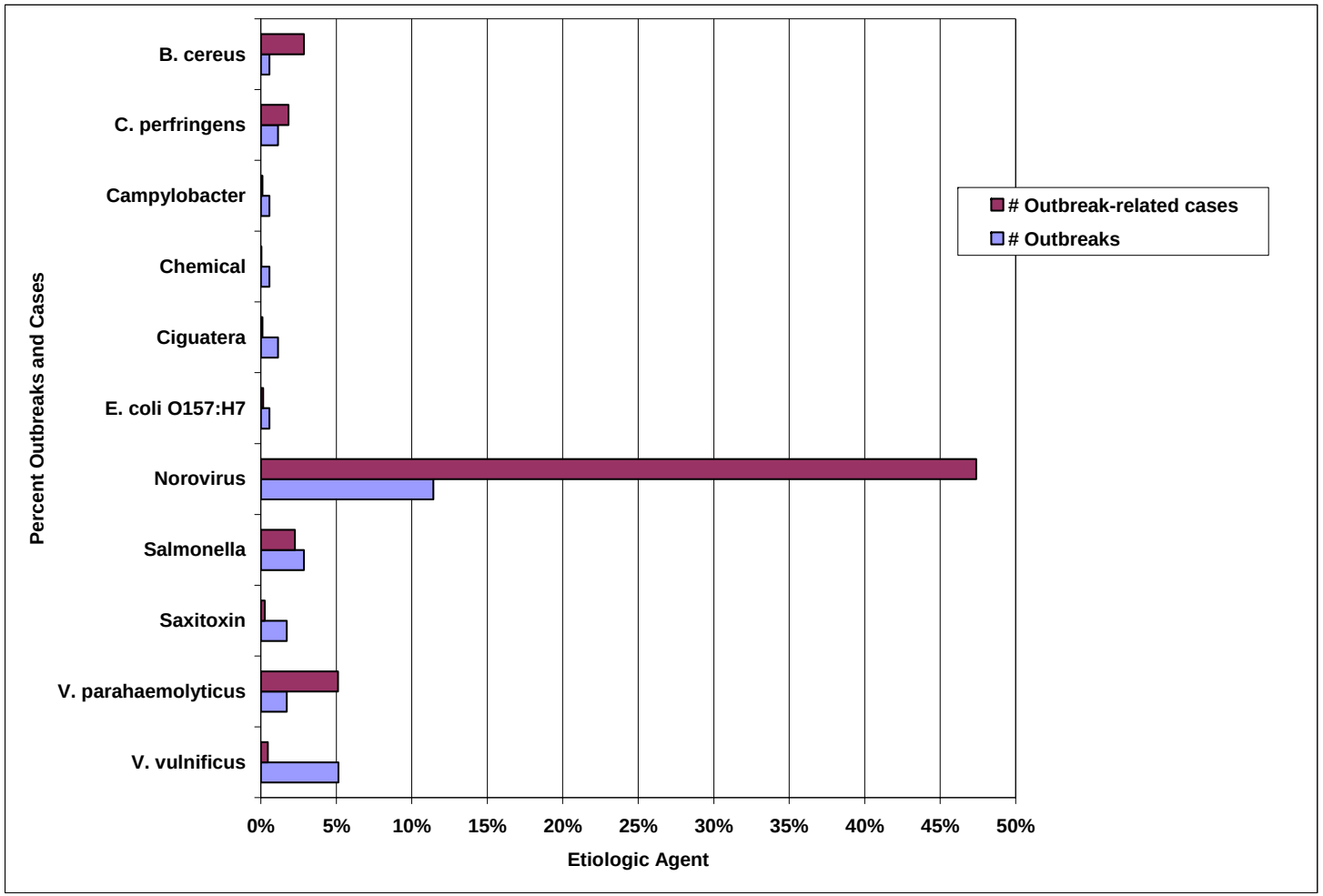
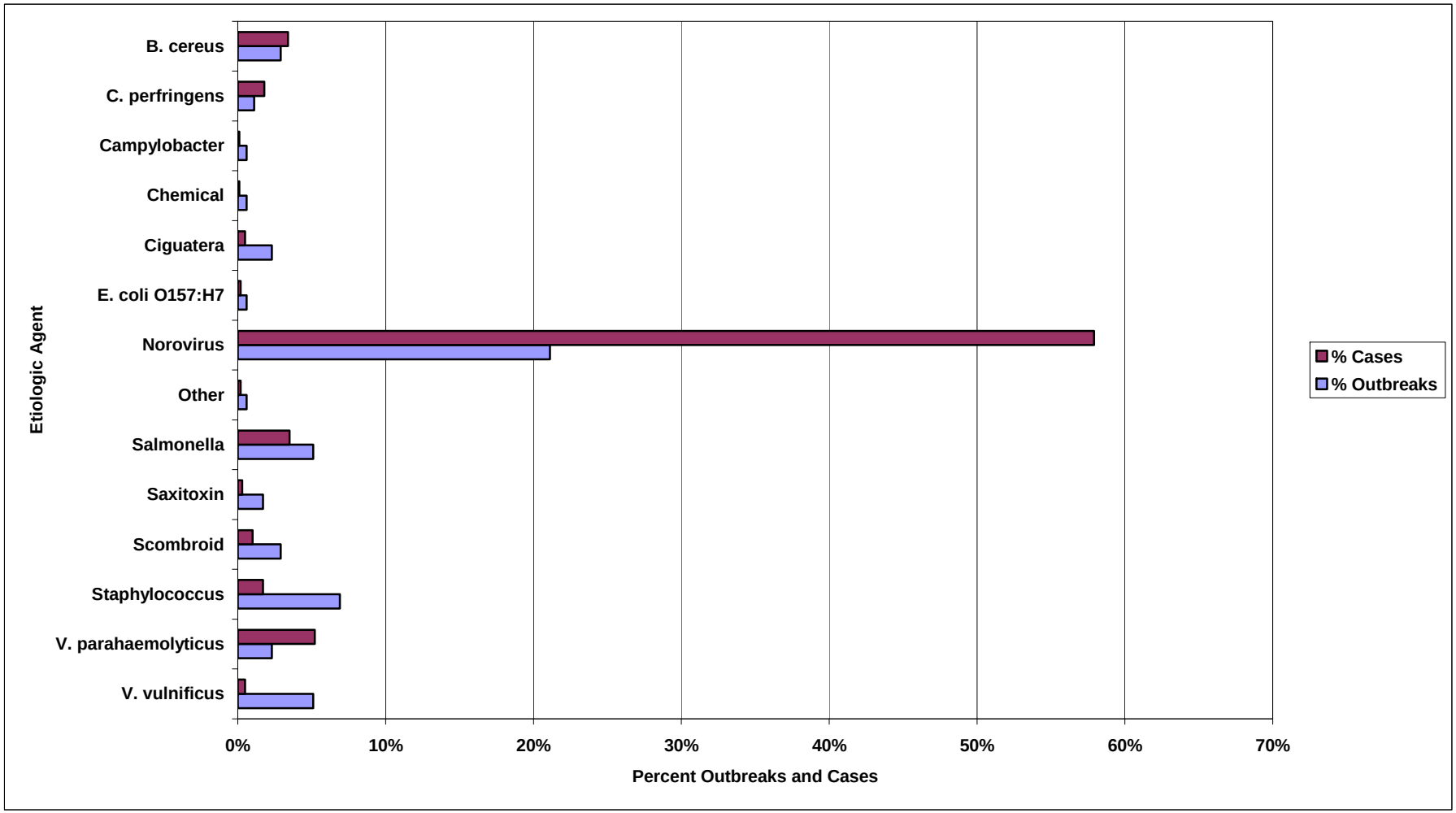
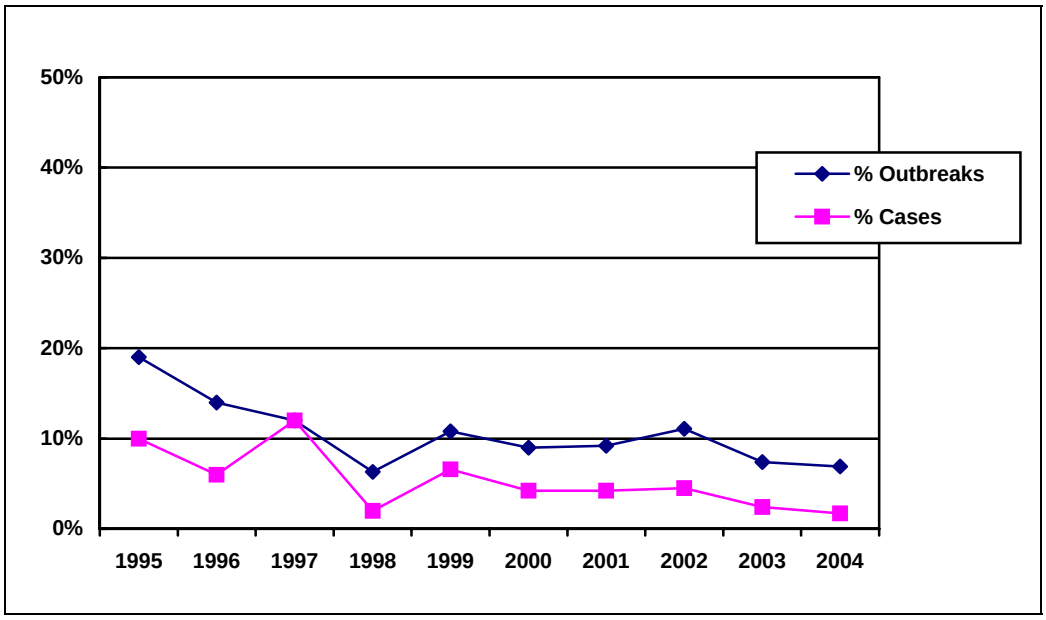


Figure 10: Percent Total Food and Waterborne Disease Outbreaks and Cases by Etiologic Agent, Florida, 2004*



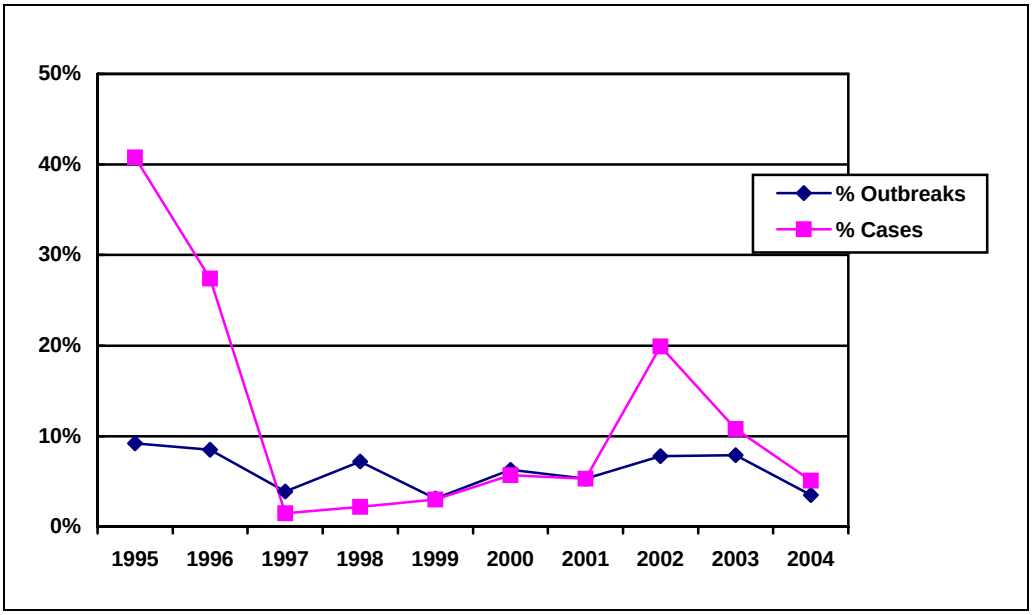
*The etiologic agent was unknown in 46% of the outbreaks and 24% of the cases.

Figure 11: Trends of Staphylococcus in Reported Food and Waterborne Outbreaks and Outbreak-related Cases, Florida, 1995-2004



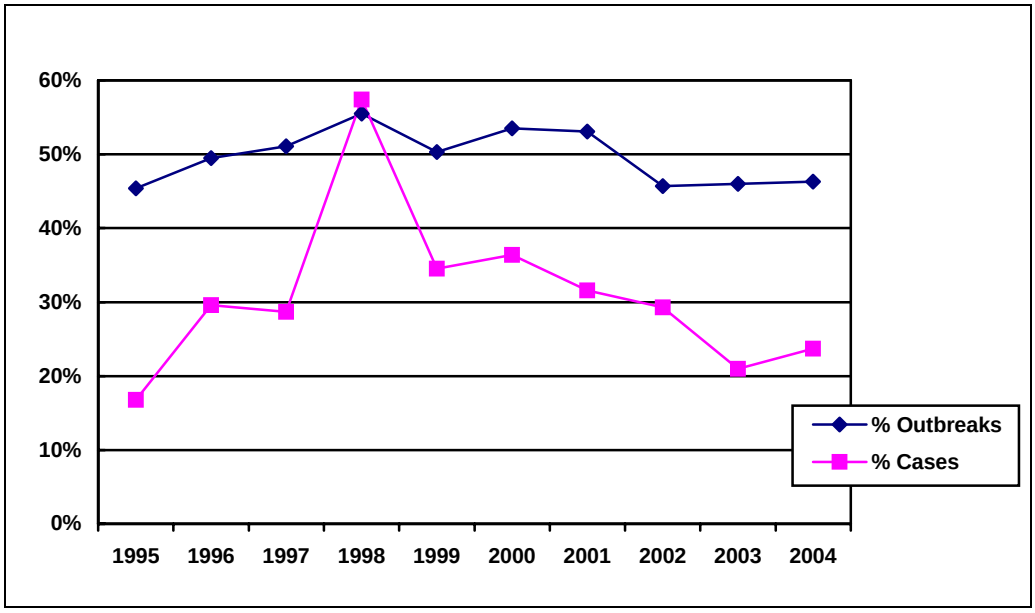
Reported food and waterborne Staphylocccus outbreaks and cases show a downward trend over time.

Figure 12: Trends of Salmonella in Reported Food and Waterborne Outbreaks and Outbreak-related Cases, Florida, 1995-2004



Reported food and waterborne Salmonella outbreaks and cases show a downward trend over time.

Figure 13: Trends of Unknown Pathogens in Reported Food and Waterborne Outbreaks and Outbreak-related Cases, Florida, 1995-2004



The amount of food and waterborne outbreaks and outbreak-related cases from unknown causes remains fairly stable over time.

Figure 14: Percent Total Food and Waterborne Outbreaks and Outbreak-related Cases by Site, Florida, 2004

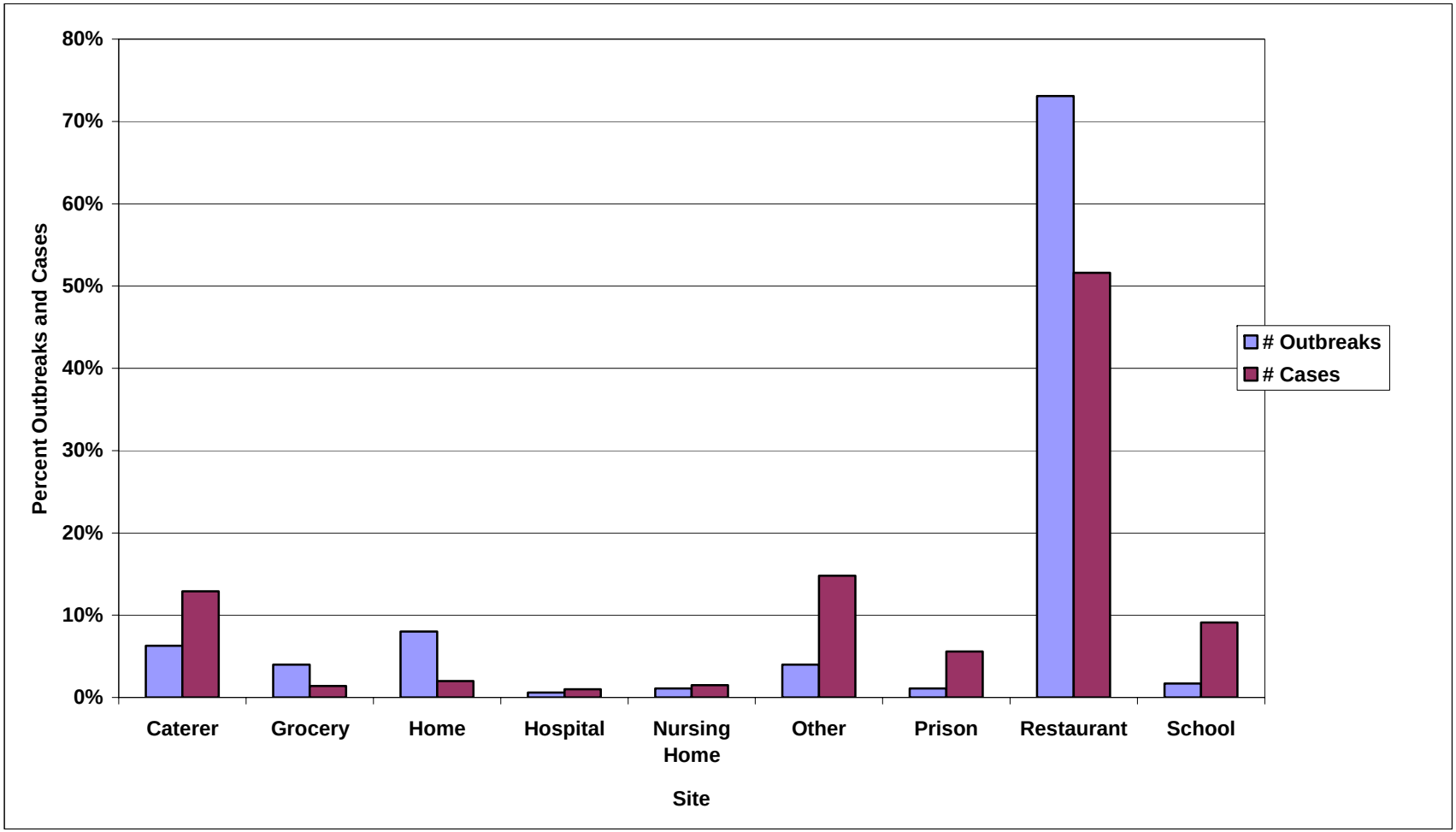


Table 13: Food and Waterborne Outbreaks by Site, Florida, 2004[20]

Status	Caterer	Grocery	Home	Hospital	Nursing Home	Other[21]	Prison	Restaurant	School	Total
Confirmed	8	4	5	0	1	7	2	28	3	**58**
row %	13.8%	6.9%	8.6%	0.0%	1.7%	12.1%	3.4%	48.3%	5.2%	**33.1%**
col %	72.7%	57.1%	35.7%	0.0%	50.0%	100.0%	100.0%	21.9%	100.0%	
Suspected	3	3	9	1	1	0	0	100	0	**117**
row %	2.6%	2.6%	7.7%	0.9%	0.9%	0.0%	0.0%	85.5%	0.0%	**66.9%**
col %	27.3%	42.9%	64.3%	100.0%	50.0%	0.0%	0.0%	78.1%	0.0%	
Total	11	7	14	1	2	7	2	128	3	**175**
% Total	**6.3%**	**4.0%**	**8.0%**	**0.6%**	**1.1%**	**4.0%**	**1.1%**	**73.1%**	**1.7%**	**100%**

Table 14: Food and Waterborne Outbreak-related Cases by Site, Florida, 2004[22]

Status	Caterer	Grocery	Home	Hospital	Nursing Home	Other[23]	Prison	Restaurant	School	Total
Confirmed	234	20	11	0	20	289	109	637	178	**1498**
row %	15.6%	1.3%	0.7%	0.0%	1.3%	19.3%	7.3%	42.5%	11.9%	**76.7%**
col %	92.5%	74.1%	28.2%	0.0%	66.7%	100.0%	100.0%	63.1%	100.0%	
Suspected	19	7	28	20	10	0	0	372	0	**456**
row %	4.2%	1.5%	6.1%	4.4%	2.2%	0.0%	0.0%	81.6%	0.0%	**23.3%**
col %	7.5%	25.9%	71.8%	100.0%	33.3%	0.0%	0.0%	36.9%	0.0%	
Total	253	27	39	20	30	289	109	1009	178	**1954**
% Total	**12.9%**	**1.4%**	**2.0%**	**1.0%**	**1.5%**	**14.8%**	**5.6%**	**51.6%**	**9.1%**	**100%**

[20] First percentage figure under confirmed row is a measure of the total outbreaks, the second percentage figure is a measure of the outbreaks in that column.
[21] E.g. potluck office parties, retirement parties, Little League games, etc.
[22] First percentage figure under suspected row is a measure of the total cases, the second percentage figure is a measure of the cases in that column.
[23] Ibid.

Table 15: Food and Waterborne Outbreaks and Cases Reported by Agency of Jurisdiction,[24,25] Florida, 2004

Agency	# Outbreaks	% Outbreaks	# Cases	% Cases
DACS	20	11.4%	194	9.9%
DBPR	134	76.6%	1163	59.5%
DOH	11	6.3%	532	27.2%
OTHER	10	5.8%	65	3.4%
Total	175	100.0%	1954	100.0%

Figure 15: Reported Food and Waterborne Disease Outbreaks by Agency of Jurisdiction, 1995-2004

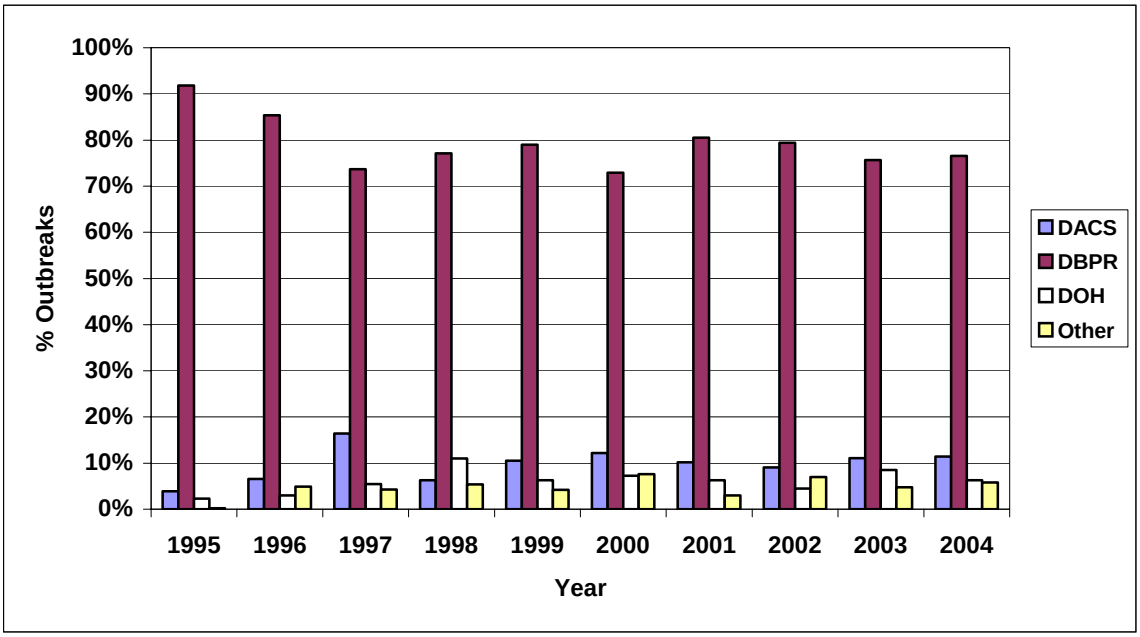
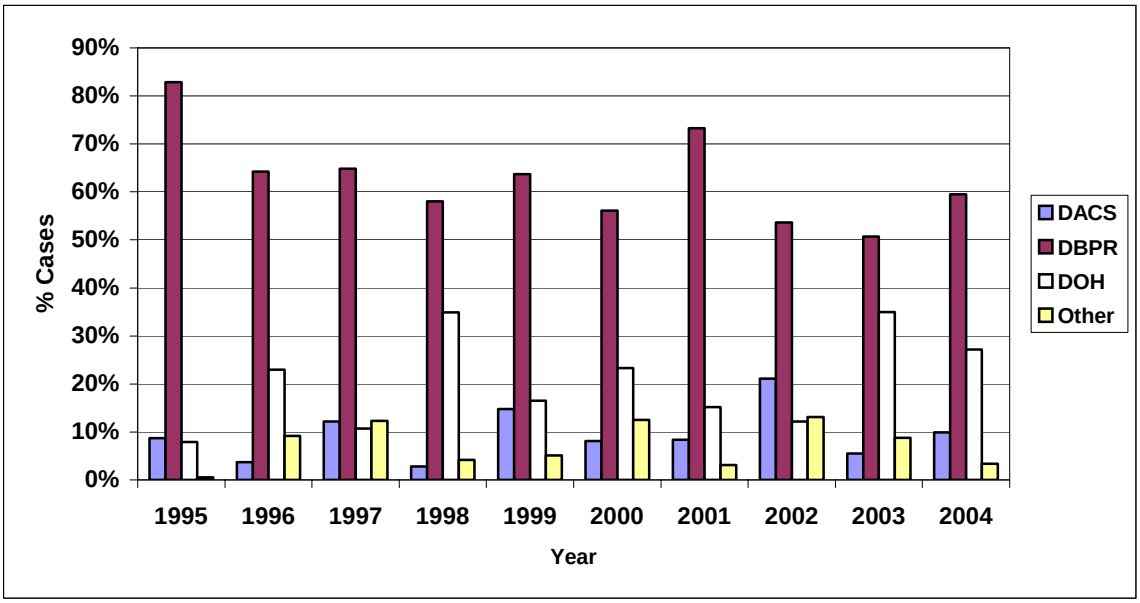


Figure 16: Cases Associated With Reported Food and Waterborne Disease Outbreaks by Agency of Jurisdiction, 1995–2004



[24] Agency of jurisdiction refers to the agency regulating the primary food source and/or food workers identified as the cause of the outbreak (DACS = Department of Agriculture and Consumer Services, DBPR = Department of Business and Professional Regulation, DOH = Department of Health, OTHER = most often private homes or events, occasionally other state or federal agencies).

[25] Data from previous years can be found in the 2002 and 2003 Annual Reports.

Figure 17: Percent Total Food and Waterborne Outbreaks and Outbreak-related Cases by Vehicle, Florida, 2004

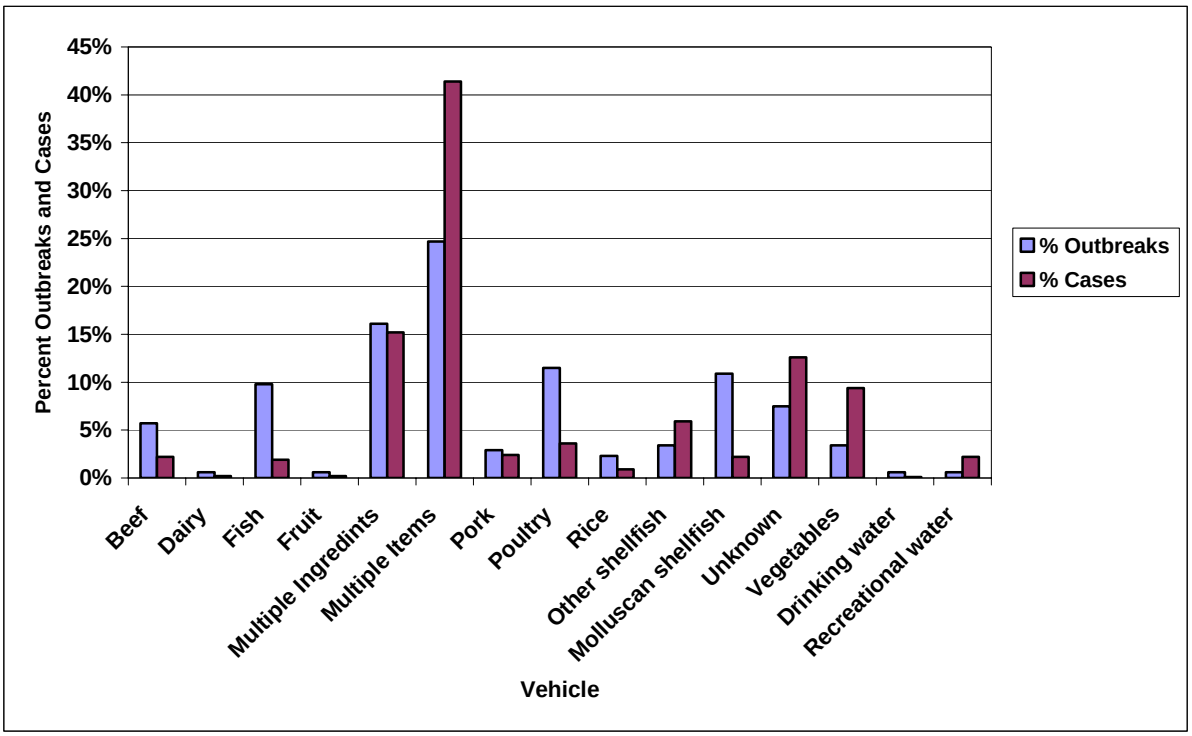


Table 16: Food and Waterborne Outbreaks by Vehicle, Florida, 2004[26]

Status	Beef	Dairy	Fish	Fruit	Mult Ingred	Mult Items	Pork	Poultry	Rice	Other shellfish	Molluscs	Unk	Vegs	Drink Water	Rec Water	Total
Confirmed	1	0	6	1	7	13	2	1	0	3	12	6	4	1	1	58
row %	1.7%	0.0%	10.3%	1.7%	12.1%	22.4%	3.4%	1.7%	0.0%	5.2%	20.7%	10.3%	6.9%	1.7%	1.7%	33.3%
col %	10.0%	0.0%	35.3%	100.0%	25.0%	30.2%	40.0%	5.0%	0.0%	50.0%	63.2%	46.2%	66.6%	100.0%	100.0%	
Suspected	9	1	11	0	21	30	3	19	4	3	7	7	2	0	0	117
row %	7.8%	0.9%	9.5%	0.0%	18.1%	25.9%	2.6%	16.4%	3.4%	2.6%	6.0%	6.0%	1.7%	0.0%	0.0%	66.8%
col %	90.0%	100.0%	64.7%	0.0%	75.0%	69.8%	60.0%	95.0%	100.0%	50.0%	36.8%	53.8%	33.3%	0.0%	0.0%	
Total	10	1	17	1	28	43	5	20	4	6	19	13	6	1	1	175
Total %	**5.7%**	**0.6%**	**9.8%**	**0.6%**	**16.1%**	**24.7%**	**2.9%**	**11.5%**	**2.3%**	**3.4%**	**10.9%**	**7.5%**	**3.4%**	**0.6%**	**0.6%**	**100%**

Table 17: Food and Waterborne Outbreak-related Cases by Vehicle, Florida, 2004[27]

Status	Beef	Dairy	Fish	Fruit	Mult Ingred	Mult Items	Pork	Poultry	Rice	Other shellfish	Molluscs	Unk	Vegs	Drink Water	Rec Water	Total
Confirmed	15	0	10	4	217	700	36	17	0	109	19	158	170	1	42	1498
row %	1.0%	0.0%	0.7%	0.3%	14.5%	46.7%	2.4%	1.1%	0.0%	7.3%	1.3%	10.5%	11.3%	0.1%	2.8%	76.7%
col %	35.7%	0.0%	27.0%	100.0%	73.3%	86.5%	78.3%	24.3%	0.0%	94.0%	45.2%	64.5%	92.4%	100.0%	100.0%	
Suspected	27	3	27	0	79	109	10	53	17	7	23	87	14	0	0	456
row %	5.9%	0.7%	5.9%	0.0%	17.4%	24.0%	2.2%	11.7%	3.7%	1.5%	5.1%	19.2%	3.1%	0.0%	0.0%	23.3%
col %	64.3%	100.0%	73.0%	0.0%	26.7%	13.5%	21.7%	75.7%	100.0%	6.0%	54.8%	35.5%	7.6%	0.0%	0.0%	
Total	42	3	37	4	296	809	46	70	17	116	42	245	184	1	42	1954
Total %	**2.2%**	**0.2%**	**1.9%**	**0.2%**	**15.2%**	**41.4%**	**2.4%**	**3.6%**	**0.9%**	**5.9%**	**2.2%**	**12.6%**	**9.4%**	**0.1%**	**2.2%**	**100%**

[26] First percentage figure under confirmed row is a measure of the total outbreaks, the second percentage figure is a measure of the outbreaks in that column.
[27] First percentage figure under suspected row is a measure of the total cases, the second percentage figure is a measure of the cases in that column.

Table 18: Total Food and Waterborne Outbreaks, Florida, 2004: Etiologic Agent by Vehicle

Pathogen	Beef	Dairy	Fish	Fruit	Multiple Ingred	Multiple Items	Pork	Poultry	Rice	Other shellfish	Molluscs	Unk	Vegs	Drinking Water	Rec Water	Total
B. cereus	0	0	0	0	1	3	0	1	0	0	0	0	0	0	0	5
C. perfringens	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
Campylobacter	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Chemical	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Ciguatera	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
E. coli O157:H7	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Norovirus	1	0	0	0	6	11	0	0	0	0	5	9	4	0	1	37
Other	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Salmonella	0	0	0	0	3	1	1	2	1	0	0	0	1	0	0	9
Saxitoxin	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Scombroid	0	0	3	0	0	0	0	0	0	2	0	0	0	0	0	5
Staphylococcus	1	1	3	0	1	1	0	4	1	0	0	0	0	0	0	12
Unknown	8	0	4	0	17	26	2	13	2	2	3	3	1	0	0	81
V. parahaemolyticus	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	4
V. vulnificus	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	9
Total	**10**	**1**	**17**	**1**	**28**	**43**	**5**	**20**	**4**	**6**	**19**	**13**	**6**	**1**	**1**	**175**

Table 19: Total Food and Waterborne Outbreak-related Cases, Florida, 2004: Etiologic Agent by Vehicle

Pathogen	Beef	Dairy	Fish	Fruit	Multiple Ingred	Multiple Items	Pork	Poultry	Rice	Other shellfish	Molluscs	Unk	Vegs	Drinking Water	Rec Water	Total
B. cereus	0	0	0	0	2	61	0	3	0	0	0	0	0	0	0	66
C. perfringens	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	36
Campylobacter	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Chemical	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Ciguatera	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9
E. coli O157:H7	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
Norovirus	3	0	0	0	146	564	0	0	0	0	21	182	173	0	42	1131
Other	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4
Salmonella	0	0	0	0	45	5	3	5	2	0	0	0	9	0	0	69
Saxitoxin	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
Scombroid	0	0	7	0	0	0	0	0	0	13	0	0	0	0	0	20
Staphylococcus	2	3	7	0	2	6	0	11	2	0	0	0	0	0	0	33
Unknown	37	0	9	0	101	171	7	51	13	5	8	60	2	0	0	464
V. parahaemolyticus	0	0	0	0	0	0	0	0	0	98	4	0	0	0	0	102
V. vulnificus	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	9
Total	**42**	**3**	**37**	**4**	**296**	**809**	**46**	**70**	**17**	**116**	**42**	**245**	**184**	**1**	**42**	**1954**

Table 20: Confirmed Food and Waterborne Outbreaks, Florida, 2004: Etiologic Agent by Vehicle

Pathogen	Beef	Fish	Fruit	Multiple Ingred	Multiple Items	Pork	Poultry	Other shellfish	Molluscs	Unk	Vegs	Drinking Water	Rec Water	Total
B. cereus	0	0	0	0	1	0	0	0	0	0	0	0	0	1
C. perfringens	0	0	0	0	0	2	0	0	0	0	0	0	0	2
Chemical	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Ciguatera	0	2	0	0	0	0	0	0	0	0	0	0	0	2
E. coli O157:H7	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Norovirus	0	0	0	3	9	0	0	0	2	4	3	0	1	22
Other	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Salmonella	0	0	0	3	0	0	0	0	0	0	1	0	0	4
Saxitoxin	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Scombroid	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Staphylococcus	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Unknown	1	0	0	1	3	0	1	0	0	1	0	0	0	7
V. parahaemolyticus	0	0	0	0	0	0	0	2	1	0	0	0	0	3
V. vulnificus	0	0	0	0	0	0	0	0	9	0	0	0	0	9
Total	**1**	**6**	**1**	**7**	**13**	**2**	**1**	**3**	**12**	**6**	**4**	**1**	**1**	**58**

Table 21: Food and Waterborne Outbreak-related Cases in Confirmed Outbreaks, Florida, 2004: Etiologic Agent by Vehicle

Pathogen	Beef	Fish	Fruit	Multiple Ingred	Multiple Items	Pork	Poultry	Other shellfish	Molluscs	Unk	Vegs	Drinking Water	Rec Water	Total
B. cereus	0	0	0	0	56	0	0	0	0	0	0	0	0	56
C. perfringens	0	0	0	0	0	36	0	0	0	0	0	0	0	36
Chemical	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Ciguatera	0	2	0	0	0	0	0	0	0	0	0	0	0	2
E. coli O157:H7	0	0	0	0	0	0	0	0	0	3	0	0	0	3
Norovirus	0	0	0	131	551	0	0	0	8	102	161	0	42	995
Other	0	0	4	0	0	0	0	0	0	0	0	0	0	4
Salmonella	0	0	0	45	0	0	0	0	0	0	9	0	0	54
Saxitoxin	0	5	0	0	0	0	0	0	0	0	0	0	0	5
Scombroid	0	0	0	0	0	0	0	11	0	0	0	0	0	11
Staphylococcus	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Unknown	15	0	0	41	93	0	17	0	0	53	0	0	0	219
V. parahaemolyticus	0	0	0	0	0	0	0	98	2	0	0	0	0	100
V. vulnificus	0	0	0	0	0	0	0	0	9	0	0	0	0	9
Total	15	10	4	217	700	36	17	109	19	158	170	1	42	1498

Table 22: Suspected Food and Waterborne Outbreaks, Florida, 2004: Etiologic Agent by Vehicle

Pathogen	Beef	Dairy	Fish	Multiple Ingred	Multiple Items	Pork	Poultry	Rice	Other shellfish	Molluscs	Unk	Vegs	Total
B. cereus	0	0	0	1	2	0	1	0	0	0	0	0	4
Campylobacter	0	0	0	0	1	0	0	0	0	0	0	0	1
Ciguatera	0	0	2	0	0	0	0	0	0	0	0	0	2
Norovirus	1	0	0	3	2	0	0	0	0	3	5	1	15
Salmonella	0	0	0	0	1	1	2	1	0	0	0	0	5
Scombroid	0	0	3	0	0	0	0	0	1	0	0	0	4
Staphylococcus	1	1	2	1	1	0	4	1	0	0	0	0	11
Unknown	7	0	4	16	23	2	12	2	2	3	2	1	74
V. parahaemolyticus	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	**9**	**1**	**11**	**21**	**30**	**3**	**19**	**4**	**3**	**7**	**7**	**2**	**117**

Table 23: Food and Waterborne Outbreak-related Cases in Suspected Outbreaks, Florida, 2004: Etiologic Agent by Vehicle

Pathogen	Beef	Dairy	Fish	Multiple Ingred	Multiple Items	Pork	Poultry	Rice	Other shellfish	Molluscs	Unk	Vegs	Total
B. cereus	0	0	0	2	5	0	3	0	0	0	0	0	10
Campylobacter	0	0	0	0	2	0	0	0	0	0	0	0	2
Ciguatera	0	0	7	0	0	0	0	0	0	0	0	0	7
Norovirus	3	0	0	15	13	0	0	0	0	13	80	12	136
Salmonella	0	0	0	0	5	3	5	2	0	0	0	0	15
Scombroid	0	0	7	0	0	0	0	0	2	0	0	0	9
Staphylococcus	2	3	4	2	6	0	11	2	0	0	0	0	30
Unknown	22	0	9	60	78	7	34	13	5	8	7	2	245
V. parahaemolyticus	0	0	0	0	0	0	0	0	0	2	0	0	2
Total	27	3	27	79	109	10	53	17	7	23	87	14	456

Figure 18: Percent Total Food and Waterborne Outbreaks and Cases by Month, Florida, 2004

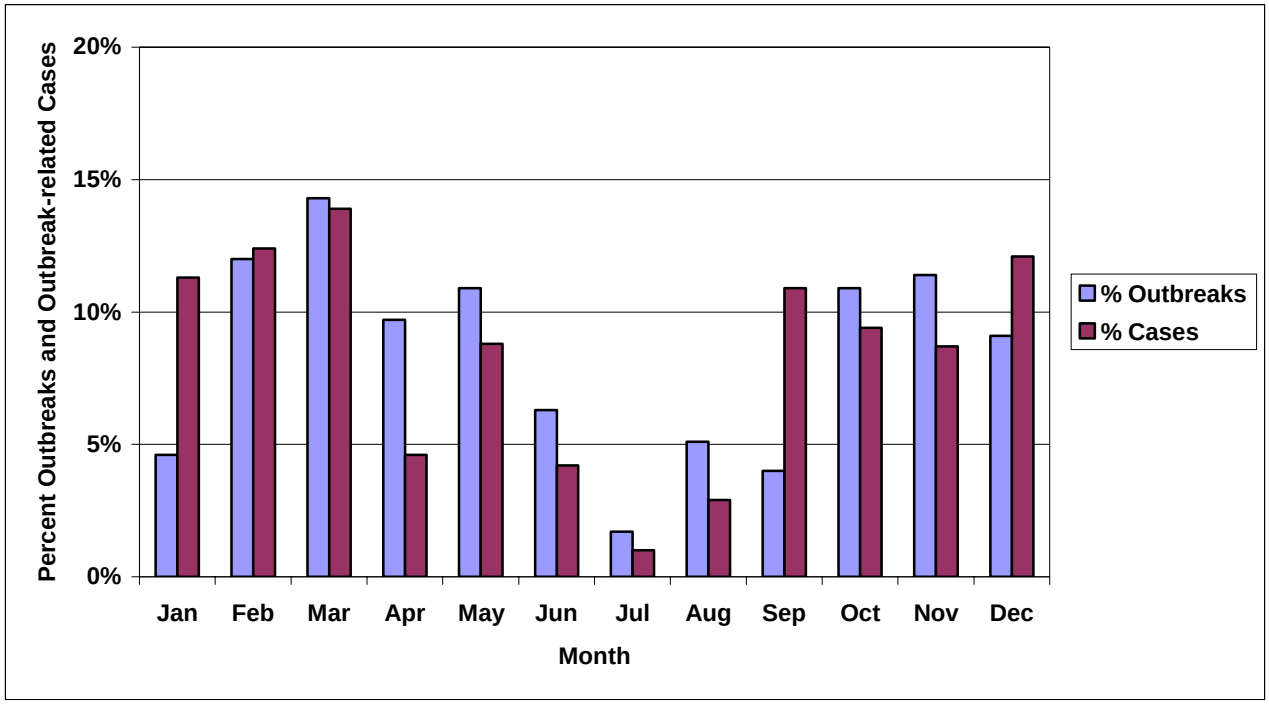


Table 24: Food and Waterborne Outbreaks by Month, Florida, 2004

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	4	7	5	4	6	2	0	3	4	8	11	4	58
row%	6.9%	12.1%	8.6%	6.9%	10.3%	3.4%	0.0%	5.2%	6.9%	13.8%	19.0%	6.9%	33.1%
col%	50.0%	33.3%	20.0%	23.5%	31.6%	18.2%	0.0%	33.3%	57.1%	42.1%	55.0%	25.0%	
Suspected	4	14	20	13	13	9	3	6	3	11	9	12	117
row%	3.4%	12.0%	17.1%	11.1%	11.1%	7.7%	2.6%	5.1%	2.6%	9.4%	7.7%	10.3%	66.9%
col%	50.0%	66.7%	80.0%	76.5%	68.4%	81.8%	100.0%	66.7%	42.9%	57.9%	45.0%	75.0%	
Total	8	21	25	17	19	11	3	9	7	19	20	16	175
Total %	**4.6%**	**12.0%**	**14.3%**	**9.7%**	**10.9%**	**6.3%**	**1.7%**	**5.1%**	**4.0%**	**10.9%**	**11.4%**	**9.1%**	**100%**

Table 25: Food and Waterborne Outbreak-related Cases by Month, Florida, 2004

Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Confirmed	208	201	196	34	134	18	0	40	205	139	143	180	1498
row%	13.9%	13.4%	13.1%	2.3%	8.9%	1.2%	0.0%	2.7%	13.7%	9.3%	9.5%	12.0%	76.7%
col%	94.5%	82.7%	72.3%	38.2%	78.4%	22.0%	0.0%	70.2%	96.2%	76.0%	84.1%	76.3%	
Suspected	12	42	75	55	37	64	19	17	8	44	27	56	456
row%	2.6%	9.2%	16.4%	12.1%	8.1%	14.0%	4.2%	3.7%	1.8%	9.6%	5.9%	12.3%	23.3%
col%	5.5%	17.3%	27.7%	61.8%	21.6%	78.0%	100.0%	29.8%	3.8%	24.0%	15.9%	23.7%	
Total	220	243	271	89	171	82	19	57	213	183	170	236	1954
Total %	**11.3%**	**12.4%**	**13.9%**	**4.6%**	**8.8%**	**4.2%**	**1.0%**	**2.9%**	**10.9%**	**9.4%**	**8.7%**	**12.1%**	**100%**

Table 26: Food and Waterborne Outbreaks With Greater Than 10 Cases (n=33), Florida, 2003[28]

County	# Cases	Site	Agency	Vehicle	Pathogen	Pathogen Status
Broward	11	Restaurant	DBPR	Crabs	Scombroid	Suspected
Dade	12	Restaurant	DBPR	Pizza	Unknown	Unknown
Pasco	12	Caterer	DBPR	Garden salad	Norovirus	Confirmed
Orange	15	School	OTHER	Collard greens chicken	Unknown	Unknown
Polk	15	Restaurant	DBPR	Unknown	Norovirus	Confirmed
Dade	15	Caterer	DBPR	Shredded beef, rice	Unknown	Unknown
Hillsborough	15	Caterer	DACS	Stuffed potato	Salmonella	Suspected
Dade	16	Restaurant	DBPR	Unknown	Unknown	Unknown
Dade	17	Grocery	DACS	Chicken	Unknown	Unknown
Manatee	18	Restaurant	DBPR	Bbq pork	C. perfringens	Confirmed
Pinellas	19	Caterer	DBPR	Greek salad	Norovirus	Suspected
Broward	20	Nursing Home	DOH	Unknown	Norovirus	Confirmed
Broward	20	Hospital	DOH	Unknown	Norovirus	Suspected
Hillsborough	26	Caterer	DACS	Stuffed potato	Salmonella	Confirmed
Hillsborough	27	Other	Other	Buffet items	Norovirus	Suspected
Sarasota	39	Restaurant	DBPR	Unknown	Norovirus	Confirmed
Dade	39	Restaurant	DBPR	Pizza, chicken wings and drumsticks	Unknown	Unknown
Dade	39	Restaurant	DBPR	Unknown	Unknown	Unknown
Dade	41	Caterer	DACS	Cake	Unknown	Unknown
Duval	42	School	DOH	Recreational waterslide	Norovirus	Confirmed
Collier	43	Caterer	DOH	Cajun shrimp w/pineapple/ mango salsa tomato basil	Norovirus	Confirmed
Pinellas	49	Restaurant	DBPR	House salad	Norovirus	Confirmed
Brevard	53	Prison	DOH	Unknown	Unknown	Unknown
Palm Beach	56	Prison	DOH	Baked beans, turkey bologna, pudding	B. cereus	Confirmed
Indian River	61	Other	DOH	Unknown	Norovirus	Confirmed
Hillsborough	66	Caterer	DACS	Spring mix salad	Norovirus	Suspected
Bay	72	Restaurant	DBPR	Salad	Norovirus	Confirmed
St. Johns	76	Restaurant	DBPR	Lettuce	Norovirus	Confirmed
Nassau	94	Other	DBPR	Multiple items	Norovirus	Confirmed
Palm Beach	95	Restaurant	DBPR	Shrimp and/or scallops	V. parahaemolyticus	Confirmed
Sarasota	102	Other	DOH	Boston cream pie,salad,water	Norovirus	Confirmed
Dade	121	School	DOH	Unknown	Norovirus	Confirmed
Bay	148	Restaurant	DBPR	Water/salad	Norovirus	Confirmed
	1494	Total # Cases				

[28] The total number of outbreaks with more than ten cases is: 33 (18.9% of the total). The total number of cases associated with these outbreaks is 1494 (77% of the total).

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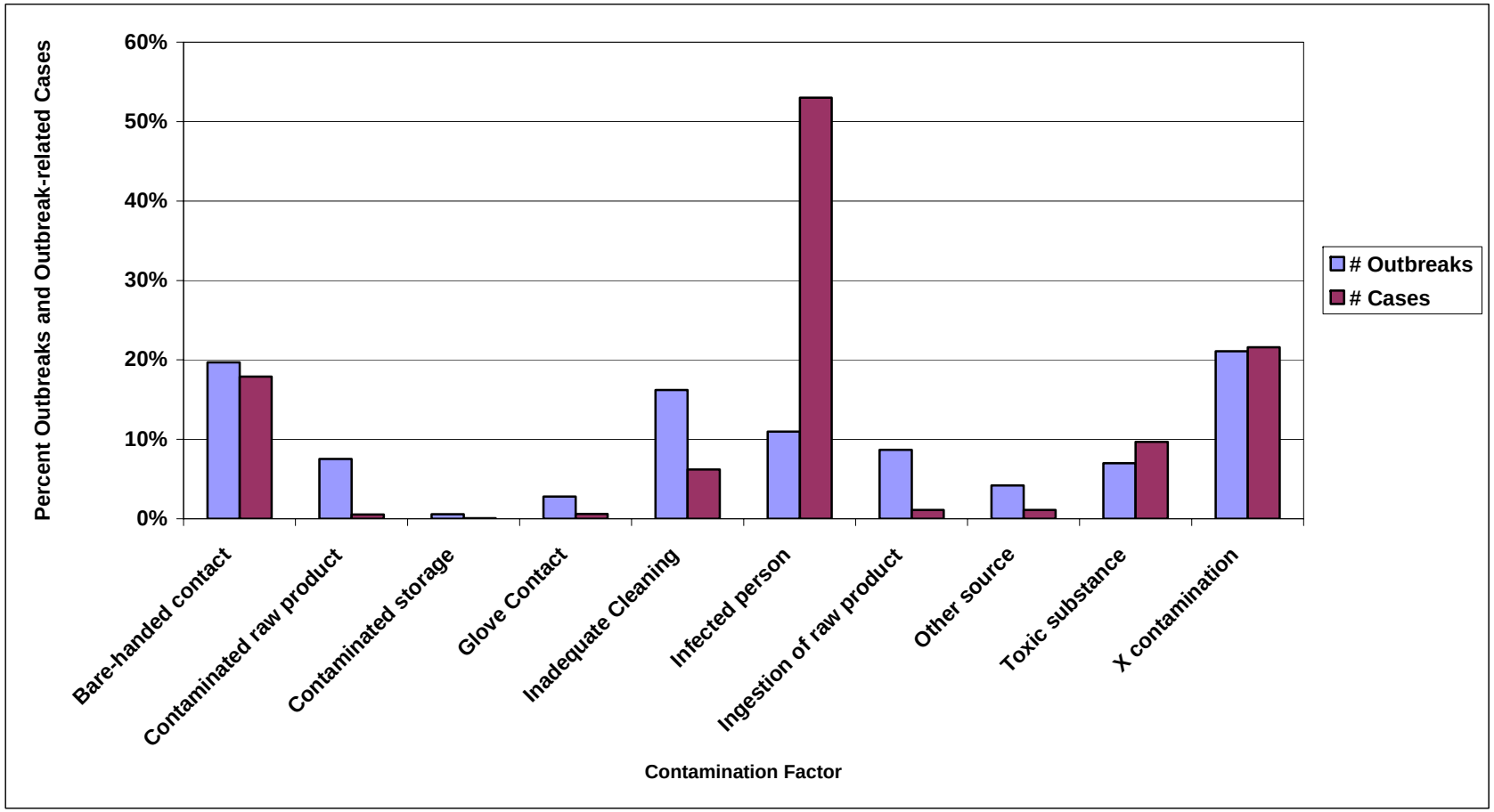
Figure 19: Contamination Factor – Percent Total Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004 [29]



[29] Each outbreak may have up to three contamination factors, thus the numbers and percentages will not add up to the actual number of outbreaks and outbreak-related cases.

Table 27: Contamination Factor - Number of Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004[30]

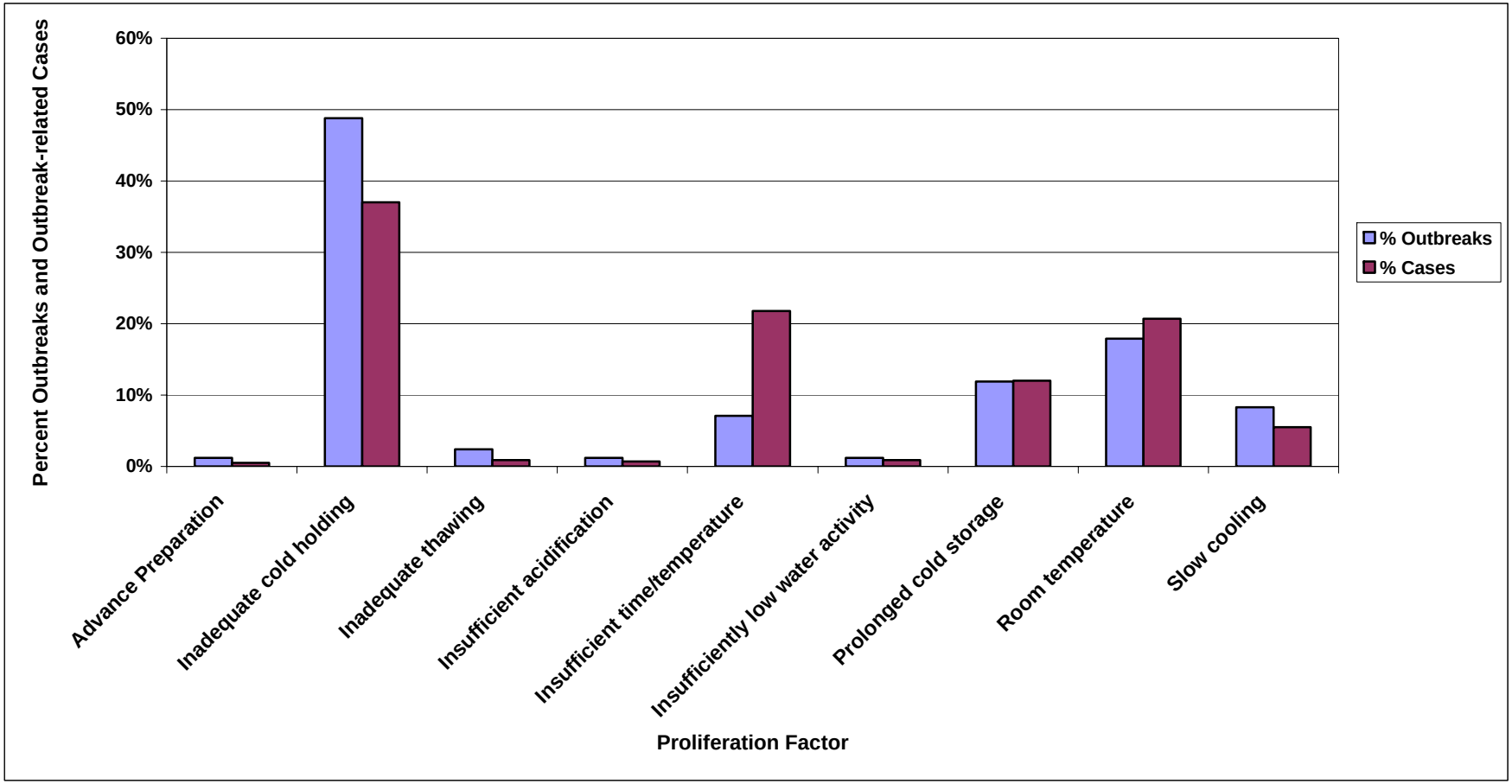
Contamination Factor	# Outbreaks	# Cases
Bare-handed contact	28	380
Contaminated raw product	13	88
Contaminated storage	1	1
Glove contact	4	12
Inadequate Cleaning	23	132
Infected person	19	771
Ingestion of raw product	15	16
Other source	6	23
Toxic substance	10	206
X contamination	30	457

Table 28: Contamination Factor: Percent of Total Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004

Contamination Factor	% Outbreaks	% Cases
Bare-handed contact	19.7%	17.9%
Contaminated raw product	7.5%	0.5%
Contaminated storage	0.6%	0.1%
Glove contact	2.8%	0.6%
Inadequate cleaning	16.2%	6.2%
Infected person	11.0%	53.0%
Ingestion of raw product	8.7%	1.1%
Other source	4.2%	1.1%
Toxic substance	7.0%	9.7%
X contamination	21.1%	21.6%

[30] Each outbreak may have up to three contamination factors, thus the numbers and percentages will not add up to the actual number of outbreaks and outbreak-related cases.

Figure 20: Proliferation/Amplification Factor: Percent Total Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004[31]



[31] Each outbreak may have up to three proliferation/amplification factors, thus the numbers and percentages will not add up to the actual number of outbreaks and outbreak-related cases.

Table 29: Proliferation/Amplification Factor:
Number of Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004

Proliferation Factor	# Outbreaks	# Cases
Advance Preparation	1	2
Inadequate cold holding	41	161
Inadequate thawing	2	4
Insufficient acidification	1	3
Insufficient time/temperature	6	95
Insufficiently low water activity	1	4
Prolonged cold storage	10	52
Room temperature	15	90
Slow cooling	7	24

Table 30: Proliferation/Amplification Factor:
Percent Total Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004

Proliferation Factor	% Outbreaks	% Cases
Advance Preparation	1.2%	0.5%
Inadequate cold holding	48.8%	37.0%
Inadequate thawing	2.4%	0.9%
Insufficient acidification	1.2%	0.7%
Insufficient time/temperature	7.1%	21.8%
Insufficiently low water activity	1.2%	0.9%
Prolonged cold storage	11.9%	12.0%
Room temperature	17.9%	20.7%
Slow cooling	8.3%	5.5%

Figure 21: Survival Factor: Percent Total Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004[32]

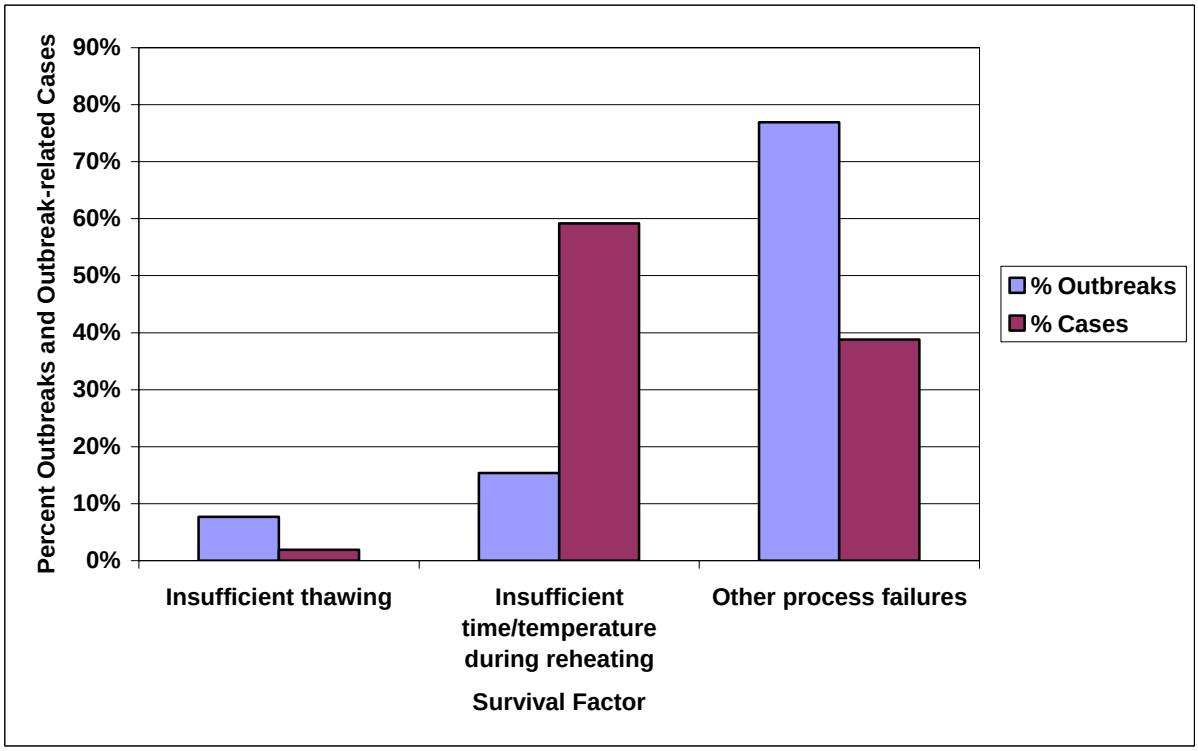


Table 31: Survival Factor:
Number of Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004

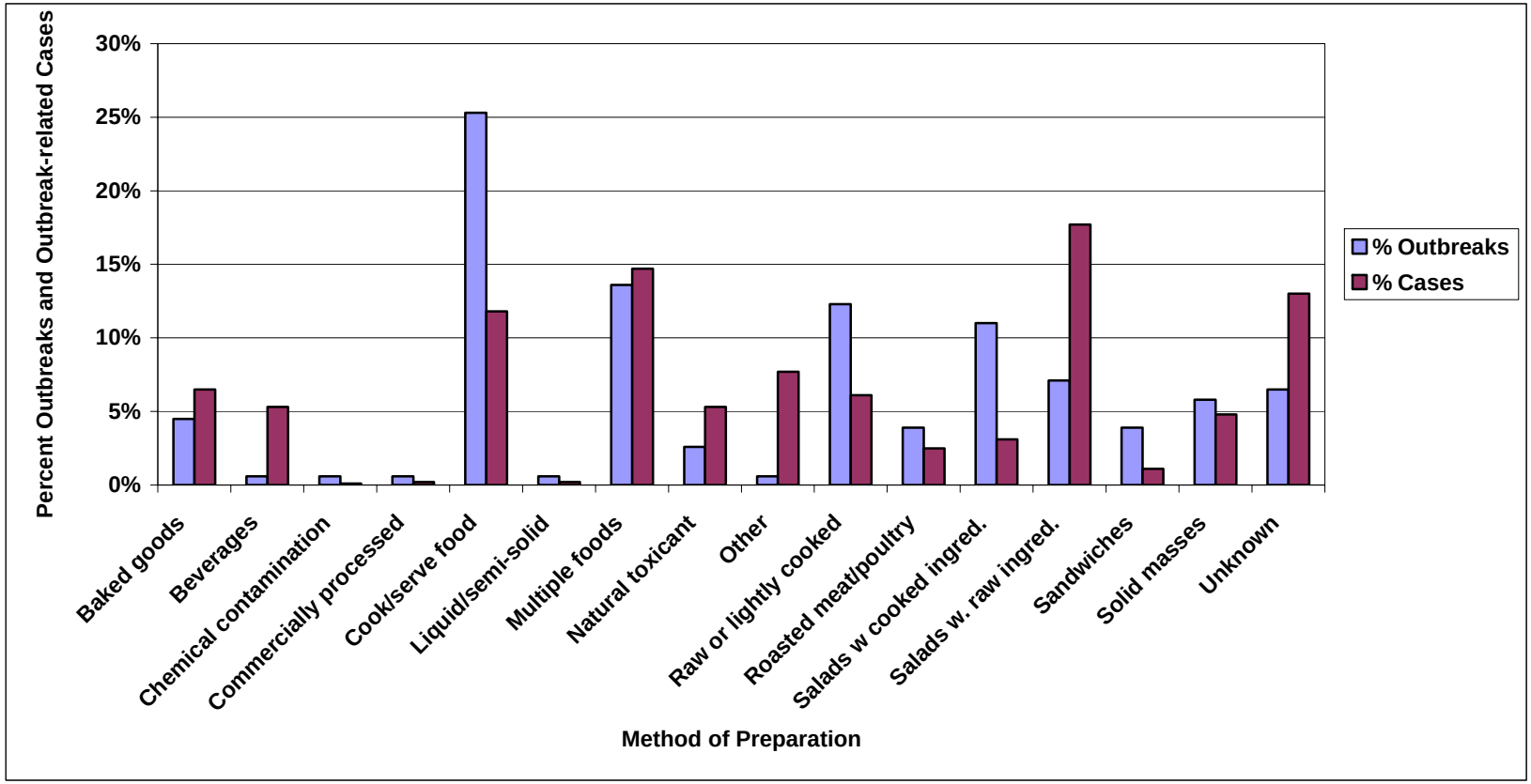
Survival Factor	# Outbreaks	# Cases
Insufficient thawing	1	2
Insufficient time/temperature during reheating	2	61
Other process failures	10	40

Table 32: Survival Factor:
Percent Total Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004

Survival Factor	% Outbreaks	% Cases
Insufficient thawing	7.7%	1.9%
Insufficient time/temperature during reheating	15.4%	59.2%
Other process failures	76.9%	38.8%

[32] Each outbreak may have up to three survival factors, thus the numbers and percentages will not add up to the actual number of outbreaks and outbreak-related cases.

Figure 22: Method of Preparation Factor: Percent Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004[33]



[33] Each outbreak may have up to three method of preparation factors, thus the numbers and percentages will not add up to the actual number of outbreaks and outbreak-related cases.

Table 33: Method of Preparation Factor:
Number of Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004

Method of Preparation Factor	# Outbreaks	# Cases
Baked goods	7	126
Beverages	1	102
Commercially processed	1	3
Cook/serve food	39	228
Liquid/semi-solid	1	3
Multiple foods	21	284
Natural toxicant	4	102
Other	1	148
Raw or lightly cooked	21	119
Roasted meat/poultry	6	49
Salads w cooked ingred.	17	60
Salads w. raw ingred.	11	341
Sandwiches	6	21
Solid masses	9	93
Unknown	10	250

Table 34: Method of Preparation Factor:
Percent Total Foodborne Outbreaks (n=173) and Outbreak-related Cases (n=1455), Florida, 2004[34]

Method of Preparation Factor	% Outbreaks	% Cases
Baked goods	4.5%	6.5%
Beverages	0.6%	5.3%
Chemical contamination	0.6%	0.2%
Commercially processed	25.3%	11.8%
Cook/serve food	0.6%	0.2%
Liquid/semi-solid	13.6%	14.7%
Multiple foods	2.6%	5.3%
Natural toxicant	0.6%	7.7%
Other	1.4%	8.2%
Raw or lightly cooked	3.9%	2.5%
Roasted meat/poultry	11.0%	3.1%
Salads w cooked ingred.	7.1%	17.7%
Salads w. raw ingred.	3.9%	1.1%
Sandwiches	5.8%	4.8%
Solid masses	6.5%	13.0%
Unknown	4.5%	6.5%

[34] Each outbreak may have up to three method of preparation factors, thus the numbers and percentages will not add up to the actual number of outbreaks and outbreak-related cases.

Table 35: Contamination Factors by Etiologic Agent for Foodborne Outbreaks Reported in Florida (n=173), 2004

Pathogen	Bare-handed contact	Contam. raw product	Contam. storage	Glove-handed contact	Inad. cleaning	Infected person	Ingestion of raw product	Other source	Toxic substance	X contam.	Total
B. cereus	0	1	0	1	1	0	0	1	0	1	5
C. perfringens	1	0	0	0	1	0	0	0	0	2	4
Chemical	0	0	2	0	0	0	0	0	0	0	2
Ciguatera	0	0	0	0	0	0	0	0	3	0	3
Norovirus	8	6	0	2	3	20	0	2	0	7	48
Other	0	0	0	0	0	0	0	0	1	0	1
Salmonella	3	0	0	0	4	0	1	0	0	4	12
Saxitoxin	0	0	0	0	0	0	0	0	3	0	3
Scombroid	0	0	0	0	0	0	0	0	1	1	2
Staphylococcus	4	0	0	0	2	0	0	0	0	3	9
Unknown	11	0	0	1	10	1	0	3	0	8	34
V. parahaemolyticus	1	0	0	0	2	0	0	0	2	4	9
V. vulnificus	0	4	0	0	0	0	9	0	0	0	13
Total	28	11	2	4	23	21	10	6	10	30	143

Table 36: Contamination Factors by Etiologic Agent for Cases in Foodborne Outbreaks Reported in Florida (n=1455), 2004

Pathogen	Bare-handed contact	Contam. raw product	Contam. storage	Glove-handed contact	Inad. cleaning	Infected person	Ingestion of raw product	Other source	Toxic substance	X contam.	Total
B. cereus	0	56	0	2	2	0	0	3	0	2	65
C. perfringens	18	0	0	0	18	0	0	0	0	36	72
Chemical	0	0	2	0	0	0	0	0	0	0	2
Ciguatera	0	0	0	0	0	0	0	0	5	0	5
Norovirus	261	26	0	8	26	718	0	10	0	219	1268
Other	0	0	0	0	0	0	0	0	4	0	4
Salmonella	46	0	0	0	50	0	2	0	0	49	147
Saxitoxin	0	0	0	0	0	0	0	0	5	0	5
Scombroid	0	0	0	0	0	0	0	0	2	3	5
Staphylococcus	9	0	0	0	4	0	0	0	0	7	20
Unknown	44	0	0	2	28	53	0	10	0	37	174
V. parahaemolyticus	2	0	0	0	4	0	0	0	190	104	300
V. vulnificus	0	4	0	0	0	0	9	0	0	0	13
Total	380	86	2	12	132	771	11	23	206	457	2080

Table 37: Proliferation/Amplification Factors by Etiologic Agent for Foodborne Outbreaks Reported in Florida (n=173), 2004

Pathogen	Advanced Prep.	Inad. cold hold	Inad. thawing	Insufficient acidification	Insuff. time/T	Insuff. low a_w	Prolonged cold storage	Room T	Slow cooling	Total
B. cereus	0	1	0	0	1	0	0	1	0	3
C. perfringens	0	2	0	0	0	0	0	2	0	4
Campylobacter	0	1	0	0	0	0	0	0	0	1
Norovirus	0	4	0	0	3	1	2	1	1	12
Salmonella	0	2	0	0	1	0	2	1	1	7
Scombroid	1	1	0	0	0	0	0	2	0	4
Staphylococcus	0	8	1	0	0	0	1	2	1	13
Unknown	0	20	1	1	1	0	5	5	3	36
V. parahaemolyticus	0	2	0	0	0	0	0	1	1	4
Total	1	41	2	1	6	1	10	15	7	84

Table 38: Proliferation/Amplification Factors by Etiologic Agent for Cases in Foodborne Outbreaks Reported in Florida (n=1455), 2004

Pathogen	Advanced Prep.	Inad. cold hold	Inad. thawing	Insufficient acidification	Insuff. time/T	Insuff. low a_w	Prolonged cold storage	Room T	Slow cooling	Total
B. cereus	0	2	0	0	56	0	0	3	0	61
C. perfringens	0	36	0	0	0	0	0	36	0	72
Campylobacter	0	2	0	0	0	0	0	0	0	2
Norovirus	0	20	0	0	29	4	25	6	6	90
Salmonella	0	13	0	0	5	0	8	9	4	39
Scombroid	2	2	0	0	0	0	0	13	0	17
Staphylococcus	0	22	2	0	0	0	2	6	4	36
Unknown	0	59	2	3	5	0	17	14	7	107
V. parahaemolyticus	0	5	0	0	0	0	0	3	3	11
Total	2	161	4	3	95	4	52	90	24	435

Table 39: Survival Factors by Etiologic Agent for Foodborne Outbreaks Reported in Florida (n=173), 2004

Pathogen	Insufficient thawing	Insufficient time/T	Other process failure	Total
B. cereus	0	1	2	3
C. perfringens	0	0	1	1
Campylobacter	0	0	1	1
Staphylococcus	1	0	2	3
Unknown	0	1	4	5
Total	1	2	10	13

Table 40: Survival Factors by Etiologic Agent for Cases in Foodborne Outbreaks Reported in Florida (n=1455), 2004

Pathogen	Insufficient thawing	Insufficient time/T	Other process failure	Total
B. cereus	0	56	4	60
C. perfringens	0	0	18	18
Campylobacter	0	0	2	2
Staphylococcus	2	0	6	8
Unknown	0	5	10	15
Total	2	61	40	103

Table 41: Method of Preparation Factors by Etiologic Agent for Foodborne Outbreaks Reported in Florida (n=173), 2004

Pathogen	Baked goods	Drinks	Commerc. processed	Cook/ serve food	Liquid/ semi-solid	Mult. foods	Natural toxicant	Other	Raw or lightly cooked	Roasted meat/ poultry	Salads w. cooked ingred.	Salads w. raw ingred.	Sandw.	Solid masses	Unk.	Total
B. cereus	0	0	0	1	1	2	0	0	0	0	1	0	0	0	0	5
C. perf.	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Campy	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Ciguatera	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Norovirus	1	1	0	1	0	4	0	1	6	1	4	7	2	0	9	37
Other	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Salmonella	0	0	0	2	0	1	0	0	2	2	0	0	0	1	0	8
Saxitoxin	0	0	0	3	0	0	1	0	0	0	0	0	0	0	0	4
Scombroid	0	0	0	3	0	0	0	0	0	0	1	0	0	0	0	4
Staph.	0	0	0	3	0	1	0	0	2	0	3	1	1	1	0	12
Unknown	6	0	1	23	0	12	0	0	0	1	8	3	3	7	1	65
V. para.	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	3
V. vul	0	0	0	0	0	0	1	0	9	0	0	0	0	0	0	10
Total	7	1	1	39	1	21	4	1	21	6	17	11	6	9	10	155

Table 42: Method of Preparation Factors by Etiologic Agent for Cases in Foodborne Outbreaks Reported in Florida (n=1455), 2004

Pathogen	Baked goods	Drinks	Commerc. processed	Cook/ serve food	Liquid/ semi-solid	Mult. foods	Natural toxicant	Other	Raw or lightly cooked	Roasted meat/ poultry	Salads w. cooked ingred.	Salads w. raw ingred.	Sandw.	Solid masses	Unk.	Total
B. cereus	0	0	0	3	3	58	0	0	0	0	2	0	0	0	0	66
C. perf.	0	0	0	0	0	0	0	0	0	36	0	0	0	0	0	36
Campy	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Ciguatera	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	5
Norovirus	102	102	0	4	0	80	0	148	89	3	32	331	12	0	245	1148
Other	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
Salmonella	0	0	0	41	0	5	0	0	11	6	0	0	0	2	0	65
Saxitoxin	0	0	0	5	0	0	2	0	0	0	0	0	0	0	0	7
Scombroid	0	0	0	16	0	0	0	0	0	0	2	0	0	0	0	18
Staph.	0	0	0	7	0	6	0	0	6	0	7	2	2	2	0	32
Unknown	24	0	3	147	0	133	0	0	0	4	17	8	7	89	5	437
V. para.	0	0	0	0	0	0	95	0	4	0	0	0	0	0	0	99
V. vul	0	0	0	0	0	0	1	0	9	0	0	0	0	0	0	10
Total	126	102	3	228	3	284	102	148	119	49	60	341	21	93	250	1929

Figure 23: Waterborne Disease Factors: Percent Total Waterborne Outbreaks (n=2) and Outbreak-related Cases (n=43), Florida, 2004[35]

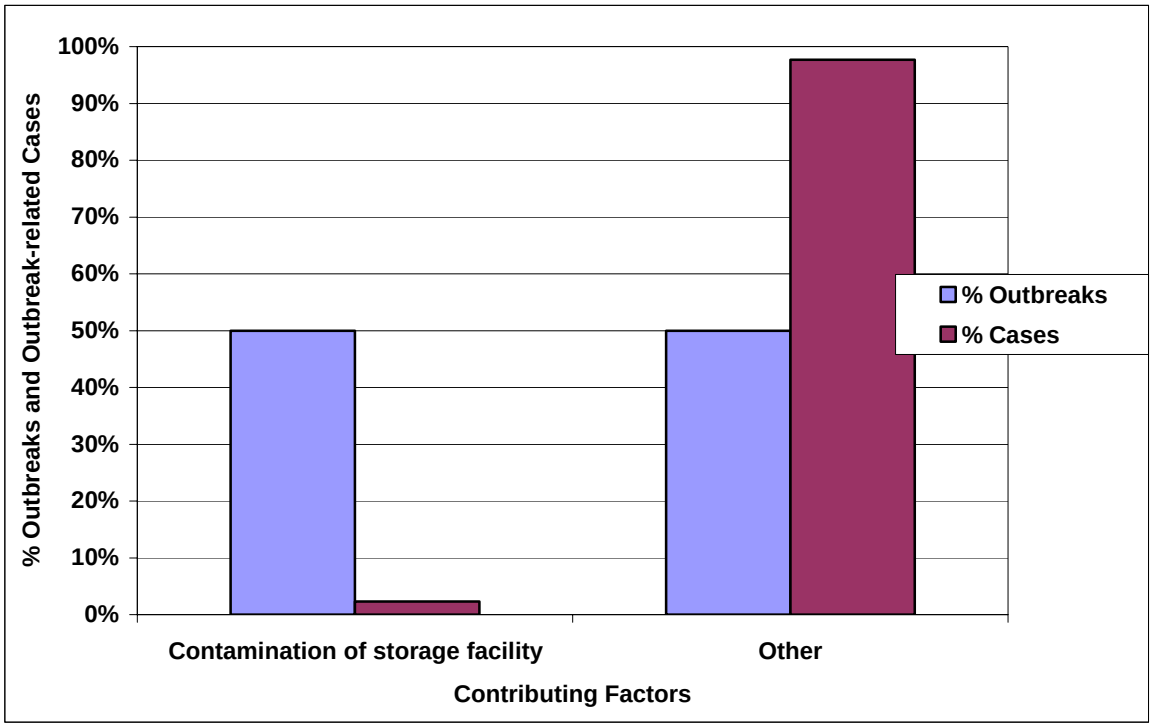


Table 43: Waterborne Disease Factors:
Number of Waterborne Outbreaks (n=2) and Outbreak-related Cases (n=43), Florida, 2004

Water	# Outbreaks	# Cases
Other	1	42
Contamination of storage facility	1	1

Table 44: Waterborne Disease Factors:
Percent Total Waterborne Outbreaks (n=2) and Outbreak-related Cases (n=43), Florida, 2004[36]

Water	% Outbreaks	% Cases
Other	50%	97.7%
Contamination of storage facility	50%	2.3%

[35] Each outbreak may have up to three waterborne disease factors, thus the numbers and percentages will not add up to the actual number of outbreaks and outbreak-related cases.
[36] Each outbreak may have up to three waterborne disease factors, thus the numbers and percentages will not add up to the actual number of outbreaks and outbreak-related cases.

Table 45: Contributing Factors by Etiologic Agent for All Waterborne Outbreaks (n=2), Florida, 2004

Pathogen	Other	Contamination of storage facility	Total
Chemical	0	1	1
Norovirus	1	0	1
Total	1	1	2

Table 46: Contributing Factors by Etiologic Agent for Cases Associated With All Waterborne Outbreaks (n=43), Florida, 2004

Pathogen	Other	Contamination of storage facility	Total
Chemical	0	1	1
Norovirus	42	0	42
Total	42	1	43

Table 47: Line List of Waterborne Outbreaks, Florida, 2004

County	Status	# Cases	Site	Vehicle	Pathogen	Pathogen Status
Brevard	Confirmed	1	Grocery	Bottled water	Chemical	Confirmed
Duval	Confirmed	42	School	Recreational water slide	Norovirus	Confirmed
	Total # Cases	**43**				

CDC 52.13 REV. 8/1999

The following codes are to be used to fill out Part 1 (question 9) and Part 2 (question 15).

Contamination Factors:[1]

C1 - Toxic substance part of tissue (e.g., ciguatera)
C2 - Poisonous substance intentionally added (e.g., cyanide or phenolphthalein added to cause illness)
C3 - Poisonous or physical substance accidentally/incidentally added (e.g., sanitizer or cleaning compound)
C4 - Addition of excessive quantities of ingredients that are toxic under these situations (e.g., niacin poisoning in bread)
C5 - Toxic container or pipelines (e.g., galvanized containers with acid food, copper pipe with carbonated beverages)
C6 - Raw product/ingredient contaminated by pathogens from animal or environment (e.g., *Salmonella enteriditis* in egg, Norwalk in
shellfish, *E. coli* in sprouts)
C7 - Ingestion of contaminated raw products (e.g., raw shellfish, produce, eggs)
C8 - Obtaining foods from polluted sources (e.g., shellfish)
C9 - Cross-contamination from raw ingredient of animal origin (e.g., raw poultry on the cutting board)
C10 - Bare-handed contact by handler/worker/preparer (e.g., with ready-to-eat food)
C11 - Glove-handed contact by handler/worker/preparer (e.g., with ready-to-eat food)
C12 - Handling by an infected person or carrier of pathogen (e.g., *Staphylococcu*s, *Salmonell*a, Norwalk agent)
C13 - Inadequate cleaning of processing/preparation equipment/utensils – leads to contamination of vehicle (e.g., cutting boards)
C14 - Storage in contaminated environment – leads to contamination of vehicle (e.g., store room, refrigerator)
C15 - Other source of contamination *(please describe in Comment*s)

Proliferation/Amplification Factors:[1]

P1 - Allowing foods to remain at room or warm outdoor temperature for several hours (e.g., during preparation or holding for service)
P2 - Slow cooling (e.g., deep containers or large roasts)
P3 - Inadequate cold-holding temperatures (e.g., refrigerator inadequate/not working, iced holding inadequate)
P4 - Preparing foods a half day or more before serving (e.g., banquet preparation a day in advance)
P5 - Prolonged cold storage for several weeks (e.g., permits slow growth of psychrophilic pathogens)
P6 - Insufficient time and/or temperature during hot holding (e.g., malfunctioning equipment, too large a mass of food)
P7 - Insufficient acidification (e.g., home canned foods)
P8 - Insufficiently low water activity (e.g., smoked/salted fish)
P9 - Inadequate thawing of frozen products (e.g., room thawing)
P10 - Anaerobic packaging/Modified atmosphere (e.g., vacuum packed fish, salad in gas flushed bag)
P11 - Inadequate fermentation (e.g., processed meat, cheese)
P12 - Other situations that promote or allow microbial growth or toxic production *(please describe in Comment*s)

Survival Factors:[1]

S1 - Insufficient time and/or temperature during cooking/heat processing (e.g., roasted meats/poultry, canned foods, pasteurization)
S2 - Insufficient time and/or temperature during reheating (e.g., sauces, roasts)
S3 - Inadequate acidification (e.g., mayonnaise, tomatoes canned)
S4 - Insufficient thawing, followed by insufficient cooking (e.g., frozen turkey)
S5 - Other process failures that permit the agent to survive *(please describe in Comment*s)

Method of Preparation:[2]

M1 - Foods eaten raw or lightly cooked (e.g., hard shell clams, sunny side up eggs)
M2 - Solid masses of potentially hazardous foods (e.g., casseroles, lasagna, stuffing)
M3 - Multiple foods (e.g., smorgasbord, buffet)
M4 - Cook/serve foods (e.g., steak, fish fillet)
M5 - Natural toxicant (e.g., poisonous mushrooms, paralytic shellfish poisoning)
M6 - Roasted meat/poultry (e.g., roast beef, roast turkey)
M7 - Salads prepared with one or more cooked ingredients (e.g., macaroni, potato, tuna)
M8 - Liquid or semi-solid mixtures of potentially hazardous foods (e.g., gravy, chili, sauce)
M9 - Chemical contamination (e.g., heavy metal, pesticide)
M10 - Baked goods (e.g., pies, eclairs)
M11 - Commercially processed foods (e.g., canned fruits and vegetables, ice cream)
M12 - Sandwiches (e.g., hot dog, hamburger, Monte Cristo)
M13 - Beverages (e.g., carbonated and non-carbonated, milk)
M14 - Salads with raw ingredients (e.g., green salad, fruit salad)
M15 - Other, does not fit into above categories *(please describe in Comments)*
M16 - Unknown, vehicle was not identified

[1] Frank L. Bryan, John J. Guzewich, and Ewen C. D. Todd. Surveillance of Foodborne Disease III. Summary and Presentation of Data on Vehicles and Contributory Factors; Their Value and Limitations. Journal of Food Protection, 60; 6:701-714, 1997.
[2] Weingold, S. E., Guzewich JJ, and Fudala JK. Use of foodborne disease data for HACCP risk assessment. Journal of Food Protection, 57; 9:820-830, 1994.

Factors Contributing to Water Contamination[37]

At Source:

- Overflow of sewage
- Flooding, heavy rains
- Underground seepage of sewage
- Use of a back-up source of water by a water utility
- Improper construction or location of well or spring
- Contamination through creviced limestone or fissured rock

At Treatment Plant

- No disinfection
- Temporary interruption of disinfection
- Chronically inadequate disinfection
- No filtration
- Inadequate filtration
- Deficiencies in other treatment processes

In Distribution System

- Cross connection
- Back siphonage
- Contamination of mains during construction or repair
- Contamination of storage facility

Other

[37] Waterborne Diseases Outbreak Report, CDC 52.12 (rev. 12/96).