Food and Waterborne Disease Program

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FOOD AND WATERBORNE ILLNESS SURVEILLANCE AND INVESTIGATION

ANNUAL REPORT, FLORIDA, 2010

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OVERVIEW

PURPOSE

The Florida Department of Health (FDOH) investigates and reports food and waterborne disease outbreaks, in part, as an effort to better understand and define the epidemiology of these diseases in the state. These surveillance data provide an indication of the etiologic agents, vehicles of transmission, and contributing factors associated with food and waterborne disease and help direct the public and stakeholders towards appropriate health actions to reduce illness and death caused by food and waterborne disease outbreaks.

The activities reported here are conducted by county health department staff with guidance and/or coordination of Florida's Food and Waterborne Disease Program (FWDP). The program facilitates outbreak investigations from preparation to intervention including the steps of:

- Planning and Preparation
- Surveillance and Outbreak Detection
- Investigation of Clusters and Outbreaks, and
- Implementation and Evaluation of Control Measures.

The Food and Waterborne Illness Surveillance and Investigation Annual Report is compiled to summarize epidemiologic data on food and waterborne disease outbreaks within the state of Florida in 2010 focusing on:

- Summarizing outbreak surveillance activities and
- Summarizing outbreak investigation findings.

FOOD AND WATERBORNE DISEASE OUTBREAK DEFINITIONS AS DEFINED BY THE STATE OF FLORIDA DEPARTMENT OF HEALTH

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 foodborne outbreak is one in which a common food has been ingested by such persons. A single case of suspected botulism, mushroom poisoning, ciguatera or paralytic shellfish poisoning are also considered outbreaks. Other rare diseases, 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 will be investigated further but may not be reported.

WATERBORNE ILLNESS OUTBREAK:

Drinking water outbreak[1]: Two criteria must be met for an event to be defined as a drinking water-associated disease outbreak. First, ≥2 persons must have experienced a similar illness after exposure to water. This criterion is waived for single cases of laboratory-confirmed primary amebic meningoencephalitis (PAM) and for single cases of chemical poisoning if water-quality

[1] Surveillance for Waterborne-Disease Outbreaks Associated with Drinking Water --- United States, 2001—2002, MMWR, October 22, 2004/53(SS08):23-45, http://www.cdc.gov/Mmwr/preview/mmwrhtml/ss5308a4.htm (accessed 9/8/09).

data indicate contamination by the chemical. Second, epidemiologic evidence must implicate drinking water as the probable source of the illness.

Recreational water outbreak[2]: Two criteria must be met for an event to be defined as a recreational water-associated disease outbreak. First, >2 persons must have experienced a similar illness after exposure to water or air encountered in a recreational water setting. This criterion is waived for single cases of laboratory-confirmed primary amebic meningoencephalitis (PAM), single cases of *Vibrio* sp. wound infections and single cases of chemical poisoning if water-quality data indicate contamination by the chemical. Second, epidemiologic evidence must implicate recreational water or the recreational water setting as the probable source of the illness. Recreational settings include swimming pools, wading pools, whirlpools, hot tubs, spas, waterparks, interactive fountains, and fresh and marine surface waters.

THE FOOD AND WATERBORNE DISEASE PROGRAM

The FWDP began in 1994 and is charged with monitoring and investigating all food and waterborne disease outbreaks in Florida. The program aims to rapidly detect, investigate, and intervene in food and waterborne disease outbreaks which could lead to preventing future outbreaks, reducing incidence of food and waterborne illness, and increasing the health of the general population. The FWDP investigates outbreaks to prevent further spread of disease, to promote timely treatment of susceptible populations, and to prevent future similar outbreaks from occurring. With an estimated 18 M population and 83.9 M annual visitors to Florida, along with an aging and high risk population, the FDOH continues its ongoing responsibility and authority for epidemiological investigation. The program is funded by the Departments of Business and Professional Regulation (DBPR) and the Department of Agriculture and Consumer Services (DACS) through license fees. The FDH FWDP bases its procedural activities and goals on the Florida Public Health Statutes translated through the Council to Improve Foodborne Outbreak Response (CIFOR) Guidelines for Foodborne Disease Outbreak Response recommendations. Without a coordinated food and waterborne disease response, Florida would not be able to respond efficiently and in a timely manner to food and water complaints or to determine the cause of outbreaks and best practices needed to prevent them. See our website for more program details: www.foodandwaterdisease.com .

This program operates under the authority given below:

Authority

1. S. 381.006 (10), F.S. Addresses the environmental epidemiology function of FDOH, including the investigation of food and waterborne disease.

2. Ss. 509.032 (2) (d) and 509.035 (1) (a), F.S. The first section addresses the adoption of rules by DBPR providing the standards and requirements for "cooperating and coordinating with DOH in epidemiological investigations." The second section

[2] Surveillance for Waterborne-Disease Outbreaks Associated with Recreational Water --- United States, 2001—2002, MMWR, October 22, 2004/53/(SS08):1-22, http://www.cdc.gov/Mmwr/preview/mmwrhtml/ss5308a1.htm (accessed 9/8/09)

addresses the coordination between DBPR and DOH on closures of establishments due to a public health threat.

3. Rule 64D-3.029 & 64D-3.040 (4), (6), (8) & 64D-3.041, F.A.C. This rule is known as the reportable diseases rule and lists those diseases that are reportable in Florida, many of which are food and waterborne. The list also includes reporting of food and waterborne disease outbreaks as well as individually confirmed cases of illness. The rule also addresses the exclusion of food workers in certain situations and the posting of warnings regarding raw oyster consumption in restaurants. The rule also addresses epidemiological investigations.

4. Interagency Agreement between the Florida Department of Business and Professional Regulation and the Florida Department of Health (http://www.doh.state.fl.us/environment/medicine/foodsurveillance/investigation_docs/DBPR_DOH_Interagency_Agreement.pdf). This agreement clarifies the duties and responsibilities of DOH and DBPR with regard to conducting epidemiological investigations in public food service establishments licensed by DBPR.

The FWDP carries out the activities of training and preparing county health department (CHD) staff in methods and procedures used in outbreak investigations, surveillance for the detection of food and waterborne diseases, investigation food and waterborne disease outbreaks, and reporting these incidents to appropriate authorities, with a staff of regional environmental epidemiologists (REE), a statewide coordinator, a counter bioterrorism coordinator, and an administrative assistant.

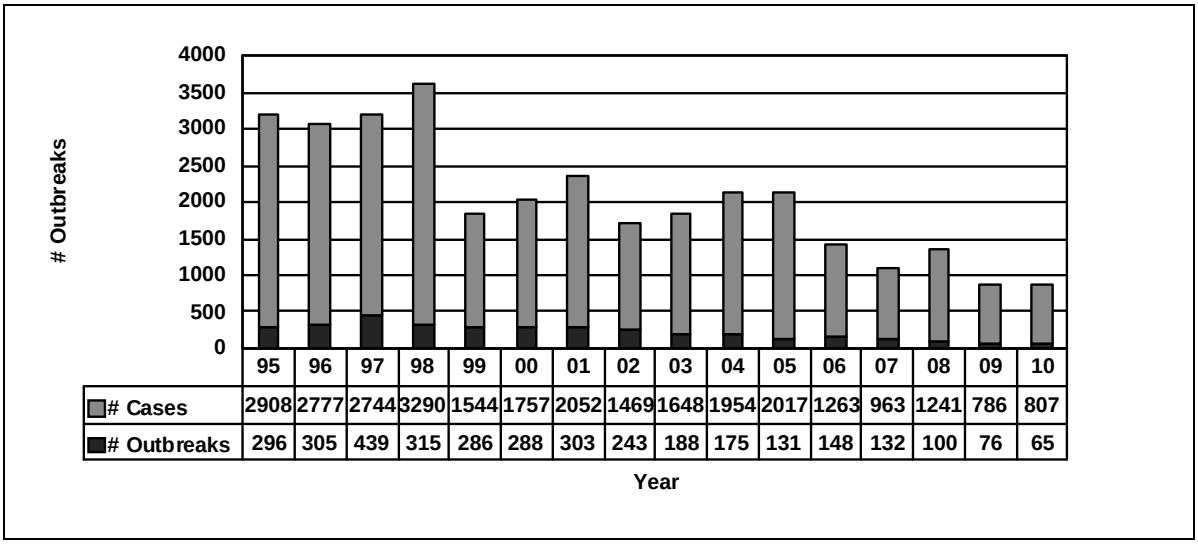
OUTBREAK SUMMARY 1995-2010

From 1995-2010, the FWDP working in close partnership with CHDs and regulatory agencies has investigated 3,491 outbreaks with 29,237 cases. In addition to outbreak investigations, the program also coordinates the follow up on 1,500 – 4,000 individual food and waterborne illness complaints every year. Training has been developed on investigation methods and specific pathogens are being presented around the state. In 2010, the number of foodborne outbreaks decreased to the lowest number since the start of the program in 1994: 65 (Table 1, Figure 1). There are several possibilities for this change that could include improved food and water safety practices, possible changes in use of outbreak definitions, and the implementation of an internal quality assurance review team to ensure consistency in reporting (deleting misclassified or inconclusive outbreaks from the data). Additional data years are needed to determine if this is a continuing positive trend. It is consistent with a national decrease in reported foodborne disease outbreaks. The rate of cases per 100,000 population decreased from 2009 (4.33 per 100,000) to 2010 (4.29 per 100,000).

TABLE 1: SUMMARY OF FOOD AND WATERBORNE ILLNESS OUTBREAKS REPORTED TO FLORIDA, 1989–2010[3]

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
2005	131	2017
2006	148	1263
2007	132	963
2008	100	1241
2009	76	786
2010	65	807

FIGURE 1: NUMBER OF FOOD AND WATERBORNE OUTBREAKS AND OUTBREAK-RELATED CASES BY YEAR, FLORIDA, 1995-2010



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

PLANNING AND PREPARATION:

Having a planning and preparation system in place allows investigators to identify the source of an outbreak quickly and implement control measures more efficiently and effectively. Planning and preparation activities are far-reaching and include working with partner agencies and ensuring that all know their roles and are adequately trained.

PARTNER AGENCIES

In Florida, food and waterborne disease outbreaks are coordinated through the FWDP and CHDs; however, the regulatory authority over implicated facilities often lies under the purview of other agencies. These agencies have roles to perform that aid in the regulatory prevention, detection, investigation, and monitoring the implementation of control measures in facilities. The regulatory agencies in Florida are given below.

- FDOH, Division of Environmental Health regulates food service facilities and operations located in institutional settings (such as schools, assisted living facilities, and detention facilities), civic and fraternal organizations, theaters (that limit their menu to drinks, candy, popcorn, hotdogs, and nachos), and bars and lounges that don't prepare food.
    - FDOH Responsibilities – Evaluation and Permitting of Food Service Facilities, Institutional, and Group Care Facilities.
- DBPR, Division of Hotels and Restaurants regulates public lodging and food service establishments.
- DACS, Division of Food Safety regulates food establishments and food products in grocery stores and gas stations.
- The Department of Environmental Protection (DEP) regulates public water systems.
- The Department of Children and Families responsibilities – Prior to licensing/opening a group care establishment that depends on a water supply regulated by Chapter 64E-8, F.A.C. and/or wastewater system regulated by Chapter 64E-6, F.A.C., approval is required from the CHD for the following:
- The Agency for Persons with Disabilities responsibilities - Prior to licensing/opening a group care establishment that depends on a water supply regulated by Chapter 64E-8, F.A.C. and/or wastewater system regulated by Chapter 64E-6, F.A.C., approval is required from the CHD for the following:
- The Agency for Healthcare Administration (AHCA) responsibilities – Based on changes to oversight of foodservice operations for hospitals and nursing homes emphasis will be placed on coordination of approvals prior to licensure for these facilities. Prior to licensing/opening a hospital/nursing home establishment that depends on a water supply regulated by Chapter 64E-8, F.A.C. and/or wastewater system regulated by Chapter 64E-6, F.A.C.

EDUCATION AND TRAINING

Team members, CHDs and agency partners, are trained in the FWDP outbreak response protocols (based on CIFOR guidelines) and trained as to their roles on outbreak response teams by the food and waterborne disease program's REEs. The program provides training through on site classroom, live webinars, and some online self-study courses.

In 2010, 12 training sessions were held around the state training specifically targeting FDOH environmental health and epidemiology staff (over 200 staff). Sessions were also presented to other audiences. Some of the training sessions and presentations included Food and Waterborne Investigations, Norovirus Presentation, Environmental Health Assessment, Training in Foodborne Illness Outbreaks, Tabletop exercise for Foodborne Illness, Vibrio Diseases and

Service Delivery, Foodborne Pathogen Training, Epidemiology and Outbreak Investigations, Food and Waterborne Illness Epidemiology Seminar, and Complaints and Joint Investigation Determination.

Besides CHD environmental health, nursing and epidemiology staff, audiences included members of the Florida Environmental Health Association districts, the National Environmental Health Association, the Florida College of Emergency Physicians, and the Florida Association of Physicians Assistants. Trainers also presented guest lectures to public health students at the University of Florida and Florida Agricultural and Mechanical University. Other community groups who received foodborne illness prevention presentations included home childcare providers, food distributors and retail market corporations, and a hospital. *Vibrio vulnificus* displays were provided to annual meetings of the Florida Association of Physicians Assistants, the Florida Dietetic Association, and the Florida College of Emergency Physicians.

The FDOH Food and Waterborne Disease Program continued its *Vibrio vulnificus* education campaign in 2010. Targeted audiences included high risk groups, health care practitioners and the general public. Presentations were delivered to county health departments, professional associations, community groups, universities, and Florida state agencies. Educational displays were presented and educational materials were distributed during health fairs and at a national conference. The Food and Waterborne Disease Program also continues their collaboration with the Hepatitis Prevention Program with the distribution of *Vibrio vulnificus* educational materials and participation in their World Hepatitis Day health fair at the State Capitol

SURVEILLANCE AND OUTBREAK DETECTION:

Food and Waterborne disease outbreak surveillance in Florida involves the routine monitoring of food and waterborne illness complaints, confirmed enteric disease cases, and changes in normal disease trends potentially transmitted through food. The FWDP uses pathogen specific surveillance with the Merlin system, complaint and outbreak surveillance in the statewide database, FWVSS and syndromic surveillance in the ESSENCE system, and an online complaint reporting system (www.reportfoodpoisoning.com).

COMPLAINTS

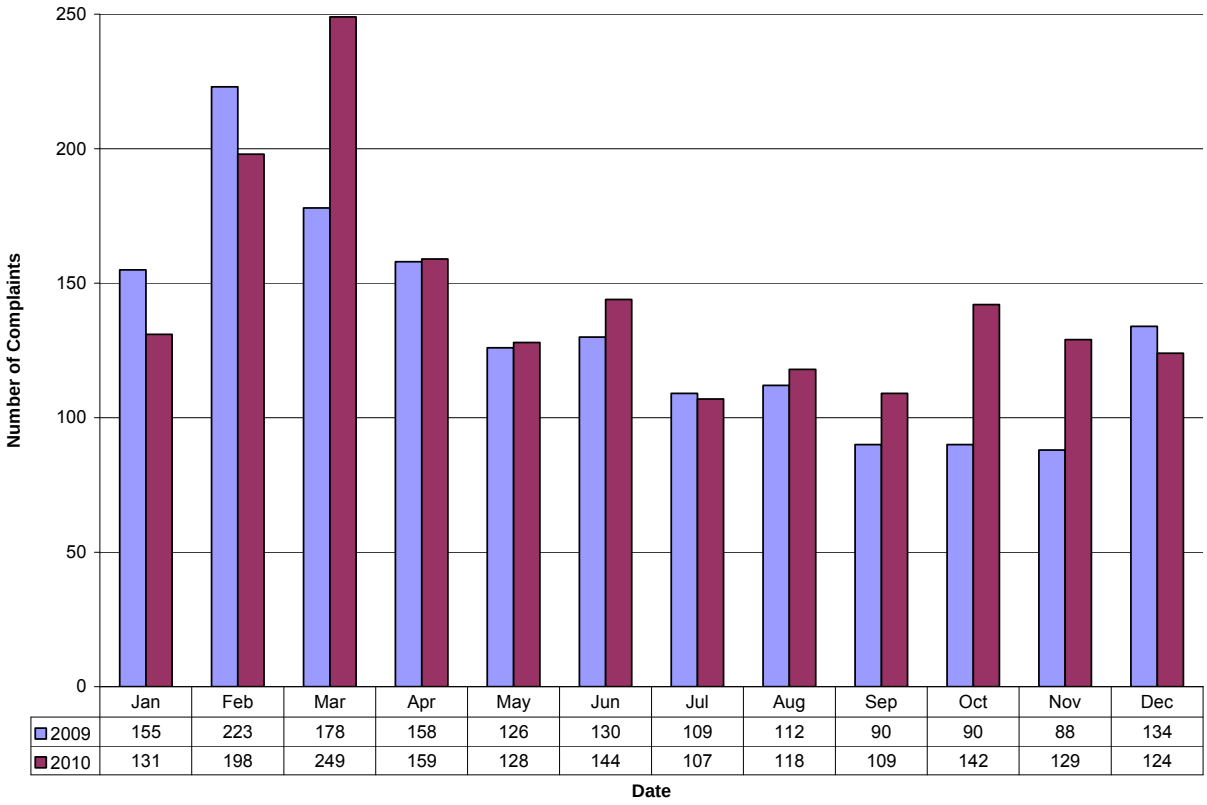
In 2010, a total of 1,739 food and waterborne illness complaints were reported in Florida which is a 9% increase compared to the 1,593 complaints that were reported in 2009 (Table 2). Of the 1,739 complaints, 1,455 were linked to DBPRs establishments; 185 to DACS establishments; 32 to FDOH establishments; three to DEP, two to Federal agencies, one to AHCA, and 61 to home, other, or unknown establishments. The months with the largest number of complaints reported in 2010 were February (223) and March (178) the months with the fewest complaints were September, October, and November (90, 90, and 88, respectively) (Figure 2). Dade and Broward counties reported the most food and waterborne illness complaints with 210 and 162 complaints respectively (Table 3).

TABLE 2: FOOD AND WATERBORNE DISEASE COMPLAINTS, OUTBREAKS, AND OUTBREAK RELATED CASES REPORTED BY AGENCY OF JURISDICTION, 2009-2010

Agency	# Complaints	% Complaints	# Outbreaks	% Outbreaks	# Cases	% Cases
2009						
DACS	205	13%	5	6.58%	34	4.33%
DBPR	1265	79%	44	57.89%	446	56.74%
DEP	3	0%	0	0.00%	0	0.00%
DOH	32	2%	12	15.79%	185	23.54%
Other	88	6%	15	19.74%	121	15.39%
Total	1593	100%	76	100%	786	100%
2010						
DACS	185*	11%	9	14%	46	6%
DBPR	1455*	84%	41	63%	498	62%
DEP	3	0%	0	0%	0	0%
DOH	32	2%	8	12%	212	26%
Federal	2	0%	0	0%	0	0%
AHCA	1	0%	0	0%	0	0%
Other	61	4%	7	11%	51	6%
Total	1738	100%	65	100%	807	100%

* ONE FACILITY WAS REGULATED BY TWO AGENCIES.

FIGURE 2: COMPLAINTS REPORTED IN FLORIDA BY MONTH, 2009-2010



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	155	223	178	158	126	130	109	112	90	90	88	134
2010	131	198	249	159	128	144	107	118	109	142	129	124

Date

TABLE 3: COMPLAINTS REPORTED IN FLORIDA BY COUNTY AND REGULATORY AGENCY, 2010

		Agency							
		AHCA	DACS	DBPR	DEP	DOH	Federal	Other	Total
County	Alachua	0	4	30	0	0	0	0	34
	Bay	0	2	37	0	0	0	1	40
	Bradford	0	1	4	0	0	0	0	5
	Brevard	0	3	20	0	0	0	1	24
	Broward	0	16*	172*	0	3	1	0	190*
	Charlotte	0	1	8	0	1	0	0	10
	Citrus	0	1	6	0	1	0	0	8
	Clay	0	1	6	0	0	0	0	7
	Collier	0	4	25	0	0	0	0	29
	Columbia	0	1	4	1	0	0	0	6
	Dade	1	17	173	0	6	0	46	244
	Dixie	0	1	0	0	0	0	0	1
	Duval	0	11	87	0	0	0	0	98
	Escambia	0	5	43	0	0	0	1	49
	Flagler	0	4	2	0	0	0	0	6
	Franklin	0	0	0	0	0	0	1	1
	Gilchrist	0	1	0	0	0	0	0	1
	Glades	0	0	1	0	0	0	0	1
	Hendry	0	0	1	0	0	0	0	1
	Hernando	0	2	10	0	1	0	0	13
	Highlands	0	8	10	0	0	0	0	18
	Hillsborough	0	4	63	1	0	0	0	68
	Indian River	0	0	3	0	1	0	0	4
	Lake	0	4	27	0	1	0	0	32
	Lee	0	7	84	0	1	0	0	92
	Leon	0	2	21	0	0	0	0	23
	Levy	0	1	0	0	0	0	0	1
	Manatee	0	0	19	0	0	0	0	19
	Marion	0	4	31	0	1	0	0	36
	Martin	0	2	24	0	0	0	1	27
	Monroe	0	2	11	0	1	0	2	16
	Nassau	0	0	6	0	0	0	0	6
	Okeechobee	0	1	0	0	1	0	0	2
	Orange	0	16	107	0	4	0	1	128
	Osceola	0	0	16	0	0	0	0	16
	Palm Beach	0	21	165	1	7	0	1	195
	Pasco	0	4	23	0	0	0	0	27
	Pinellas	0	6	70	0	1	0	0	77
	Polk	0	5	13	0	0	0	1	19
	Putnam	0	0	8	0	0	0	0	8
	Saint Johns	0	1	9	0	0	0	0	10
	Saint Lucie	0	4	11	0	0	0	0	15
	Santa Rosa	0	3	17	0	1	0	1	22
	Sarasota	0	4	36	0	0	0	2	42
	Seminole	0	5	30	0	0	0	2	37
	Sumter	0	2	7	0	1	0	0	10
	Suwannee	0	2	1	0	0	0	0	3

Volusia	0	3	14	0	0	0	0	17
Total	1	184	1454	3	32	1	61	1738

* One facility was regulated by two agencies

OUTBREAK INVESTIGATION SUMMARY 2010

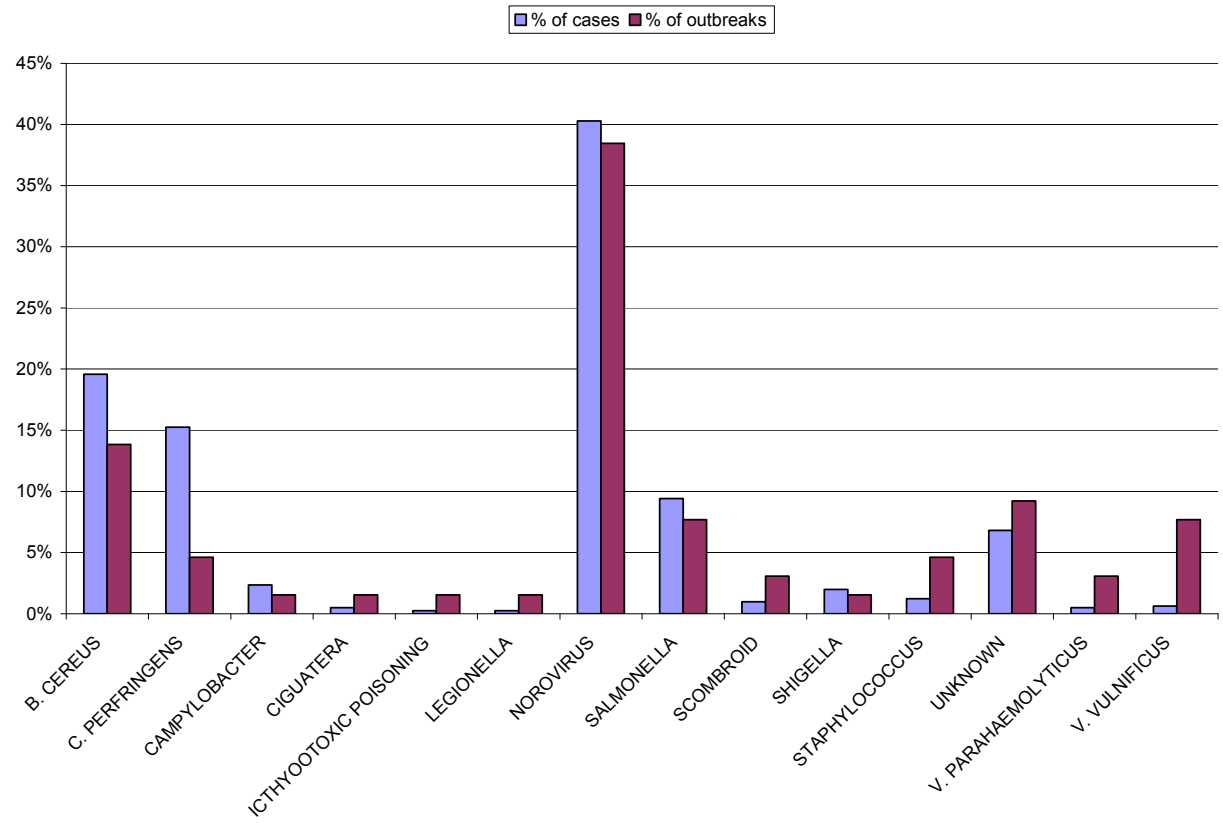
A total of 65 food and waterborne outbreaks with 807 cases were reported in 2010, a 14% decrease in outbreaks compared to the previous year (2009) 76 outbreaks with 786 cases, which also showed a 24% decrease from 2008, 100 outbreaks and 1,241 (Table 1, Figure 1). Investigators were able to laboratory confirm the pathogens in 48% of outbreaks (31), down from the 52% the previous year (52 outbreaks pathogen confirmed in 2009) (Table 4). Foodborne outbreaks numbered 64 with 805 cases (Table 5, and Figure 5). One waterborne outbreak was reported in 2010, with a total of 2 cases (Table 5). The largest outbreak reported in 2010 was due to a *Bacillus cereus* outbreak in an Okeechobee County prison with a total case count of 103, accounting for 12% of all outbreak-related cases reported in 2010 (Table 6).

Norovirus, *Vibrio vulnificus, Salmonella sp.,* and *Bacillus cereus* were implicated in the largest percentage of the total reported outbreaks (35%, 16%, 16% and 10%, respectively) (Table 4, and Figure 3). After norovirus (41% outbreak-related cases), *B. cereus* was identified as the pathogen with the largest percentage of cases in reported outbreaks (30%) followed by *Salmonella sp.* (17%) (Table 4). Restaurants were the exposure site in 57% of the outbreaks (37) reported and for 44% of the cases (352) (Table 7, Figure 6, and Figure 7). Multiple items and ingredients (29% and 35% respectively), fish (9%), and shellfish-mollusk (9%) accounted for the majority of responsible vehicles for most 2010 outbreaks. Multiple items/ingredients combined, accounted for 58% of all outbreak-related cases, followed by rice (13%) and poultry (12%) (Table 5; Figure 4). The month with the largest percentage of outbreaks reported was March (17%) the largest percentage of cases were reported in November (16%) (Table 8 and Figure 7). Large (greater than 10 cases) outbreaks accounted for 42% (27) of the total reported outbreaks and 83% (672) of the total number of outbreak-related cases (Table 6).

Table 4: Number of Reported Food and Waterborne Outbreaks with Laboratory-Confirmed Etiologic Agents and Number of Confirmed and Epi-linked Cases Associated With These Outbreaks, Florida, 2010

PATHOGEN	case	% of confirmed cases	outbreaks	% of confirmed outbreaks
CAMPYLOBACTER	19	4%	1	3%
CIGUATERA	4	1%	1	3%
LEGIONELLA	2	0%	1	3%
SCOMBROID	2	0%	1	3%
SHIGELLA	16	4%	1	3%
VIBRIO PARAHAEMOLYTICUS	4	1%	2	6%
B. CEREUS	134	30%	3	10%
SALMONELLA	76	17%	5	16%
V. VULNIFICUS	5	1%	5	16%
NOROVIRUS	184	41%	11	35%
Total	446	100%	31	100%

FIGURE 3: FOOD AND WATERBORNE TOTAL OUTBREAKS - MOST COMMON PATHOGENS (INCUDING SUSPECT AND CONFIRMED), 2010

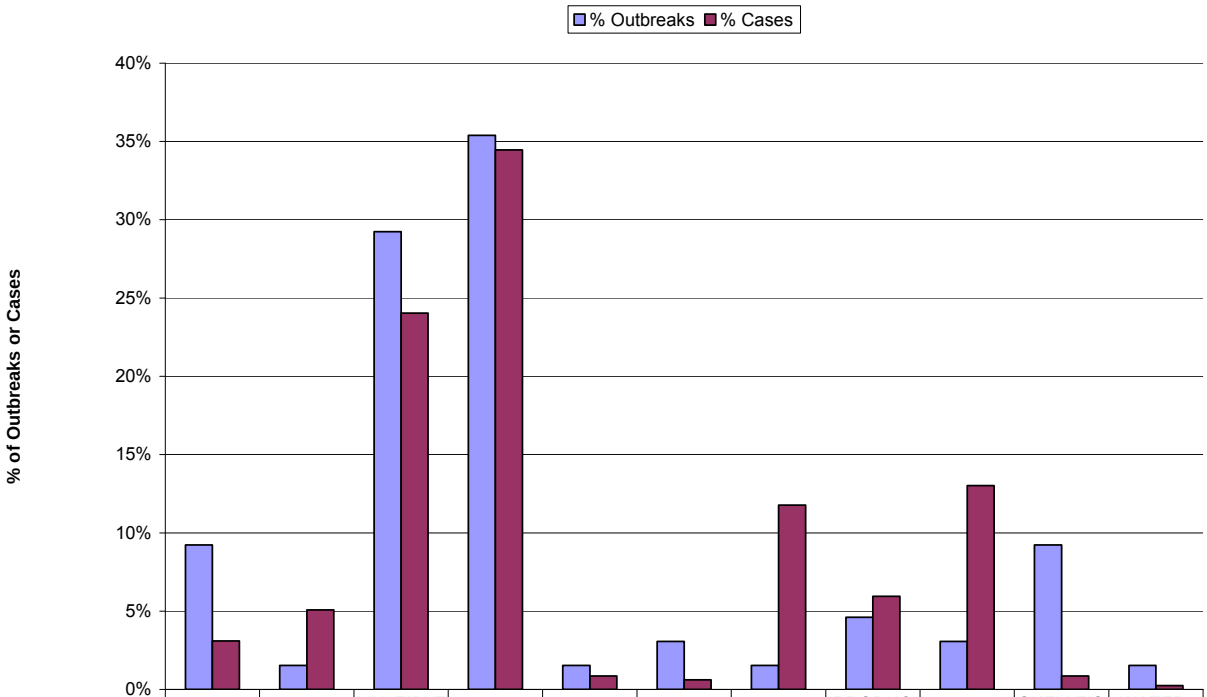


Outbreaks with Unknown Pathogens: 9% (7% cases)

TABLE 5: NUMBER OF FOODBORNE AND WATERBORNE OUTBREAKS AND OUTBREAK-RELATED CASES BY VEHICLE, FLORIDA, 2010

	outbreaks	cases
FISH	6	25
ICE	1	41
MULTIPLE INGREDIENTS	19	194
MULTIPLE ITEMS	23	278
PIZZA	1	7
PORK	2	5
POULTRY	1	95
PRODUCE-VEGETABLE	3	48
RICE	2	105
SHELLFISH-MOLLUSCAN	6	7
WATER-RECREATIONAL	1	2
Total	65	807

FIGURE 4: FOOD AND WATERBORNE PERCENT TOTAL OUTBREAKS AND OUTBREAK RELATED CASES BY VEHICLE, FLORIDA, 2010



	FISH	ICE	MULTIPLE INGREDIENTS	MULTIPLE ITEMS	PIZZA	PORK	POULTRY	PRODUCE-VEGETAB	RICE	SHELLFISH-MOLLUSC	WATER-RECREATIONAL
% Outbreaks	9%	2%	29%	35%	2%	3%	2%	5%	3%	9%	2%
% Cases	3%	5%	24%	34%	1%	1%	12%	6%	13%	1%	0%

TABLE 6: FOOD AND WATERBORNE OUTBREAKS WITH GREATER THAN 10 CASES (N=27), FLORIDA, 2010

COUNTY	NO OF CASES	SITE	SPECIFIC VEHICLE	PATHOGEN STATUS	PATHOGEN
OKEECHOBEE	103	PRISON	RICE	CONFIRMED	B. CEREUS
HILLSBOROUGH	95	CATERER	CHICKEN BREAST	SUSPECTED	C. PERFRINGENS
PALM BEACH	41	RESTAURANT	ICE	SUSPECTED	NOROVIRUS
SUMTER	37	OTHER	BBQ PORK AND CHICKEN	CONFIRMED	SALMONELLA
MANATEE	31	RESTAURANT	BEEF & BROCCOLI	CONFIRMED	NOROVIRUS
PINELLAS	27	RESTAURANT	DINNER BUFFET	CONFIRMED	NOROVIRUS
SARASOTA	25	RESTAURANT	LETTUCE	CONFIRMED	NOROVIRUS
DUVAL	25	RESTAURANT	BURRITOS	SUSPECTED	C. PERFRINGENS
DADE	20	CATERER	CHICKEN, CHICKEN QUESADILLAS, GUACAMOLE	UNKNOWN	UNKNOWN
HILLSBOROUGH	19	RESTAURANT	MULTIPLE FOOD ITEMS	SUSPECTED	NOROVIRUS
ALACHUA	19	RESTAURANT	SALAD	SUSPECTED	NOROVIRUS
SUMTER	19	PRISON	COLESLAW; BROCCOLI; MASHED POTATOES	CONFIRMED	CAMPYLOBACTER
BROWARD	19	HOME	ICE CREAM CAKE	CONFIRMED	NOROVIRUS
ORANGE	17	GROCERY	PORK AND CHICKEN	CONFIRMED	B. CEREUS
DADE	17	HOSPITAL	PANCIT	CONFIRMED	SALMONELLA
BROWARD	16	CATERER	CHICKEN, RICE, AND TOMATO DISH	CONFIRMED	SALMONELLA
ALACHUA	16	RESTAURANT	SALSA	CONFIRMED	SHIGELLA
LAKE	15	OTHER	BAKED BEANS AND BBQ PORK	CONFIRMED	NOROVIRUS
LAKE	15	RESTAURANT	SALAD	CONFIRMED	NOROVIRUS
LEON	14	OTHER	MASHED POTATOES	CONFIRMED	B. CEREUS
MARION	14	OTHER	SALAD BAR (MULTIPLE ITEMS)	CONFIRMED	NOROVIRUS
PALM BEACH	12	HOME	MULTIPLE ITEMS	CONFIRMED	NOROVIRUS
HILLSBOROUGH	12	RESTAURANT	VARIOUS MEXICAN FOOD ITEMS	SUSPECTED	B. CEREUS
OKALOOSA	12	HOME	CAKE FONDANT	CONFIRMED	NOROVIRUS
PINELLAS	11	RESTAURANT	VARIOUS FOOD ITEMS	CONFIRMED	NOROVIRUS
POLK	11	RESTAURANT	SALAD	SUSPECTED	NOROVIRUS
PALM BEACH	10	RESTAURANT	MULTIPLE ITEMS	UNKNOWN	UNKNOWN

Total	672	

The total number of outbreaks with more than ten cases is 27 (42% of the total). The total number of cases associated with these outbreaks is 588 (83% of the total)

TABLE 7: NUMBER OF FOODBORNE AND WATERBORNE OUTBREAKS AND OUTBREAK-RELATED CASES BY FACILITY TYPE, FLORIDA, 2010

	outbreaks	% of outbreaks	cases	% of cases
CATERER	5	7.7	142	18%
GROCERY	4	6.2	27	3%
HOME	7	10.8	52	6%
HOSPITAL	1	1.5	17	2%
OTHER	9	13.8	95	12%
PRISON	2	3.1	122	15%
RESTAURANT	37	56.9	352	44%
Total	65	100.0	807	100%

FIGURE 5: NUMBER OF FOODBORNE AND WATERBORNE OUTBREAKS AND OUTBREAK-RELATED CASES BY FACILITY TYPE, FLORIDA, 2010

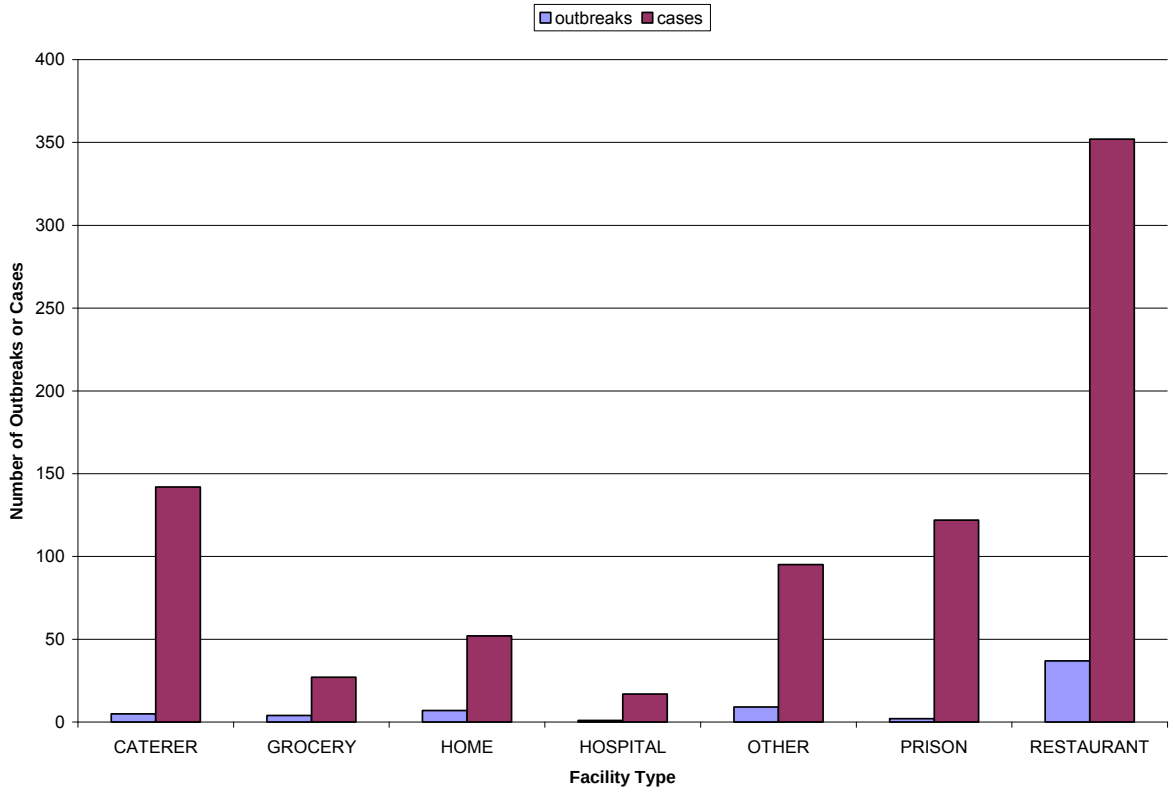


FIGURE 6: FOOD AND WATERBORNE PERCENT TOTAL OUTBREAKS AND CASES BY FACILITY TYPE, FLORIDA, 2010

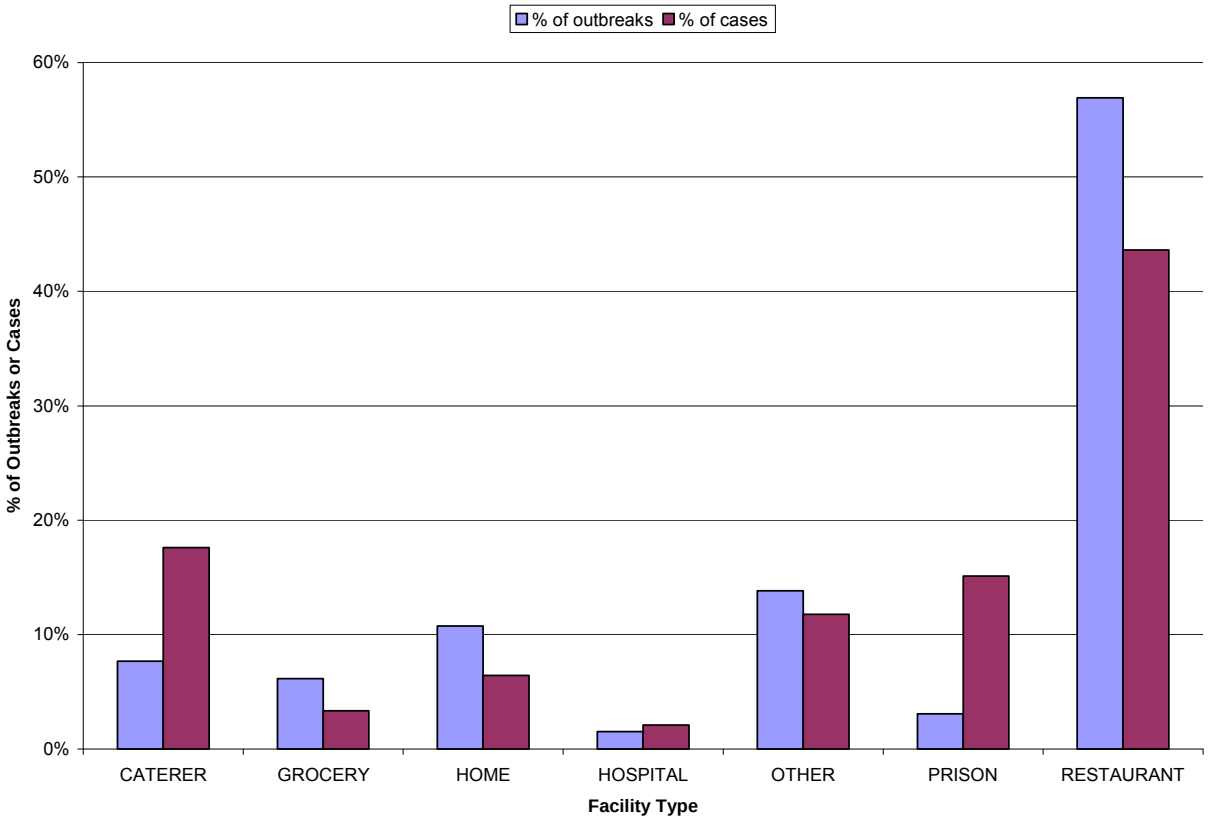
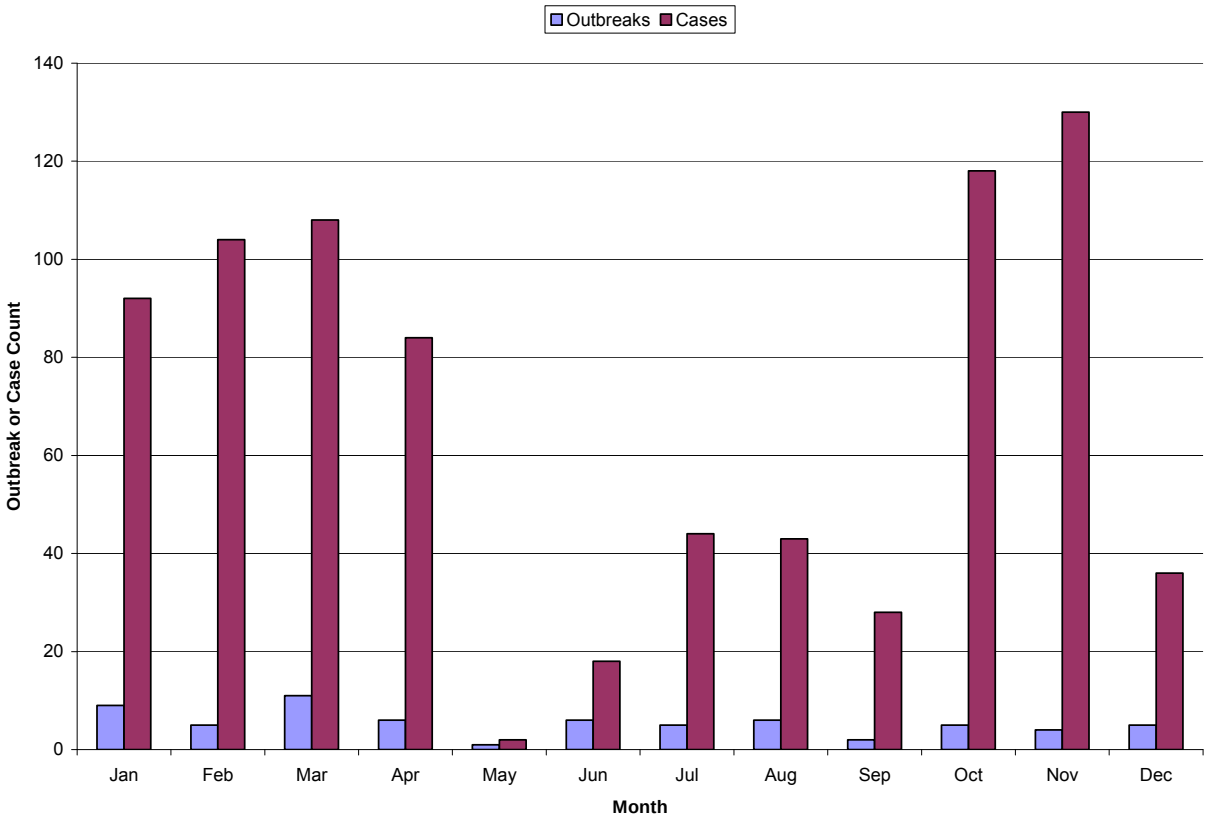


FIGURE 7: FOOD AND WATERBORNE OUTBREAKS, AND CASES BY MONTH, FLORIDA, 2010



SELECTED FLORIDA OUTBREAK

Data from selected reportable pathogens from 2010 specifically infections with *Vibrio vulnificus*, *Staphylococcus aureus*, and *Salmonella sp*, along with other outbreak related diseases with high incidence, such as Norovirus and unknown pathogens are further analyzed in this section

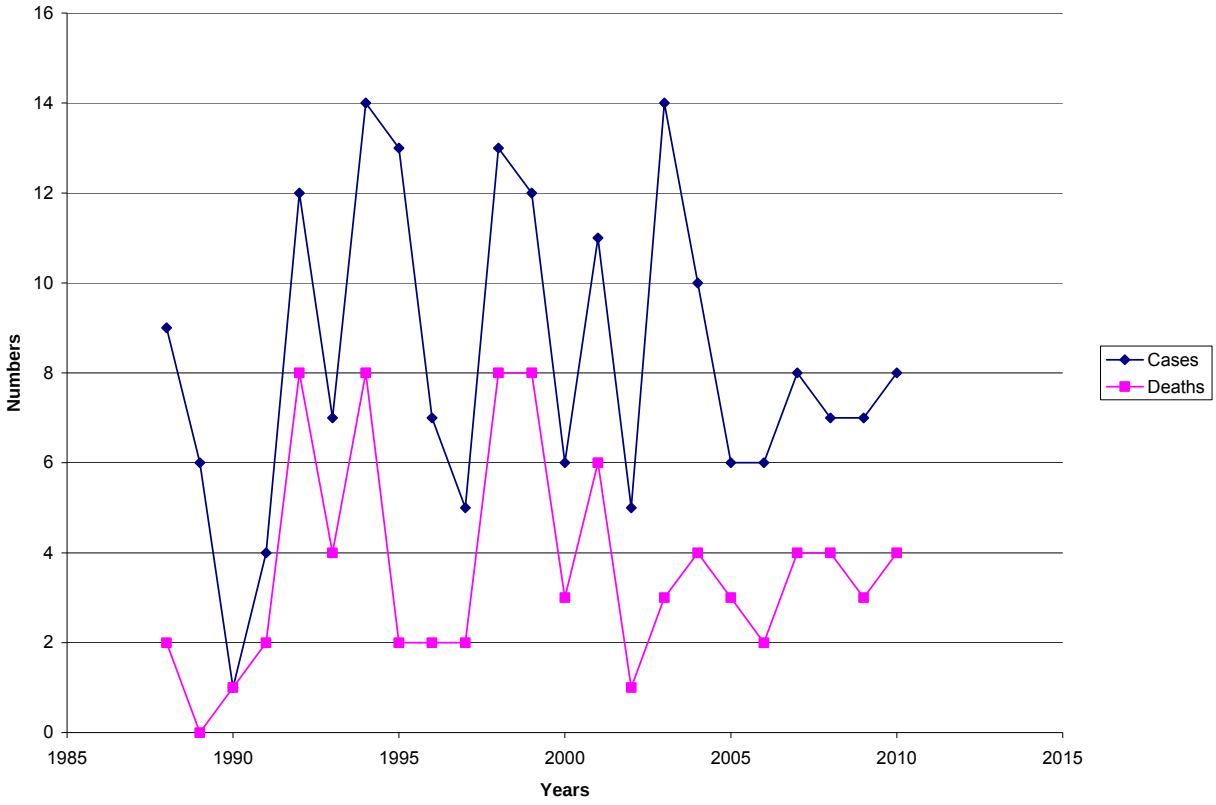
AN OVERVIEW OF *VIBRIO VULNIFICUS*, FLORIDA, 2010

For 2010, there were a total of 32 *Vibrio vulnificus* cases reported in Florida, eight more than the 24 reported in 2009. Of these, 19 were wound-related cases, 8 cases were associated with the consumption of raw oysters, and 5 were from unknown exposures. There was 1 wound-related death, 4 oyster consumption-related deaths, and 4 deaths from unknown exposures (see Table 9 and Figure 8).

TABLE 8: REPORTED CASES OF *VIBRIO VULNIFICUS* INFECTIONS, FLORIDA 2010

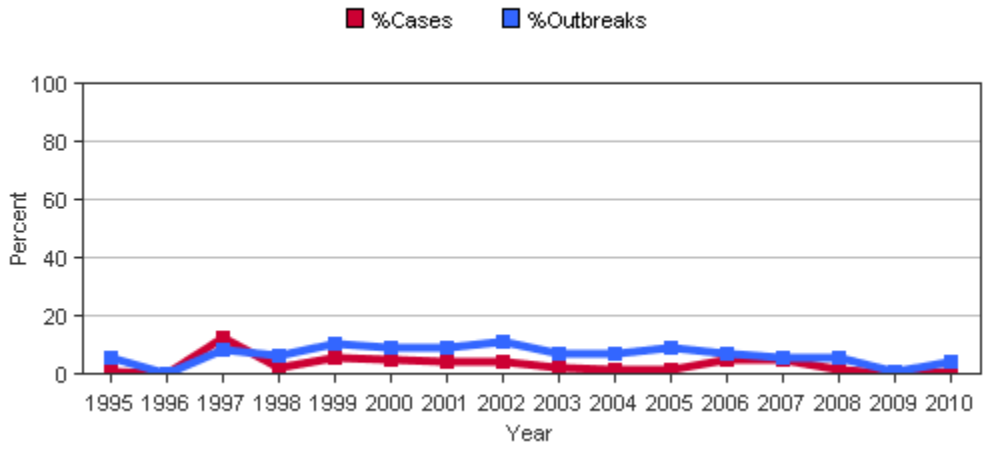
Exposure	Cases	Deaths
Wound	**19**	**1**
Oysters	**8**	**4**
Unknown	**5**	**4**
Total	32	9

FIGURE 8: VIBRIO *VULNIFICUS* CASES AND DEATHS ASSOCIATED WITH OYSTER CONSUMPTION, FLORIDA 1990-2010



OVERVIEW OF FOOD BORNE *STAPHYLOCOCCUS AUREUS* IN FLORIDA

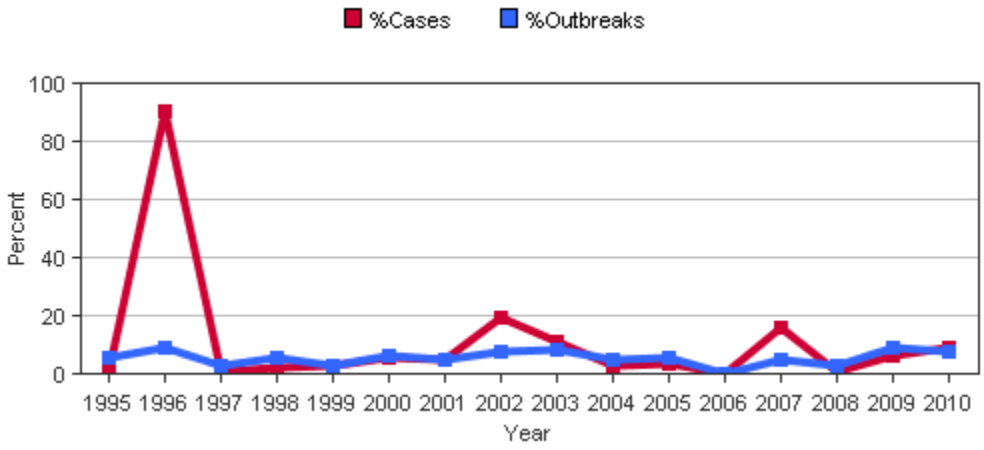
FIGURE 9: TRENDS OF *STAPHYLOCOCCUS AUREUS* IN REPORTED FOOD AND WATERBORNE OUTBREAKS AND OUTBREAK-RELATED CASES, FLORIDA, 1995-2010



Reported food and waterborne *Staphylococcus aureus* outbreaks and outbreak related cases show a slight downward trend over time.

OVERVIEW OF *SALMONELLA SP.* OUTBREAKS

FIGURE 10: TRENDS OF *SALMONELLA SP.* IN REPORTED FOOD AND WATERBORNE OUTBREAKS AND OUTBREAK-RELATED CASES, FLORIDA, 1995-2010



Reported food and waterborne *Salmonella sp.* outbreaks and outbreak related cases show a steady trend over time.

AN OVERVIEW OF FOODBORNE NOROVIRUS REPORTED IN FLORIDA, 2000-2009

CDC estimates that norovirus is the etiologic agent in approximately 50% of foodborne outbreaks in the U.S.* Of the estimated 23 million cases of norovirus infections each year, foodborne norovirus accounts for 9.2 million cases (67% of the total foodborne illness cases) nationally. In addition, foodborne norovirus is attributed to approximately 20,000 (33% total) of U.S. hospitalizations and 124 (7% total) deaths. [4] It is important to note that norovirus is not a nationally reportable condition, as such these are estimates.

In Florida, 13% of total food and waterborne outbreaks that occurred from 1995 to 2010 or 30% total food and waterborne cases can be attributed to norovirus infections (no data are available on Florida hospitalizations or deaths) (Figure 11). From 1995 to 2010 there were a total of 365 food or waterborne norovirus outbreaks with 7,326 associated cases (Table 10). Vehicles of transmission included produce, ice, beverages, and foods with multiple items or ingredients. The primary contributing factors in outbreaks in 2010 were bare and gloved hand contact with food by a worker who is likely working while infectious. Other risk factors for outbreaks include a lack of good personal hygiene and handwashing as well as overboard dumping of raw sewage

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[4] 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)

*Centers for Disease Control and Prevention: Yellow Book, Chapter 5: Norovirus (Accessed 12/10/10): http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-5/norovirus.aspx

causing oyster-related outbreaks. Control of the outbreaks involved excluding the ill foodworker(s) when possible and providing handwashing education to foodworkers and sport and commercial fishermen.

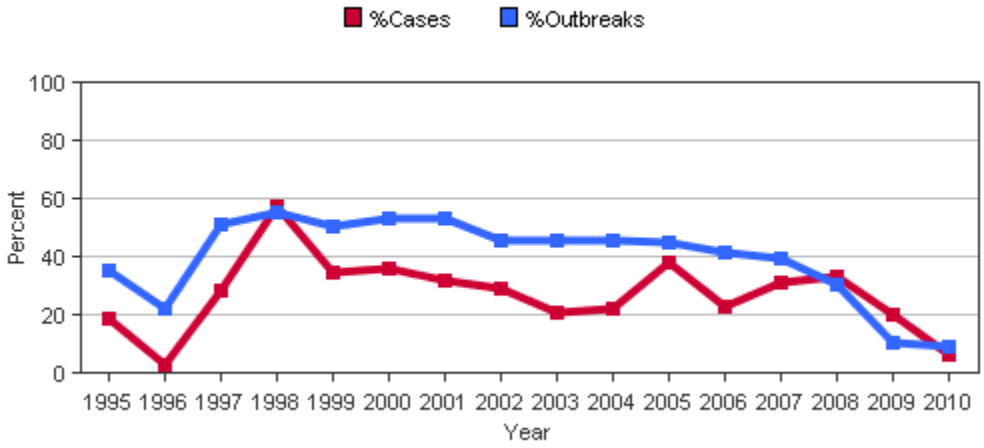
TABLE 9: NUMBER OF REPORTED FOOD AND WATERBORNE NOROVIRUS OUTBREAKS AND RELATED CASES, FLORIDA, 1995-2010

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	20
Norovirus Outbreaks	1	0	44	19	21	24	34	27	29	35	12	30	17	26	21	25
Total Food & Waterborne Disease Outbreaks per year	296	305	439	315	286	288	303	243	188	175	131	148	132	100	76	65
%of Total Outbreaks	0.34%	0.00%	10.02%	6.03%	7.34%	8.33%	11.22%	11.11%	15.43%	20.00%	9.16%	20.27%	12.88%	26.00%	27.63%	38
Total Norovirus cases	12	0	704	462	303	596	734	382	743	1126	118	707	245	538	331	32
Total Food & Waterborne Cases per Outbreak	2908	2777	2744	3290	1544	1757	2052	1469	1648	1954	2017	1263	963	1241	786	80
%Total cases	0.41%	0.00%	25.66%	14.04%	19.62%	33.92%	35.77%	26.00%	45.08%	57.63%	5.85%	55.98%	25.44%	43.35%	42.11%	40

A total of 25 norovirus outbreaks involving 325 cases were investigated in 2010. Of these, 11 or 44% had laboratory confirmation. Since the development of the FDOH Bureau of Laboratories ability to test stools for norovirus in 1999, food and waterborne outbreak investigations have focused on collecting both enteric and viral stool samples for ruling out or confirming norovirus. The FWDP has been working with CHDs to encourage proper stool sampling procedures. Regional food and waterborne disease epidemiologists are available to present norovirus training to CHDs, professional associations and interested community groups around the state. The training was also given to a cruise line who requested it.

Overview of Unknown Pathogens in Florida Outbreaks

Figure 11: Trends of Unknown Pathogens in Reported Food and Waterborne Outbreaks and Outbreak-related Cases, Florida, 1995-2010



The number of food and waterborne outbreaks and outbreak-related cases from unknown causes show a very slight downward trend over time.

CONTRIBUTING FACTORS: INVESTIGATION FINDINGS

In 2009, CDC launched the National Outbreak Reporting System (NORS). Under the NORS surveillance system, the contributing factors and food specific data were modified. Modification of the contributing factors included adding a not applicable response for each type of contributing factor and also streamlined some of the proliferation/amplification factor responses. Foodborne contributing factors are defined as the food safety practices and behaviors which most likely contributed to a foodborne illness outbreak. These contributing factors are classified according to contamination, proliferation (bacterial agents only), and survival (microbial agents only). Food specific data include method of processing, method of preparation and level of preparation. Foodborne contributing factors were unknown for 8 outbreaks involving 118 cases. For waterborne outbreaks the contributing factors have been expanded to improve risk factor data and are sectioned according to the type of water venue including: recreational water treated venue, recreational water untreated venue, drinking water, and water not intended for drinking (WNID).

Please check Appendix A for descriptions of contributing factors to food and waterborne outbreaks. Additional data on each contributing factor (contamination, proliferation, survival, and preparation method) is located in Appendix B.

TABLE 10: EIGHT MOST PREVALENT CONTRIBUTING FACTORS IN FOODBORNE OUTBREAKS, FLORIDA (N=64), 2010

Contributing Factor	# Outbreaks	# Cases
CONTAMINATION FACTOR		
C10 - Bare-handed contact by a food handler/worker/preparer who is suspected to be infectious	12	167
C7 - Contaminated raw product - food was intended to be consumed raw or undercooked / under-processed	8	42
PROLIFERATION FACTOR		
P7 - Improper hot holding due to improper procedure or protocol	9	72
P2 - No attempt was made to control temperature of implicated food or length of time food was out of temperature	8	109
SURVIVAL FACTOR		
S1 - Insufficient time and/or temperature control during initial cooking/heat processing	3	79
S2 - Insufficient time and/or temperature during reheating	2	39
S5 - Other process failures that permit pathogen growth	4	37
METHOD FACTOR		
3 - Ready to eat food: Manual preparation, No cook step	23	205
4 - Cook and Serve Foods: Immediate service	10	93
5 - Cook and hot hold prior to service	10	93

TABLE 11: WATERBORNE DISEASE CONTRIBUTING FACTORS: NUMBER OF WATERBORNE OUTBREAKS (N=1) AND OUTBREAK-RELATED CASES (N=2), FLORIDA, 2010

Factors Contributing to Recreational Water Contamination and/or Increased Exposure in Treated Venues	# Outbreaks	# Cases
People Factors		
Operator error	1	2
Facility Design Factors		

Maintenance: Equipment and Operation Factors		
Disinfectant control system malfunctioning, inadequate, or lacking	1	2
pH control system malfunctioning inadequate, or lacking	1	2
Policy and Management Factors		
Inadequate water quality monitoring	1	2
No shock or hyperchlorination policy	1	2
Unknown		

TABLE 12: LINE LIST OF WATERBORNE OUTBREAKS (N=1), FLORIDA, 2010

COUNTY	# CASES	SITE	SPECIFIC VEHICLE	PATHOGEN
Orange	2	Other	Recreational Water	LEGIONELLA

CONTROL MEASURES

The FWDP works with CHDs and regulatory agencies to recommend control measures that will prevent further illnesses in an outbreak. Two of the program's control measures are described here.

FOOD WORKER EXCLUSIONS

The program works with regulatory agencies to ensure that food managers and workers are trained in the importance of reporting unusual patterns of illness among workers or customers and food code requirements for disease reporting. The program keeps a toolkit for reference by CHDs and the public on the current guidelines for food worker exclusions.

RECALLS

The FWDP has been alerting the public health community of recall notices that have been distributed by the Food and Drug Administration (FDA) and the United States Department of Agriculture (USDA), Food Safety and Inspection Service since 2003. The recall notice information is obtained from the FDA & USDA web sites and also from the recalls.gov web site. This information generally involves class 1 & 2 recalls and is distributed to health department and other partner agencies through e-mail and the FDOH EpiCom network. A searchable recalls database was developed and is located on the FWDP website.

http://www.myfloridaeh.com/medicine/foodsurveillance/Recalls_Page.htm

During 2010, 77 recall notices were distributed to the public health community through the EpiCom network and email notification. These recalls included; FDA enforcement reports, product allergy alerts, under processing or adulteration of food items and numerous other recalls due to potential chemical, bacterial and viral contaminations. Some of the recalls involved contamination of pet foods. Some of the most common pathogens or other agents involved in recalls notices were *Salmonella*, *Listeria monocytogenes*, *Escherichia coli 0157:H7*. and lead contamination. The largest number of recalls during 2010, involved products potentially contaminated with *Salmonella*. Several large shell egg recalls occurred in 2010 due to a multistate *Salmonella* outbreak.

FOOD AND WATERBORNE OUTBREAK PUBLICATIONS AND ARTICLES

The year 2010 was an active time period for Florida food and waterborne disease investigations and a number of articles were published. A detailed listing of program publications is available at the program website www.foodandwaterdiseaseflorida.com. Some additional information and data on food and waterborne illnesses can be obtained from the 2010 Annual Florida Morbidity Statistics Report at:

http://www.doh.state.fl.us/Disease_ctrl/epi/Morbidity_Report/2010/amr_2010.html

APPENDIX: EXPLANATION OF CONTRIBUTING FACTORS FOR FOODBORNE ILLNESS OUTBREAKS FROM CDC FORM 52.13

LIST OF CONTRIBUTING FACTORS OF FOODBORNE ILLNESS OUTBREAKS

Source: CDC Form 52.13, NORS.

☐ Contributing Factors Unknown

CONTAMINATION FACTORS:

C1 – Toxic substance part of the tissue
C2 – Poisonous substance intentionally/deliberately added
C3 – Poisonous substance accidentally/inadvertently added
C4 – Addition of excessive quantities of ingredients that are toxic in large amounts
C5 – Toxic container
C6 – Contaminated raw product – food was intended to be consumed after a kill step
C7 – Contaminated raw product – food was intended to be consumed raw or undercooked/underprocessed
C8 – Foods originating from sources shown to be contaminated or polluted (such as a growing field or harvest area)
C9 – Cross-contamination of ingredients (cross-contamination does not include ill food workers)
C10 – Bare-hand contact by a food handler/worker/preparer who is suspected to be infectious
C11 – Glove-hand contact by a food handler/worker/preparer who is suspected to be infectious
C12 – Other mode of contamination (excluding cross-contamination) by a food handler/worker/preparer who is suspected to be infectious
C13 – Foods contaminated by non-food handler/worker/preparer who is suspected to be infectious
C14 – Storage in contaminated environment
C15 – Other source of contamination
C-N/A – Contamination Factors - Not Applicable

PROLIFERATION/AMPLIFICATION FACTORS:

P1 – Food preparation practices that support proliferation of pathogens (during food preparation)
P2 – No attempt was made to control the temperature of implicated food or the length of time food was out of temperature control (during food service or display of food)
P3 – Improper adherence of approved plan to use Time as a Public Health Control
P4 – Improper cold holding due to malfunctioning refrigeration equipment
P5 – Improper cold holding due to an improper procedure or protocol
P6 – Improper hot holding due to malfunctioning equipment
P7– Improper hot holding due to improper procedure or protocol
P8 – Improper/slow cooling
P9 – Prolonged cold storage
P10 – Inadequate modified atmosphere packaging
P11 – Inadequate processing (acidification, water activity, fermentation)
P12 – Other situations that promoted or allowed microbial growth or toxic production
P-N/A – Proliferation/Amplification Factors - Not Applicable

SURVIVAL FACTORS:

S1 – Insufficient time and/or temperature control during initial cooking/heat processing
S2 – Insufficient time and/or temperature during reheating
S3 – Insufficient time and/or temperature control during freezing
S4 – Insufficient or improper use of chemical processes designed for pathogen destruction
S5 – Other process failures that permit pathogen survival
S-N/A – Survival Factors - Not Applicable

FOOD SPECIFIC DATA:

METHOD OF PROCESSING

(Prior to point-of-service: Processor):

1 – Pasteurized (e.g., liquid milk, cheese, and juice etc)
2 – Unpasteurized (e.g., liquid milk, cheese, and juice etc)
3 – Shredded or diced
4 – Pre-packaged (e.g., bagged lettuce or other produce)
5 – Irradiation
6 – Pre-washed
7 – Frozen
8 – Canned
9 – Acid treatment (e.g., commercial potato salad with vinegar, etc)
10 – Pressure treated (e.g., oysters, etc)
11 – Other
12 – Unknown

METHOD OF PREPARATION

(At point-of-service: Retail: restaurant, grocery store): Select only one

1 – Prepared in the home
2 – Ready to eat food: No manual preparation, No cook step. (e.g., sliced cheese, pre-packaged deli meats; whole raw fruits; pre-shucked raw oysters, etc)
3 – Ready to eat food: Manual preparation, No cook step. (e.g., cut fresh fruits and vegetables, chicken salad made from canned chicken, etc)
4 – Cook and Serve Foods: Immediate service. (e.g., soft-cooked eggs, hamburgers, etc)
5 – Cook and hot hold prior to service. (e.g., soups, hot vegetables, mashed potatoes, etc)
6 – Advance preparation: Cook, cool, serve (e.g., sliced roast beef from a whole cooked roast, etc)
7 – Advance preparation: Cook, cool, reheat, serve (e.g., casseroles, soups, sauces, chili, etc)
8 – Advance preparation: Cook, cool, reheat, hot hold, serve (e.g., chili, refried beans, etc)
9 – Advance preparation: Cook-chill and Reduced Oxygen Packaging (ROP) (e.g., sauces, gravies, cheeses, etc packaged under ROP)
10 – Other
11 – Unknown

LEVEL OF PREPARATION**:**

Select only one

1 – Foods eaten raw with minimal or no processing. (e.g., washing, cooling)
2 – Foods eaten raw with some processing. (e.g., no cooking, fresh cut and/or packaged raw)
3 – Foods eaten heat processed. (e.g., cooked: a microbiological kill step was involved in processing)

LIST OF WATERBORNE CONTRIBUTING FACTORS

Source: CDC Form 52.12, NORS

RECREATIONAL WATER TREATED VENUES

CDC 52.12 (NORS) – Contributing Factors

1) People

• Out of compliance with bather load/density requirements
• Primary intended use of water is by diaper/toddler-aged children (e.g. kiddie pool)
• Heavy use by child care center groups
• Fecal/vomitus accidents
• Patrons continued to swim when ill or within 2 weeks of being ill
• Operator error
• Intentional contamination (explain in remarks)

2) Facility Design

• Combined pool filtration systems led to cross contamination
• Hygiene facilities inadequate or distant (e.g. no toilets, no diaper changing facilities)
• Spray feature water demand higher than treatment system capacity so water returns to features and bypasses filtration/treatment system
• No supplemental disinfection installed that would have inactivated pathogen (e.g. Cryptosporidium) - For example, this would apply in a cryptosporidiosis outbreak if the pool had chlorination but no UV disinfection.
• Water temperatures ≥ 300C (≥ 86°F)
• Cross connection with wastewater or non-potable water

3) Maintenance: Equipment and Operation

• Disinfectant control system malfunctioning, inadequate, or lacking (e.g. hand feed)
• Incorrect settings on disinfectant control system
• pH control system malfunctioning inadequate, or lacking (e.g. hand feed)
• Incorrect settings on pH control system
• Filtration system malfunctioning or inadequate (e.g. low flow rate)
• Supplemental disinfection system malfunctioning (e.g. ultraviolet light, ozone)
• Insufficient system checks so breakdown detection delayed- For example, a breakdown in the system was not detected promptly because the system was not checked often enough or thoroughly enough.
• No preventive maintenance programs to reduce breakdowns- For example, there was a lack of scheduled maintenance to keep the components of the system in good working order.
• Remote monitoring system in use
• Ventilation insufficient for indoor aquatic facilities
• Chemical handling error (e.g. chemical hookup, improper mixing or application) - For example, a chemical feed line was not clamped before disconnecting, resulting in a spill or chemical mixing (e.g., chlorine and acid) OR chemicals were mixed together or applied incorrectly (e.g. by staff members).
• Maintenance chemicals not flushed from system before opening to swimmers- For example, the pool was not closed to swimmers during maintenance or was reopened before maintenance steps were completed.
• Low or zero water flow combined with continuous feed of chemicals resulted in excess chemicals in water
• Extensive slime/biofilm formation
• Recent construction
• Cyanurate level excessive
• Lack of draining/cleaning
• Stagnant water in spa piping was aerosolized

RECREATIONAL WATER TREATED VENUES

CDC 52.12 (NORS) – Contributing Factors

4) Policy and Management

• No aquatics operators on payroll who have received state/local certified training
• Untrained/inadequately trained staff on duty
• Unclear communication chain for reporting problems
• Inadequate water quality monitoring (e.g. inadequate test kit, inadequate testing frequency)
• Employee illness policies absent or not enforced
• Missing or poor chemical handling policies, practices, and training
• No operator on duty at the time of incident
• Facility falls outside aquatic health code
• No shock or hyperchlorination policy

5) Unknown or insufficient information to assign deficiencies

CDC 52.12 NORS Contributing Factors

1) People

- Out of compliance with bather load/density requirements
- Primary intended use of water is by diaper/toddler aged children (e.g., kiddie pool area)
- Heavy use by child care center groups
- Fecal/vomitus accident
- Patrons continued to swim when ill or within 2 weeks of being ill
- Operator error
- Intentional contamination (explain in remarks)

2) Swim Area Design

- Hygiene facilities inadequate or distant (e.g. no toilets, no diaper changing facilities)
- Malfunctioning or inadequate onsite wastewater treatment
- Poor siting/design of onsite wastewater treatment system
- Stagnant or poorly circulating water in swim area

3) Water Quality

- Heavy rainfall and runoff
- Sanitary sewer overflow (SSO) impact
- Combined sewer overflow (CSO) impact
- Domestic animal contamination (e.g., livestock, pets)
- Wildlife contamination - Birds
- Wildlife contamination - Mammals
- Wildlife contamination - Fish kill
- Wastewater treatment plant effluent flows past swim area
- Wastewater treatment facility malfunction
- Sewer line break
- Nearby biosolid/land application site (e.g., human or animal waste application)
- Contamination from agricultural chemical application (e.g., fertilizer, pesticides)
- Contamination from chemical pollution not related to agricultural application
- Water temperatures ≥ 300C (≥ 86°F)
- Seasonal variation in water quality (e.g. lake/reservoir turnover events)
- Inappropriate dumping of sewage into water body (e.g. boat, RV)
- Algal bloom
- Dumping of ballast water
- Tidal wash (i.e., tide exchange or influence by inland water)

4) Policy and Management

• Aquatics operator has not received state/local certified training
• Untrained/inadequately trained staff on duty
• Unclear communication chain for reporting problems
• Employee illness policies absent or not enforced
• No operator on duty at the time of incident

5) Unknown or insufficient information to assign deficiencies

DRINKING WATER

CDC 52.12 NORS Contributing Factors

Source Water Factors

• Sanitary sewer overflow (SSO)
• Combined sewer overflow (CSO)
• Malfunctioning onsite wastewater treatment system
• Sewage treatment plant malfunction
• Sewer line break
• Poor siting/design of wastewater treatment system
• Nearby biosolid/land application site (e.g., human or animal waster application)
• Contamination from agricultural chemical application (e.g., fertilizer, pesticides)
• Contamination from chemical pollution not related to agricultural application
• Contamination by a chemical that the current treatment methods were not designed to remove
• Domestic animal contamination (e.g., livestock, concentrated feeding operations, pets)
• Wildlife contamination – Birds
• Wildlife contamination – Mammals
• Wildlife contamination – Fish Kill
• Flooding/heavy rains
• Algal bloom
• Seasonal variation in water quality (e.g., lake/reservoir turnover events, resort community with seasonal loading)
• Low water table (e.g., drought, over-pumping)
• Ground water under direct influence of surface water (e.g., shallow well)
• Contamination through limestone or fissured rock (e.g., karst)
• Contaminated recharge water
• Use of an alternate source of water by a water utility
• Mixing of raw water from different sources
• Improper construction or location of a well or spring
• Water system intake failure (e.g., cracked well casing, cracked intake pipe)
• Intentional Contamination (explain in remarks)
• Other, specify:
• Unknown

Treatment Factors

• Change in treatment process
• No disinfection
• Temporary interruption of disinfection
• Chronically inadequate disinfection
• No filtration
• Inadequate filtration
• Deficiencies in other treatment processes
• Corrosion in or leaching from pipes or storage tanks
• Pipe/component failure or break (e.g., pipes, tanks, valves)
• Contamination during construction or repair of pipes/components
• Construction or repair of pipes/components without evidence of contamination
• Operator error
• Other, specify:
• Unknown

Distribution and Storage Factors

• Cross-connection of potable and nonpotable water pipes resulting in backflow
• Low pressure or change in water pressure in the distribution system
• Change in water flow direction in the distribution system
• Mixing of treated water from different sources
• Pipe/Component failure or break (e.g., pipes, tanks, valves)
• Corrosion in or leaching from pipes or storage tanks
• Contamination of mains during construction or repair (e.g., a water main)
• Construction or repair of mains without evidence of contamination (e.g., a water main)
• Scheduled flushing of the distribution system
• Contamination of storage facility
• Aging water distribution components (e.g., pipes, tanks, valves)
• Water Temperature ≥ 30°C (≥ 86°F)
• Intentional contamination (explain in remarks)
• Other, specify
• Unknown

Factors Outside the Jurisdiction of Water/Utility or at the Point of Use

• *Legionella species* in water system
• Cross-connection of potable and nonpotable water pipes resulting in backflow
• Lack of backflow prevention in plumbing
• Low pressure or change in water pressure in the plumbing
• Change in water flow direction in the plumbing
• Corrosion in or leaching from pipes or storage tanks
• Pipe/component failure or break (e.g., pipes, tanks, valves)
• Aging plumbing components (e.g., pipes, tanks, valves)
• Contamination of plumbing during construction or repair
• Construction or repair of plumbing without evidence of contamination
• Deficiency in building/home-specific water treatment after the water meter or property line
• Deficiency or contamination of equipment/devices using or distributing water
• Contamination during commercial bottling or making beverage or ice

• Contamination during shipping, hauling, or storage
• Contamination at point of use - Tap
• Contamination at point of use - Hose
• Contamination at point of use – Commercially-bottled water
• Contamination at point of use – Container, bottle, or pitcher
• Contamination at point of use – Unknown
• Water Temperature ≥ 30°C (≥ 86°F)
• Intentional Contamination (explain in remarks)
• Other, specify:
• Unknown

WNID

CDC 52.12 NORS Contributing Factors

Water Not Intended for Drinking or Water of Unknown Intent (WNID/WUI) Factors

• Cooling tower/evaporative condenser – shutdown for >3 days without draining to waste
• Cooling tower/evaporative condenser – lack of maintenance program
• Cooling tower/evaporative condenser – lack of qualified water quality specialist
• Cooling tower/evaporative condenser – presence of scale or corrosion
• Cooling tower/evaporative condenser – presence of dirt, organic matter, or other debris in cold water basin
• Cooling tower/evaporative condenser – absence of drift eliminators
• Cooling tower/evaporative condenser – presence of damaged drift eliminators
• Cooling tower/evaporative condenser – history of recent repairs to the device
• Cooling tower/evaporative condenser – siting of device near building air intakes
• Cooling tower/evaporative condenser – siting of device near windows that can be opened
• Cooling tower/evaporative condenser – siting of device in immediate area of kitchen exhaust fans, live, plants, truck bays, or other sources of organic matter
• Cooling tower/evaporative condenser – construction on the premises of the device within 6 months before the index case
• Cooling tower/evaporative condenser – construction within 100 meters of the premises of the device within 6 months before the index case
• Ornamental fountain – presence of submerged lighting
• Ornamental fountain – lack of written cleaning and maintenance program
• Ornamental fountain – presence of dirt, organic matter, or other debris in the water basin
• Broken/damaged sewer pipe
• Recycling of water
• Water temperature ≥ 30°C (≥ 86°F)
• Other, Specify:
• Unknown