Food and Waterborne Illness Surveillance and Investigation Annual Report, 2011

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OVERVIEW

PURPOSE

The Florida Department of Health (DOH) investigates and reports food and waterborne disease outbreaks, in part, as an effort to better understand and improve our ability to prevent and control these diseases in Florida. 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
- 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 2011 focusing on:

- Outbreak surveillance activities
- Outbreak investigation findings

FOOD AND WATERBORNE DISEASE OUTBREAK DEFINITIONS AS DEFINED BY THE 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, more than two persons must have experienced a

[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).

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 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, two or more persons must be epidemiologically linked by the illness, time, and location of the exposure to recreational water. Second, the epidemiologic evidence must implicate water or volatilization of water-associated compounds into the air surrounding an aquatic facility or water body as the probable source of the illness. This criterion is waived for single cases of laboratory-confirmed PAM, single cases of *Vibrio* spp. wound infections and single cases of chemical poisoning if water quality data indicate contamination by the chemical. 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 to prevent future outbreaks, reduce incidence of food and waterborne illness, and increase 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. With an estimated 18 million population and 83.9 million annual visitors to Florida, along with an aging and high-risk population, the DOH continues its ongoing responsibility and authority for disease and outbreak response. The program is funded by the Department of Business and Professional Regulation (DBPR) and the Department of Agriculture and Consumer Services (DACS) through license fees. Each entity (DBPR and DACS) charge an epidemiological investigation component for their operating fees that funds the FWDP. The DOH 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 program, Florida would not be able to respond efficiently and in a timely manner to food and waterborne illness 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:

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[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)

1. Section 381.006 (10), Florida Statutes addresses the environmental epidemiology function of DOH, including the investigation of food and waterborne disease.
2. Section 509.032 (2) (d) and 509.035 (1) (a), Florida Statutes 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 addresses the coordination between DBPR and DOH on closures of establishments due to a public health threat.
3. Florida Administrative Code rules 64D-3.029 and 64D-3.040 (4), (6), (8) and 64D-3.041, known as the reportable diseases rules, list diseases that are reportable in Florida, many of which are food and waterborne. The list includes reporting of food and waterborne disease outbreaks as well as individually confirmed cases of illness. The rules address the exclusion of food workers in certain situations and the posting of warnings regarding raw oyster consumption in restaurants. The rules also address epidemiological investigations.
4. Interagency agreement between the DBPR and the DOH (for a copy contact FWDP) 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 provides training and assistance to county health department (CHD) staff in methods and procedures used in outbreak investigations, surveillance for the detection of food and waterborne diseases, investigation of food and waterborne disease outbreaks, and reporting these incidents to appropriate authorities. FWDP is staffed with regional environmental epidemiologists (REE), a statewide coordinator, a counter bioterrorism coordinator, and an administrative assistant.

Outbreak Summary 1989-2011

From 1989-2011, the FWDP, working in close partnership with CHDs and regulatory agencies, investigated 4,014 outbreaks with 33,863 associated cases. In addition to outbreak investigations, the program also coordinated the follow-up on 1,500–4,000 individual food and waterborne illness complaints every year. In 2011, the number of foodborne outbreaks decreased to the lowest number since the start of the program in 1994: 55 (Table 1). The rate of cases per 100,000 population decreased from 4.29 in 2010 to 2.44 in 2011. 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). Additionally, the decline in the number of reported outbreaks could be due to decreased staffing at the CHD and the FWDP program. Additional data are needed to determine the impact of this trend.

TABLE 1: SUMMARY OF FOOD AND WATERBORNE ILLNESS OUTBREAKS REPORTED TO FLORIDA, 1989–2011[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
2011	55	462

*Food and Waterborne Disease Program established within DOH

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 of the implementation of control measures in facilities. The regulatory agencies in Florida are given below.

[3] All data for this report have been compiled from the Food, Waterborne, and Vectorborne Surveillance System (FWVSS)

- DOH Bureau 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 do not prepare food. DOH responsibilities also include the 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 related to food are within child care facilities and child care services programs. However, prior to licensing/opening establishments that depend on a water supply regulated by Florida Administrative Code Chapter 64E-8, and/or wastewater system regulated by Florida Administrative Code Chapter 64E-6, approval is required from the CHD.

- The Agency for Persons with Disabilities responsibilities related to food are within residential institutions including some group care facilities. As with child care facilities prior to opening such facilities that depend on a water supply regulated by Florida Administrative Code Chapter 64E-8, and/or wastewater system regulated by Florida Administrative Code Chapter 64E-6, approval is required from the CHD.

- The Agency for Health care Administration (AHCA) responsibilities for food are within foodservice operations for hospitals and nursing homes. However, prior to licensing/opening a hospital/nursing home establishment that depends on a water supply regulated by Florida Administrative Code Chapter 64E-8, and/or wastewater system regulated by Florida Administrative Code Chapter 64E-6, approval is required from the CHD.

EDUCATION AND TRAINING

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

In 2011, a four-part web-based training series entitled “When Food is Poisoned: A Comprehensive Look at Intentional Food Contamination” was conducted by the FWDP. The series included an introduction to food terrorism, a lecture on foodborne disease surveillance, an in-depth case study of a salmonellosis outbreak in The Dalles, Oregon, and a section about lessons learned from previous incidents of intentional food contamination. A total of 58 (87%) CHDs participated in at least one of the sessions provided. This training was well attended by

our partnering agencies and national public health partners as well (Appendix 2). Fifteen training sessions were held around Florida, specifically targeting DOH environmental health and epidemiology staff (over 378 staff). Sessions were also presented to university students and regulatory audiences. Some of the training sessions and presentations included "Food and Waterborne Investigations," "*Vibrio cholerae* O75 Cluster," "Foodborne Complaint Module Training," and "Primary Amebic Meningoencephalitis Ecology and Epidemiology."

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 common disease trends caused by agents potentially transmitted through food. The FWDP uses pathogen-specific surveillance with the Merlin system (Florida's web-based reportable disease surveillance system), complaint and outbreak surveillance in the statewide database, Florida's Food Waterborne and Vectorborne Surveillance System (FWVSS), and the Florida's Electronic Surveillance System for the Early Notification of Community-based Epidemics system (ESSENCE), and an online complaint reporting system (www.reportfoodpoisoning.com).

COMPLAINTS

In 2011, 1,526 food and waterborne illness complaints were reported in Florida, which is a 12% decrease compared to the 1,738 complaints that were reported in 2010 (Table 2). Of the 1,526 complaints, 1,313 were linked to DBPR regulated establishments, 138 to DACS regulated establishments, 19 to DOH regulated establishments, one to AHCA regulated establishments, and 55 to home, other, or unknown establishments. The months with the largest number of complaints reported in 2011 were January through April (131,198, 249, and 159, respectively) and the months with the fewest complaints were September, October, and November (84, 75, and 86, respectively) (Figure 2). Dade and Palm Beach counties reported the most food and waterborne illness complaints, with 202 and 170 complaints, respectively (Table 3).

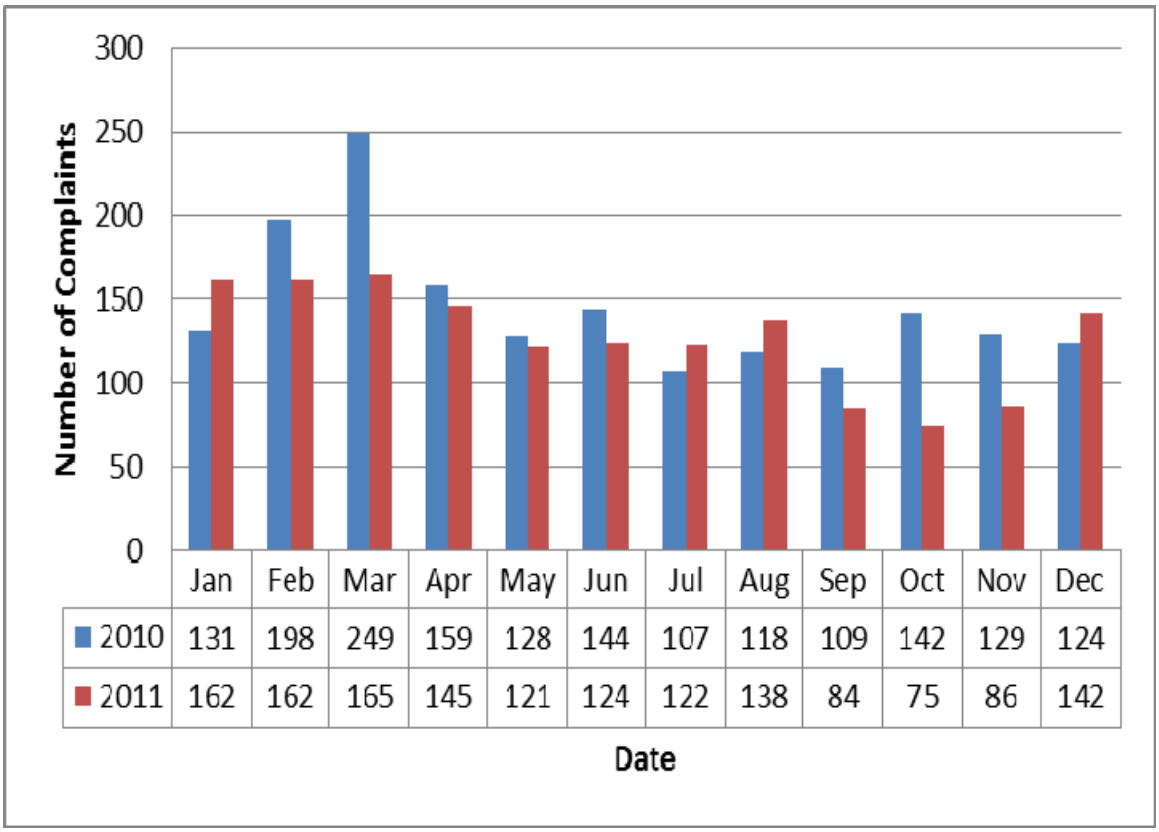
TABLE 2: FOOD AND WATERBORNE DISEASE COMPLAINTS, OUTBREAKS, AND OUTBREAK RELATED CASES REPORTED BY AGENCY OF JURISDICTION, 2010-2011 FROM FWVSS

Agency	# Complaints	% Complaints	# Outbreaks	% Outbreaks	# Cases	% Cases
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%
2011						
DACS	138	9%	6	11%	21	5%
DBPR	1313	86%	32	58%	320	69%
DEP	0	0%	0	0%	0	0%
DOH	19	1%	4	7%	51	11%
Federal°	0	0%	0	0%	0	0%
AHCA	1	0%	0	0%	0	0%
Other°	55	4%	13	24%	70	15%
Total	1526	100%	55	100%	462	100%

* ONE FACILITY WAS REGULATED BY TWO AGENCIES.

°OTHER DENOTES MOSTLY OUTBREAKS ASSOCIATED WITH A HOME THAT IS NOT REGULATED AND FEDERAL DENOTES FEDERAL CORRECTIONAL FACILITIES

FIGURE 1: FOOD AND WATERBORNE COMPLAINTS REPORTED IN FLORIDA BY MONTH, 2010-2011 FROM FWVSS



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	131	198	249	159	128	144	107	118	109	142	129	124
2011	162	162	165	145	121	124	122	138	84	75	86	142

TABLE 3: FOOD AND WATERBORNE COMPLAINTS REPORTED IN FLORIDA BY COUNTY AND REGULATORY AGENCY, 2011 FROM FWVSS

		Agency							
		AHCA	DACS	DBPR	DEP	DOH	Federal	Other	Total
County	Alachua	0	1	25	0	0	0	0	26
	Bay	0	3	39	0	0	0	0	42
	Bradford	0	2	0	0	0	0	0	2
	Brevard	0	3	31	0	2	0	3	39
	Broward	0	9	145	0	0	0	3	157
	Calhoun	0	0	2	0	0	0	0	2
	Charlotte	0	3	7	0	0	0	0	10
	Citrus	0	3	14	0	0	0	0	17
	Clay	0	1	6	0	0	0	0	7
	Collier	0	3	24	0	0	0	2	29
	Columbia	0	0	6	0	0	0	0	6
	Dade	0	15	149	0	6	0	32	202
	Dixie	0	0	0	0	0	0	0	0
	Duval	0	5	45	0	0	0	0	50
	Escambia	0	3	32	0	0	0	0	35
	Flagler	0	0	3	0	0	0	0	3
	Franklin	0	0	0	0	0	0	0	0
	Gadsden	0	0	1	0	0	0	0	1
	Gilchrist	0	0	0	0	0	0	0	0
	Glades	0	0	0	0	1	0	0	1
	Hardee	0	1	1	0	0	0	1	3
	Hendry	0	0	1	0	0	0	0	1
	Hernando	0	3	11	0	0	0	0	14
	Highlands	0	2	6	0	2	0	0	10
	Hillsborough	0	7	41	0	0	0	2	50
	Indian River	0	0	6	0	0	0	0	6
	Jackson	0	0	1	0	0	0	0	1
	Lake	0	2	23	0	0	0	0	25
	Lee	0	3	61	0	0	0	0	64
	Leon	0	0	18	0	0	0	1	19
	Levy	0	0	1	0	0	0	0	1
	Manatee	0	2	21	0	0	0	0	23
	Marion	0	0	32	0	0	0	0	32
	Martin	0	5	17	0	1	0	0	23
	Monroe	0	0	19	0	0	0	6	25
	Nassau	0	0	1	0	0	0	0	1
	Okaloosa	0	0	9	0	0	0	0	9
	Okeechobee	0	0	1	0	0	0	0	1
	Orange	0	18	132	0	0	0	2	152
	Osceola	0	0	12	0	1	0	0	13
	Palm Beach	1	21	144	0	2	0	2	170
	Pasco	0	2	9	0	0	0	1	12
	Pinellas	0	5	49	0	0	0	0	54
	Polk	0	5	36	0	2	0	0	43
	Putnam	0	0	0	0	0	0	0	0
	Saint Johns	0	0	6	0	0	0	0	6
	Saint Lucie	0	6	25	0	0	0	0	31
	Santa Rosa	0	1	1	0	1	0	0	3
	Sarasota	0	2	34	0	0	0	0	36
	Seminole	0	0	26	0	1	0	0	27
	Sumter	0	0	3	0	0	0	0	3
	Suwannee	0	0	0	0	0	0	0	0
	Volusia	0	2	35	0	0	0	0	37
	Wakulla	0	0	1	0	0	0	0	1
	Walton	0	0	1	0	0	0	0	1
Total		1	138	1313	0	19	0	55	1526

OUTBREAK INVESTIGATION SUMMARY 2011

Fifty-five food and waterborne outbreaks with 462 associated cases were reported in 2011, a 15% decrease in outbreaks compared to the previous year (2010), with 65 outbreaks with 807 cases (Table 1). Investigators were able to laboratory confirm the pathogens in 67% (37) of outbreaks in 2011, an increase from 2010 when 48% (31) of outbreaks had a laboratory confirmed pathogen (Table 4). Fifty-one foodborne outbreaks occurred in 2011 and accounted for 407 associated cases (Table 5). Four waterborne outbreaks occurred in 2011 with a total of 55 associated cases (Table 5). The largest outbreak based on case count (n=78) reported in 2011 was a norovirus outbreak in Hernando County. The outbreak which was linked to a restaurant accounted for 16.9% of all outbreak-related cases reported in 2011 (Table 6).

Outbreaks of any size were most often caused by *Vibrio vulnificus,* ciguatera and norovirus (29.8%, 24.3% and 24.3%, respectively) (Table 4). Considering the number of cases in an outbreak, norovirus led all agents with 219 of the 333 confirmed cases (65.8%). *Salmonella spp*. were identified as the pathogens with the next largest percentage of cases in reported outbreaks (12%); followed by ciguatera (9.6%) (Table 4). For most outbreaks, restaurants were the site of exposure (n=33, 60%) as well as the site of exposure for most cases (n=332, 71.9%) (Table 7). Fish and molluscan-shellfish, (23.6%, 21.8%) accounted for the majority of responsible vehicles for outbreaks in 2011. The months with the largest percentage of outbreaks reported were April and July (16%) and the largest number of cases were reported in May (n=94) (Table 8 and Figure 2). Large (greater than 10 cases) outbreaks accounted for 21% (n=12) of the total reported outbreaks and 67% (n=309) 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 CASES ASSOCIATED WITH THESE OUTBREAKS, FLORIDA, 2011 FROM FWVSS

Pathogen	Case	% of Confirmed Cases	Outbreaks	% of Confirmed Outbreaks
Ciguatera	32	9.6%	9	24.3%
Cyclospora	12	3.6%	1	2.7%
Legionella	3	0.9%	1	2.7%
Naegleria fowleri	1	0.3%	1	2.7%
Norovirus	219	65.8%	9	24.3%
Vibrio cholerae O75	10	3.0%	1	2.7%
Salmonella	40	12%	3	8.1%
Scombroid	5	1.5%	1	2.7%
Vibrio vulnificus	11	3.3%	11	29.8%
Total	333	100%	37	100%

TABLE 5: NUMBER OF FOODBORNE AND WATERBORNE OUTBREAKS AND OUTBREAK-RELATED CASES BY VEHICLE, FLORIDA, 2011 FROM FWVSS

Vehicle	Outbreaks	Cases
Beverage	1	6
Fish	13	45
Multiple Ingredients	4	19
Multiple Items*	11	142
Produce Vegetables	4	100
Rice	3	17
Shellfish Crustacean	1	1
Shellfish Molluscan	12	27
Unknown	2	50
Water Drinking	1	22
Water Recreational	3	33
Total	55	462

*Outbreaks with multiple items could not solely identify a specific food product that was statistically significant for the outbreak.

TABLE 6: FOOD AND WATERBORNE OUTBREAKS WITH GREATER THAN 10 CASES (N=12), FLORIDA, 2011 FROM FWVSS

COUNTY	NUMBER OF CASES	SITE	SPECIFIC VEHICLE	PATHOGEN STATUS	PATHOGEN
Hernando	78	Restaurant	Lettuce	Confirmed	Norovirus
Palm Beach	39	Restaurant	Multiple Items	Confirmed	Norovirus
Lee	32	Restaurant	Unknown	Confirmed	*Salmonella*
Glades	29	Recreational Water	Spring-Fed Lake	Confirmed	Norovirus
Lee	24	Restaurant	Fruit Cup	Confirmed	Norovirus
Dade	22	Other	Bottled Water	Suspected	*Shigella*
Duval	22	Restaurant	BBQ Beef and Smoked Turkey	Suspected	*Clostridium perfringens*
Leon	18	Restaurant	Unknown	Confirmed	Norovirus
Volusia	13	Restaurant	Tossed Salad	Confirmed	Norovirus
Collier	12	Restaurant	Cilantro	Confirmed	*Cyclospora*
Multiple Counties	10	Restaurant	Raw Oysters	Confirmed	*Vibrio cholerae* O75
Total	309				

The number of outbreaks with more than ten cases is 12 (21% of all outbreaks). The number of cases associated with these 12 outbreaks is 309 (67% of all cases).

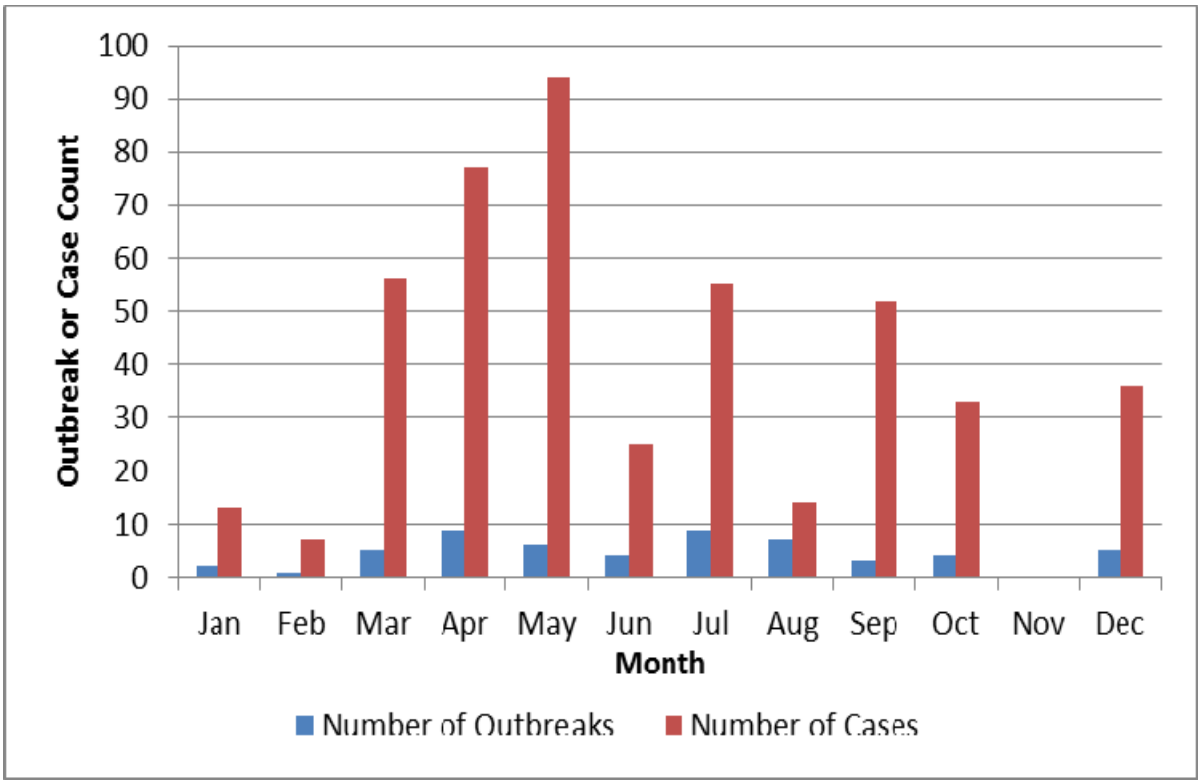
TABLE 7: NUMBER OF FOODBORNE AND WATERBORNE OUTBREAKS AND OUTBREAK-RELATED CASES BY FACILITY TYPE, FLORIDA, 2011 FROM FWVSS

Facility Type	Outbreaks	% of Outbreaks	Cases	% of Cases
Caterer	1	1.8%	7	1.5%
Grocery	3	5.5%	9	1.9%
Home	10	18.2%	32	6.9%
Other	8	14.5%	82	17.8%
Restaurant	33	60.0%	332	71.9%
Total	55	100.0%	462	100.0%

TABLE 8: NUMBER OF FOODBORNE AND WATERBORNE OUTBREAKS AND OUTBREAK-RELATED CASES BY MONTH, FLORIDA, 2011 FROM FWVSS

Month	Outbreaks	% of Outbreaks	Cases	% of Cases
January	2	3.6	13	2.8
February	1	1.8	7	1.6
March	5	9.1	56	12.1
April	9	16.4	77	16.7
May	6	10.9	94	20.3
June	4	7.3	25	5.4
July	9	16.4	55	11.9
August	7	12.7	14	3.0
September	3	5.4	52	11.3
October	4	7.3	33	7.1
November	0	0.0	0	0
December	5	9.1	36	7.8
Total	55	100.0%	462	100.0%

FIGURE 2: FOOD AND WATERBORNE OUTBREAKS AND CASES BY MONTH, FLORIDA, 2011 FROM FWVSS



SELECTED FLORIDA OUTBREAKS

Data from selected reportable pathogens from 2011 are further discussed in this section. Specifically, information related to infections with *Vibrio cholerae* O75*, Vibrio vulnificus*, and *Salmonella spp.*, along with other outbreak-related diseases with high incidence, such as norovirus and unknown pathogens have been included.

AN OVERVIEW OF *VIBRIO CHOLERAE O75*, FLORIDA, 2011

On Friday April 15, 2011 the epidemiology team at the Florida Department of Health in Escambia County (DOH-Escambia) notified the DOH FWDP of a case of *Vibrio cholerae* non-O1/non-O139. The man, in his early 20s, had fallen ill with cramps, fever, watery diarrhea, and nausea on April 12 after consuming raw oysters at a restaurant on April 6. On April 18, the Florida Department of Health in Nassau County (FDOH-Nassau) reported two cases of gastrointestinal illness after consumption of steamed shell stock oysters on April 10. On April 19, the FWDP was notified of a Louisiana resident who had consumed raw oysters in Okaloosa County on April 7 and was diagnosed with *V. cholerae* non-O1/non-O139.

DOH-Escambia began investigating their case and forwarded the *V. cholerae* specimen to the Bureau of Public Health Laboratories for typing and toxin testing. DOH-Nassau collected stool specimens from ill people for analysis and began investigating the source of the oysters. The FWDP began working with DACS, the agency with regulatory oversight of the oyster industry, and posted EpiCom and Epi-X messages to find additional cases.

Laboratory results yielded *V. cholera*e O75. Ten cases (eight confirmed, one probable, and one suspect) were identified in this outbreak. Seven were Florida residents; the three other cases were from Indiana, Georgia, and Louisiana. Cases ranged in age from 22 to 74; 60% of the cases were male. Cases reported symptoms of nausea (7), vomiting (4), diarrhea (9), chills (8), cramps (1), and fever (1). None required hospitalization and no deaths were reported. The oysters had been harvested in the same area, Apalachicola Bay section 1642. The harvest area was closed on April 30 and dealers and retailers were asked to recall any implicated product still in commerce. The harvest area was reopened on May 11 after oysters from the area tested negative through the Food and Drug Administration (FDA) laboratory in Dauphin Island, Alabama.

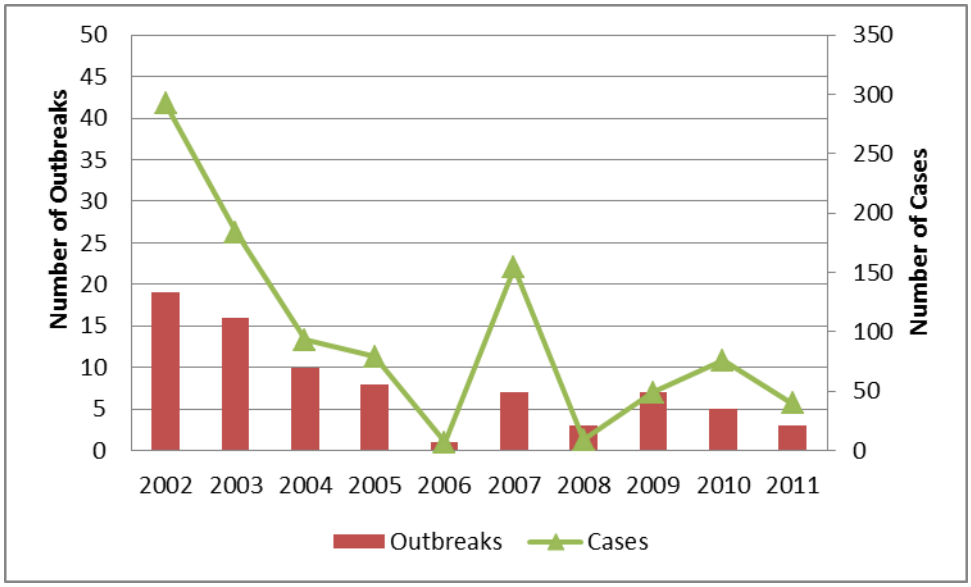
This was the first recorded outbreak of *V. cholerae* O75 associated with oyster consumption. In response to this outbreak, DACS continues to monitor the harvesting environment and investigates factors that may have promoted the growth of this pathogen.

AN OVERVIEW OF *VIBRIO VULNIFICUS*, FLORIDA, 2011

During 2011, 35 *Vibrio vulnificus* infected cases were reported to DOH. Patients ranged in age from 16-84 years with a median of 58 years; 29 (83%) cases were male, onset dates ranged from February 6 – December 13, 2011, and 83% of cases were hospitalized. Twelve deaths were reported (individuals resided in the following counties but were not necessarily exposed in the same county: Bay, Escambia (2), Hernando, Lee, Leon, Manatee, Pasco (2), Pinellas, and Seminole). Eleven cases reported consuming either raw oysters or preparing and consuming steamed blue crab.

Overview of *Salmonella spp.* Outbreaks

Figure 3: Trends of *Salmonella spp.* in Reported Food and Waterborne Outbreaks and Outbreak-Related Cases, Florida, 2002-2011 from FWVSS



Reported food and waterborne *Salmonella spp.* outbreaks and outbreak-related cases showed a decreasing trend from 2002-2006; however in 2007 outbreaks increased again. The goal is to identify more outbreaks and any related cases by improving laboratory capabilities and surveillance.

An Overview of Foodborne Norovirus Reported in Florida, 2002-2011

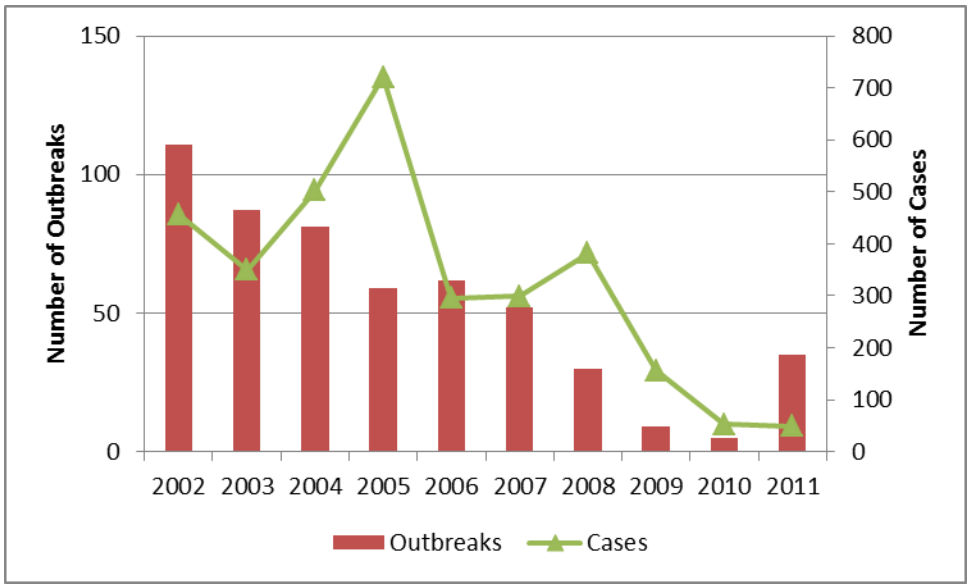
In Florida, 16% of total food and waterborne outbreaks that occurred during 2011 and 50% of the cases can be attributed to norovirus infections (Table 9). From 2002 to 2011, there was a total of 231 food or waterborne norovirus outbreaks with 4,748 associated cases. Vehicles of transmission included produce, shellfish, beverages, a spring-fed lake, and foods with multiple items or ingredients. The primary contributing factor in outbreaks in 2011 was bare-and gloved-hand contact with food by a worker who was likely working while infectious. Control of the outbreaks involved excluding the ill food worker(s) when possible and providing hand washing education to food workers.

TABLE 9: NUMBER OF REPORTED FOOD AND WATERBORNE CONFIRMED AND SUSPECTED NOROVIRUS OUTBREAKS AND RELATED CASES, FLORIDA, 2002-2011 FROM FWVSS

Year	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Norovirus Outbreaks	27	29	35	12	30	17	26	21	25	9
Total Food and Waterborne Outbreaks	243	188	175	131	148	132	100	76	65	55
% of Outbreaks	11.11%	15.43%	20.00%	9.16%	20.27%	12.88%	26.00%	27.63%	38.46%	16.36%
Total Norovirus Cases	382	743	1126	118	707	245	538	331	325	233
Total Food and Waterborne Cases	1469	1648	1954	2017	1263	963	1241	786	807	462
% of Cases	26.00%	45.08%	57.63%	5.85%	55.98%	25.44%	43.35%	42.11%	40.27%	50.43%

Overview of Unknown Pathogens in Florida Outbreaks

Figure 4: Trends of Unknown Pathogens in Reported Food and Waterborne Outbreaks and Outbreak-Related Cases, Florida, 2002-2011 from FWVSS



The number of food and waterborne outbreaks and outbreak-related cases from unknown causes show a downward trend as laboratory and outbreak investigation methodologies have improved. During 2011, the number of outbreaks with unknown etiologies increased; however the number of cases associated with those outbreaks remained low.

Contributing Factors: Investigation Findings

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. 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) are located in Appendix B.

TABLE 10: TEN MOST PREVALENT CONTRIBUTING FACTORS IN FOODBORNE OUTBREAKS, FLORIDA (n=51), 2011 FROM FWVSS

Contributing Factor	# Outbreaks	# Cases
Contamination factor		
C1 – Toxic substance part of the tissue	12	41
C7 - Contaminated raw product - food was intended to be consumed raw or undercooked/under-processed	14	119
Proliferation factor		
P1 – Food preparation practices that support proliferation of pathogens	2	7
P5 – Improper cold holding due to an improper procedure or protocol	4	16
P7 - Improper hot holding due to improper procedure or protocol	2	24
Survival factor		
S1 - Insufficient time and/or temperature control during initial cooking/heat processing	2	24
S5 - Other process failures that permit pathogen growth	1	6
Method factor		
1 – Prepared in home	8	28
3 – Ready-to-eat food: manual preparation, no cook step	18	183
4 - Cook and serve foods: immediate service	7	26

TABLE 11: WATERBORNE DISEASE CONTRIBUTING FACTORS: NUMBER OF WATERBORNE OUTBREAKS (n=4) AND OUTBREAK-RELATED CASES (n=55), FLORIDA, 2011 FROM FWVSS

Factors Contributing to Recreational Water Untreated Venues	# Outbreaks	# Cases
People Factors		
Fecal/vomitus accident	1	29
Patrons continued to swim when ill or within 2 weeks of being ill	1	29
Swim Design		
Stagnant or poorly circulating water in swim area	1	1
Water Quality		
Water temperatures ≥300°C (≥86°F)	1	1
Factors Contributing to Drinking Water		
Factors Outside the Jurisdiction of Water/Utility or at Point of Use		
Contamination at point of use – commercially-bottled water	1	22
Factors Contributing to Water Not Intended for Drinking or Water of Unknown Intent (WNID/WUI)		
Ornamental fountain – presence of dirt, organic matter, or other debris in the water basin	1	3

TABLE 12: LINE LIST OF WATERBORNE OUTBREAKS (n=4), FLORIDA, 2011 FROM FWVSS

County	# Cases	Site	Specific Vehicle	Pathogen
Dade	22	Other	Water-Drinking	*Shigella*
Hillsborough	3	Other	Decorative Fountain	*Legionella*
St. Johns	1	St. Johns River Tributary	Water-Recreational Untreated Venue	*Naegleria fowleri*

Glades	29	Other	Water-Recreational Untreated Venue	Norovirus

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 on 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 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 and USDA websites and also from the www.recalls.gov website. This information generally involves class 1 and 2 recalls. Class 1 recalls involve a situation in which there is a reasonable probability that the use of or exposure to a violative product will cause serious adverse health consequences or death. Class 2 recalls occur when the use of or exposure to a violative product may cause temporary or medically reversible adverse health consequences or where the probability of serious adverse health consequences is remote. These recalls are distributed to health departments and other partner agencies through email and the DOH 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 2011, 59 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*, and *Escherichia coli* 0157:H7. The largest number of recalls during 2011 involved products potentially contaminated with *Salmonella*, closely followed by *Listeria monocytogenes*.

FOOD AND WATERBORNE OUTBREAK PUBLICATIONS AND ARTICLES

Additional information and data on food and waterborne illnesses can be obtained from the 2011 Florida Morbidity Statistics Report at:

http://www.floridahealth.gov/diseases-and-conditions/disease-reporting-and-management/disease-reporting-and-surveillance/data-and-publications/fl-amsr1.html#2011

APPENDIX 1: 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 ≥ 300°C (≥ 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 ≥ 300°C (≥ 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

APPENDIX 2: PARTNERING AGENCIES ATTENDANCE FOR “WHEN FOOD IS POISONED: A COMPREHENSIVE LOOK AT INTENTIAL FOOD CONTAMINATION”

University of Missouri
Florida Department of Law Enforcement
Food and Drug Administration – Tampa Office
Florida Department of Agriculture and Consumer Services
Food Safety and Public Health, Worldwide Safety, Walt Disney Parks and Resort
Northwest Florida Fusion Center
Central Florida Fusion Center
U.S. Food and Drug Administration – Tallahassee Office
Florida Department of Environmental Protection – Southwest District
USDA/APHIS/VS
Florida Fish and Wildlife
Food and Drug Administration – Miami Office
Florida Hospital – Altamonte
Okaloosa County Department of Corrections
Surgical Lab of Florida Hospital South
Food and Drug Administration – Jacksonville Office