Section 3

Summary of Cancer Data, 2009

Cancer incidence data are collected, verified, and maintained by the Florida Cancer Data System (FCDS), Florida's statewide cancer registry. The FCDS is administered by the Florida Department of Health, Bureau of Epidemiology and operated by the Sylvester Comprehensive Cancer Center at the University of Miami Leonard M. Miller School of Medicine.

The FCDS began operation with a pilot project for cancer registration in 1980 and commenced statewide collection of cancer incidence data from all Florida hospitals in 1981. The FCDS now collects incidence data from hospitals, freestanding ambulatory surgical centers, radiation therapy facilities, pathology laboratories, and private physician offices. Each facility, laboratory, and practitioner is required to report to the FCDS within six months of each diagnosis and within six months of the date of each treatment. In addition, FCDS data are linked annually to mortality and hospital discharge databases respectively to find any missed cancer report. Consequently, a complete diagnosis year file is not available for surveillance activities and analysis until approximately two years after the close of the year (i.e., 2009 cancer diagnosis file is available at the earliest January 1, 2012).

During 2009, physicians diagnosed 103,783 primary cancers among Floridians, an average of 284 cases per day (Table 1). The statewide age-adjusted rate for all cancers was 432.2 per 100,000 population (Table 2). Cancer occurs predominantly among older people, as age is the top risk factor. Approximately 59.2% of the newly diagnosed cancers in 2009 occurred in persons age 65 and older; this age group accounts for 17.8% of Florida's population. The four most common cancers in Floridians were lung and bronchus (16,181 cases), prostate (13,743 cases), female breast (13,829 cases), and colorectal (9,593 cases), which accounted for 51.4% of all new cases in Florida (Table 1). Slightly more than half (54,489, 52.5%) of new cancers were diagnosed in males (Table 1). Age-adjusted rates by sex and race are presented in Table 2. The number of new cancer cases in Florida's five most populous counties (Broward, Miami-Dade, Hillsborough, Palm Beach, and Pinellas) accounted for 38.9% of the new cancer cases in Florida (Table 3). Age-adjusted rates by county are presented in Table 4.

Over the 29-year period from 1981 to 2009, males had a higher age-adjusted incidence rate than females (Figure 1, Figure 2). Among blacks, the age-adjusted incidence for males was 46.2% higher than for females in 2009. Among whites, the age-adjusted incidence for males was 22.6% higher than for females in 2009. White females had higher age-adjusted incidence rates than black females in all 28 years. Black males had higher age-adjusted incidence rates than white males in all years, except in 1987, 1988, and 2006. Age-specific incidence rates for all cancers by sex and race are presented in Figure 3.

More information about the burden of cancer in Florida is provided in the *Florida Annual Cancer Report,* an epidemiological series available on the department's web site at http://www.doh.state.fl.us/disease_ctrl/epi/cancer/CancerIndex.htm or the FCDS web site at http://www.fcds.med.miami.edu.

Table 1. Number of New Cancer Cases by Gender and Race[1], Florida, 2009

	All Cancers	Lung & Bronchus	Prostate	Breast	Colorectal	Bladder	Head & Neck	Non-Hodgkin[2]	Melanoma	Cervix	Ovary
Florida	**103,783**	**16,181**	**13,743**	**13,836**	**9,593**	**4,985**	**4,009**	**4,118**	**4,107**	**941**	**1,407**
Female	49,250	7,527	-	13,829	4,662	1,164	976	1,868	1,514	941	1,407
Male	54,489	8,643	13,741	-	4,922	3,817	3,031	2,250	2,446	-	-
Black	10,150	1,134	2,060	1,490	1,034	199	332	359	-	181	102
White	90,350	14,737	11,273	11,869	8,210	4,627	3,554	3,647	3,962	721	1,258
Black Female	4,796	477	-	1,490	505	60	81	174	-	181	102
White Female	42,847	6,923	-	11,869	3,985	1,069	861	1,646	1,514	721	1,258
Black Male	5,353	657	2,060	-	529	139	251	185	-	-	-
White Male	47,466	7,805	11,273	-	4,217	3,555	2,691	2,001	2,446	-	-

Source of data: Florida Cancer Data System

1 Florida incidence totals include new cancers in persons of "other" races, cases with unknown race, cases with unknown or unspecified gender, and cases with unknown age. Totals by gender include cases with unknown or other race and unknown age. Totals by race include cases with unknown gender and unknown age.

2 Non-Hodgkin refers to Non-Hodgkin's lymphoma.

Table 2. Age-Adjusted Incidence Rates by Gender and Race[1], Florida, 2009

	All Cancers Rate (CI[2])	Lung & Bronchus Rate (CI[2])	Prostate Rate (CI[2])	Breast Rate (CI[2])	Colorectal Rate (CI[2])	Bladder Rate (CI[2])
Florida	**432.2 (429.5, 434.9)**	**64.5 (63.5, 65.5)**	**120.4 (118.3, 122.4)**	**113.5 (111.6, 115.5)**	**38.7 (37.9, 39.5)**	**19.4 (18.9, 20.0)**
Female	389.4 (385.9, 393.0)	55.2 (54.0, 56.5)	-	113.5 (111.6, 115.5)	34.1 (33.1, 35.1)	8.2 (7.7, 8.7)
Male	487.4 (483.3, 491.6)	75.9 (74.3, 77.5)	120.3 (118.3, 122.4)	-	44.0 (42.8, 45.2)	33.3 (32.2, 34.4)
Black	410.6 (402.5, 419.0)	48.4 (45.5, 51.4)	191.5 (183.0, 200.4)	104.2 (98.9, 109.7)	43.4 (40.7, 46.2)	9.0 (7.7, 10.3)
White	428.2 (425.4, 431.1)	66.0 (64.9, 67.1)	110.7 (108.7, 112.8)	112.8 (110.7, 115.0)	37.3 (36.5, 38.1)	20.1 (19.5, 20.7)
Black Female	344.0 (334.2, 354.1)	35.5 (32.4, 39.0)	-	104.2 (98.9, 109.7)	37.4 (34.1, 40.9)	4.7 (3.6, 6.1)
White Female	390.0 (386.1, 393.9)	57.5 (56.1, 58.9)	-	112.8 (110.7, 115.0)	32.9 (31.8, 34.0)	8.5 (8.0, 9.0)
Black Male	503.0 (488.9, 517.5)	66.5 (61.2, 72.1)	191.5 (183.0, 200.4)	-	51.3 (46.8, 56.2)	15.3 (12.8, 18.3)
White Male	478.0 (473.6, 482.3)	76.3 (74.6, 78.0)	110.7 (108.7, 112.8)	-	42.2 (40.9, 43.5)	34.2 (33.1, 35.4)

	Head & Neck Rate (CI[2])	Non-Hodgkin[3] Rate (CI[2])	Melanoma Rate (CI[2])	Cervix Rate (CI[2])	Ovary Rate (CI[2])
Florida	**16.9 (16.4, 17.5)**	**17.3 (16.7, 17.8)**	**19.6 (19.0, 20.3)**	**9.4 (8.8, 10.1)**	**11.3 (10.7, 11.9)**
Female	7.7 (7.2, 8.2)	14.3 (13.6, 15.0)	15.2 (14.4, 16.0)	9.4 (8.8, 10.1)	11.3 (10.7, 11.9)
Male	27.4 (26.4, 28.4)	20.7 (19.9, 21.6)	25.2 (24.2, 26.3)	-	-
Black	12.9 (11.5, 14.4)	13.8 (12.4, 15.4)	-	12.5 (10.7, 14.6)	7.2 (5.9, 8.9)
White	17.3 (16.7, 17.9)	17.3 (16.8, 17.9)	19.6 (19.0, 20.3)	8.9 (8.2, 9.6)	11.7 (11.1, 12.4)
Black Female	5.8 (4.6, 7.3)	12.3 (10.5, 14.3)	-	12.5 (10.7, 14.6)	7.2 (5.9, 8.9)
White Female	7.8 (7.3, 8.4)	14.3 (13.6, 15.0)	15.2 (14.4, 16.0)	8.9 (8.2, 9.6)	11.7 (11.1, 12.4)
Black Male	21.8 (19.1, 24.9)	15.8 (13.4, 18.5)	-	-	-
White Male	27.8 (26.7, 28.9)	20.8 (19.9, 21.7)	25.2 (24.2, 26.3)	-	-

Source of data: Florida Cancer Data System

1 Rates are expressed as number of cases per 100,000 population per year, adjusted to the 2000 U.S. standard population. Florida incidence rates include new cancers in persons of "other" races, cases with unknown race, and cases with unknown or unspecified gender. Rates calculated by gender include cases with unknown or other race. Rates by race include cases with unknown gender. By definition, age-adjusted incidence rates cannot include cases with unknown age.

2 95% confidence interval.

3 Non-Hodgkin refers to Non-Hodgkin's lymphoma.

Table 3. Number of New Cancer Cases by County, Florida, 2009

	All Cancers	Lung & Bronchus	Prostate	Breast	Colorectal	Bladder	Head & Neck	Non-Hodgkin[1]	Melanoma	Cervix	Ovary
Florida	**103,783**	**16,181**	**13,743**	**13,836**	**9,593**	**4,985**	**4,009**	**4,118**	**4,107**	**941**	**1,407**
Alachua	1,099	167	148	172	92	37	42	37	48	10	13
Baker	123	30	11	13	^	^	^	^	^	^	^
Bay	983	185	157	133	65	46	44	34	42	^	10
Bradford	134	26	25	15	17	^	^	^	^	^	^
Brevard	3,719	681	434	447	319	207	159	172	166	29	44
Broward	9,041	1,184	1,162	1,301	849	415	324	379	324	93	126
Calhoun	68	15	^	^	^	^	^	^	^	^	^
Charlotte	1,276	221	196	139	127	81	45	48	63	^	^
Citrus	1,266	227	197	155	115	72	45	39	52	^	25
Clay	878	142	122	108	70	51	26	34	28	14	15
Collier	1,959	295	343	237	150	114	71	70	114	12	21
Columbia	364	73	68	29	38	13	19	12	^	^	^
DeSoto	179	31	32	16	21	^	^	^	13	^	^
Dixie	99	26	^	^	^	^	^	^	^	^	^
Duval	4,364	692	631	634	372	164	174	154	145	48	56
Escambia	1,502	299	177	200	152	76	62	52	51	^	17
Flagler	663	113	59	99	52	36	27	24	36	^	^
Franklin	77	19	13	^	^	^	^	^	^	^	^
Gadsden	212	24	31	36	15	^	^	11	^	^	^
Gilchrist	104	23	14	11	10	^	^	^	^	^	^
Glades	55	^	^	^	^	^	^	^	^	^	^
Gulf	89	20	^	11	^	^	^	^	^	^	^
Hamilton	67	^	15	10	^	^	^	^	^	^	^
Hardee	114	12	10	10	14	^	^	^	^	^	^
Hendry	145	23	11	^	17	^	11	^	^	^	^
Hernando	1,283	241	154	141	91	87	48	59	55	11	27
Highlands	722	157	55	76	68	24	16	40	44	^	10
Hillsborough	5,832	873	720	805	561	225	250	229	227	59	88
Holmes	62	15	^	^	^	^	^	^	^	^	^
Indian River	1,048	183	118	111	110	68	34	38	63	^	14
Jackson	174	22	26	14	24	^	^	^	^	^	^
Jefferson	94	^	19	13	^	^	^	^	^	^	^
Lafayette	37	10	^	^	^	^	^	^	^	^	^
Lake	2,381	407	388	266	230	141	62	94	94	18	25
Lee	3,734	608	583	473	322	208	152	145	175	34	51
Leon	915	117	161	138	89	19	28	24	30	^	20
Levy	287	68	34	37	29	16	15	^	^	^	^
Liberty	23	^	^	^	^	^	^	^	^	^	^
Madison	77	18	13	^	15	^	^	^	^	^	^
Manatee	1,911	311	177	262	179	102	64	76	116	13	21
Marion	2,523	461	372	321	247	123	91	95	83	24	40
Martin	1,100	181	196	151	88	66	36	31	62	^	12
Miami-Dade	11,462	1,228	1,763	1,537	1,250	470	426	475	228	153	168
Monroe	420	60	42	64	34	17	23	15	21	^	10
Nassau	408	69	49	62	33	16	12	12	20	10	^
Okaloosa	906	147	116	140	75	44	41	37	42	^	^
Okeechobee	229	49	24	23	17	12	^	^	15	^	^
Orange	4,603	623	645	648	434	162	164	185	169	43	52
Osceola	1,060	131	141	141	117	48	42	36	37	14	10
Palm Beach	8,159	1,257	938	1,125	702	462	281	404	362	58	108
Pasco	2,868	481	369	348	254	161	101	119	140	30	36
Pinellas	5,874	1,011	641	855	535	328	255	207	211	38	78
Polk	3,796	644	508	402	371	163	170	146	161	38	53
Putnam	479	93	73	56	35	14	31	17	20	^	^
Santa Rosa	620	119	66	96	56	14	32	26	30	^	^
Sarasota	3,004	508	360	436	254	170	94	119	143	13	40
Seminole	1,723	229	222	264	142	75	63	71	80	18	35
St. Johns	1,061	160	132	170	71	44	52	45	49	^	15
St. Lucie	1,436	249	191	192	139	89	42	34	72	11	24
Sumter	910	174	159	95	72	61	26	38	43	^	10
Suwannee	243	45	26	30	27	^	^	12	11	^	^
Taylor	112	24	12	22	^	^	^	^	^	^	^
Union	216	30	42	15	16	^	21	12	^	^	^
Volusia	2,964	527	252	411	295	138	153	120	116	27	50
Wakulla	134	30	16	20	15	^	^	^	^	^	^
Walton	214	46	24	22	17	^	17	^	^	^	^
Washington	99	19	18	^	10	^	^	^	^	^	^

Source of data: Florida Cancer Data System

1 Non-Hodgkin refers to Non-Hodgkin's lymphoma.

^ Statistics for cells with fewer than 10 cases are not displayed.

Table 4. Age-Adjusted Incidence Rates[1] by County, Florida, 2009

	All Cancers	Lung & Bronchus	Prostate	Breast	Colorectal	Bladder
	Rate (CI[2])	Rate (CI)	Rate (CI)	Rate (CI)	Rate (CI)	Rate (CI)
Florida	**432.2 (429.5, 434.9)**	**64.5 (63.5, 65.5)**	**120.4 (118.3, 122.4)**	**113.5 (111.6, 115.5)**	**38.7 (37.9, 39.5)**	**19.4 (18.9, 20.0)**
Alachua	484.0 (455.3, 514.2)	74.9 (63.8, 87.5)	138.2 (116.4, 163.3)	144.9 (123.7, 169.0)	40.2 (32.3, 49.7)	16.8 (11.8, 23.4)
Baker	478.0 (395.6, 574.0)	116.7 (78.0, 169.7)	77.9 (38.0, 157.8)	102.8 (54.1, 181.8)	^	^
Bay	474.3 (444.6, 505.7)	87.6 (75.3, 101.6)	153.7 (130.3, 180.6)	125.7 (104.8, 150.3)	30.1 (23.1, 38.8)	21.5 (15.7, 29.2)
Bradford	416.1 (348.1, 495.1)	81.7 (53.1, 122.1)	162.3 (104.4, 243.8)	85.6 (47.3, 153.8)	53.3 (30.9, 87.7)	^
Brevard	448.6 (433.8, 464.0)	76.8 (71.0, 83.0)	106.3 (96.5, 117.2)	106.9 (96.7, 118.2)	37.4 (33.3, 42.2)	23.2 (20.0, 26.8)
Broward	455.7 (446.2, 465.4)	59.0 (55.7, 62.6)	130.1 (122.7, 138.0)	124.1 (117.3, 131.2)	42.0 (39.2, 45.0)	20.3 (18.3, 22.4)
Calhoun	407.8 (315.8, 520.8)	91.5 (51.0, 154.6)	^	^	^	^
Charlotte	370.3 (347.0, 395.6)	57.8 (49.8, 67.9)	112.8 (97.0, 132.9)	83.4 (67.5, 104.0)	34.8 (28.3, 43.5)	20.0 (15.5, 26.8)
Citrus	435.7 (408.9, 465.0)	71.4 (61.8, 83.5)	132.3 (113.9, 155.9)	117.0 (95.7, 144.1)	37.2 (30.1, 47.1)	23.2 (17.4, 32.1)
Clay	458.8 (428.4, 491.0)	74.5 (62.5, 88.3)	132.9 (109.8, 159.9)	104.8 (85.7, 127.4)	36.8 (28.5, 46.8)	27.8 (20.5, 37.0)
Collier	365.9 (348.9, 383.8)	50.0 (44.3, 56.5)	126.0 (112.8, 140.8)	96.3 (83.4, 111.3)	27.2 (22.8, 32.5)	19.1 (15.6, 23.4)
Columbia	442.1 (397.2, 491.7)	89.1 (69.6, 113.4)	164.7 (127.6, 210.8)	66.4 (43.9, 100.2)	45.3 (32.0, 63.6)	15.5 (8.2, 28.2)
DeSoto	412.4 (352.1, 482.1)	66.8 (45.2, 98.4)	146.5 (99.4, 212.1)	84.0 (44.9, 151.4)	50.9 (30.8, 81.9)	^
Dixie	430.8 (347.6, 533.0)	105.9 (68.5, 163.4)	^	^	^	^
Duval	484.0 (469.5, 498.9)	78.6 (72.7, 84.8)	154.5 (142.4, 167.5)	127.0 (117.1, 137.5)	41.2 (37.1, 45.7)	18.9 (16.1, 22.2)
Escambia	418.0 (396.8, 440.1)	82.3 (73.2, 92.5)	104.7 (89.7, 121.8)	106.3 (91.7, 123.1)	42.2 (35.7, 49.8)	20.6 (16.2, 26.1)
Flagler	396.8 (363.9, 433.3)	58.0 (47.5, 72.3)	70.5 (53.1, 96.0)	129.3 (101.1, 165.9)	26.4 (19.6, 37.3)	18.7 (12.8, 28.9)
Franklin	433.9 (340.7, 549.4)	97.8 (58.5, 160.5)	132.0 (69.7, 234.5)	^	^	^
Gadsden	379.0 (329.0, 435.3)	41.0 (26.2, 62.6)	118.9 (80.5, 172.2)	122.2 (85.0, 172.0)	26.9 (15.0, 45.9)	^
Gilchrist	472.3 (384.4, 578.7)	101.3 (63.6, 158.7)	125.5 (68.1, 223.6)	97.0 (47.3, 189.6)	45.4 (21.7, 90.3)	^
Glades	362.6 (270.6, 480.9)	^	^	^	^	^
Gulf	400.9 (321.3, 496.5)	87.5 (53.2, 138.6)	^	120.4 (56.0, 247.6)	^	^
Hamilton	439.4 (339.3, 562.1)	^	198.2 (109.4, 335.3)	153.8 (72.3, 295.7)	^	^
Hardee	409.6 (337.3, 494.3)	42.5 (21.8, 76.6)	74.1 (35.5, 137.4)	76.4 (35.4, 150.7)	49.7 (27.1, 85.6)	^
Hendry	415.9 (350.6, 490.5)	67.3 (42.6, 101.8)	60.8 (30.3, 111.1)	^	47.7 (27.6, 77.5)	^
Hernando	433.6 (407.2, 461.9)	73.5 (64.0, 84.9)	99.6 (84.1, 119.1)	95.5 (78.1, 117.2)	27.8 (21.8, 36.0)	25.9 (20.4, 33.5)
Highlands	399.3 (365.9, 436.1)	76.4 (63.8, 92.7)	59.3 (44.2, 81.9)	92.9 (69.2, 125.1)	36.2 (26.9, 49.4)	9.6 (6.0, 17.7)
Hillsborough	473.4 (461.2, 485.8)	71.6 (66.9, 76.6)	125.9 (116.7, 135.6)	123.1 (114.7, 132.1)	45.7 (41.9, 49.7)	18.3 (16.0, 20.9)
Holmes	259.3 (198.0, 336.4)	57.8 (32.1, 99.8)	^	^	^	^
Indian River	408.4 (382.0, 437.0)	69.6 (59.3, 82.1)	97.0 (80.1, 118.6)	84.7 (68.6, 105.5)	42.3 (34.0, 53.1)	22.8 (17.4, 30.6)
Jackson	271.9 (232.3, 317.5)	34.0 (21.2, 53.4)	82.9 (54.0, 124.8)	42.4 (22.0, 79.2)	40.0 (25.4, 61.3)	^
Jefferson	480.4 (386.3, 593.8)	^	202.5 (120.6, 324.2)	131.8 (69.2, 247.0)	^	^
Lafayette	438.6 (307.7, 610.9)	121.1 (57.6, 229.4)	^	^	^	^
Lake	482.9 (462.3, 504.4)	76.2 (68.7, 84.7)	158.9 (143.0, 176.7)	111.3 (97.1, 127.6)	45.8 (39.7, 52.9)	25.0 (21.0, 30.0)
Lee	385.1 (372.1, 398.7)	56.9 (52.3, 61.9)	118.3 (108.7, 128.8)	104.6 (94.5, 115.8)	31.5 (27.9, 35.5)	19.5 (16.8, 22.6)
Leon	391.9 (366.1, 419.1)	52.4 (43.0, 63.3)	142.8 (120.8, 168.2)	109.6 (91.6, 130.3)	40.1 (32.1, 49.8)	8.1 (4.8, 13.1)
Levy	489.9 (432.9, 554.3)	110.3 (85.2, 142.9)	110.1 (75.8, 161.0)	123.3 (85.8, 176.5)	47.6 (31.6, 71.6)	27.1 (15.2, 47.8)
Liberty	295.4 (186.8, 447.2)	^	^	^	^	^
Madison	335.4 (264.2, 422.8)	81.3 (48.6, 131.5)	115.1 (60.9, 202.7)	^	64.6 (35.8, 111.1)	^
Manatee	402.2 (383.4, 422.0)	61.1 (54.3, 68.9)	75.8 (64.9, 88.6)	113.1 (98.9, 129.3)	35.7 (30.4, 41.8)	18.6 (15.1, 23.1)
Marion	476.2 (456.7, 496.7)	80.8 (73.4, 89.2)	140.5 (126.4, 156.4)	124.9 (110.5, 141.4)	44.6 (38.9, 51.3)	19.8 (16.3, 24.1)
Martin	423.1 (396.2, 452.2)	62.6 (53.5, 74.0)	153.2 (132.1, 178.7)	136.1 (112.5, 165.3)	30.9 (24.3, 40.1)	21.2 (16.2, 28.8)
Miami-Dade	420.1 (412.4, 428.0)	44.3 (41.8, 46.9)	143.1 (136.4, 150.0)	105.3 (100.0, 110.8)	45.3 (42.8, 47.9)	16.9 (15.4, 18.5)
Monroe	369.2 (333.6, 408.6)	49.9 (37.9, 66.1)	65.6 (46.9, 92.5)	118.7 (90.3, 155.8)	29.9 (20.5, 43.7)	14.6 (8.4, 25.5)
Nassau	445.0 (401.7, 492.7)	73.4 (56.8, 94.4)	101.5 (74.4, 137.7)	125.3 (95.4, 163.9)	37.4 (25.4, 54.0)	17.7 (10.0, 30.2)
Okaloosa	411.9 (385.2, 440.1)	66.5 (56.1, 78.4)	105.8 (87.2, 127.7)	121.7 (102.1, 144.5)	33.8 (26.5, 42.7)	19.9 (14.5, 27.1)
Okeechobee	481.8 (420.3, 551.5)	97.7 (71.9, 131.8)	99.2 (63.5, 150.5)	118.2 (73.2, 185.8)	33.4 (19.3, 56.4)	22.8 (11.8, 43.0)
Orange	476.2 (462.3, 490.5)	67.4 (62.1, 73.0)	143.6 (132.4, 155.6)	121.7 (112.4, 131.6)	46.4 (42.1, 51.1)	18.3 (15.5, 21.4)
Osceola	413.0 (388.1, 439.2)	52.4 (43.7, 62.5)	114.4 (96.0, 135.8)	101.7 (85.5, 120.4)	46.4 (38.3, 55.9)	20.0 (14.6, 26.7)
Palm Beach	432.2 (422.4, 442.2)	61.3 (57.8, 64.9)	111.0 (103.9, 118.5)	121.0 (113.6, 128.9)	34.7 (32.0, 37.6)	21.0 (19.0, 23.1)
Pasco	433.3 (416.6, 450.8)	67.3 (61.2, 74.1)	113.0 (101.5, 125.8)	108.1 (96.2, 121.4)	35.5 (31.0, 40.7)	21.9 (18.5, 26.0)
Pinellas	424.4 (413.2, 436.0)	68.6 (64.4, 73.2)	97.8 (90.3, 105.9)	123.9 (115.3, 133.2)	36.2 (33.1, 39.6)	21.5 (19.2, 24.1)
Polk	500.2 (484.0, 516.9)	80.3 (74.1, 86.9)	137.6 (125.8, 150.4)	104.8 (94.3, 116.2)	48.7 (43.7, 54.1)	20.3 (17.3, 23.9)
Putnam	453.5 (412.6, 498.8)	86.6 (69.4, 108.4)	135.4 (106.0, 174.0)	104.9 (77.9, 141.3)	30.6 (21.3, 44.7)	12.8 (6.9, 23.9)
Santa Rosa	395.7 (364.6, 428.9)	77.5 (63.9, 93.2)	79.5 (61.0, 102.8)	120.2 (96.9, 147.8)	35.9 (27.0, 47.1)	9.3 (5.0, 16.0)
Sarasota	399.7 (383.6, 416.7)	60.0 (54.5, 66.3)	99.3 (89.0, 111.3)	121.0 (108.0, 135.7)	31.4 (27.1, 36.5)	19.0 (16.0, 22.8)
Seminole	396.2 (377.4, 415.8)	55.7 (48.6, 63.5)	104.7 (91.1, 120.1)	108.9 (96.0, 123.2)	33.7 (28.3, 39.9)	17.6 (13.8, 22.3)
St. Johns	454.3 (426.8, 483.5)	67.6 (57.4, 79.5)	113.6 (94.7, 135.8)	137.5 (117.1, 161.3)	29.6 (23.0, 37.9)	18.3 (13.3, 25.2)
St. Lucie	354.6 (335.7, 374.7)	56.0 (49.2, 64.0)	97.5 (84.0, 113.3)	102.9 (87.7, 120.6)	32.5 (27.2, 39.0)	20.2 (16.2, 25.5)
Sumter	475.5 (442.7, 511.3)	82.8 (70.5, 98.3)	168.6 (142.8, 200.9)	105.7 (83.2, 136.7)	36.7 (28.1, 48.8)	27.8 (21.0, 38.3)
Suwannee	439.2 (384.2, 501.8)	79.6 (57.8, 109.3)	91.8 (59.9, 139.1)	105.8 (70.4, 159.1)	53.8 (34.6, 81.7)	^
Taylor	406.5 (333.9, 491.7)	86.2 (54.8, 130.6)	92.5 (47.0, 168.2)	170.3 (105.0, 269.2)	^	^
Union	1358.1 (1,178.4, 1562.4)	201.1 (133.7, 296.1)	473.7 (333.9, 675.5)	253.3 (139.8, 439.9)	100.0 (56.1, 171.9)	^
Volusia	397.2 (382.4, 412.6)	66.8 (61.1, 73.1)	70.0 (61.5, 79.7)	109.1 (98.1, 121.4)	37.2 (33.0, 42.1)	16.4 (13.7, 19.7)
Wakulla	372.6 (310.1, 445.5)	84.6 (56.1, 124.2)	85.3 (47.2, 147.9)	113.0 (67.8, 182.1)	43.2 (23.7, 74.3)	^
Walton	269.2 (233.6, 309.8)	54.7 (40.0, 74.7)	57.6 (36.9, 88.6)	52.7 (32.6, 84.7)	22.1 (12.6, 37.4)	^
Washington	327.4 (265.3, 401.6)	61.6 (36.9, 99.3)	116.4 (68.6, 187.1)	^	30.8 (14.7, 60.3)	^

Source of data: Florida Cancer Data System

1 Rates are expressed as number of cases per 100,000 population per year, adjusted to the 2000 U.S. standard population.

2 95% confidence interval.

3 Non-Hodgkin refers to Non-Hodgkin's lymphoma.

Table 4. (Continued) Age-Adjusted Incidence Rates[1] by County, Florida, 2009

	Head & Neck	Non-Hodgkin[3]	Melanoma	Cervix	Ovary
	Rate (CI[2])	Rate (CI)	Rate (CI)	Rate (CI)	Rate (CI)
Florida	**16.9 (16.4, 17.5)**	**17.3 (16.7, 17.8)**	**19.6 (19.0, 20.3)**	**9.4 (8.8, 10.1)**	**11.3 (10.7, 11.9)**
Alachua	17.3 (12.4, 23.7)	16.0 (11.1, 22.4)	25.8 (18.9, 34.9)	9.3 (4.4, 17.6)	10.7 (5.7, 19.1)
Baker	^	^	^	^	^
Bay	21.7 (15.7, 29.7)	17.8 (12.2, 25.3)	24.2 (17.3, 33.3)	^	9.7 (4.6, 19.1)
Bradford	^	^	^	^	^
Brevard	21.2 (17.9, 25.1)	21.1 (17.9, 24.8)	24.1 (20.4, 28.6)	8.9 (5.8, 13.4)	11.1 (7.8, 15.6)
Broward	16.4 (14.7, 18.3)	19.1 (17.2, 21.2)	20.1 (17.9, 22.5)	9.5 (7.6, 11.7)	12.3 (10.2, 14.7)
Calhoun	^	^	^	^	^
Charlotte	16.1 (11.1, 23.9)	14.2 (10.1, 20.9)	17.7 (12.7, 25.6)	^	^
Citrus	15.3 (10.9, 22.8)	17.9 (11.5, 27.7)	18.7 (13.5, 27.4)	^	16.1 (9.9, 29.2)
Clay	13.6 (8.8, 20.3)	18.1 (12.5, 25.7)	15.7 (10.4, 23.1)	14.6 (7.9, 25.1)	14.8 (8.2, 25.1)
Collier	13.9 (10.7, 18.0)	13.3 (10.2, 17.5)	21.7 (17.6, 26.8)	6.5 (3.1, 12.6)	8.4 (4.8, 14.3)
Columbia	22.6 (13.4, 36.9)	14.5 (7.3, 27.1)	^	^	^
DeSoto	^	^	34.5 (17.7, 64.6)	^	^
Dixie	^	^	^	^	^
Duval	18.6 (15.9, 21.7)	17.5 (14.8, 20.5)	21.3 (17.9, 25.3)	10.3 (7.6, 13.8)	11.5 (8.7, 15.1)
Escambia	17.1 (13.0, 22.2)	14.3 (10.7, 19.1)	18.4 (13.6, 24.8)	^	8.6 (5.0, 14.6)
Flagler	16.3 (10.3, 26.9)	14.2 (8.8, 24.1)	27.2 (17.8, 42.1)	^	^
Franklin	^	^	^	^	^
Gadsden	^	20.9 (10.3, 39.0)	^	^	^
Gilchrist	^	^	^	^	^
Glades	^	^	^	^	^
Gulf	^	^	^	^	^
Hamilton	^	^	^	^	^
Hardee	^	^	^	^	^
Hendry	33.8 (16.8, 61.1)	^	^	^	^
Hernando	18.0 (12.8, 25.4)	19.0 (13.9, 26.5)	20.2 (14.5, 28.4)	12.7 (5.7, 25.5)	17.4 (10.8, 28.7)
Highlands	10.7 (5.4, 20.8)	20.7 (13.8, 31.8)	25.1 (17.1, 38.1)	^	10.0 (4.7, 25.3)
Hillsborough	19.8 (17.4, 22.5)	18.3 (16.0, 20.9)	21.5 (18.7, 24.6)	9.5 (7.2, 12.3)	13.8 (11.1, 17.1)
Holmes	^	^	^	^	^
Indian River	14.1 (9.5, 21.4)	13.6 (9.4, 20.5)	28.5 (20.8, 39.4)	^	9.6 (5.0, 20.2)
Jackson	^	^	^	^	^
Jefferson	^	^	^	^	^
Lafayette	^	^	^	^	^
Lake	13.8 (10.4, 18.3)	19.1 (15.2, 24.2)	20.5 (16.1, 26.1)	11.2 (6.2, 19.0)	9.6 (5.9, 15.8)
Lee	16.2 (13.6, 19.4)	16.1 (13.4, 19.3)	19.7 (16.5, 23.4)	11.7 (7.9, 16.8)	11.2 (8.1, 15.3)
Leon	12.0 (7.9, 17.8)	9.9 (6.2, 15.2)	12.3 (7.5, 19.4)	^	13.5 (8.1, 21.8)
Levy	25.0 (13.8, 45.0)	^	^	^	^
Liberty	^	^	^	^	^
Madison	^	^	^	^	^
Manatee	13.7 (10.4, 17.9)	15.2 (11.7, 19.7)	28.5 (23.1, 35.1)	7.3 (3.6, 13.4)	8.5 (5.1, 14.1)
Marion	18.2 (14.5, 22.9)	17.5 (13.9, 22.1)	18.9 (14.5, 24.5)	14.9 (9.2, 23.2)	15.3 (10.5, 22.2)
Martin	14.9 (10.3, 22.2)	11.4 (7.6, 18.0)	19.8 (14.4, 28.1)	^	8.3 (4.1, 19.4)
Miami-Dade	15.5 (14.0, 17.1)	17.5 (16.0, 19.2)	9.1 (7.9, 10.5)	11.2 (9.4, 13.1)	11.5 (9.8, 13.4)
Monroe	19.6 (12.3, 31.5)	13.2 (7.3, 23.7)	18.1 (10.8, 30.5)	^	20.1 (9.3, 41.4)
Nassau	13.1 (6.6, 24.6)	14.6 (7.4, 26.9)	23.7 (13.9, 39.0)	25.1 (11.6, 49.2)	^
Okaloosa	18.2 (13.0, 25.1)	17.6 (12.3, 24.6)	21.5 (15.3, 29.5)	^	^
Okeechobee	^	^	36.0 (19.7, 63.2)	^	^
Orange	16.6 (14.1, 19.4)	19.2 (16.5, 22.2)	21.0 (17.9, 24.6)	8.0 (5.8, 10.9)	10.0 (7.4, 13.2)
Osceola	16.4 (11.7, 22.4)	13.8 (9.6, 19.3)	16.3 (11.4, 22.8)	10.7 (5.8, 18.4)	7.1 (3.4, 13.5)
Palm Beach	15.6 (13.8, 17.7)	20.4 (18.4, 22.7)	23.8 (21.2, 26.8)	8.4 (6.3, 11.0)	11.0 (8.9, 13.5)
Pasco	16.5 (13.2, 20.5)	19.0 (15.5, 23.2)	24.0 (19.8, 29.0)	13.3 (8.7, 19.7)	10.5 (7.1, 15.5)
Pinellas	19.8 (17.4, 22.6)	15.1 (13.0, 17.5)	17.6 (15.1, 20.4)	6.9 (4.7, 9.8)	10.6 (8.2, 13.7)
Polk	23.2 (19.7, 27.1)	19.1 (16.1, 22.7)	26.0 (22.0, 30.8)	12.3 (8.6, 17.3)	13.8 (10.2, 18.5)
Putnam	28.6 (19.3, 42.7)	19.1 (10.7, 33.1)	22.2 (13.0, 38.0)	^	^
Santa Rosa	18.8 (12.8, 27.1)	16.0 (10.4, 24.0)	21.1 (14.1, 30.7)	^	^
Sarasota	13.4 (10.5, 17.1)	15.7 (12.6, 19.7)	19.1 (15.5, 23.8)	5.8 (2.8, 11.3)	10.3 (7.1, 15.6)
Seminole	14.7 (11.2, 19.0)	16.9 (13.2, 21.5)	20.1 (15.8, 25.3)	7.7 (4.6, 12.5)	14.0 (9.7, 19.7)
St. Johns	21.1 (15.6, 28.3)	19.2 (13.9, 26.3)	22.7 (16.5, 30.9)	^	11.7 (6.4, 20.8)
St. Lucie	11.0 (7.8, 15.5)	8.1 (5.5, 12.1)	18.4 (14.0, 24.2)	6.0 (2.8, 12.2)	11.9 (7.4, 19.2)
Sumter	13.8 (8.6, 23.1)	19.4 (13.2, 29.5)	24.4 (16.6, 36.9)	^	10.5 (4.8, 27.4)
Suwannee	^	21.6 (10.8, 41.5)	24.3 (11.5, 47.8)	^	^
Taylor	^	^	^	^	^
Union	125.3 (77.0, 200.4)	67.7 (35.0, 128.1)	^	^	^
Volusia	20.5 (17.3, 24.4)	16.3 (13.4, 19.9)	17.6 (14.3, 21.7)	10.0 (6.3, 15.3)	12.7 (9.3, 17.6)
Wakulla	^	^	^	^	^
Walton	21.1 (12.1, 35.7)	^	^	^	^
Washington	^	^	^	^	^

Source of data: Florida Cancer Data System

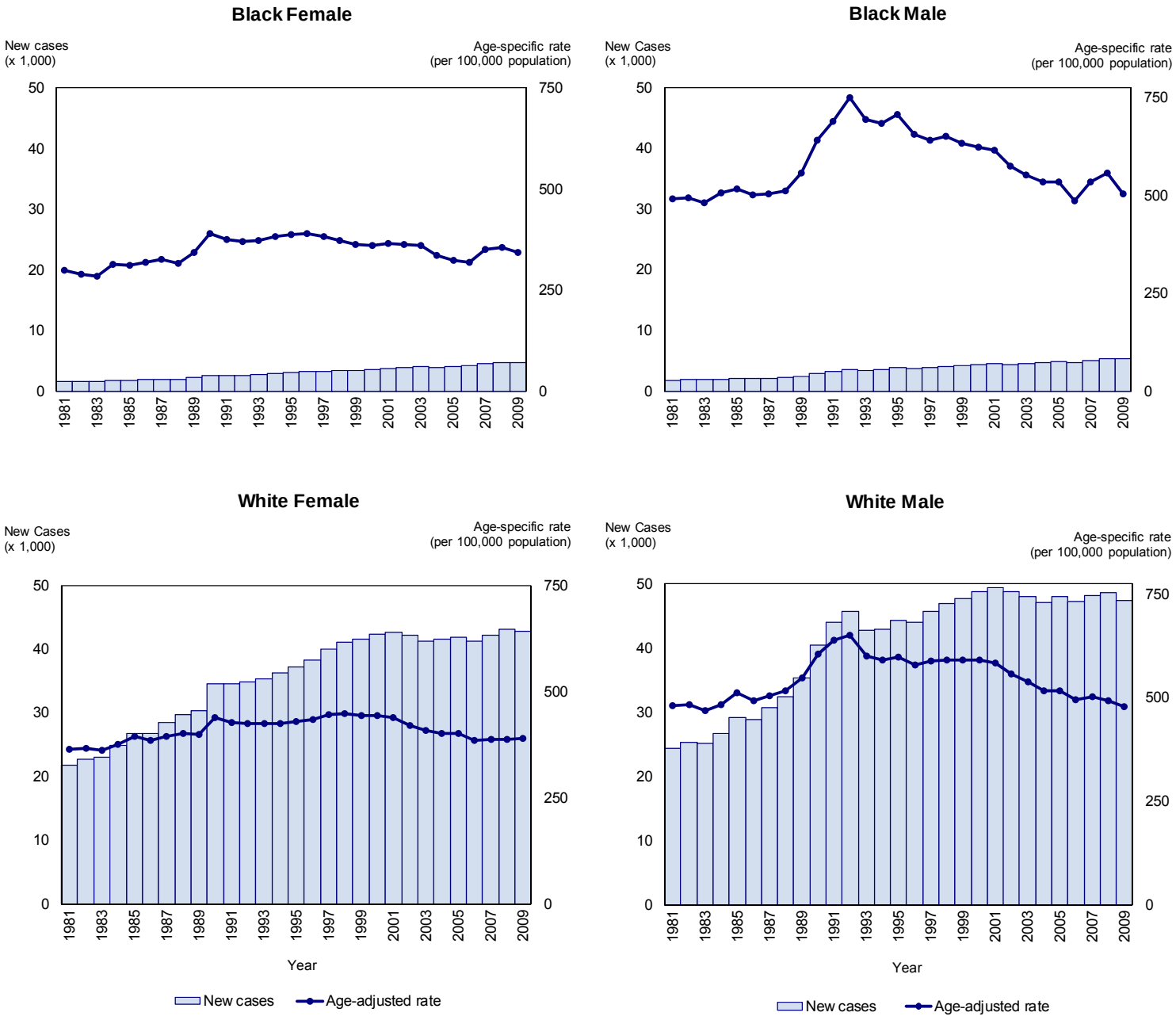
1 Rates are expressed as number of cases per 100,000 population per year, adjusted to the 2000 U.S. standard population.

2 95% confidence interval.

3 Non-Hodgkin refers to Non-Hodgkin's lymphoma.

^ Statistics for cells with fewer than 10 cases are not displayed.

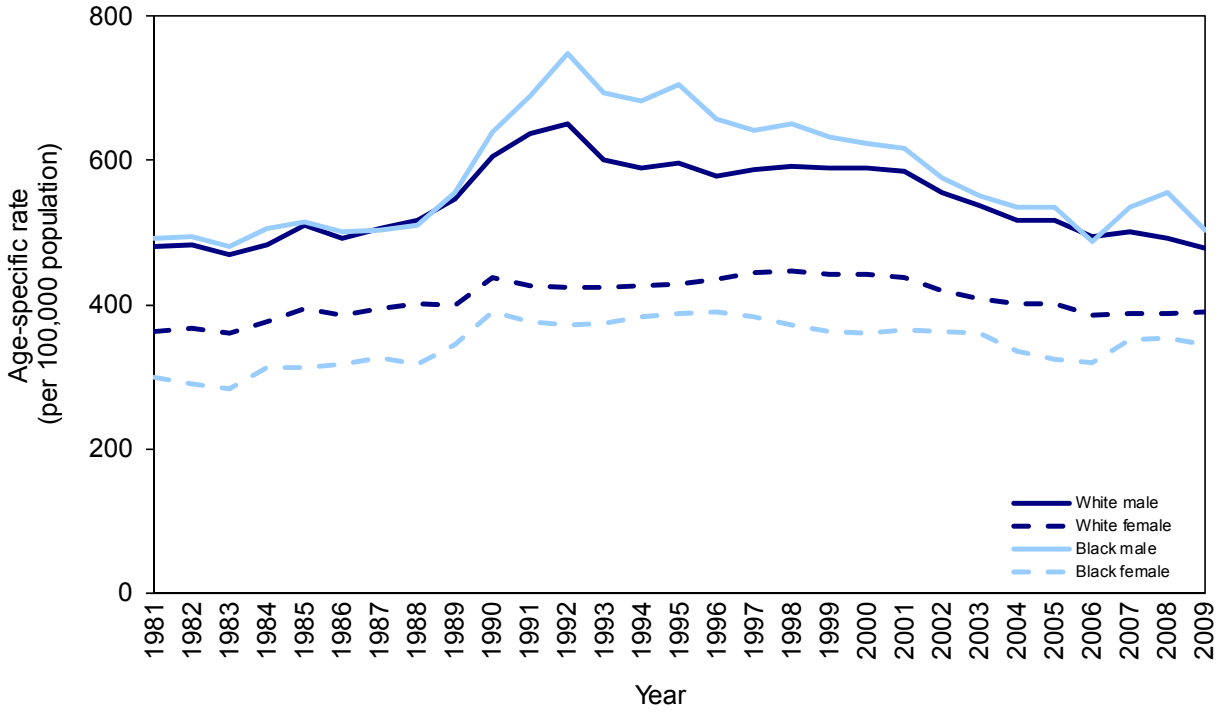
Figure 1. New Cases and Age-Adjusted Incidence Rates for All Cancers by Gender and Race[1], Florida, 1981-2009



Source of data: Florida Cancer Data System

1 Rates are expressed as number of cases per 100,000 population per year, adjusted to the 2000 U.S. standard population. Florida incidence rates include new cancers in persons of "other" races, cases with unknown race, and cases with unknown or unspecified gender. Rates calculated by gender include cases with unknown or other race. Rates by race include cases with unknown gender. By definition, age-adjusted incidence rates cannot include cases with unknown age.

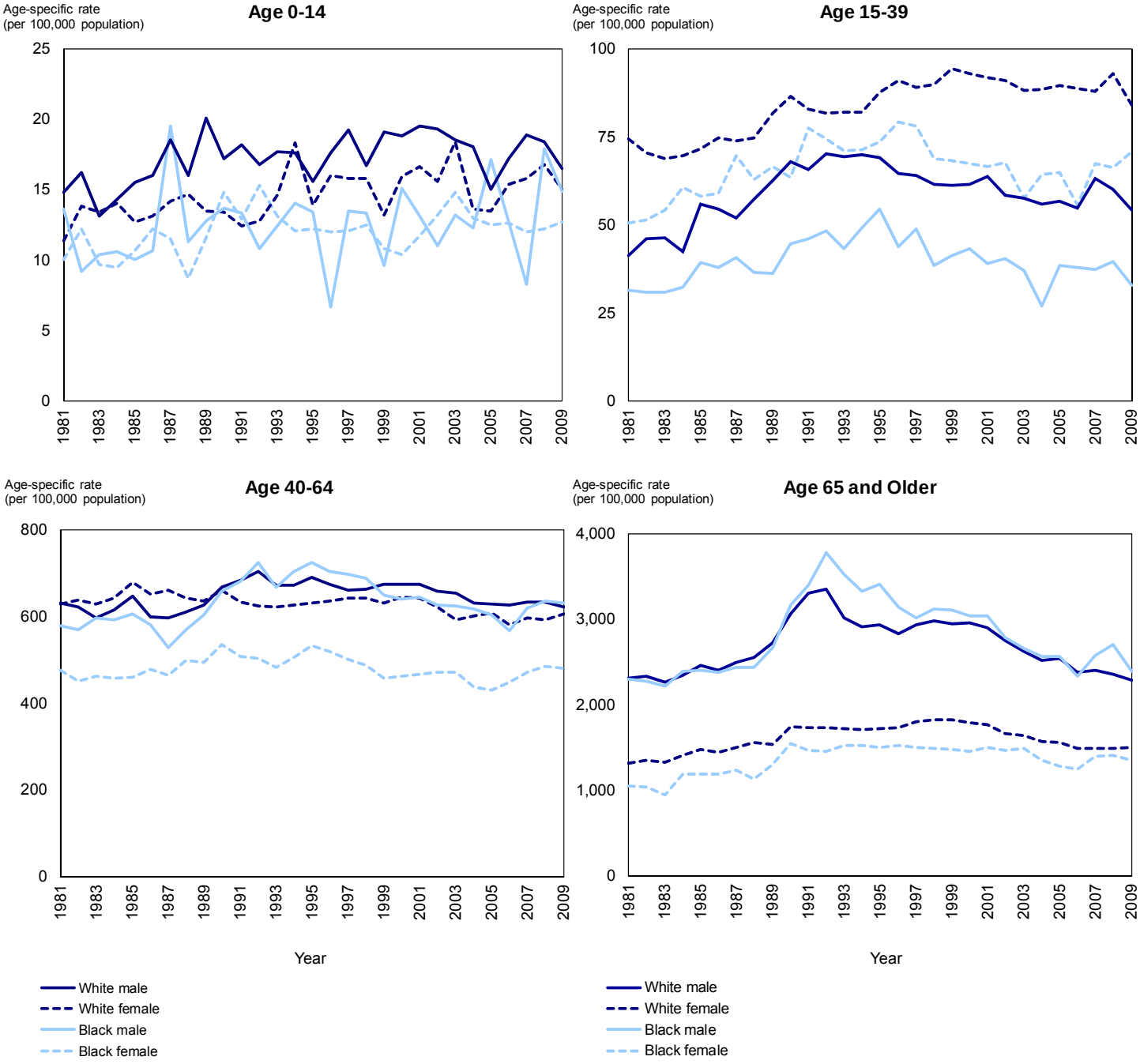
Figure 2. Age-Adjusted Incidence Rates for All Cancers by Gender and Race[1], Florida, 1981-2009



Source of data: Florida Cancer Data System

1 Rates are expressed as number of cases per 100,000 population per year, adjusted to the 2000 U.S. standard population. Florida incidence rates include new cancers in persons of "other" races, cases with unknown race, and cases with unknown or unspecified gender. Rates calculated by gender include cases with unknown or other race. Rates by race include cases with unknown gender. By definition, age-adjusted incidence rates cannot include cases with unknown age.

Figure 3. Age-Specific Incidence Rates for All Cancers by Gender, Race, and Age Group[1], Florida, 1981-2009



Source of data: Florida Cancer Data System

1 Rates are expressed as number of cases per 100,000 population per year, adjusted to the 2000 U.S. standard population. Florida incidence rates include new cancers in persons of "other" races, cases with unknown race, and cases with unknown or unspecified gender. Rates calculated by gender include cases with unknown or other race. Rates by race include cases with unknown gender. By definition, age-adjusted incidence rates cannot include cases with unknown age.

Section 4

Summary of Antimicrobial Resistance Surveillance

Antibiotics are one of the single most impressive medical achievements of the twentieth century. However, the continuing emergence and spread of antimicrobial resistance jeopardizes the utility of antibiotics and threatens public health globally. Additionally, resistant pathogens are often associated with increased morbidity and mortality, prolonged hospital stays, and increased intensity and duration of treatment.

The Florida Department of Health (FDOH) conducts surveillance for antibiotic resistance in five microorganisms. Practitioners, hospitals, and laboratories are required to report people infected with *Streptococcus pneumoniae* at a normally sterile site, including antibiotic susceptibility testing results. Practitioners, hospitals, and laboratories are required to report people infected with vancomycin non-susceptible *Staphylococcus aureus*. Laboratories participating in electronic laboratory reporting are required to report all *S. aureus* isolates from a normally sterile site with antibiotic susceptibility testing results. Isolates of *Neisseria meningitidis* from cases of meningococcal disease are sent to the Centers for Disease Control and Prevention (CDC) for additional laboratory testing as part of MeningNet. *Neisseria gonorrhoeae* isolates from the first 25 men with urethral gonorrhea seen each month in one sexually transmitted disease (STD) clinic in Miami are forwarded to CDC for susceptibility testing as part of the Gonococcal Isolate Surveillance Project (GISP).

Ideally, each patient presenting with an infection suspected to be caused by any of these organisms would be treated based on antimicrobial resistance testing of their own isolate conducted prior to the determination of an antimicrobial regimen. As that is not always possible, a cumulative or community aggregate antibiogram can provide useful operational information for the selection of an empiric therapy for a presumptive diagnosis. The selection of an antibiotic for empiric treatment should not be based solely on the community antibiogram. The community antibiogram should be considered in conjunction with factors such as the pharmacology of the antibiotic, its toxicity, the patient's hypersensitivity, the potential for interaction of the drug with other drugs the patient may be taking, the effectiveness of the patient's defense mechanisms, and the cost of the drug. Community antibiograms are also useful for tracking the antibiotic resistance patterns of clinically important microorganisms and for detecting trends towards antimicrobial resistance.

Streptococcus pneumoniae

Background

Streptococcus pneumoniae causes many clinical syndromes, depending on the site of infection (e.g., otitis media, pneumonia, bacteremia, meningitis, sinusitis, peritonitis, and arthritis). Invasive disease, for reporting purposes, includes cultures obtained from a normally sterile site, such as blood or cerebrospinal fluid. Drug-resistant *S. pneumoniae* invasive disease (DRSP) was added to Florida's list of notifiable diseases in mid-1996. Drug-susceptible *S. pneumoniae* invasive disease (DSSP) was added to Florida's list of notifiable diseases in mid-1999 to permit the assessment of the proportion of pneumococcal isolates that are drug-resistant; however, electronic data capture of resistance testing results was not fully implemented until 2005. When analyzing susceptibility testing results for *S. pneumoniae*, only one susceptibility result per case was included, in accordance with Clinical Laboratory Standards Institute (CLSI) guidelines. If there was more than one susceptibility result per case, results were then ranked on date of specimen collection (earliest to latest), date of report (latest to earliest), and the number of antibiotics tested (most to least), with the top ranking result selected for inclusion. The decision to include the first result was based on the goal of this report, which is to guide clinicians in the selection of empirical antimicrobial therapy for initial infections.

Not every specimen was tested for resistance to every antibiotic included in this report. When calculating percent susceptibility to an antibiotic, the denominator is the number of cases with an isolate tested for that particular antibiotic. Susceptibility results are presented for only those antibiotics which are recommended for routine testing and reporting, per 2008 CLSI guidelines. The CLSI guidelines split antibiotics into three groups for the purposes of reporting susceptibility testing results. Groups are based on clinical efficacy, prevalence of resistance, minimizing emergence of resistance, cost, FDA clinical indications for usage, and current consensus recommendations for first-choice and alternative drugs. Group A includes antibiotics that

CLSI considers appropriate for inclusion in routine, primary testing; Group B includes agents that may warrant primary testing but which CLSI recommends only selective reporting; Group C includes agents considered to be alternative or supplemental. Please note that cumulative aggregate susceptibility results for antimicrobials in Group B and C may underestimate the actual susceptibility rates in the community if only those isolates resistant to Group A antimicrobials are tested against Group B or C agents.

Data Summary

There were a total of 679 DSSP cases and 645 DRSP cases in 2011. Of the 679 DSSP cases, seven (1.0%) did not have antibiotic susceptibility data, most often because the patient died and further testing was not done.

The aggregate percent susceptibility for Group A agents were between 56% and 69% (Table 1). Aggregate percent susceptibility among Group B agents were more variable, ranging from 77% susceptibility to tetracycline to greater than 99% susceptibility to the fluoroquinolones (levofloxacin, moxifloxacin, and ofloxacin). Aggregate percent susceptibility for Group C agents ranged from 71% to 100%, although susceptibility percentages for Group C agents should be interpreted carefully, as often only isolates with specific susceptibility profiles against Group A or B agents are tested for susceptibility to Group C agents.

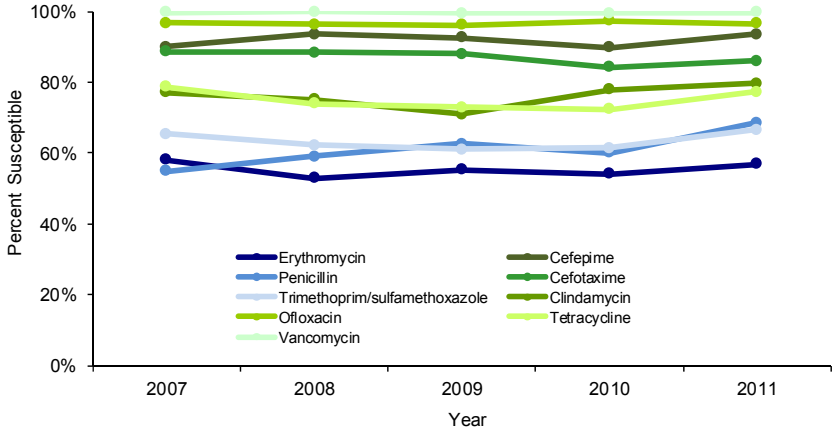
Table 1. Reported *Streptococcus pneumoniae*, Invasive Disease, Cumulative Antibiogram by CLSI Antibiotic Groups*, Florida, 2011

CLSI group	Antibiotic name	Number of cases tested	Percent of cases tested		
			Susceptible	Intermediate	Resistant
Group A*	Erythromycin	1,019	57	1	42
	Penicillin	1,166	69	14	17
	Trimethoprim/sulfamethoxazole	843	67	7	27
Group B*	Cefepime	157	94	5	2
	Cefotaxime	608	86	8	6
	Clindamycin	439	80	2	19
	Levofloxacin	901	99	1	0
	Moxifloxacin	298	100	0	0
	Ofloxacin	87	97	3	0
	Meropenem	317	82	11	7
	Tetracycline	703	77	1	21
	Vancomycin	1,180	100	0	0
Group C*	Amoxicillin/clavulanic acid	214	88	6	6
	Amoxicillin	222	91	6	4
	Chloramphenicol	335	99	0	1
	Imipenem	45	71	27	2
	Linezolid	255	100	0	0
	Rifampin	78	100	0	0

*Group A includes antibiotics that CLSI considers appropriate for inclusion in routine, primary testing; Group B includes agents that may warrant primary testing but which CLSI recommends only selective reporting; Group C includes agents considered to be alternative or supplemental.

S. pneumoniae susceptibility to most Group A and Group B antibiotics stayed relatively stable from 2007 to 2011 (Figure 1). There was a slight increase in susceptibility to penicillin.

Figure 1. Reported *Streptococcus pneumoniae*, Invasive Disease, Cumulative Percent Susceptibility to Select CLSI Group A* and Group B* Antibiotics, Florida 2007-2011



*Group A includes antibiotics that CLSI considers appropriate for inclusion in routine, primary testing; Group B includes agents that may warrant primary testing but which CLSI recommends only selective reporting. Group A antimicrobial agents are depicted on this graph with solid lines while Group B agents are depicted with dashed lines. Note: In 2010, FDOH revised the antimicrobial agents for which susceptibility testing results were collected. Prior to 2010, cumulative susceptibility results are not available for these antimicrobials (levofloxacin, moxifloxacin, and meropenem) and they are not included on this graph.

In general, the lowest cumulative susceptibility was seen among young children and youth (Table 2). For example, only 40% of cases in infants and young children (less than 4 years old) and 39% of cases in youth (15 to 24-year-olds) tested for resistance to erythromycin were susceptible, versus over 55% in all other age groups. Fewer than 63% of cases in young children (1 to 4-year-olds) and youth (15 to 24-year-olds) were susceptible to penicillin, versus more than 69% in all other age groups. Likewise, less than 56% of cases in young children and youth were susceptible to trimethoprim/sulfamethoxazole, versus more than 62% in other age groups.

Table 2. Reported *Streptococcus pneumoniae*, Invasive Disease, Cumulative Percent Susceptibility to CLSI Group A* and Group B* Antibiotics by Age Group, Florida, 2011

Age Group	Number of cases	Cumulative Percent of Cases Susceptible to Antibiotic											
		Group A*			Group B*								
		Erythromycin	Penicillin	Trimethoprim/ sulfamethoxazole	Cefepime	Cefotaxime	Clindamycin	Levofloxacin	Moxifloxacin	Ofloxacin	Meropenem	Tetracycline	Vancomycin
<1 (infant)	33	40**	55**	56**	**	83**	80**	100**	**	**	62**	91**	100
1-4 (young child)	105	40	57	46	**	75	58	100	100**	**	60	51	98
5-14 (child)	52	56	74	62	**	69**	81**	100	100**	**	70**	77	100
15-24 (youth)	40	39**	63	42**	**	76**	54**	100**	**	**	83**	44**	100
25-64 (adult)	636	62	71	71	93	89	80	98	99	93	86	78	100
65+ (senior)	458	55	69	68	97	89	88	99	100	100**	87	82	100

*Group A includes antibiotics that CLSI considers appropriate for inclusion in routine, primary testing; Group B includes agents that may warrant primary testing but which CLSI recommends only selective reporting.

**Too few cases (<30) were tested to produce reliable estimates of resistance. Results of age group/drug combinations where there were less than 10 cases tested were suppressed.

Resistance patterns were also summarized by Florida Regional Domestic Security Task Force Regions (map available at http://dohiws.doh.ad.state.fl.us/Divisions/DEMO/BPR/PDFs/rdstf-map.pdf). The southwest region tended to have the lowest cumulative susceptibility for the majority of the antimicrobials, while the northern regions (northeast, north central, and northwest) tended to have the highest cumulative susceptibility (Table 3).

Table 3. Reported *Streptococcus pneumoniae*, Invasive Disease, Cumulative Percent Susceptibility to CLSI Group A* and Group B* by Regional Domestic Security Task Force Region, Florida, 2011

Region	Number of cases	Cumulative Percent of Cases Susceptible to Antibiotic											
		Group A*			Group B*								
		Erythromycin	Penicillin	Trimethoprim/ sulfamethoxazole	Cefepime	Cefotaxime	Clindamycin	Levofloxacin	Moxifloxacin	Ofloxacin	Meropenem	Tetracycline	Vancomycin
East Central	247	49	59	63	**	77	78	98	100	98	77	74	100
North Central	44	77	88	64**	**	92**	90	100	**	**	**	83**	100
North East	160	69	71	75	96	89	81	100	100**	**	88	85	99
North West	107	49	74	71	95	96	91	100	100	**	90	86	100
South East	362	59	76	67	96**	88	74	98	100	100**	73	72	100
South West	133	50	72	67	**	91	76**	98	100	100**	84	72	100
West Central	271	57	59	63	87**	83	77	99	99	83**	78	78	100

*Group A includes antibiotics that CLSI considers appropriate for inclusion in routine, primary testing; Group B includes agents that may warrant primary testing but which CLSI recommends only selective reporting.

**Too few cases (<30) were tested to produce reliable estimates of resistance. Results of age group/drug combinations where there were less than 10 cases tested were suppressed.

Neisseria meningitidis

Background

N. meningitidis is a bacterium that is a leading cause of bacterial meningitis in the U.S. and may also cause overwhelming sepsis, purpura fulminans, or (rarely) benign meningococcemia. The emergence of quinolone-resistant *N. meningitidis* in the U.S. has raised important questions regarding current chemoprophylaxis guidelines and highlights the expanding threat of antimicrobial resistance in bacterial pathogens. The CDC responded to this concern by forming MeningNet, an enhanced meningococcal surveillance system to monitor antimicrobial susceptibility. As part of MeningNet, the Bureau of Public Health Laboratories (BPHL) began forwarding all *N. meningitidis* isolates to the CDC for antibiotic susceptibility testing in late 2008. All isolates are tested for susceptibility to penicillin, ceftriaxone, ciprofloxacin, rifampin, and azithromycin. Results are interpreted as susceptible, intermediate, or non-susceptible for penicillin, ciprofloxacin, rifampin, and susceptible or non-susceptible for ceftriaxone and azithromycin.

Data Summary

Of the 51 cases of meningococcal disease reported in Florida in 2011, 42 had isolates submitted to CDC for testing as part of MeningNet. One isolate was contaminated upon arrival at CDC, so a total of 41 isolates were tested for antibiotic susceptibility.

Statewide, there were 17 serogroup W-135, 12 serogroup B (one was contaminated and susceptibility was not tested), eight serogroup C, and five serogroup Y isolated from Florida cases (Table 4). All 41 isolates

were susceptible to ceftriaxone, ciprofloxacin, and rifampin. One isolate was non-susceptible to azithromycin, six isolates exhibited intermediate susceptibility to penicillin, and one isolate was non-susceptible to azithromycin and showed intermediate susceptibility to penicillin.

Table 4. 2011 *Neisseria meningitidis* susceptibility to select antibiotics

Serogroup	Total cases tested	Antibiotic name	Cases tested		
			Susceptible	Intermediate	Non-susceptible
B	11*	Penicillin	7	4	0
		Ceftriaxone	11	NA	0
		Ciprofloxacin	11	0	0
		Rifampin	11	0	0
		Azithromycin	11	NA	0
C	8	Penicillin	6	2	0
		Ceftriaxone	8	NA	0
		Ciprofloxacin	8	0	0
		Rifampin	8	0	0
		Azithromycin	7	NA	1
W-135	17	Penicillin	16	1†	0
		Ceftriaxone	17	NA	0
		Ciprofloxacin	17	0	0
		Rifampin	17	0	0
		Azithromycin	16	NA	1†
Y	5	Penicillin	5	0	0
		Ceftriaxone	5	NA	0
		Ciprofloxacin	5	0	0
		Rifampin	5	0	0
		Azithromycin	5	NA	0

*12 serogroup B cases; one was contaminated and susceptibility was not tested.
†Same case.

Two cases were epidemiologically linked and their isolates demonstrated intermediate susceptibility to penicillin. Five cases had a history of travel: Cuba (two cases); Sweden (one case); Tampa, FL (one case); and Orlando, FL (one case). All five cases with travel history had isolates that were susceptible to all five antibiotics screened. Seven cases were linked by pulsed-field gel electrophoresis patterns; all were part of an ongoing Miami-Dade outbreak of the W-135 strain and were susceptible to all five antibiotics screened.

Neisseria gonorrhoeae

Background

N. gonorrhoeae is a bacterium that can grow easily in the warm, moist areas of the reproductive tract, urethra, mouth, throat, eyes, and anus and causes the STD gonorrhea. Resistance to several antibiotics over time has challenged the treatment and control of gonorrhea. In the 1970's, the standard treatments, penicillin and tetracycline, were abandoned due to increased resistance to these agents. As recently as 2007, an increase in fluoroquinolone-resistant isolates prompted recommendations for new treatment guidelines supporting the use of cephalosporins, including ceftriaxone and cefixime, for gonococcal infections. In some parts of the world, *N. gonorrhoeae* is now showing potential resistance to cephalosporins, which are the only recommended class of antibiotics left to treat this common infection.

The Gonococcal Isolate Surveillance Project (GISP) was established in 1986 to continuously monitor trends

in antimicrobial resistance of *N. gonorrhoeae* across 30 cities in the U.S. The Miami-Dade STD clinic in Florida has served as one of 29 GISP sites since 1998. The Miami GISP site collects specimens each month from symptomatic males. If the Gram stain indicates the presence of diplococci, the specimen is forwarded to BPHL for culture, and the isolate is shipped to the CDC until 25 viable isolates are reached for the month. At the CDC, all isolates are tested for susceptibility to cefixime, cefpodoxime, ceftriaxone, tetracycline, spectinomycin, ciprofloxacin, penicillin, and azithromycin.

Data Summary

In the past five years, 1,119 viable isolates were collected from the Miami GISP site. In 2011, 166 specimens were submitted in which resistance to penicillin and tetracycline remained high and resistance to ciprofloxacin increased (Table 5). There were no isolates resistant to azithromycin observed in 2011. Recommendations to only use cephalosporins in 2007 have been credited with the steady decline of gonorrhea in Florida. Currently, ceftriaxone and cefixime (the cephalosporin antibiotics) have not shown any signs of resistance in isolates submitted by Florida.

Table 5. Cumulative Percent Susceptibility of *Neisseria gonorrhoeae* Isolates, Miami-Dade Gonococcal Isolate Surveillance Project Site, 2007-2011

Year	Number of isolates tested	Cumulative Percent of Isolates Susceptible to Antibiotic						
		Penicillin	Tetracycline	Spectinomycin	Ciprofloxacin	Ceftriaxone	Cefixime	Azithromycin
2007	266	79	62	100	81	100	N/A*	100
2008	259	87	61	100	84	100	N/A*	100
2009	219	88	65	100	88	100	100	100
2010	209	79	67	100	85	100	100	99
2011	166	81	63	100	77	100	100	100

*Isolates were not tested for cefixime susceptibility in 2007 and 2008.

For treatment of uncomplicated urogenital, anorectal, and pharyngeal gonorrhea, CDC recommends combination therapy with a single intramuscular dose of ceftriaxone 250 mg plus either a single dose of azithromycin 1 g orally or doxycycline 100 mg orally twice daily for seven days.

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Section 5

Summary of Foodborne Disease Outbreaks

Description

Foodborne disease surveillance, investigation, and reporting are essential public health activities. Globalization of the food supply, changes in eating habits and behaviors, and newly emerging pathogens and vehicles of transmission have impacted the risk of contracting foodborne diseases. The Centers for Disease Control and Prevention (CDC) estimates foodborne diseases from unspecified agents account for approximately 38.4 million illnesses, 71,878 hospitalizations, and 1,686 deaths per year in the U.S. An additional estimated 9.4 million illnesses, 55,961 hospitalizations, and 1,351 deaths are accounted for by confirmed foodborne pathogens. Florida has had a unique program in place since 1994 to conduct foodborne and waterborne disease surveillance, investigation, and reporting functions for the state with the intent to better detect and investigate related diseases, complaints, and outbreaks. This assists public health officials, the medical community, and the food industry in acquiring the knowledge and public health practices to prevent morbidity and mortality from contaminated food and water supplies throughout the harvesting, processing, distribution, and human consumption continuum.

Foodborne disease outbreaks, as defined by the Florida Department of Health's (FDOH) Food and Waterborne Disease Program, are incidents in which two or more people have the same disease, have similar symptoms, or excrete the same pathogens; and there is a person, place, or time association between these people along with ingestion of a common food. A single case of suspected botulism, mushroom poisoning, ciguatera, paralytic shellfish poisoning, or other rare disease, or a case of a disease that can be definitively linked to ingestion of a food, is considered an incident of foodborne illness and warrants further investigation.

Overview

FDOH identified 51 foodborne disease outbreaks with 407 associated cases in 2011 (Table 1).

Table 1. Summary of Reported Foodborne Disease Outbreaks, Florida 2002-2011

Year	Number of outbreaks	Number of cases	Number of outbreaks per 100,000 population	Number of cases per 100,000 population	Average cases per outbreak
2002	237	1,443	1.4	8.6	6.1
2003	185	1,564	1.1	9.1	8.5
2004	173	1,911	1	10.9	11.1
2005	128	1,944	0.7	10.8	15.2
2006	142	1,141	0.8	6.2	8
2007	122	852	0.7	4.6	7
2008	96	1,218	0.5	6.5	12.7
2009	65	715	0.4	3.8	11
2010	64	805	0.3	4.3	12.6
2011	51	407	0.3	2.2	8

Trends

Over the last ten years in Florida, there has been a general decreasing trend in the total number of reported foodborne disease outbreaks and number of reported foodborne disease outbreaks per 100,000 population (Figures 1 and 2).

Figure 1. Total Number of Reported Foodborne Disease Outbreaks, Florida, 2002-2011

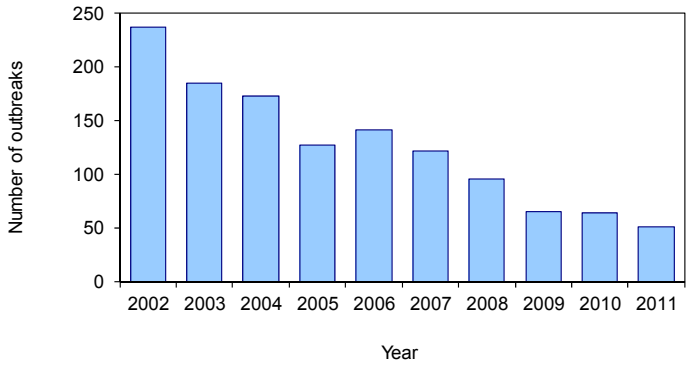
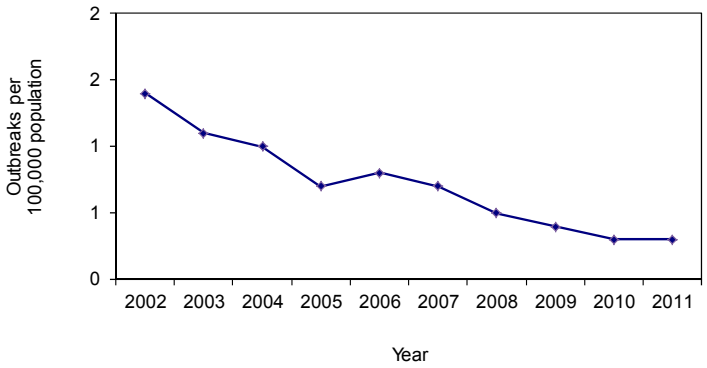


Figure 2. Number of Reported Foodborne Disease Outbreaks per 100,000 Population, Florida, 2002-2011



Over the last ten years, the number of reported foodborne illness cases and the incidence per 100,000 population has declined (Figures 3 and 4).

Figure 3. Total Number of Reported Foodborne Disease Outbreak-Related Cases, Florida, 2002-2011

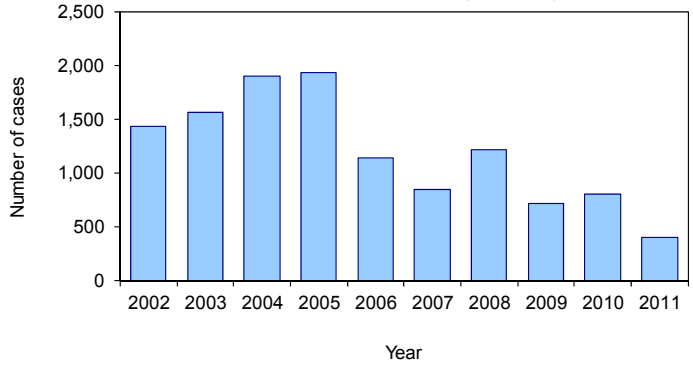
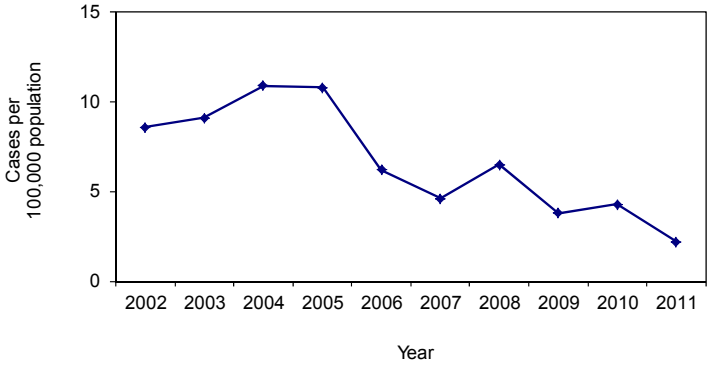


Figure 4. Number of Reported Foodborne Outbreak-Related Cases per 100,000 Population, Florida, 2002-2011



Seasonality

There was no seasonal trend in reported outbreaks. July and April had the highest number of outbreaks (eight) and November the lowest (none) (Figure 5). Similarly, there was no trend in the number of outbreak-related cases reported monthly, with the highest number of cases (94) reported in May (Figure 6).

Figure 5. Total Number of Reported Foodborne Disease Outbreaks by Month, Florida, 2011

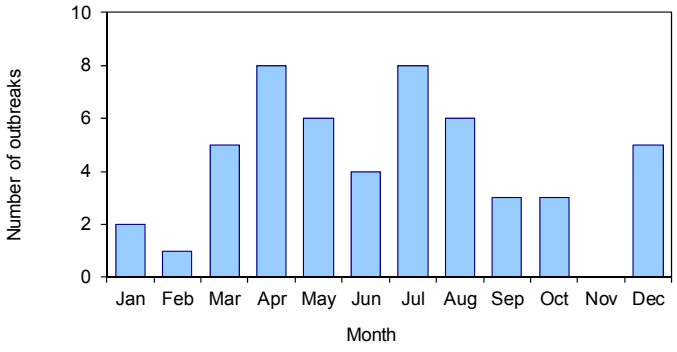
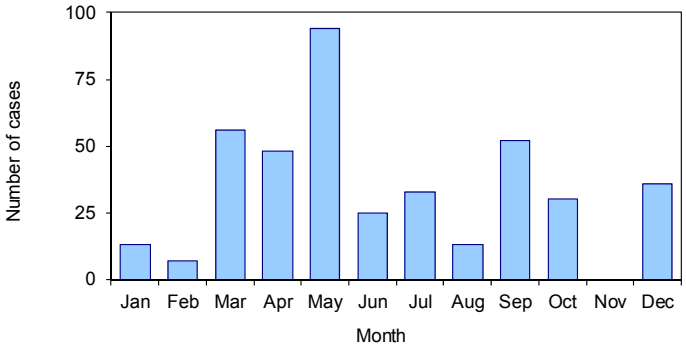


Figure 6. Total Number of Reported Foodborne Disease Outbreak-Related Cases by Month, Florida, 2011



Etiology

Foodborne disease outbreaks caused by bacteria (39.2%) and marine toxins (23.5%) accounted for most of the 2011 total reported foodborne disease outbreaks with a known etiology (Table 2). Viral pathogens (norovirus) contributed 19.6% of the outbreaks. Foodborne disease outbreaks caused by norovirus accounted for the most reported cases (50.1%). Bacterial pathogens accounted for 25.3% of reported outbreak cases while marine toxins accounted for 10.1% of cases. Pathogen type was unknown for 15.7% of the reported foodborne disease outbreaks accounting for 11.5% of the reported outbreak-related cases.

Among foodborne disease outbreaks with a suspected or confirmed etiology, *Vibrio vulnificus* was the most frequently reported etiology for 2011 accounting for 11 (21.6%) outbreaks followed by norovirus and ciguatera, accounting for ten (19.6%) and nine (17.7%) outbreaks respectively (Table 2).

Table 2. Frequency of Reported Foodborne Outbreaks and Cases by Confirmed or Suspected Etiology, Florida, 2011

Pathogen	Outbreaks Number (percent)	Cases Number (percent)
Bacteria		
Vibrio vulnificus	11 (21.6)	11 (2.7)
Salmonella	3 (5.9)	40 (9.8)
Clostridium perfringens	3 (5.9)	33 (8.1)
Bacillus cereus	2 (3.9)	9 (2.2)
Vibrio cholerae 075	1 (2.0)	10 (2.5)
Total Bacteria	**20 (39.2)**	**103 (25.3)**
Viruses		
Norovirus	10 (19.6)	204 (50.1)
Total Viral	**10 (19.6)**	**204 (50.1)**
Marine Toxins		
Ciguatera	9 (17.7)	32 (7.9)
Scombroid	3 (5.9)	9 (2.2)
Total Marine Toxins	**12 (23.5)**	**41 (10.1)**
Parasites		
Cyclospora	1 (2.0)	12 (3.0)
Total Parasites	**1 (2.0)**	**12 (3.0)**
Unknown		
Total Unknown	**8 (15.7)**	**47 (11.5)**
Total	**51 (100.0)**	**407 (100.0)**

Implicated Food Vehicles

Fish, molluscan shellfish, and multiple items were the most frequently reported general vehicles contributing to foodborne disease outbreaks in Florida that occurred in 2011 (Table 3).

Table 3. Frequency of Reported Foodborne Illness Outbreaks and Cases by General Vehicle, Florida, 2011

Food vehicle	Outbreaks Number (percent)	Cases Number (percent)
Fish	13 (25.5)	45 (11.1)
Shellfish-mollusks	12 (23.5)	27 (6.6)
Multiple items*	11 (21.6)	142 (34.9)
Multiple ingredients**	4 (7.8)	19 (4.7)
Produce-vegetables	4 (7.8)	100 (24.6)
Rice	3 (5.9)	17 (4.2)
Unknown	2 (3.9)	50 (12.3)
Shellfish-crustaceans	1 (2.0)	1 (0.2)
Beverage	1 (2.0)	6 (1.5)
Total	51 (100.0)	407 (100.0)

*Multiple items are food vehicles in which several foods are individually prepared or cooked and more than one food is suspected or confirmed to be contaminated (e.g. buffet, salad bar, chicken and shrimp, etc.).

**Multiple ingredients are food vehicles in which several foods are combined during preparation or cooking and the entire food product is suspected or confirmed to be contaminated (e.g. casseroles, soups, sandwiches, salads, etc.).

Contributing Factors

The top contributing factors associated with reported foodborne disease outbreaks in Florida for 2011 are displayed in Table 4. There are three categories of contributing factors (contamination factor, proliferation factor, survival factor). Up to three contributing factors per category can be attributed in an outbreak; as such, the reported numbers may not match the actual number of reported outbreaks and cases.

Table 4. Most Commonly Reported Foodborne Contamination Factors, Florida, 2011

Contamination factors	Number of outbreaks	Number of cases
Toxic substance part of the tissue	12	41
Contaminated raw product - food was intended to be consumed after a kill step	2	13
Contaminated raw product - food was intended to be consumed raw or undercooked/under-processed	14	42
Cross-contamination of ingredients (cross contamination does not include ill food workers)	4	19
Bare-handed contact by a food handler/worker/preparer who is suspected to be infectious	4	136
Glove-hand contact by a food handler/worker/preparer who is suspected to be infectious	2	46
Other mode of contamination (excluding cross-contamination) by a food worker who is suspected to be infectious	3	63
Storage in contaminated environment	3	28
Other source of contamination	1	3
Proliferation factors	**Number of outbreaks**	**Number of cases**
Food preparation practices that support proliferation of pathogens (during food preparation)	2	7
No attempt was made to control temperature of implicated food or length of time food was out of temperature	1	3
Improper cold holding due to malfunctioning refrigeration equipment	1	6
Improper cold holding due to an improper procedure or protocol	4	16
Improper hot holding due to malfunctioning equipment	1	3
Improper hot holding due to improper procedure or protocol	2	24
Improper/slow cooling	1	22
Other situations that promoted or allowed microbial growth or toxin production	1	10
Proliferation/amplification factors not applicable	16	192
Survival factors	**Number of outbreaks**	**Number of cases**
Insufficient time and/or temperature control during initial cooking/heat processing	2	24
Other process failures that permit pathogen survival	1	6
Survival factors not applicable	24	184

Regulatory Agency

FDOH investigates foodborne outbreaks in all public facilities regardless of the regulatory agency responsible for doing routine inspections and issuing permits and citations. Agencies which regulate facilities with foodborne outbreaks are provided in Table 5.

Table 5. Frequency of Reported Foodborne Disease Outbreaks and Cases by Agency with Regulatory Authority, Florida, 2011

Agency	Outbreaks Number (percent)	Cases Number (percent)
Department of Business and Professional Regulation	32 (62.7)	320 (78.6)
Other	11 (21.6)	47 (11.5)
Department of Agriculture and Consumer Services	6 (11.8)	21 (5.2)
Department of Health	2 (3.9)	19 (4.7)
Total	51 (100.0)	407 (100.0)

Outbreak Location

Most reported foodborne disease outbreaks and outbreak-related cases were restaurant-associated (see Table 6).

Table 6. Foodborne Illness Outbreaks and Cases by Site, Florida, 2011

Agency	Outbreaks Number (percent)	Cases Number (percent)
Restaurant	33 (64.7)	332 (81.6)
Home	10 (19.6)	32 (7.9)
Other	4 (7.8)	27 (6.6)
Grocery	3 (5.9)	9 (2.2)
Caterer	1 (2)	7 (1.7)
Total	51 (100)	407 (100)

FDOH is dedicated to the detection and investigation of foodborne-related diseases, complaints, and outbreaks. The scientific knowledge generated from these public health activities greatly assists the medical community, regulatory officials, public health officials, and the food industry to implement food safety policies and procedures to ensure a safe food supply for our citizens and visitors.

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Section 6

Notable Outbreaks and Case Investigations

Contents

Bacterial Diseases

Bacillus anthracis — Imported Inhalation Anthrax — Pinellas County 161

Bordetella pertussis — Fatal Pertussis Infection in a 6-Week-Old Infant — Palm Beach County 161

Bordetella pertussis — Pertussis Outbreak among Unvaccinated Children in an Extended Family — Escambia County 162

Capnocytophaga canimorsus — Fatal *Capnocytophaga canimorsus* Infection in a 39-Year-Old Man — Sarasota County 162

Clostridium tetani — Fatal Tetanus Case — Citrus County 163

Ehrlichia ewingii —Infection Acquired from Leukoreduced Platelet Transfusion, July 2011 — Multistate 163

Klebsiella pneumoniae — Outbreak of Carbapenem-Resistant Enterobacteriaceae at a Long-Term Acute Care Hospital — Pinellas County 164

Klebsiella pneumoniae — Outbreak of Carbapenem-Resistant *Klebsiella pneumoniae* at a Long-Term Acute Care Hospital — Broward County 165

Legionella pneumophila — An Outbreak of Legionnaires' Disease Linked to an Outside Decorative Fountain — Hillsborough County 165

Mycobacterium leprae — Leprosy in a Man with No International Travel History — Osceola County 166

Mycobacterium tuberculosis — A Complex Tuberculosis Investigation in an Assisted Living Facility — Volusia County 167

Rickettsia typhi — Imported Flea Rickettsiosis in a Resident with Travel to Texas — Hillsborough County 167

Streptococcus species — Outbreak of Streptococcal Endophthalmitis Associated with Intravitreal Injection of Bevacizumab — Miami-Dade and Broward Counties 168

Vibrio cholerae — Domestic Cholera Transmission from Conch Imported from Haiti — Collier County 169

Vibrio cholerae O75 — Toxin Producing *Vibrio cholerae* O75 Outbreak — Multistate, Escambia and Nassau Counties 169

Parasitic Diseases

Cyclospora cayetanensis — Confirmed *Cyclospora* Outbreak Linked to a Restaurant — Collier County 170

Naegleria fowleri — Primary Amebic Meningoencephalitis — Brevard County 170

Sarcoptes scabiei — Scabies in a Skilled Nursing Facility — Seminole County 171

Viral Diseases

Adenovirus — Viral Conjunctivitis Linked to an Ophthalmic Care Center — Osceola County 172

Dengue Virus — Locally-Acquired Dengue Cases — Hillsborough, Martin, Miami-Dade, and Palm Beach Counties 172

Hepatitis B Virus — Perinatal Hepatitis B Case -— Hillsborough County 173

Measles Virus — Confirmed Measles Case Acquired in India — Alachua County 174

Measles Virus — Measles Transmission at an International Trade Show — Multistate, Orange County 174

Norovirus — Foodborne Norovirus Outbreak at a Family Restaurant March 2011 — Hernando County 175

Norovirus — Norovirus Outbreak Associated With Swimming in a Recreational Spring-Fed Lake — Glades County 176

Varicella-Zoster Virus — Varicella in a Daycare Infant Room — Seminole County 176

West Nile Virus — A Review of the West Nile Virus Disease Outbreak — Duval County 177

Non-Infectious Agents

Carbon Monoxide — Vehicle-Related Carbon Monoxide Poisoning Cluster — Hillsborough County 178

Ciguatoxin — Ciguatera Outbreak Associated with Commercially Purchased Amberjack — St. Lucie County 178

Ciguatoxin — Ciguatera Outbreak in a Charter Fishing Boat Group who Traveled to Great Harbour Cay, Bahamas — Multistate, Miami-Dade, and Monroe Counties 179

Pesticides — Aerial Pesticide Application and Drift Impacting an Elementary School — Palm Beach County 179

Radioactive Strontium — Investigation of Internal Contamination with Radioactive Strontium Following a Cardiac PET Scan — Multistate, Orange County 180

Undetermined — Investigation of a Cluster of Illnesses Initially Attributed to a Chemical Exposure — Seminole County 180

Bacterial Diseases

***Bacillus anthracis* — Imported Inhalation Anthrax — Pinellas County**

Background: Inhalation anthrax is a rare, frequently fatal infection. On August 6, 2011, the Minnesota Department of Health (MN DOH) identified *Bacillus anthracis* isolated from the blood of a Florida resident who had vacationed in five northern Midwestern states.

Methods: The patient and his wife were interviewed, environmental samples were tested for *B. anthracis*, and the patient's isolate was genotyped. Enhanced surveillance for veterinary and human cases was performed in states visited by the patient, consisting of queries of veterinary diagnostic and reference laboratories for anthrax cases in animals and queries of the National Animal Health Lab Network (NAHLN) and the Laboratory Response Network (LRN) for *Bacillus* species isolates for the period June 1, 2011 to August 31, 2011.

Results: The patient was successfully treated with antimicrobials and anthrax immunoglobulin and was discharged home after a 25-day hospitalization. Possible exposures to anthrax spores in areas where *B. anthracis* is naturally endemic included inhaling dust stirred up by American bison or during rock collecting, preparing fishing flies using hair from hoofed animals, and handling antlers. No *B. anthracis* was detected from environmental samples submitted for testing, including samples collected from the patient's home in Pinellas County, Florida. The *B. anthracis* strain was identified as GT-59; no animal cases with this strain or other human cases were identified.

Conclusions: Rapid identification of the organism and aggressive treatment likely contributed to patient survival. Although he had visited areas where anthrax is enzootic and had multiple exposures to soil and animal products, specific causal exposure was not able to be determined. Comprehensive surveillance through multiple networks and systems was useful to assess for missed animal and human cases. Utilizing a "One Health" approach, which incorporated veterinary and human health, and investment in the LRN and NAHLN made this investigation possible.

Editorial Note: Although anthrax is not considered endemic to Florida, clinicians should be aware of clinical presentation and public health reporting requirements in cases of travel, contact with imported goods such as drum skins, and bioterrorist events as occurred in Florida in 2001. This summary was modified from the abstract of an article submitted for publication by the MN DOH and the multistate anthrax investigations team.

***Bordetella pertussis* — Fatal Pertussis Infection in a 6-Week-Old Infant — Palm Beach County**

On August 15, 2011, a 1-month-old premature infant boy developed a paroxysmal cough with apnea. The baby was seen by his pediatrician and was also taken to a local emergency room where he was diagnosed with an upper respiratory infection. Due to continued cough, the infant was referred for admission to the hospital by the pediatrician and azithromycin was started on August 29, 2011. A nasopharyngeal swab was polymerase chain reaction positive for *B. pertussis* on September 2, 2011. A chest x-ray was negative for pneumonia. The infant's condition continued to deteriorate and he died on September 1, 2011. During the case investigation by the Palm Beach County Health Department, two other family members were found to have a similar illness. The mother also met the Florida surveillance case definition for a confirmed case. She had a cough illness onset on August 8, 2011, and did not have a history of Tdap vaccination. The father's cough onset was more recent, starting on August 29, 2011 but he did not meet case definition. They both received treatment. Two other family members and two healthcare workers received prophylaxis.

Editorial Note: Pertussis is a potentially serious, highly contagious bacterial respiratory disease. Pertussis is transmitted by direct contact with respiratory droplets from an infected person. Infected people are contagious for up to four weeks without appropriate antibiotic therapy. During outbreaks, attack rates of up to

80% among susceptible contacts are common. Although pertussis vaccination rates are high in Florida, pertussis continues to circulate. When pertussis is introduced into a susceptible group, wide-scale transmission can occur within a few days after onset, often before diagnosis by a physician and initiation of disease prevention interventions. During this period, infants may be infected. Among infants, complications and hospitalization resulting from pertussis infection are common and antibiotic treatment may not reduce the severity of the disease. Routine childhood, adolescent, and adult vaccination reduces the risk of infection among infants, therefore preventing the most common severe cases of pertussis.

***Bordetella pertussis* — Pertussis Outbreak among Unvaccinated Children in an Extended Family — Escambia County**

Background: The Escambia County Health Department conducted an investigation following a physician's report of a suspected pertussis outbreak among two related families in July 2011.

Methods: Interviews were conducted and medical records were reviewed to collect demographic, clinical, laboratory, vaccination, and close contact information. The Florida surveillance case definition was used to classify cases.

Results: Nine confirmed cases of pertussis were identified. All cases were in unvaccinated children ranging from 1 to 18 years old (median age was 4 years old). Seven cases occurred among two related families consisting of eight children and four adults. All eight children were unvaccinated and seven (87.5%) were infected, while all four adults reported a history of pertussis vaccination and were not infected. Two unvaccinated children that attended the same church as the families were also infected. An unvaccinated 7-year-old boy from one of the families, with disease onset on June 15, 2011, was the first detected case. He infected at least seven of the other cases, with disease onsets from July 1 to July 6, 2011. The last case had disease onset on July 10, 2011. Seven of the cases tested positive for *B. pertussis* by polymerase chain reaction. None of the cases were hospitalized. Antibiotic treatment and prophylaxis was provided to all cases and close contacts. Tdap vaccination was recommended when appropriate. Following the public health and medical response, no additional cases were reported.

Conclusion: This outbreak clearly demonstrates the infectiousness of *B. pertussis* among a susceptible population. Groups of people with low vaccine coverage are at constant risk of pertussis introduction and rapid transmission.

***Capnocytophaga canimorsus* — Fatal *Capnocytophaga canimorsus* Infection in a 39-Year-Old Man — Sarasota County**

On October 12, 2011, a previously healthy 39-year-old white man with asplenia presented to a local hospital complaining of nausea, vomiting, fever, and pain two days after being bitten on the arm by a dog. A physical examination conducted at the time of admission documented a fever (104.9°F), systolic blood pressure in the low 100s, mild conjunctival infection, and tachycardia. A chest x-ray identified increasing interstitial markings and oxygen saturation was 99%. Laboratory studies performed at admission had the following abnormal hematological values: white blood cell count 3,000, platelets 92,000, hemoglobin 12.8, creatinine 1.8, and bilirubin 3.6. He was admitted to the intensive care unit with a diagnosis of sepsis syndrome. Antibiotics (vancomycin, cefepime, and clindamycin) were ordered pending cultures. Blood cultures grew *Capnocytophaga* species on October 15, which was later identified as *Capnocytophaga canimorsus* by the hospital laboratory. Antimicrobial susceptibility testing was not performed. No purulence or fasciitis was noted upon surgical exploration of the wound. He subsequently developed acute hepatitis and pulmonary infiltrates which progressed to acute respiratory distress syndrome. Ventilator support was provided. The illness progressed to multiple organ failure and the patient died on October 16.

Editorial Note: C. canimorsus *is a zoonotic bacterium that is found in the normal oral flora of dogs and cats. It is a fastidious organism, often difficult to isolate and identify. The organism can cause rare but severe illness including septicemia, meningitis, and endocarditis. Transmission to people is via bites or licks from healthy-appearing animals. People at increased risk of developing* C. canimorsus *infections include patients who are asplenic, immunosuppressed, or abuse alcohol. Medical attention and proper wound care following a dog bite may prevent infection.*

Lion C, Escande F, Burdin JC. 1996. *Capnocytophaga canimorsus* Infections in Humans: Review of the Literature and Cases Report. *European Journal of Epidemiology*, 12(5);521-533.

***Clostridium tetani* — Fatal Tetanus Case — Citrus County**

On April 29, 2011, an 89-year-old woman presented to the emergency department with a 2-day history of difficulty opening her mouth (trismus, also called lockjaw), and painful muscular contractions in her left arm. One week prior to illness onset, she sustained scratches on her left arm when several of her dogs jumped up to greet her, but she did not seek medical care. Prior tetanus vaccination history was unavailable. Probable tetanus was diagnosed and she was admitted to the hospital for further evaluation and treatment. Initial medical management was complicated by difficulty obtaining tetanus immune globulin (TIG). On May 2, she received 500 units of TIG and she was transferred to a tertiary care facility where an additional 500 units of TIG were administered. She died the following day.

Editorial Note: Three cases of tetanus were reported in 2011; this was the only fatal case. From 2001 to 2010, there were 30 cases (zero to five per year); four (13.3%) were fatal. Almost all reported cases of tetanus are in people who have never been vaccinated with a tetanus toxoid-containing vaccine, or who completed a primary series but have not had a booster in the preceding 10 years as is recommended. A primary series consists of three or four injections of tetanus toxoid-containing vaccines. A booster dose is necessary every 10 years due to waning antitoxin levels. People with wounds that are neither clean nor minor, and who have had zero to two prior doses of tetanus toxoid or have an uncertain history of prior doses should receive TIG as well as Td or Tdap. A single intramuscular dose of 3,000 to 5,000 units of TIG is generally recommended for children and adults, with part of the dose infiltrated around the wound. Intravenous immune globulin contains tetanus antitoxin and may be used if TIG is not available.

Atkinson W, Wolfe S, Hamborsky J, eds. 2011. *Epidemiology and Prevention of Vaccine- Preventable Diseases*. 12th ed. Atlanta, GA: Centers for Disease Control and Prevention; 291-300.

Lee DC, Lederman HM. 1992. Anti-Tetanus Toxoid Antibodies in Intravenous Gamma Globulin: An Alternative to Tetanus Immune Globulin. *Journal of Infectious Disease*, 166(3);642-645.

***Ehrlichia ewingii* — Infection Acquired from Leukoreduced Platelet Transfusion, July 2011 — Multistate**

Background: A Georgia patient with acute lymphoblastic leukemia presented to a local hospital with acute fever, malaise, and neutropenia following three blood transfusions and was diagnosed with *Ehrlichia ewingii* infection. The man had no known tick exposure. Transfusion products originated at a Florida blood bank.

Methods: The Florida Department of Health, the Centers for Disease Control and Prevention (CDC), and the Florida blood bank conducted traceback of transfusion product donors. Testing of the recipients and donors was conducted by a local hospital, Mayo Clinic (Rochester), or CDC.

Results: The recipient was diagnosed with *E. ewingii* infection based on detection of *Ehrlichia* morulae in blood smears and positive reverse transcription polymerase chain reaction testing of whole blood. The recipient received multiple transfusions originating from three donors, including two who donated

leukoreduced single donor platelets and one who donated irradiated and leukoreduced red blood cells. The blood bank performed a traceback on the three donors and obtained whole blood and serum from each. Follow-up of *Ehrlichia* serology was positive for one Florida donor, who had a titer of 1:512. This donor had regularly donated platelets and plasma one or two times per month. During the investigation, the donor was found to have recent known tick exposures at his home in Florida and at a wooded property in South Carolina. He reported no febrile illnesses in the two months prior to and following the suspect donation. Routine complete blood counts performed at the time of each donation were within normal limits. Further investigation identified eight additional recipients receiving blood products from the positive donor. Five recipients received leukoreduced platelets and three recipients received plasma from the donor. Three of the recipients died within one to two days of transfusion due to unrelated causes. The remaining five recipients reported no symptoms of illness associated with *E. ewingii* and all tested negative for *Ehrlichia* antibodies.

Conclusion: This is the first known transmission of any *Ehrlichia* species via blood transfusion. Leukoreduction of platelets likely reduces the risk of transmission of intracellular white blood cell pathogens, but this case demonstrates risk is not entirely eliminated.

Editorial Note: Successful transfusion-acquired infection traceback investigations require strong partnerships with blood banks, healthcare providers, and public health officials.

***Klebsiella pneumoniae* — Outbreak of Carbapenem-Resistant Enterobacteriaceae at a Long-Term Acute Care Hospital — Pinellas County**

Background: In July 2010, the Florida Department of Health became aware of carbapenem-resistant Enterobacteriaceae (CRE) detected in clinical cultures from long-term acute care hospital (LTACH) A. As a result, the county and state health department and LTACH A developed an infection prevention plan to assess and reduce CRE transmission at the facility.

Methods: Microbiology records at LTACH A from March 2009 to February 2011 were reviewed to identify CRE transmission cases and cases admitted with CRE. CRE bacteremia episodes were identified from March 2009 to July 2011. Biweekly CRE prevalence surveys were conducted from July 2010 to July 2011 and interventions to prevent transmission were implemented, including education and auditing of staff and isolation and cohorting of CRE patients with dedicated nursing staff and shared medical equipment. Trends were evaluated using weighted linear or Poisson regression. CRE transmission cases were included in a case-control study to evaluate risk factors for acquisition. A real-time polymerase chain reaction assay was used to detect the *bla*KPC gene, and pulsed-field gel electrophoresis was performed to assess the genetic relatedness of isolates.

Results: Ninety-nine CRE transmission cases, 16 admission cases (from seven acute care hospitals), and 29 CRE bacteremia episodes were identified. From July 2010 through July 2011, significant reductions were observed in CRE prevalence (49% vs. 8%), percentage of patients screened with newly detected CRE (44% vs. 0%), and CRE bacteremia episodes (2.5 vs. 0.0 per 1,000 patient-days). Cases were more likely to have received β-lactam antibiotics, have diabetes, and require mechanical ventilation. All tested isolates were *Klebsiella pneumoniae* carbapenemase-producing *K. pneumoniae* and nearly all isolates were genetically related.

Conclusion: CRE transmission can be reduced in LTACHs through surveillance testing and targeted interventions. Sustainable reductions within and across healthcare facilities may require a regional public health approach.

Chitnis AS, Caruthers PS, Rao AK, Lamb J, Lurvey R, Beau De Rochars VM, Kitchel B, Cancio M, Török TJ, Guh A, Gould CV, Wise ME. 2012. Outbreak of Carbapenem-Resistant Enterobacteriaceae at a Long-Term Acute Care Hospital: Sustained Reductions in Transmission through Active Surveillance and Targeted Interventions. *Infection Control and Hospital Epidemiology*, 33(10);984-992.

Klebsiella pneumoniae — Outbreak of Carbapenem-Resistant *Klebsiella pneumoniae* Infection at a Long-Term Acute Care Hospital — Broward County

Background: Carbapenem-resistant *Klebsiella pneumoniae* (CRKP) infections have limited treatment options and are associated with increased risk of death. In July 2011, a long-term acute care hospital (LTACH) reported four patients with CRKP to the Broward County Health Department. An investigation was conducted to describe the outbreak and develop recommendations for enhanced infection control.

Methods: Microbiology records from January 2010 to November 2011 were reviewed to identify CRKP cases. CRKP was identified in one of three ways: clinical cultures of ill patients, surveillance cultures of newly admitted patients, and periodic surveillance cultures of all patients without a history of CRKP. Point prevalence surveys were conducted from July 2011 to September 2012. The Bureau of Public Health Laboratories performed pulsed-field gel electrophoresis (PFGE) on available CRKP isolates. The facility implemented interventions to prevent transmission, including education of staff and administration, ensuring appropriate contact isolation procedures, and cohorting of CRKP patients with dedicated nursing staff and medical equipment.

Results: Thirty-two CRKP cases were detected by clinical culture (25) or by inpatient surveillance culture (7) from March 2010 to November 2011. The 25 ill patients' first CRKP-positive cultures occurred during one of two time periods; Period 1, March 2010–November 2010 (n=12), or Period 2, March 2011–November 2011 (n=13). Of these 25 cases, 14 were only identified by retrospective microbiology record review. Positive clinical culture sites included respiratory sites (10), blood (6), urine (5), and other sites (4). PFGE results of CRKP isolates from 15 patients collected during Period 2 indicated that 12 were >97% similar (Group 1); eight of these were indistinguishable. A second group of isolates (Group 2) was indistinguishable from each other and different from Group 1. One isolate, from an admission surveillance culture, was not similar to either group. CRKP prevalence was reduced from 17% in July 2011 to 4.5% in December 2011.
Conclusion: The combination of enhanced laboratory surveillance and infection control interventions was successful in controlling this long-term outbreak of CRKP. It is important that hospital and laboratory staff work together to confirm that carbapenem-resistant Enterobacteriaceae (CRE) are promptly recognized to ensure that appropriate precautions are taken.

Editorial Note: Carbapenems are a class of broad-spectrum β-lactam antibiotics used for treating severe infections caused by gram-positive, gram-negative, and anaerobic bacteria. Because they are more resistant to β-lactamase than other β-lactam antibiotics, carbapenems have been used as a drug of last resort for resistant organisms. However, healthcare-associated spread of carbapenem-resistant organisms is an increasing problem in Florida. CRE incidence and prevalence can be reduced in LTACHs through implementation of targeted infection prevention interventions. As a result of the success of the interventions put in place during the Pinellas County outbreak (above), a similar approach was replicated during the Broward County response resulting in a rapid end to a prolonged outbreak. Point prevalence studies through 2012 have demonstrated prolonged reductions in CRKP within the facility.

Legionella pneumophila — An Outbreak of Legionnaires' Disease Linked to an Outside Decorative Fountain — Hillsborough County

Background: From October 14, 2011 to October 16, 2011, three cases of community-acquired Legionnaires' disease, or legionellosis, were reported to the Hillsborough County Health Department (HCHD). The cases resided in the same retirement community in Plant City, Florida. Epidemiologic and environmental investigations were conducted to identify the source of the outbreak.

Methods: A case was identified by a positive urine antigen for *Legionella pneumophila* serogroup 1 and pneumonia confirmed by chest x-ray. Case interviews, including one proxy, were conducted using the Legionellosis Investigation Worksheet. Information was provided about planned community activities and risk

factors were identified after assessment of possible exposures on the property. On October 18, 2011, HCHD staff collected environmental samples from six sites at the retirement community. An independent environmental company hired by the management company also collected 12 environmental samples on November 4, 2011. In addition, HCHD inspected the potable water system and the Hillsborough Environmental Protection Commission inspected the wastewater treatment and reclaimed water systems.

Results: Interviews identified the main clubhouse, the decorative fountain outside the main clubhouse, showers with detachable nozzles, and community-operated sprinklers as the only common exposures among all three cases during the ten days before illness onset. All six environmental samples taken by the HCHD failed to grow *Legionella*. Inspections of the potable water, reclaimed water, and wastewater systems found them to be satisfactory. Of the 12 samples tested through independent environmental testing, only the decorative fountain outside of the main clubhouse was positive for *L. pneumophila* serogroup 1; however, the fountain had been drained prior to collection of this sample, and the sample taken was from rainwater that had since accumulated in the fountain.

Conclusion: The results of the investigation suggested that the outdoor decorative fountain at the main clubhouse was the source of the community outbreak of legionellosis. Warm water and presence of biofilm and algae in the fountain provided ideal environmental conditions for *Legionella* growth. HCHD worked closely with the community management company to ensure that all pools, hot tubs, and drinking water systems are maintained in accordance with Florida Administrative Code.

Editorial Note: Legionella pneumophila *is a common cause of community-acquired pneumonia, with an estimated 8,000 to 18,000 cases in the United States each year.* Legionella *bacteria can be found in low concentrations in the natural environment such as the slime, sediments, or biofilms that exist in lakes, rivers, and streams. Humans have coexisted with Legionella for a very long time. Ironically, the advent of industrial technology has created man-made water systems capable of harboring, growing, and transmitting* Legionella *bacteria via aerosolized pathways to humans. Examples of such systems include warm water found in whirlpool spas, indoor and outdoor decorative fountains, hot water tanks, large plumbing systems, and parts of large air conditioning systems of large buildings such as cooling towers. They do not seem to grow in car or window air conditioners. The infection of human cells by the bacteria is thought to be opportunistic. While* Legionella *pneumophila is the most common species, causing 80-90% of illness in humans, 22 species have been associated with human disease. People who are susceptible become infected with* Legionella *when they breathe in a mist or aerosol that contains the bacteria. For instance, water contaminated with* Legionella *bacteria in a whirlpool spa that is not properly cleaned, disinfected, and maintained could be aerosolized in the form of mist. Person-to-person transmission does not occur.*

***Mycobacterium leprae* — Leprosy in a Man with No International Travel History — Osceola County**

Background: On August 12, 2011, the Osceola County Health Department received a call from a local doctor reporting a suspect case of leprosy in a 46-year-old man who had been seen previously by a dermatologist in October 2010 with a quarter-sized lesion that emerged on his right thigh.

Methods: A biopsy was performed in 2010, but results were negative for acid-fast bacilli. On July 25, 2011, a second biopsy was performed by another doctor due to significant spread of the lesion.

Results: The patient reported no international travel within the past few years and multiple exposures to armadillos and hunting. Numerous acid-fast bacilli were present in the granulomatous inflammatory infiltrate within the dermis from the second biopsy. Results confirmed borderline tuberculoid leprosy. The patient was prescribed dapsone 100mg daily, rifampicin 600mg daily, and clofazimine 50mg daily.

Conclusion: The source of the infection is uncertain. Transmission from armadillos is likely because documented case reports have implicated them as a source of infection in U.S. patients.
Editorial Note: Leprosy, or Hansen's disease, is a chronic disease affecting the skin, peripheral nerves, and upper respiratory tract. The disease, caused by Mycobacterium leprae*, appears to be transmitted primarily through prolonged contact with respiratory droplets from infected people. The incubation period is nine months to 20 years after exposure. Leprosy has been reportable in Florida since 1921. Sixty-seven cases of leprosy were reported to the Florida Department of Health between 2001 and 2010; 17 (25.4%) of these reported no travel. Autochthonous cases of leprosy among native-born Americans have been observed in several southern U.S. states in recent years. Bacterial strains isolated from a number of these patients match* M. leprae *strains isolated from wild nine-banded armadillos (Dasypus novemcinctus) collected in the region. The route of transmission is unclear.*

***Mycobacterium tuberculosis* — A Complex Tuberculosis Investigation in an Assisted Living Facility — Volusia County**
Background: In June 2011, the Volusia County Health Department (VCHD) was notified of a 60-year-old white man residing at an assisted living facility (ALF) with laboratory-confirmed tuberculosis (TB). The man was hospitalized and left the hospital against medical advice, after which it was recommended the man be admitted to A.G. Holley State Hospital (AGH). The conventional contact investigation approach was challenging due to the medical and social characteristics of the residents at the ALF.

Methods: On June 23, 2011, the VCHD conducted an active TB case-finding activity at the ALF. Ninety-four ALF residents and staff were screened for active TB disease and latent TB infection (LTBI). Screening was conducted on-site at the ALF and included nursing assessment, interferon gamma release assay (IGRA) testing, chest x-ray (CXR) imaging, and sputum specimen collection. The Bureau of Public Health Laboratories performed smears to detect acid-fast bacilli, mycobacterium direct tests (MTD), and cultures on sputum specimens. An AGH physician reviewed CXR images in real-time online.

Results: Two suspected cases of TB were detected among residents, one of whom was sent to a local hospital for isolation, although TB infection was not confirmed after further evaluation and testing. Eight (8.5%) of the 94 IGRA tests were positive; 90 were repeated. Four people with LTBI were identified and completed preventative therapy. Thirty-eight sputum specimens were collected, all of which were negative for acid-fast bacilli, MTD negative, and culture negative.

Conclusions: The excellent collaborative efforts of all participants in the TB system of care resulted in rapid case detection, efficient contact evaluation, and prevention of further TB transmission in the facility and the community.

***Rickettsia typhi* — Imported Flea Rickettsiosis in a Resident with Travel to Texas — Hillsborough County**
The Hillsborough County Health Department investigated a suspected case of flea rickettsiosis in a 17-year-old woman with a history of travel to Texas. The patient adopted a stray kitten while in Corpus Christie, TX, and then spent 10 days traveling in a car with the kitten and two friends, arriving back in Florida around April 1. The day after returning, the patient developed a febrile illness of 28 days duration, swelling of the left side of the neck, generalized rash, and had elevated liver enzymes. Diagnosis was fever of unknown etiology. Fever resolved in May but the patient continued to report malaise. On June 21, the patient presented to the hospital with symptoms of headache, fever, and stiff neck and was diagnosed with aseptic meningitis. Symptoms resolved until June 28 when the patient had episodes of slurred speech, loss of sensation in one hand, unfocused stare, vomiting, photophobia, diarrhea, and confusion. Serum samples collected on June 29 were strongly positive for *Rickettsia typhi* antibody. The patient made a full recovery following treatment with doxycycline. The patient's fellow travelers also reported febrile illness following the

car trip. One, a 25-year-old man, became ill on April 16; a serum sample collected July 6 tested positive for *R. typhi* antibody. No serum samples were available from the other traveler.

*Editorial Note: Southern Texas is endemic for both murine typhus (*R. typhi*) and cat flea rickettsiosis (*R. felis*). The cat flea,* Ctenocephalides felis*, is a vector for both agents, and antibodies for* R. felis *strongly cross-react on R. typhi serologic assays. Flea rickettsiosis is typically a self-limited illness with fever, headache, and rash of less than two weeks duration. Meningoencephalitis is uncommon. Chronic infection with* R. typhi *or* R. felis *is unusual. Veterinary-approved flea treatment for pets can help prevent flea rickettsiosis and other flea associated illnesses.*

Streptococcus species — Outbreak of Streptococcal Endophthalmitis Associated with Intravitreal Injection of Bevacizumab — Miami-Dade and Broward Counties

Background: Bacterial endophthalmitis is a rare but serious complication following intravitreal bevacizumab injection. On July 11, 2011, Miami-Dade County Health Department was notified of six cases of streptococcal endophthalmitis treated at an ophthalmology referral center during the previous two days. All patients had received intravitreal bevacizumab injections one to two days previously.

Methods: A case of bevacizumab-associated endophthalmitis was defined as a clinically-compatible illness following intravitreal bevacizumab injection with illness onset from June 1 to July 15 in a resident of Miami-Dade or Broward counties. Cases were solicited using county and statewide health advisories. Medical records from patients receiving intravitreal injections at three affected practices were reviewed to determine medication type and source, and patient outcome. The Centers for Disease Control and Prevention performed multilocus sequence typing to speciate streptococcal isolates.

Results: Twelve cases of bevacizumab-associated endophthalmitis were identified. Ages ranged from 68 to 89 years old with a mean age of 78.5 years. Outcomes were poor. All but one case had worse visual acuity and seven (58.3%) required eye removal. Cases were injected over a 4-day period, from July 5 to July 8, by four different ophthalmologists at four clinics. Four batches of prefilled bevacizumab syringes prepared by one compounding pharmacy over a 4-week period were associated with cases. There were no cases among patients receiving bevacizumab from other sources ($p<0.0001$). Vitreous from 10 cases and 12 unused syringes yielded four streptococcal species (nine strains); two strains were common to cases and syringes. Pharmacy records review and inspection identified numerous deficiencies in sterile compounding practices at the preparation pharmacy.

Conclusions: This outbreak was caused by contamination of bevacizumab syringes during preparation (repackaging) at a compounding pharmacy. Multiple errors in sterile compounding practices at the pharmacy could have contributed to product contamination.

Editorial Note: Age-related macular degeneration (AMD) is a leading cause of blindness in the U.S. and worldwide. Bevacizumab is a U.S. Food and Drug Administration (FDA) approved drug used off-label (since 2005) by ophthalmologists to treat patients with AMD and other eye conditions associated with neovascularization. A related medication, ranibizumab, is FDA approved (2006) for treatment of AMD, but costs about 40 times more than bevacizumab. Both drugs represent a major advancement in treatment of AMD and use of both has increased rapidly. The reported incidence of endophthalmitis after intravitreal injection is 0.02%–0.05%.

*The severity of illness in this outbreak was typical for endophthalmitis caused by streptococci. There is a poor prognosis even when treatment is initiated promptly as occurred in this outbreak. The species of streptococci (*S. infantis, S. oralis, S. sanguinis*, and* S. salivarius*) recovered from patients and unused syringes are typically part of normal mouth flora. Aerosols containing mouth flora could have been generated in the production area if, for example, personnel did not wear face masks consistently or spoke while syringes*

were being prepared. Mouth flora could have been introduced into sterile bevacizumab vials if the device used to access vials was removed and reinserted or replaced. Once contaminated, there were insufficient safeguards to detect and discard contaminated syringes before distribution to physician offices.
In recent years, many outbreaks in Florida and elsewhere have been linked to inappropriate use of medications labeled as "single dose" or "single use." These vials typically lack antimicrobial preservatives and can be a source of infection if use is not limited to a single patient and for a single injection or procedure. When necessary because of drug shortage (or high drug cost in the case of bevacizumab) single use vials can be "repackaged" by qualified healthcare personnel in accordance with United States Pharmacopeia General Chapter 797, Pharmaceutical Compounding — Sterile Preparations. Unfortunately, this outbreak was caused by of lack of adherence to these quality assurance standards by the implicated compounding pharmacy. Increasing clinical use of bevacizumab and related drugs may lead to increased use of compounding pharmacies and this increased reliance may result in outbreaks like the one described here. Additional information about how to safely repackage bevacizumab is provided in the reference cited below.

Lim LS, Mitchell P, Seddon JM, Holz FG, Wong TY. 2012. Age-Related Macular Degeneration. *Lancet*, 379 (9827);1728-1738.

***Vibrio cholerae* — Domestic Cholera Transmission from Conch Imported from Haiti — Collier County**
Cholera cases identified by the Florida Department of Health following confirmation of the outbreak in Hispaniola in October 2010 have predominantly been associated with a recent history of travel. On January 21, 2011, the Collier County Health Department was notified by a local hospital that a member of their staff had tested positive for *Vibrio cholerae.* Interview identified no history of travel or known contact with a cholera case; however, two asymptomatic family members had recently returned from a trip to Haiti. On January 11, one of these travelers bought conch from a vendor in Haiti and transported leftover baked conch into Florida using a carry-on cooler with ice. On January 12, the patient consumed the baked conch after reheating in the microwave; onset of symptoms was three days later. Further testing by the Bureau of Public Health Laboratories and the Centers for Disease Control and Prevention confirmed that this case was positive for toxigenic *V. cholerae* O1, making this the first instance of domestic cholera transmission associated with the outbreak in Hispaniola. Isolated cases of cholera related to imported food have been associated with travelers to countries with epidemic cholera. If cholera is suspected in the absence of a history of travel, the collection of a food history should include questions specific for imported food items. The transport of perishable souvenir seafood from countries with epidemic cholera should be discouraged.

Newton A, Heiman K, Schmitz A, Török T, Apostolou A, Hanson H, *et al.* 2011. Cholera in United States Associated with Epidemic in Hispaniola. *Emerging Infectious Diseases,* 17(11); 2166-2168.

***Vibrio cholerae* O75 — Toxin-Producing *Vibrio cholerae* O75 Outbreak — Multistate, Escambia and Nassau Counties**
Background: Non-O1/non-O139 *Vibrio cholerae* strains have been associated with sporadic cases of gastroenteritis. On April 15, 2011, the Escambia County Health Department (ECHD) notified the Florida Department of Health Food and Waterborne Disease Program (FWDP) of a possible case of *Vibrio cholerae* non-O1/non-O139 in a man who developed cramps, fever, watery diarrhea, and nausea on April 12. The case had consumed raw oysters at a restaurant on April 6. On April 18, the Nassau County Health Department (NCHD) 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.

Methods: ECHD began investigating their case and forwarded the *V. cholerae* specimen to the Bureau of Public Health Laboratories for typing and toxin testing. NCHD collected stool specimens from ill people for analysis and began investigating the source of the oysters. The FWDP began working with the Florida

Department of Agriculture and Consumer Services (DOACS), the agency with regulatory oversight of the oyster industry, and posted EpiCom and Epi-X messages to find additional cases.
Results: Laboratory results yielded *V. cholerae* 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; six of the 10 cases were men. Cases reported symptoms of nausea (7), vomiting (4), diarrhea (9), chills (8), cramps (1), and fever (1). None required hospitalization. The oysters had been harvested in the same area, Apalachicola Bay 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 laboratory in Dauphin Island, Louisiana.

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

Parasitic Diseases

***Cyclospora cayetanensis* — Confirmed *Cyclospora* Outbreak Linked to a Restaurant — Collier County**
Background: On July 29, 2011, the Collier County Health Department (CCHD) and the Florida Department of Health Food and Waterborne Disease Program (FWDP) began investigating three cases of cyclosporiasis that were linked to a restaurant.

Methods: CCHD interviewed other patrons of the restaurant and posted an EpiCom message alerting other counties of the potential exposure. The FWDP conducted a joint environmental assessment of the restaurant with the Florida Department of Business and Professional Regulation.

Results: Thirteen people were interviewed and 12 met the case definition. Cases ranged from 18 to 64 years old; the median age was 51 years, and 66.7% of the cases were women. Duration of symptoms ranged from 5 to 29 days with a median of 15 days. Three cases sought medical care; none were hospitalized. From the patient interviews and the joint environmental assessment, cilantro and onions were identified as common ingredients used in all food dishes prepared at the restaurant. Traceback of the cilantro and onions was not completed because the restaurant did not have the necessary invoices and receipts.

Conclusion: This outbreak of cyclosporiasis was associated with dining at a restaurant in Collier County and was likely caused by contaminated onions or cilantro.

Editorial Note: Cyclosporiasis is an intestinal illness caused by the microscopic parasite Cyclospora cayetanensis. People can become infected with Cyclospora by consuming food or water contaminated with the human parasite. Symptoms of cyclosporiasis begin an average of seven days after ingestion of the parasite. Symptoms may include watery diarrhea, nausea, loss of appetite, abdominal pain, fatigue, and weight loss. Previous outbreaks of cyclosporiasis have been associated with various types of imported fresh produce. Future recommendations are to have restaurants store receipts and invoices for products that they receive in a systematic way to aid in the potential traceback of a contaminated product. The parasite is killed by cooking. Human-to-human transmission is unlikely since Cyclospora *parasites shed in human stool require a few days to weeks in the environment before becoming infectious.*

***Naegleria fowleri* — Primary Amebic Meningoencephalitis — Brevard County**
Background: On Wednesday, August 10, 2011, the Brevard County Health Department (BCHD) epidemiology department was notified of a possible case of bacterial meningitis in a 16-year-old woman.

Methods: BCHD conducted an epidemiologic investigation of the case and the hospital collected cerebrospinal fluid (CSF) from the woman for laboratory testing.

Results: Motile amebas were found in CSF samples taken from the patient on August 10. On August 15, the Centers for Disease Control and Prevention confirmed the presence of *Naegleria fowleri* by culture and polymerase chain reaction. The woman expired on August 13. The investigation identified that the woman swam (including diving) in a body of freshwater on August 3 and 4 with four other people. The body of freshwater is adjacent to man-made canals on a tributary of a river that is very slow moving. The specific area of exposure was slow moving and stagnant in some places and the water temperature on August 12 was 88°F and air temperature was 99°F.

Conclusion: On August 12, 2011, a health advisory was issued by the BCHD warning of the presence of amebas in bodies of freshwater and the precautions to take when swimming in such waters. This release was also posted on the BCHD website.

Editorial Note: Primary amebic meningoencephalitis (PAM) is an infection caused by N. fowleri*. Initial signs and symptoms of PAM start 1 to 14 days after exposure. Symptoms include headache, fever, nausea, vomiting, and stiff neck.* N. fowleri *is found worldwide. Most commonly, the ameba is found in warm bodies of freshwater, such as lakes and rivers; geothermal water, such as hot springs; warm water discharge from industrial plants; poorly maintained and minimally-chlorinated swimming pools; and soil. Although* Naegleria *is commonly found in the environment, infections rarely occur. PAM has only been reportable in Florida since 2008, however 33 infections were documented from 1962 to 2011.*

***Sarcoptes scabiei* — Scabies in a Skilled Nursing Facility — Seminole County**

Background: An outbreak investigation of scabies in a skilled nursing facility (SNF) in Seminole County was conducted by the Seminole County Health Department (SCHD) epidemiology staff. A case was defined as any resident or staff with a clinical diagnosis of scabies.

Methods: The facility enhanced its rash illness surveillance of residents and staff. SCHD reviewed control measures with their Director of Nursing, including guidelines from the Centers for Disease Control and Prevention.

Results: Twelve cases were identified, which included one resident (1.0% of facility residents) and 11 staff members (6.2% of facility staff). The onset date for the resident was August 8; onset dates for staff ranged from August 12 to August 15. The resident case, a 100-year-old woman, had a microscopically-confirmed infection. The patient had dementia and was not ambulatory. Scabies-like illness among staff was clinically diagnosed. The affected resident lived on the second floor of the facility, while the majority of the staff cases worked only on the first floor. Prophylactic treatment was recommended and implemented for all residents and staff in the facility.

Conclusion: Prompt recognition and treatment of scabies in SNF residents and staff is essential to control transmission. No additional cases were identified.

Editorial Note: Scabies is a contagious parasitic dermatosis caused by an infestation of the skin by the human scabies mite, Sarcoptes scabiei var. hominis*. Individual cases of scabies are not reportable to the Florida Department of Health, although outbreaks of this or any other disease are reportable. Symptoms of scabies develop two to six weeks after initial infestation, and one to three days following re-infestation. Classic scabies manifests as generalized intensive pruritus (i.e. severe itching) with nocturnal predominance. Lesions appear as burrows or tiny raised and crooked grayish-white or skin-colored lines on the skin surface, often on the hands, wrists, elbows, genitalia, axillae, umbilicus, buttocks, and nipples. During suspected*

scabies outbreaks, it is beneficial to get microscopic confirmation of the diagnosis in a few affected people, including staff and residents. It is not uncommon for staff to feel itchy after scabies has been detected among SNF residents. Simultaneous prophylactic treatment of exposed people is one of the most effective interventions in response to scabies cases in institutional settings. Unfortunately, facilities may be hesitant to provide prophylactic treatment due to the expense. It is not uncommon for outbreaks to persist for several weeks when prophylaxis is incomplete.

Viral Diseases

Adenovirus — Viral Conjunctivitis Linked to an Ophthalmic Care Center — Osceola County
Background: On January 7, 2011, the Osceola County Health Department (OsCHD) was contacted by a person diagnosed with viral conjunctivitis by a local ophthalmologist who suspected that the source of the infection was a local optical facility.

Methods: OsCHD queried local syndromic surveillance data and compiled a list of additional people presenting to hospital emergency departments with complaints related to eye infections. Hospitals were then contacted for additional information on these patients and the OsCHD contacted each patient to gather additional information. An inspection of the optical facility was conducted and infection control measures were assessed. Two specimens were obtained from two patients and sent to the Bureau of Public Health Laboratories.

Results: Six additional patients reported associations with the same optical facility before their eye infections developed for a total of seven identified cases. Onset dates ranged from December 17, 2010 to January 24, 2011. The optical facility had two locations; four patients were seen at one location and three patients were seen at the other. The majority of cases reported symptoms primarily affecting the left eye following eye examinations at the optical facility. Five (71.4%) patients were seen for an eyeglasses examination and the remaining two (28.6%) had a contact lens exam. Duration of symptoms was between 14 and 33 days. No eye infections were reported among facility employees. Both patient specimens collected tested positive for adenovirus by polymerase chain reaction.

Conclusion: Antibiotics or antibacterial eye drops were given to most patients to help alleviate symptoms. Ongoing surveillance for additional cases was recommended and the 2009 American Academy of Ophthalmology Infection Prevention in Eye Care Services and Operating Areas guidelines were provided to the facility. The exposure source remains unknown.

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Gonzalez S, Rosenfeld PJ, Stewart MW, Brown J, Murphy SP. 2012. Avastin Doesn't Blind People, People Blind People. *American Journal of Ophthalmology*, 153(2);196-203.

Dengue Virus — Locally-Acquired Dengue Cases — Hillsborough, Martin, Miami-Dade, and Palm Beach Counties
Background: From 2009 to 2010, an outbreak of locally-acquired dengue fever with 93 cases occurred in Key West, Florida, after more than 60 years with no local dengue transmission detected in the state. Subsequent

enhanced surveillance identified at least six additional dengue virus introductions in 2011. Epidemiologic, ecologic, and laboratory findings from these introductions and associated prevention efforts are discussed.

Methods: Data were collected by the Florida Department of Health (FDOH) Vectorborne Disease Surveillance Program from county health departments and local mosquito control programs. Laboratory testing was performed at FDOH Bureau of Public Health Laboratories.

Results: Introductions occurred in four of Florida's 67 counties: Hillsborough (1), Martin (1), Miami-Dade (3 or 4), and Palm Beach (2). Two cases in Miami-Dade County may have been linked or individual introductions. In all other instances, virus typing and epidemiological data confirmed that cases were isolated. In two instances, autochthonous infections followed international travel by another household member. Imported dengue infections in Florida are commonly identified in Hillsborough, Miami-Dade, and Palm Beach counties, but not in Martin County. The outbreak area in Miami-Dade County included a popular domestic and international tourist destination. Likely sites of exposure include the residence (4 or 5), outdoor occupation (1), and socializing outside a popular restaurant (1). *Aedes albopictus* was believed to be the primary vector in Martin County and for at least one of the Palm Beach County introductions. *Aedes aegypti* appeared to be the most likely vector in the other introductions.

Conclusions: Prevention efforts targeting travelers and international ports of exit and entry are needed. Emphasis should also be placed on using prevention practices when travelers become sick after returning home. Outreach is particularly important in counties with high numbers of imported dengue infections or that have robust populations of *A. aegypti*.

Editorial Note: Local dengue transmission with limited sustained transmission has likely gone undetected in the past. Factors required for sustained transmission as occurred in Monroe County are complex and could occur in future Florida introductions.

Hepatitis B Virus — Perinatal Hepatitis B Case — Hillsborough County

On December 10, 2010, the Hillsborough County Health Department (HCHD) Epidemiology Program received a positive hepatitis B surface antigen (HBsAg) electronic laboratory result for a 1-year-old girl. The infant, born September 2009, was already enrolled in the Perinatal Hepatitis B Prevention Program due to the mother's positive HBsAg status documented during her pregnancy. The mother was born in Thailand, where the prevalence of hepatitis is very high. The infant received hepatitis B immune globulin prophylaxis and the first and second dose of hepatitis B vaccine on schedule. The infant received the third dose of vaccine at nine months of age instead of the recommended six months of age for at-risk infants, potentially leaving the child susceptible to hepatitis B infection. At fourteen months of age, the pediatrician tested only for hepatitis B surface antibody, which was detected. HCHD recommended that the pediatrician also test for hepatitis B virus (HBV) viral load and HBsAg. Upon report of the positive HBsAg, the mother was contacted and advised to retest and follow-up with a specialist. In January 2011, the infant was seen by a pediatric infectious disease specialist and again tested positive for HBsAg and hepatitis B viral DNA. At this time, the mother refused all follow-up care, stating that everyone in her family had hepatitis B and they had remained healthy.

Editorial Note: As a result of routine HBV screening of pregnant women and the availability of effective immunoprophylaxis, perinatal transmission of HBV is rare in Florida. The last perinatal hepatitis B case was reported in 2008. This case illustrates the importance of following recommended hepatitis B vaccination and testing guidelines for at-risk infants. hepatitis B vaccine and hepatitis B immunoglobulin administered within 12 to 24 hours after birth, followed by completion of the three dose vaccine series at 0, 1 to 2, and 6 months, has been shown to be 89-98% effective in preventing acute and chronic HBV infection in infants born to women who are positive for HBsAg. Hepatitis B is endemic in China and other parts of Asia as well as in the Amazon and southern parts of eastern and central Europe. Sensitivity to cultural attitudes could increase the likelihood that people infected with HBV receive appropriate follow-up and medical management.

Measles Virus — Confirmed Measles Case Acquired in India — Alachua County
Background: On Friday April 8, 2011, the Alachua County Health Department (ACHD) received notification of a mother presenting at an ACHD clinic and reporting measles in her 12-year-old son.

Methods: The child received a medical evaluation. Blood, urine, and throat specimens were collected and sent to the Bureau of Public Health Laboratories. ACHD contacted the mother for additional information and she was advised to isolate her son until further information was received. A notification was distributed to local healthcare providers as well as school and religious sector contacts. Surveillance for rash illness was enhanced.

Results: Three measles cases were identified. The 12-year-old boy visited India along with his mother, 16-year-old sister, and a friend (14-year-old girl) from November 10, 2010 to March 31, 2011. The 16-year-old sister was diagnosed with measles while in India; her rash onset was on March 23. The 12-year-old boy's rash onset was April 4. Serologic testing for the 12-year-old boy was positive for measles IgM on April 11 and measles-virus-specific nucleic acid was detected by polymerase chain reaction on April 12. Following laboratory confirmation, it was reported that the 14-year-old friend also had illness compatible with measles; her rash onset was on April 5. All three cases were unvaccinated due to religious beliefs but all parents reported previous vaccinations.

Conclusions: No additional cases among close contacts associated with the trip to India were identified.

Measles Virus — Measles Transmission at an International Trade Show — Multistate, Orange County
Background: On March 24, 2011, Minnesota reported a laboratory-confirmed case of measles (rash onset March 21) in a 34-year-old who was likely exposed during a March 1 to March 10 business trip to Orlando, Florida. From March 1 to March 8, he set up and worked at a booth at an international aviation trade show that featured more than 600 exhibitors and had more than 17,000 attendees.

Methods: To identify additional cases associated with the trade show, the Orange County Health Department (OCHD) posted an alert on EpiCom, notified community healthcare providers, and worked with trade show organizers. OCHD and state partners enhanced emergency department syndromic surveillance through the Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE) for rash illness, notified national public health partners, and developed a questionnaire to collect detailed information about Orlando activities during the exposure period.

Results: Five cases of laboratory-confirmed measles were reported among attendees; four had a professional affiliation with a common exhibitor and the fifth was an infant of an unaffected adult. Cases resided in Michigan (1), Minnesota (1), and Texas (3). Adults were 28, 34, 37, and 49 years old; the infant was 11 months old. Two adult cases reported receiving one dose of measles-containing vaccine as children, two adults were unvaccinated, and vaccination status of the infant was unknown. Fever onset ranged from March 12 to March 19 and rash onset ranged from March 18 to March 23. The infected people attended the trade show between March 1 and March 8, but there was no single date or event when all were in attendance. Infected people stayed at different hotels and no common activities except for the trade show were identified among cases. At least 20 other people from the U.S., France, and Germany were affiliated with the same exhibitor; none were reported ill. Laboratory testing at the Centers for Disease Control and Prevention of one case isolate identified measles virus genotype D4, a strain in wide circulation in Europe. A sixth case (rash onset April 1) was exposed in Texas when the spouse returned from the trade show. No additional measles cases were identified among the 1,946 registered attendees from Florida or in the community at large.

Conclusions: These five cases acquired measles at the trade show over several days, most likely in the vicinity of their booth, and subsequently became ill in their home states. The source of the outbreak was not

determined, but the D4 genotype suggests importation from Europe, possibly from a visitor or exhibitor at the trade show. Measles outbreaks were widespread in Europe in 2011, with the greatest number of cases occurring among unvaccinated children and young adults. Lack of transmission to Florida attendees likely reflects higher measles vaccination rates in the U.S.

Editorial Note: This outbreak highlights the ongoing and underappreciated burden of measles importation into Florida. None of the five cases exposed at the trade show are included as measles cases in the 2011 Florida Morbidity Statistics Report because their official residences are outside of the state. Nevertheless, OCHD led, in cooperation with state and federal officials, a complex, time consuming and costly response effort to limit the possible spread of measles in Orange County and statewide. Endemic transmission of measles ended in the U.S. in the late 1990s, but as a major tourist destination, Florida will always remain a destination for measles until measles is eradicated worldwide. Healthcare providers should suspect measles in people with febrile rash illness and clinically compatible signs and symptoms who have traveled abroad or who have had contact with travelers. Providers should isolate suspected measles cases immediately, report to their local county health department, and obtain appropriate specimens for measles testing.

Centers for Disease Control and Prevention. Measles — United States, 2011. 2012. *Morbidity and Mortality Weekly Report*, 61(15);253-257.

Norovirus — Foodborne Norovirus Outbreak at a Family Restaurant March 2011 — Hernando County
Background: On March 11, 2011, the Florida Department of Business and Professional Regulation (DBPR) and the Hernando County Health Department (HeCHD) received numerous calls from people who had dined at the same restaurant in Hernando County during a six-day period from March 6 to March 11, 2011. Initial reports indicated the patrons had developed gastrointestinal symptoms approximately 30 hours after dining at the restaurant.

Methods: HeCHD and the Florida Department of Health Food and Waterborne Disease Program (FWDP) developed a questionnaire to assess food exposure and symptoms. A case was defined as anyone who visited and consumed food items served at the restaurant between March 6 and March 11 and reported diarrhea or vomiting and an additional gastrointestinal symptom. Four stool specimens were collected and analyzed by the Bureau of Public Health Laboratories. A joint environmental assessment of the restaurant was conducted by DBPR and FWDP.

Results: Seventy-eight ill people met the case definition. Onset of symptoms ranged from seven to 48 hours after the consumed meal with a mean of 27.5 hours. Predominate symptoms included vomiting (83%), nausea (77%), diarrhea (76%), abdominal pains (65%), chills (60%) and fever (30%). Four stool specimens were positive for norovirus genotype II. A case-control study identified iceberg lettuce as statistically significant with an odds ratio of 3.31 and a 95% confidence interval of 1.25 to 11.91. The environmental assessment identified a norovirus-positive food handler with vomiting on March 6. The implicated food handler's primary responsibility was to prepare food items for the salad bar.

Conclusion: This was a classic foodborne norovirus outbreak associated with fresh produce handled by an ill food worker.

Editorial Note: Although transmission of norovirus can be limited by good hand hygiene, people who become sick with vomiting or diarrhea should refrain from preparing food for others until two to three days after symptoms have resolved. Food handlers should inform managers if they have symptoms of norovirus and adequate sick leave should be permitted for the food handler to ensure they do not spread the illness to others.

Norovirus — Norovirus Outbreak Associated With Swimming in a Recreational Spring-Fed Lake — Glades County

Background: On Monday, April 25, 2011, the Glades County Health Department (GCHD) received calls from several groups of concerned citizens because some people from their groups had become ill with symptoms of diarrhea and vomiting after camping in a local campground over the Easter holiday weekend. Preliminary interviews with these different groups did not identify any food items in common or other interaction between groups.

Methods: GCHD and the Florida Department of Health Food and Waterborne Disease Program developed a questionnaire to assess water exposure and symptoms. A case was defined as a person who visited the campground between April 21 and April 24, 2011 and became ill with vomiting or diarrhea (defined as three or more loose stools within 24 hours) within 72 hours. Two stool specimens were collected and analyzed by the Bureau of Public Health Laboratories. GCHD interviewed 78 people as part of a case-control study and an environmental assessment of the campground was conducted. Water samples from the swimming area were collected and the swim area was temporarily closed.

Results: Twenty-nine (37.2%) people met the case definition. Seventeen (58.6%) of the cases were men, ages ranged from 8 months to 43 years old with a median of 12 years. The incubation period ranged from 24 to 72 hours. Two people reported having gastrointestinal symptoms in the two weeks prior to visiting the campground. An incident of someone vomiting in the water was reported and one person reported having diarrhea prior to swimming. None of the cases were hospitalized and three (10.3%) sought medical care. The case-control study identified swimming as a statistically significant risk factor with an odds ratio of 20.7, a 95% confidence interval of 2.60 to 165.49, and p-value of 0.0001. One stool specimen was positive for norovirus genogroup II. Swimming area water samples were satisfactory for total enterococci levels and the swim area was reopened.

Conclusion: This outbreak was most likely caused by norovirus associated with swimming in a lake at a campground. Reports of people swimming while ill suggest that they may have contaminated the swimming area.

Editorial Note: Norovirus is a highly contagious pathogen with a very low infectious dose, estimated to be between 10 and 100 viral particles. Transmitted primarily through the fecal-oral route, norovirus particles may be spread through direct contact or through consuming fecally-contaminated food or water. People should refrain from swimming for at least two weeks after the cessation of a diarrheal illness, avoid getting water in their mouths while swimming, and practice good hygiene to reduce the possibility of developing or transmitting a recreational water illness.

Varicella-Zoster Virus — Varicella in a Daycare Infant Room — Seminole County

Background: On February 24, 2011, a local daycare director reported a clinically diagnosed case of varicella in an 8-month-old boy to the Seminole County Health Department (SCHD). By March 9, six additional cases were reported.

Methods: The SCHD initiated an investigation to gather additional information. Ill cases were excluded from the daycare, and parents were informed about the cases and were provided educational and preventative information. The SCHD conducted active surveillance for an additional two weeks following the last reported case.

Results: A total of eight cases were identified. Seven cases were among infant attendees and one case was in an adult employee. Disease onset for the initial case was February 13 with subsequent case onsets ranging from February 27 to March 6. All cases were clinically diagnosed without any laboratory confirmation.

The outbreak occurred in one of two infant rooms at the daycare facility. The attack rate was 64% among infants in this room.

Conclusion: All attendees in the affected infant room were less than 12 months old, too young to receive the varicella vaccine; however, they did not intermingle with the general student body or aftercare program. The vaccination status of the adult case is unknown. All other employees assigned to the infant room were vaccinated.

Editorial Note: Rapid case identification and public health action are important to prevent varicella infection of susceptible people. Although varicella vaccination coverage has increased and disease incidence has declined, outbreaks continue to occur. Elementary schools are now the most common sites for varicella outbreaks, although they are also commonly identified in daycare settings and in middle and high schools.

West Nile Virus — A Review of the West Nile Virus Disease Outbreak — Duval County
Background: In 2011, Duval County had a resurgence of West Nile virus (WNV) activity and reported the highest number of WNV illness cases in Florida. Twenty locally-acquired WNV infections with onsets ranging from June 23 to October 4, 2011 were identified and three additional asymptomatic blood donors were identified via routine screening.

Methods: Data were collected on cases reported to the Duval County Health Department (DCHD) and included demographics, laboratory information, medical history, and risk factors for infection. Cases were classified using the Florida surveillance case definition for WNV illness. Rates were calculated overall and stratified by age, ZIP code, smoking status, and homelessness using Florida census data for population estimates, Behavioral Risk Factor Surveillance System data for smoking rates, and the University of North Florida Homeless Report.

Results: Sixteen (80.0%) cases had neuroinvasive illness and four (20.0%) had WNV fever. Two neuroinvasive illnesses were fatal. Ages ranged from 38 to 85 years old with a median age of 55 years. Reported risk factors for exposure included smoking (55.0%), spending time outdoors (75.0%), and being homeless (20.0%). Eleven cases (55.0%) had pre-existing medical conditions. Twelve cases (60.0%) and three asymptomatic blood donors resided within two ZIP codes; the rate in these two ZIP codes (17.9 cases per 100,000 population) was higher than for the remainder of Duval County (1.3 cases per 100,000 population). The rate for adult smokers in this area (6.8 cases per 100,000 population) was higher than that for adult non-smokers in Duval County (1.3 cases per 100,000 population). The rate in the homeless population in Duval County was 97.4 cases per 100,000 population.

Conclusion: WNV disease outbreaks can occur in intense focal clusters as in this event. The risk factors associated with this outbreak mirror those seen nationally. Sentinel chicken surveillance did not predict the outbreak. Flock locations were adjusted to improve future surveillance efforts.

Editorial Note: It is important to engage healthcare providers, mosquito control, advocacy groups for vulnerable populations such as the homeless, and the public in the response to arboviral disease outbreaks. Immediately after the 2011 WNV disease outbreak began, the Duval County Health Department, in collaboration with the City of Jacksonville's Mosquito Control Division, focused their control efforts in targeted ZIP codes. The response included enhanced mosquito light trap and sentinel chicken surveillance, property inspections, source reduction, biological and chemical control, and community education. Aggressive outreach to healthcare providers was conducted via advisories to the medical community and participation in medical rounds to ensure reporting of arbovirus cases. The homeless coalition was also engaged to help provide insect repellants for the homeless population.

Non-Infectious Agents

Carbon Monoxide — Vehicle-Related Carbon Monoxide Poisoning Cluster — Hillsborough County
Background: On June 13, 2011, eight adults had a party in an apartment residence and left their car running in the garage overnight. When they woke up at noon the following day, they did not feel well. They called 911 and helped each other out of the apartment.

Methods: The Hillsborough County Health Department conducted an investigation which included hospital record reviews and patient interviews. All cases were classified based on the Florida surveillance case definition for carbon monoxide (CO) poisoning. Environmental testing of the apartment was performed by a hazmat team. Environmental levels of CO were assessed using an MSA Altair device.

Results: The eight affected people were men ranging from 22 to 52 years old. Following the exposure, they experienced headache, fatigue, dizziness, confusion, vomiting, and weakness. Seven of eight cases visited the hospital following the incident. All recovered from their illness. Environmental testing detected CO levels of 60 parts per million (ppm) in the apartment. Based on U.S. Environmental Protection Agency (EPA) estimates, average CO levels in homes without gas stoves vary from 0.5 to 5 ppm. Levels near properly adjusted gas stoves are often 5 to 15 ppm and those near poorly adjusted stoves may be 30 ppm or higher. All eight people at the party were classified as confirmed cases of CO poisoning.

Conclusion: Eight cases of CO poisoning were identified due to exposure to car exhaust. All cases were Asian and seven only communicated in Mandarin, making communication and follow-up challenging.

Editorial Note: CO is an invisible, odorless, tasteless gas, and is highly poisonous. Vehicle-related CO poisonings and deaths were observed throughout 2011. Reported cases increase slightly in summer months, highlighting the importance of prevention messaging at the beginning of the summer. Data collected from Florida cases indicate that people rely on their automobile air conditioning and stay inside the car or run the car inside the garage during hot weather.

Ciguatoxin — Ciguatera Outbreak Associated with Commercially Purchased Amberjack — St. Lucie County
On August 25, 2011, the St. Lucie County Health Department was notified of a possible ciguatera outbreak involving three people. The cases became ill after consuming smoked amberjack on August 14. Initial symptoms included vomiting, diarrhea, abdominal pain, and nausea within 5.5 to 10 hours of consumption and were soon followed by temperature reversal, pain in teeth and body joints, breathing difficulties, headache, rash, and itching. Two cases visited healthcare providers (one primary care and one emergency department physician), but neither was able to diagnose their illnesses. The third case visited his dentist as he thought he had a dental problem. After interviewing the cases, it was determined that these people had ciguatera fish poisoning based on their symptoms and type of fish consumed. The smoked amberjack was purchased at a local seafood market. The Florida Department of Agriculture and Consumer Services was notified and a joint investigation was conducted. A sample of the amberjack obtained from one of the cases tested positive for ciguatoxin at the U.S. Food and Drug Administration Gulf Coast Seafood Laboratory in Dauphin Island, Alabama. The environmental health assessment of the seafood market established that the amberjack was caught by a commercial fisherman in approved Florida Atlantic waters. The amberjack was filleted and processed by the market and some of it was sent to a local meat smoking facility where it was smoked and returned to the seafood market.

Editorial Note: In 2011, 48 ciguatera fish poisoning cases were reported to the Bureau of Epidemiology. Of the 20 cases who acquired their illness outside the U.S., 11 (55.0%) consumed fish from the Bahamas, two (10.0%) reported eating fish from Cuba and one (5.0%) ate fish from St. Thomas, USVI. The source of the

fish consumed by the remaining seven cases was not known. Starting in 2006, an overall increase in the incidence of ciguatera cases was observed with the incidence peaking in 2008, when 53 cases were reported. Although this increase may be attributable to an increase in reporting, it is possible that a true increase in ciguatera poisonings has occurred in recent years.

Ciguatoxin — Ciguatera Outbreak in a Charter Fishing Boat Group who Traveled to Great Harbour Cay Bahamas — Multistate, Miami-Dade, and Monroe Counties

A ciguatera outbreak among a group of Florida travelers who visited Great Harbour Cay in the Central Bahamas in July 2011 was investigated by the Monroe and Miami-Dade county health departments. The group commissioned a private charter boat captain to transport them to the Bahamas from the Florida Keys. On July 12, while in the Bahamas, they caught an 86-pound black grouper and froze the fish. Seven people from Monroe County (2), Miami-Dade (2), South Carolina (2), and the Bahamas (1) consumed the grouper upon returning home. All reportedly became ill. The two residents from Monroe County, who were reached for an interview, consumed their portion of the grouper on August 1. Symptoms began 4.5 to 5 hours later and included nausea/vomiting; diarrhea; abdominal pain; loss of appetite; metallic taste; itching or rash; joint or muscle pain or weakness; dizziness or vertigo; tingling, numbness, or pain in hands, feet, gums, or mouth; temperature reversal; attention or concentration problems; anxiety; insomnia; lack of sex drive; excessive salivation; headaches; and irritability. Fish samples tested positive for Caribbean ciguatoxin (C-CTX-1 and C-CTX-2) at the U.S. Food and Drug Administration Gulf Coast Seafood Laboratory in Dauphin Island, Alabama. Snapper caught during the same fishing trip tested negative for ciguatoxin.

Pesticides — Aerial Pesticide Application and Drift Impacting an Elementary School — Palm Beach County

Background: As students were arriving for classes at an elementary school in Palm Beach County on March 31, 2011, an agricultural applicator airplane was spraying a nearby corn field with pesticides (included a pyrethroid insecticide, a bisdithiocarbamate fungicide, and fertilizer). Students and school staff began to notice an odor and complained of eye and skin irritation.

Methods: A survey was conducted using a standard questionnaire to identify symptomatic people and collect additional information. The case definition for this incident was based on the Florida surveillance case definition for pesticide exposure. Environmental sampling and investigation details surrounding the pesticide application were obtained from a Florida Department of Agriculture and Consumer Services investigation.

Results: Interviews indicated that 22 of 813 (2.7%) students and 45 of 85 (52.9%) staff present developed symptoms. Common symptoms were skin itching, burning eyes, and vomiting. Students were 5 to 14 years old and staff ranged from 25 to 65 years old. Of the 67 symptomatic people, 57 (85.0%) were classified as probable cases, of which 27 (47.4%) had low severity of illness and 30 (52.6%) had moderate severity of illness. People with pre-existing conditions were more likely to experience moderate rather than low severity of illness. Similarly, people with moderate versus low severity of illness were more likely to receive medical care. Environmental sampling could not confirm that pesticide misuse had occurred.

Conclusion: Investigation findings indicate that the health effects following the drift incident at the elementary school are consistent with exposure to the pesticides used.

Editorial Note: Past studies indicate that aerial pesticide applications are the most common application method where drift events occur. This event highlights the importance of identifying and preventing contributing factors for drift incidents through investigation, regulation, and education related to aerial pesticide spraying.

Radioactive Strontium — Investigation of Internal Contamination with Radioactive Strontium Following a Cardiac PET Scan — Multistate, Orange County

Background: In the spring of 2011, three people (two from Florida) were identified by U.S. Customs and Border Protection to have internally elevated levels of radioactive strontium (Sr-82/Sr-85). Interviews found that all three people had received a cardiac positron emission tomography (PET) scan using a specific type of generator in the preceding months. To assess the extent of internal contamination with radioactive strontium, the Florida Department of Health (including the Orange County Health Department), along with the U.S. Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention, carried out a study in Florida as part of a larger nationwide study (including Alabama, Pennsylvania, and Tennessee).

Methods: Patients that had a cardiac PET scan between February 17 and July 26, 2011 were randomly selected for recruitment among participating facilities that used the same type of generator in their practice. A clinic was held in Orange County from October 3 to October 6, 2011. Participants were interviewed; onsite radiation, height, and weight measurements were recorded; and a urine sample was collected. Whole body count (WBC) was performed by Oak Ridge National Laboratory in Tennessee on nine patients with the highest strontium above background. Background was established by doing 10-minute counts at the fixed geometry on staff that had not had any medical radioisotope imaging.

Results: Of the 119 patients that participated, five (4.2%) had strontium levels more than twice background levels. Results for all nine participants with a WBC found no increased risk of adverse health effects associated with the amount of strontium received during their cardiac PET scan. Of 101 urine samples available for analysis, strontium levels were either below the minimum detectable activity of 2.5 Becquerel/liter or if they were measurable, levels detected were very low.

Conclusion: The findings of this investigation indicate that none of the study participants received breakthrough of strontium at levels that would lead to adverse health effects.

Editorial Note: Cardiac PET myocardial perfusion imaging is used to diagnose coronary artery disease and myocardial viability. Before sales of new generator units were stopped and existing units were recalled by the manufacturer, this generator was used in clinic settings across the U.S. During this procedure, rubidium-82 (Rb-82) is administered intravenously. The half-life is short, 76 seconds; Rb-82 breaks down quickly. The parent isotope, Sr-82, has a much longer half-life of 26 days. "Breakthrough" of small amounts of Sr-82/Sr-85 is allowable under specific trace level limitations. Exposure to a higher dose of radiation can cause harm. These products are regulated by the FDA.

Undetermined — Investigation of a Cluster of Illnesses Initially Attributed to a Chemical Exposure — Seminole County

Background: On August 17, 2011, the Seminole County Health Department (SCHD) was notified that the Seminole County Fire and Rescue (SCFR) had evacuated an office building in response to a sudden onset of illnesses. Symptoms among five employees included difficulty breathing, dizziness, and burning of the eyes and throat, possibly attributable to a chemical exposure. SCFR assessed eight additional ill employees on site, but found no likely agents during monitoring.

Methods: SCHD conducted an outbreak investigation to identify a possible common exposure source among affected employees. A case was defined as any illness in a worker who presented to either the company nurse or SCFR at the time of the incident.

Results: A total of 13 people were identified that met the case definition. Six cases, including the initial five symptomatic employees, reported smelling a substance in the air that might have triggered their symptoms; however, descriptions of the odor varied widely. No evidence of another possible common exposure was identified.

Conclusion: The lack of identified exposure source, the number of employees becoming ill after evacuation, and the large number of people working in close proximity to each other suggest the possibility that mass psychogenic illness may have been a factor among many of the cases involved in this incident.

Editorial Note: Mass psychogenic illness, also referred to as epidemic hysteria or sociogenic illness, and transient situational disturbance has been discussed for hundreds of years and in many different settings. As described in this investigation, mass psychogenic illness can be difficult to differentiate from acute exposure to toxic substances. Mass psychogenic illness is best managed by providing a credible explanation for symptoms, separating symptomatic from non-symptomatic people, and minimizing unnecessary medical response.

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Section 8

Public Health Laboratory Status Report

The Florida Department of Health (DOH) Bureau of Public Health Laboratories (BPHL) is a network of four laboratories located in Jacksonville, Miami, Pensacola, and Tampa that provides population-based diagnostic, screening, monitoring, reference, emergency, and research laboratory services. BPHL collects epidemiologic and demographic information to support the core public health functions of DOH. Technical services, based upon evolving community requirements, include screening and confirmatory testing for biological and chemical threats, disease outbreak investigations, sexually transmitted diseases, tuberculosis, HIV, mosquito-borne viruses, animal rabies, and parasitology. Accurate and timely laboratory data are critical to support informed public health decisions. BPHL also provides training for healthcare providers and laboratory scientists; tests samples from potable, environmental, and recreational water sources, pollution spills, and suspect contaminated foods; and certifies environmental and water testing laboratories. BPHL provides laboratory screening of all newborns in Florida for 34 genetic disorders, which can lead to death or severe physical and mental disabilities without detection and early treatment.

BPHL supports all 67 county health departments, other DOH programs, physicians, hospitals, and numerous state and federal agencies by providing public health diagnostic, screening, and reference laboratory services.

History

The Florida Legislature established the State Board of Health in Jacksonville in 1889. In 1903, the Legislature established the State Public Health Laboratory, also located in Jacksonville. Seven years later, in 1910, the Tampa and the Pensacola Laboratories were established. Like the Jacksonville Laboratory, the Pensacola and Tampa Laboratories were responsible for providing diagnostic testing to the State Board of Health and to private physicians. With three laboratories up and running, BPHL was able to provide vital services to what were then the most populous areas of Florida. The Miami Laboratory was established in 1914 and the Tallahassee Laboratory in 1915. The Tallahassee Laboratory closed in 1917, was re-opened in 1921, and closed permanently in 1992. The Orlando Laboratory was opened in 1948 and operated until 1992. The West Palm Beach/Lantana Laboratory was opened in 1953 in the basement at the A.G. Holley State Tuberculosis Hospital; since 1982, it had its own separate building on the campus. The West Palm Beach/Lantana Laboratory ceased accepting specimens on September 5, 2011 and closed entirely on September 29, 2011.

Preparedness

Phil Lee, of the BPHL Jacksonville Laboratory, was invited by the Trust for America's Health (TFAH) and the Robert Wood Johnson Foundation to write an article concerning his experience in confirming the identification of *Bacillus anthracis* in the index patient during the anthrax incident of 2001 entitled *Anthrax Events in 2001-10 Years After: Firsthand Story from Phil Lee, BPHL-Jacksonville*. The article, published in September 2011 in *Remembering 9/11 and Anthrax: Public Health's Vital Role in National Defense* (http://healthyamericans.org/assets/files/TFAH911Anthrax10YrAnnvFINAL.pdf), also includes the activities of BPHL at that time and will be used to recognize the efforts of public health professionals and demonstrate the ongoing importance and the continued need to support public health preparedness. TFAH shared these stories with members of Congress, governors, other state and local officials, and members of the media during commemoration activities for the ten year anniversaries of the September 11 and anthrax tragedies. The lessons learned from the anthrax incident of 2001 and the subsequent injection of additional state and federal funding has greatly increased Florida's capability and capacity to respond to public health emergencies, whether due to terrorism, natural disasters, outbreaks, or emerging infectious diseases such as SARS and 2009 H1N1 pandemic influenza.

Public Health Laboratory Interoperability Project (PHLIP) Initiative

The Informatics Program Manager for the Association of Public Health Laboratories (APHL), speaking on behalf of APHL and their contractors working on the Public Health Laboratory Interoperability Project (PHLIP)

initiative, recognized the work that BPHL staff continues to provide at the national level. BPHL staff and their electronic messaging team from the DOH Division of Information Technology provided PHLIP and the Laboratory Technical Implementation Assistance for Public Health (LTIAPH) with important expertise and assistance contributing to the ongoing success of these projects.

Out of all of the project participants across the nation, Florida is the only state that has successfully participated in all project activities:

- PHLIP influenza result reporting to the Centers for Disease Control and Prevention (CDC), known as the Electronic Laboratory Surveillance Message (ELSM),
- H1N1 pandemic influenza electronic test order and result (ETOR) messaging with the Texas Public Health Laboratory to ensure surge capacity and mutual assistance,
- Electronic order and result messaging to CDC for the *Salmonella* phase 1 implementation (first to send an order message for validation), and
- HITECH Cooperative Agreement to help create Electronic Laboratory Reporting (ELR) HL7 v2.5.1 message to Public Health (LTIAPH).

In addition, the DOH electronic messaging team is one of only two teams in the country supporting a technical route-not-read hub to support national laboratory data sharing. In conclusion, the contributions, expertise, technical prowess, and collaborative approach of DOH teams have been invaluable to the ongoing success of APHL's informatics projects.

Tuberculosis

In August 2011, BPHL staff surveyed all licensed clinical laboratories in Florida to identify the laboratories that provide testing for *Mycobacterium tuberculosis* (TB) and determine the scope of testing that is performed. Florida laboratories that perform TB testing were sent a copy of the most recent CDC guidelines for Nucleic Acid Amplification Testing (NAAT) for TB. These laboratories were also sent information about the Hain Genotype® MTBDR*Plus* (Hain test), a NAAT for the detection of common mutations resulting in resistance to rifampin and/or isoniazid. BPHL performed this test on all clinical specimens that are both acid-fast bacilli (AFB) smear-positive and positive for TB with the *Mycobacterium tuberculosis* Direct (MTD) NAAT test. The communication of current guidelines, coupled with information obtained during the survey process and data on the number and types of TB samples submitted to the BPHL from Florida laboratories, were part of a systems approach to ensure that the appropriate tests are ordered on patients suspected of infection with TB. This will enable BPHL to continue to offer the highest quality testing services to the citizens of Florida, while avoiding costs associated with redundant or unnecessary testing. In 2010, the BPHL performed 23,074 TB cultures, 10,746 MTD tests, and 288 Hain tests. In 2011, BPHL performed 21,736 TB cultures, 9,618 MTD tests, and 255 Hain tests.

Since July 2009, the BPHL Jacksonville Laboratory has performed a molecular rapid test (Hain) automatically on all initial sputum AFB smear and nucleic acid amplification test positive specimens (i.e., highly infectious patients). By conventional methods, drug susceptibility results are available within four to eight weeks. The early detection of multidrug-resistant tuberculosis (MDR TB) cases allows for patients to be placed on appropriate anti-TB therapy much sooner and results in cost savings for the public health system in Florida. DOH has been recognized by the Association of State and Territorial Health Officials (ASTHO) with the 2012 Vision Award for the Florida Multidrug-Resistant (MDR) Tuberculosis (TB) Screening Program. ASTHO's annual award program recognizes best practices at state health departments that demonstrate creative and innovative approaches to addressing public health needs and challenges. Applications are judged and scored by experts and leaders in state public health through a peer-reviewed process, and are evaluated on background information, innovation, effectiveness, and potential for replication.

Sentinel Chicken Viral Surveillance
Throughout Florida, sentinel chickens are used to identify mosquito-transmitted encephalitis viruses currently circulating in the environment. For 26 years, BPHL has assayed weekly serum samples from sentinel chickens located throughout the state for antibody development to St. Louis encephalitis virus (SLEV), eastern equine encephalitis virus (EEEV), Highlands J virus (HJV), and, since 2000, West Nile virus (WNV). Over time, improvement of the assays and the information distribution system allow for more effective use of test results by our partners in environmental health, epidemiology, county health departments and mosquito control in order to better control the risk of disease from these viruses.

Florida uses sentinel chickens to help assess the risk of large-scale transmission of these viruses. Flocks of four to six chickens were maintained in 27 counties in 2011, either by the county mosquito control agency or the county health department. The number and distribution of these flocks is determined by the county; it is important to have enough flocks to provide good geographic coverage. Chickens are used because they do not become ill from these viruses and, if infected with the virus, are not able to infect another mosquito to perpetuate the transmission cycle. Since blood samples from the sentinel chickens are tested weekly, the detection of antibody in a chicken that had no antibody previously (seroconversion from antibody negative to antibody positive) indicates recent transmission of virus at the bird's location.

During 2011, 44,356 sera from 2,898 chickens were assayed; 234 seroconverted to WNV (8.1%), 65 to SLEV (2.2%), 44 to EEEV (1.5%), and 12 to Highlands J virus (HJV) (0.4%). In 2011, more sentinels seroconverted to SLEV antibody than in any year since WNV first appeared in Florida (2001), indicating the continued potential risk for SLEV activity and outbreaks.

Because of Florida's climate, there is mosquito activity and virus transmission year round. The historical county sentinel seroconversion data is used to determine when significant levels of seroconversion are detected. At that time, our partners take action, adjusting mosquito control activities to meet the situation and announcing the need for personal protection activities. Although we cannot prevent every case of infection, these activities do serve to reduce the risk of widespread outbreaks with large numbers of cases.

Chromium-6 (Hexavalent Chromium) in Drinking Water
In 1974, Congress passed the Safe Drinking Water Act. The maximum contaminant level goal (MCLG) in water for chromium (total) is 0.1 milligrams per liter (mg/L) or 100 parts per billion (ppb). The most common forms of chromium in the environment are trivalent (chromium-3), hexavalent (chromium-6), and the metal form, chromium-0. Chromium-3 occurs naturally in many vegetables, fruits, meats, grains, and yeast. Chromium-6 and 0 are generally produced by industrial processes. In a September 2010 draft human health assessment for chromium-6, the U.S. Environmental Protection Agency proposed to classify chromium-6 via ingestion as likely to be carcinogenic to humans. According to the BPHL Environmental Laboratory Certification Program, many laboratories in Florida and out of state are certified to test for chromium (total) in non-potable (168) and potable water (90), and are certified to test for chromium-6 in non-potable (88) and potable water (1). The BPHL Jacksonville Laboratory implemented the assay for chromium-6 in potable water in September 2011.

Severe Combined Immunodeficiency (SCID)
Severe Combined Immunodeficiency (SCID), also known as bubble boy disease, is a treatable illness in which an infant fails to develop a normal immune system. After successful treatment, infants with SCID can lead a normal life. The U.S. Department of Health and Human Services (HHS) includes SCID in the national core panel of disorders for newborn screening to protect infants with this disorder. In January 2011, the Florida Genetic Testing and Newborn Screening Advisory Council endorsed the addition of the screening test for SCID to the Florida Newborn Screening test panel, which was implemented October 1, 2012.

Genetic Screening Processor for Newborn Screening Laboratory

The transfer of testing from the old instrument (AutoDelfia) to Genetic Screening Processor (GSP) for congenital hypothyroidism (T4 - thyroxine and TSH - thyroid stimulating hormone), congenital adrenal hyperplasia (17OHP – 17-alpha hydroxyprogesterone) and cystic fibrosis (IRT – immunoreactive trypsinogen) was completed on September 1, 2011. GSP provides automation and ensures higher quality results. All reagents and consumables are barcoded and scanned by the instruments, which can significantly reduce potential errors.

2010 Newborn Screening Morbidity Data

The DOH Children's Medical Services Newborn Screening Follow-up Program, in collaboration with BPHL, manages the Newborn Screening (NBS) program for Florida. BPHL performs screening tests for the core disorders as recommended by the HHS Secretary's Advisory Committee on Heritable Disorders in Newborns and Children (SACHDNC). BPHL performs screening tests for additional disorders for a total of 35 diseases and conditions (including a hearing screen). Table 1 shows the newborn screening morbidity counts for 2009 and 2010, the most recent years for which data are available.

Table 1. Newborn Screening Morbidity Counts, Florida 2009 and 2010

Conditions	Morbidity Counts	
	2009	2010
Live births	221,632	214,934
Confirmed diagnosis by Florida referral centers		
Biotinidase deficiency	0	1
Partial	6	3
Congenital adrenal hyperplasia	5	11
Congenital hypothyroidism	68	68
Cystic fibrosis		
2 mutations	25	43
1 mutation	10	20
Ultra-high IRT/No mutations	1	1
Galactosemia (G/G)	1	4
Variant	NA	21
Sickle cell		
Sickle cell anemia (SS)	140	135
Hemoglobin SC disease (SC)	82	91
Sickle beta thalassemia (SA)	9	9
Disorders detected by tandem mass spectrometry	32	29
Hearing loss recognized through NBS follow-up program	249	238