



Epi Update



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Surveillance Report of Haiti-related Health Issues, Florida, 2010

Janet J. Hamilton, M.P.H., Aaron Kite-Powell, M.S., Leah Eisenstein, M.P.H., Richard S. Hopkins, M.D., M.S.P.H., and Tim Doyle, M.P.H.

On January 12, 2010 at 16:53 local time (GMT 21:53 hrs.), an earthquake measuring 7.0 on the Richter scale, followed by multiple aftershocks, struck near the Haitian capital of Port-au-Prince and created enormous devastation. The immediate local impact of the earthquake included extensive loss of life, injury, and disruption of medical and other essential services. The U.S. Government continues to respond to the consequences of the earthquake that impacted Haiti. Florida, as the U.S. state located closest to Haiti, became an initial focal point for assisting the federal repatriation and humanitarian parolee efforts. Florida supported shipments of personnel and relief supplies into Haiti, and served as the point of entry for repatriated U.S. citizens and those evacuated from Haiti for medical care. Due to the anticipated large influx of persons into Florida from Haiti, the Florida Department of Health (FDOH) began conducting surveillance to document health effects and impact, or lack of impact, on healthcare systems in Florida. This report describes Florida's experience with two disease surveillance systems used to monitor the impact of the Haitian earthquake on Florida. The results suggest most of the visits to emergency departments were for injuries (48.2%) and that malaria represented 37.5% (6 of 16 cases) of the notifiable diseases identified. This information can be used to help inform public health and those providing healthcare services in this evolving situation.

The two Florida disease surveillance systems used to monitor the impact of the Haitian earthquake are: 1) emergency department (ED) chief complaint data captured in the statewide syndromic surveillance system, Electronic Surveillance System for the Early Notification of

Community-Based Epidemics (ESSENCE); and 2) reportable disease data captured in Florida's reportable disease surveillance system, Merlin.

As of February 9, 2010, there have been over 22,500 arrivals in Florida from Haiti that are related to repatriation and medical humanitarian missions. These individuals have primarily arrived in the Orlando, Tampa, and Miami areas. The vast majority of these arrivals have been repatriated U.S. citizens (most of Haitian origin), and dependent family members who may or may not be U.S. citizens. Many of these people immediately traveled on to other locations, mostly in the eastern U.S., where they have family and friends.

Approximately 650 people arrived in Florida during this period as medical evacuees, and were transported and directly admitted to hospitals for treatment of severe or complicated injuries. Some of these people also made ED visits on arrival. These were primarily Haitian nationals.

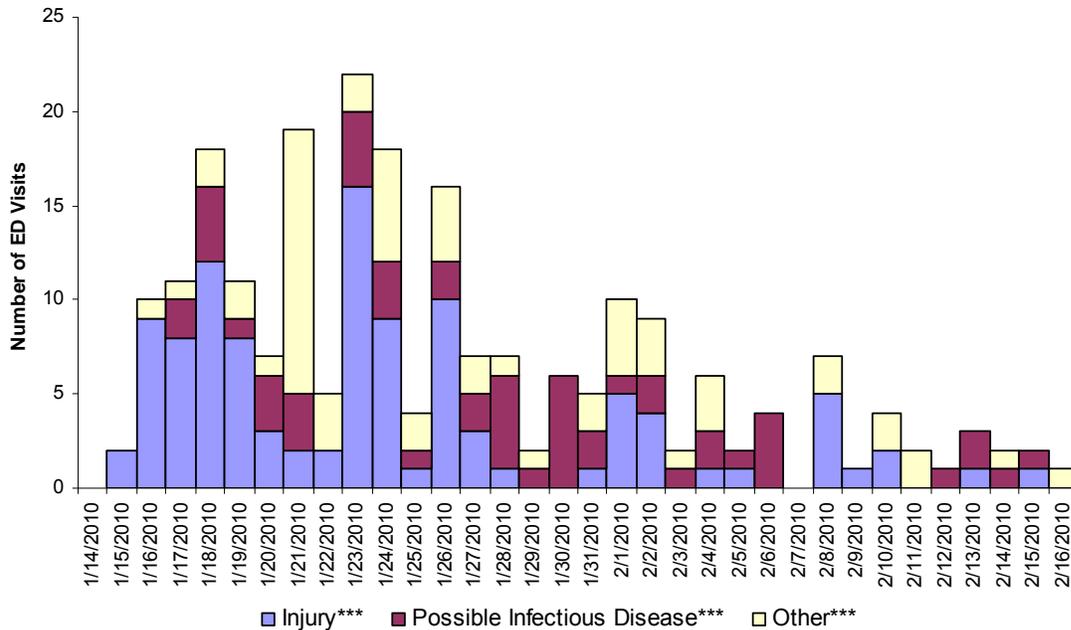
ESSENCE Emergency Department Surveillance for "Haiti"-associated Chief Complaints

Florida uses ESSENCE as its statewide syndromic surveillance system. Currently, 133 hospitals across the state are reporting ED data to ESSENCE. This represents approximately 75% of all ED visits in the state. On January 15, 2010, the FDOH, Bureau of Epidemiology, requested that hospitals reporting to the ESSENCE syndromic surveillance system add the word "Haiti" to chief complaints of visits to EDs in people who were in Haiti on or after the earthquake on January 12, 2010. Hospital staff were not requested to inquire about nationality or immigration status, or to change their usual practices in any other way. The intent of this surveillance is to capture data on all persons presenting to the ED for care, including care provided for U.S. citizens returning from Haiti (whether residents, visitors, aid workers, volunteers, etc.) as well as any foreign nationals who present to Florida EDs for care. Queries of the free-text chief complaints were then conducted by combining "Haiti" and "earthquake" with other words suggestive of either injuries, trauma, or possible infectious diseases (See the "Explanation for Chief Complaint Free-text Queries" further on in this article).

From January 15, 2010 to February 16, 2010, 33 hospitals in 9 counties reported 226 patients where Haiti or earthquake was mentioned in the chief complaint. Injury-associated chief complaints are included in 108 of the 226 (47.8%) ED visits, and of these, approximately 57 (58.2%) were the result of being airlifted to Florida for care, and 41 (41.8%) were individuals who were not airlifted but sought care in Florida EDs. Fifty-five of the 226 (24.3%) ED visits were categorized as possibly due to infectious disease (Figure 1). Of those categorized as associated with infectious diseases, 20% included fever, 58.2% included gastrointestinal complaints, 16.3% included respiratory complaints, and the remaining 5% fell outside of those categories. Sixty-three (27.8%) ED visits included chief complaints that were not placed into syndrome categories at all, because they either did not have enough information to categorize, or fell into categories

that were not being utilized.

Figure 1. Haiti-related Emergency Department (ED) Chief Complaints* (N=226) Associated with Injuries and Possible Infectious Disease Syndrome Categories Identified by Free Text Queries, Florida, 1/14/2010-2/16/2010



* Chief complaint data from the statewide Florida ESSENCE syndromic surveillance system.

**Twenty-six hospitals have recorded "Haiti" in at least one chief complaint since the initiation of the FDOH request.

***The query for each category (injury, possible infectious disease, other) is described in the "Explanation for Chief Complaint Free-text Queries" further on in this article

Reportable Disease Data from Merlin

Each licensed practitioner, hospital, and laboratory who diagnoses, treats, or suspects a case or an occurrence of a disease or condition listed as reportable in the state of Florida is required to report the disease or condition to the FDOH, per Florida Administrative Code (F.A.C.), 64D-3. Reportable disease data on Florida residents (excluding HIV/AIDS, tuberculosis, and sexually transmitted diseases) are monitored and recorded in the Merlin system. Within Merlin, there are fields to capture whether the illness was acquired outside of the U.S., and if so, from what country. In most instances, county health department (CHD) staff perform the case data entry into Merlin and only data on Florida residents is documented in the system. In response to the Haiti earthquake, a request was made to CHD staff to document cases of notifiable diseases in Merlin for all persons (regardless of whether they were Florida residents). For this event, a case of disease in a person returning from Haiti after the earthquake was defined as: a person (including relief workers) with a reportable disease per F.A.C. 64D-3 who was in Haiti on January 12, 2010 or had been in Haiti since January 12, 2010. Reportable diseases, in Florida or non-Florida residents, will continue to be investigated and control measures implemented when appropriate and in accordance with existing CHD disease management protocols.

Under normal circumstances, travel between Florida and Haiti is common. Each year, FDOH documents reports of notifiable diseases where the source of the exposure is determined to be

recent travel history to Haiti. From January 1, 2009 to December 31, 2009, Florida had a total of 1,721 reportable diseases reported as being acquired outside of the U.S. Of those, 135 (7.8%) were reported as acquired in Haiti. Giardiasis and malaria were the most commonly reported conditions.

As of February 17, 2010, 29 reportable diseases were reported to FDOH among people returning from Haiti after the earthquake on January 12, 2010 (see Table below). More than a third of those illnesses (9) were malaria. Other diseases and conditions reported include lead poisoning (7), giardiasis (3), possible exposure to rabies (2), shigellosis (2), tetanus (2), cryptosporidiosis (1), dengue fever (1), *Haemophilus influenzae* invasive disease (1), and salmonellosis (1). In several instances, these illnesses were identified in individuals who originally presented for care for trauma or injuries.

Table: Distribution of Reportable Diseases Reported in Florida in 2009 and in People Returning from Haiti since the Earthquake on January 12, 2010

Reportable Disease (F.A.C. 64D-3)*	Cases of Disease in Florida Residents January 1, 2009 to December 31, 2009		Cases of Disease in People Returning from Haiti since Earthquake January 12, 2010 to February 17, 2010	
	Number	Percent of Total	Number	Percent of Total
Cryptosporidiosis	0	0.0%	1	3.4%
Cyclosporiasis	1	0.7%	0	0.0%
Dengue Fever	6	4.4%	1	3.4%
Giardiasis	32	23.7%	3	10.3%
<i>Haemophilus Influenzae</i> (Invasive Disease)	0	0.0%	1	3.4%
Hepatitis A	1	0.7%	0	0.0%
Hepatitis B (+HBsAg In Pregnant Women)	9	6.7%	0	0.0%
Hepatitis B, Chronic	12	8.9%	0	0.0%
Lead Poisoning	22	16.3%	7	24.1%
Malaria	41	30.4%	9	31.0%
Mumps	1	0.7%	0	0.0%
Possible Exposure to Rabies	0	0.0%	2	6.9%
Salmonellosis	2	1.5%	1	3.4%
Shigellosis	4	3.0%	2	6.9%
Tetanus	0	0.0%	2	6.9%
Typhoid Fever	4	3.0%	0	0.0%
Total	135	100.0%	16	100.0%

* Each licensed practitioner, hospital, and laboratory who diagnoses, treats, or suspects a case or an occurrence of a disease or condition listed as reportable in the state of Florida is required to report the disease or condition to the FDOH, per Florida Administrative Code (F.A.C.), 64D-3.

Editorial Note

The earthquake in Haiti has disrupted medical services in a country where there was already existing infrastructure deficiencies including electrical blackouts, water, and sanitation problems,

and general impoverishment (1). The findings from these two surveillance systems underscore previous knowledge that earthquakes cause injuries due to the impact and due to rescue and clean-up activities. In addition, the findings also indicate that due to the precarious pre-earthquake water and sanitation systems and other environmental issues, persons with travel to Haiti or who are from Haiti are at risk of vectorborne and waterborne diseases such as malaria and giardia. Low vaccination rates in Haiti may also lead to increased morbidity and mortality from tetanus and other vaccine preventable diseases.

The findings in this report are subject to the following limitations.

1. ESSENCE data capture ED visits only, and as a result any patient admitted directly to the hospital will not be captured in this system.
2. Hospitals participating in ESSENCE that use standardized chief complaints are often not able to add the additional "Haiti" text to chief complaints.
3. ED registration staff from hospital facilities participating in ESSENCE needed to be trained to know when to add the "Haiti" text in the chief complaint, and so depending on the circumstances in each hospital some of these patients may not be captured.
4. Reportable diseases in non-Florida residents are not routinely reported in Merlin. CHD staff needed to be trained to know to record the cases in non-Florida residents with travel to Haiti and as a result, some of these cases may not be captured.

Many of the 22,500 post-earthquake arrivals in Florida have not actually remained in Florida but traveled on to other locations in the U.S. Emergency departments and other healthcare providers outside Florida in communities with significant populations of Haitian origin may treat persons with a similar spectrum of illness and injury as seen in Florida emergency departments. Relatively simple modifications to existing surveillance systems may enable public health agencies to monitor the impact on their communities of the large number of persons leaving Haiti after the earthquake. The information can be used to help anticipate the types of infectious diseases that physicians may encounter among those presenting for care in the U.S. who were recently in Haiti. This information can also be used by communities or states that encounter a need to monitor health effects of evacuees and the impact of the potential influx of patients on the receiving healthcare systems following natural disasters.

Explanation of Chief Complaint Free Text Queries:

ESSENCE gives the user the ability to query the free text chief complaints using boolean operators "and," "or," "andnot" to string together various groupings of words for rapid development of new categories. The wildcard symbol "^" is also used in these queries. During this event the words "earthquake" and/or "Haiti" are used in combination with other text observed in the data.

Any mention of either earthquake or Haiti:

`^earthquake^,or,^haiti^`

Haiti-related possible infectious disease query:

`^haiti^,and,^mening^,or,^haiti^,and,^abdominal^,or,^haiti^,and,^gastro^,or,^haiti^,and,^fever^,or,^haiti^,and,^sorethroat^,or,^haiti^,and,^vomit^,or,^haiti^,and,^diarr^,or,^haiti^,and,^cough^,or,^haiti^,and,^sepsis^,or,^haiti^,and,^rash^,andnot,^crash^,or,^haiti^,and,^pneum^,or,^earthquake^,and,^fever^`

Haiti-related and mention of fever:

`^haiti^,and,^fever^,or,^haiti^,and,^sepsis^,or,^earthquake^,and,^fever^`

Haiti-related and gastrointestinal symptoms:

`^haiti^,and,^abdominal^,or,^haiti^,and,^gastro^,or,^haiti^,and,^vomit^,or,^haiti^,and,^diarr^`

Haiti-related and respiratory symptoms:

`^haiti^,and,^sore throat^,or,^haiti^,and,^cough^,or,^haiti^,and,^pneum^`

Haiti-related and injuries:

`^haiti^,and,^injury^,or,^haiti^,and,^fracture^,or,^haiti^,and,^hit head^,or,^haiti^,and,^pain^,andnot,^abdominal^,andnot,^chest^,andnot,^ear pain^,andnot,^stomach pain^,andnot,^epigastric pain^,andnot,^blood pressure^,andnot,^shortness^,or,^haiti^,and,^trauma^,or,^haiti^,and,^fall^,or,^haiti^,and,^fell^,or,^haiti^,and,^burn^,or,^haiti^,and,^broken^,or,^haiti^,and,^paraplegia^,or,^haiti^,and,^gunshot^,or,^earthquake^,and,^injury^,or,^earthquake^,and,^fracture^,or,^earthquake^,and,^lacerat^,or,^haiti^,and,^wou^,or,^haiti^,and,^abrasion^,or,^haiti^,and,^cellu^,or,^haiti^,and,^heat exhaust^,or,^haiti^,and,^brick^`

References:

1. World Health Organization. Public health risk assessment and interventions Earthquake: Haiti. WHO Communicable Diseases Working Group on Emergencies, Communicable Diseases Surveillance and Response, WHO Regional Office for the Americas, WHO Country Office, Haiti. January 2010 WHO/HSE/GAR/DCE/2010.1 Available at http://www.who.int/diseasecontrol_emergencies/publications/who_hse_gar_dce_2010_1/en/index.html

For further information please contact FDOH, Bureau of Epidemiology at 850-245-4401.

Janet J. Hamilton is the Surveillance Section Administrator in the Bureau of Epidemiology, Florida Department of Health. Aaron Kite-Powell and Leah Eisenstein are surveillance epidemiologists with the Bureau of Epidemiology. Richard S. Hopkins is the Acute Section Administrator for the Bureau of Epidemiology, as well as the Acting State Epidemiologist at the Florida Department of Health. Tim Doyle is regional epidemiologist with the Bureau of Epidemiology. Ms. Hamilton can be contacted at 850.245.4651 or by email at Janet_J_Hamilton@doh.state.fl.us. Mr. Kite-Powell can be contacted at 850.245.4444, ext 2638 or by email at Aaron_Kite-Powell@doh.state.fl.us. Ms. Eisenstein can be contacted at 850.245.4444, ext 2481 or by email at Leah_Eisenstein@doh.state.fl.us. Dr. Hopkins can be contacted at 850.245.4412 or by email at Richard_Hopkins@doh.state.fl.us. Mr. Doyle can be contacted at 305.324.2415 or by email at Tim_Doyle@doh.state.fl.us.

Pertussis Outbreak in Two Assisted Living Facilities, Escambia and Santa Rosa Counties

Robert Cosgrove, M.P.H., Samantha Rivers, M.S., M.P.H., and Mary Beverly, B.S., R.S.

This article is an epidemiologic investigation report of a cluster of *B. pertussis* in staff and patients associated with an assisted living facility (ALF).

Introduction and Background

Bordetella pertussis is a gram negative coccobacillus bacteria that has caused an increasing number of recognized infections during the past two decades. Resurgence of the disease may be due to waning immunity, erythromycin-resistant strains, decreased vaccination coverage, or increased recognition. The infection is highly communicable, with reported attack rates well over 80% in susceptible household contacts². The disease typically begins with a steadily progressive cough that eventually leads to paroxysms, and is sometimes accompanied by post-tussive vomiting and a characteristic whoop in small children. The incubation period for non-immunocompromised persons is generally five to fourteen days; however, disease may occur up to twenty-one days after exposure¹.

Surveillance classification of cases and contacts can be difficult because of testing misclassification and the need to meet explicit case definitions. Polymerase chain reaction (PCR) tests have an average specificity of 96% (range: 93% to 98%) and a sensitivity of nearly 100%. As a result, some PCR positives are false positives and depending on PCR alone may over count cases. Cultures have a sensitivity ranging from 20% to 90% (60% average) and a specificity of 100%, and can miss cases. Reverse transcriptase (RT)-PCR is much more sensitive than culture, and can detect recent infection even when no viable cells are present.

There is not much literature to clearly characterize the definition of a close contact in a pertussis outbreak, making it difficult to calculate attack rates and to know when to initiate post-exposure prophylaxis measures³. The Centers for Disease Prevention and Control (CDC) currently recommends DTaP (tetanus, diphtheria, and pertussis) vaccination for children at the ages of two, four, six, and fifteen to eighteen months, four to six years, and a booster dose of Tdap (tetanus, diphtheria and pertussis) at age eleven. In addition, because of evidence of waning immunity after the age of six¹, Tdap vaccination is now recommended for persons 10 to 65 years who have not had a regular Td (tetanus diphtheria) vaccination in the previous two years.

The Outbreak Investigation

On May 29, 2009, a local infection control practitioner (ICP) contacted the Santa Rosa County Health Department (CHD) Epidemiology Program staff to report a possible case of pertussis in an employee of an ALF. The ICP reported that a 38 year-old woman presented to a local hospital emergency department with a persistent cough of over three weeks duration with associated paroxysms. The patient had been taking amoxicillin for a week prior to this case report, as a result of a previous diagnosis of bronchitis. The hospital's referral laboratory confirmed *B. pertussis* by PCR testing, and both the Escambia CHD and Santa Rosa CHD were notified as the infected person had reportedly worked at ALFs in both counties while symptomatic. A total of six employees, three residents, and three secondary household contacts subsequently presented with a coughing illness in the Santa Rosa ALF, and six employees and one secondary household contact were reported at the Escambia facility.

Methodology

Working closely with the Florida Department of Health (FDOH) and eventually with an Epi-Aid team from the CDC, the Escambia CHD and the Santa Rosa CHD epidemiology staff conducted investigations of both facilities.

The clinical portion of the FDOH surveillance case definition is a cough illness lasting ≥ 2 weeks with one of the following: paroxysms of coughing, inspiratory "whoop", or post-tussive vomiting, without other apparent cause as reported by a health professional. Confirmed cases must meet the clinical criteria as well as being laboratory confirmed by PCR or culture, or be epidemiologically linked to a confirmed case. Cases meeting only the clinical case definition, but without lab confirmation or linkage to a confirmed case, are reported as probable cases. Secondary or household contacts are defined as relatives, family members, or individuals who spent a substantial amount of time with a primary case. The original investigation occurred from May 29, 2009 to August 6, 2009, after which time no further cases were reported at either facility. Follow-up status on cough duration among cases was conducted at least two weeks after the initial onset of cough.

The CDC, Escambia CHD, and Santa Rosa CHD conducted a follow-up investigation of the outbreak on November 17, 2009. Data was compiled from case report forms and Merlin[®]. Florida's electronic reportable disease database. The follow-up investigation started with a review of the index case history, symptoms, household contacts, and work contacts. A line-listing of all employees and residents at both facilities was obtained and missing data was gathered through follow-up phone calls.

Results

Dates of onset of cases in the outbreak ranged from May 29, 2009 to August 6, 2009. The total number of cases from both facilities was 19 (4 probable, 14 epidemiologically-linked, and 1 PCR confirmed).

Escambia had a total of seven persons classified as cases, six of which were in epidemiologically-linked staff members, and one was a household contact. The ALF had a total of 31 staff and 41 non-affected residents. The individual, who eventually was classified as a confirmed case, tested PCR negative. However, this person had been started on antibiotic prophylaxis before the specimen was taken. This individual still met the case definition after it was discovered a household contact later tested PCR positive. The attack rate for the Escambia County ALF was 9.7% (7/72).

Santa Rosa had a total of 12 persons classified as cases, including 6 residents and 6 staff. All were epidemiologically linked to a PCR confirmed case. There were 107 residents and 51 staff members for a total of 158 people at risk of possible exposure. The resulting attack rate for the Santa Rosa facility was 7.6% (12/158). One secondary household attack rate was calculated at 83% with five individuals out of the six residents living in that household meeting the case definition for pertussis.

For the 19 people with confirmed and probable cases from both facilities, the following symptoms were reported: cough -19 (100%), paroxysmal cough -14 (73%), postussive vomiting - 3 (17%), whoop - 0 (0%) (see Chart 2). On June 9, 2009, 26 days after the initial onset of symptoms, prophylaxis was recommended to all individuals including employees.

Tables 1 through 3 represent the demographics of the cases from both ALFs including the duration of illness. Chart 1 shows an epi-curve using the data for the confirmed and probable cases along with the dates of onset using five-day increments. The incidence rate for the individuals presenting symptoms of pertussis was 12% for the staff/secondary contacts and 6% for the residents at the Santa Rosa ALF, and 30% for staff/household contacts at the Escambia ALF.

Recommendations

A primary recommendation is to encourage Tdap vaccinations of residents of assisted living facilities to reduce the risk of pertussis outbreaks. As is currently recommended, Tdap boosters to adolescents and adults would further disrupt the transmission and spread of this bacterium by increasing herd immunity throughout the community. Proper hand washing, sanitation, masks for the infected, and isolation techniques should be encouraged, after possible cases have been identified. Timely post-exposure prophylaxis should be recommended for all close contacts and the immuno-compromised.

Discussion

Regardless of successful vaccine coverage for decades, pertussis remains endemic in most parts of the United States. Epidemiological trends and data suggest that waning immunity may play a major role in this phenomenon. Recent studies have indicated that pertussis incidence is about 1% a year in adolescents and adults, with five asymptomatic or mild cases for every one case that met the clinical case definition⁴. These infections may be the source of transmission throughout the community to infants with less immunity.

There were several limitations to this study, including but not limited to, incomplete testing, inaccurate recall of cough duration, reluctance of facilities to disclose information about symptomatic residents and staff, and confounding co-morbid conditions often found in elderly individuals, which may mimic pertussis symptoms. Additional testing would have been helpful in further characterizing the extent of this outbreak including acute specimens for PCR and culture. Data suggests that older individuals have fewer severe infections, which makes diagnosis of pertussis more difficult. Antibody testing is rarely useful. Even though IgG and IgA antibodies to pertussis toxin (PT) are most specific to *B. pertussis*, it also decays at the fastest rate and, therefore, may not capture all cases. Since older individuals are partially immune as a result of prior immunizations and natural infections, it is difficult to distinguish between new infections and prior immunity, unless serum samples are taken early on in the course of the infection in order to detect changes in serum levels⁴.

Follow-up on symptoms of elderly residents depends on recall from the staff or resident. Questioning a few months after the initial onset of symptoms may have resulted in errors as to the nature and timing of symptoms. Many barriers contribute to facilities being reluctant to identify additional cases. Consequently, it is not certain that all the cases were identified. Additionally, elderly residents living in an ALF present with cough symptoms on a regular basis, and may be immuno-compromised from a current illness or medication. Likewise, it is difficult to distinguish between symptoms of pertussis and multiple other respiratory infections.

This investigation demonstrated the ease of communicability of *B. pertussis* among staff in ALF settings. Staff education and adult Tdap vaccinations for both staff and residents may assist in preventing future outbreaks. Following CDC and FDOH recommendations, such as isolation of suspected cases, post exposure prophylaxis (PEP) for all asymptomatic exposed individuals, and immediate 5 day furloughs for those on PEP, are key control and mitigation measures.

Table 1. Cases by Duration of Illness

Duration of Illness:	
Minimum duration of illness	14 days
Maximum duration of illness	28 days

Table 2. Cases by Gender

Gender	Number	Percent
Male	5	26.32%
Female	14	73.68%
Total	19	100.00%

Table 3. Cases by Age Group

Age Group	Number	Percent
0 - 4	2	10.52%
5 - 9	2	10.52%
10 - 14	0	0%
15 - 19	0	0%
20 - 24	1	5.30%
25 - 29	0	0%
30 - 39	4	21.05%
40 - 49	1	5.30%
50 - 59	3	15.79%
60+	6	31.58%
Total	19	100.00%

Chart 1: The epi-curve chart below indicates the dates of initial onsets for all cases as well as color-coded references between staff (beige), secondary household contacts (green), and residents (blue).

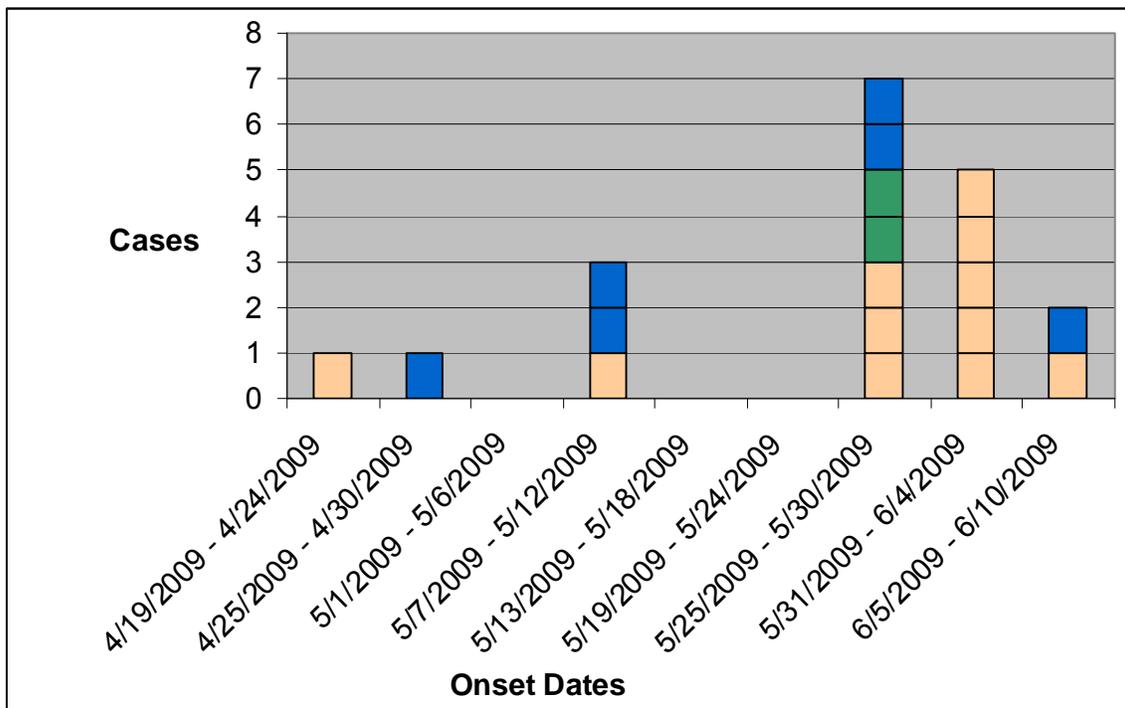
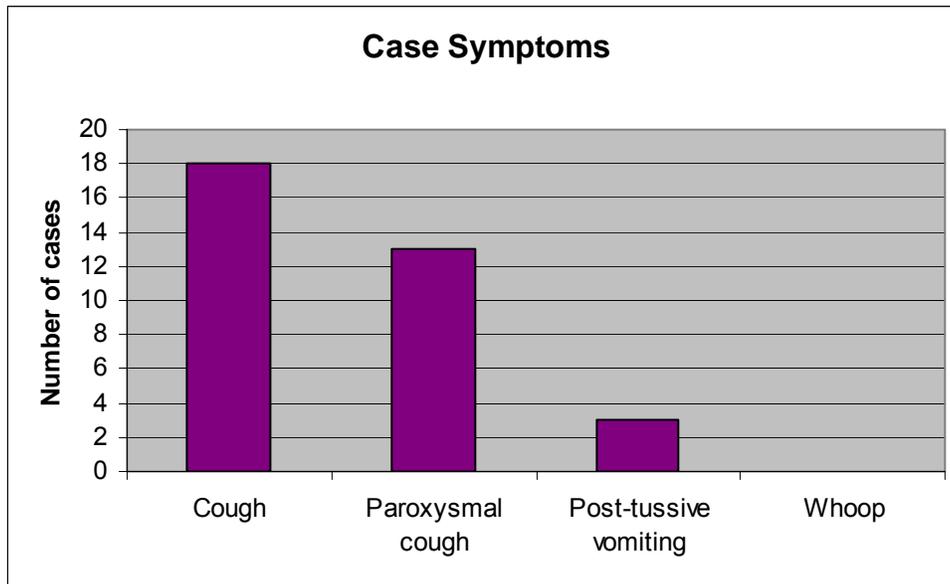


Chart 2: Number of cases with each of the four symptoms, ALF-related outbreak.



References:

1. Center for Disease Control and Prevention. Epidemiology and Prevention of Vaccine-Preventable Diseases. Atkinson W, Wolfe S, Hamborsky J, McIntyre L, eds. 11th ed. Washington DC: Public Health Foundation, 2009.
2. Deen J, Mink C, Cherry J. Household Contact Study of *Bordetella pertussis* Infections. Pediatrics 1995;21:1211-19.
3. Farizo K, Cochi S, Zell E. Epidemiological Features of Pertussis in the United States. Clinical Infectious Disease 1992;14:708-19.
4. Ward J, Cherry J, Chang S. *Bordetella pertussis* Infections in Vaccinated and Unvaccinated Adolescents and Adults, as Assessed in a National Prospective Randomized Acellular Pertussis Vaccine Trial (APERT). 2006;43:151-57.

Robert Cosgrove, M.P.H. is an EIS Fellow with the Bureau of Epidemiology located in the Santa Rosa County Health Department. Mr. Cosgrove can be contacted at 850.983.5200, ext 116 or by email at Robert_Cosgrove@doh.state.fl.us. **Samantha Rivers, M.S., M.P.H.** is a Health Services Manager with the Santa Rosa County Health Department. Ms. Rivers can be contacted at 850.983.5200, ext 105 or by email at Samantha_Rivers@doh.state.fl.us. **Mary Beverly, B.S., R.S.** is a Biological Scientist with the Escambia County Health Department. Ms. Beverly can be contacted at 850.595.6683 or by email at Mary_Beverly@doh.state.fl.us.

Carbon Monoxide Poisoning Case Investigations in Duval and Orange Counties

Jessica Fung, M.P.H., Amber Barnes, M.P.H., Tania Harper, M.P.H., Taj Azarian, M.P.H.

Carbon monoxide (CO) poisoning was added to Florida's list of reportable diseases on November 24, 2008. Due to its recent addition, infection preventionists (IP) and physicians are not yet routinely reporting cases to the local health departments. As a result, CO poisonings have primarily been identified through the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE), Florida's syndromic surveillance system, and the Florida Poison Information Center Network (FPICN), which provides poison prevention and management information to Florida healthcare providers and citizens. Daily emergency department (ED) visits from enrolled hospitals are monitored by ESSENCE. In addition, real-time data from the FPICN are accessible to authorized Florida Department of Health (FDOH) users through a module within ESSENCE. This provides monitoring of exposure and information calls received by FPICN for public health surveillance.

This report describes recent CO poisoning cases from Duval and Orange counties. Additionally, it addresses the notification process, case investigation, and challenges faced at the local level.

ESSENCE Monitoring in Duval County

Within Duval County, aberrations from eight local ESSENCE hospitals and FPICN calls are recorded in an EpiInfo 3.5.1 log by surveillance staff. ESSENCE free-text queries for "carbon monoxide" and "poison" identify ED visits for CO-related events. Exposure calls for CO within the fumes, gases, and vapors substance category are additionally identified through the FPICN ESSENCE module. Identified instances of CO poisoning are compared between data sources to enhance case finding. Authenticated FDOH users are then able to initiate a secure, encrypted session from any web browser to display individual case level information from FPICN reported cases. Case specific information including exposure, environmental monitoring, clinical symptoms, and carboxyhemoglobin (COHb) levels are obtained through the FPICN case report. If the instance was solely identified through ED data, the respective hospital's IP is contacted to obtain the necessary information. Cases that meet the FDOH surveillance case definition for CO poisoning are reported through Merlin, FDOH's reportable disease network, and the entry within the ESSENCE monitoring log is updated with the appropriate follow-up information.

Duval County

Daily monitoring of ESSENCE provided the initial outbreak identification for a cluster of 11 CO poisoning exposures. Individual case reports were obtained through FPICN. The reports provided exposure information, lab results, and the environmental monitoring efforts at that time. Although the outbreak exposed additional persons, only four patients met the critical COHb level of $\geq 9\%$ necessary for reporting to Merlin.

In the early morning of December 7, 2009, a 13 year-old child awoke with symptoms of nausea and dizziness and attempted to wake his mother. When she had difficulty responding, he dialed 911. Responders from the Jacksonville Fire Rescue Department (JFRD) determined that the family of five had been exposed to CO due to the improper use of a gas stove to heat the home. HAZMAT teams found the level of CO to be twenty times the norm of at or below nine parts-per-million (PPM) for an eight-hour time period, according to the U.S. National Ambient Air Quality Standards. The five individuals, as well as six additional exposed individuals in an adjacent

apartment, were transported to two local hospitals for medical evaluation and treatment. Four family members of the primary apartment exposure had critically high COHb levels with fractional percentages of 10.6%, 15.0%, 29.3%, and 37.7%. These patients were admitted and treated in hyperbaric oxygen chambers for less than 72 hours, then discharged. The family members of the secondary apartment exposure were examined and discharged without treatment. A total of 11 individuals were known to be exposed in this outbreak. No further complications have been reported.

The JFRD emergency responders and HAZMAT team spoke to residents of the apartment complex regarding the dangers of CO poisoning. Local news sources reported on the story with education on safe ways to heat a home during the winter and signs and symptoms of CO poisoning. Citizens were reminded to install a CO detector in their homes and to replace the batteries regularly. On December 22, 2009, the FDOH Office of Communications presented a press release on the hazards of CO poisoning. However, more education must be provided to physicians, hospitals, and labs so that they are aware that CO poisoning is now reportable. This will facilitate the identification of patients meeting the surveillance case definition for CO poisoning.

Orange County

ESSENCE was implemented in Orange County in late October 2009. The Chemical Surveillance Coordinator, Dr. Prakash Mulay, Bureau of Environmental Public Health Medicine, notified Orange County Health Department (CHD) Epidemiology Program of its first identified CO case by FPICN data monitoring through ESSENCE. A cluster of three family household members was exposed to CO gas on December 18, 2009. Power to the house was shut off three weeks earlier and since that time a generator in the garage had been used. On the day of the event, the garage door was accidentally closed, releasing gas into the house. After this family cluster was identified, Orange CHD sent a press release to media contacts and posted an alert on the county website educating residents on CO poisoning prevention during cold winter months or loss of power.

This event was the first time that CO poisoning data were requested on patients from the local hospital system and obstacles were identified in obtaining patient information from the IP. The limited demographic information on each patient made it difficult for the IP to locate the medical records for those involved in the outbreak. Typically, searches require, at minimum, a name and date of birth (DOB) or a medical record number. FPICN data included patient names and ages, but not DOB. The family involved had very common names, increasing the difficulty in identifying the patients. Eventually, the IP contacted the ED and the correct patients were identified by cross-referencing the admission date and time listed in ESSENCE FPICN data. The Orange CHD Epidemiology Program requested that the hospital develop a formal means of identifying and reporting CO poisoning cases to the health department, as with other reportable diseases. It is advisable for CHDs to ensure that the local IPs know that CO poisoning is a reportable condition and that appropriate methods are in place to report these cases. Protocols should also be in place for retrieving medical records on patients with limited identifying data available in ESSENCE.

Conclusion

Due to CO poisoning's recent addition to Florida's list of reportable diseases, formal protocols have not been developed to consistently report CO poisoning cases to CHD epidemiology divisions. ESSENCE and FPICN have been instrumental in the early identification of CO

poisoning. With these surveillance instruments in place, public health prevention messages can be developed quickly to prevent further cases in the community.

Jessica Fung is a FL-EIS Fellow with the Bureau of Epidemiology located in the Orange County Health Department. Ms. Fung can be contacted at 407.858.1400, ext 1351 or by email at Jessica.Fung@doh.state.fl.us. Amber Barnes is a FL-EIS Fellow with the Bureau of Epidemiology located in the Duval County Health Department. Ms. Barnes can be contacted at 904.253.1864 or by email at Amber.Barnes@doh.state.fl.us. Tania Harper is an epidemiologist for the Orange County Health Department. Ms. Harper can be contacted at 407.858.1400, ext 1136 or by email at Tania.Harper@doh.state.fl.us. Taj Azarian is a surveillance epidemiologist with the Duval County Health Department. Mr. Azarian can be contacted at 904.253.1856 or by email at Taj.Azarian@doh.state.fl.us.

Florida Influenza Surveillance Report

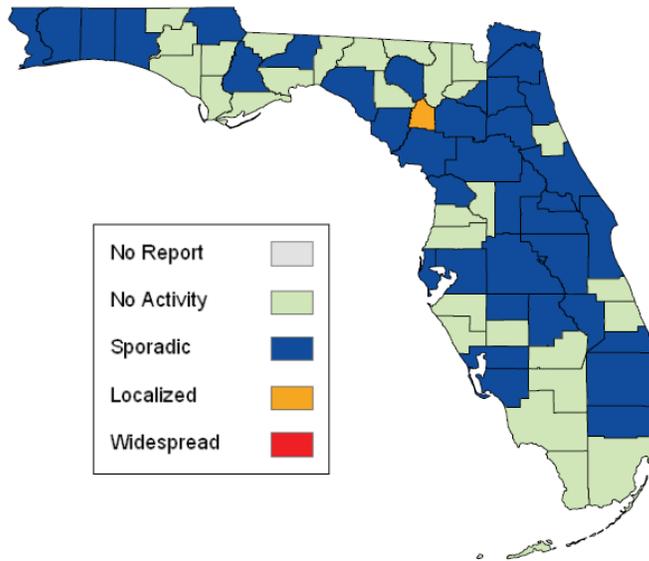
Colin Malone, M.P.H.

Florida is currently experiencing low levels of influenza activity. The 2009 H1N1 influenza A continues to circulate in Florida, but most of Florida's surveillance systems show influenza activity levels at or below previous years at this time. The Florida Department of Health (FDOH) maintains a variety of these surveillance systems to monitor influenza activity. The Bureau of Epidemiology summarizes the data from these systems in a weekly report to help FDOH track influenza activity. The surveillance sources summarized in these reports include:

1. Emergency department syndromic surveillance as monitored through the Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE);
2. Laboratory data from the Bureau of Laboratories (BOL);
3. County influenza activity levels as reported by county health department epidemiologists;
4. The Florida Pneumonia and Influenza Mortality Surveillance System (FPIMSS);
5. Florida Outpatient Influenza-Like Illness Surveillance Network (ILINet) providers;
6. Novel H1N1 influenza notifiable disease data for special surveillance populations (deaths, hospitalized pregnant women, and those with life threatening illness) and pediatric influenza-associated mortality as reported in the Merlin system for notifiable disease surveillance; and
7. Outbreaks or clusters of influenza-like illness (ILI) as reported through EpiCom.

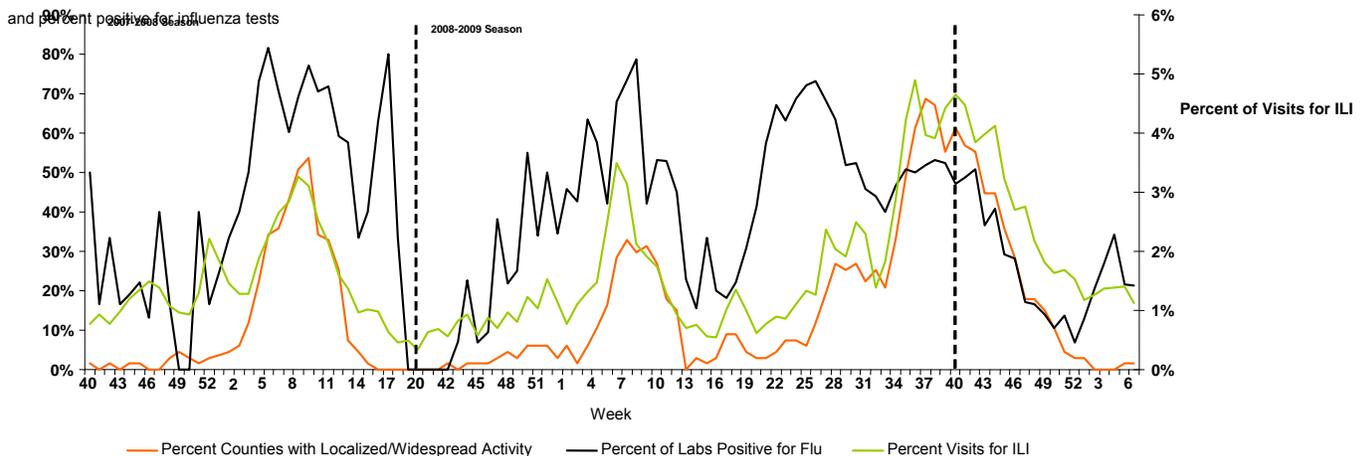
Week six (February 6-February 13, 2010) was the seventh week in a row that Florida reported Sporadic statewide influenza activity to the CDC. There are five possible categories: No Activity, Sporadic, Local, Regional, or Widespread. The CDC report can be viewed at <http://www.cdc.gov/flu/weekly/usmap.htm>. In weeks five and six, no counties reported widespread activity, and a single county reported localized activity in each week. This was an increase from weeks two, three, and four, during which no counties reported localized or widespread activity. The vast majority of counties report either sporadic or no influenza activity, as shown by Map 1 below. These levels are slightly lower than previous influenza seasons at this time.

Weekly County Influenza Activity for Week 6
as Reported by 12:00 p.m. February 17, 2010



There have been no influenza outbreaks reported into EpiCom for seven consecutive weeks. The percentage of visits for ILI reported by ILINet sentinel providers is at 1.1%, below the threshold for moderate activity and below activity seen in previous years at this time. ESSENCE data also show that ILI visits to emergency departments are near expected values for this time of year. Although the vast majority of influenza circulating in Florida continues to be 2009 H1N1, two specimens tested by the BOL in the past three weeks were positive for influenza B. Influenza B can cause seasonal flu outbreaks but is not considered to have pandemic potential. No influenza virus other than H1N1, nor any other viruses that cause ILI, are currently causing significant ILI in Florida. RSV, a virus that affects infants and toddlers, is currently active throughout the state, as is normal at this time of year. The graph below shows the progression of the 2007-2008, 2008-2009, and 2009-2010 influenza seasons in three of the seven surveillance systems: ILINet, county influenza activity reporting, and BOL viral surveillance.

Percent of counties reporting localized or widespread activity
FIGURE 1: Percentage of Visits for ILI to ILINet Sites, Percentage of Counties with Localized or Widespread Activity, and Percentage of Specimens Tested by Florida Bureau of Laboratories Positive for Influenza, 2007-2008 (Weeks 40-20), 2008-2009 (Weeks 40-39), and 2009-2010 (Week 40-6)



Since the fall wave of 2009 H1N1 ended, Florida has experienced a sustained period of low flu activity, but flu will likely to continue to cause illness in Florida for months to come. In non-pandemic years, peak influenza season occurs during January-March. There have been no indications that Florida will see another peak of influenza activity, but FDOH will continue to monitor for any increase in influenza activity during the winter months.

For up-to-date information on influenza surveillance and H1N1 influenza in Florida, please visit the Bureau of Epidemiology influenza surveillance reports website at http://www.doh.state.fl.us/disease_ctrl/epi/htopics/flu/reports.htm.

Colin Malone is an influenza surveillance epidemiologist in the Bureau of Epidemiology. Mr. Malone can be contacted at 850.245.4444, ext 2403 or by email at Colin_Malone@doh.state.fl.us.

Florida Year-to-Date Mosquito-Borne Disease Summary Through February 19, 2010

Elizabeth Radke, M.P.H., Kristina Weis, Ph.D., Danielle Stanek, D.V.M., Carina Blackmore, D.V.M., Ph.D.



During the period from January 1 through February 19, 2010, the following arboviral activity was recorded in Florida:

Eastern Equine Encephalitis Virus (EEEV) Activity

Positive samples were obtained from three sentinel chickens and three live wild birds in four counties.

West Nile Virus (WNV) Activity

Positive samples were obtained from five sentinel chickens in two counties.

St. Louis Encephalitis Virus (SLEV) Activity

No activity reported in 2010.

Highlands J Virus (HJV) Activity

No activity reported in 2010.

California Encephalitis Group Viruses (CEV) Activity

No activity reported in 2010.

Dengue Virus (DENV)

Four imported cases in Florida residents were reported from the following counties: Miami-Dade, Osceola, Pasco, and Seminole. Places of origin include Columbia, Haiti, Jamaica, and Venezuela.

Malaria

Fourteen imported cases of malaria with onset in 2010 were reported in Florida residents from the following counties: Broward (3), Hillsborough, Miami-Dade (4), Orange, Osceola, Palm Beach,

Seminole, Volusia, and Wakulla. Places of origin included Angola, Ghana, Guyana, Haiti (7), Nigeria (2), and West Africa. Twelve (86%) were diagnosed with *Plasmodium falciparum* and two (14%) with *Plasmodium vivax*.

Dead Bird Reports

The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. Since January 1, 2010, 34 reports representing a total of 121 dead birds (0 crows, 1 jays, 9 raptors, 111 others) have been received from 17 of Florida's 67 counties. Please note that FWC collects reports of birds that have died from a variety of causes, not only arboviruses. Dead birds should be reported to www.myfwc.com/bird/.

See the following web site for more information:

<http://www.doh.state.fl.us/Environment/medicine/arboviral/index.html>.

Elizabeth Radke is the Arthropod-borne Disease Surveillance Coordinator with the Bureau of Environmental Public Health Medicine. Ms. Radke can be contacted at 850.245.4444, ext 2437 or by email at Elizabeth.Radke@doh.state.fl.us. Dr. Kristina Weis is the CDC/CSTE Applied Epidemiology Fellow with the Bureau of Environmental Public Health Medicine. Dr. Weis can be contacted at 850.245.4444, ext 2016 or by email at Kristina.Weis@doh.state.fl.us. Dr. Danielle Stanek is a medical epidemiologist with the Bureau of Environmental Public Health Medicine. Dr. Stanek can be contacted at 850.245.4117 or by email at Danielle.Stanek@doh.state.fl.us. Dr. Carina Blackmore is the State Public Health Veterinarian and the Chief of the Bureau of Environmental Public Health Medicine. Dr. Blackmore can be contacted at 850.245.4732 or by email at Carina.Blackmore@doh.state.fl.us. The Bureau of Environmental Public Health Medicine is part of the Division of Environmental Health, Florida Department of Health.

Recent Publications

Doyle TJ, Mejia-Echeverry A, Fiorella P, Leguen F, Livengood J, Kay R, et al. Cluster of serogroup W135 meningococci, southeastern Florida, 2008–2009. *Emerg Infect Dis*. 2010 Jan. Available from <http://www.cdc.gov/EID/content/16/1/113.htm>

Upcoming Events

Bureau of Epidemiology Monthly Grand Rounds

Date: Last Tuesday of each month

Time: 10 a.m.-11 a.m., E.T.

Location: Building 2585, Room 310A

Dial-In Number: 877.646.8762 (password: Grand Rounds)

March 30, 2010: “Tools for Cancer Assessment, Surveillance, and Research” presented by Tara Hylton, M.P.H. and Aruna Surendera Babu, M.P.H.

Emory University’s “Applied Epidemiology in Action” Course

Dates: June 14 – 25, 2010

Location: Orlando

Registration will begin in March.

Reportable Diseases in Florida

Up-to-date information about the occurrence of reportable diseases in Florida, based on the Merlin surveillance information system, is available at the following site: <http://www.floridacharts.com/merlin/freqrpt.asp>. Counts can be displayed by disease, diagnosis status, county, age group, gender, or time period.

Monthly Notifiable Disease Data

Table 1. Provisional Cases* of Selected Notifiable Diseases, Florida, January 1-31, 2010

Disease Category	Month				Cumulative (YTD)	
	2010	2009	Mean [†]	Median [‡]	2010	2009
A. Vaccine Preventable Diseases						
Diphtheria	0	0	0	0	0	0
Measles	0	1	0.2	1	0	1
Mumps	1	0	1.0	3	1	0
Pertussis	18	35	17.0	18	18	35
Poliomyelitis	0	0	0	0	0	0
Rubella	0	0	0	0	0	0
Smallpox	0	0	0	0	0	0
Tetanus	0	0	0	0	0	0
Varicella	63	101	N/A	N/A	63	101
B. CNS Diseases & Bacteremias						
Creutzfeldt-Jakob Disease	1	3	2.0	1	1	3
<i>H. Influenzae</i> (invasive)	12	19	11.8	2	12	19
in those ≤5	0	2	3.4	3	0	2
Listeriosis	6	5	5.2	4	3	1
Meningitis (bacterial, cryptococcal, mycotic)	21	12	0	0	12	12
Meningococcal Disease	8	6	5.0	6	8	6
<i>Staphylococcus aureus</i> (VISA, VRSA)	0	0	0	0	0	0
Streptococcal Disease, Group A, Invasive	18	28	23.0	28	17	22
<i>Streptococcus pneumoniae</i> (invasive disease)						
Drug resistant	85	84	74.2	81	85	84
Drug susceptible	101	121	43.6	44	69	83
C. Enteric Infections						
Campylobacteriosis	50	75	67.4	63	50	75
Cholera	0	0	0	0	0	0
Cryptosporidiosis	20	26	23.0	23	20	26
Cyclospora	1	5	2.2	4	1	5
<i>Escherichia coli</i> , Shiga-toxin producing (STEC)**	7	10	2.0	4	7	10
Giardiasis	122	171	82.0	84	122	171
Hemolytic Uremic Syndrome	0	0	0.6	1	0	0
Salmonellosis	314	294	285.0	294	314	294
Shigellosis	37	56	88.8	77	37	56
Typhoid Fever	2	0	1.2	1	2	0
D. Viral Hepatitis						
Hepatitis A	7	19	16.8	15	7	19
Hepatitis B, Acute	26	23	30.2	27	26	23
Hepatitis C, Acute	3	1	4.0	4	3	1
Hepatitis +HBsAg in pregnant women	33	51	41.6	44	33	51
Hepatitis D, E, G	1	0	0	0	1	0

* Confirmed and probable cases based on date of report as reported in Merlin
Incidence data for 2010 is provisional, data for 2009 will be finalized on April 1, 2010

† Mean of the same month in the previous five years

‡ Median for the same month in the previous five years

** Includes *E. coli* O157:H7; shiga-toxin positive, serogroup non-O157; and shiga-toxin positive, not serogrouped

†† Includes neuroinvasive and non-neuroinvasive

N/A indicates that no historical data is available to calculate mean and median

Table 1. (cont.) Provisional Cases* of Selected Notifiable Diseases, Florida, January 1-31, 2009

Disease Category	Month				Cumulative (YTD)	
	2009	2008	Mean [†]	Median [¶]	2009	2008
F. Vector Borne, Zoonoses						
Dengue	3	4	1.4	4	3	4
Eastern Equine Encephalitis ^{††}	0	0	0	1	0	0
Ehrlichiosis/Anaplasmosis	1	0	0.2	1	1	0
Leptospirosis	0	0	0	1	0	0
Lyme Disease	14	1	1.6	2	14	1
Malaria	5	6	6.2	6	5	6
Plague	0	0	0	0	0	0
Psittacosis	0	0	0	0	0	0
Q Fever (acute and chronic)	0	0	0	0	0	0
Rabies, Animal	15	7	13.0	13	15	7
Rabies (possible exposure)	113	82	80.6	78	113	82
Rocky Mountain Spotted Fever	0	0	0.6	2	0	0
St. Louis Encephalitis ^{††}	0	0	0	0	0	0
Toxoplasmosis	1	0	0.2	1	1	0
Trichinellosis	0	0	0	0	0	0
Tularemia	0	0	0	0	0	0
Typhus Fever (epidemic and endemic)	0	0	0	0	0	0
Venezuelan Equine Encephalitis ^{††}	0	0	0	0	0	0
West Nile Virus ^{††}	0	0	0.4	1	0	0
Western Equine Encephalitis ^{††}	0	0	0	0	0	0
Yellow Fever	0	0	0	0	0	0
G. Others						
Anthrax	0	0	0	0	0	0
Botulism-Foodborne	0	0	0	0	0	0
Botulism-Infant	0	0	0	0	0	0
Brucellosis	1	1	1.0	2	1	1
Glanders	0	0	0	0	0	0
Hansen's Disease (Leprosy)	0	2	0.6	2	0	2
Hantavirus Infection	0	0	0	0	0	0
Legionella	13	15	9.6	9	13	15
Melioidosis	0	0	0	0	0	0
Vibriosis	5	3	2.2	2	5	3

* Confirmed and probable cases based on date of report as reported in Merlin

Incidence data for 2009 is provisional, data for 2008 will be finalized on April 1, 2009

† Mean of the same month in the previous five years

¶ Median for the same month in the previous five years

†† Includes neuroinvasive and non-neuroinvasive

N/A indicates that no historical data is available to calculate mean and median

Note: The 2008 case counts are provisional and are subject to change until the database closes. Cases may be deleted, added, or have their case classification changed based on new information and therefore the monthly tables should not be added to obtain a year to date number.

Please refer any questions regarding the data presented in these tables to Kate Goodin at Kate_Goodin@doh.state.fl.us or 850.245.4444 Ext. 2440.

This Month on EpiCom

Christie Luce



EpiCom is located within the Florida Department of Health's Emergency Notification System (FDENS). The Bureau of Epidemiology encourages *Epi Update* readers to register on the EpiCom system by emailing the Florida Department of Health Emergency Notification System Helpdesk at FDENS-help@doh.state.fl.us. Users are invited to contribute appropriate public health observations related to any suspicious or unusual occurrences or circumstances through the system. EpiCom is the primary method of communication between the Bureau of Epidemiology and other state medical and public health agencies during emergency situations. The following are titles from selected recent postings:

- Update: Gastrointestinal (GI) illness outbreak investigation, Jan. 13, Orange County
- Carbon Monoxide cluster, Collier County
- Florida Red Tide: moderate to high impacts, Lee County
- Possible foodborne illness investigation, Jan. 7, Escambia County
- Update: *Legionella* outbreak, Jan. 15, Miami-Dade County
- Brucellosis in a child, Hernando County
- Update: GI illness outbreak investigation, Jan. 20, Orange County
- GI outbreak in a local adult living facility (ALF), Miami-Dade County
- Investigation of a GI outbreak with travelers from Ohio to Citrus County
- Cluster of Carbon Monoxide poisoning, Alachua County
- Multi-state outbreak of *Salmonella* Montevideo 0908ORJIX-1 – three cases reported in Florida
- Multiple GI outbreaks in facilities, Collier County
- Noroviral outbreak in skilled nursing facility, Okaloosa County
- Suspected foodborne outbreak, Okaloosa County
- Dengue fever in resident with travel history to Haiti, St. Johns County
- GI illness cluster linked to a single restaurant, Lake County
- Scarlet fever outbreak at a daycare center, Osceola County
- Norovirus outbreak at a nursing facility, Brevard County
- Pertussis, Clay County
- Non-safety-related voluntary recall of unused doses from certain lots of Sanofi Pasteur H1N1 vaccine
- Acute Hepatitis B virus infections in an adult living facility, Palm Beach County
- Varicella, Santa Rosa County
- Suspected Norovirus outbreak in an assisted living facility, Seminole County
- Noroviral outbreaks in three nursing facilities, Lee County
- GI illness outbreak at a nursing home, Pasco County
- GI outbreak associated with local hotel, Broward County
- FDOH recommendations/guidelines for infection control of Haitian earthquake evacuees
- Imported Malaria infections associated with the earthquake in Haiti
- Hepatitis A, Brevard County
- Rabies alert, Volusia County
- Outbreaks of GI illness, Hillsborough County
- GI illness in long term care facility, Clay County

- GI illness in an assisted living facility, Alachua County
- Norovirus outbreak at an assisted living facility, Duval County
- Hepatitis A case, Alachua County
- Imported case of Dengue fever associated with earthquake in Haiti, Seminole County
- Rabies alert, Orange County

Christie Luce is the Surveillance Systems Administrator for the Bureau of Epidemiology. Ms. Luce can be contacted at 850.245.4418 or by email at Christie.Luce@doh.state.fl.us.

Epi Update is the peer-reviewed journal of the Florida Department of Health, Bureau of Epidemiology and is published monthly on the Internet. Current and past issues of Epi Update are available online: http://www.doh.state.fl.us/disease_ctrl/epi/Epi_Updates/index.html. The current issue of Epi Update is available online at http://www.doh.state.fl.us/disease_ctrl/epi/Epi_Updates/2009/January2010EpiUpdate.pdf.

For submission guidelines or questions regarding Epi Update, please contact Leesa Gibson at 850.245.4409 or by email at Leesa.Gibson@doh.state.fl.us.

