



Epi Update



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Epidemiology of Vaccine-Preventable Diseases, Part 2: Diphtheria, Tetanus, and Pertussis

Kate Goodin, M.P.H., Leah Eisenstein, M.P.H., Brian Fox, M.A., Janet Hamilton, M.P.H., and Richard Hopkins, M.D., M.S.P.H.

Vaccine-preventable diseases are still a serious threat to the population of the United States and, specifically, Florida. The results of the 2007 National Immunization Survey indicate that vaccination coverage for vaccines recommended routinely since 2000 and before reached record high levels (1). Despite this, one study has suggested an increasing number of vaccine exemptions among children who attend school in states that allow philosophical exemptions while outbreaks of vaccine-preventable diseases continue to occur in the United States (2). This article is one of a series of articles that examine the diseases' history, the vaccines' description and history, and the epidemiology of these diseases in Florida. Part 2 covers diphtheria, tetanus, and pertussis. Please see the link below to access the December 2008 issue of Epi Update for Part 1 covering measles, mumps, and rubella.

http://www.doh.state.fl.us/disease_ctrl/epi/Epi_Updates/2008/December2008EpiUpdate.pdf

Disease History

Diphtheria is an acute bacterial disease caused by the bacteria *Corynebacterium diphtheriae* that infects the mucous membranes; mainly the tonsils, pharynx, larynx, and nose. It is possible for the bacteria to infect other mucous membranes, as well as skin, but these sites are by far the most common. The bacteria produce a toxin that is responsible for local cell death and tissue destruction. Early symptoms include a low fever, malaise, sore throat, hoarseness, and a barking cough. Within two to three days a bluish-white membrane forms in the throat and may eventually turn grayish-green or black, if bleeding occurred in the affected tissue. In many cases, the toxin action and the membrane formation may lead to swelling in the neck and lymph nodes. Even in moderate cases, this swelling may cause airway obstruction. The membrane location is where

the toxin enters the bloodstream and can cause systemic disease. Symptoms include extreme exhaustion, paleness or whiteness of the skin, rapid pulse, stupor, and coma. Complications include myocarditis and neuritis. The case fatality rate for diphtheria is 5% to 10%, but can be up to 20% in people less than four or over 40 years of age. In the pre-vaccine era, diphtheria was a major cause of mortality in children and was listed as one of the three top causes of death for children under 15 years of age in England and Wales. Whether a strain of the bacterium produces toxins or not is determined by infection of the bacteria by a bacteriophage (virus).

Tetanus is an acute disease caused by a toxin produced by the anaerobic bacteria *Clostridium tetani*. The bacteria usually enter the body through a wound where they can replicate and produce the toxin, but are not spread from person to person. The toxin interferes with neurotransmitters in the brain leading to unopposed muscle contraction and spasms causing the distinctive clinical symptoms. The disease presents with a descending pattern, starting with lockjaw followed by a stiff neck, difficulty swallowing, and abdominal rigidity. Full body spasms can occur frequently and last for several minutes. The case fatality rate for tetanus is currently estimated at 11% to 22%, but can be as high as 80%, based on the location of the injury and access to supportive care. The tetanus bacterium is ubiquitous in the environment; therefore, prevention of exposure is not feasible. There has been a decrease in the number of cases reported nationally from approximately 600 per year in the 1940s to less than 50 cases per year as a result of the introduction of the tetanus toxoid immunization. Tetanus cases have been below 50 cases per year since the 1990's. Those currently at highest risk for tetanus infection are injection drug users, especially heroin users, and neonates of mothers who are not immune.

Pertussis is an acute bacterial disease caused by infection with the bacteria *Bordetella pertussis*. The main effects of the disease are caused by a toxin produced by the bacteria which paralyze the cilia in the lungs. There are three stages to the clinical illness of pertussis. The first (catarrhal) stage is characterized by a runny nose, sneezing, low fever, and a mild cough lasting approximately two weeks. The second (paroxysmal) stage, which can last six weeks, is characterized by bursts of rapid coughs without the ability to inhale. After the coughs, the patient then has a long inspiratory effort with a whoop sound which gave the disease its other name, Whooping Cough. The coughing fit may also be followed by vomiting and extreme exhaustion. The third (convalescent) stage is characterized by a gradual decrease in the severity and frequency of the cough and may last for three weeks. The most common complication of pertussis is secondary bacterial pneumonia. However, complications from the primary infection include seizures, encephalopathy, collapsed lungs, nose bleeds, bruises to brain tissue, hernias, rectal prolapse, and middle ear infections. In the pre-vaccine era, there were approximately 175,000 cases of pertussis per year in the U.S. Widespread vaccine use resulted in the incidence decreasing to approximately 2,900 cases reported in 1990 in the U.S. However, the number of pertussis cases has been increasing since then. Immunity due to disease or immunization is not thought to be permanent; therefore, routine boosters and vaccination of adolescents may be required to consistently maintain low disease rates.

Vaccination History

for more than two centuries, millions of people have benefited from disease immunity produced by vaccines. Vaccination is one of a small group of medical interventions with direct and simultaneous benefits to individuals and communities. Sustained person-to-person disease transmission is more difficult in populations with large numbers of immune persons. The more vaccinated individuals there are in a community, the less likely susceptible persons are to be exposed to the disease, which translates into protection known as herd immunity. This concept is only applicable to diseases which are spread person-to-person, including diphtheria and pertussis.

A combined vaccine for diphtheria, tetanus, and pertussis (DTP) has been commonly used since the 1940s. The diphtheria and tetanus components are actually toxoids, which provide protection against the toxins produced by the bacteria rather than the bacteria itself. In contrast, the pertussis component provides protection against the actual bacteria. Initially, a whole-cell pertussis component was used in this vaccine; however, concerns over adverse events led to the development of an acellular pertussis vaccine in the early 1990s. The acellular vaccine contains specific antigens, rather than the whole bacteria and has been associated with fewer local, systemic, and other serious adverse events. The DTaP combines the acellular pertussis vaccine with vaccines for diphtheria and tetanus and was first licensed in 1991. There are currently four combination vaccines used to prevent diphtheria, tetanus, and pertussis: DTaP, Tdap, DT, and Td as discussed below.

DTaP and DT are given to children younger than seven years of age. Children need five doses of DTaP for maximum protection. The first three shots are given at two, four, and six months of age. Boosters should be administered at 15 to 18 months and 4 to 6 years of age. DT does not contain the pertussis component and is used on children who cannot tolerate the pertussis vaccine. There are many more contraindications for the pertussis component of any of the combined vaccines. That is because the pertussis component is an acellular vaccine, not a toxoid like the tetanus and diphtheria portions. Contraindications for pertussis vaccine include moderate to severe illness and the time of injection among a long list of others. However, the only contraindications for tetanus and diphtheria are previous allergic reactions to components of the vaccine.

Protection provided by these vaccines is very high; 95% of children are protected from diphtheria, 80% to 85% from pertussis, and nearly 100% from tetanus when the vaccine is given according to schedule. Immunity wanes over time, however, and boosters are recommended every 10 years. Td is similar to DT, but has a lower concentration of the diphtheria component, and is used for routine 10 year boosters. Tdap, licensed in 2005, is the first vaccine with a pertussis component to be licensed in the United States for older children and adults. A single dose is recommended for adolescents aged 11 or 12 years, or in place of one Td dose in a series, or one booster in older adolescents and adults aged 19-64 years.

The 2007 National Immunization Survey found that 92.6% of children aged 19 to 35 months nationwide had four or more doses of the DTP/DT/DTaP vaccine. The same survey of children immunized by public and private providers estimated coverage (four or more doses of DTP/DT/DTaP) in Miami to be 86.0% and 84.9% in the rest of Florida, for a statewide average of 85.0%.

Epidemiology in Florida

Recently, Rousch, et al. published a compilation of VPD morbidity and mortality data for the United States. This article provided the basis for completing a similar summary of Florida data. The following tables and charts have been compiled from surveillance data collected in Florida over the past 73 years to quantify and visually assess the impact that vaccination practices have had on the burden of disease in this state.

Table 1 depicts the decline in the number of diphtheria, tetanus, and pertussis cases and deaths after widespread use of vaccination. While comparing the number of diphtheria, tetanus, and pertussis cases in 2007 to the number of cases in 1934 is certainly meaningful, this may not be a fair comparison due to the drastic change in Florida's population over time. Florida's population has grown from just under 1.6 million residents in 1934 to over 18.5 million in 2005; a larger population would be expected to have a larger number of cases, all else being equal. To address

this, the 2007 population (18,762,014 residents) was used to estimate the number of cases that would have been reported for each year, had the population size been comparable to the 2007 population. This standardized estimate was calculated by dividing the 2007 population by the population for a given historical year to get a population ratio. The number of cases reported for that given year was multiplied by the population ratio. For example, the 2007 population was 10.1 times the population in 1939 (1,853,660 residents). The number of cases reported in 1939 was multiplied by 10.1 to estimate the number of cases that would have been reported in 1939 if the 1939 population was equal in size to the 2007 population. Table 2 presents a summary of these standardized estimates of select vaccine-preventable disease cases occurring in census years for 1940 to 2000. These standardized estimations are represented in Charts 1-3 as a dashed line. The actual number of cases reported for each year is represented in the charts as a solid line. Note that as the population size approaches the 2007 value, the dashed line and the solid line converge.

When calculating estimates of case or death counts for a disease to adjust for an increase in population over time, it is important to consider advances in medicine that have occurred over the same time. For example, case-fatality rates from diphtheria, tetanus, and pertussis might be lower today than they were in the early 1900s because of better health status of the population and better medical care. For some diseases, such as diphtheria and pertussis, there might be fewer cases today than in the past, even without a vaccine, due to the availability of treatment and/or prophylaxis.

Thanks to vaccines, diphtheria, tetanus, and pertussis cases have become less common in Florida. However, Florida is experiencing an increase in pertussis cases, with 314 confirmed and probable cases reported, in 2008, compared to only 208 cases in 2005. Pertussis rates for these years are 1.15 cases per 100,000 in 2005, and 1.66 cases per 100,000 in 2008. These cases highlight the importance of achieving and maintaining high vaccination coverage for all vaccine-preventable diseases.

Table 1: Average Diphtheria, Tetanus, and Pertussis Cases and Deaths Pre-Vaccine Compared to Post-Vaccine (2007) in Florida

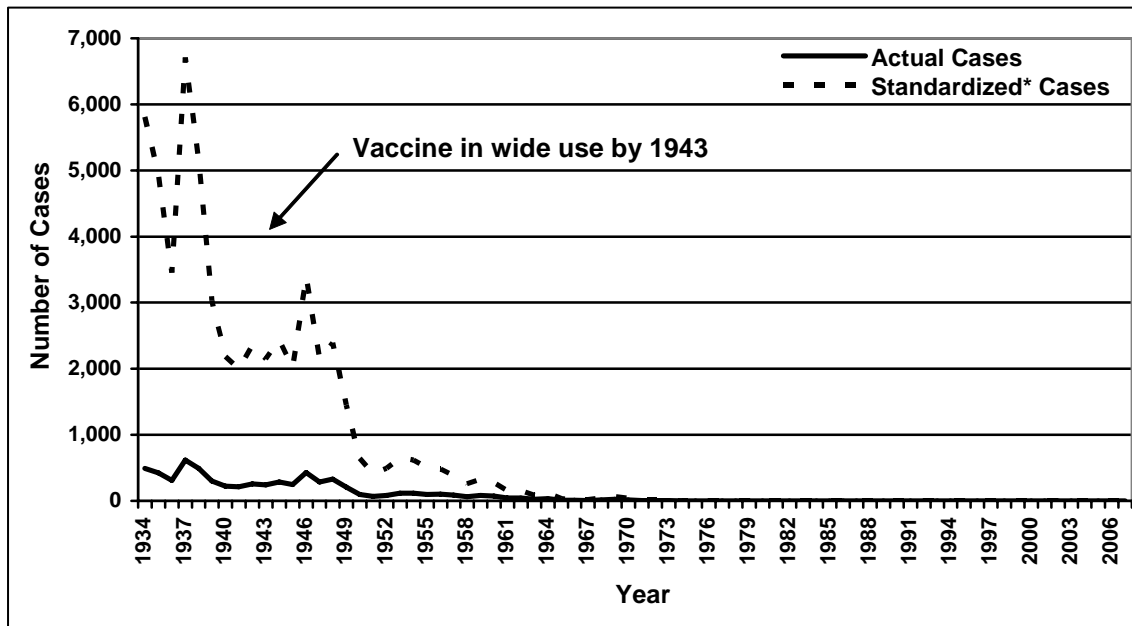
Disease (Pre-Vaccine Years Averaged)	Pre-Vaccine		Year Vaccine in Wide Use	Post-Vaccine (2007)	
	Cases/ Year	Deaths/ Year		Cases	Deaths
Diphtheria (1936-1945)	319	36	1943	0	0
Tetanus (1947-1949)	57	37	1949	5	1
Pertussis (1934-1943)	723	58	1941	211	0

Table 2. Summary of Standardized Estimates* of Diphtheria, Tetanus, and Pertussis Cases Occurring in Census Years 1940 through 2000

Year	Diphtheria	Tetanus	Pertussis
1940	2,185	167	3,752
1950	645	286	3,133
1960	274	105	1,587
1970	38	44	260
1980	0	8	130
1990	1	9	84
2000	0	1	78

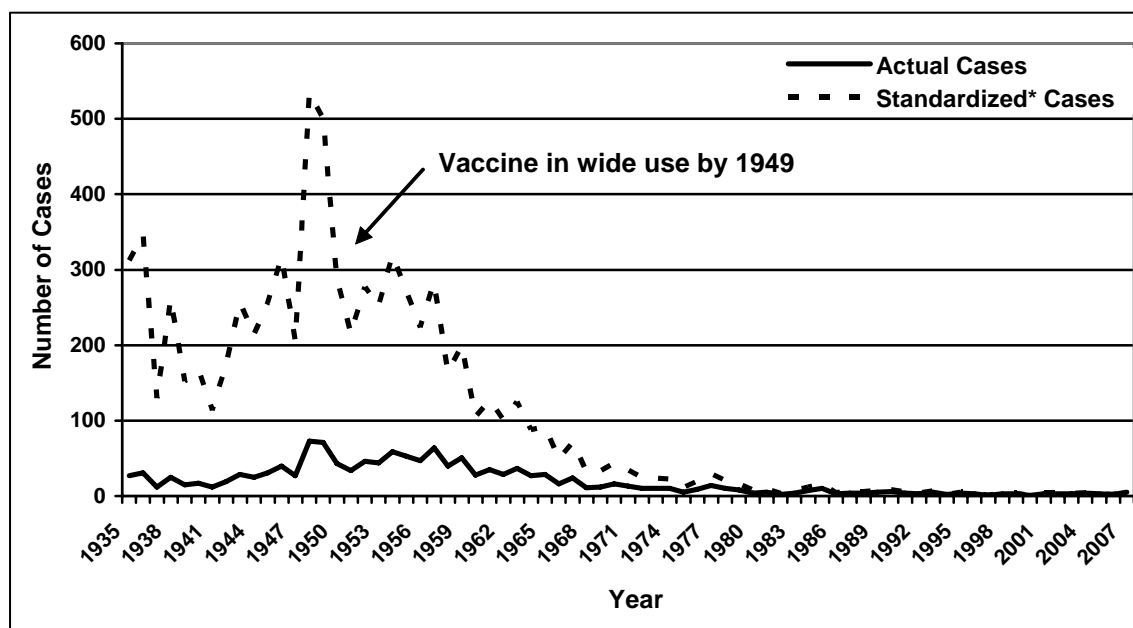
*Number of cases that would have occurred in Florida each year if Florida had a population of 18,762,014 (see text for further explanation).

Chart 1: Reported and Standardized* Diphtheria Cases in Florida, 1934-2007



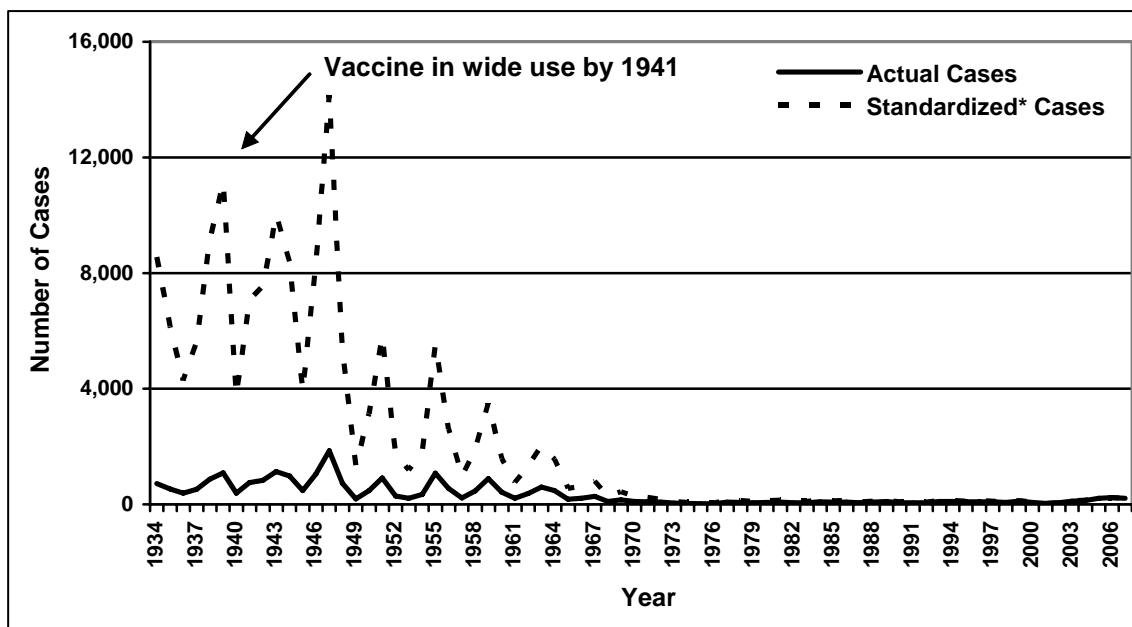
*Number of cases that would have occurred in Florida each year if Florida had a population of 18,762,014 (see text for further explanation).

Chart 2: Reported and Standardized* Tetanus Cases in Florida, 1935-2007



*Number of cases that would have occurred in Florida each year if Florida had a population of 18,762,014 (see text for further explanation).

Chart 3: Reported and Standardized* Pertussis Cases in Florida, 1937-2007



*Number of cases that would have occurred in Florida each year if Florida had a population of 18,762,014 (see text for further explanation).

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Rousch SW, Murphy TV, and the Vaccine-Preventable Disease Table Working Group. Comparisons of Morbidity and Mortality for Vaccine-Preventable Diseases in the United States. *JAMA*. 2007; 298(18): 2155-2163.

Additional Resources

Bureau of Immunization website: www.immunizeflorida.com

Bureau of Epidemiology, Annual Morbidity Statistics Reports: http://www.doh.state.fl.us/disease_ctrl/epi/Morbidity_Report/amr.html

Centers for Disease Control and Prevention (CDC) websites:

Diphtheria

http://www.cdc.gov/ncidod/diseases/submenus/sub_diphtheria.htm

Diphtheria Vaccination

<http://www.cdc.gov/vaccines/vpd-vac/diphtheria/default.htm>

Tetanus

http://www.cdc.gov/ncidod/diseases/submenus/sub_tetanus.htm

Tetanus Vaccination

<http://www.cdc.gov/vaccines/vpd-vac/tetanus/default.htm>

Pertussis

<http://www.cdc.gov/vaccines/vpd-vac/pertussis/default.htm>

Kate Goodin and Leah Eisenstein are surveillance epidemiologists, Brian Fox is an administrative assistant and Janet J. Hamilton is the Surveillance Section Administrator in the Bureau of Epidemiology, Florida Department of Health.

Syndromic Patterns Among Miami-Dade Visitors, 2007

Rene Borroto-Ponce, B.A.

Background

The Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE) uses syndromic and non-traditional health information to provide an early warning of

abnormal health conditions in a community. The system integrates clinical indicators (chief complaint, discharge diagnosis) as well as non-clinical variables (patient demographics, zip code of residence, date/time of emergency department visit) as a means of identifying the anomaly as close to the time of the onset of symptoms as possible (1).

The Office of Epidemiology and Disease Control (OEDC) at Miami-Dade County Health Department (CHD) uses ESSENCE for situational awareness and early detection of disease outbreaks. In 2007, 4% of all patients who visited emergency departments (ED) of the 14 hospitals located in Miami-Dade County that fed data into ESSENCE were residents of territories outside Miami-Dade and its two neighbors, Broward and Monroe counties. Nearly half (48%) visited just two of the 14 hospitals. Little is known, however, about the syndromic patterns of these patients, even though they could potentially introduce diseases or strains of micro-organisms circulating in their regions of residence.

Objective

The objective is to identify syndromic patterns among patients who reside outside Miami-Dade County and visited EDs of two hospitals that had the highest number of these patients during 2007. The purpose is to integrate this knowledge into the growing use of syndromic surveillance as an early-warning public health tool.

Methods

The limiting area for the analysis was composed of Miami-Dade County and its neighboring counties of Broward and Monroe. Patients who live outside this area and who attended the two hospital EDs were included in the study and are hereafter referred to as "visitors." Patients who went to these hospitals and reside in Miami-Dade County are identified as "locals."

ED patients who reside in neighboring Broward and Monroe counties were not included in the analysis because their syndromic patterns and choice of ED facilities are closer to those of a local than to the patterns and choices of a visitor.

Intra-hospital proportions of ED visitors were calculated by syndrome for both the entire year 2007 and during the occurrence of red alerts in 2007. A red alert is flagged in ESSENCE when the count of ED visitors with a specific syndrome is 3 standard deviations or higher than the mean count of ED visitors during the previous 28 days. Syndromes analyzed were gastrointestinal (GI), respiratory, fever, influenza-like illness (ILI), rash, and injury. Other syndromes recorded in ESSENCE were excluded from the analysis, due to their relatively low sensitivity/specificity.

ED patients whose zip code was coded 00007 (homeless people) were considered to be locals. Zip codes that were left blank, were incomplete, were not available (99999), or had a license plate code were removed from the analysis. This amounted to 3.5% of all ED visitors and 0.14% of all ED patients in 2007.

SAS 9.1 and EpiInfo 3.3.2 were used for data processing and analysis. Chi-square statistics were calculated to test whether the difference of proportions between visitors and locals in terms of age, gender, and season were due to chance. The same statistics were also calculated to test whether the differences in syndromic patterns between the two hospitals (coded A and B) were due to chance. The proportion of visitors who made visits to each hospital ED during days of red alerts was compared to the countywide proportion of visitors during the same time frame by syndrome. Chi-square statistics were also used to test whether the differences between each pair of proportions were due to chance.

Results

Countywide Demographic Analysis

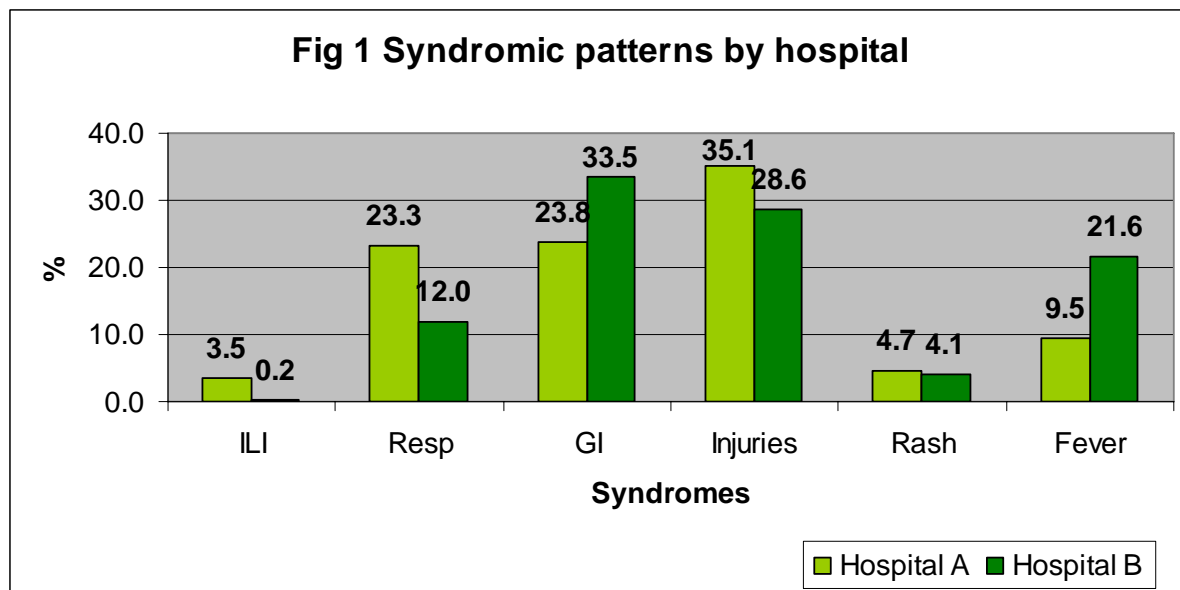
In 2007, 32,841 visitors attended EDs of the 14 hospitals reporting to ESSENCE. The majority of patients, whether visitors or locals, were in the 18 to 64 age group, though the proportion in this age group among visitors (79.7%) was higher than among locals (52.2%). The opposite pattern was observed among children age birth to four years, five to 17 years, as well as adults 65+ years old (chi-square = 28.31, d.f. = 3, $p < .001$).

There was a majority of males among visitors (56.6%), while there was a majority of females among locals (54.5%) (chi-square = 4.6, d.f. = 1, $p < .05$). For the quarterly patterns, 29% of visitors went to EDs during the first quarter of the year as opposed to 25.7% among locals. The third quarter had the lowest percentages, 22.6% among visitors and 24.2% for locals (chi-square = 0.6, d.f. = 3, $p > .05$).

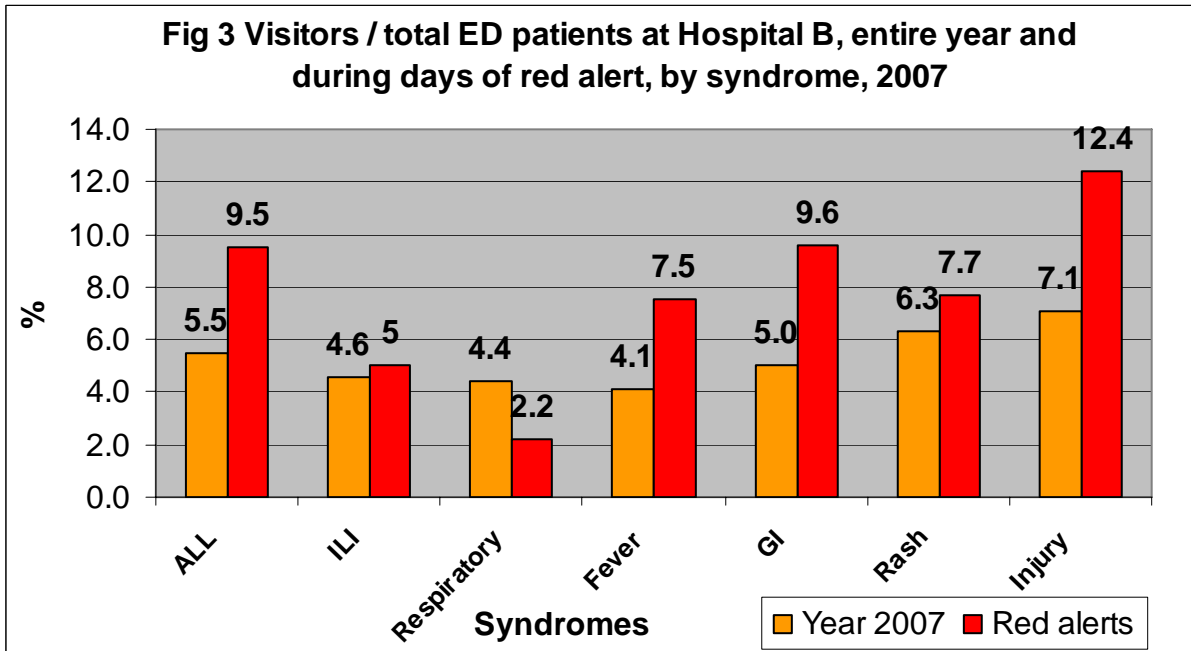
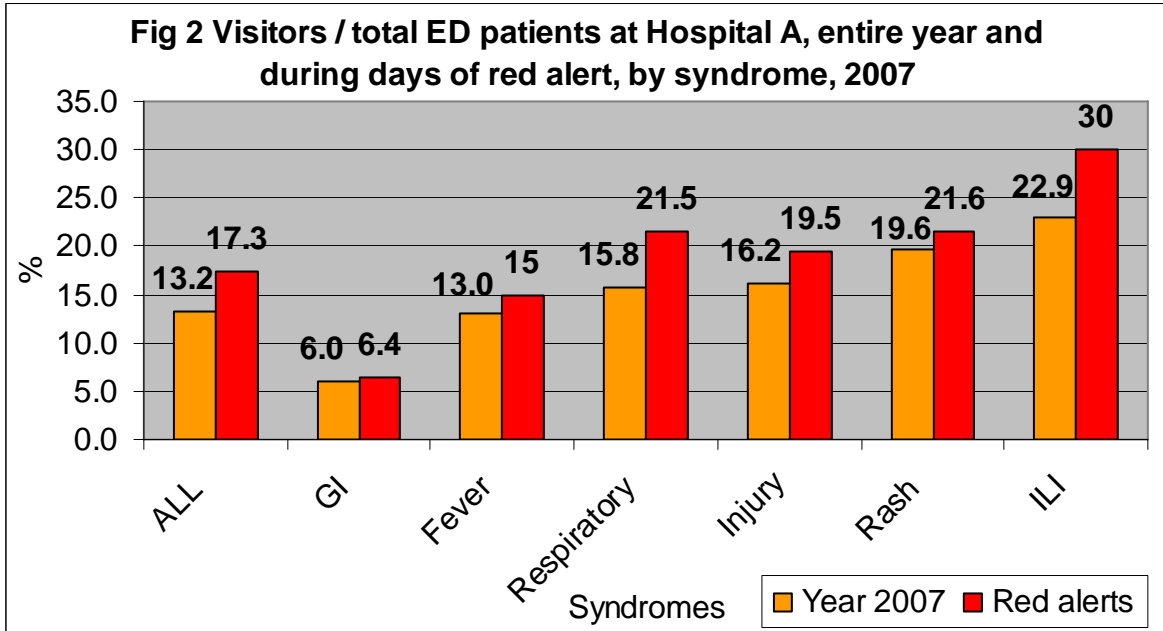
Comparison of Hospitals A and B

Hospital A had 6,240 visitors at the ED, which accounted for 13.2% of the overall count of patients that received care in that ED. For Hospital B, 9,524 patients, 5.5% of its total ED patients, were visitors.

Injury, GI, respiratory, and fever syndromes accounted for the vast majority of visitors who attended the two sampled hospital EDs. However, the syndromic patterns of these hospitals differed (chi-square = 65.1, d.f. = 5, $p < .005$), particularly due to the higher proportion of ED patients with respiratory, ILI, and injury syndromes in Hospital A and with GI and fever syndromes in Hospital B (Figure 1).



During red alerts, the relative proportion of visitors went up in both hospitals across all syndromes, with the exception of the respiratory syndrome in Hospital B (Figures 2 and 3). The red alert spikes were most notable among visitors with ILI and respiratory syndrome at Hospital A and among visitors with GI syndromes at Hospital B.



During red alerts, the proportion of visitors who went to the ED of Hospital A was higher than the proportion of visitors to the other 13 hospitals, with statistical significance across all syndromes except GI (Table 1). For Hospital B, the ILL, respiratory, and injury syndromes did not achieve statistical significance (Table 2).

Table 1. Proportion of Visitors (During Red Alerts) Among Those who Attended the ED of Hospital A in Comparison to the Other 13 Hospitals Included in ESSENCE

Syndrome	Hospital A (%)	County (ex-Hospital A) (%)	Statistical Significance
ILI	30	3.5	.000001
Respiratory	21.5	3.8	.0001
Gastrointestinal	6.4	3.4	.12
Fever	15	4	.0001
Rash	21.6	3.5	.00007
Injury	19.5	14.8	.04

Table 2. Proportion of Visitors (During Red Alerts) Among Those who Attended the ED of Hospital B in Comparison to the Other 13 Hospitals Included in ESSENCE

Syndrome	Hospital B (%)	County (ex-Hospital B) (%)	Statistical Significance
ILI	5	4.2	.57
Respiratory	2.2	4.8	.98
Gastrointestinal	9.6	2.6	.0001
Fever	7.5	3.4	.0001
Rash	7.7	3.5	.01
Injury	12.4	15.8	.84

Discussion

Red alerts in both hospitals appear to have been augmented by patients who live outside Miami-Dade and its two neighboring counties. What proportion were ill due to exposure to pathogens prior to, rather than after, arrival in Miami-Dade County is difficult to ascertain, because ED data is based on the chief complaint before a laboratory-confirmed diagnosis is obtained. However, this analysis suggests that in a pandemic scenario, ill visitors from other regions could be tracked using the ED-based data of ESSENCE. This could be important during an influenza pandemic, as the onset of symptoms may occur after the patient arrives in Miami, assuming a one to four day incubation period.

The ILI and respiratory syndromes displayed a stark contrast when comparing the two hospitals during red alerts, with both syndromes achieving statistical significance in Hospital A, while the opposite pattern was noted in Hospital B. This suggests that data from Hospital A should be prioritized to track and analyze respiratory conditions or the micro-organisms that cause them (including, a potential pandemic influenza strain) among visitors. Conversely, Hospital B should be prioritized to track and analyze visitors with GI syndrome.

During the celebration of the Super Bowl in February 2007, the OEDC used this data for monitoring purposes by focusing on ED patients coming from the states hosting the two competing teams (2). Cluster analysis by chief complaint, zip code of residence, hospital, race/ethnicity, and time of visit is currently performed at the OEDC on a daily basis, focusing on patients who live in Miami-Dade County. This analysis could also be expanded in the future to include ED patients from other areas in the United States as well as patients who live abroad. This would help identify possible disease outbreaks among visitors before they are transmitted to

locals, or early in the process, thus helping the ensuing case management or outbreak investigations conducted by the OEDC.

During red alerts, the increased number of visitors in need of health care during emergencies may overwhelm EDs, creating situations of crowding and delays in some hospitals. In these situations, the transfer of ESSENCE data from the hospital to the OEDC could shift from daily to a narrower time span, i.e. twice a day or shorter, if needed. Extracting and analyzing this data would also be helpful for surge management and situational awareness.

Limitations

An unknown number of visitors who were staying in Miami-Dade County might have visited EDs of hospitals located in neighboring territories, particularly Broward and Monroe counties. The extent of this subgroup is unknown. However, there is a high density of facilities with high-quality services in Miami-Dade County. Hence, supply-side considerations are probably not a major issue. Nearness of an ED is usually an important factor that is considered during emergencies requiring prompt care, thus discouraging traveling longer distances to out-of-county facilities.

References

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2. O'Connell E, Zhang, G, Leguen F. Mass gathering public health surveillance. Poster presentation at the Epidemiology Statewide Seminar, Florida Department of Health, 2007.

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Rene Borroto-Ponce is a biological scientist with the Miami-Dade County Health Department, Office of Epidemiology and Disease Control.

Florida Year-to-Date Mosquito-Borne Disease Summary Through January 17, 2009

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 17, the following arboviral activity was recorded in Florida: Eastern equine encephalitis virus (EEEV), West Nile virus (WNV), St. Louis encephalitis virus (SLEV), Highlands J virus (HJV), and California encephalitis group viruses (CEV).

EEEV Activity

A positive sample was obtained from an equine in Volusia County on January 3.

WNV/SLEV Activity

None

HJV activity

None

CEV activity

None

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, nine reports representing a total of 42 dead birds (23 crows, no jays, 1 raptor, and 18 others) were received from seven 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>.

Ms. Radke is the Arthropod-borne Disease Surveillance Coordinator. Dr. Weis is the CDC/CSTE Applied Epidemiology Fellow with the Bureau of Environmental Public Health Medicine. Dr. Stanek is a medical epidemiologist with the Bureau of Environmental Public Health Medicine. Dr. Blackmore is the State Public Health Veterinarian and the Chief of the Bureau of Environmental Public Health Medicine. The Bureau of Environmental Public Health Medicine is part of the Division of Environmental Health, DOH.

Florida Influenza Surveillance Report

Kateesha McConnell, M.P.H.

Influenza surveillance in Florida consists of seven surveillance components: 1) Florida Sentinel Provider Influenza Surveillance Network (FSPISN); 2) Florida Pneumonia and Influenza Mortality Surveillance System; 3) State laboratory viral surveillance; 4) County influenza activity levels; 5) Notifiable Disease Reports 6) Influenza or influenza-like illness (ILI) outbreaks and 7) Syndromic Surveillance.

Syndromic surveillance ILI data as monitored through the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) is a newly added component of the overall state influenza surveillance program. Each week, a graph of the percentage of ILI visits to participating emergency departments will be available in the weekly influenza surveillance report. This added information will provide an additional source of data to monitor ILI activity in the state.

For the most up to date information regarding influenza surveillance and the progress of influenza season in Florida please visit the Bureau of Epidemiology influenza surveillance reports website at:

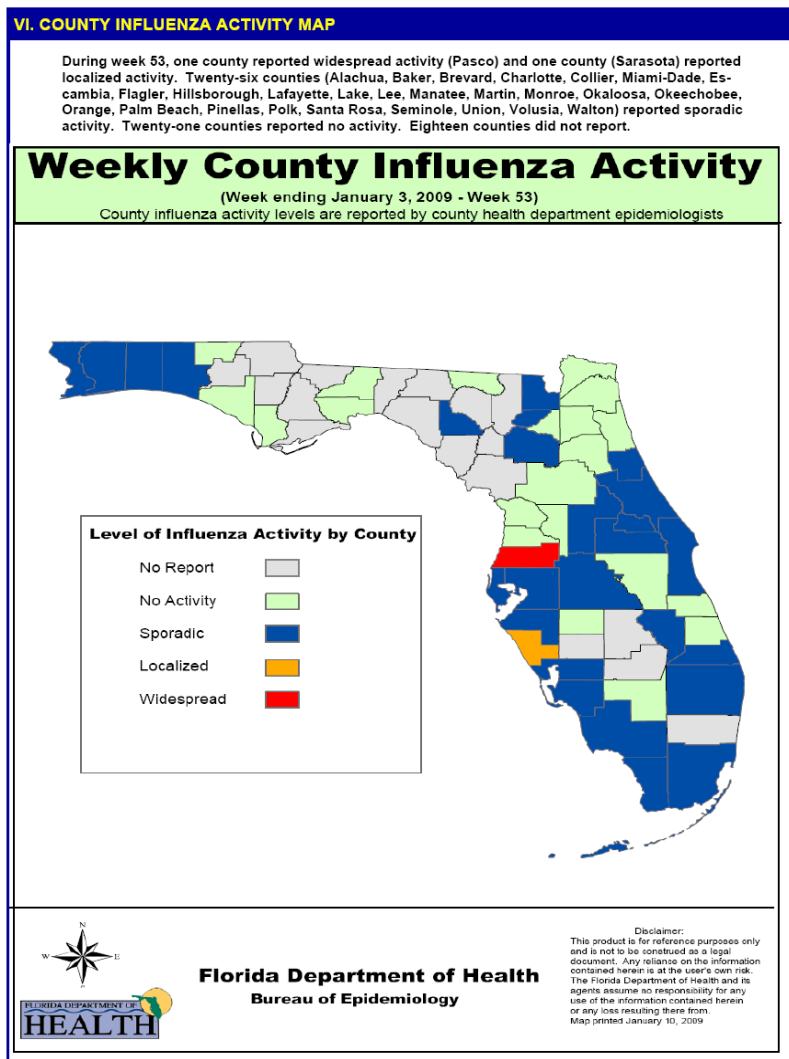
http://www.doh.state.fl.us/disease_ctrl/epi/htopics/flu/reports.htm.

During weeks 50-53 of the 2008-2009 influenza season, statewide influenza activity was reported as localized according to the national CDC influenza activity criteria. The proportion of patient visits for ILI as reported by the FSPISN averaged 1.32% for these four weeks which is below the state threshold for moderate activity of 2.98%. There have been no isolated ILI outbreaks noted in Florida so far this season. Influenza activity across the nation has also been low during this same time period. Nationally, most of the viruses characterized this season have been related to

the strains found in the 2008-2009 vaccine. However, in Florida, influenza B Malaysia (not a component of this season's vaccine) is the predominant strain of influenza in the state. Antiviral resistant influenza A (H1N1) viruses have also been detected in a small number of samples submitted by various states and analyzed by the CDC laboratory. For more information please visit: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5749a3.htm>

Florida Bureau of Laboratories has tested a total of 181 specimens for influenza viruses since September 28, 2008. Fifty-one (28%) of the specimens have tested positive for influenza. They include 12 influenza A H1, four influenza A, and 35 influenza B. Although influenza A is typically more commonly isolated than influenza B, so far this season influenza B has been the predominant isolated type. During week 53, one county reported widespread activity and one county reported localized activity. Twenty-six counties reported sporadic activity and 21 counties reported no activity. Eighteen counties did not report.

Overall, the flu season in Florida is progressing normally. Thank you to all of our surveillance partners for their continuous surveillance efforts which enables us to accurately monitor influenza activity in the state. The peak of influenza season is usually around February, so now is an excellent time to protect yourself and your family from the flu. Get your flu shot today!



For more information please visit: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5749a3.htm>

Kateesha A. McConnell is the respiratory disease surveillance epidemiologist in the Bureau of Epidemiology.

Recently Published

Watson M, Saraiya M, Benard V, Coughlin S, Flowers L, Cokkinides V, Schwenn M, Huang Y, Giuliano A,: Burden of Cervical Cancer in the United States, 1998-2003. Cancer (Supplement) Nov 15, 2008, 113(10): 2588-64.

Nieder AM, MacKinnon JA, Huang Y, Fleming LE, Koniaris LG, Lee DJ: Florida Bladder Cancer Trends 1981-2004: Minimal progress in the reduction of advanced disease. J Urol. 2008;179(2): 491-5; discussion 495. 2008.

Upcoming Events

Bureau of Epidemiology Monthly Grand Rounds

Date: Last Tuesday of each month (except March)

Time: 10 a.m.-11 a.m.

Location: Building 2585, Room 310A

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

Upcoming Topics:

- February 24 - "Epidemiology and Environmental Health Strike Team Exercise Overview," presented by Lauren Ball, D.O., M.P.H.
- March 24 – “Comprehensive Review of Salmonellosis in Florida” presented by Leah Eisenstein, MPH

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, December 1-31, 2008

Disease Category	Month				Cumulative (YTD)	
	2008	2007	Mean [†]	Median [‡]	2008	2007
A. Vaccine Preventable Diseases						
Diphtheria	0	0	0	0	0	0
Measles	2	0	0.0	0	2	5
Mumps	5	4	2.2	3	30	21
Pertussis	42	8	15.4	10	314	211
Poliomyelitis	0	0	0	0	0	0
Rubella	0	0	0	0	3	0
Smallpox	0	0	0	0	0	0
Tetanus	1	0	0.2	1	2	5
Varicella	221	144	38.6	97	1,738	1,321
B. CNS Diseases & Bacteremias						
Creutzfeldt-Jakob Disease	3	1	2.8	2	30	12
<i>H. Influenzae</i> (invasive)	20	9	8.8	4	154	114
in those ≤5	5	11	7.8	9	59	74
Listeriosis	5	6	5.4	6	49	30
Meningitis (bacterial, cryptococcal, mycotic)	21	14	20.6	13	200	135
Meningococcal Disease	2	6	7.8	8	54	67
<i>Staphylococcus aureus</i> (VISA, VRSA)	0	1	0	1	3	1
Streptococcal Disease, Group A, Invasive	22	17	27.6	30	275	309
<i>Streptococcus pneumoniae</i> (invasive disease)						
Drug resistant	119	72	78.8	74.5	789	726
Drug susceptible	124	67	75.4	68	708	622
C. Enteric Infections						
Campylobacteriosis	94	76	87.2	79	1,118	1,017
Cholera	0	0	0	0	1	0
Cryptosporidiosis	51	39	35.2	23	549	738
Cyclospora	4	0	3.0	2	59	32
<i>Escherichia coli</i> , Shiga-toxin producing (STEC)**	9	2	11.2	3	54	37
Giardiasis	167	82	105.4	99	1,392	1,268
Hemolytic Uremic Syndrome	1	0	0.4	1	5	6
Salmonellosis	492	472	497.6	468	5,314	5,022
Shigellosis	46	225	179.8	171	801	2,288
Typhoid Fever	2	2	0.8	1	17	15
D. Viral Hepatitis						
Hepatitis A	16	15	19.4	18	168	171
Hepatitis B, Acute	42	26	49.4	45	361	368
Hepatitis C, Acute	9	1	2.8	2	61	46
Hepatitis +HBsAg in pregnant women	63	74	64.8	66	606	643
Hepatitis D, E, G	0	0	0	2	2	0

* Confirmed and probable cases based on date of report as reported in Merlin
Incidence data for 2008 is provisional, data for 2007 are finalized

† 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, December 1-31, 2008

Disease Category	Month				Cumulative (YTD)	
	2008	2007	Mean [†]	Median [‡]	2008	2007
F. Vector Borne, Zoonoses						
Dengue	7	7	4.4	6	37	46
Eastern Equine Encephalitis ^{††}	0	0	0	0	1	0
Ehrlichiosis/Anaplasmosis	4	2	1.2	3	17	21
Leptospirosis	0	1	0	1	0	1
Lyme Disease	22	3	4.4	4	153	30
Malaria	9	6	7.4	8	65	56
Plague	0	0	0	0	0	0
Psittacosis	0	0	0	0	4	0
Q Fever (acute and chronic)	0	0	0.6	2	1	2
Rabies, Animal	4	10	13.0	12	139	128
Rabies (possible exposure)	161	133	134.2	131	1,625	1,474
Rocky Mountain Spotted Fever	4	4	4.0	4	23	19
St. Louis Encephalitis ^{††}	0	0	0	0	0	0
Toxoplasmosis	5	4	3.0	5	17	9
Trichinellosis	0	0	0	0	1	0
Tularemia	0	0	0	0	0	0
Typhus Fever (epidemic and endemic)	0	0	0	1	0	1
Venezuelan Equine Encephalitis ^{††}	0	0	0	0	0	0
West Nile Virus ^{††}	2	0	1.8	9	6	3
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	0.4	2	1	1
Brucellosis	2	2	1.6	2	13	10
Glanders	0	0	0	0	0	0
Hansen's Disease (Leprosy)	0	1	1.4	4	11	10
Hantavirus Infection	0	0	0	0	0	0
Legionella	15	20	15.6	14	152	153
Melioidosis	0	0	0	0	0	0
Vibriosis	10	4	9.6	7	99	97

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

Incidence data for 2008 is provisional, data for 2007 are finalized

† 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 not only to register on the EpiCom system by emailing the Florida Department of Health Emergency Notification System Helpdesk at FDENS-help@doh.state.fl.us, but to sign up for features such as automatic notification of certain events. 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 agencies during emergency situations. Following are selected recent postings:

- Confirmed case of measles in a traveler to Sarasota County
- Outbreak of gastrointestinal illness following a church supper, Bradford County
- Suspected foodborne outbreak from a catered business party, Duval County
- Legionella positive environmental samples from a hot tub at a resort hotel, Orange County
- Varicella outbreak at a high school, Volusia County
- Cluster of rash illness at a jail, Putnam County
- Suspected norovirus in a correctional facility, Union County
- Suspected foodborne illness outbreak possibly associated with a catered lunch, Escambia County
- Mumps case, Martin County
- Bacterial meningitis in a child, Miami-Dade County
- Norovirus outbreak at a long term care facility, Seminole County
- GI outbreak in an assisted living facility, Broward County
- GI illness at a long term care facility, Brevard County
- Suspected *Salmonella* outbreak in a federal detention center, Miami-Dade County
- GI illness outbreak in a nursing home, Broward County
- National *Salmonella Typhimurium* in the news, U.S.
- Pertussis cases, Alachua County
- Suspected Ciguatera outbreak, Miami-Dade County
- Cluster of GI illness related to local restaurant, Nassau County
- Possible foodborne outbreak from a wedding reception in a hotel, Miami-Dade County
- Norovirus in a Long Term Care Facility, Palm Beach County
- Imported measles case, Polk County
- GI Illness in a Nursing Home Facility, Martin County
- Influenza-Like Illness in a Residential Facility, Duval County

For physicians and other health care providers who want more information on diagnosis and treatment of foodborne illness: *Recommendations and Reports April 16, 2004 / Vol. 53 / No. RR-4: Diagnosis and Management of Foodborne Illnesses A Primer for Physicians and Other Health Care Professionals* at <http://www.cdc.gov/mmwr/PDF/rr/rr5304.pdf>

Christie Luce is the Surveillance Systems Administrator for the Bureau of Epidemiology.

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/January2009EpiUpdate.pdf.

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

