2009 Epidemiology Annual Report: A Summary of Reportable Diseases in Seminole County

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Introduction:

This report reviews morbidity data received by the Epidemiology Program of the Seminole County Health Department (SCHD) during calendar year 2009. A comprehensive statewide morbidity report for the years 1997 through 2006 and the 2007 and 2008 annual morbidity reports are available on the Florida Department of Health website for the Bureau of Epidemiology at the following links: http://www.doh.state.fl.us/disease_ctrl/epi/Morbidity_Report/amr_1997to2006.pdf http://www.doh.state.fl.us/disease_ctrl/epi/Morbidity_Report/amr_2007.html and http://www.doh.state.fl.us/disease_ctrl/epi/Morbidity_Report/amr_2008.html.

The SCHD Epidemiology Program conducts surveillance and investigation of approximately 95 reportable diseases/conditions (excluding STDs, HIV/AIDS, and Tuberculosis); the complete list is included in Appendix 1. Clusters of any illness or outbreaks among any groups with similar signs and symptoms are also reportable, and the program conducts outbreak investigations and provides consultation for control measures in those situations. The team is comprised of two Senior Community Health Nurses, two Hepatitis Health Services Representatives, a Florida Epidemic Intelligence Service Fellow, and an Epidemiology Manager.

Surveillance of reportable diseases involves:

1. *Data collection*- Healthcare providers, laboratories, school health personnel, and other community partners are required to report cases of reportable diseases. Individuals in the community are encouraged to report outbreaks or suspicious illnesses to the health department or their healthcare provider. The Epidemiology Program is responsible for receiving and investigating these cases of reportable diseases or conditions, and for providing prevention information to clients at risk for acquiring or transmitting a communicable disease.

2. *Analysis*- The Epidemiology Program uses the state surveillance system, "Merlin", to track reportable diseases and conduct basic analyses of the data including calculating frequencies, epidemic curves, and rates. Merlin is capable of displaying the data based on selected criteria such as demographics and risk factors. State laboratories and some private laboratories are capable of electronically submitting lab results through Merlin.

3. *Dissemination of resulting information*- The Epidemiology Program regularly provides information through a variety of forums, including a monthly newsletter that is distributed to healthcare providers in the county. This newsletter contains cumulative data on reportable disease trends and highlights information from local and statewide outbreak investigations, research, and publications.

Acknowledgements

- All healthcare providers in Seminole County
- Infection Control Practitioners, Laboratories and Emergency Departments of:
  - Central Florida Regional Hospital
  - Florida Hospital Altamonte
  - South Seminole Hospital
- Influenza-Like-Illnesses (ILI) Sentinel Physicians in Seminole County
- Crossroads of Sanford
- Daycares in Seminole County
- John E. Polk Correctional Facility, Seminole County Sheriff's Office
- Rescue Outreach Mission
- Teen Challenge
- Harvest Time International
- Florida Department of Health
  - Bureau of Epidemiology
  - Bureau of Laboratories
  - Bureau of Immunization
  - Division of Environmental Health Public Health Medicine
- Seminole County Department of Public Safety –Animal Services Division
- Seminole County Department of Public Safety –Division of Emergency Management
- Seminole County Public Schools
- All other programs within the Seminole County Health Department

Data Interpretation:

The following should be considered when interpreting the data in this report:

1. Under-reporting

The number of cases of a particular disease reported to the health department may not accurately reflect the true number of cases that occurred in the community. The frequency of case reporting is dependent on:

- The patient who is ill and whether or not he/she chooses to visit a physician or otherwise report the illness. This can vary based on the severity of the illness and access to healthcare, among other factors.
- The physician who cares for the ill patient and whether or not he/she requests laboratory testing of biological samples from the patient, or otherwise reports the disease to the health department based on his/her professional judgment of the suspected agent.

2. Reporting Period

The data in this report are aggregated by the date the case was reported to the Bureau of Epidemiology for each of the years presented, beginning January 1, 2009 and ending December 31, 2009. Frequency counts include confirmed and probable cases for most diseases and suspected cases for selected diseases reported during this time. In some cases, diseases reported in 2009 may have onset dates in 2008. In other cases, disease with onset dates in 2009 may have been reported in 2010.

Although this report focuses primarily on morbidity trends for Seminole County, large recent changes in rates for certain diseases are compared to statewide trends for context. Current and historical information on other disease counts, both statewide and for each individual county, can be obtained from the public website for Merlin data at: http://www.floridacharts.com/merlin/freqrpt.asp

The 2009 case rates in this report are based on 2009 population estimates for Seminole County, and 2009 for statewide rates. Case rates for all years prior to 2009 are based on population estimates for each respective year (Appendix 2). Population estimates for other counties can be found at: http://www.floridacharts.com/FLQuery/Population/PopulationRpt.aspx

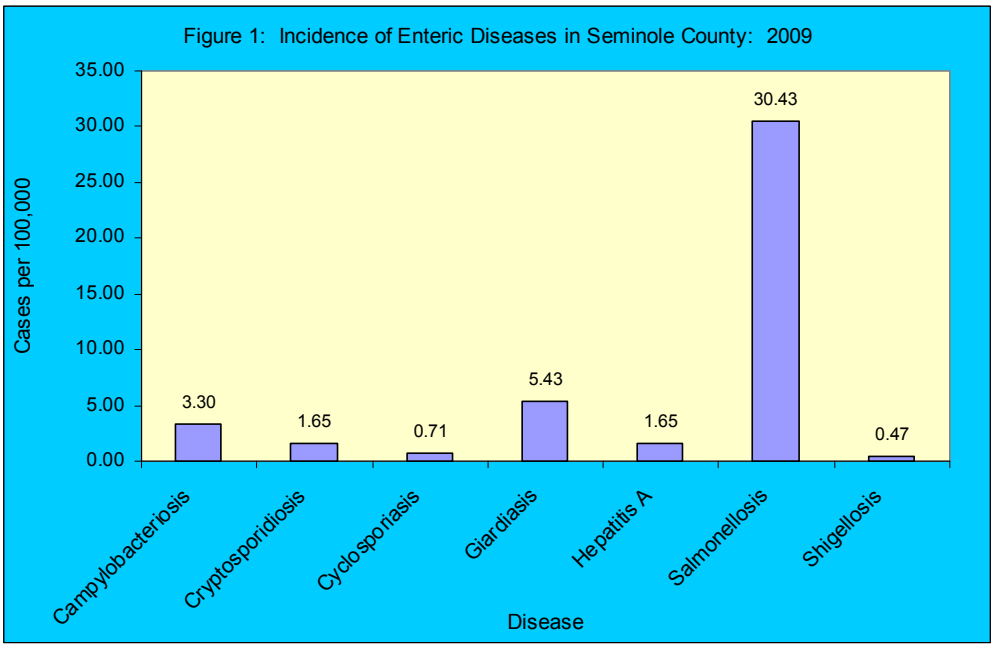
Many diseases are more likely to affect people in a certain age, gender, race or ethnic group than others, and are noted below when appropriate. A table of reported counts for all diseases by age group is included in Appendix 3. Similar tables of reported disease distribution by gender and race are included in Appendices 4 and 5. A table illustrating the top ten most frequently reported diseases by age group is listed in Appendix 6.

Case Investigations:

Hepatitis viruses and enteric diseases comprise the majority of cases reported to the SCHD in 2009. In 2009, 721 cases of reportable disease were investigated. Most of these (87%, 629/721) were confirmed and probable cases and the remainder, suspected cases (13%, 92/721). Chronic hepatitis B and C combined accounted for 38% of all cases (276/721), 2009 pandemic influenza A H1N1 20% (141/721), enteric diseases 26% (185/721), vaccine preventable diseases[1] 5% (37/721), animal bites to humans requiring rabies post exposure prophylaxis 3% (24/721), legionellosis 2% (12/721), and all other diseases 6% (46/721). Each case requires, at a minimum, contacting the patient for information regarding possible sources of exposure and any family or other close personal contacts who also may be at risk, and if necessary making further contacts with the patient's physician, the hospital, and/or the diagnostic laboratory providing the information. If the patient works for (or attends) a setting where the risk of transmitting certain diseases is high (such as restaurants, hospitals or daycares), the epidemiology staff will also contact the co-workers or fellow attendees to advise them on preventive measures and to offer prophylaxis when appropriate.

Enteric Diseases:

In 2009, there were 185 cases of enteric disease[2] in Seminole County. Confirmed and probable cases accounted for 95% (176/185) of theses cases (Figure 1). Salmonellosis was the most commonly reported enteric disease (18%, 129/721). This marks a 29% increase in case count from 2008 (89/152, 59% of enteric cases), and is significantly higher than the previous three years in 2006-2008 (87 cases). Seminole County's enteric disease rate for 2009 (30.0 cases per 100,000 population) was lower than the overall statewide rate (35.3cases per 100,000 population).

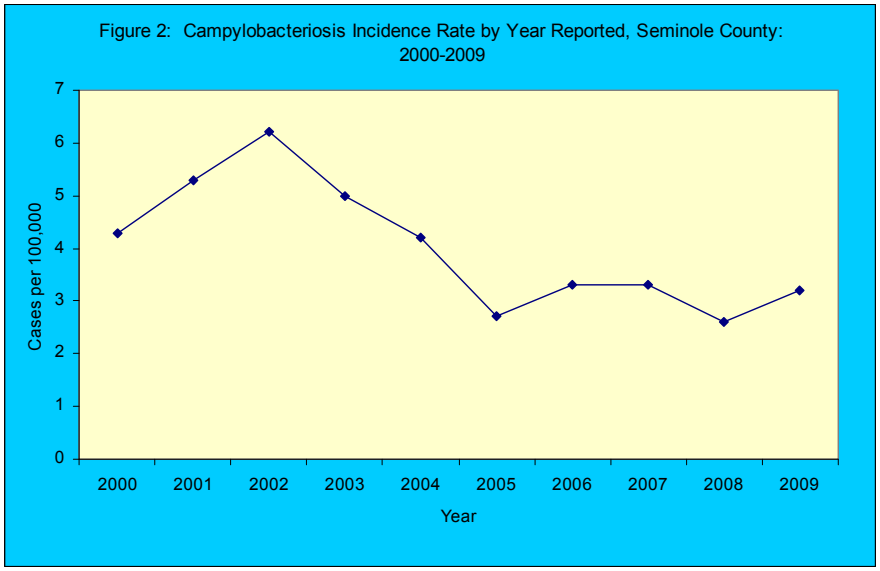


[1] **Vaccine preventable diseases reported in Seminole County 2009 include:** Acute Hepatitis A & B, influenza-associated pediatric mortality, mumps, pertussis and varicella.

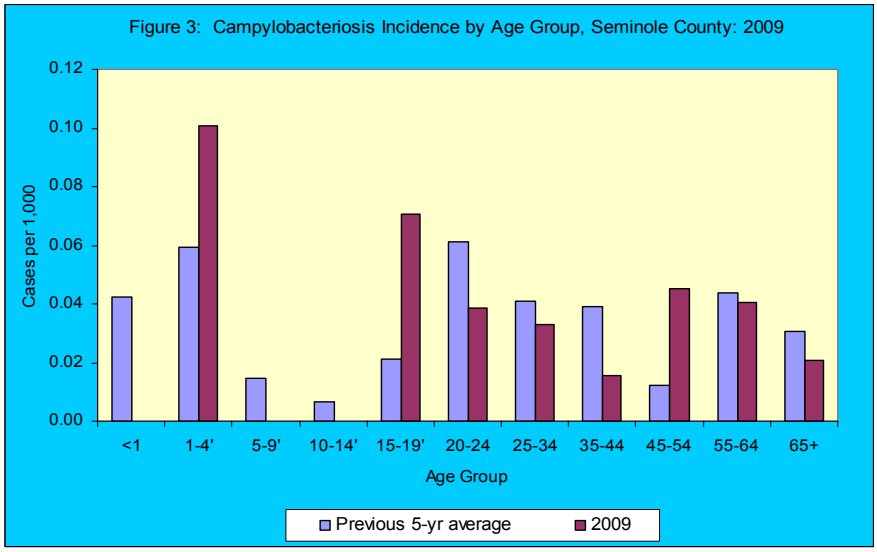
[2] **Enteric diseases reported in Seminole County in 2009 include**: campylobacteriosis, cryptosporidiosis, cyclosporiosis, giardiasis, hepatitis A, salmonellosis and shigellosis

Campylobacteriosis:

In 2009, there were 14 cases of campylobacteriosis in Seminole County with a rate of 3.2 cases per 100,000 population. This is higher than the average number of cases reported during 2006-2008 (2.6 cases/100,000 population). In 2009, the incidence was identical to the previous 5-year average[3] (3.2 cases per 100,000) (Figure 2).



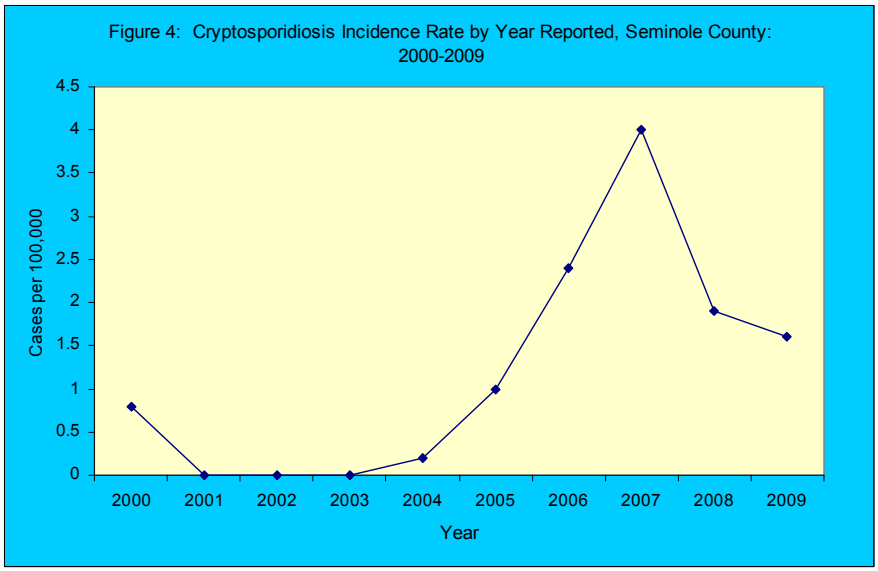
The highest incidence occurred among children 1-4 and 15-19 years of age (0.06 and 0.02 cases/1,000, respectively). When compared to the previous 5-year age distribution the highest incidence occurred among children 1-4 and adults 20-24 (Figure 3). The 2009 incidence among males (4.33 cases/100,000 population) was almost twice the amount seen among females (2.33 cases/100,000 population).



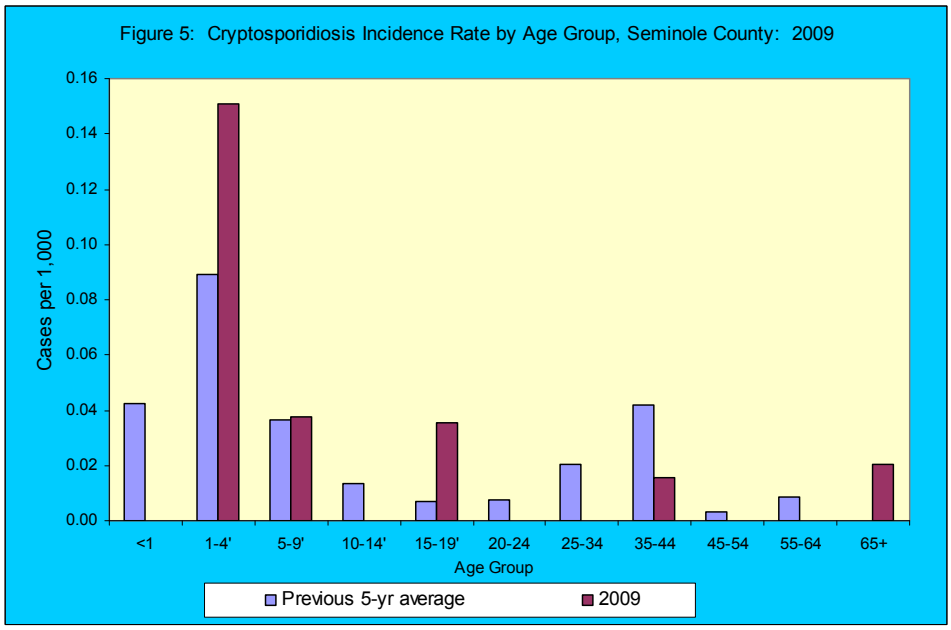
[3] "**Previous 5-year average**" here and throughout is 2004-2008

Cryptosporidiosis:

In 2009, there were 7 cases of cryptosporidiosis in Seminole County with a rate of 1.7 cases per 100,000 population. This represents an 11% decrease from 2008 (1.9 cases/100,000) and a 50% decrease from 2006 (2.4 cases/100,000 population) (Figure 4). The incidence reported in 2009 is also lower than the previous 3-year average (2.8 cases/100,000 population). There was a peak in 2006 which was largely influenced by a giardiasis and cryptosporidiosis outbreak that occurred in East Orange County.

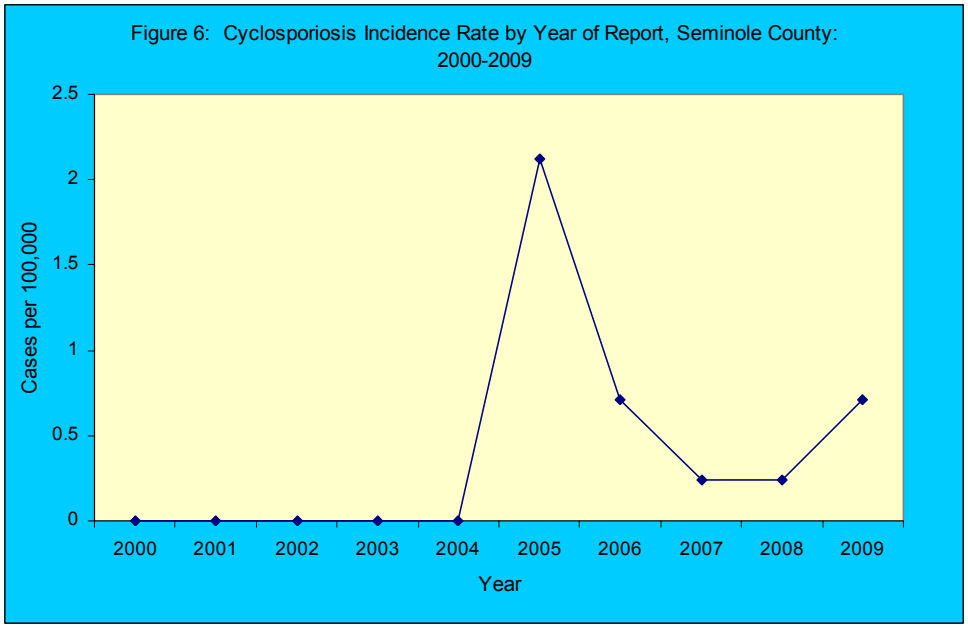


The highest incidence occurred among children age <5 years of age (0.15 cases/1,000 population). While this rate is higher than the previous 5-year average, the age distribution pattern is similar (Figure 5). The 2009 incidence was higher among females (1.86 cases/100,000 population, compared to 1.44 cases per /100,000 population for males).

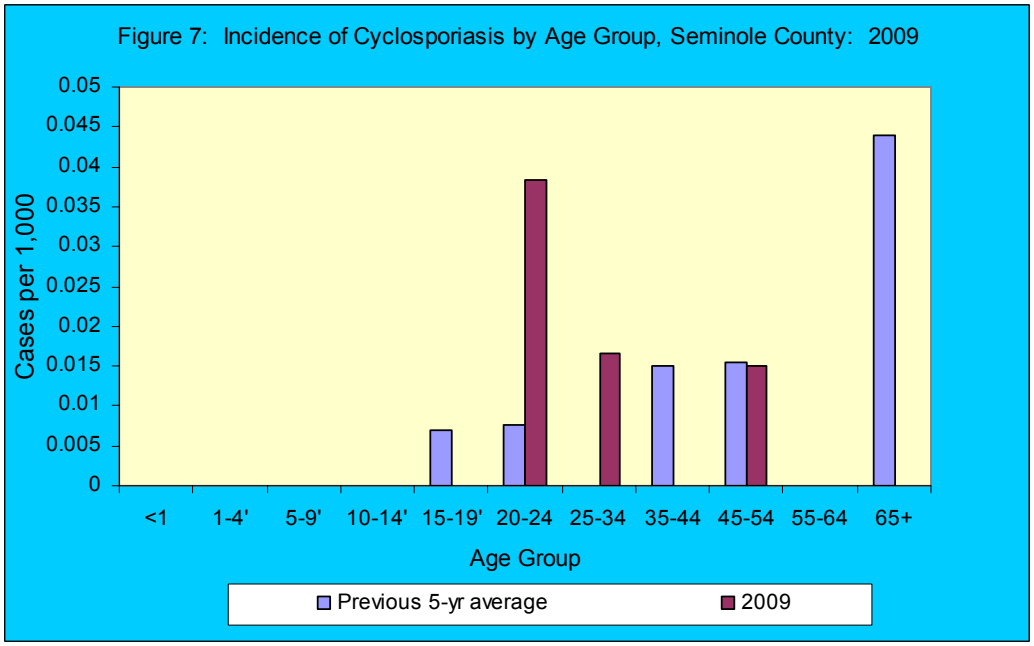


Cyclosporiasis:

In 2009, there were 3 reported cases of cyclosporiasis (0.47 cases/100,000 population). The incidence rate (Figure 6) is the same as the previous 3-year average (0.47 cases/100,000 population). The peak in 2005 represented two outbreak-associated cases.



Two cases occurred in males 21 and 34 years of age and a female 47 years of age (Figure 7). In 2009, the highest incidence occurred among adults 20-24 and 25-34. The age distribution was different from to the previous 5-year average with the highest incidence in ≥65 age group. All 2009 cases were acquired in Florida.

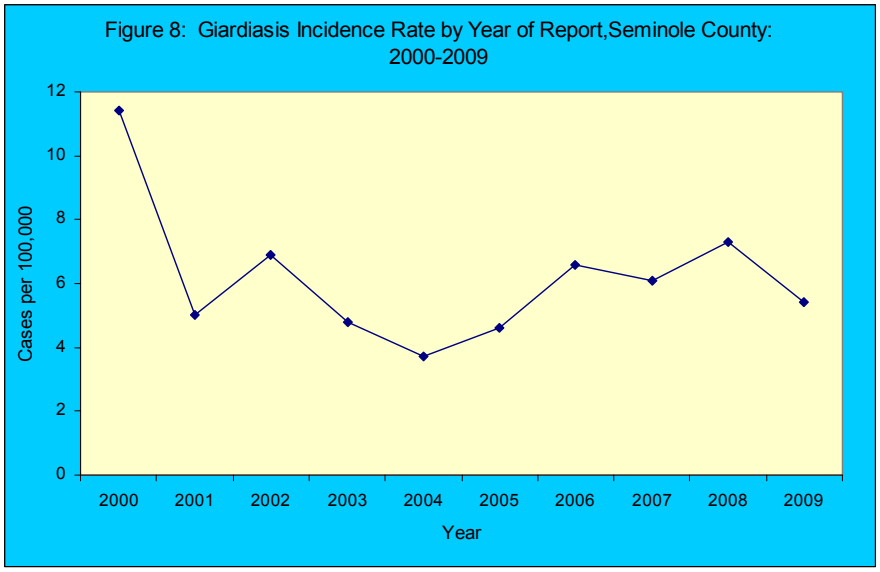


Escherichia coli 0157:H7 shiga toxin producing (STEC):

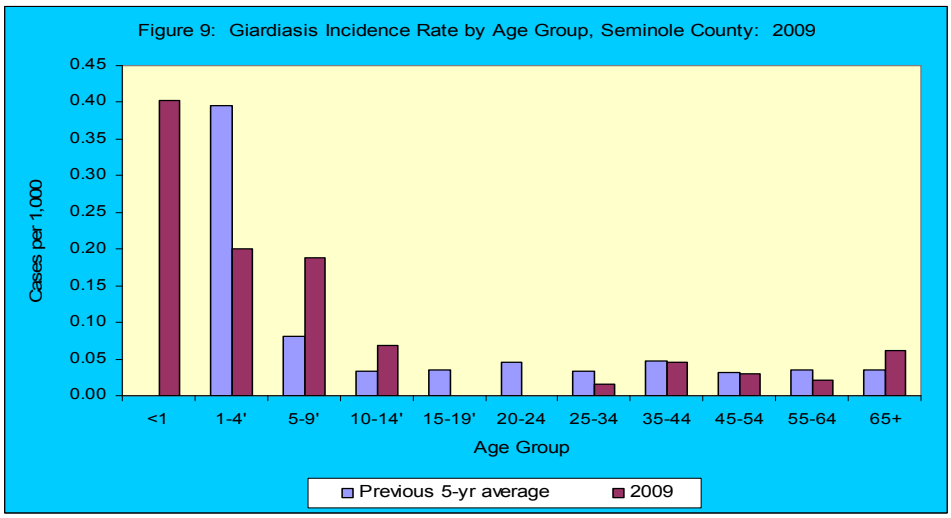
One case of *E. coli* 0157:H7 was reported in 2009 (0.23 case/100,000 population). *E.coli* O157:H7 is the most commonly identified Shiga toxin producing *Escherichia coli* in the U.S. There have been 20 reported cases within the last 10 years. These cases were due to other serogroups (O26, O111 and O103, which are the non-O157) that most often cause illness in people in the U.S. Prior to changes in reporting criteria in 2008, STEC was reported under multiple disease codes, depending in the serogroup; i.e., one reporting code captured only serogroup O157:H7nother reporting code captured known serogroups other than O157:H7. In 2008, these reporting codes were combined into one and *E.coli* O157:H7 is no longer separated from the non-O157 strains.

Giardiasis:

There were a total of 23 cases reported in Seminole County in 2009 (5.4 cases/100,000 population) (Figure 8). This was less than the 2006-2008 average of 6.6 cases/100,000 population.

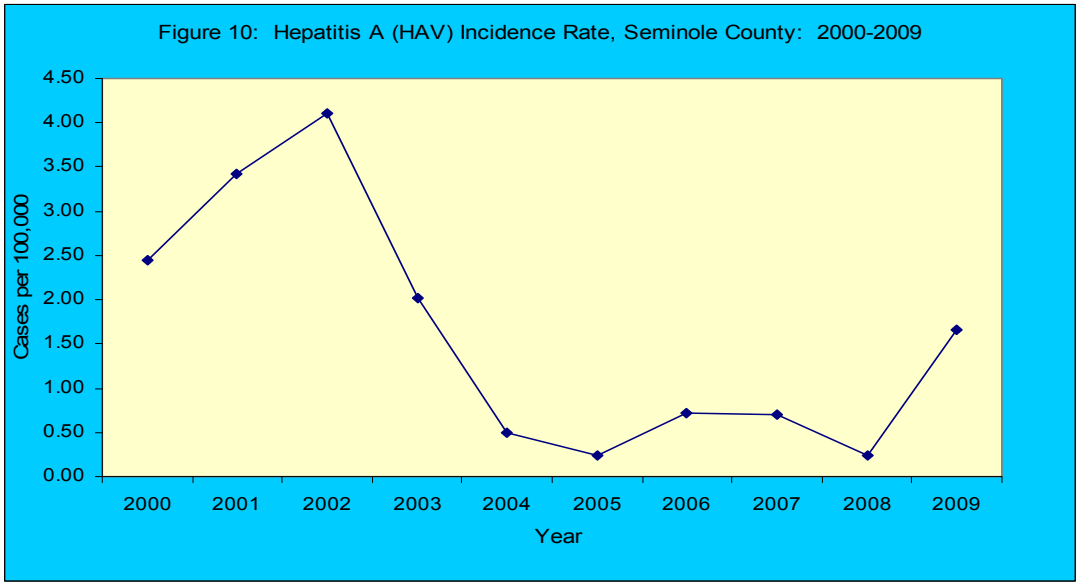


The highest incidence continues to occur in the younger age groups between ≤5 and 5-9 years of age. There were two cases reported among infants ≤ 1 year of age, an age group in which no cases had been reported within the last 5 years (Figure 9). Males were disproportionately affected by the disease at a ratio of 2:1 (7.6 cases/per 100,000 population).

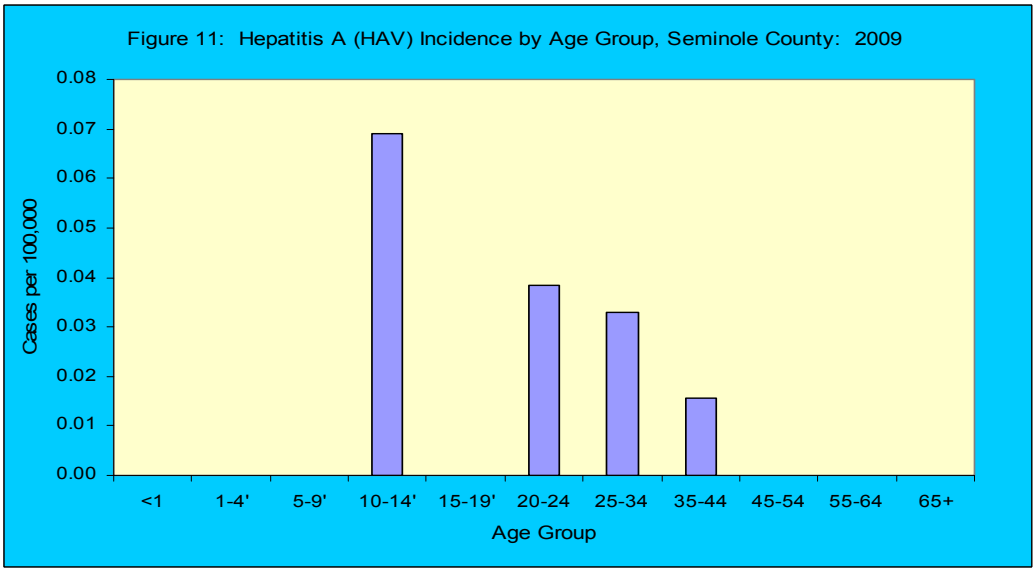


Hepatitis A:

A total of 7 cases (1.65 cases/100,000 population) were reported in Seminole County in 2009 (Figure 10). This represents a significant increase since 2008 (0.23 cases/100,000 population), and was the highest since 2003 (2.02 cases/100,000 population).



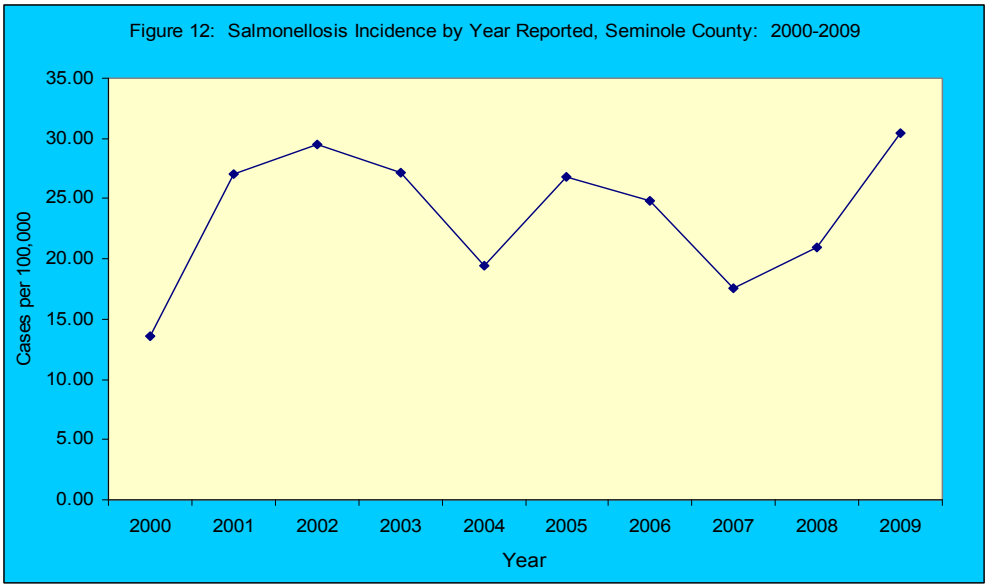
The highest incidence of hepatitis A in Seminole County in 2009 occurred among the 10-14 and 20-24 age groups (Figure 11). The incidence was highest in males (1.91 cases/100,000 population). White Hispanics accounted for the majority of cases (57%, 4/7).



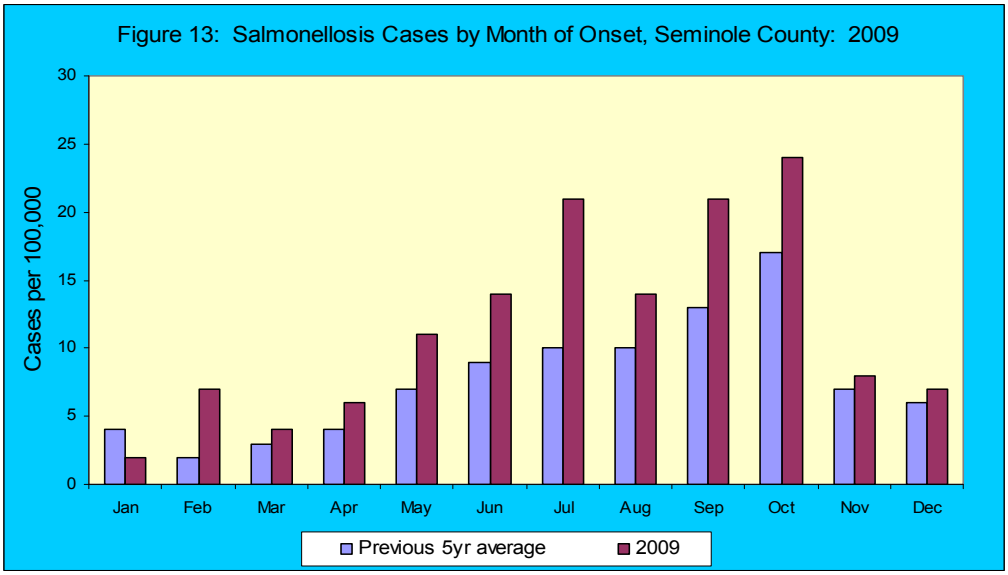
Seventy-one percent (5/7) of the cases were reported as sporadic and 28% (2/7) were outbreak-related. None of the cases were associated with sensitive occupations or settings (i.e. food handlers, daycares, waterborne or injection drug use). A significant proportion of the cases (43%, 3/7) were acquired outside of the United States.

Salmonellosis

The incidence rate for salmonellosis has fluctuated over the last ten years. A total of 129 cases were reported in 2009, all of which were classified as confirmed in 2009, for an incidence rate of 30.4 cases/100,000 population. This marks the highest reported rate within the last ten years (Figure 12).

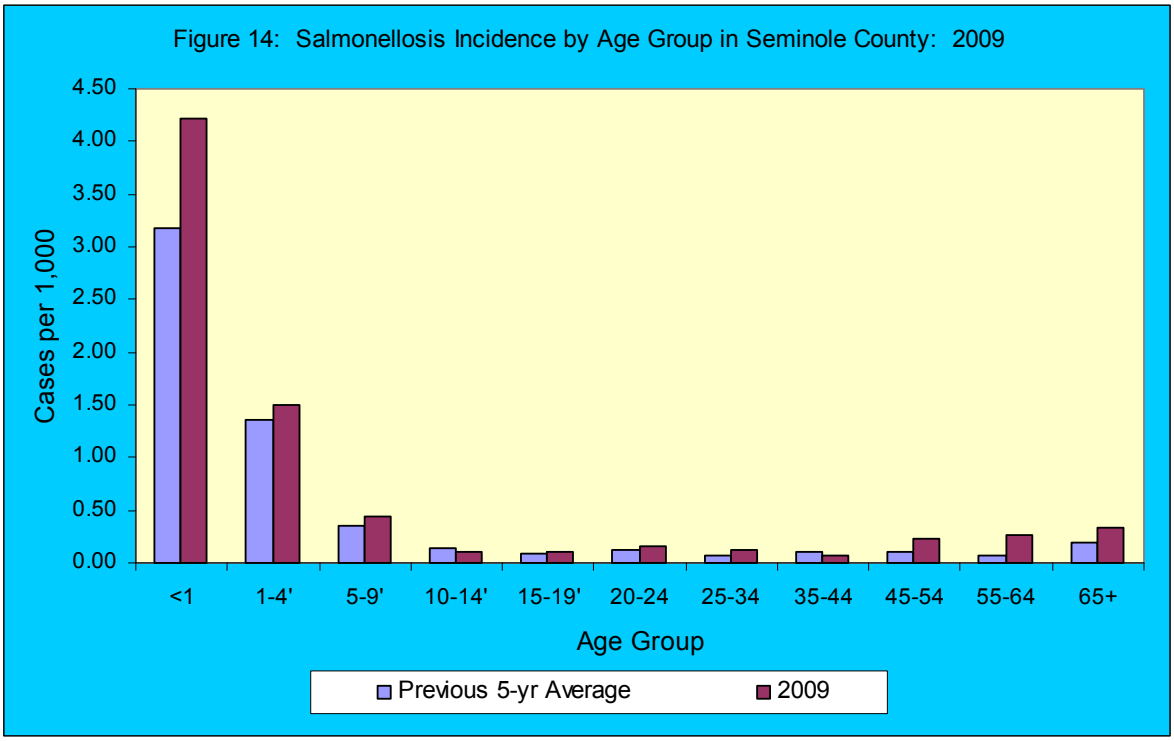


The peak seasons for the reported cases were summer and early fall. In 2009, the number of cases exceeded the previous 5-year average in all months except January (Figure 13). All cases were classified as sporadic in 2009.



The highest incidence continues to occur among children <5 years of age. In 2009, the incidence rate was substantially higher than the previous 5-year average in those <5 years of age. The rates were similarly elevated in the other age groups (Figure 14). Young children and the elderly are historically the most vulnerable groups for contracting salmonellosis. However, the risk factors that contributed to this significant increase in 2009 remains unknown. Most of the cases, 98% (126/129) occurred among

individuals employed in non-sensitive occupations[4]. A small portion (2%, 3/129) occurred among health care workers.

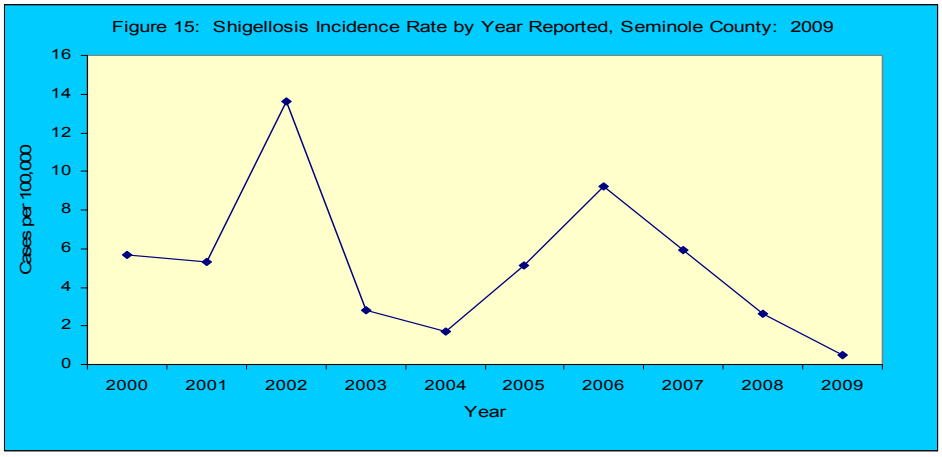


Males and females had almost similar incidence rates (0.31 and 0.30 per 100,000 respectively). The incidence was higher in Non-Whites for both males and females (0.38 and 0.35 per 1000 respectively) when compared to White males and females (0.29 per 1000 for both males and females). Non-Hispanics accounted for the largest proportion of cases (70%, 90/129), while Hispanics accounted for 22% (28/129), and ethnicity was unknown for the remaining cases (9%, 11/129). Typical sources of *Salmonella* include contaminated food (e.g., undercooked foods such as poultry, raw eggs and unpasteurized milk or orange juice, or cross-contamination during food preparation), animal contact (e.g., lizards and turtles), and poor personal hygiene. *Salmonell*a typing is occasionally done to identify circulating strains and possible sources of the bacteria. Serogroup information was available for 51% (66/129) of the cases. The most common serogroups were Group D (35%, 23/66), followed by Group B (27%, 18/66) and Group C (24%, 16/62). Other circulating strains included Group C1-C3 (6%, 4/66), Group E and Group I (2% each, 1/66) and Group Z (6%, 4/66).

[4] **Sensitive occupations** include settings such as: hospitals, day cares, nursing homes, schools, correctional facilities and other congregate settings.

Shigellosis:

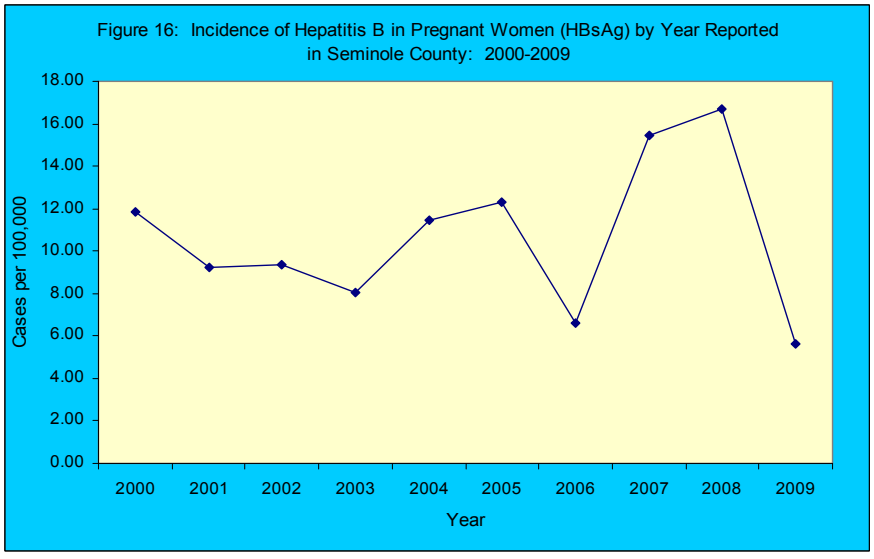
The incidence rate for shigellosis fluctuates periodically, with previous peaks in 2002 and 2006. In 2009, the incidence was 0.47cases/100,000 population; the lowest reported rate within the last 10 years (Figure 16).



Hepatitis B and C:

Hepatitis B (+HBsAg in pregnant women):

The incidence of HBsAg[5] in pregnant women in Seminole County has declined drastically since 2007, with 5 reported cases in 2009 (5.64 cases/100,000 population). This is three times lower than the rate reported in 2008 (16.69 cases/100,000 population), and is the lowest reported rate within the last ten years (Figure 16). The cases occurred in the 20-29 age groups. Asian/Pacific Islander or Other[6] ethnicity accounted for the majority of the cases reported (40% each).

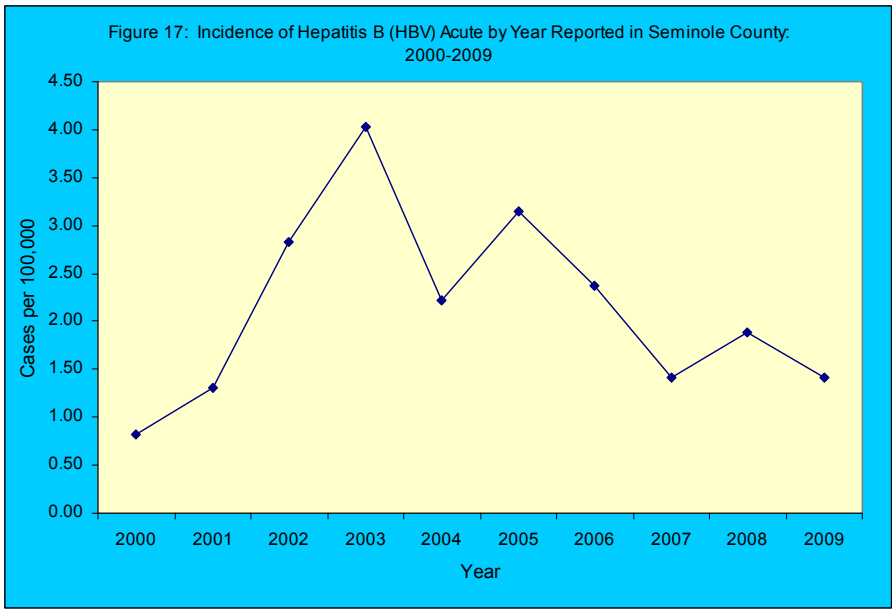


[5] **Incidence of HBsAg is estimated based on population of women of childbearing ages (15-44) in Seminole County per 100,000.**

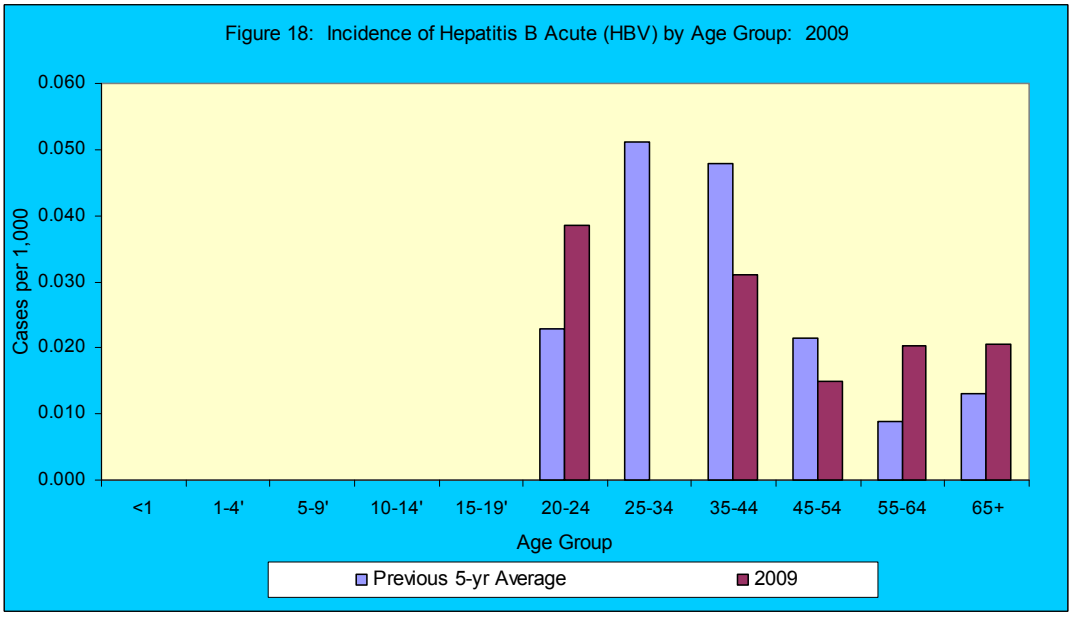
[6] According to the U.S. Census Bureau, **"Other" includes** all responses not included in the "White," "Black or African American," "American Indian or Alaska Native," "Asian," and "Native Hawaiian or Pacific Islander" race categories.

Hepatitis B, Acute:

The incidence rate for acute Hepatitis B has declined gradually over the last ten years (Figure 17). The 2009 incidence rate (1.42 cases per 100,000) was 24% lower than the average from 2006-2008 (1.88 cases/100,000). A total of 6 cases were reported in 2009, of which 83% (5/6) were classified as confirmed.

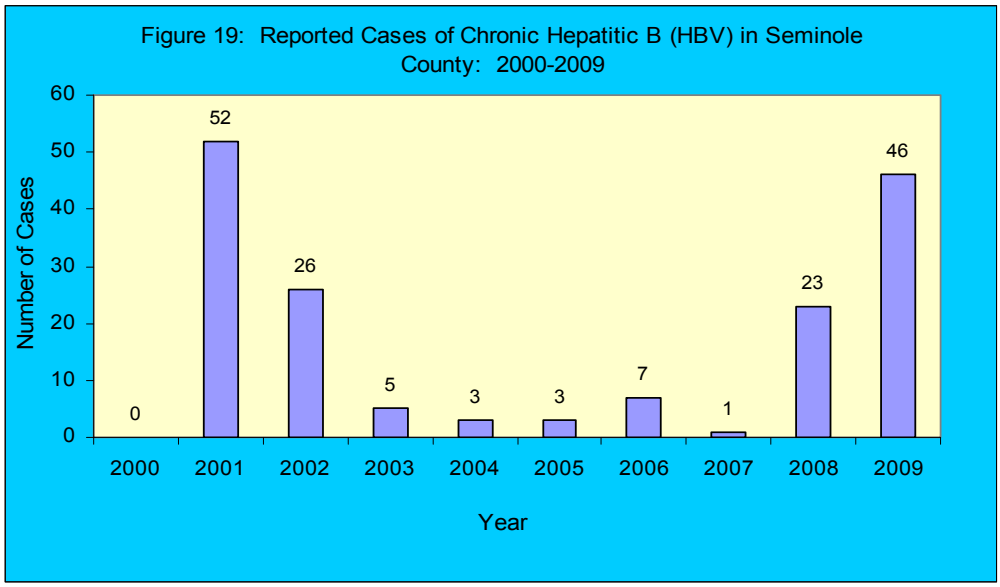


The highest incidence occurred in the 20-24 and 35-44 age groups (Figure 18). The 2009 incidence was lower than the previous 5-year average for all reported age groups except for adults 45-54 years of age. When compared with the previous 5-year average, there continues to be no reported cases persons ≤19 years of age. This has been the historical trend which is also underscored by the immunization campaigns following the introduction of an effective vaccine in 1981. The SCHD Hepatitis Program has been very instrumental in raising awareness about the disease as well as administering vaccinations against Hepatitis A and B among populations at risk. The incidence was slightly higher among males (1.44 cases/per 100,000 population) than females (1.40 cases/100,000 population).

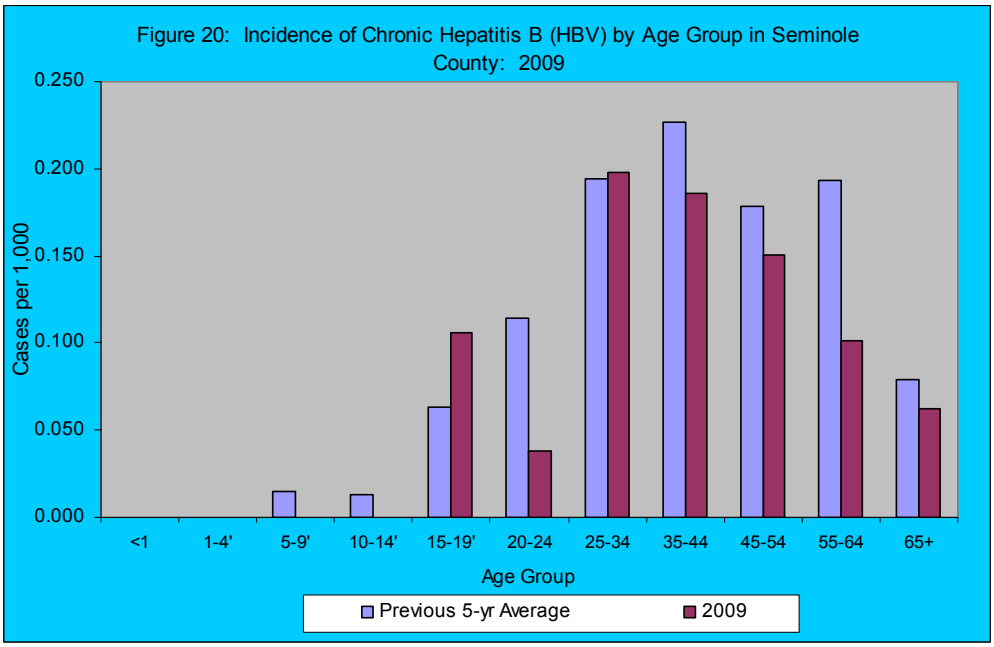


Hepatitis B, Chronic:

The routine recording of chronic hepatitis B case reports in Seminole County began with the establishment of the SCHD Hepatitis Program in 2003. The number of reported chronic Hepatitis B cases has increased significantly since 2008. In 2009, there were 46 reported cases, 96% (44/46) were confirmed and probable cases, and the remainder were suspected cases (4%, 2/46). This was twice the amount of cases reported in 2008 (Figure 19) and was six times higher than the 2004-2008 average.

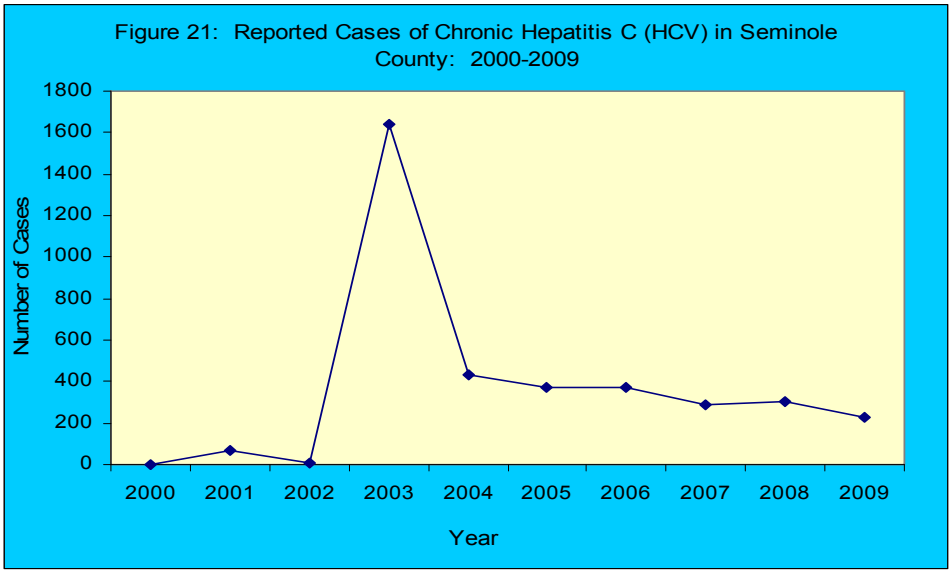


In comparison to the previous 5-year average, the highest number of cases continues to occur in people 25-54 years of age (Figure 20). The gender distribution was higher among males (24 cases) than among females (22 cases).

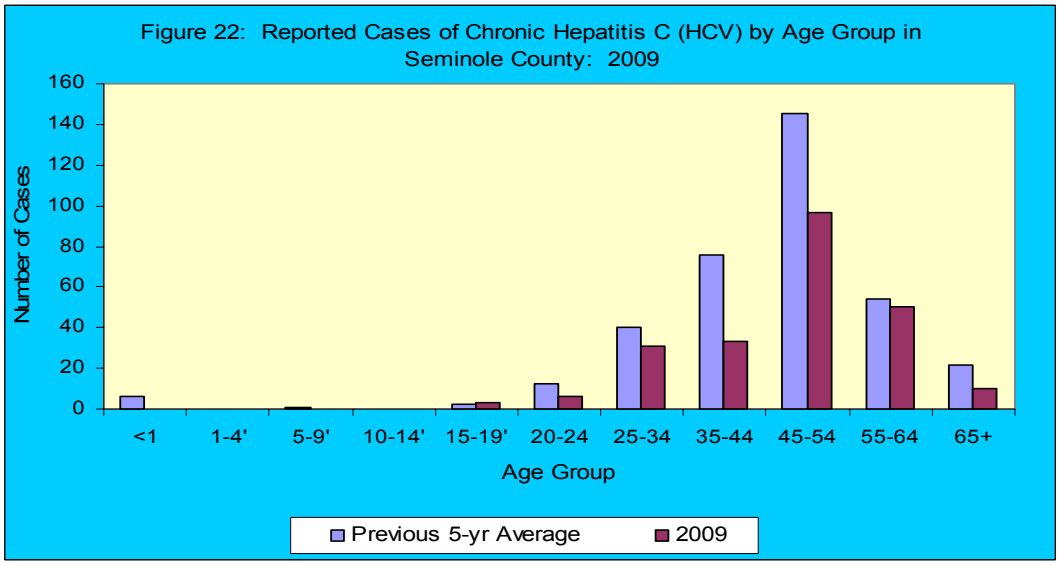


Hepatitis C, Chronic:

The number of reported cases of Chronic Hepatitis C has varied over the last ten years (Figure 21). A total of 230 cases were reported in 2009; 62% (142/230) were confirmed and probable cases, and the remainder were suspected cases. This was a 24% decrease from the number of cases reported in 2008 and 42% lower than the previous 5-year (2004-2008) average.

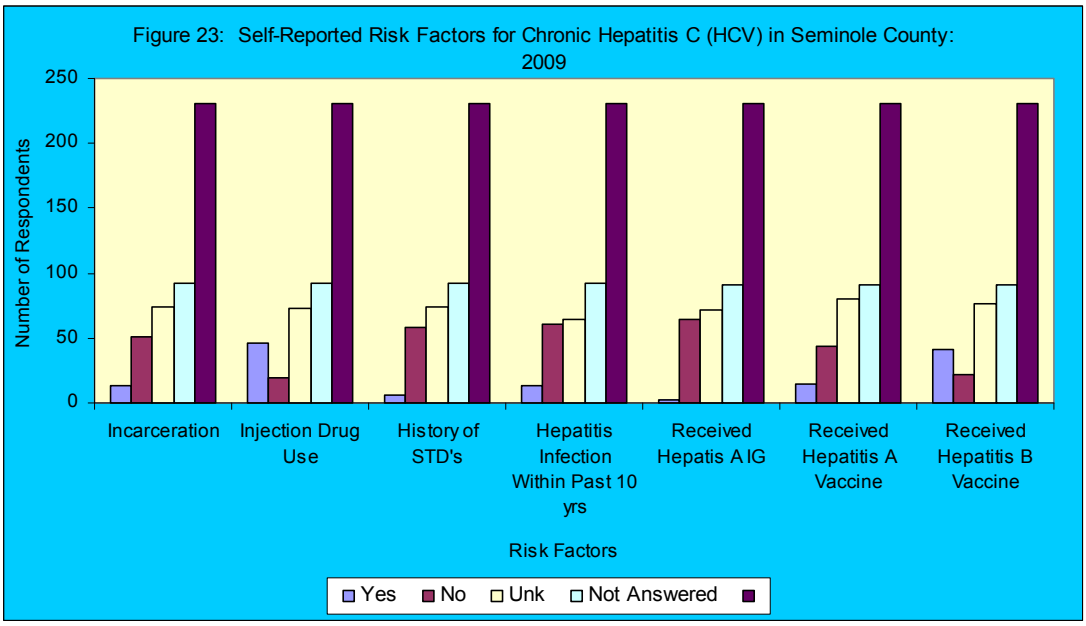


The majority of cases (60%, 139/230) were disproportionately reported among males. The highest number of cases occurred among those in the 45-54 and 55-64 age groups (Figure 22). While case counts were highest among Whites (86/142, 0.24 cases/1,000 population), the race adjusted rate was highest among non-Whites[7] (2.3 cases/1,000 population) followed by Blacks (0.29 cases per 1,000)



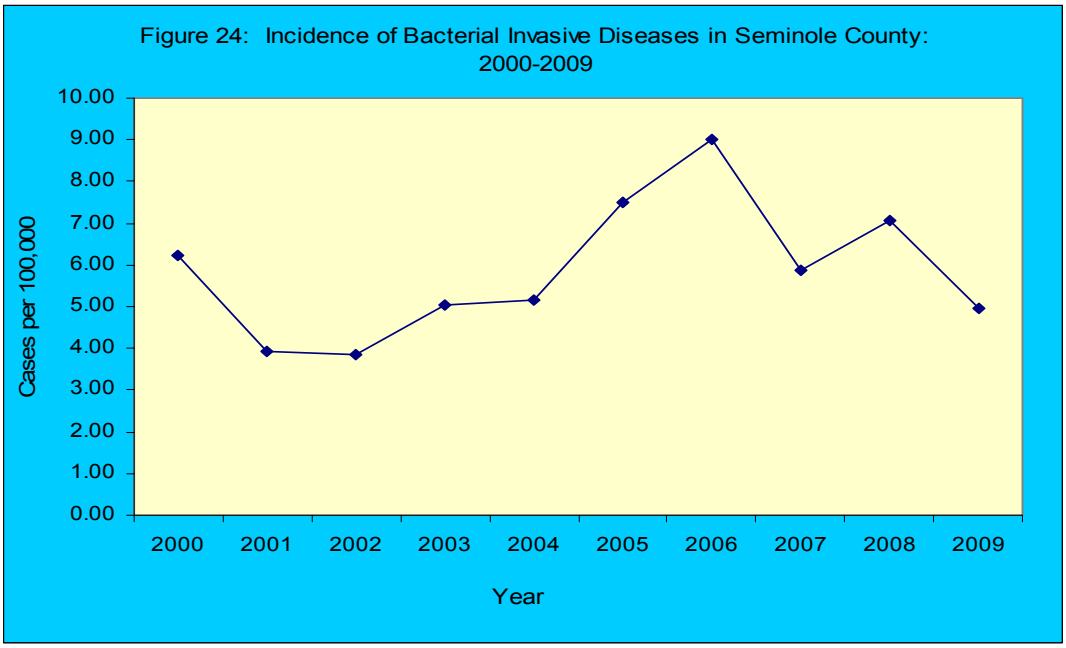
[7] **Non-Whites include**: Asian/Pacific Islander, American Indian/Alaskan Native, Unknown and Other

As with hepatitis B, the routine recording of chronic hepatitis C case reports in Seminole County began with the establishment of the Hepatitis Program in 2003, and is largely responsible for the dramatic rise in reported cases. As previously mentioned some of the goals of the program include screening, testing, and vaccinating high risk groups against hepatitis A and B. Risk assessments are completed for clients seen through the 09 program. Some notable risk factors among the cases when information was available (142 cases) include the following: ever incarcerated, ever injected street drugs, and infected with Hepatitis in the past ten years (Figure 23).



Bacterial Invasive Diseases:

The incidence of bacterial invasive diseases[8] has decreased since 2008 (7.0 cases/100,000 population); in 2009[9], there were 23 reported cases (4.9 cases/100,000 population). Drug-susceptible and resistant invasive *Streptococcus pneumoniae* disease accounted for 29% each (6/21) of the cases. When compared to 2008 (7.0 cases/100,000 population) the incidence of bacterial invasive diseases decreased by 30% (Figure 24). The 2009 incidence rate is also 35% lower than the 2006-2008 average (7.5 cases/100,000 population).



Haemophilus influenzae (Invasive Disease):

In 2009, there were 3 cases of *H. influenzae* (invasive disease), for an incidence rate of 0.71 cases/100,000 population. This was triple the amount reported in 2008 (0.23 cases/100,000 population). The cases ranged between the ages of 1 to 91 years. Vaccination against *H. influenza* was reported only in the one year of age child. There have been 5 cases in the past 10 years, ranging between 0-98 years of age. Prior to 2008, the last case was reported in 2004.

Meningococcal Disease: In 2009, there was 1 case of meningococcal disease in a female 72 years of age. There have been 19 cases in the past 10 years.

Meningitis, (Bacterial, Cryptococcal and Mycotic):

In 2009, there were 4 cases (0.79case/100,000 population) of meningitis due to an organism other than *H. influenzae* or *Streptococcus pneumoniae*: these organisms were *Cryptococcus neoforans, Staphylococcus*

[8] **Bacterial Invasive Diseases include**: Meningitis (Bacterial, Cryptococcal and Mycotic), Meningitis *Streptococcus pneumonaie*, Meningitis Group B *Streptococcus pneumoniae*, Meningococcal Disease, *Haemophilus influenzae* (invasive disease), *H. influenza* pneumonaie, Streptococcal Disease(invasive group A) and *Streptococcus pneumoniae* (invasive disease, non-Group A, drug-resistant and drug susceptible)

[9] **Bacterial Invasive Diseases reported in 2009 include**: *Haemophilus influenzae* (invasive disease), Meningitis (Bacterial, Cryptococcal and Mycotic), Meningococcal Disease, Streptococcal Disease(invasive group A) and *Streptococcus pneumonaie* (invasive disease, non-Group A, drug-resistant and drug susceptible)

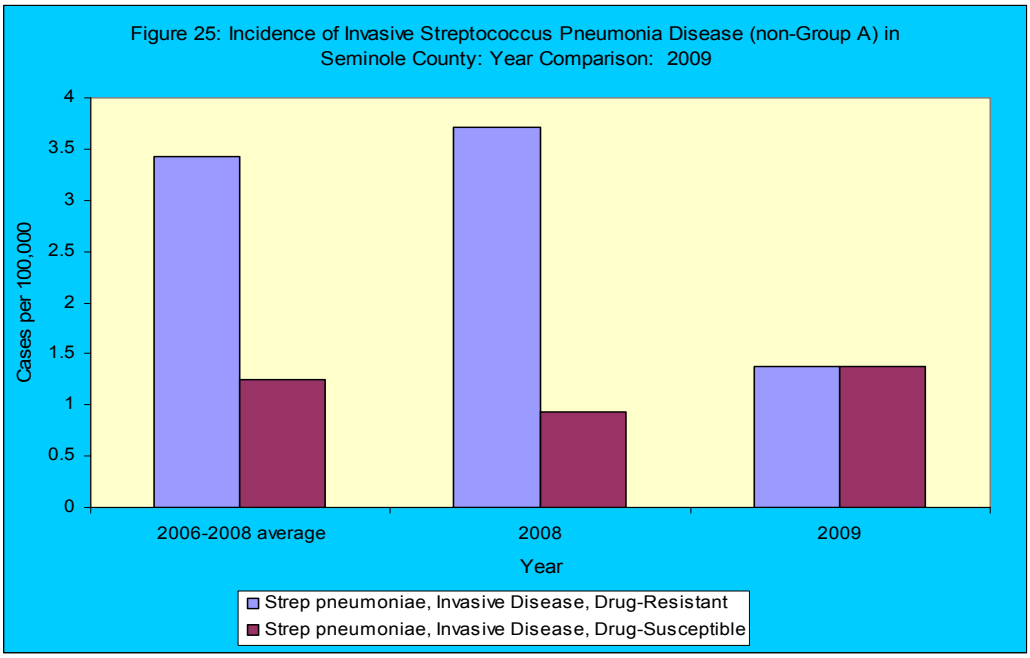
epidermidis and Group B *Streptococcus*. The cases occurred in 1 male and 3 females ranging between 1-40 years of age. There were 3 reported cases in 2008 (0.7 case/100,000 population). In the past 10 years, there have been 18 cases of meningitis that were caused by these other organisms.

Streptococcal Disease (invasive group A):

In 2009, there was 1 case (0.24 case/100,000 population) of invasive streptococcal disease due to the group A strain of the bacterium in a female 86 years of age. This represented an 80% decrease when compared to 5 reported cases (1.17 case/100,000 population) in 2008. The 2009 incidence rate was lower than the previous 3-year average. There were 6 reported cases during the 2006-2008 (1.4 cases/100,000 population). There have been 40 reported cases in the last 10 years.

Streptococcus pneumoniae (Invasive Disease):

The incidence rate of invasive *Streptococcus pneumoniae* disease (non-Group A) was 2.8 cases per 100,000 population. In 2009, there were 12 cases of invasive *Streptococcus pneumoniae* disease (non-Group A); 6 were drug-resistant and 6 were susceptible to all antibiotic drugs. For drug-resistant cases, age ranges were between 2-108 years of age, with 67% involving females. For drug-susceptible cases, age ranges were between 37-85 years of age, also with 67% involving females. Since 2008, reported cases of drug-resistant strains decreased by 63%, while reported cases of drug-susceptible increased by 48% when compared to the same time period (Figure 25).



Vaccine-preventable Diseases:

Haemophilus influenza (Hib):

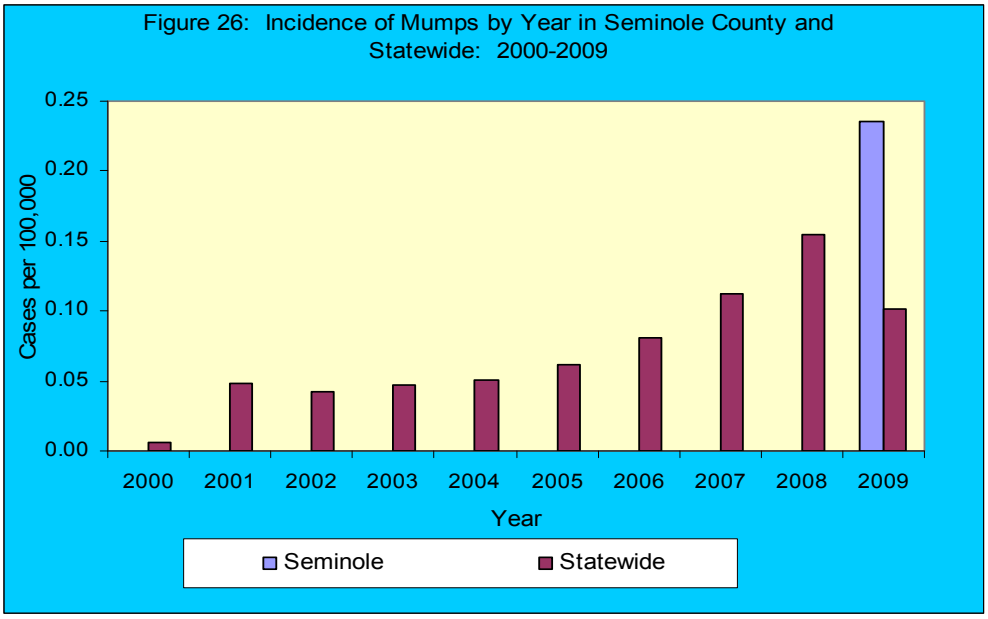
(See Bacterial Invasive Diseases section above)

Hepatitis A & Hepatitis B, Acute:

(See Enteric Diseases and Hepatitis section above)

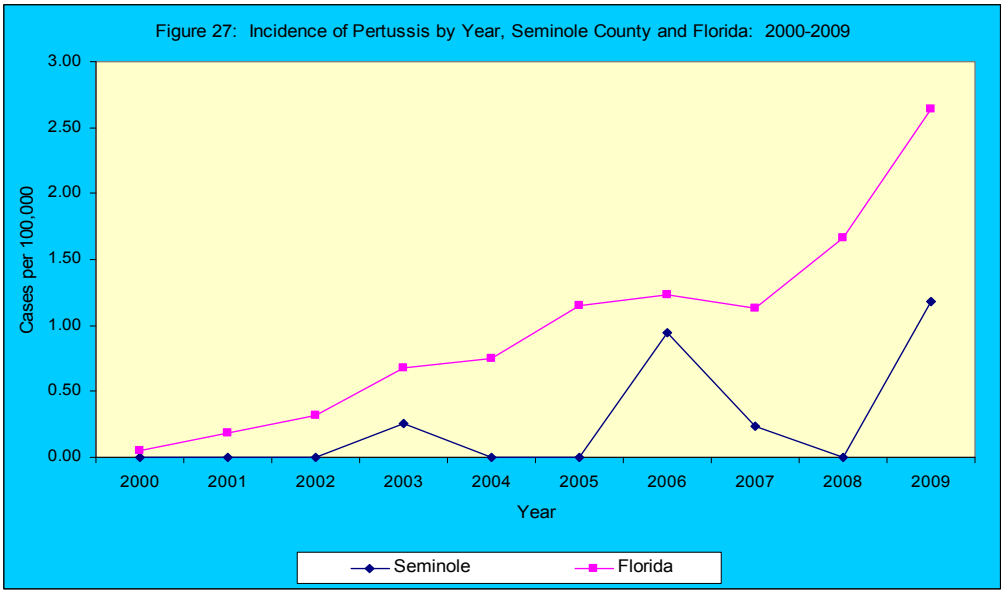
Mumps:

While mumps cases have been reported elsewhere in Florida since 2000, one case (0.24 case/100,000 population) was reported in Seminole County in 2009 for the first time in the last 10 years. The 2009 incidence rate in Seminole County was higher than the statewide rate (0.10 case/100,000 population) in 2009 (Figure 26). The confirmed case was reported in an unvaccinated female 49 years of age with extensive travel history outside of the United States starting two weeks prior to illness onset. The patient was a foreign-born native who migrated to Florida at the age of 19 and did not recall previous vaccination with MMR series.



Pertussis:

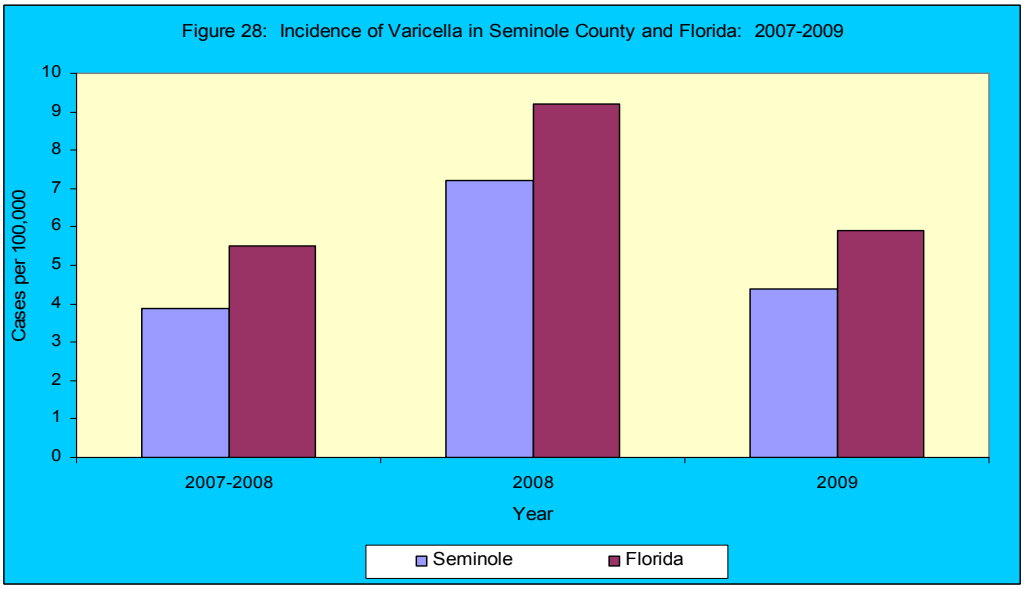
There were 5 reported cases of pertussis in Seminole County in 2009, for an incidence of 1.18 cases/100,000 population. This was the same as the combined amount reported within the previous 5 years. This represented a significant increase when compared to the 2006-2008 average (0.39 case/100,000 population). The increased incidence rates of pertussis were observed across the entire state of Florida in 2009 (Figure 27).



While all reported cases in Seminole were sporadic, 48% (240/497) of all Florida cases were categorized as outbreak-associated occurring in multiple counties; this trend has not been observed in previous years. The cases in Seminole County ranged between 0-81 years of age with the majority among females (3/5, 60%). All cases were acquired in Florida.

Varicella:

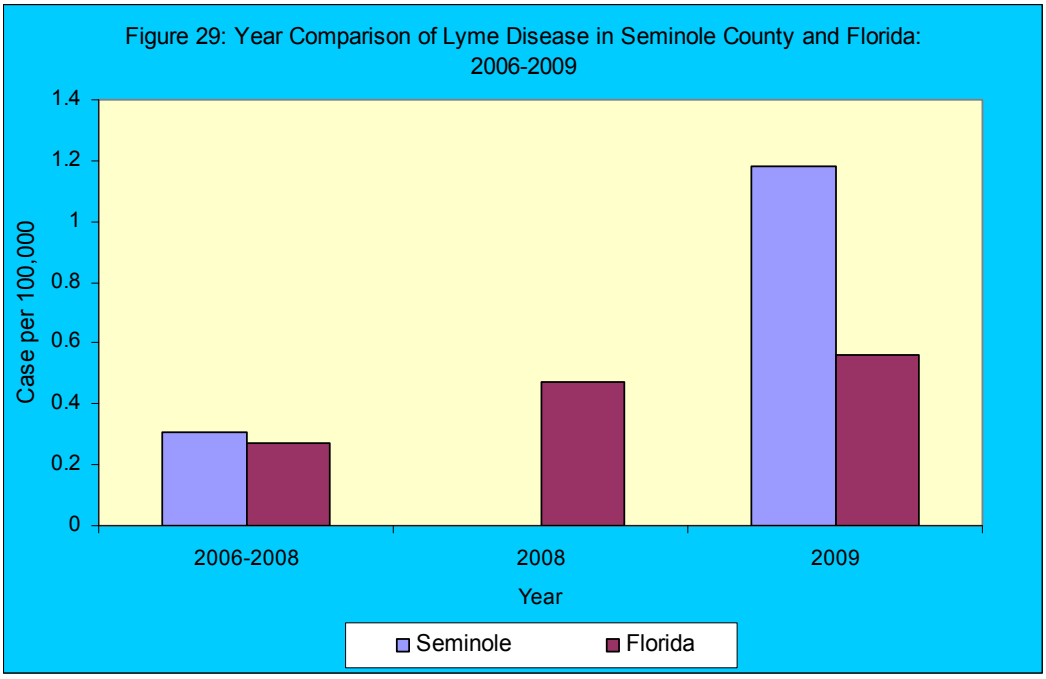
Varicella was added to the list of reportable diseases in 2007 and has been decreasing in Seminole County and statewide since 2008 (Figure 28). This decrease does not necessarily represent the true incidence of the disease; in fact, cases may still be under-reported. There were 19 reported cases of varicella in Seminole County in 2009 (4.37 cases/100,000 population). This represents a 65% decrease when compared to 2008 (7.22 cases/100,000 population). Most of the cases occurred among the 10-14 age group (42%, 8/19). The cases ranged between 3-41 years of age and were mostly females (58%, 11/19). Most of the cases reported vaccination history (74%, 14/19), and were sporadic (89%, 17/19) rather than outbreak-associated.



Vector-borne Diseases:

Lyme disease:

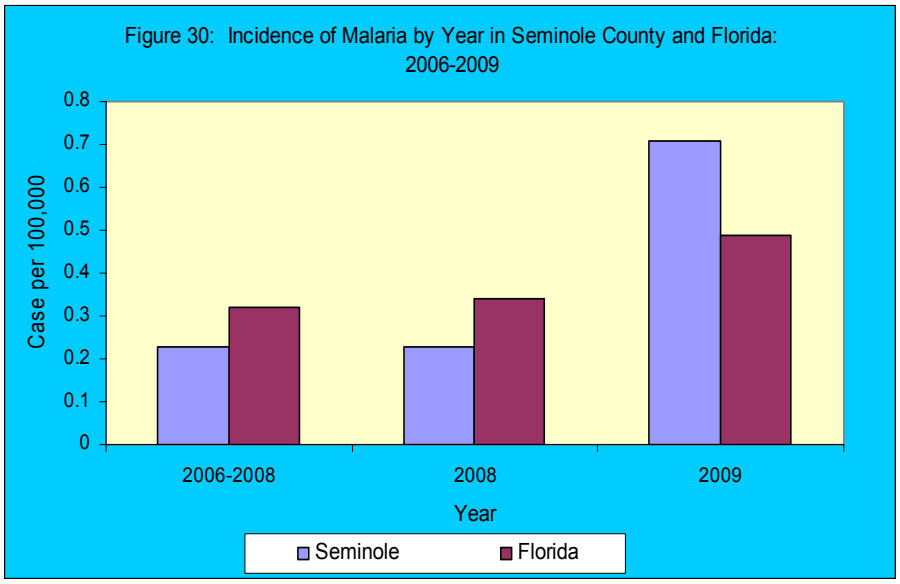
The incidence rate for Lyme disease has increased when compared to the previous three years (2006-2008). There were 5 reported cases in 2009: 2 were confirmed cases, 1 probable and 2 suspect cases. The reported incidence rate in Seminole County for 2009 was 1.18 case/100,000 population. This increase may be due to a change in laboratory diagnostic practices. Prior to 2008, a positive ELISA test followed by a Western Blot was required to meet surveillance criteria for for case confirmation. However, some laboratories provided only EIA testing which did not allow cases to meet the case definition, or did not report the results of Western Blot testing along with initial EIA result. This practice may have resulted in an underestimation of cases prior to 2008. The 2006-2008 incidence was 0.31 case/100,000 population. Prior to 2009, the last reported cases were in 2006 (4 cases, 0.31 case/100,000 population). There have been 8 reported cases within the last 10 years. The incidence rate in Seminole County continues to be higher than the statewide rates (Figure 29).



The cases ranged between 16-48 years of age. One of the confirmed reported cases in 2009 was acquired in Florida, while the other case reported travel history to New York prior to illness onset.

Malaria:

The 2009 incidence rate of reported cases of malaria has increased in both Seminole County and statewide (Figure 30) when compared to 2008 and the previous three-year (2006-2008). There were 3 reported cases in Seminole County in 2009 (0.71 case/100,000 population in 2009), all acquired following travel outside of the United States to either Africa (Malawi and Ghana, both due to *Plasmodium falciparum*) or Central America (Honduras, due to *P. vivax*). The cases ranged between 17-71 years of age. There have been 14 reported cases of malaria in Seminole County over the last 10 years.

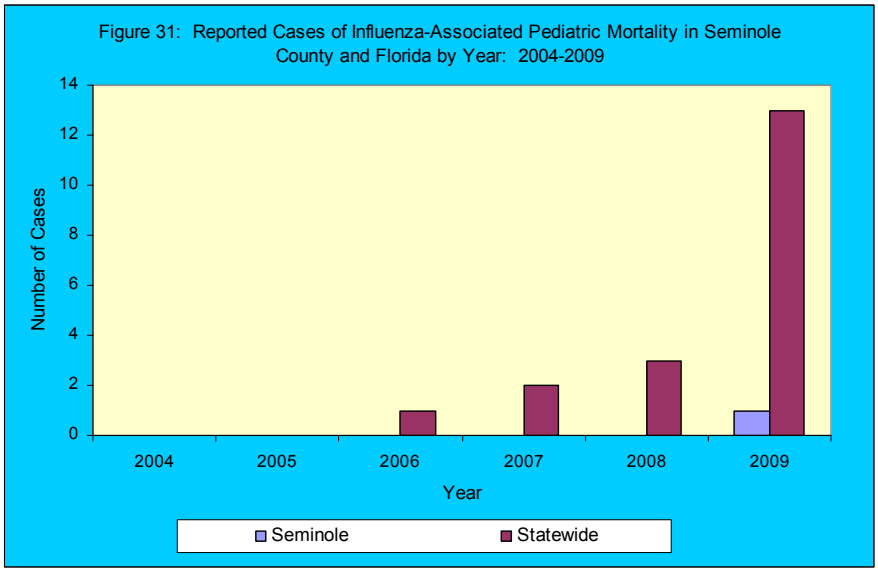


Respiratory Diseases:

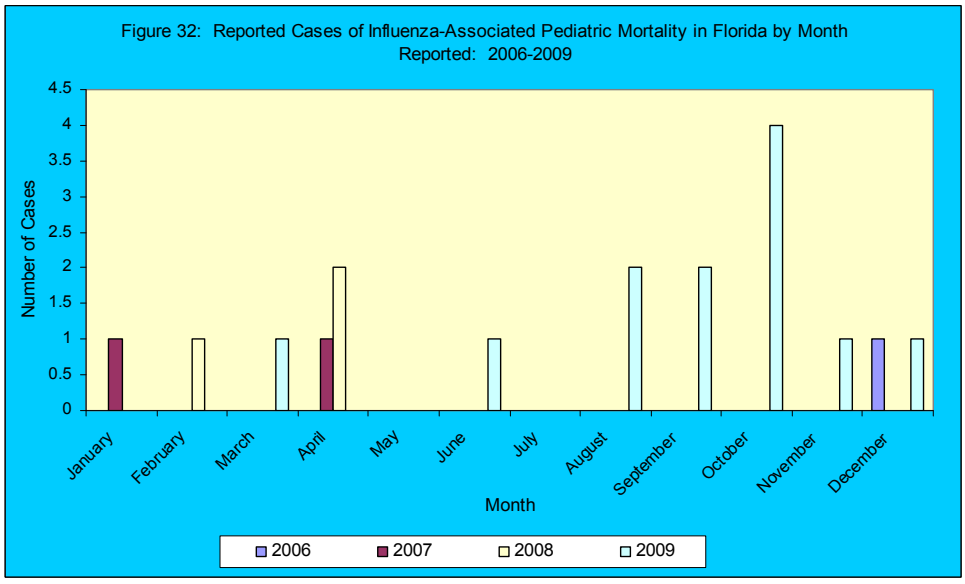
Influenza-Associated Pediatric Mortality:

Pediatric influenza-associated mortality surveillance started in 2004. This surveillance is to monitor the number of deaths in individuals <18 years of age who died as a result of complications from an infection. One case of Influenza-Associated Pediatric Mortality[10] was reported in Seminole County in 2009, and was the first case within a ten year period. The patient was a female 13 years of age who had multiple underlying medical conditions that placed her at an increased risk for adverse outcomes (i.e. hospitalizations and death). There was also a statewide increase in reported cases of Pediatric influenza-associated mortality (Figure 31).

[10] **Influenza-associated death** is defined for surveillance purposes as a death resulting from a clinically compatible illness that was confirmed to be influenza by an appropriate laboratory or rapid diagnostic test. There should be no period of complete recovery between the illness and death. Influenza-associated deaths in all persons aged <18 years should be reported.



The increase can be largely attributed to the 2009 Novel Influenza A H1N1 pandemic as well as changes to the reporting criteria and/or surveillance case definition for influenza-like-illnesses. Enhanced surveillance, awareness and media attention are also factors that likely impacted the reported incidence. Of significance most of the deaths occurred during months when influenza-associated deaths normally would not be expected when compared to previous years (Figure 32).



Legionellosis:

Twelve cases of Legionellosis were reported in Seminole County residents in 2009. The resulting rate of almost 3 cases per 100,000 population per year was the highest within the previous 10 years. A case analysis was done to provide possible explanations for such a significant increase, and is included in Appendix 7.

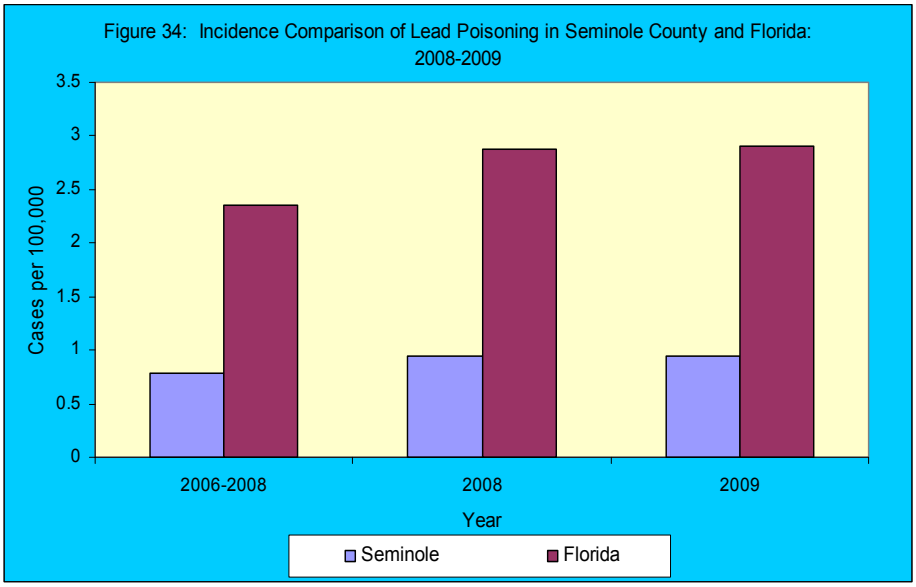
Chemical/Toxin Poisoning:

Carbon Monoxide Poisoning:

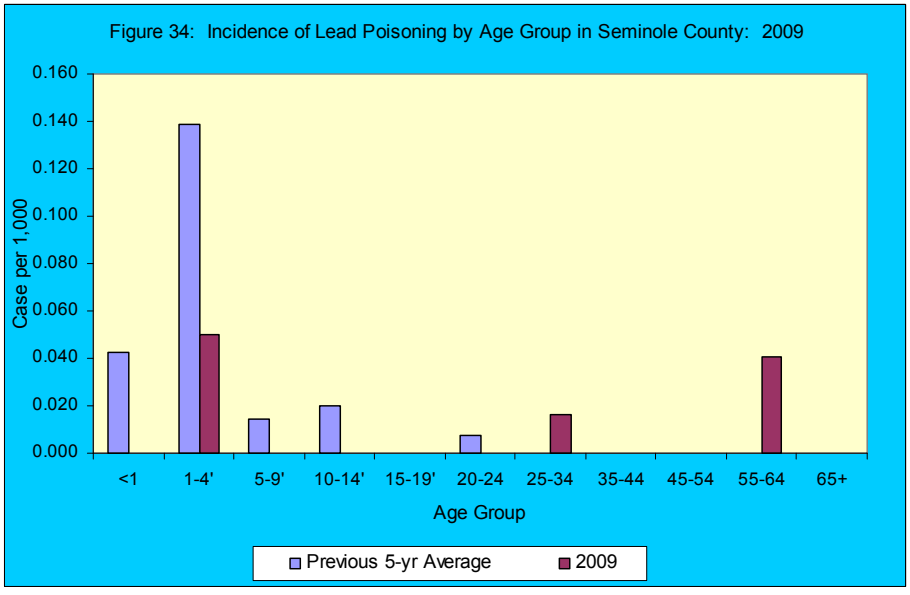
Carbon monoxide (CO) poisoning was added to the list of reportable diseases in 2008 for all laboratory results with COHb levels of 9% or more. There was one confirmed death due to CO poisoning in Seminole County in 2009, in a Black male 51 years of age. This event was categorized as an unintentional exposure to CO poisoning due to a house fire. There were 43 reported cases statewide. and Most of the cases (51%, 22/43) involved multiple people per one exposure.

Lead Poisoning:

The incidence of Lead poisoning in Seminole County is 21% greater than the 2006-2008 average. However, the rate remained unchanged when compared to 2008. This trend has been observed across the state of Florida (Figure 33). There were 4 reported cases in 2009 and 35 cases over a ten year period.



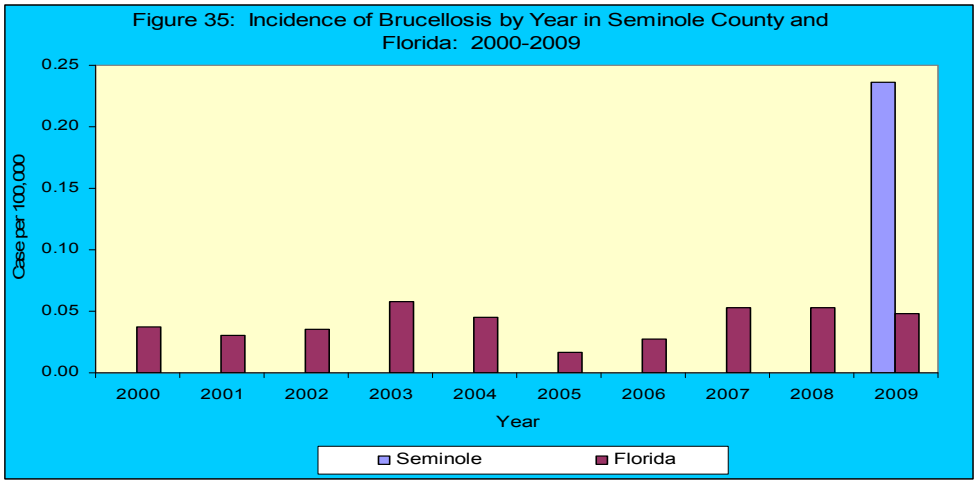
The 2009 lead poisoning cases ranged between 1-64 years of age and were mostly reported in males (75%, (3/4). The 2009 age distribution is different from that reported in the previous 5-year, with most of the cases in the in the1-24 age group (Figure 34).



Re-emerging reportable diseases in Seminole County in 2009 that had not occurred in the past decade (2000-2009):

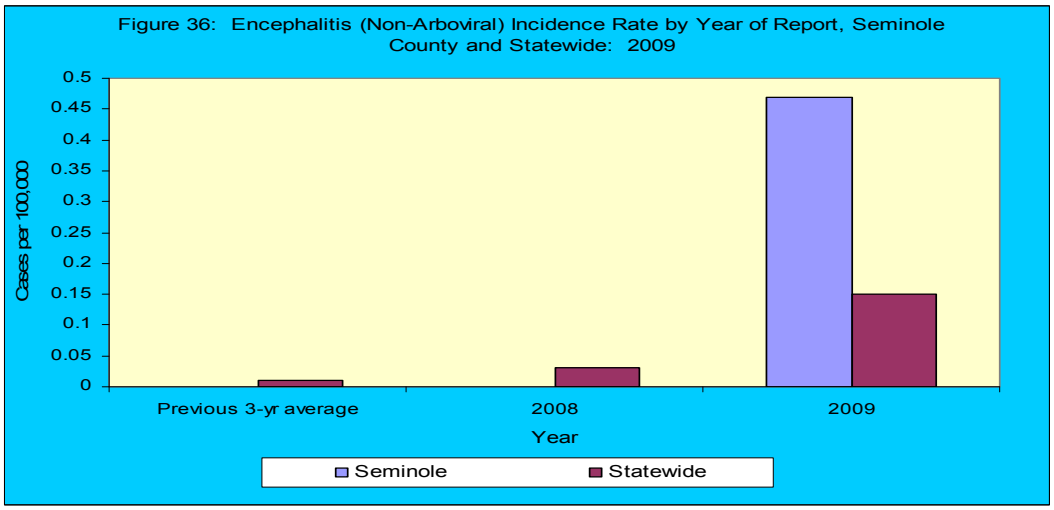
Brucellosis:

Cases of brucellosis have been reported continually across the state of Florida throughout the last decade. One case was reported in Seminole County 2009, the first within the last decade (Figure 35). The case was reported in a White female 27 years of age. While the patient traveled to a country where brucellosis is endemic, she did not report any high risk exposures such as consumption of unpasteurized milk-based products, or agricultural or animal contact. The only identifiable exposures in the U.S. were contact with deer blood while in the household and a spouse who occasionally hunts. There were combinations of high and low risk exposures among hospital laboratory workers who unknowingly handled the specimens without appropriate precautions; fortunately, there were no secondary cases related to the exposure.



Encephalitis, Other[11] (Non-Arboviral):

A total of 2 cases were reported in 2009 (0.47 cases/100,000 population), the first in Seminole County since 2002. The incidence in Seminole County is higher than that reported statewide (0.15 cases/100,000 population) (Figure 36). The cases were in White (non-Hispanic) females between 50-59 years of age. One of the cases was secondary to influenza A infection, while the other was due to herpes simplex encephalitis viruses (HSV) 1 and 2.



[11] **Encephalitis, other** is reserved for cases of primary encephalitis that are not categorized under one of the other reportable diseases or conditions. Cases of encephalitis due to arboviral infection or infection by a vaccine preventable disease are assessed using those specific case definitions and reported under those disease codes.

Influenza-Associated Pediatric Mortality:
See above section on Respiratory Diseases

Mumps:
See above section on Vaccine Preventable Diseases

Emerging reportable diseases in Seminole County and Florida in 2009 but have not occurred in the past:

2009 Novel Influenza A H1N1 Pandemic:

The Centers for Disease Control and Prevention (CDC) reported the detection of a novel strain of influenza A (H1N1) in the United States on April 15, 2009, which was responsible for the first flu pandemic in more than 40 years. It was reported that the virus started in Mexico. Upon identification of the virus in the United States, CDC and state and local health departments began investigating all reported U.S. cases to ascertain clinical features and epidemiologic characteristics. All states were asked to intensify influenza surveillance and control activities.

As part of the initial response, clinicians were advised to test for febrile respiratory illnesses (FRI) if the patient:

1. Resided in affected countries
2. Reported recent travel to affected countries such as Mexico
3. Reported contact with symptomatic person meeting these criteria, during the 7 days prior to onset

Clinicians were advised to send all positive samples to the public health laboratories for characterization.

The SCHD has multiple surveillance systems in place to monitor influenza activity. These include:

1. Sentinel physician surveillance for influenza-like-illnesses (ILI) which monitors the percentage of doctor visits for symptoms that could be influenza, and provides an understanding of influenza activity in the general population.

2. The Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE), emergency department (ED) surveillance, which tracks numbers of patients presenting with influenza-like-illnesses to participating facilities, and aids in understanding the severity of the illness.

3. Deaths from the Florida Pneumonia and Influenza Surveillance System that reports the total number of deaths and the number of those coded as influenza or pneumonia in the 24 most populous counties of Florida (Seminole is one of the 24 counties). This provides insight into the severity of infection from influenza.

4. School Clinic Surveillance which monitors the number of visits to school clinics related to influenza and other selected illnesses.

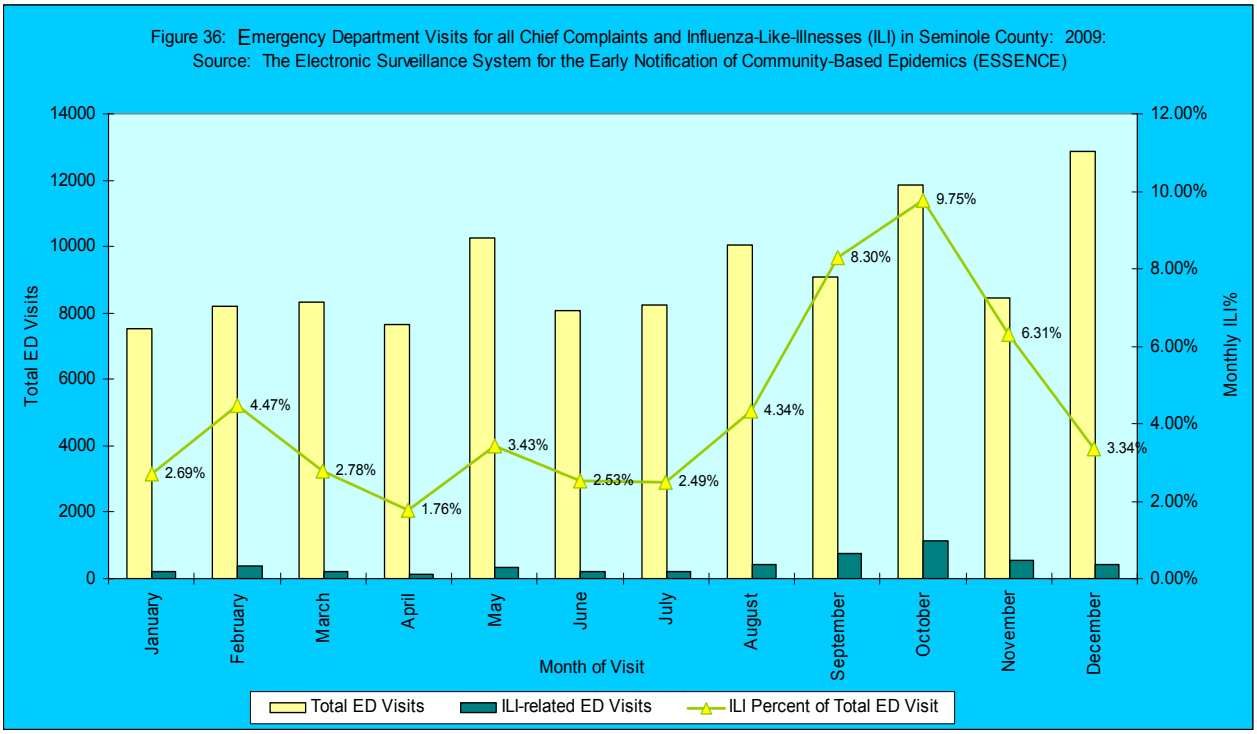
5. Monitoring reports of influenza outbreaks occurring in the county, which aids in understanding how special and/or high-risk populations may be impacted.

6. The number of laboratory-confirmed cases of influenza A H1N1 in those with life threatening illnesses, hospitalized pregnant women, and the number of laboratory

confirmed deaths from influenza of all types among children, which also increases understanding of the severity of influenza illness.

ESSENCE was used to monitor ED visits related to ILI on a weekly basis. The first peak in ED visits due to chief complaint of ILI-related illnesses peaked in February 2009, which is typical for seasonal influenza. ILI-related ED visits steadily declined after February. There was a second peak in visits in May 2009; this was largely driven by the H1N1 virus, including a large number of "worried-well" individuals seeking care for complaints related to ILI. There was a third and highest peak in October, followed by a steady decline thereafter (Figure 37).

Figure 36: Emergency Department Visits for all Chief Complaints and Influenza-Like-Illnesses (ILI) in Seminole County: 2009:
Source: The Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE)



As more became known about the H1N1 virus, guidance documents were updated to reflect the current situation. Disease progression was uncomplicated cases generally recovered with supportive care. While testing was widely utilized, the CDC and state public health labs quickly became overwhelmed with requested H1N1 testing. As the pandemic developed, testing recommendations changed as follows:

1. De-emphasized recent travel
2. Did not require symptomatic contacts
3. Prioritized certain high risk groups

Once it was determined that the H1N1 virus accounted for ≥90% of all samples tested at the labs, individual case counts were no longer necessary because H1N1 was the predominant circulating strain. Reporting guidelines changed in August 2009 to include only the following: all laboratory-confirmed H1N1 deaths, patients with life-threatening illness (e.g., hospitalized in intensive care units), hospitalized pregnant women, and outbreaks.

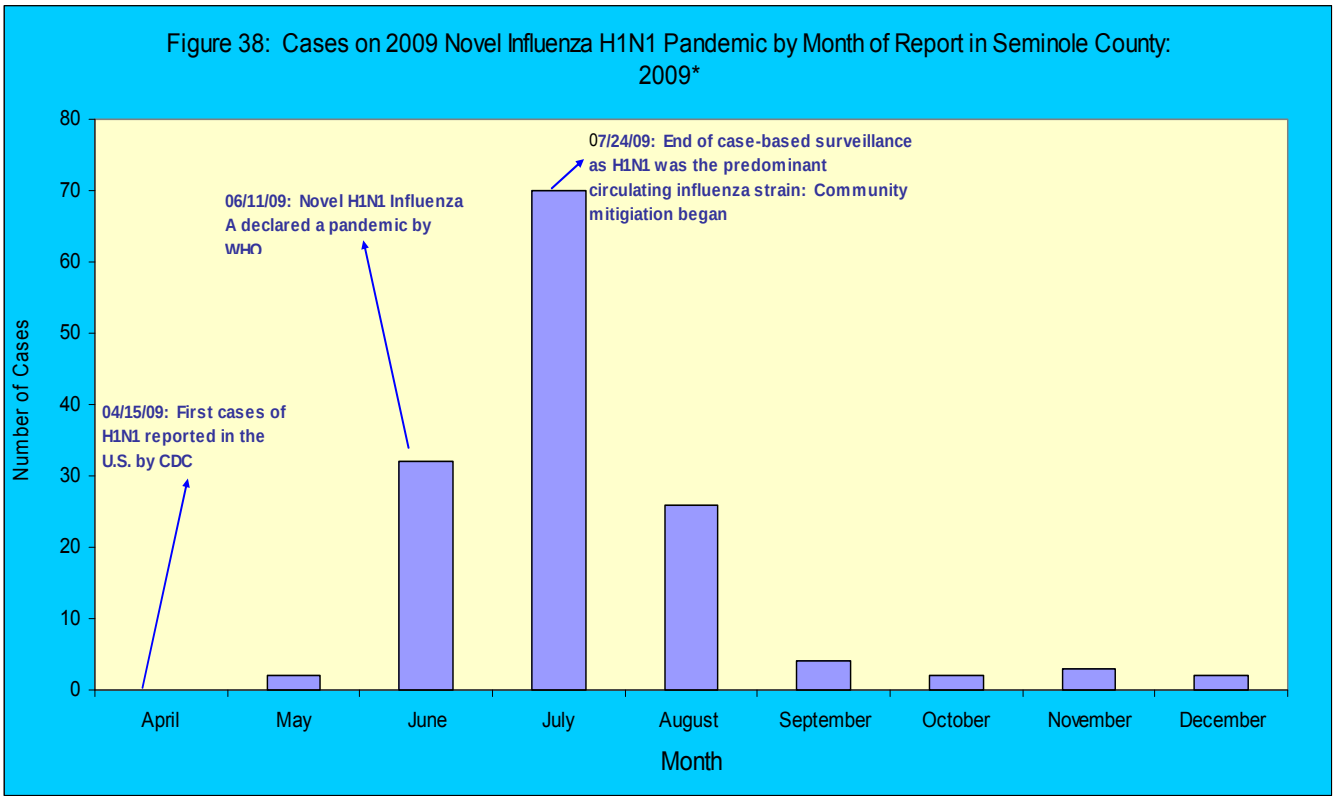
The current recommendations since January 2010 changed to request laboratory testing and reporting of cases that appear to be clinically significant:

1. People with lab-confirmed or highly suspected influenza who:
    a. Have a life-threatening or fatal illness
    b. Are pregnant or post partum (up to six weeks) and hospitalized

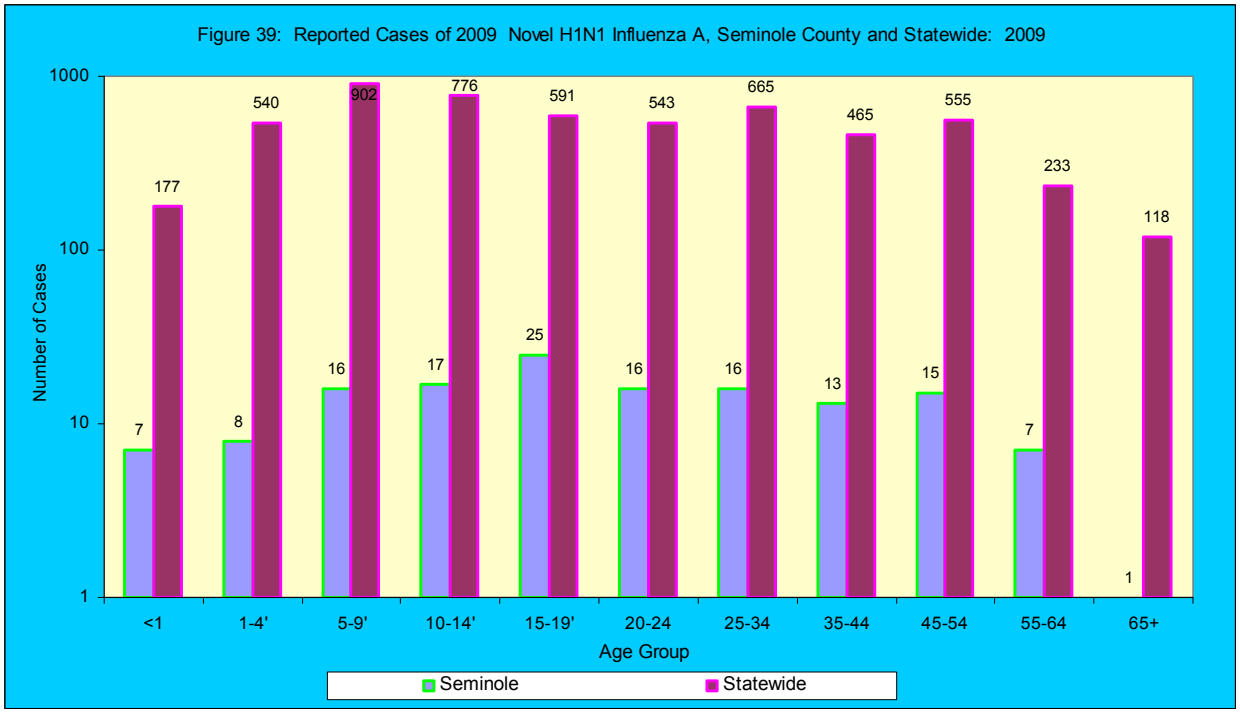
c. Have documented repeat influenza infections
d. Develop documented influenza in spite of vaccination
e. Have documented infections that are highly suspected to be resistant to antiviral therapies
f. Are part of outbreaks
    i. Outbreaks of particular interest are those occurring in settings not seen during the recent wave of influenza, such as retirement communities or nursing homes, or those that have unusual presentations such as hemorrhagic pneumonia.

Surveillance and epidemiologic data were used to monitor the magnitude of H1N1 in the community. This included identifying affected age groups and other demographic and clinical characteristics of the cases. The surveillance data included factors such as the total number of laboratory confirmed cases, number of hospitalizations due to influenza-like-illnesses, hospitalization in pregnant women, hospitalizations in individuals with life threatening conditions, number of deaths, and the number of outbreaks reported in congregate settings (i.e. schools, businesses, and nursing homes). There were 141 reported cases of the 2009 Novel Influenza A H1N1 virus in Seminole County (Figure 38). It is important to note that this an underestimation of the true burden of disease, as testing and reporting requirements changed as described above.

Figure 38: Cases on 2009 Novel Influenza H1N1 Pandemic by Month of Report in Seminole County: 2009*



Most of the cases were reported among younger individuals between 5-19 years of age and 20-49 years of age (Figure 39). Older individuals born on or before 1950 appeared to be spared from the brunt of H1N1. People with underlying medical conditions, hospitalized in intensive care units (ICU) and pregnant women were at a greater risk for adverse outcomes such as secondary infections as well as the 5 deaths in Seminole County attributed to the virus.



In addition to routine case investigations, epidemiology staff dedicated a considerable amount of time to the novel 2009 H1N1 influenza pandemic in activities such as:

- Assisting physicians with identifying suspected cases,
- Providing specimen collection kits and sending specimens to the state lab.
- Tracing all contacts of suspected cases and recommending isolation of ill individuals.
- Providing antiviral treatment recommendations for patients and antiviral prophylaxis of contacts through a physician.
- Monitoring the health of all suspected cases and contacts on a daily basis by telephone until their infectious or possible incubation period was over.
- Participated in the mass vaccination campaign as well as hosting additional vaccination clinics at high-risk settings where hepatitis outreach activities are conducted.

In addition to routine surveillance, SCHD conducted a survey of large businesses in the county to assess their awareness of influenza and H1N1 prevention methods, and to request their help in reporting significant absenteeism in the workplace. The details of this survey are listed in Appendix 8.

Mass vaccination campaigns were conducted to control the spread of H1N1 and alleviate its impact. During a pandemic, a mass vaccination campaign needs to be delivered over a shorter time than the current practice. It was critical to vaccinate as many in the target population as soon as the vaccines were allocated to Seminole County. Preparation for organizing the vaccination campaign began in early July and was expected to be completed by September 30, 2009, based on vaccine availability. The main objective of the school-based vaccination campaign, once vaccines were allocated, was to vaccinate at least 10% (of the high priority groups in Seminole County by November 30, 2009. Based on state estimates, approximately 11% (45,000/423,947) of the counties population was categorized as high priority groups. The high priority groups as outlined by the CDC were:

- Pregnant women
- Persons who live with or provide care for infants <6 months

- Children 6 months to 4 years of age
- Children and adolescents 5-18 years of age
- Persons with underlying medical conditions
- Healthcare and emergency workers.

The Seminole County Health Department in conjunction with the Seminole County Divison of Emergency Management and the superintendent of Seminole County Public Schools formalized the cooperative plan to utilize selected school sites. Once the memorandum of agreement was finalized, the schools were strategically selected throughout the county to meet the needs of all residents.

The vaccination clinics were launched at all nine public high schools in Seminole County as points of distribution (PODS) to host initial vaccination clinics. It was determined that geographically dispersed high school campuses within Seminole County would serve to reach the priority groups. The school locations were widely known to residents throughout the county; for example, due to enrollment of their own children in the individual schools, or awareness through sporting events, etc.

The clinics targeting high priority groups were conducted during October 17 to November 21, 2009. All clinics were hosted on Saturdays and staffed by SCHD personnel and student nurses from Seminole State College. Clinics were held on Saturdays as a matter of convenience for working individuals, and to minimize interference with classes or extracurricular activities held at the schools. Also, children <18 years of age would need parental consent and weekends might be more convenient for parents and guardians.

The planning team adopted elements outlined by the CDC that should be considered for vaccine administration. Some of these elements included:

1. Ensuring proper vaccine storage
2. Distributing consent forms and verifying student vaccination eligibility
3. Communicating with vaccine recipients
4. Staffing the vaccination sites
5. Billing for vaccine administration

In addition to school vaccination campaigns, other strategies were used to ensure that the vaccines would reach all groups within Seminole County. A series of town hall meetings were held with physician providers to answer questions on participating in the vaccination campaign, and more importantly to. Other private providers were encouraged to participate as a means to expand capacity. For those citizens willing to pay a modest administration fee, the convenience of a local pharmacy or physician provider was available. A large staffing agency also set up clinics in various hotels and assembly areas large enough to accommodate the anticipated numbers of persons seeking the vaccine.

The following reportable diseases caused zero cases in Seminole County in 2009 but have occurred in the past decade (2000-2009):

No Case
Case

Table 1: Reportable Diseases that caused Zero Cases in Seminole County in 2009 but have occurred in the Past Decade (2000-2009)

DISEASES	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Dengue						3		1		4
Ehrlichiosis/Anaplasmosis, HME, E. Chaffeensis	1								1	2
Hemolytic Uremic Syndrome (HUS)						1				1
Hepatitis C, Acute	3			1			1			5
H. influenzae Meningitis			1							1
H. influenzae Primary Bacteremia			1		1					2
Listeriosis							3			3
Meningitis, Group B Streptococcus	1								1	2
Rocky Mountain Spotted Fever	1				1		1		1	4
Saxitoxin Poisoning					1					1
Toxoplasmosis		1			1				1	3
Typhoid Fever			1							1
Vibriosis (Vibrio Infections)			1	1		2				4
West Nile Virus				1						1
Total	6	1	4	3	4	6	5	1	4	34

The following reportable diseases caused zero cases in Seminole County in the past decade (2000-2009), but have occurred elsewhere in the State of Florida:

Amebic Encephalitis: There have been 3 confirmed cases in the past 10 years.

Anthrax: There have been 2 combined cases in the past 10 years.

Arsenic: Arsenic was added to the list of reportable diseases in Florida in 2008. Since then, there have been 10 reported cases (9 confirmed and 1 probable). 70% of the cases were reported in 2009.

Botulism: There have been 9 confirmed cases (including food borne, infant and other) in the past 10 years

California Serogroup, Neuroinvasive Virus: There have been 6 confirmed cases, 5 confirmed and 1 probable in the past 10 years.

California Serogroup, Non-Neuroinvasive Virus: There has been 1 probable case in the past 10 years.

Ciguatera Fish Poisoning (Ciguatera): There have been 218 cases in the past 10 years.

Creutzfeldt - Jakob disease (CJD): There have been 99 cases in the past 10 years, of which 65 (77%) were classified as confirmed.

Eastern Equine Encephalitis (EEE) Neuroinvasive Disease: There have been 13 confirmed cases in the past 10 years.

Ehrlichiosis/Anaplasmosis, HGE, A.Phagocytophilum: There have been 19 cases reported in the past 10 years; 10 of which were probable and 9 confirmed.

H. Influenzae Cellulitis: There have been 8 cases in the past 10 years.

H. Influenzae Epiglottitis: There have been 8 cases in the past 10 years.

H. Influenzae Septic Arthritis: There have been 4 cases in the past 10 years.

Hansen's disease (Leprosy): There have been 59 cases in the past 10 years.

Hepatitis B, Perinatal: There have been 30 cases in the past 10 years, 31 (97%) of which were classified as confirmed.

Hepatitis D: There have been 2 confirmed cases in the past 10 years.

Hepatitis E: There have been 4 confirmed cases in the past 10 years.

Hepatitis G: There has been 1 confirmed cases reported in 2008.

Human Rabies: There has been 1 confirmed case (fatal) reported in 2004.

Leptospirosis: There have been 12 cases in the past 10 years, 4 (33%) of which were classified as confirmed.

Measles: There have been 20 confirmed cases in the past 10 years.

Meliodosis: There have been 2 cases (1 confirmed and 1 probable) in the past 10 years.

Meningitis, *Listeria Monocytogenes*: There have been 62 cases in the past 10 years.

Mercury Poisoning: There have been 218 cases in the past 10 years.

Monkey Bite: There have been 18 cases in the past 10 years.

Neurotoxic Shellfish Poisoning: There have been 21 cases in the past 10 years.

Pesticide-related Illness and Injury: There have been 23 cases in the past 10 years.

Psittacosis (Ornithosis): There have been 15 cases in the past 10 years.

Q Fever: There have been 2 probable cases in the past 10 years.

Rubella: There have been 14 cases in the past 10 years; 13 (93%) of which was classified as confirmed.

Rubella, Congenital: There has been 1 confirmed case reported in 2000.

Staphylococcus aureus (with intermediate or full resistance to vancomycin, VISA, VRSA): There have been 10 confirmed cases in the past 10 years.

Staphylococcus Aureus, Community Associated Mortality: There have been 20 confirmed cases in the past 10 years.

Staphylococcus Enterotoxin B: There have been 2 cases in the past 10 years.

St. Louis Encephalitis (SLE) Virus Disease: has been 1 confirmed case in the past 10 years.

Tetanus: There have been 26 cases in the past 10 years.

Trichinellosis: There have been 4 confirmed cases in the past 10 years.

Tularemia: There have been 2 cases (1 confirmed and 1 probable) in the past 10 years.

Typhus Fever: There have been 5 (2 confirmed and 3 probable) cases (endemic murin) in the past 10 years.

The following reportable diseases caused zero cases in the State of Florida in the past decade (2000-2009):

Cholera (*V. cholerae* type O1), *Clostridium perfringens* (epsilon toxin), Diphtheria, Glanders, Hantavirus infection, , Plague, Poliomyelitis, Ricin toxicity, Severe Acute Respiratory Syndrome-associated Coronavirus (SARS-CoV) Disease, Smallpox, Vaccinia, Venezuelan Equine Encephalitis (VEE) Virus Disease, Viral Hemorrhagic Fevers (Ebola, Marburg, Lassa, and Machupo), Western Equine Encephalitis (WEE) Virus Disease, and Yellow Fever.

Summary of Rabies Surveillance:

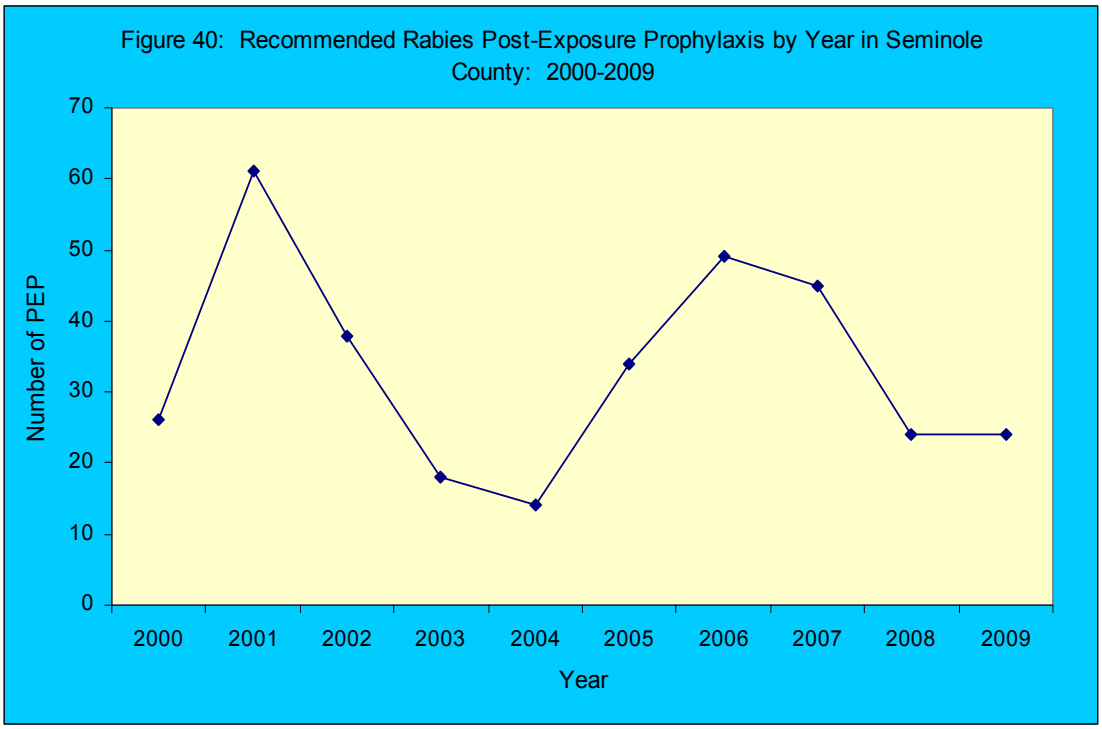
Summary of animal bites and rabies testing in Seminole County:

In 2009, 826 bites were reported to Seminole County Animal Services; 136 (17%) were turned over to SCHD. Of the 136 bites reported to the health department, 53 (39%) were dog exposures, 39 (29%) were cat exposures, 27 (20%) were bat exposures, 14 (10%) was an animal to wildlife exposure, and 3 (2%) was due to unknown exposure. Post-exposure prophylaxis (PEP) was recommended for 24 (18%) of these bites and exposures.

Laboratory results were received for 98 animals; 8 (8%) were positive for rabies. This is a 14% increase in reported animal rabies cases in 2008 (7), and an 11% decrease in the average number of cases seen during 2006-2008 (9). The distribution of rabies cases were as follows: 5 (63%) raccoons, and 3 (37%) bats. Two (25%) of the positive animals involved human exposures. Statewide, more animals tested positive in Leon (12), Marion and Orange (10 each) and Sarasota (9) than in Seminole County during 2009. The same amount (7) of animals tested positive in Alachua, Escambia and Manatee.

Epidemiology of Animal Bites to Humans:

In 2008, there were 24 animal bite cases for which PEP was recommended (Figure 40). The incidence of exposures (5.6/100,000 population) in 2009 remained unchanged when compared to 2008 (5.6/100,000 population). The 2009 incidence of rabies exposure was 39% lower than the 2006-2008 average (9.2/100,000 population), for which PEP was recommended.



The 2009 bite reports occurred in individuals ranging from 9 to 76 years of age. Most of the exposures (46%, 11/24) occurred in individuals 35-54 years of age. Females accounted for most of the exposures (63%, 15/24).

Outbreak Investigations:

Month of Investigation	Type of Facility	Total Ill	Mode of Transmission	Causative Agent
FEBRUARY	Assisted Living	$^{24}/_{105}$	Person-to-Person	Suspected Norovirus
	High School Football Team	$^{17}/_{64}$	Person-to-Person & Airborne	Suspected H1N1 Virus
	Small Business	$^{31}/_{115}$	Person-to-Person & Airborne	Suspected H1N1 Virus
AUGUST	Drug & Alcohol Rehabilitation Center	$^{20}/_{105}$	Person-to-Person & Airborne	Suspected H1N1 Virus
	Elementary School	$^{106}/_{980}$	Person-to-Person & Airborne	Suspected H1N1 Virus
OCTOBER	Middle School	$^{238}/_{1493}$	Person-to-Person & Airborne	Suspected H1N1 Virus

Epidemiology Program Activities:

Through its community outreach programs, the Epidemiology Department provides disease information to individuals, professional organizations, daycares, and other community partners.

Below, are some of the outreach activities that were conducted during 2009:

1. Staff provided technical support for other notifiable diseases requiring additional measures, such as the administration of rabies post-exposure prophylaxis to 24 patients following a bite by an animal where the possible transmission of the disease could not be ruled out.
2. Program staff assisted in the identification of eight rabies cases in animals submitted for testing by Seminole County Animal Services.
3. Provided disease prevention information to 10 local daycares. The information packets distributed to the facilities discussed SCHD services, prevention and control of enteric and respiratory diseases, links to educational resources, childhood immunizations, and hand hygiene promotion.
4. Staff participated in recruiting sentinel providers to report cases of influenza-like-illnesses throughout the entire year.
5. Long term case management was also required for 5 pregnant women identified as being positive for hepatitis B virus infection, in order to prevent transmission during the birth of their children.
6. The program received reports of 44 separate food borne illness complaints.
7. Program staff assisted in the control of two norovirus outbreaks in local long-term care and assisted living facilities.
8. The program investigated multiple influenza-like illnesses which were suspected to be infection with the novel H1N1 virus.
9. Staff answered questions from the general public on a routine basis on topics such as MRSA, local impact of nationwide food borne disease outbreaks, scabies, nursing home complaints, tick bites, etc.
10. The staff participated in activities with other SCHD programs, including local health fairs and back to school immunizations.
11. Participated in conference calls and meetings with local organizations dealing with infection control and emergency preparedness such as the Central Florida Association of Practitioners in Infection Control and the Patient Safety Council quarterly meetings, as well as monthly City-wide (greater Orlando area) Infectious Disease meetings etc.
12. Staff participated in local, regional, and statewide inter- and intra-agency committees and workgroups.
13. Published a monthly bulletin, “Epi-Gazette”, which was distributed to local healthcare and infection control practitioners.
14. The program has attracted a steady stream of nursing and epidemiology students from USF, UCF, and Remington College, as well as Florida Epidemic Intelligence Service fellows for the past two years. The students and fellows have provided valuable help to the Epi/Hep programs.

Hepatitis 09 Program Outreach Activities during 2009:

1. Community outreaches such as hepatitis education, testing and vaccination were conducted approximately once monthly at locations such as Rescue Mission and Vision of God and twice monthly at Teen Challenge. Staff also participated in eight health fairs where education, risk assessments, and testing were performed.
2. Provides education and vaccinations for inmates at the county jail since 2008
3. Hosted Hepatitis Month in May 2009 at SCHD, highlighting hepatitis testing and vaccination.
4. Hosted monthly hepatitis support groups at the health department.
5. Participated in joint outreaches with the sexually transmitted disease program.
6. Performed and processed hepatitis risk assessments.
7. The Hepatitis Program Coordinator, Enid Santiago-Cruz, is an active member of the statewide Florida Viral Hepatitis Council. The Council is made up of leading clinical practitioners, community advocates, and state hepatitis program staff, and provides advice and guidance to the Florida Hepatitis Prevention Program.
8. Participated as a member of the Central Florida Hepatitis Consortium formed to identify ways to provide medical care to chronically infected viral hepatitis patients who are unable to afford treatment. Provided information on the epidemiology of viral hepatitis in the region and worked on a white paper prepared for the consortium.

Activity	Total Administered/ Clients Serviced
Hepatitis Risk Assessments	3806
Hepatitis Education	3567
Hepatitis Panels	3736
Hepatitis C Home Test Kits	98
Hepatitis A, B, and combination doses of A&B Vaccines	1494

Epidemiology Strike Team:

The SCHD Epidemiology Program Manager was responsible for coordinating the establishment, training, and maintenance of an Epidemiology Strike Team comprised of 52 members from the nine local county health departments within east central Florida for responding to public health emergencies within the state. The team is comprised of a very diverse group of public health professionals. The team includes 1 physician, 26 nurses, 12 Epidemiologists, 5 health service representatives, 4 phlebotomist, environmental health specialists, lab personnel and administrative support staff. Some members of the strike team participated in activities such as planning and coordinating the Epidemiology portion of the multi-agency 2009 Florida Chemical Exposure Exercise, and ensuring that the ongoing training requirements of strike team members were met.

Appendix 1: Reportable Diseases/Conditions in Florida

Reportable Diseases/Conditions in Florida

Practitioner* List 11/24/08

Did you know that you are required by Florida statute to report certain diseases to your local county health department?**

*Reporting requirements for laboratories differ. For specific information on disease reporting, consult Rule 64D-3, *Florida Administrative Code (FAC)*.

! = Report immediately 24/7 by phone upon initial suspicion or laboratory test order

☎ = Report immediately 24/7 by phone

• = Report next business day

+ = Other reporting timeframe

- ! Any disease outbreak
- ! Any case, cluster of cases, or outbreak of a disease or condition found in the general community or any defined setting such as a hospital, school or other institution, not listed below that is of urgent public health significance. This includes those indicative of person to person spread, zoonotic spread, the presence of an environmental, food or waterborne source of exposure and those that result from a deliberate act of terrorism.
- Acquired Immune Deficiency Syndrome (AIDS)+
- Amebic encephalitis•
- Anaplasmosis•
- ! Anthrax
- Arsenic poisoning•
- ! Botulism (foodborne, wound, unspecified, other)
- Botulism (infant)•
- ! Brucellosis
- California serogroup virus (neuroinvasive and non-neuroinvasive disease)•
- Campylobacteriosis•
- Cancer (except non-melanoma skin cancer, and including benign and borderline intracranial and CNS tumors)+
- Carbon monoxide poisoning•
- Chancroid•
- Chlamydia•
- ! Cholera
- Ciguatera fish poisoning (Ciguatera)•
- Congenital anomalies•
- Conjunctivitis (in neonates ≤ 14 days old)•
- Creutzfeldt-Jakob disease (CJD)•
- Cryptosporidiosis•
- Cyclosporiasis•
- Dengue•
- ! Diphtheria
- Eastern equine encephalitis virus disease (neuroinvasive and non-neuroinvasive)•
- Ehrlichiosis•
- Encephalitis, other (non-arboviral)•
- ☎ Enteric disease due to: *Escherichia coli*, O157:H7 *Escherichia coli*, other pathogenic *E. coli* including entero- toxigenic, invasive, pathogenic, hemorrhagic, aggregative strains and shiga toxin positive strains
- Giardiasis•
- ! Glanders
- Gonorrhea•
- Granuloma inguinale•
- ! *Haemophilus influenzae* (meningitis and invasive disease)
- Hansen's disease (Leprosy)•
- ☎ Hantavirus infection
- ☎ Hemolytic uremic syndrome
- ☎ Hepatitis A
- Hepatitis B, C, D, E, and G•
- Hepatitis B surface antigen (HBsAg) (positive in a pregnant woman or a child up to 24 months old)•
- Herpes simplex virus (HSV) (in infants up to 60 days old with disseminated infection with involvement of liver, encephalitis and infections limited to skin, eyes and mouth; anogenital in children ≤ 12 yrs)•
- Human Immunodeficiency Virus (HIV) infection (all, and including neonates born to an infected woman, exposed newborn)+
- Human papillomavirus (HPV) (associated laryngeal papillomas or recurrent respiratory papillomatosis in children ≤ 6 years of age; anogenital in children ≤ 12 yrs)•
- ! Influenza due to novel or pandemic strains
- ☎ Influenza-associated pediatric mortality (in persons aged < 18 yrs)
- Lead poisoning (blood lead level ≥ 10µg/dL); additional reporting requirements exist for hand held and/or on-site blood lead testing technology, see 64D-3 FAC•
- Legionellosis•
- Leptospirosis•
- ☎ Listeriosis
- Lyme disease•
- Lymphogranuloma venereum (LGV)•
- Malaria•
- ! Measles (Rubeola)
- ! Melioidosis
- Meningitis (bacterial, cryptococcal, mycotic)•
- ! Meningococcal disease (includes meningitis and meningococcemia)
- Mercury poisoning•
- Mumps•
- ☎ Neurotoxic shellfish poisoning
- ☎ Pertussis
- Pesticide-related illness and injury•
- ! Plague
- ! Poliomyelitis, paralytic and non-paralytic
- Psittacosis (Ornithosis)•
- Q Fever•
- ☎ Rabies (human, animal)
- ! Rabies (possible exposure)
- ! Ricin toxicity
- Rocky Mountain spotted fever•
- ! Rubella (including congenital)
- St. Louis encephalitis (SLE) virus disease (neuroinvasive and non-neuroinvasive)•
- Salmonellosis•
- Saxitoxin poisoning including paralytic shellfish poisoning (PSP)•
- ! Severe Acute Respiratory Syndrome-associated Coronavirus (SARS-CoV) disease
- Shigellosis•
- ! Smallpox
- *Staphylococcus aureus*, community associated mortality•
- ☎ *Staphylococcus aureus* (infection with intermediate or full resistance to vancomycin, VISA,VRSA)
- ☎ Staphylococcal enterotoxin B (disease due to)
- Streptococcal disease (invasive, Group A)•
- *Streptococcus pneumoniae* (invasive disease)•
- Syphilis•
- ☎ Syphilis (in pregnant women and neonates)
- Tetanus•
- Toxoplasmosis (acute)•
- Trichinellosis (Trichinosis)•
- Tuberculosis (TB)•
- ! Tularemia
- ☎ Typhoid fever
- ! Typhus fever (disease due to *Rickettsia prowazekii* infection)
- Typhus fever (disease due to *Rickettsia typhi, R. felis* infection)•
- ! Vaccinia disease
- Varicella (Chickenpox)•
- Varicella mortality•
- ! Venezuelan equine encephalitis virus disease (neuroinvasive and non-neuroinvasive)
- Vibriosis (Vibrio infections)•
- ! Viral hemorrhagic fevers (Ebola, Marburg, Lassa, Machupo)
- West Nile virus disease (neuroinvasive and non-neuroinvasive)•
- Western equine encephalitis virus disease (neuroinvasive and non-neuroinvasive)•
- ! Yellow fever

You are an invaluable part of Florida's disease surveillance system.

For more information, please call the epidemiology unit at your local county health department or the Bureau of Epidemiology, Florida Department of Health (FDOH): 850-245-4401 or visit http://www.doh.state.fl.us/disease_ctrl/epi/topics/surv.htm

FLORIDA DEPARTMENT OF HEALTH

**Section 381.0031(1,2), Florida Statutes provides that "Any practitioner, licensed in Florida to practice medicine, osteopathic medicine, chiropractic, naturopathy, or veterinary medicine, who diagnoses or suspects the existence of a disease of public health significance shall immediately report the fact to the Department of Health." The FDOH county health departments serve as the Department's representative in this reporting requirement. Furthermore, this Section provides that "Periodically the Department shall issue a list of diseases determined by it to be of public health significance ... and shall furnish a copy of said list to the practitioners...."

Appendix 2: Seminole County Population Demographics

Population Estimates 2009: Seminole County				
Age Group in Years	Population*		Gender	Population
<1	4976		Male	209002
1-4	19906		Female	214945
5-9	26702			
10-14	28947		Total	423947
15-19	28317			
20-24	26021		Race	Population
25-34	60603		White	358426
35-44	64454		Black	49060
45-54	66450		Other Non-White	16461
55-64	49171		Total	423947
65-74	26047			
75-84	16140		Ethnicity	Population
85+	6213		Hispanic	66453
Total	423947		Non-Hispanic	357494

Year	Population Estimate
2000	368,231
2001	380, 763
2002	389,549
2003	396,934
2004	405,565
2005	413,937
2006	422,288
2007	426,364
2008	425,911
2009	423,947

Appendix 3: Reported Diseases by Age Group, Seminole County: 2009

Reported Diseases*	<1 yr	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-49	50-59	60+	Total
Brucellosis	0	0	0	0	0	0	1	0	0	0	0	1
Campylobacteriosis	0	2	0	0	2	1	2	1	2	2	2	14
Carbon Monoxide Poisoning	0	0	0	0	0	0	0	0	0	1	0	1
Cryptosporidiosis	0	3	1	0	1	0	0	0	1	0	1	7
Cyclosporiosis	0	0	0	0	0	1	0	1	1	0	0	3
Encephalitis, Other (Non-Arboviral)	0	0	0	0	0	0	0	0	0	2	0	2
Escherichia Coli, 0157:H7 Shiga Toxin Producing	0	0	0	1	0	0	0	0	0	0	0	1
Giardiasis	2	4	5	2	0	0	0	3	1	2	4	23
Haemophilus Influenzae (Invasive Disease)	0	1	0	0	0	0	0	1	0	0	1	3
Hepatitis A	0	0	0	2	0	1	2	1	0	0	1	7
Hepatitis B (+HBsAg in Pregnant Women)	0	0	0	0	0	1	4	0	0	0	0	5
Hepatitis B, Acute	0	0	0	0	0	1	0	0	3	0	2	6
Hepatitis B, Chronic	0	0	0	0	3	1	7	14	8	6	7	46
Hepatitis C, Chronic	0	0	0	0	3	6	14	30	73	70	34	230
Influenza A, Novel or Pandemic Strain	7	8	16	17	25	16	9	14	18	8	3	141
Influenza-Associated Pediatric Mortality	0	0	0	1	0	0	0	0	0	0	0	1
Lead Poisoning	0	1	0	0	0	0	0	1	0	0	2	4
Legionellosis	0	0	0	1	0	0	0	0	1	3	7	12
Lyme Disease	0	0	0	0	1	1	0	1	2	0	0	5
Malaria	0	0	0	0	1	0	0	0	0	0	2	3
Meningitis, Bacterial, Cryptococcal	2	0	0	0	0	0	1	1	0	0	0	4
Meningococcal Disease	0	0	0	0	0	0	0	0	0	0	1	1
Mumps	0	0	0	0	0	0	0	0	1	0	0	1
Pertussis	2	0	1	1	0	0	0	0	0	0	1	5
Rabies, Possible Exposure	0	0	1	3	2	2	0	6	3	4	3	24
Salmonellosis	21	30	12	3	3	4	3	7	8	12	26	129
Shigellosis	0	0	0	0	0	1	0	0	0	0	1	2
Strep Pneumoniae, Invasive Disease, Drug-Resistant	0	1	0	0	1	1	0	1	0	0	2	6
Strep Pneumoniae, Invasive Disease, Drug-Susceptible	0	0	0	0	0	0	0	2	0	4	0	6
Streptococcal Disease, Invasive Group A	0	0	0	0	0	0	0	0	0	0	1	1
Varicella	0	2	5	8	0	0	1	1	2	0	0	19
Total	34	52	41	39	42	37	44	85	124	114	101	713

*Table does not include 8 animal rabies cases

Appendix 4: Reported Diseases by Gender, Seminole County: 2009

Disease	Male*		Female*	
	Number	Rate***	Number	Rate***
Brucellosis	0	0	1	0.47
Campylobacteriosis	9	4.31	5	2.33
Carbon Monoxide Poisoning	1	0.48	0	0.00
Cryptosporidiosis	3	1.44	4	1.86
Cyclosporiosis	2	0.96	1	0.47
Encephalitis, Other (Non-Arboviral	0	0.00	2	0.93
Escherichia Coli, Shiga Toxin Producing	0	0.00	1	0.47
Giardiasis	16	7.66	7	3.26
Haemophilus Influenzae (Invasive Disease)	2	0.96	1	0.47
Hepatitis A	4	1.91	3	1.40
Hepatitis B (+HBsAg in Pregnant Women)	0	0	5	5.64
Hepatitis B, Acute	3	1.44	3	1.40
Hepatitis B, Chronic	24	11.48	22	10.24
Hepatitis C, Chronic	139	66.51	91	42.34
Influenza A, Novel or Pandemic Strains	61	29.19	78	36.29
Influenza-Associated Pediatric Mortality	0	0	1	0.47
Lead Poisoning	3	1.44	1	0.47
Legionellosis	8	3.83	4	1.86
Lyme Disease	1	0.48	4	1.86
Malaria	1	0.48	2	0.93
Meningitis, Bacterial, Crytococcal, Mycotic	1	0.48	3	1.40
Meningococcal Disease	0	0	1	0.47
Mumps	0	0	1	0.47
Pertussis	2	0.96	3	1.40
Rabies, Possible Exposure	9	4.31	15	6.98
Salmonellosis	64	30.62	65	30.24
Shigellosis	2	0.96	0	0
Strep Pneumoniae, Invasive Disease, Drug-R	2	0.96	4	1.86
Strep Pneumoniae, Invasive Disease, Drug-Susceptible	2	0.96	4	1.86
Streptococcal Disease Group A	0	0	1	0.47
Varicella	8	3.83	11	5.12
Total	367		344	711.00

*Based on population estimate of 209,000

**Based on population estimate of 214,945

**Rate calculated per 100,000 using July 1 population estimates from the Florida Legislature, Office of Economic and Demographic Research: 423947

Appendix 5: Reported Diseases by Race, Seminole County: 2009

Disease	White*	Black**	Asian/Pacific***	American Indian***	Unknown	Other	Total****
Brucellosis	1	0	0	0	0	0	1
Campylobacteriosis	13	0	0	0	1	0	14
Carbon Monoxide Poisoning	0	1	0	0	0	0	1
Cryptosporidiosis	7	0	0	0	0	0	7
Cyclosporiosis	2	0	0	0	1	0	3
Enccephalitis, Other (Non-Arboviral)	2	0	0	0	0	0	2
Escherichia Coli, Shiga Toxin Producing	1	0	0	0	0	0	1
Giardiasis	18	2	2	0	1	0	23
Haemophilus Influenzae (Invasive Disease)	3	0	0	0	0	0	3
Hepatitis A	6	0	0	0	0	1	7
Hepatitis B (+HBsAg in Pregnant Women)	1	0	2	0	0	2	5
Hepatitis B, Acute	6	0	0	0	0	0	6
Hepatitis B, Chronic	23	5	16	0	2	0	46
Hepatitis C, Chronic	155	23	5	0	45	2	230
Influenza A, Novel or Pandemic Strains	106	19	2	0	13	1	141
Influenza-Associated Pediatric Mortality	1	0	0	0	0	0	1
Lead Poisoning	3	0	0	0	1	0	4
Legionellosis	11	1	0	0	0	0	12
Lyme Disease	4	1	0	0	0	0	5
Malaria	1	0	2	0	0	0	3
Meningitis, Bacterial, Crytococcal, Mycotic	4	0	0	0	0	0	4
Meningococcal Disease	1	0	0	0	0	0	1
Mumps	1	0	0	0	0	0	1
Pertussis	5	0	0	0	0	0	5
Rabies, Possible Exposure	22	2	0	0	0	0	24
Salmonellosis	105	8	2	0	12	2	129
Shigellosis	1	1	0	0	0	0	2
Strep Pneumoniae, Invasive Disease, Drug-R	2	4	0	0	0	0	6
Strep Pneumoniae, Invasive Disease, Drug-Suscept	5	1	0	0	0	0	6
Streptococcal Disease Group A	1	0	0	0	0	0	1
Varicella	18	1	0	0	0	0	19
Total	529	69	31	0	76	8	713
* Total population=358426							
**Total population=49060							
***Categorized as Other Non-Whites: Population Estimate=16461							
**** Total does not include 8 cases of animal rabies							

Appendix 6: Top Ten Reportable Diseases by Age Group: Seminole County: 2009

Rank	<1 yr	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-49	50-59	60+
1	Salmonellosis (21	Salmonellosis (30)	2009 Novel Infulenza A (16)	2009 Novel Infulenza A (17)	2009 Novel Influenza A (25)	2009 Novel Influenza A (16)	Hepatitis C, Chronic (14)	Hepatitis C, Chronic (73)	Hepatitis C, Chronic (70)	Hepatitis C, Chronic (34)	Salmonellosis (26)
2	2009 Novel Infulenza A (7)	2009 Novel Infulenza A (8)	Salmonellosis (12)	Varicella (8)	Hepatitis B, Chronic (3)	Hepatitis C, Chronic (5)	2009 Novel Influenza A (9)	Hepatitis B, Chronic (14)	2009 Novel Influenza A (18)	Salmonellosis (12)	Hepatitis C, Chronic (21)
3	Giardiasis (2)	Giardiasis (4)	Giardiasis (5)	Salmonellosis (3)	Salmonellosis (3)	Salmonellosis (4)	Hepatitis B, Chronic (7)	2009 Novel Influenza A (14)	Hepatitis B, Chronic (8)	2009 Novel Influenza A (8)	Hepatitis B, Chronic (7)
4	Pertussis (2)	Cryptosporidiosis (3)	Varicella (5)	Rabies, Possible Exposure (3)	Hepatitis C, Chronic (2)	Rabies, Possible Exposure (2)	Hepatitis B (+HBsAg in Pregnant Women) (4)	Salmonellosis (7)	Salmonellosis (8)	Hepatitis B, Chronic (4)	Legionellosis (7)
5	Meningitis, Bacterial (2)	Campylobacteriosis (2)	Cryptosporidiosis (1)	Giardiasis (2)	Rabies, Possible Exposure (2)	Cyclosporiosis (1)	Salmonellosis (3)	Rabies, Possible Exposure (6)	Hepatitis B, Acute (3)	Rabies, Possible Exposure (4)	Giardiasis (4)
6		Varicella (2)	Pertussis (1)	Hepatitis A (2)	Cryptosporidiosis (1)	Hepatitis A (1)	Campylobacteriosis (2)	Giardiasis (3)	Rabies, Possible Exposure (3)	Legionellosis (3)	Strep Pneumonaie, Invasive Disease, Drug-Suscept (4)
7		Haemophilus Influenzae (Invasive Disease) (1)	Rabies, Possible Exposure (1)	E.Coli, Shiga Toxin Producing (1)	Lyme Disease (1)	Hepatitis B (+HBsAg in Pregnant Women) (1)	Haemophilus Influenzae (Invasive Disease) (2)	Campylobacteriosis (1)	Campylobacteriosis (2)	Campylobacteriosis (2)	2009 Novel Infulenza A (3)
8		Lead Poisoning (1)		Influenza-Associated Pediatric Mortality (1)	Malaria (1)	Hepatitis B, Acute (1)	Brucellosis (1)	Cyclosporiosis (1)	Varicella (2)	Giardiasis (2)	Rabies, Possible Exposure (3)
9		Strep Pneumonaie, Invasive Disease, Drug-R (1)		Legionellosis (1)	Strep Pneumonaie, Invasive Disease, Drug-Suscept (1)	Hepatitis B, Chronic (1)	Meningitis, Bacterial (1)	Lead Poisoning (1)	Legionellosis (1)	Encephalitis, Other (Non-Arboviral) (2)	Campylobacteriosis (2)
10				Pertussis (1)		Shigellosis (1)	Varicella (1)	Hepatitis A (1)	Mumps (1)	Haemophilus Influenzae (Invasive Disease) (2)	Hepatitis B, Acute (2)

Appendix 7: Case Analysis of Legionellosis in Seminole County: 2009

Tara Richardson, M.P.H., Gregory Danyluk, Ph.D, M.P.H., M.S., Peggy Booth, RN, BSN, Helen Morin, RN, BA

Introduction

Twelve cases of legionellosis were reported in Seminole County residents in 2009. The resulting rate of almost 3 per 100,000 population per year was the highest within the previous 10 years (Figure 1). Two of the cases were linked to a common site and residence in the same city, while the remaining cases were broadly dispersed throughout the county, and had no common exposures identified. While the presence of 2009 H1N1 influenza may have accounted for heightened concern and testing for acute respiratory illnesses during this period, the case rate was still considerably higher in Seminole County (2.76/100,000) than the remainder of the state during the same period (1.03/100,000) including adjacent or nearby counties (1.64/100,000 for Brevard, Lake, Orange, Osceola, and Volusia). Seminole was second only to Nassau County (2.80/100,000) for the highest rate in the state.

Five of the cases had an onset date in July 2009, including the two linked cases (figure 2). This represents the greatest number of reported cases within any four week period during the previous 10 years. One case was especially noteworthy, as it occurred in a 14 year old adolescent boy, which is an age group not normally considered at risk for the disease. This report includes a brief description of the five July onset cases, followed by a summary of risk factors and demographics for all 2009 cases (Table 1-2).

Case Reports

Case 1

A 41 year old white man with a past medical history (PMH) of kidney stones, sinusitis, and psoriatic arthritis was being treated with Methotrexate; resulting in weakened immunity. He developed malaise and myalgia on 07/01/09 and presented to the emergency department (ED) at Hospital A on 7/6/09 with nausea, vomiting, and diarrhea, fever, and a headache. He was diagnosed with viral meningitis and admitted for further workup. During his admission, he developed shortness of breath on 07/06/09 and was transferred to the Progressive Care Unit (PCU) for treatment of hypoxemia. A chest x-ray (CXR) on 07/07/09 demonstrated dense consolidation in the right upper lobe with air bronchogram, consolidation in both lower lobes and patchy infiltrates in the right lower lobe and left infrahilar region, consistent with multifocal pneumonia. Adenopathy was present in the hilum and mediastinum and based on these findings, the patient was suspected to have pneumonitis or an underlying tumor. A urine antigen specimen for *Legionella* was reported positive on 7/7/09. During his hospitalization, the patient was treated with intravenous antibiotics (Zithromax, Avelox, and Rocephin). This treatment course was in line with recommendations for treating cases of community-acquired pneumonia. He subsequently improved and was discharged on 07/10/09.

Case 2

A 70 year old white man had a PMH of 100-pack-year smoking, chronic obstructive pulmonary disease (COPD), and obesity. He was admitted to Hospital B for pneumonia on 07/18/09 following a progressively worsening 7 day history of fever, cough, myalgia and non-specific abdominal pain for which he had previously seen his primary care provider. A rapid influenza test upon admission was negative for both influenza A and B. A chest x-ray showed extensive left lung pneumonia and some volume loss on the left side and on physical exam he had decreased breath sounds and wheezing. The patient subsequently developed respiratory failure secondary to pneumonia and COPD and was placed on oxygen, but did not require mechanical ventilation or intubation. He was treated with Zosyn, Vancomycin, Azithromycin, and Zithromax. He subsequently recovered and was discharged on 07/25/09. On 7/28/09 a positive urine antigen for *Legionella* was reported.

The patient was readmitted on 08/17/09 as he was not responding to antibiotic therapy and had left upper lobe pneumonia. A urine antigen test performed on 08/18/09 was again positive for *Legionella pneumophila* Group 1. A bronchoscopy demonstrated extrinsic compression in left upper lobe. The patient was started on intravenous antibiotics including Maxipime and Zithromax. Following treatment, he improved considerably and was discharged on 08/22/09.

Risk factors for *Legionella* included daily use of the swimming pool and shower facilities at a local fitness facility for several days prior to becoming ill. He denied exposure to any other water-related activities, including use of the sauna or spa.

Case 3

A 75 year old white man with multiple underlying medical conditions including hypertension, diabetes, prostate disease and Alzheimer's dementia was admitted to the ICU at Hospital A on 07/15/09 with a 24 hour history of fever and a recent syncopal episode. A specimen collected on the same day for urine antigen testing was positive for *Legionella*. Serogroup information was not available for this patient. A nasopharyngeal specimen collected on 07/16/09 was sent to the Florida Department of Health Bureau of Laboratories (FL DOH BOL) in Jacksonville and was negative for seasonal and novel H1N1 influenza A. He was treated with Vancomycin, Rocephin, and doripenem. He recovered and was subsequently discharged on 07/26/09.

A proxy interview conducted with his daughter with whom he lived revealed he was a member of the same local fitness facility as case 2 where he had used the pool and shower prior to becoming ill. The patient also had a dental cleaning procedure two weeks prior to illness. This case patient was epidemiologically linked to case patient two and met the criteria for legionella testing.

Case 4

A 66 year old white Hispanic man had a history of hypertension and chronic lymphocytic Leukemia (CLL). In April 2009 he underwent a bone marrow transplant at a cancer center in another state and stayed in a hotel in that state while receiving chemotherapy. On 7/12/09, he developed symptoms of cough, fever, chills, malaise, and shortness of breath. He returned home to Florida on 7/16/09 and was admitted in the intensive care unit (ICU) at Hospital C with pneumonia and was seen by an infectious disease doctor on 07/17/09 for a bronchoscopy. While hospitalized he was treated with Vancomycin, Tobramycin, Azithromycin, and Cefepime. He subsequently expired on 07/18/09. Infection with *Legionella* was subsequently confirmed on 07/22/09 by urine antigen testing. His was the only fatal case in Seminole County for 2009.

Case 5

A morbidly obese 14 year old white adolescent boy with pre-hypertension and pre-diabetes developed fever, cough and chest pain starting on 7/18/09. He was initially taken to nearby Hospital D on 07/20/09 and one day later was transferred to hospital E. A chest x-ray taken upon admission to Hospital E demonstrated right lower lobe pneumonia and a nasal wash was positive for Influenza A. Subsequent testing at the FL DOH BOL in Jacksonville was negative for seasonal and novel H1N1. Due to worsening respiratory status, he was transferred to the pediatric intensive care unit on 7/24/09 and intubated. *Legionella* was confirmed on 07/23/09 by urine antigen testing. A tracheal aspirate culture was performed on 07/24/09 and was positive for *Legionella pneumophila* Group 1 on 07/24/09. A follow-up chest x-ray on 7/27/09 showed progressive pneumonia involving the right middle and lower lobes and most of the left lung. During his hospitalization, he was treated with Tamiflu, Rocephin, Oseltamivir, and Rimantadine. He subsequently recovered and was discharged on 08/14/09.

While he had no traditional risk factors for *Legionella*, the patient reported swimming in the pool at home. The patient also has a detachable shower head at home which he used to take his showers prior to infection.

Discussion

Legionellosis is caused by the bacterium *Legionella pneumophila* and other *Legionella* species (1). *Legionella* can be found in natural, freshwater environments, but are present in insufficient numbers to cause disease. Drinking water systems, whirlpool spas, and cooling towers provide the three conditions needed for *Legionella* transmission: heat, stasis, and aerosolization. Hence, exposure to water from these sources is the most common origin of outbreaks. Although most cases are sporadic, travel-associated outbreaks, outbreaks in community settings, and nosocomial and occupational outbreaks are common (1).

People with *Legionella* pneumonia frequently require hospitalization. According to the Centers for Disease Control and Prevention (1), there are between 8,000 and 18,000 hospitalizations due to legionellosis in the United States each year. While it may be successfully treated, between 5-30% of the cases are fatal. These figures do not represent a true estimation of the disease burden due to low use of diagnostic testing and underreporting (2). Low use may be a result of adherence to the recommendations from the American Thoracic Society (ATS) to limit Legionella laboratory testing to certain groups such as high-risk patients admitted to the intensive care unit (ICU) (3).

Legionellosis is associated with two clinically and epidemiologically distinct illnesses; Legionnaires disease, which is characterized by fever, myalgia, cough, pneumonia, and Pontiac Fever, a milder illness without pneumonia. A confirmed case of legionellosis must meet one or more of the laboratory criteria which includes isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile site, or detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents or fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* using validated reagents (4).

Risk factors for *Legionella* exposure include use of whirlpool spas, recent travel and overnight stay outside of the home, and recent repairs or maintenance on domestic plumbing (4). Those who are at higher risk of getting the disease are people over age 65, smokers, and those who have co-morbidities such as chronic obstructive lung disease (COPD), diabetes, cancer or kidney disease or are immunosuppressed.

The mode of transmission for legionellosis mainly includes airborne transmission (5). However, other modes are possible including aspiration of water. The incubation period for legionellosis ranges between 2-10 days, most often 5-10 days. The incubation period for Pontiac fever which is a milder form of the disease ranges between 5-72 hours, most often 24-48 hours. Person-to-person transmission of the disease has not been documented (6).

The importance of recognizing legionellosis early is that it is best treated with antibiotics not usually administered for common types of pneumonia. Outbreaks or increases in the number of cases legionellosis present a public health challenge since rapid, sensitive, and specific diagnostic tests are not widely used (6). The American Thoracic Society (ATS) guidelines on community acquired pneumonia (CAP) do not favor routine laboratory testing for *Legionella* of all patients with CAP; empiric therapy is recommended instead. The guidelines on community-acquired pneumonia do not recommend laboratory testing for legionellosis unless the patient is admitted to the ICU, not responding to ß-lactam treatment, or is part of an epidemic an epidemic. Thus, *Legionella* testing is often confined to patients with severe pneumonia and less likely to be ordered for patients who are not severely ill (7).

Empiric therapy for persons hospitalized with CAP should also include coverage for legionellosis. Pontiac fever is self-limited and does not require antimicrobial therapy. Specific therapy effective against *Legionella* infection includes antibiotic capable of achieving high intracellular concentrations, such as levofloxacin, or a newer macrolide (azithromycin). Observational studies suggest that levofloxacin may be more effective than macrolides, especially in severe cases. Azithromycin and levofloxacin are also licensed by the Food and Drug Administration (FDA) for the treatment of LD and are considered preferably to erythromycin which was historically the drug of choice. Rifampicin has been used as an adjunct in patients failing standard therapy, but data to support this approach are lacking. Penicillin, the cephalosporins and aminoglycosides are ineffective.

The legionellosis rate in Seminole County during 2009 was 2.76/100,000, which was the highest reported rate within the last ten years. Among the 12 cases in 2009, a large proportion (5/12, 42%) had an onset date in July. The majority of the cases occurred among males (7/12, 58%), and non-Hispanic whites (7/12, 58%).

All patients (12/12, 100%) had ≥2 of the clinical features for legionellosis, including cough, chest pain, fever/chills, malaise, loss of appetite, and/or shortness of breath and all required hospitalization. All patients had radiographic evidence of pneumonia and a positive urine antigen test. Two of the twelve cases (17%) were linked to a local fitness facility although a specific exposure is unknown as environmental samples tested were negative for *Legionella*. The majority of cases (10/12, 83%) did not report travel history outside of Florida or Outside the United States in the two weeks prior to illness onset, and were considered to be cases acquired in Florida. The one patient who died was receiving cancer chemotherapy as recently as two days prior to illness onset. The other 11 patients (92%) recovered from the infection.

With the exception of the teenage boy, most cases had recognized underlying risk factors. This include being 65 years of age or older (58%), chronic heart disease (50%), COPD (42%), immunosuppressive conditions (42%), immunosuppressive therapy, malignancies, and smoking (33%). While high blood pressure and obesity are not traditional risk factors for contracting *Legionella*, each was reported among 50% and 33% of case patients respectively.

Most of the cases appeared to have been community-acquired; however potential exposure risk factors were also reported. Two patients (17%) swam in a pool outside of their residence during their incubation period, while two (17%) reported either dental work or travel. One patient (8%) also reported drinking from a public water fountain. One (8%) case patient reported being employed as a landscaper.

In retrospect, based on recommendations from the ATS, six (6/12, 50%) of the case patients met one or more of the criteria for *Legionella* testing. Of those, four (67%) of the case patients required admission to ICU, two (33%) were outbreak related and one (17%) was not responding to empiric therapy. All twelve (100%) case patients received at least one or more antibiotics that are recommended for treating CAP during the initial and final treatment regimen.

Environmental inspections are not recommended for sporadic cases; however, two of the case patients were linked to a point source thus warranting an environmental investigation which was conducted at the fitness club on 08/10/09. Following consultation with the Florida Department of Health Bureau of Laboratories, Jacksonville branch, swabs and/or water samples were collected from the showers, water heater, shower head, and the water (equipment room) and sent to the laboratory. The samples were tested on 08/11/09. All environmental samples collected from the facility were negative for *Legionella pneumophila*. There were no noted violations observed during the inspection. The lack of positive laboratory results for *Legionella* from the environmental samples could be due to laboratory error,

sampling error, organism not being present in detectable quantities for methods used, organism not being present at time of sampling, or this facility not being the source of infection.

Conclusion

The risk factors for *legionella* infection and severe outcomes may be different. However, they tend to be the same if only severe cases are detected. The number of legionellosis cases in Seminole County during 2009 represents a significant increase in incidence when compared to previous years. All twelve patients had clinical features and radiographic evidence of legionellosis. Notably, the youngest patient (14 years of age) did not have any of the traditional risk factors for contracting legionellosis. Understanding the natural history and risk factors associated with *Legionella* infections in children and to improve diagnostic testing in this group may be beneficial. Epidemiologic investigations have not identified a point source or clustering in a certain neighborhood other than the two cases that were linked to the local fitness center.

An explanation for the increase in Seminole County may be increased vigilance in identifying high risk patients for diagnostic testing as well as provider awareness (7). Fifty-eight percent (7/12) of the case patients were hospitalized within the same hospital system, which may be more likely to utilize diagnostic testing (8). It is unknown if increased legionellosis incidence rate in Seminole County represents a true increase in disease activity, detection, reporting, or some combination thereof.

Recommendations

The ATS guidelines on community-acquired pneumonia do not support routine laboratory testing for legionellosis unless the patient is admitted to the ICU, for patients who do not respond to ß-lactam treatment, or part of an epidemic. Due to these stringent guidelines, clinicians may be more reluctant to perform testing for legionellosis in patients with CAP in an effort to adhere to the recommendations. This is a problem for patients who would benefit from targeted therapy to reduce the risk of morbidity and mortality. As early detection contributes to better treatment outcomes, it is important that health care providers continue to test and report highly suspected cases of legionellosis. It is also important to test environmental samples for *Legionella* to identify potential sources of exposure when the cases are epidemiologic linked to a point source. Continued surveillance will also be important in evaluating if the trend of increasing cases is ongoing.

References

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Figure 1: Rate of Legionellosis in Seminole County: 2000-2009

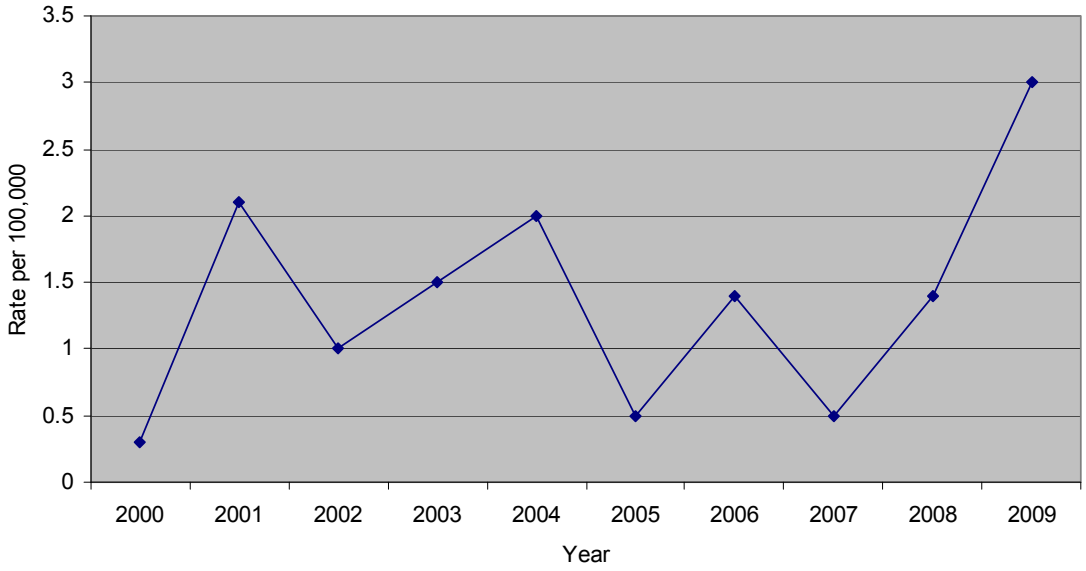

Figure 2: Reported Cases of Legionellosis in Seminole County: 01/01/08-11/30/09

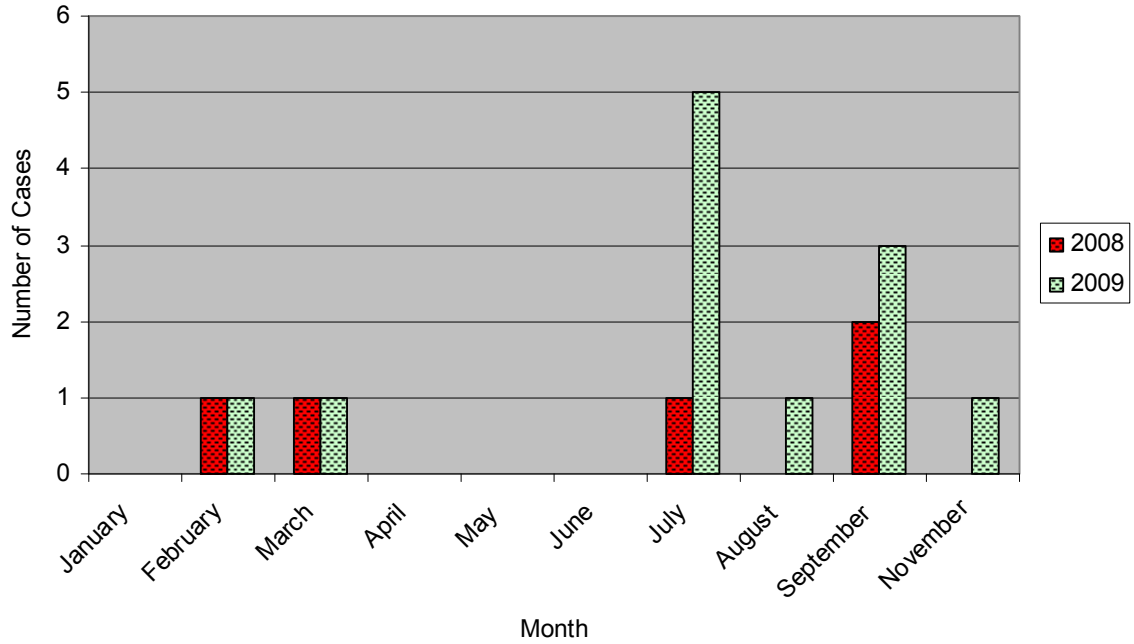

Table 1: Demographic Characteristics of Case Patients		
Demographics	**Number**	**Percentage***
Gender		
Male	7	58
Female	5	42
Total	12	100
Age		
15-19	1	8
40-49	1	8
50-59	3	25
≥60	7	58
Total	12	99
Race/Ethnicity		
White, Non-Hispanic	7	58
Black, Non-Hispanic	1	8
Hispanic	4	33
Total	12	99
*May not equal 100% due to rounding		

Table 2: Clinical and Epidemiologic Risk Factors		
Underlying Medical Conditions	**Number***	**Percentage (%)**
Chronic obstructive pulmonary disease	5	42
Chronic heart disease	6	50
Malignancies	4	33
Diabetes	2	17
End-stage renal disease	1	8
Kidney disease	1	8
Immunosuppressive conditions	5	42
Immunosuppressive therapy	4	33
High blood pressure	6	50
Obesity	4	33
Signs/Symptoms		
Cough	8	67
Fever/chills	12	100
Shortness of breath	10	83
Malaise	11	92
Anorexia/loss of appetite	8	67
Headache	3	25
Diarrhea	2	17
Myalgia/muscle pain	6	50
Risk Factors		
Smoker	4	33
Travel	2	17
Dental work	2	17
Water exposure	3	25
Sensitive occupation	1	8
ATS Guidelines for *Legionella* Testing		
Outbreak-related	2	17
Admission to Intensive Care Unit	4	33
ß-lactum Therapy Failure	1	8
*Number of case patients of a total (12) patients		

Appendix 8: Assessing Awareness of 2009 Pandemic Influenza A (H1N1) among Business Owners, Seminole County.

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Businesses have an important role in protecting employee's health and safety as well as maintaining a viable economy. Employees who have close contact with each other and the public are particularly at risk for acquiring and transmitting infection. Following the emergence of the 2009 Pandemic Influenza A (H1N1), it is important to provide current information to businesses to assist them with their response plans. On August 19, 2009, the Centers for Disease Control and Prevention (CDC) released its new Guidance for Businesses and Employers to Plan for and Respond to the 2009-2010 Influenza Season. The document includes recommendations to keep sick workers home and to be prepared for dismissal from school and closure of child care programs due to increased illnesses. Although school closures are not anticipated, individual employees may be affected if they need to stay home to provide care to family members.

According to the US Census Bureau 2005-2007 American Community Survey, 110,876 Seminole County residents work within the county. Beginning, August 25, 2009, the Seminole County Health Department contacted local businesses with more than 100 employees in order to alert them to the new CDC guidance. In addition, they were asked whether they have sick leave policies in place and were encouraged to create and review sick leave policies with regards to a pandemic. They were also asked whether they would be willing to assist the health department in its influenza surveillance by reporting unusually high numbers of absences due to illness.

Method

A list of Seminole County private businesses with contact information and numbers of paid employees was obtained through the County Office of Emergency Management. Human Resource departments at businesses headquartered in Seminole County with more than 100 employees were contacted and interviewed using a brief telephone survey. The included businesses were questioned about awareness of CDC's recent guidance for businesses, sick leave policies addressing respiratory illnesses, pandemic preparedness plans, willingness to report increases in absence due to ILI to the Seminole CHD, and a primary contact for the agency. All information was recorded in Microsoft Access 2003.

Results

A total of 86 businesses with a combined total of 20,479 employees that met the inclusion criteria were contacted. Most of the businesses were not aware of the recent guidance and did not have a pandemic plan. However, most of the businesses stated that they have a sick leave policy in place. Most of the businesses stated that they would be willing to report increased absentee rate due to ILI to the health department (Table 1).

Table 1: Responses to telephone survey regarding awareness of CDC guidance for businesses and employers to plan for and respond to the 2009-2010 Influenza Season.

Questions	*Yes*	*No*	*Total*
Are you aware of the CDC guidance document for businesses and employees?	16 (19%)	70 (81%)	86 (100%)
Do you have sick leave policies?	77 (90%)	9 (10%)	86 (100%)
Do you have a pandemic plan?	19 (22%)	67 (78%)	86 (100%)
Would you be willing to report outbreak of ILI to the health department?	56 (65%)	30 (35%)	86 (100%)

Discussion and Conclusions

The number of businesses contacted as of September 10, 2009 represents approximately 20% of the Seminole County workforce. However, the number of non-Seminole County residents employed at these businesses is unknown. In addition, the list was created in September 2008 at a time of relatively low unemployment in the county. Local county and municipal agencies were not contacted as part of this survey because of their relatively frequent contact with the health department, including for example the largest employer in the county, the public school system.

It was beneficial to contact the businesses as most of them were not previously aware of the guidance document or general recommendations for addressing absences due influenza-like-illnesses. This was a good opportunity to provide them with links to the document and discuss infection control measures to reduce and prevent additional illness. While most of the businesses had a sick leave policy, it is recommended that they start adjusting their plans to account for large amount of illnesses and absences due to ILI and respiratory illnesses. Businesses were also encouraged to review and/or create pandemic plans in advance of a larger scale event.

Resources

Centers for Disease Control and Prevention (CDC) website:
H1N1
http://cdc.gov/h1n1flu/business/guidance/

Florida Department of Health (FLDOH) website:
H1N1 Swine Flu
http://www.doh.state.fl.us/DEMO/php/FluInfo.htm#Communities%20and%20Workplace

United States Census Bureau, American Community Survey website:
http://factfinder.census.gov/servlet/STTable?_bm=y&-geo_id=05000US12117&-qr_name=ACS_2007_3YR_G00_S0801&-ds_name=ACS_2007_3YR_G00_&-redoLog=false

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