Fall
2014

Florida Department of Health
Volusia County

Office of Disease Control and Health Protection

EPI-LOG

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Emerging Pathogens
By: Paul Rehme, DVM, MPH

The concept of Emerging Pathogens has been front and center for most of this year in the national and local media. Between Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV), Chikungunya Virus, and Ebola Virus Disease (EVD) it seems there is a new scare every couple of months. The emergence or re-emergence of pathogens in the western hemisphere or in any other place in the world is something that has been expected by scientists for some time and came into its own as a concept after the emergence of Human Immunodeficiency Syndrome (HIV) in the 1980's.

There are numerous factors as to why we see pathogens that we have not seen before. One factor is the relationship between man and animals. It's been estimated that between 60 and 80 percent of emerging pathogens are zoonotic and thus potentially spread from animals to humans. Both MERS-CoV and EVD are believed to have an animal reservoir in nature. The close proximity of fowl, hogs, and humans in some parts of the world is generally believed to be where new influenza strains originate. Another factor for emergence is the speed of global travel in today's world. Passengers are whisked rapidly around the world so any disease is simply a plane ride away from anywhere else. Along the same line is that a truly global economy has emerged which increases the opportunities for human and animal travel as well as for agricultural products to end up a long way from their origination.

The re-emergence of old pathogens in more virulent or resistant forms, or in new locations is a similar concept. Some of the former has been discussed in various other forums in terms of inappropriate use of antibiotics (e.g., MRSA and resistant forms of *C. difficile*) and the latter is quite often a function of the shrinking world as noted above (e.g., West Nile Virus and Chikungunya).

The concept of "One Health" was honed from the concern over emerging and re-emerging pathogens. It is centered on the notion that human health, animal health, and the ecosystem are all inextricably linked. With professionals from all of those disciplines working together we can improve the health and well-being of all. Please visit the One Health Initiative website for more information on this concept: http://www.onehealthinitiative.com/

Another valuable resource is the Emerging Pathogens Institute at the University of Florida. The Emerging Pathogens Institute was created in 2006 to provide a world-class research environment to facilitate interdisciplinary studies of emergence and control of human, animal and plant pathogens of concern to Florida, to the nation and to the world. Please visit their website for information on emerging pathogens including EVD as well as other news and events: http://epi.ufl.edu/

One way to prepare ourselves both locally and nationally for these emerging and re-emerging pathogens is by looking back and re-evaluating all of our infectious disease protocols. The next disease threat we face may, and will likely, be completely different from MERS-CoV or EBV which will make it just as challenging. By re-evaluating how we deal with all infectious diseases and developing standard protocols and procedures based on sound scientific principles we can be ready for the next challenge.

Drs. Morens and Fauci in the article "Emerging Infectious Diseases: Threats to Human Health and Global Security" conclude: "We have many tools in our armamentarium, including preparedness plans and stockpiles of drugs and vaccines. But each new disease brings unique challenges, forcing us to continually adapt to ever-shifting threats. The battle against emerging infectious diseases is a continual process; winning does not mean stamping out every last disease, but rather getting out ahead of the next one."

For more information please visit the websites noted above. For specific disease information the World Health Organization (www.who.int), Centers for Disease Control and Prevention (www.cdc.gov), and the Florida Dept. of Health (www.floridahealth.gov) all have lots of information on many infectious diseases.

Reference: Morens DM, Fauci AS (2013) Emerging Infectious Diseases: Threats to Human Health and Global Stability, PLoS Pathog 9(7): e1003467. doi:10.1371/journal.ppat.1003467

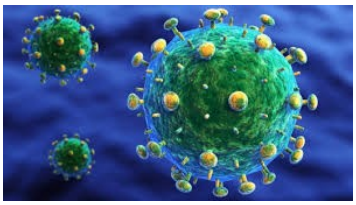
This Issue:

Ebola Virus Disease Questions?
For the latest information/guidance visit:
http://www.cdc.gov/vhf/ebola/index.html or
http://www.floridahealth.gov/diseases-and-conditions/ebola/index.html

Revised HIV Case Definition

By: Patrick Forand, MPH

Over the past thirty years advancements in testing technology and medications have highlighted changes in the detection and treatment of the Human Immunodeficiency Virus (HIV). Another change that has taken place is a revision to the surveillance case definition. The latest revision was published in the Center for Disease Control and Prevention's MMWR on April 11, 2014. The changes were needed to address several issues: the need to adapt to recent changes in diagnostic criteria, recognition of early HIV infection, differentiation between HIV-1 and HIV-2 infections, consolidation of staging systems for adults/adolescents and children, simplification of criteria for opportunistic illnesses indicative of AIDS (Acquired Immune Deficiency Syndrome), and revision of criteria for reporting diagnoses without laboratory evidence.



There have been significant advances in the technology of HIV diagnostic testing that do not use the Western blot or immunofluorescence HIV antibody assays. Now with the new definition a Western blot does not need to be conducted as a confirmation test. The confirmation test is performed as part of a multitest algorithm that can include antibody immunoassays or nucleic acid tests (NAT).

Along with the changes to the diagnostic testing there is now an addition of "stage 0". This addition takes advantage of tests incorporated in the new algorithms that are more sensitive during early infection than previously used tests and that together with a less sensitive antibody test, yield a combination of positive and negative results enabling diagnosis of acute HIV infection, which occurs before the antibody response has fully developed. With stage 0 being added allows for the monitoring of cases that have been diagnosed much sooner after infection, which is the most highly infectious period when viral loads are higher.

An important change of note for physicians is that the new case definition removes the requirement that a "physician-documented" diagnosis must be based on laboratory evidence. Surveillance staff can now use sufficient clinical evidence when it is impractical to retrieve laboratory test information regarding the initial diagnosis.

This revised case definition, is intended primarily for public health surveillance of HIV infection on a population level. The staging system should not be used by clinicians as a guide to manage patients. Antiretroviral guidelines recommend antiretroviral therapy for all HIV infected individuals.

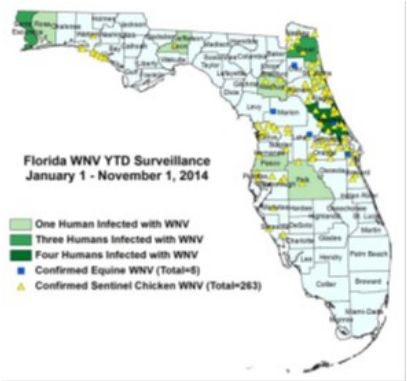
For more information regarding this definition and the HIV/AIDS Surveillance program at the Florida Department of Health in Volusia County, contact Patrick Forand at Patrick.Forand@flhealth.gov or 386-274-0585.

Selik, MD, R., Mokotoff, MPH, E., Branson, MD, B., Owen, PhD, S., Whitmore, DrPH, S., & Hall, PhD, H. (2014). Revised Surveillance Case Definition for HIV Infection - United States, 2014. *MMWR, 63*(3), 1-13. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6303a1.htm?s_cid=rr6303a1_e

West Nile Virus

By: Jyothi Praveen, MPH

We have had four cases of locally acquired West Nile Virus (WNV) from August through October 2014 in Volusia County. All these cases were neuro-invasive. The last known locally acquired case of WNV prior to this year was in 2003. Sero-conversions have been seen in sentinel chicken flocks and a horse beginning late July 2014. WNV activity is widespread throughout the county. Volusia County has been under a mosquito-borne illness advisory since June 2014 which was upgraded to an alert in October 2014.

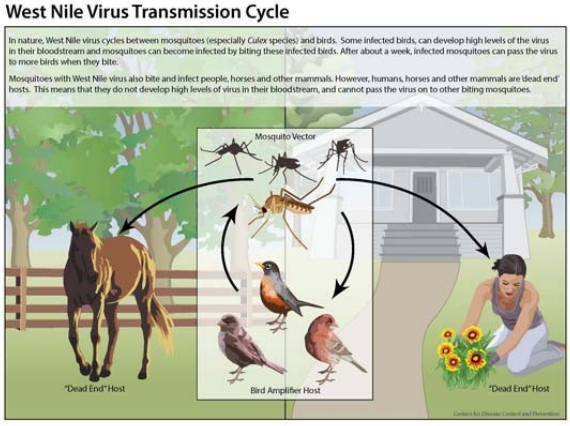


WNV emerged in the United States in 1999 in New York and made its way to Florida in 2001. It is considered endemic in the U.S. with the annual incidence peaking in summer. In Florida, the peak period of transmission is July through September.

The West Nile virus cycles between *Culex sp.*of mosquitoes and birds in nature. In some infected birds high levels of WNV can develop in the blood stream. Mosquitoes can get infected by biting these infected birds. The infected mosquitoes pass the virus to other birds when they bite. Sometimes infected mosquitoes can also bite humans, horses and other mammals and cause disease. Humans and horses are "dead-end" hosts meaning that they do not spread infection while they are infected .

Approximately 80% of people who become infected with WNV do not develop symptoms. One out of 5 people will develop febrile illness and/or associated symptoms like headache, body aches, joint pain, vomiting, diarrhea and rash. Persons who develop this will completely recover except for weakness and fatigue lasting for several weeks to months. Severe symptoms develop in a few people with neurologic illness such as encephalitis and meningitis. Recovery in severe neurologic illness may take several weeks to months and some of the effects may be permanent. Less than 1% of the infected people can develop fatal neurologic illness.

West Nile Virus Transmission Cycle



Providers need to have an index of suspicion in persons presenting with febrile or acute neurologic illness with exposure to mosquitoes, blood transfusion, and organ transplant. Lab testing should include testing of serum and cerebrospinal fluid (CSF) to detect WNV-specific IgM antibodies. Other testing like reverse transcriptase-polymerase chain reaction [RT-PCR] can be performed on serum, CSF, and tissue specimens early on to confirm an infection. Serum and CSF samples in suspected WNV case should be forwarded to our Bureau of Public Health Laboratories for further testing through guidance from health department.

Prevention of WNV disease is by avoiding mosquito bites when going outdoors through use of mosquito repellents containing up to 30% DEET (10% for children), staying indoors during peak mosquito activity from dusk to dawn, wearing long sleeve shirts and pants, and eliminating water-holding containers in the property where mosquitoes can breed. For more information on prevention measures, please follow the link: http://www.floridahealth.gov/diseases-and-conditions/mosquito-borne-diseases/prevention.html

Volusia County Disease Activity*	3rd Quarter 2014	3rd Quarter 2013	YTD 2014 (30 Sep)	Full Year 2013
Vaccine Preventable				
Mumps	0	0	1	1
Pertussis	5	3	9	18
Varicella	1	1	6	15
CNS Diseases and Bacteremias				
Creutzfeldt-Jakob disease (CJD)	0	0	0	2
Haemophilus influenzae (invasive)	0	1	4	6
Meningitis (bacterial, cryptococcal, mycotic)	0	0	1	2
Meningococcal disease	0	0	0	2
Staphylococcus aureus (GISA/VISA)	0	0	0	0
Streptococcus pneumoniae (invasive disease)	4	3	31	39
Drug resistant	2	0	14	19
Drug susceptible	2	3	17	20
Enteric Infections				
Campylobacteriosis	17	27	48	75
Cryptosporidiosis	26	1	35	10
Cyclosporiasis	1	1	1	1
Escherichia coli, shiga-toxin producing (STEC)	3	5	13	11
Giardiasis	4	4	12	22
Listeriosis	0	0	0	0
Salmonellosis	56	58	99	178
Shigellosis	6	1	13	3
Typhoid Fever	0	0	0	0
Viral Hepatitis				
Hepatitis A	1	2	1	2
Hepatitis B, acute	1	2	3	7
Hepatitis B, chronic	23	16	67	70
Hepatitis C, acute	0	5	2	12
Hepatitis C, chronic	187	162	552	848
Hepatitis E	0	0	0	0
Hepatitis +HBsAg in pregnant women	2	0	5	6
Vector Borne, Zoonoses				
Brucellosis	0	0	1	0
Chikungunya	2	0	2	0
Dengue Fever	1	2	1	2
Ehrlichiosis/Anaplasmosis	1	2	1	2
Lyme disease	5	6	8	7
Malaria	0	0	1	0
Monkey bite	0	0	0	0
Q Fever, acute	0	0	0	0
Rabies, animal	1	1	3	5
Rabies (possible exposure)	42	45	104	178
Rocky Mountain spotted fever	0	1	0	2
West Nile virus, neuroinvasive	2	0	2	0
HIV/AIDS†				
HIV	31	25	89	113
AIDS	15	21	43	71
STDs†				
Chlamydia	436	411	1212	1729
Gonorrhea	94	160	304	576
Syphilis				
Infectious (Primary and Secondary)	2	8	12	29
Early latent (Infection for <1 year)	2	3	8	14
Late latent (Tertiary)	16	3	26	23
Latent, unknown duration	0	0	8	9
Others				
Carbon monoxide poisoning	3	3	22	10
Ciguatera Fish Poisoning	0	0	1	0
Hansen's Disease (leprosy)	0	0	0	0
Hemolytic Uremic Syndrome	0	0	0	2
Influenza due to novel or pandemic strains	0	0	0	0
Influenza-associated pediatric mortality	0	0	0	0
Lead poisoning	1	1	1	5
Legionellosis	3	0	6	6
Pesticide related illness or injury	0	0	0	3
Tuberculosis			9	13
Vibriosis	2	2	2	3

*Includes reported confirmed/probable cases. Data is provisional and subject to change.
† Numbers are for Area 12 (Volusia/Flagler)

Influenza Season Update

By: David Parfitt, MPH

The 2014-2015 Florida flu season has begun. As the first line of defense, the Centers for Disease Control and Prevention (CDC) encourages the annual flu vaccine for those age 6 months and older. In addition, the CDC recommends that healthy children (ages 2 through 8) utilize the nasal spray vaccine as it has shown to be more effective than the flu shot for children of these ages. As always, remember to practice good hand hygiene, avoid contact with those who are sick and to stay home if you are not feeling well.

According to the latest Florida Flu Review, 31 counties across the state are reporting increasing influenza activity. Statewide emergency department and urgent care center influenza-like illness (ILI) visits are also increasing. In Florida, the most common subtype that has been determined by the Bureau of Public Health Laboratories (BPHL) was influenza A (H3). During influenza Week 45 approximately 57% of specimens submitted to the state labs tested PCR positive for influenza. Of the 31 that were positive, 4 were classified as influenza A (H3), 24 were positive for influenza A unspecified, 2 were influenza B unspecified and 1 was detected as influenza B Yamagata. In addition, one outbreak of influenza was reported during this same flu week. There have been no pediatric influenza associated deaths within Week 45.

Nationally, influenza activity has been reported as low. While the geographic distribution of the flu is widespread, per the CDC, the percentage of outpatient visits for ILI is 1.5% and below the national baseline of 2.0% . During the latest weekly report, out of 504 specimens testing positive, 394 were influenza A and 110 were influenza B. Among those specimens positive for influenza A, 120 were further categorized as H3.

The state recommends that the influenza vaccine continued to be administered by health care professionals as long as the flu is circulating. Vaccine manufacturers are expected to produce as many as 156 million doses of the influenza vaccine available for use in the United States this season. The vaccines are created to protect against the main flu viruses: Influenza A (H1N1) viruses, influenza A (H3N2) viruses, and influenza B viruses.

For more information regarding the flu, the current vaccine, or other health department recommendations please contact the Florida Department of Health in Volusia County at 386-274-0651.

References:
Centers for Disease Control and Prevention
Florida Department of Health
Reportable Diseases/Conditions in Florida Practitioner List 06/04/2014

Florida Department of Health in Volusia County
Office of Disease Control and Health Protection