



Epi Update



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*Vigilance and preparedness to prevent disease when we can,
control when we must!*

Epidemiology and Surveillance Role During BioWatch Actionable Result (BAR)

by Sarah K. Winn, MPH and Sa'ad Zaheer, MD, PhD, MSPH

Objectives

This report will describe the roles of epidemiology and surveillance regarding the general communication process, decision-making procedures, and systems for interpreting signals associated with a BAR.

Background

BioWatch is an early warning system that can quickly detect trace amounts of biological materials in the air whether they are due to calculated release or minute quantities that may occur naturally in the environment. The system assists public health experts in determining the presence and geographic scope of a biological agent release, allowing federal, state, and local officials to more rapidly determine emergency response, medical care, and consequence management needs. In the event of a BAR, it will be necessary to rapidly collect and comprehend information from various data sources to properly assess risks to public health.

Methods

On February 13, 2007 a BioWatch tabletop exercise was conducted in Ponte Vedra, Florida. Representatives from the city, Duval County, and the state of Florida participated in the tabletop exercise. The exercise included an introductory briefing on the BioWatch Program, and the tabletop exercise focused on three elements of a response to a BAR:

- Notification drill held prior to the exercise and recommended changes to notification protocol to address challenges or gaps.
- BioWatch Advisory Committee (BAC) conference call - A plenary session walk-through of the BAC and a post-BAR initial meeting agenda that included mock briefings from key BAC members, initial assessment of public health risks, and associated key decisions to be made during the conference call; identified gaps in the current procedures for the conference call; and developed an agenda for the call with federal partners.
- Event characterization - A plenary session that focused on how BAC members and staff will collect, present and use the information provided by environmental sampling and enhanced surveillance. It included the detected organism's regional profile and event reconstruction results, and concluded with approaches to risk management communications to public, local, state and national officials, and the media.

Results

The BioWatch laboratory director provided the first situation briefing, summarizing critical information about the BAR. This information included the organism, *Yersinia pestis*, and other information classified for official use only. Following the laboratory director's summation, members of the Duval County Health Department Epidemiology and Surveillance Division provided the epidemiology situation briefing, addressing general agent briefing in accordance with the Florida Department of Health fact sheet on plague.

Staff of the Epidemiology Division also provided regional profile data, which indicated that no plague cases have appeared in the city or the state of Florida since the early 1900's. Animal surveillance data was pending, as no veterinarian was on the BAC call. An initial review of surveillance data from various syndromic surveillance systems indicated an increase in respiratory disease was evident; however, staff determined that further investigations were necessary to determine the cause of this increase if it was not due simply to seasonal variations.

Further elaboration on the different sources of surveillance data included BioDefend. BioDefend was developed in preparation for the Superbowl event in Jacksonville in 2005. BioDefend monitors seven syndromes and botulism in near real-time and can be accessed through the Internet. It can produce reports focusing upon only one syndrome, or one hospital, or all of them at the same time. Other surveillance systems that were used included:

- CDC/Florida Department of Health ILI Sentinel Providers List
- FluStar public domain for one hospital and three labs
- National retail drug monitoring, which monitors the sale of over-the-counter medications
- FDOH flu activity report
- Merlin (FDOH secure website)

Conclusion

The Epidemiology and Surveillance Division acted out its role during the BAC call and made actionable decisions as if the tabletop were an actual event. Importantly, their initial information supplemented BAC's decision-making process, such that the event was deemed PROBABLE health risk BAR. This decision permitted the BAC to react appropriately by transitioning quickly from the BioWatch Response Plan to the city-wide Bioterrorism Response Plan. Staff were able to effectively and efficiently use BioWatch detection of a bioagent release to trigger their own response plans. Several gap areas were identified; for example, the need for animal health surveillance was noted. Action plans were discussed and documented for future problem-solving discussions and meetings among BAC members, of whom the Epidemiology and Surveillance Division is also a member.

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Acknowledgements

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Florida Epidemic Intelligence Service Program

by Patti Ragan, PhD, MPH, PA-C



Spring is an exciting time for the Florida Epidemic Intelligence Service (FL-EIS) Program!

If you are not already familiar with FL-EIS, it was started in 2001 as part of the state's response to terrorism. The program offers two-year, post-graduate applied epidemiology training to masters or doctoral graduates in the health sciences who have a strong interest in public health epidemiology. The goals of the program are to increase the capacity of the Department of Health and county health departments to respond to challenges in disease control and prevention, and to develop future leaders in the field of public health. County health departments throughout the state act as host sites for the fellows, who in turn provide assistance with outbreak investigations, surveillance, public inquiries, education and other epidemiologic activities. To date, a majority of the program's first three graduating classes are employed as epidemiologists in Florida.

Recruitment for the sixth class of fellows is well underway and applications for the county health department host sites were due earlier this month on March 7. Each year, interest in the program continues to grow. It is rewarding to see the high quality of the host site and prospective fellow applications that are being received. This year, five fellows and host sites will be selected, following which "match day" assignments will be determined. After introductions to current fellows and other colleagues at the Florida Epidemiology Conference in May, the new FL-EIS fellows for 2007-2009 will arrive at their respective county health departments in June to begin work.

Another event not to be missed at the epidemiology conference is the FL-EIS graduation, which will be held on the evening of May 22. Five fellows of the class of 2005 -2007 will be awarded certificates to recognize their successful completion of the program. It is also an opportunity for the program to recognize their supervising preceptors for their dedicated commitment and mentoring. The 2007 graduates include Nicole Basta (Collier), Sharlene Emmanuel (Polk), Aaron Kite-Powell (Broward), Patti Ragan (Northwest Consortium) and Sharleen Traynor (Duval).

Lastly, the annual epidemiology conference also provides an opportunity for Florida EIS fellows to showcase the work that they, along with their host site colleagues, have been doing over the past year. Presentations will include reports from outbreak investigations, research studies, interesting case studies, and use of specialized epidemiologic tools such as GIS. The professional poster session will be held the first afternoon of the conference, with the breakout session for EIS oral presentations the following afternoon.

On behalf of the program, we invite you to join us for these special events and look forward to introducing the FL-EIS class of 2007-2009!

Patti Ragan is the new administrator of the Florida EIS Program and can be reached at 850.245.4406.

Florida Epidemiology Conference Highlights

by Debora Campbell, MS, CHES

The Florida Epidemiology Conference is shaping up to be exciting! The agenda topics are finalized and we are polishing our presentations in the expectation that we'll have another outstanding conference.

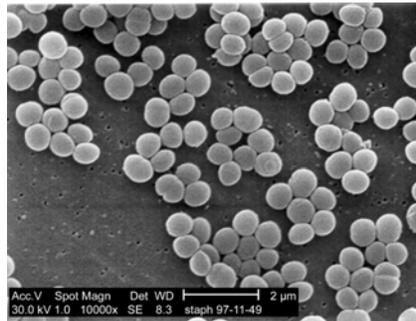
As a new feature for this year's conference, we have added pre- and post-conference workshops to the agenda. The pre-conference workshop, entitled *Introduction to Applied Epidemiology*, will be held on May 22, from 8:30 – 11:30 a.m. The post-conference workshop, entitled *Study Design*, will be held on May 24, from 1:30 – 4:30 p.m. Space is limited in both workshops, so register early.

Visit the conference website at http://www.doh.state.fl.us/disease_ctrl/epi/index.html to register for the conference, make hotel reservations, and review the at-a-glance agenda. We update the website frequently with new information that will help to make participation in the conference and your visit to Daytona Beach enjoyable, so check back often.

Debora Campbell is the Training and Communications Section administrator at the Bureau of Epidemiology in Tallahassee. She can be reached at 850.245.4409.

Vancomycin-intermediate *Staphylococcus* (VISA) Acquired in Florida

by Leah Eisenstein, MPH and Roger Sanderson, MS, RN



On December 12, 2006, the Orange County Health Department was notified by a local hospital of a possible vancomycin-intermediate *Staphylococcus aureus* case, which is a reportable disease in Florida. The patient was a 46 year-old female visiting Orlando from Connecticut. She presented at a local emergency room on December 1 with a five-day history of generalized weakness, nosebleed, discoloration of her feet and toes, evidence of skin lesions, a diffuse mottling of her skin, and evidence of renal failure. She had a history of polycystic kidney disease with end-stage renal disease, for which she had previously undergone hemodialysis, though at the time of admission was undergoing peritoneal dialysis. According to her husband, she had multiple episodes of peritoneal dialysis-related Staphylococcal sepsis, including methicillin-resistant *S. aureus* (MRSA). She also had a history of coronary artery disease, with three bypass graft surgeries in the past year. The patient was admitted to the intensive care unit with a diagnosis of septic shock, disseminated intravascular coagulation, and thrombocytopenia.

Multiple blood samples taken between December 1 and December 8 cultured MRSA with a vancomycin minimum inhibitory concentration (MIC) of two, indicating that the patient was infected with a vancomycin-susceptible strain of MRSA. At this time, the patient was being treated with vancomycin, gentamicin, rifampin, and daptomycin and the source of infection was believed to be endocarditis associated with an internal defibrillator. The patient was transferred to another hospital on December 8 to be evaluated for possible defibrillator explant. A blood sample taken on December 11 cultured MRSA with a vancomycin MIC of four, indicating that while hospitalized, the bacteria's susceptibility to vancomycin had decreased and was now classified as VISA. Treatment with vancomycin was discontinued at this point; gentamicin, rifampin, and daptomycin were continued, with an increase in the daptomycin dosage. Daptomycin is a novel antibiotic that provides rapid bactericidal activity against gram positive bacteria in vitro, including MRSA and VISA, and some studies suggest a synergistic effect when daptomycin is combined with gentamicin or rifampin ^(1,2,3,4). This treatment regimen continued for several weeks and the patient underwent surgery to remove the defibrillator on December 19. Additional blood samples taken on December 15 and 18 were positive for VISA, but subsequent samples did not culture *S. aureus*. As of March 7, 2007 the patient is still hospitalized in the ICU and has had multiple drug-resistant infections, including *Escherichia coli*, *Pseudomonas aeruginosa*, and *Stenotrophomonas maltophilia*.

Staph aureus (staph) is a common bacteria found on the skin and in the noses of healthy people. Most staph infections are minor, but sometimes serious or fatal bloodstream infections, wound infections, or pneumonia can occur ⁽⁵⁾. Historically, staph infections have been treated with penicillin-related antibiotics, but over the past 50 years, antimicrobial drug resistance has emerged as a serious problem ⁽⁶⁾. MRSA, which is resistant to methicillin and frequently to other classes of antibiotics, has led to a greater dependence on vancomycin to treat these infections ⁽⁶⁾. Another type of

antimicrobial-resistant bacteria is vancomycin-resistant enterococci (VRE), which was first reported in 1988 and quickly became endemic in hospital intensive care units ⁽⁷⁾. VRE strains contain the *vanA* gene, which confers vancomycin resistance ⁽⁷⁾. VISA and vancomycin-resistant *S. aureus* (VRSA) have recently emerged as a potential public health threat.

VISA and VRSA are characterized not only by different levels of resistance, but fundamentally different types of resistance mechanisms. To date, the resistance seen in VISA strains has been associated with exposure to vancomycin, which causes a thickening of the cell wall matrix ⁽⁷⁾. This resistance mechanism is not transferable to susceptible strains or other organisms, and so the likelihood of transmitting and maintaining the VISA phenotype is thought to be low in the absence of exposure to vancomycin ⁽⁶⁾. In contrast, VRSA strains have been characterized by a gene-mediated resistance. The VRSA strains carry the *vanA* gene, commonly found in VRE, which confers vancomycin resistance ⁽⁶⁾. Recent exposure to vancomycin is not necessary; all VRSA cases have been previously co-colonized with MRSA and VRE ⁽⁷⁾. This type of gene-mediated resistance is theoretically transferable to susceptible strains or organisms, so there is potential for person-to-person transmission.

The first VISA case was detected in 1996 in Japan and to date, we have had approximately 70-80 cases in the US ⁽⁶⁾, (Jeffrey C Hageman, electronic mail, January 12, 2007). The first VRSA case in the US was detected in 2002 in Michigan, and as of September 2006, six cases have been reported in the US ⁽⁶⁾. VISA and VRSA cases have several underlying health conditions (diabetes, kidney disease, etc.), previous MRSA infections, tubes going into the body (e.g., intravenous catheters), and exposure to vancomycin ⁽⁵⁾. Nearly all VISA and all VRSA strains as of June 2006 have also been methicillin-resistant ⁽⁶⁾.

In September 2006, the Centers for Disease Control and Prevention published revised guidelines for the investigation and control of VISA and VRSA. The major change in this revision was that the CDC no longer recommends contact investigations for VISA cases unless there is suspicion that transmission has occurred ⁽⁶⁾. This change in recommendations comes as a result of more experience with the epidemiology of VISA. Routine contact investigations and follow-up for VRSA cases are still recommended. All VISA and VRSA patients should be placed on the same contact precautions used for MRSA ⁽⁶⁾.

The revised CDC guidelines also include the updated case definitions for VISA and VRSA. In January 2006, the Clinical and Laboratory Standards Institute lowered the MIC breakpoints for VISA from eight to four ug/ml and for VRSA from 32 to 16 ug/ml ⁽⁶⁾. The Council for State and Territorial Epidemiologists approved these breakpoint changes for the CDC case definitions, effective in January 2007. Florida adopted the CDC case definitions for VISA and VRSA, also effective in January 2007.

As VISA and VRSA strains become established and with recent case definition changes, it is likely that Florida will see an increase in the prevalence of VISA and VRSA cases. It is important to be aware of this emerging threat and be familiar with the current case definitions and investigation and control measures to minimize this threat. Thus far, there has been no person-to-person transmission of VISA or VRSA in the US, partially due to the aggressive infection control measures that have been implemented.

Useful websites:

CDC case definition: <http://www.cdc.gov/epo/dphsi/casedef/vancomycincurrent.htm>

CDC Investigation and Control of Vancomycin-Intermediate and -Resistant *S. aureus*:

http://www.cdc.gov/ncidod/dhqp/pdf/ar/visa_vrsa_guide.pdf

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Mosquito-borne Disease Summary March 11-17, 2007

Rebecca Shultz, MPH, Caroline Collins, Daneshia Roberts, Carina Blackmore, PhD

During the period March 11-17, 2007, the following arboviral activity (St. Louis Encephalitis [SLE] virus, Eastern Equine Encephalitis [EEE] virus, Highlands J [HJ] virus, West Nile virus [WNV], California Group [CE] virus) was recorded in Florida:

EEE virus activity Two seroconversions to EEE virus were reported in sentinel chickens from Orange County. Two live blue jays captured from Okaloosa County tested positive for antibodies to EEE virus.

WNV activity None.

SLE virus activity None.

HJ virus activity None.

Dead Bird Reports The Fish and Wildlife Conservation Commission (FWC) collects reports of dead birds, which can be an indication of arbovirus circulation in an area. This week, 20 reports representing 56 dead birds were received from 18 counties. Four birds were identified as crows, one was identified as a raptor, and 51 were identified as other species. Please note that FWC collects reports of birds that have died from a variety of causes, not only arboviruses. Dead birds should be reported to www.myfwc.com/bird/.

Year-to-Date Summary Since January 1st, seven counties have reported EEE virus activity, four have reported WN virus activity and one has reported SLE virus activity. No locally-acquired human cases of arboviral infection have been reported this year.

See the web for more information at <http://www.doh.state.fl.us/environment/community/arboviral/index.html>. The Disease Outbreak Information Hotline offers recorded updates on medical alert status and surveillance at 888.880.5782.



This Month on EpiCom

by Christie Luce

The Bureau of Epidemiology encourages *Epi Update* readers to not only register on the EpiCom system at <https://www.epicomfl.net>, but to sign up for features such as automatic notification of certain events at EpiCom_Administrator@doh.state.fl.us and contribute appropriate public health observations related to any suspicious or unusual occurrences or circumstances. EpiCom is the primary method of communication between the Bureau of Epidemiology and other state medical agencies during emergency situations.

- Increase of shigellosis in Broward County
- Suspect infant case of botulism in Palm Beach County
- Legionellosis in Sarasota County
- Pertussis in Okaloosa County
- Possible rabies exposure in Martin County

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Weekly Disease Table

by D'Juan Harris, MSP

Go to http://www.doh.state.fl.us/disease_ctrl/epi/Disease_Table/2007_Weeks/dt_index.htm to review the most recent disease figures provided by the Florida Department of Health, Bureau of Epidemiology.

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