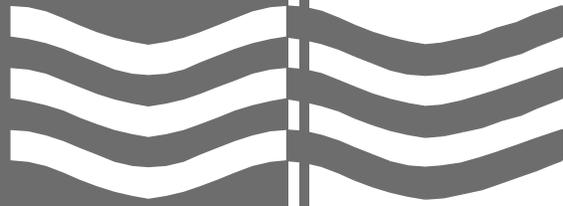


# Epi Notes



North Carolina Department of Health and Human Services ♦ Division of Public Health

Volume 2004-2

June 2004 - August 2004

## In This Issue:

Update on Lyme Disease .....	1
Lyme Disease in N.C., Position Statement .....	3
State Laboratory Changes Chlamydia and Gonorrhea Testing .....	3
Response Protocol for Biological Agent Threats .....	4
Knowing Where to Go by Looking at Where We Are: Results of a Survey on the Public's Perception of Public Health Preparedness .....	5
Bioterrorism Wall Charts .....	6
HIV/Syphilis Co-morbidity: Identifying and Describing Persons Who Contract HIV and Syphilis in North Carolina ...	7
CDC "Dear Colleague Letter" and the 2002 STD Treatment Guidelines for Men Who Have Sex with Men (MSM) .....	7
<i>Vibrio vulnificus</i> Wound Infections in Diabetics, 1999-2003 .....	8
Reported Communicable Diseases, N.C. January-June 2004 .....	9
HOPWA Needs Assessment .....	10
State Lab Director Has National and International Roles .....	11
Employee Recognition: Kristy Osterhout Employee of the Quarter .....	11

## Update on Lyme Disease

Prepared by Jeffrey Engel, MD, Branch Head and Jean-Marie Maillard, MD, General Communicable Disease Control Branch; Carl Williams, Public Health Veterinarian, Occupational and Environmental Epidemiology

Lyme disease emerged in 1976 when a cluster of children living in and around Lyme, Connecticut were diagnosed with suspected juvenile rheumatoid arthritis. Community concern resulted in an epidemiologic and microbiologic investigation that eventually led to the discovery of a tick-borne infection caused by the spirochete bacterium, *Borrelia burgdorferi*.

The life cycle of this interesting zoonotic infection has now been well described. Certain species of ticks, notably those of the genus *Ixodes*, feed on field mice in their larval stage. Mice, who serve as the reservoir for *B. burgdorferi*, are asymptotically infected and carry a high number of these spirochetes in their bloodstream. After feeding on an infected mouse, the *Ixodes* larva will harbor *B. burgdorferi* in the gut for the rest its life. Larval ticks then develop into nymphs following the blood meal from a mouse. The nymph must take another blood meal prior to molting into an adult, and this is where people are at most risk. The peak feeding time for nymphs is from May through late summer in NC. Adult ticks will take a final blood meal, usually in late fall or winter, prior to laying eggs. White-tailed deer are the preferred hosts for adult ticks, but serve as poor reservoirs for *B. burgdorferi*. White-tailed deer thus serve to maintain the population of ticks, and not that of *B. burgdorferi*. *B. burgdorferi* is transmitted trans-stadially from larvae to nymph to adult, so even adult tick bites pose a risk to people. Importantly, a tick must be attached to its human host for at least 24 hours for *Borrelia* transmission to occur.

It turns out that *Borrelia* infections were not new in 1976. In retrospect, cases were described in Europe in the early 1900s. What happened in Lyme, CT, then in 1976? This is a classic example of the ever-repeating story of an emerging infectious disease. A ballooning population of white-tailed deer in Lyme and other areas in New England, combined with suburban spread into wooded areas, resulted in an ecological collision that no one predicted. People, particularly children, were encountering *Ixodes* ticks while playing in deer-infested backyards and hiking trails. The setting was right for an epizootic transmitting to humans.

After an incubation period of 3-30 days (average 7-10 days) following a tick bite, Lyme disease begins with the classic rash called erythema migrans (EM). This is a circular red "bull's eye" rash expanding from the bite and is at least 5 cm in diameter. This early stage is associated with low-grade fevers and malaise. Symptoms gradu-

(continued on page 2)

**(Update on Lyme Disease, continued from page 1)**

ally disappear over a 2-week period, even without treatment. Weeks to months later, late manifestations develop in a proportion of people. Via bloodstream dissemination, *B. burgdorferi* can cause cardiac, rheumatologic, and neurologic disease. Late manifestations can be chronic, debilitating and extremely hard to treat.

Laboratory diagnosis is made by detection of *B. burgdorferi* in a clinical specimen (such as a skin biopsy of EM) or detection of antibody production in serum or cerebrospinal fluid (in cases of meningitis, a possible neurologic complication). Case definition and laboratory confirmation criteria for surveillance purposes are summarized in Figure 1. Figure 2 depicts the

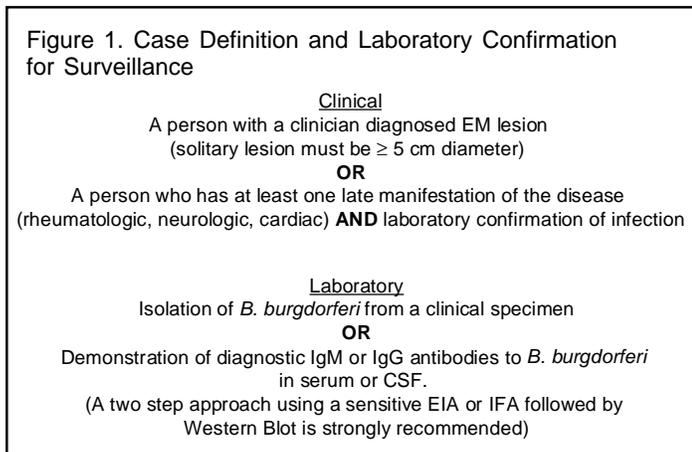
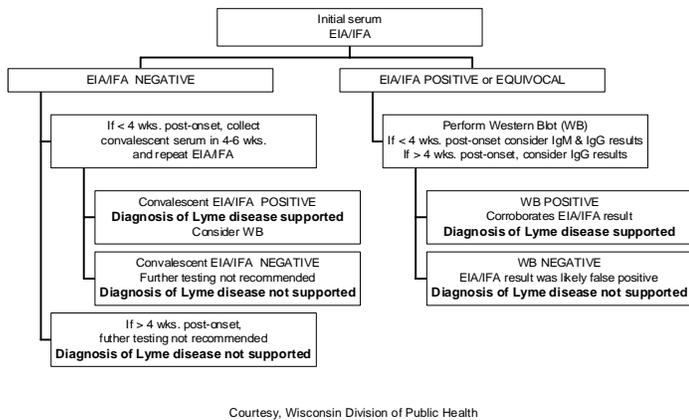


Figure 2. Testing Algorithm for Suspected Lyme Disease



laboratory testing algorithm for a person with suspected Lyme disease.

Since its emergence in New England, other hot spots in the United States have been identified. Locations where *Ixodes* ticks, mice and deer populations, and humans coexist give rise to high incidence rates. Northern California, Minnesota and Western Wisconsin, and New England extending south to the Eastern Shore of Maryland are considered endemic disease regions. Human infection rates as high as 32 cases per 100,000 population were recorded in these states in 2002.

What about the Southeast United States, specifically North Carolina? As shown in Figure 3, cases have been increasing since 2000. Figure 4 shows the geographic distribution and incidence rate by county of residence of EM cases from 2000-2003. (Only cases of EM are shown because it is more likely that they represent the true location of disease acquisition). A cluster of EM cases in marines at Camp Lejeune resulted in a

higher incidence rate in Onslow County. Despite this, the NC rate is far lower than the endemic hot spots in the US.

Recent ecological studies in the Southeast US have revealed important distinctions from classic Lyme disease. First, small reptiles such as lizards serve as a major reservoir for *Borrelia* in the South. Second, in the mid-1990s, clusters of EM were described in NC and other southern states. Patients remained seronegative for Lyme, did not develop late manifestations, and repeated attempts to isolate *B. burgdorferi* from EM lesions failed. It was discovered that the common southern tick, *Amblyomma americanum* or the lone star tick, was causing EM, so this new syndrome was called the Southern Tick-Associated Rash Illness or STARI. Subsequently, a new species of *Borrelia* has been found infecting lone star ticks and has been suitably named *B. lonestari*. Hopefully, a new serologic test that detects infection from this new species will be forthcoming, because it is felt by many experts that most cases of Lyme disease in the South are actually EM cases resulting from lone star tick bites and *B. lonestari* infections. This may explain the increasing incidence of cases reported in NC (Figure 3), about half of which are EM and are thus reported without laboratory confirmation (refer to Figure 1).

Whether STARI or Lyme disease or any other tick-borne infection, it is important to remember prevention. Tick bites can be prevented by wearing protective clothing while in the woods or garden, applying insect repellent, and ridding the yard of old piles of branches and clippings where ticks tend to live. If a tick is embedded in the skin, prompt removal by gentle pulling of its body straight out, careful not to break off the mouth parts, is essential. If a rash develops, the person should see their primary care provider, and if it's EM, antibiotics for 10-14 days is curative and prevents late manifestations. ♦

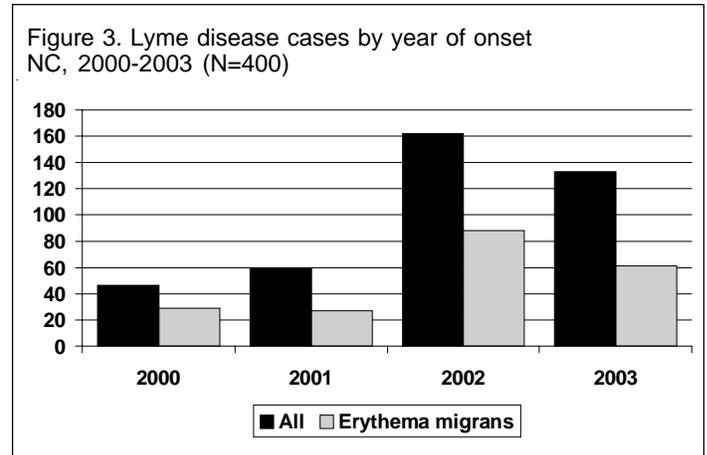
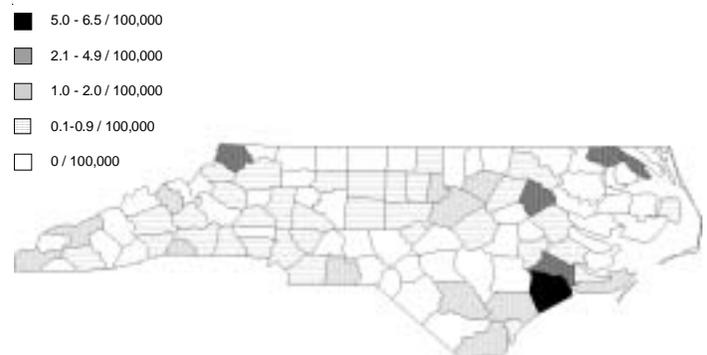


Figure 4. Lyme Disease (EM Cases) Incidence by County of Residence, 2000-2003 (N=205)



**Lyme Disease in North Carolina**  
**NC Division of Public Health**  
**Position Statement**  
July 2, 2004

**Case Reporting**

While Lyme Disease is more prevalent in other parts of the country, cases have been identified in NC. NCDPH recognizes the protean clinical manifestations of Lyme Disease. Nevertheless, NCDPH, as all other state health departments, must use only established case definitions (Figure 1) for the purposes of surveillance. In particular, the Communicable Disease rule in the NC Administrative Code (10A NCAC 41A .0201, Control Measures General) states that “guidelines and recommendations published by the Centers for Disease Control and Prevention (CDC) shall supercede those contained in the Control of Communicable Disease Manual and are likewise incorporated by reference”. Thus NCDPH must use current CDC case definitions for all reportable communicable diseases.

NCDPH acknowledges that there are people who suffer from chronic symptoms that resemble some of the manifestations of late Lyme Disease. However, if these people lack measurable antibody to Lyme Disease (Figure 1), they do not meet the national case definition criteria for surveillance and therefore cannot be counted as cases for the purposes of surveillance. NCDPH cannot accept non-FDA approved laboratory tests as laboratory confirmation of Lyme Disease. Also, anecdotal reports of people not fulfilling case definition (Figure 1) but who have responded to long courses of antibiotics (with activity against *B. burgdorferi* and many other bacteria) will not be considered cases of Lyme Disease.

**Research**

NCDPH supports the need for further research of Lyme Disease as an emerging infectious disease. Particular areas in need of study are the ecology in the southern United States, the clinical spectrum of disease and its pathogenesis, and clinical therapeutic trials. NCDPH will seek research opportunities and foster collaboration with academic and private practice clinical research centers. In an era of limited resources, however, NCDPH realizes there are competing public health needs. Public health priorities are based on scientific studies published in peer-reviewed literature and consensus statements by national experts.

**Prevention**

NCDPH has a mission of disease prevention and will continue to issue and strengthen its message to the public regarding Lyme Disease prevention. Partnering with the Division of Environmental Health PH Pest Management Section, NCDPH is committed to educating the public on avoiding tick bites and recognizing the early manifestations of Lyme Disease when the infection is most easily treated and cured.

**State Laboratory Changes Chlamydia and Gonorrhea Testing**

*Prepared by Myra Brinson, MT (ASCP), Supervisor, Bacterial STD Laboratory, State Laboratory of Public Health*

Chlamydia and gonorrhea infections are two of the most common sexually transmitted infections worldwide. Because chlamydial infections of women are often asymptomatic, undiagnosed cases may lead to pelvic inflammatory disease (PID), tubal pregnancy, or consequent infertility. Untreated gonorrheal infections, which may also be asymptomatic, can lead to the same serious health sequelae. In addition, patients infected with one sexually transmitted disease are more susceptible to contracting other sexually transmitted infections such as HIV or Herpes simplex.

In 1996, North Carolina began screening a select population of women for chlamydia using federal funding for an Infertility Prevention Project (IPP). This ongoing project is coordinated between the HIV/STD Prevention and Care Branch, the Women’s Health Branch, and the State Laboratory of Public Health (SLPH). Historically, chlamydia testing at the SLPH had been limited to endocervical specimens submitted from local health departments on either prenatal patients or symptomatic women. The IPP funding has enabled expansion of chlamydia testing to include asymptomatic women under the age of 25 who undergo pelvic examination at local health department clinics.

Until recently, chlamydia testing has been performed using an enzyme immunoassay (EIA) procedure that detected the chlamydia antigen from an endocervical swab specimen. Gonorrhea testing has been performed by bacterial culture at the local health departments for over 30 years. Recent technological advances have adapted new testing methods employing nucleic acid amplified tests (NAAT) with semi-automated instrumentation capable of handling the large test volumes of a public health laboratory. The NAATs offer the advantage of detecting more cases of infection due to their higher sensitivity and enable testing for both chlamydia and gonorrhea on the same endocervical swab specimen.

Recognizing the need to improve the testing for chlamydia and gonorrhea, the SLPH conducted a pilot study during the fall of 2003. Five local health departments (Gaston, Haywood, Pitt, Robeson, and Union) participated by collecting two endocervical swabs to be tested using the existing EIA method for chlamydia and the new NAAT method for dual testing of chlamydia and gonorrhea. The NAAT gonorrhea results were compared to the bacterial culture results obtained at the local health departments.

A total of 800 specimens were evaluated for chlamydia using both methods. Results showed that the NAAT method detected 35% more true confirmed positives than the EIA method. The gonorrhea results for 763 of these specimens were compared to the culture results provided by the health departments; the NAAT method detected 25% more true confirmed positives than bacterial culture. Sensitivity and specificity of the NAAT assay, as well as positive predictive value (PPV) and negative predictive value (NPV), approached 100%. This pilot study clearly proved that the new technology would greatly improve the quality of chlamydia and gonorrhea testing

*(continued on page 4)*

by detecting more cases that would have been missed using the older methods.

Based on the results of the pilot study, a decision was made to convert the existing Chlamydia testing program at the SLPH to a Chlamydia/Gonorrhea testing program employing the NAAT technology from Gen-Probe, Inc., effective May 10, 2004. A PHTIN presentation to the health departments in March addressed many of the issues involved in the changeover. The new collection kits, collection instructions, and informational materials were distributed across the state in April, and testing began the second week of May 2004.

Initial testing results for the month of May are as follows: 5168 endocervical swab specimens were tested; of these 433 (8.4%) were positive for chlamydia and 103 (2.0%) were positive for gonorrhea. Less than 0.3% was equivocal for either agent. In contrast, chlamydia positivity rates for 2003 were 5.4%, with an additional 2.5% having an equivocal result that generated the request for a repeat specimen. Because 2003 gonorrhea testing was performed at the local health departments where data was not collected, gonorrhea positivity rates are not available for comparison.

A preliminary analysis of this data shows a clinically significant increase in chlamydia positivity rates when using the NAAT method of detection. This increase is consistent with reports from the other states in the southeastern region of the IPP that have also changed to NAAT testing. The equivocal rate has decreased, also as expected, since the amplified technology offers a much clearer delineation between a positive and a negative result. Extrapolation of this data would suggest an increase in gonorrhea rates as well.

The change to nucleic acid amplified testing for chlamydia and gonorrhea offers a greatly improved method of assessing the true prevalence of these diseases. The probability of earlier detection, along with subsequent treatment, should certainly aid in the control of infection transmission. ❖

## **Response Protocol for Biological Agent Threats (endorsed by SERC)**

*Prepared by Will Service, Industrial Hygienist  
Office of Public Health Preparedness and Response*

### **Introduction**

Following the anthrax attacks in the fall of 2001, North Carolina public health agencies and emergency responders were besieged with public reports of powders and other substances suspected of being bioterrorism (BT) agents in mail and public places. Response methods—including sample collection and submission, identification and isolation of exposed individuals, area isolation, and threat assessment—were not standardized and were performed with mixed effectiveness. In early 2003 the Office of Public Health Preparedness and Response released guidelines to promote consistent and effective response to reports of suspicious substances. The guidelines were developed with participation of local state and federal law enforcement, local and regional hazardous materials response (hazmat) teams, and local, regional and state public health. The guidelines describe the recommended response from discovery of a substance to delivery to the State Laboratory of Public Health (SLPH).

The seven Public Health Regional Surveillance Teams have taken on responsibility for implementation of the guidelines. PHRST members have been training local health departments, hazmat teams and local law enforcement. Additionally, the PHRST are called upon to respond to these incidents in the field along with law enforcement and hazmat teams.

### **Challenges**

PHP&R and the PHRST teams have had mixed success implementing the guidelines. Implementation of the guidelines in the field has proven to be the most effective method of training. Conversely, staff have run into some resistance where local hazmat and law enforcement express a preference for use of their local protocols. One of the primary causes of this divergence is the local preference for the use of colorimetric field test kits for BT agents. The US Department of Health and Human Services, the US Postal Service, and as a result, the DPH protocol advise against the use of these devices because of the high rate of false positives and false negatives associated with their use. Some local responders view the devices as a tool in the toolbox and prefer to continue using them.

A second barrier to successful implementation of the guidelines centers around the described role of law enforcement in the response. The role of law enforcement responders is to take the lead in deciding whether a report involves a credible threat. Responders must decide whether it is likely enough that the suspicious substance was put in place with the intent of causing someone harm to warrant considerable effort, including commitment of laboratory resources to process a sample, isolation and decontamination of those exposed, and isolation of contaminated environments. Law enforcement responders are asked to assess the potential for criminal activity and there has at times been reluctance to do so. Collaboration with law enforcement responders and training are seen as keys to resolving this issue.

Public health has teamed up with the NC Justice Academies to roll out training to law enforcement professionals across the state. Justice academy trainers have begun including the guidelines in their “Basic Anti-terrorism Training Awareness” (BATA) training that they are providing for law enforcement officers across the state.

### **Successes**

Since the fall of last year, ricin, a toxin that is relatively easily produced from extracts of the common castor bean plant, was mailed to a postal facility in South Carolina and to a senate office building in Washington, DC. Publicity about these events, and resulting public concern about intentional releases of these agents, has resulted in a flurry of public reports of suspicious powders or substances in the environment. Several of the PHRST teams have responded to a number of these incidents, along with their local or regional hazmat teams and local law enforcement. These events offer an opportunity to exercise the guidelines and test their effectiveness. Reports from the field suggest that the guidelines protocols do work when used. Training and continued exercise of the guidelines are critical for success.

*(continued on page 5)*

*(Protocol for Biological Agent Threats, continued from page 4)*

On July 9 of this year the State Emergency Response Commission, chaired by Bryan Beatty, Secretary of the Department of Crime Control and Public Safety, reviewed the guidelines and endorsed them at the request of the Division of Public Health. This endorsement will assist public health in encouraging law enforcement and hazmat partners to utilize the guidelines to standardize incident response across the state.

### **Guidelines Components**

The guidelines divide the response into phases. The first phase is discovery of a substance. For example, an office worker opens a hand-addressed letter with an unrecognized return address and powder falls on his desk. The guidelines describe the initial steps that should be taken by the discoverer, including summoning law enforcement and isolating exposed people in a “safe room”.

The next phase of the response is threat assessment as described above. If law enforcement responders, in collaboration with public health and hazmat responders, determine that there is a credible threat presented, samples are collected to be submitted to the SLPH and all of the subsequent steps including isolation, decontamination, contact information collection follow. The protocol asks responders to shape the response assuming that the substance is a live BT agent until the SLPH determines otherwise.

The guidelines suggest that sample collection should be done only by responders using appropriate personal protective equipment. That normally involves air purifying respirators and protective clothing. An appendix to the protocol describes how samples should be collected and transported to the SLPH. Other appendices include sample collection forms, chain of custody forms and laboratory submittal forms.

A copy of the guidelines and attachments are available online at <http://www.epi.state.nc.us/epi/phpr/protocolguide.html>



to develop better awareness and educational materials for the public, especially during an actual disease outbreak. As the conduit through which most of such information will pass, PHP&R also wanted to better understand the media’s knowledge base regarding these matters as well as what actions might be taken to facilitate the delivery of vital information to the public.

The following article is a summary of the results obtained from the media portion of the survey. Information relating to the public portion of the survey was provided in the previous edition of EpiNotes.

Effectively delivering health messages to the public during a public health crisis would be almost impossible without the media. Because they each deliver news in different ways, newspapers, radio stations and television stations have different logistical and material requirements. It is also worth noting that members of the media are also part of the public at large and have a need for information during a public health crisis the same as other members of the public do.

French|West|Vaughan approached the media component of the survey with the realization that reporters and editors in North Carolina have not had to cover large-scale disease outbreaks or bioterrorism events. The agency also understood that – because the news business is driven by constantly changing events and perpetual deadlines – it would be almost impossible use a focus group to test the media survey instrument. To achieve results similar to those obtained for the general public portion of the survey the agency worked with PHP&R to create a questionnaire and then submitted it to six top media outlets for review. Those editors responding to the draft questionnaire were asked not to share the contents with anyone for four months so as to ensure purity of the survey that was to follow. After incorporating their responses into the survey instrument the agency initiated the media interviews in late October 2003.

French|West|Vaughan contacted and completed surveys with 40 members of the media based in or maintaining a bureau in North Carolina. The goal was to obtain an accurate cross-section of media responses, indicating how the media prefer to receive and disseminate information. Initially the goal included surveying an additional 10 members of the national media but most of these outlets declined, indicating that it was against their policy to participate in survey or that they would rely on state/regional media and the CDC for information.

Surveyed members of the media were selected for participation based on a series of criteria that ensured a good cross-section:

- Role at the organization - FWV targeted those most likely to be making decisions in times of a bioterrorism crisis.
- Location - FWV targeted top media outlets, as well as outlets that most likely varied in terms of preparedness.
- Circulation/viewership - FWV targeted top media outlets, as well as outlets that varied in terms of circulation or viewership.
- Type of outlet - FWV targeted media in several different categories, including Spanish-language media and English-

*(continued on page 6)*

**Knowing Where to Go by Looking at Where We Are: Results of a Survey on the Public’s Perception of Public Health Preparedness**  
(Part two of a two-part report)  
*Prepared by Bill Furney, Information Communication Specialist, Public Health Preparedness and Response*

Last summer the Office of Public Health Preparedness and Response (PHP&R) contracted the French|West|Vaughan advertising/marketing agency in Raleigh to conduct a comprehensive public perception survey during the final quarter of 2003. The survey focused on the perceptions of both North Carolina’s residents and the media regarding issues related to bioterrorism and disease outbreak preparedness. The survey also included a small (non-representative) sampling of the state’s Hispanic population intended to help identify special needs or concerns, if any, for further study.

As the office responsible for educating and informing North Carolinians about the threat of bioterrorism, biological agents, disease outbreaks, and emergencies that could impact their health, PHP&R wanted to broaden its understanding of their prevailing beliefs and attitudes. Such information can be used

## Bioterrorism Wall Charts

Prepared by Jean-Marie Maillard, MD, MSc., Surveillance and Investigation, General Communicable Disease Control Branch

The UNC Statewide Program for Infection Control and Epidemiology has developed two wall charts on “Bioterrorism Agents” and the diseases they cause, and a third chart on “Chemical Terrorism and Syndromes.” These charts can be ordered from the SPICE Web site at

<http://www.unc.edu/depts/spice/bioterrorism.html> or downloaded for printing in smaller format on 8 ½ x 11 pages. Three individual pocket guides (folded size 3x5 inches), one per chart, are also available from this Web site.

The following is extracted from the SPICE Web site:

“The North Carolina Statewide Program for Infection Control and Epidemiology (SPICE), at the University of North Carolina at Chapel Hill, has developed two wall charts on bioterrorism agents. [...] A small version of these wall charts is online and available for your use for educational purposes as long as you use the charts in their complete form, including the disclaimer and credit to the North Carolina Statewide Program for Infection Control and Epidemiology.

The purpose of the charts is for display for medical personnel in emergency rooms, urgent care centers, physicians’ offices, and other primary care first responders. The charts present a concise summary of signs and symptoms to assist with early recognition and alert healthcare workers of the potential for bioterrorism agents. Once a bioterrorism agent is suspected, the healthcare worker will need to consult more in-depth resources.”

Staff: William A. Rutala, Ph.D., Director; Karen K. Hoffmann, R.N., M.S., C.I.C., Associate Director; David J. Weber, M.D., Associate Director; Eva P. Clontz, M.Ed., Program Coordinator ♦

*(The Public’s Perception of Public Health Preparedness, cont’d from page 5)*

speaking, print, radio, television, and national and regional media serving North Carolina.

French|West|Vaughan completed nine interviews each with national/regional media; North Carolina television, radio, and print outlets; and the state’s only wire service, for a total of 37 outlets. The agency also interviewed three Spanish-language media outlets (one print, one radio, one television) to gain a representative “snapshot” sample.

National, regional, and wire outlets were included because in the case of a major event it is expected that people will seek out national news sources that will certainly cover an outbreak or attack. Local and national outlets also are likely to share content between local/national networks and newswires.

French|West|Vaughan targeted editors, producers, news directors, and assignment managers for the survey because they oversee the newsrooms across the state and would dictate policy for the reporters in the case of a bioterrorism attack. Surveying these key players in addition to beat reporters

was key to determining existing procedures and receiving feedback regarding the other items of interest to PHP&R.

Consultations with television assignment desk editors made it clear that procedures for handling emergency information are evaluated on a case-by-case basis, and appropriate action is determined by the number of people affected and the severity of the emergency. Additionally, it was determined that North Carolina Internet-based media are directly affiliated with print, radio or television outlets, making duplicate interviews unnecessary.

### Conclusions:

The information gathered from the media survey provides a clearer picture as to how information is processed by the different types of media and what they are looking for from state government officials during a health crisis. The survey also reinforces the belief that establishing media skills at the local level is essential to ensuring a well-executed media response. Because of this, PHP&R has initiated a program titled the Intrastate Crisis Communication Exchange Network (ICCE Net) to enhance health communications across the state, especially at the local and regional levels. Other aspects gleaned from the survey include:

- Nearly all media respondents said that they turn to local government and law enforcement officials to obtain and verify information. Local health officials must be prepared to deal with the media during public health crises even if they are not affected by the event.
- Many media outlets, both English and Spanish, do not have a plan for handling public health events within their own organizations. Bringing their attention to this fact may help generate preparedness stories focused on their communities.
- It is important for public health to identify spokespeople at all levels (i.e., state, county, local) and channels of communication in the event of emergency. Having established guidelines for dealing with the media and alerting key contacts to respond to media inquiries/issues is essential.
- During a public health crisis, most media outlets would like to receive information through multiple channels (contact via fax, email and phone). This increases the likelihood that the information will reach the correct person and adds a higher sense of importance to the information.
- The majority of state television stations have no formal plans in place for dealing with bioterrorism events or emergencies, and few stations have a contingency plan in place for reporting if staff members get sick. It is important to know that the media’s ability to react during a public health crisis may be limited.
- Spanish-speaking media respondents expressed a need for materials translated into Spanish. While most outlets have the capability to translate materials, it saves time and ensures accuracy if the information is already provided in Spanish. ♦

## **HIV/Syphilis Co-morbidity: Identifying and Describing Persons Who Contract HIV and Syphilis in North Carolina**

*Prepared by Bill Jones, Lead Epidemiologist, and  
Del Williams, Manager Epidemiology and Special Studies Unit,  
HIV/STD Prevention and Care Branch*

Clinicians and managers of STD prevention programs such as the North Carolina Syphilis Elimination Initiative need comprehensive information about persons at risk of contracting both syphilis and HIV. Persons who contract both diseases may be less responsive to traditional prevention messages and likely engage in riskier behaviors. To identify and fully describe the demographic and risk factor profile of these persons, information was retrieved and analyzed from multiple databases, including the state's partner counseling and referral services (PCRS) data system and the state's morbidity databases (HARS and STD-MIS). HARS (HIV/AIDS Reporting System) and STD-MIS (Sexually Transmitted Disease Management Information System) are centrally maintained computer-based data systems that house demographic and risk information for reports of persons infected with HIV, syphilis and other STDs in the state. The PCRS data system, on the other hand, is composed of seven regional stand-alone systems that also utilize STD-MIS software, but the focus of the information is case follow-up, investigation, counseling and referral. The PCRS and the central morbidity databases are maintained within strict confidentiality guidelines in highly secure environments.

A total of 17,669 HIV/AIDS case reports were extracted for persons newly diagnosed and reported between 1993 and 2002 from the morbidity database and 19,510 early syphilis cases (primary, secondary and early latent) for the same period were extracted from the PCRS data system. Pertinent clinical, demographic, and risk-behavior information for cases from each data source were combined into a single data set by developing a unique identifier for each person in the originating data sets using an electronic match. The quality of risk factor and demographic information was improved by assessing disagreement among the databases. Persons who contracted both HIV and syphilis were identified and compared to persons who had contracted only syphilis or only HIV respectively.

**Results:** 982 co-morbid cases were identified, which represents about 5.5 percent of the HIV reports or 5 percent of the syphilis reports. While the co-morbid cases often appeared as a compromise between the respective syphilis and HIV/AIDS populations, there were some notable differences. For males, co-morbid cases were slightly more likely to be black non-Hispanic (87% as compared to 85% for syphilis alone and 67% for HIV alone). For females, co-morbid cases also were more likely to be black non-Hispanic (91% as compared to 82% for syphilis alone and 81% for HIV alone). Although only 16 Hispanic co-morbid cases were identified, all were males and were recently infected. There was also a gender difference in which disease was reported first. Of males, 28% were reported with syphilis first, as opposed to 41% of females. Some striking differences in the proportions of risk factors between genders existed for co-morbid cases. Risk factor categories reported

here are not exclusive; persons may be reported with more than one risk. A greater proportion of co-morbid females indicated that they had exchanged sex for drugs or money (44% compared to 29% for co-morbid males); had heterosexual sex with an HIV-positive person or IV drug user (61% compared to 46% for males); or had used crack, marijuana, and non-injecting cocaine (83% compared to 52% for males). These gender differences for risk were partly explained by homosexual activity among males, a risk category exclusive to males, but some differences remained even when controlling for this risk activity.

**Limitations:** The quality and exactness of the identifying information in the respective databases may affect the yield of the electronic matching of cases; thus, co-morbidity is likely understated. Although syphilis diagnoses (and report dates) can be used to estimate the time of infection, HIV diagnoses generally can not and may be affected by changes in testing patterns for the populations at risk. Therefore, inferences made by comparing reports dates for the two diseases should be viewed with caution. Race/ethnicity itself is not a risk factor for contracting sexually transmitted disease and thus does not fully explain risk. Race/ethnicity differences may be a result of the differences in distribution of poverty, access to health care, health-seeking behaviors, the level of illicit drug use, and social networks with high STD prevalence for various populations.

**Conclusions:** Case matching between surveillance databases for the same and different diseases is beneficial because it improves data quality and yields better descriptions of infected populations. It can also identify difficult-to-reach populations and thus improve the targeting of prevention efforts. More information about sexually transmitted diseases in North Carolina can be found in the *North Carolina Epidemiologic Profile for 2004 HIV/STD Prevention and Care Planning* at <http://www.epi.state.nc.us/epi/hiv/surveillance.html>.

Acknowledgements: Aaron Wendelboe, University of North Carolina at Chapel Hill, School of Public Health and Michael Hilton, Epidemiology and Special Studies Unit, HIV/STD Prevention and Care ♦

## **CDC "Dear Colleague Letter" and the 2002 STD Treatment Guidelines for Men who have Sex with Men (MSM)**

*Prepared by Pete Moore, Senior Federal Public Health Advisor,  
HIV/STD Prevention and Care Branch*

On March 8, 2004, CDC released a "Dear Colleague" letter which calls upon public health programs and private health care providers to offer comprehensive STD prevention services for men who have sex with men (MSM). The letter is a reminder that MSM are at increased risk for multiple STDs including syphilis, chlamydia, gonorrhea, HIV, and hepatitis A and B. This document also mentions the rapid nationwide increase in syphilis morbidity among males and presents data to suggest that efforts to prevent and treat syphilis among MSM need to be improved to address this potential epidemic.

The letter reminds health care providers to follow the CDC's STD Treatment Guidelines – 2002 (May 10 2002/

*(continued on page 8)*

51(RR06); 1-80), which recommend that clinicians routinely assess the STD risk for all male patients, including routinely asking about the gender of their male patients' sex partners. Clinicians are also advised to routinely conduct STD/HIV risk assessment and to provide client HIV/STD prevention counseling for all MSM, regardless of HIV status. At a minimum, the following STD prevention services should be provided during clinic visits of persons engaging in MSM activity:

- Annual counseling and testing for HIV;
- Annual screening for syphilis, gonorrhea, and chlamydia;
- Vaccination against hepatitis A and B; and
- Syphilis screening every 3 to 6 months is recommended for MSM who have multiple or anonymous sexual partners, who have sex in conjunction with illicit drug use, or whose sex partners participate in these activities.

A complete version of the CDC's "Dear Colleague" letter is available through the HIV/STD Branch. If you would like a copy, please contact Lumbe Davis at 733-2030 extension 49.



## ***Vibrio vulnificus* Wound Infections in Diabetics, 1999-2003**

*Prepared by Mina Shehee, PhD, Coordinator, Harmful Algal Blooms Program, Occupational & Environmental Epidemiology Branch; Edgardo Valeriano, MD, MPH, Medical Epidemiologist, NC Diabetes Prevention and Control Branch; Pattie Fowler, BS, Environmental Supervisor, Shellfish Sanitation and Recreational Water Quality Section, Division of Environmental Health, DENR*

### **Introduction**

*Vibrio vulnificus* is a marine bacterium that can produce wound infections and gastroenteritis, but ingestion of contaminated raw oysters—especially by those persons with underlying liver disease—can result in a life-threatening primary septicemia. The case fatality rates for primary septic events ranges from 60 to 75 percent. *V. vulnificus* can also cause a devastating wound infection from recreational or occupational dermal exposure to waters containing high numbers of the microorganism. Individuals with non-intact skin or puncture wounds incurred during contact with estuarine waters may develop wound infections. The case fatality rate of *V. vulnificus* wound infections is considerably lower than that from foodborne illness, but it is still high (20-30%). Persons with underlying illnesses such as diabetes or liver disease may be at increased risk of *V. vulnificus* wound infections if proper precautions are not implemented.

During the summer of 2003, the number of *V. vulnificus* infections reported in persons with diabetes increased to a number that alerted the North Carolina Shellfish Sanitation Section. In collaboration with the Harmful Algal Blooms Program, the Diabetes Prevention and Control Program, and the General Communicable Disease Branch, an educational strategy to reduce *V. vulnificus* infections was developed. The purpose of this article is to inform public health professionals and health care providers about the recreational and occupa-

tional risks of wound infections in people exposed to this estuarine microorganism during the summer season.

### ***Vibrio vulnificus* Wound Infections and Diabetes**

In the United States, approximately 45 percent of *V. vulnificus* infections are wound infections. *V. vulnificus* wound infections may result from a puncture injury incurred while handling shellfish or from contamination of an existing wound exposed to estuarine water. It has been estimated that 50 percent of wound infections are attributable to injuries sustained during exposure to water. Persons who develop *V. vulnificus* wound infections often have underlying chronic illnesses other than liver disease. Most wound infections occur in older men. The incubation period can range from hours to days (median 12 - 18 hours). Wound infections may progress to cellulitis and septicemia.

Diabetes is a common disease in North Carolina. Approximately 653,500 adults have diabetes (diagnosed and undiagnosed). From 1995 to 2003, the prevalence of diagnosed diabetes increased 78 percent (from 4.6% to 8.2%). Almost one in every ten adults with diabetes self-reported a slow-healing (> 4 weeks) foot sore or ulcer.

Epidemiologic investigations examining the association between diabetes mellitus and *V. vulnificus* wound infections are primarily limited to case reports and general surveillance statistics. Persons with diabetes are at increased risk for primary septicemia following ingestion of contaminated raw shellfish, and they also are at risk for wound infections after contact with estuarine waters containing high concentrations of the microorganism. People with diabetes may be unaware of sores and skin ulcers due to peripheral neuropathy of their extremities, thus making them more susceptible to infections at these sites.

### ***North Carolina Reportable Cases***

*V. vulnificus* infection is a reportable disease; surveillance of cases in North Carolina began in 1997. From 1999 to 2003, there were a total of 27 reported cases of *V. vulnificus* infection in the state (Figure 1). Over 70 percent of the cases were wound infections involving the extremities after handling live shellfish or after exposure to contaminated water. Sustaining an injury while handling crabs was a common theme. Most persons required hospitalization. The mean and median number of reported *V. vulnificus* cases per year (1999 – 2002) were 5.4 and 6 respectively. In 2003, the number of cases increased to 9; 89 percent of these were wound infections. The most common underlying illness during this time period was diabetes (Figure 2). However, the distribution of case patients with diabetes is not uniform. Prior to 2003, the total number of *V. vulnificus* case patients with diabetes was 5 (28%). In 2003, 5 of 9 (56%) case patients were diabetics.

The reasons for this increase in the total number of *V. vulnificus* cases and the number of cases with diabetes are unknown and may be multifactorial. Some plausible explanation

*(continued on page 10)*

## Reported Communicable Disease Cases, N.C., January-June 2004 (by date of report)\*

Disease	Year-to-Date (through 2 <sup>nd</sup> Quarter)			2 <sup>nd</sup> Quarter 2004	Comments / Notes
	2004	2003	Mean (99-2003)		
Campylobacter	241	275	239	126	
Chlamydia, laboratory reports	14393	13031	11727	7190	
Cryptosporidiosis	38	15	13	13	Note 1 & 2
Dengue	2	2	1	1	
E. coli, Shiga toxin-producing	6	11	18	3	Note 3 & 9
Ehrlichiosis, Monocytic	5	5	3	2	
Foodborne, C. perfringens	2	2	10	0	
Foodborne, other	365	21	7	349	
Foodborne, staphylococcal	5	1	14	2	
Gonorrhea	7621	7420	8481	3703	
Haemophilus influenzae	35	15	20	23	
Hepatitis A	35	33	76	19	
Hepatitis B, acute	91	95	118	47	
Hepatitis B, chronic	379	496	397	243	
Hepatitis B, perinatal	3	1	-	3	Note 10
Hepatitis C, acute	6	5	13	3	
HIV/AIDS	875	1126	857	402	Note 5
Legionellosis	15	16	8	8	
Listeriosis	8	10	-	4	Note 8
Lyme disease	49	20	23	19	
Malaria	9	8	8	5	
Meningococcal disease	21	19	28	11	
Meningitis, pneumococcal	21	11	28	10	
Mumps	2	2	3	1	
Rabies, animal	322	403	306	174	
Rocky Mountain Spotted Fever	110	60	48	44	
Salmonellosis	389	482	449	197	
Shigellosis	137	449	191	26	
Strepto. A, invasive	82	66	66	48	
Syphilis, total	222	247	462	106	Note 6
Tetanus	1	0	0	1	
Tuberculosis	128	143	172	90	
Toxic Shock Syndrome (TSS)	2	0	1	1	
TSS, Streptococcal	2	0	0	1	
Typhoid, Acute	3	5	2	1	
Vanco. Resistant Enterococci	373	261	251	191	
Vibrio, other	3	3	4	1	
Whooping cough	46	71	44	20	

\*Preliminary data, as of 4/12/2004. Quarters are defined as 13-week periods. Only diseases with cases reported in the year 2004 are listed in the table.

Notes: 1. Not reportable in this entire time period; 2. Reportable since 8/1/1998; 3. E. coli O157:H7 became reportable 10/1/1994; 4. Became reportable as "Hepatitis C, acute" rather than the previous "Hepatitis, non A-non B;" and as "arboviral encephalitis" (coded by type) rather than "Encephalitis," both changes 8/1/1998; 5. Earliest report with HIV infection or AIDS diagnosis; 6. Primary, secondary and early latent syphilis; 7. Reportable since 7/1/1997; 8. Reportable since 7/2001; 9. Reportable since 2/15/2003; and E. coli, Shiga toxin-producing replaces E. coli O157:H7; 10. Coded as such since 2002.

(*Vibrio vulnificus*, continued from page 8)

tions might be that this increase is a statistical anomaly; the number of people with diabetes has increased due to changes in the case definition of diabetes mellitus; or that better weather conditions encouraged more persons to be active outdoors, thereby increasing the number of individuals exposed.

**Conclusions**

- ◆ Infections with *V. vulnificus* are uncommon. In North Carolina, most reported *V. vulnificus* cases (1999 – 2003) were wound infections. The number of *V. vulnificus* reported cases with an underlying illness of diabetes increased substantially in 2003.
- ◆ Diabetes is increasing in North Carolina. People with diabetes are at higher risk of wound infection due to neuropathy and microvascular complications. Proper and frequent foot inspections are essential for detecting infections.
- ◆ Persons with diabetes should take extra precautionary measures during and after contact with coastal waters or handling shellfish. Thorough washing of exposed skin after contact with shellfish or estuarine waters is recommended. Use of impervious boots and gloves may prevent exposure of hands and feet to contaminated estuarine waters and injury from handling shellfish. These precautions are recommended, especially in diabetics whose occupation requires exposure to seawater and seafood. In addition, persons with diabetes should not eat raw or improperly cooked seafood, especially oysters.
- ◆ A delay in proper medical treatment could lead to severe infection resulting in long hospitalization, extremity amputation, and possibly death. Medical and public health professionals should be aware of *V. vulnificus* infections, proper treatment strategies, and preventative measures. Centers for Disease Control and Prevention recommended antibiotics include doxycycline or a third-generation cephalosporins (e.g., ceftazidime).
- ◆ Active environmental monitoring of suspected sites for *V. vulnificus* in coastal waters should be expanded. ◆

Figure 1. Total number of reported North Carolina *Vibrio* and *Vibrio vulnificus* Cases 1999 - 2003

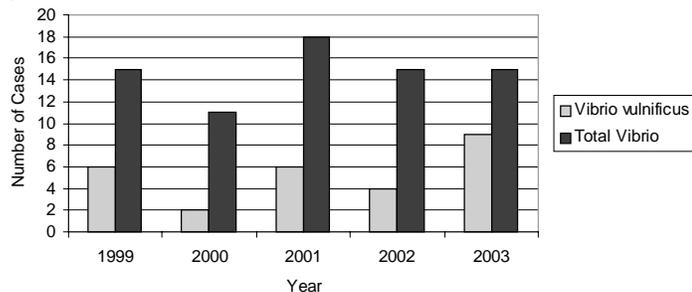
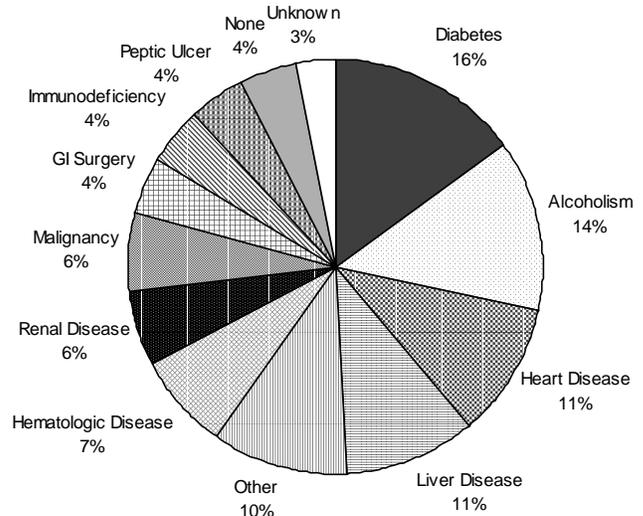


Figure 2. Type of underlying illness of *Vibrio vulnificus* cases by percent 1999 - 2003 (not mutually exclusive)



**HOPWA Needs Assessment**  
 Prepared by Phyllis Johnson, Community Development Specialist,  
 HIV/STD Prevention and Care Branch



North Carolina’s first statewide Housing Opportunities for Persons with AIDS (HOPWA) needs assessment was initiated in January 2004. The purpose of the HOPWA Program is to devise long-term comprehensive strategies for meeting the housing needs of persons living with acquired immunodeficiency syndrome (AIDS) or related diseases, and their families. The needs assessment will help determine exactly what these housing needs are for persons living with HIV/AIDS (PLWHA) and their families in our state.

The HIV/STD Prevention and Care Branch has contracted with AIDS Housing of Washington (AHW), a national technical assistance provider, to facilitate the needs assessment process. The process involves the formation of a HOPWA steering committee and the conduction of key informant interviews, client surveys and focus groups. Currently, the steering committee is comprised of 22 members, including consumers, representatives from state agencies, service providers and other non-profit representatives.

The steering committee is the key to the overall success of the needs assessment. Responsibilities of the committee include, but are not limited to, the following: provide guidance regarding local perspectives and issues of significance; identify key informants to be interviewed; participate in the development of a client survey tool and survey distribution; review written drafts of the plan as well as intermediate updates; participate in discussion of needs assessment findings and interpret their significance; develop recommendations that respond to identified issues; and help gain community-wide support for the plan’s recommendations and implementation.

(continued on page 11)

## State Lab Director Has National and International Roles

Prepared by Dr. Leslie Wolf, Assistant Director,  
State Laboratory of Public Health



Dr. Lou F. Turner, director of the State Laboratory of Public Health (SLPH), was recently nominated to two prestigious assignments, one at the federal level and one at the international level.

At the invitation of the U.S. Secretary for Health and Human Services, Dr. Turner will serve a four-year term on the national Clinical Laboratory Improvement Advisory Committee (CLIAC). This 20-member group provides scientific and technical advice and guidance to the U.S. HHS secretary, the assistant secretary for health, the director of the CDC, the commissioner of the FDA and the administrator for the Centers for Medicare and Medicaid Services.

CLIAC provides advice and guidance on clinical standards for laboratories throughout the United States, including the impact of standards changes and technological advances. The committee also makes recommendations on such topics as personnel standards for laboratories, proficiency testing standards, patient test management, quality control and quality assurance standards. Dr. Turner's appointment to CLIAC begins July 1, 2004 and ends June 30, 2008.

On the international front, Dr. Turner was asked to attend the World Health Organization (WHO) meeting, "Partnerships for Sustainable Public Health Laboratory Capacity: Twinning Partnerships between National Laboratories in Developing Countries and Specialized Institutions" April 20 and 21 in Lyon, France.

The conference focused on a program being developed by WHO and other international partners to strengthen laboratory capacity worldwide by helping national and international laboratories in their critical roles of disease surveillance and early detection of epidemic-prone diseases. As part of this effort, a two-year coaching program was designed for laboratory leaders and specialists from national public health laboratories in developing countries. The goals include training laboratory specialists, implementing specific national plans of action, establishing quality control programs, developing Internet-based communications, sharing knowledge, and developing advocacy tools related to core laboratory diagnostic capacities. To sustain the benefits of the coaching program, WHO and APHL plan to set up "twinning" programs, pairing national laboratories with specialized research or public health institutions.

The SLPH participated in a similar "sister" laboratory program several years ago with the national laboratory of Ecuador under the auspices of Pan American Health Organization (PAHO). At that time, John Sheats, then assistant laboratory director, visited Ecuador's lab. In return, laboratory specialists from Ecuador made several visits to the SLPH. Because of North Carolina's previously successful efforts in such international laboratory cooperative initiatives, the Association of Public Health Laboratories (APHL) nominated Dr. Turner to attend the WHO "twinning" initiative planning and organizing meeting in France.

## Employee Recognition: Kristy Osterhout Employee of the Quarter

Prepared by Patsy West, Administrative Assistant,  
Epidemiology Section



Kristy Osterhout has received the Epidemiology Section's Employee Recognition Award for the second quarter of 2004. Ms. Osterhout was nominated in the category of Service Excellence.

In 1988, Ms. Osterhout began employment with the State of North Carolina as a consultant in the Laboratory Improvement Branch of the State Laboratory of Public Health. Over the past 16 years, Ms. Osterhout has been responsible for developing and presenting workshops on management topics, microscopy and safety issues. In her effort to ensure the safety of the SLPH and county health department laboratories, Ms. Osterhout keeps current on all federal regulations regarding blood-borne pathogens, chemical hygiene, and DOT/IATA/FAA packing and shipping requirements. In order to achieve excellence in her work, Ms. Osterhout consults with the NC Department of OSHA, develops and presents modules to assist local health departments with writing required safety procedures, and consults with other agencies and other states regarding specific safety issues. Ms. Osterhout developed a web-based blood-borne pathogen training for the North Carolina Department of Health and Human Services. Ms. Osterhout was asked to visit Virginia's BSL 3 lab and was able to provide valuable feedback when the BSL 3 lab was constructed for the State Laboratory of Public Health. In her quest for excellence, Ms. Osterhout pursued and received a safety certification from the ASCP (American Society of Clinical Pathologists). For many years, Ms. Osterhout served as the chairman of the Laboratory's safety committee and now serves as the advisor to the safety committee. In her endeavor to maintain the highest degree of safety, Ms. Osterhout designs, presents and updates safety training for all new Lab employees, in addition to any required safety training. Because of her enthusiasm for service excellence, she has made the NC State Laboratory of Public Health and county health departments safer places to work. There is no wonder that she has been deemed the Laboratory's "Safety Queen."

In addition to receiving the Epidemiology Section's Employee Recognition Award, she will be presented with a gift certificate to a local restaurant from the Epidemiology Section Management Team. ♦

*(HOPWA Needs Assessment, continued from page 10)*

Upon completion of the needs assessment, a statewide housing plan for persons living with HIV/AIDS and their families will be developed. This information will be used as a guide to increase knowledge and understanding of the housing needs of PLWHA, and the findings will also be the basis for development of a Request for Application (RFA) that will be used to allocate HOPWA funding in SFY 05-06. An update of the project will be provided in this venue when the assessment is completed. ♦

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