



EpiNotes

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North Carolina Department of Health and Human Services | Division of Public Health | www.epi.state.nc.us/epi

Lyme Disease Surveillance & Endemic Counties

Several vector-borne diseases in North Carolina (Lyme disease, RMSF, ehrlichiosis, arboviral encephalitides) can cause severe or even fatal illness. Detailed information is collected for all submitted cases, but surveillance for Lyme disease (LD) is an especially complicated undertaking. Properly interpreting the case definition requires not only understanding clinical and laboratory evidence, but also elements less commonly found in case definitions such as exposure history. In evaluating exposure history, it is necessary to determine where the case patient acquired the illness, and if the county of disease acquisition is “endemic” for Lyme disease.

The current case definition states that a county is considered endemic for LD after at least two confirmed cases have been **acquired** in the county. Determining where a case of LD was acquired can be difficult; this document seeks to clarify surveillance for early LD and how the N.C. Division of Public Health will determine where a case was acquired.

In general, a confirmed case must include a combination of clinical (early or late) manifestations and laboratory (serology or culture) evidence of infection, per the case definition. Only if the confirmed case includes erythema migrans (EM) as a clinical component, will N.C. DPH attempt to determine the county of acquisition. Although other vector-borne diseases may cause a variety of rash presentations (generalized, focal, etc.), an EM rash is specific to LD and to Southern Tick Associated Rash Illness (STARI).

In determining county of acquisition, EM is a prerequisite because it represents the acute manifestation of LD. Late manifestations of LD may occur either early or late in the course of disease. Although their presence may allow confirmation of a case, the onset of these symptoms is not predictable, and therefore they are not suitable in determining where a case was acquired. Because EM is present in only 70-80% of early cases, determining the county of acquisition will not be possible for all early cases of LD.

Background

The case definition for LD was amended in 2008 to require laboratory confirmation of EM or exposure to known tick habitat in a county endemic for Lyme disease. The 1996 case definition did not take into account the presence of Southern Tick Associated Rash Illness (STARI), which was confounding surveillance for LD in southern states.

STARI is a common tickborne illness that produces a rash identical in appearance to the EM of LD. The only way to differentiate one from the other is through use of laboratory criteria for LD, because the causative agent of STARI is unknown. The 1996 LD case definition included EM of ≥ 5 cm diagnosed by a physician as sufficient to categorize a case as confirmed, without requiring laboratory confirmation. Southern states were therefore potentially reporting cases of STARI as confirmed LD.

Thus, EM of ≥ 5 cm diagnosed by a physician is classified as a confirmed case of LD if one of the two following conditions is met:

1. Less than or equal to 30 days before onset of EM, the patient was in wooded, brushy, or grassy areas (i.e., potential tick habitats) in a county in which Lyme disease is endemic.
2. There is laboratory evidence of infection (see box below).

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Determining N.C. Counties Endemic for LD

The first step to determining whether or not a county is endemic for LD is to identify whether or not a patient is a confirmed case of early LD. The algorithm at right was created to help identify confirmed early stage LD cases (for surveillance purposes).

In order to properly classify a case of LD, the investigator must understand “lab evidence of infection” and “exposure.” Laboratory evidence of infection consists of one of the three following elements:

- 1) Positive culture for *Borrelia burgdorferi*
- 2) Positive two-tier serologic testing
- 3) Positive serologic single tier IgG immunoblot

Serology (numbers 2 and 3 above) is most commonly used to confirm a case, but serologic evaluation of a patient for LD surveillance purposes **MUST** be conducted as shown in the accompanying algorithm.

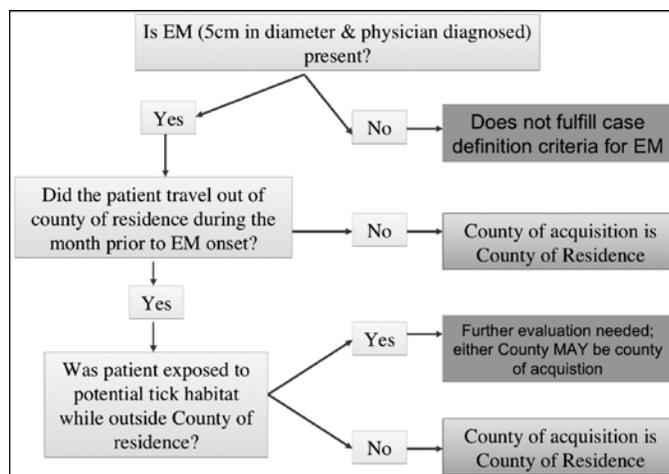
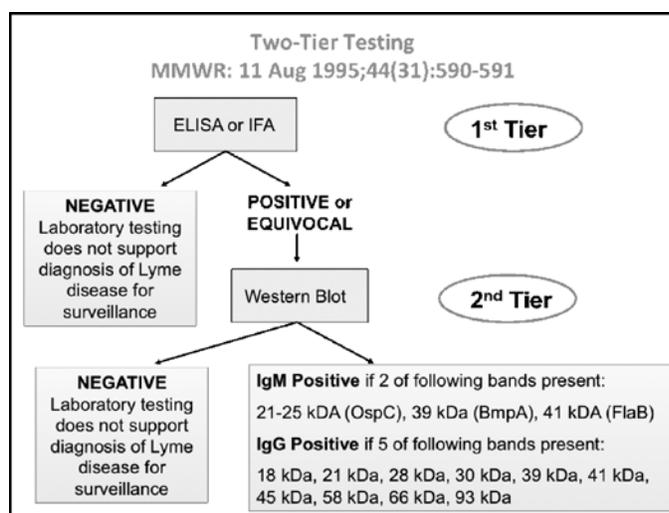
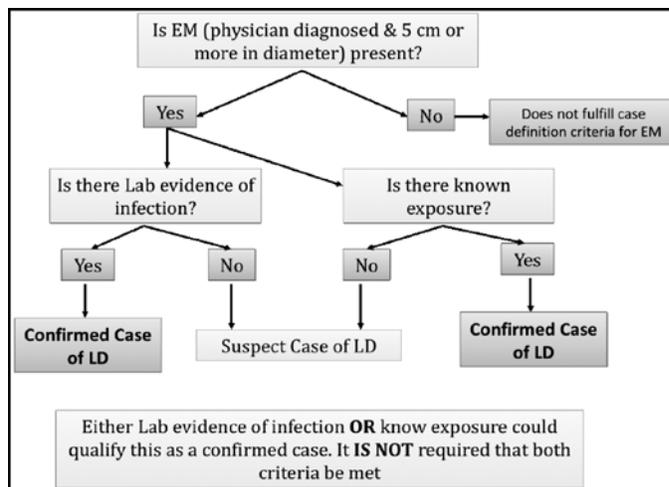
Known exposure is another means to confirm a case of early LD. See the following definition:

Exposure: Having been (less than or equal to 30 days before onset of EM) in wooded, brushy, or grassy areas (i.e., potential tick habitats) in a county in which Lyme disease is endemic. A history of tick bite is not required.

As you can see this raises another question: What is an endemic county? For surveillance purposes an endemic county is defined as follows:

Endemic county: A county in which Lyme disease is endemic is one in which at least two laboratory confirmed cases have been acquired in the county.

Initially, cases of LD will not be classified as confirmed on the basis of being in an endemic county in the state because, currently, there are no counties designated as LD-endemic in North Carolina. Therefore, all cases of early LD must be confirmed by laboratory means (see previous page). However, when and if it can be determined that at least two laboratory confirmed cases of LD were acquired in the same N.C. county, that county would be declared endemic for LD. NOTE: Identification of *Ixodes scapularis* ticks infected with *Borrelia burgdorferi* ss will not be used to declare a county endemic, due to tick behavior which appears to reduce the risk of transmission to humans.



So, how can it be determined if LD cases were acquired in a particular county? The algorithm at right was created to allow investigators to answer this question. Remember, tick habitat is defined as wooded, brushy, or grassy areas.

Treatment NOTE: The N.C. DPH recommends that any person who develops a skin lesion, expanding rash, or viral infection-like illness within 1 month after removing a tick or within 1 month of being in a brushy or wooded area seek medical attention to assess the possibility of having acquired tick-borne illness. An EM rash may well

represent a case of Lyme disease or a case of STARI. In both cases, individuals should be appropriately treated by a physician.

Submitted by:

Megan Davies, MD, State Epidemiologist

Carl Williams, DVM, State Public Health Veterinarian

Dr. Megan Davies is new State Epidemiologist

Dr. Megan Davies is the new state epidemiologist and chief of the Epidemiology Section of the N.C. Division of Public Health. A member of the Division of Public Health staff since 2002, Davies assumed her new duties on Aug. 10. As a physician with experience at the national Centers for Disease Control and Prevention as well as at the community and state levels, she is well-suited for her new roles.

Davies received her BA degree from Warren Wilson College in Asheville and her MD from the University of North



Dr. Megan Davies

Carolina. She completed residency training in Family Medicine at East Carolina University and then practiced family medicine in western North Carolina for four years. In 1998, she joined CDC's Epidemic Intelligence Service (EIS) for a two-year fellowship. She was a staff epidemiologist with CDC after completing her EIS training in 2000 and in 2002 came to the N.C. Division of Public Health as a career epidemiology field officer, working to develop new surveillance systems and enhance state epidemiologic capacity.

North Carolina State Laboratory of Public Health Welcomes New Assistant Laboratory Director

The newest member of the management team at the North Carolina State Laboratory of Public Health is Dr. David E. Keller, PhD, CHE. He began work as Assistant Laboratory Director on Aug. 3, reporting to the Laboratory Director, Dr. Leslie Wolf, PhD, HCLD(ABB).

David's post-secondary education began at Auburn University, where he graduated with a Bachelor's of Science in chemical engineering with a minor in biochemistry, followed by a PhD in biochemical engineering at North Carolina State University. David's thesis work involved experimental derivatization and characterization of high pressure liquid chromatography supports.

With an industry background in the area of pharmaceuticals and medical diagnostics, David has held various scientific positions at Organon-Teknika (now bioMérieux) for 14 years developing and manufacturing various *in vitro*

diagnostic assays in the areas of immunology/virology, clinical microbiology, and hemostasis. More recently he held engineering, consulting and leadership positions in the pharmaceutical industry with Biogen-Idec and Glaxo Smith Kline.

During this period, he developed expertise with regulated quality systems (Food and Drug Administration, International Standards Organization, and International Committee on Harmonisation Standards), validation (methods, instrumentation, manufacturing processes, computer systems, control systems, cleaning processes), structured development processes, quality by design, and project management in addition to the more traditional engineering/scientific expertise associated with pharmaceutical and medical diagnostic manufacturing. David also has significant scientific customer service experience through providing solutions to assay and laboratory issues for the American Red Cross blood banking system.

Utilization of the NC Laboratory Response Forum and Micronet During the Initial Recognition and Characterization of the H1 N1 Pandemic

Many preparedness activities in the N.C. State Laboratory of Public Health (NCSLPH) are supported by the CDC Public Health Emergency Preparedness Cooperative Agreement (PHEP). In North Carolina, these funds allowed for the creation of the Micronet listserv. Micronet was developed in 2001 in the wake of the 'anthrax mailings.' Using a survey that was sent to each of the hospital and reference laboratories, contact names, positions and email addresses were collected, along with technical laboratory capacity information. The listserv created from this survey remains the primary mode of immediate and direct communication from the NCSLPH to sentinel microbiology laboratories in the state. Micronet also serves as an electronic forum for members to query peers as to best practices and other information sharing.

PHEP funds were also used to create and maintain the N.C. Laboratory Response Forum (NC LRF). The NC LRF was established in 2006 with the overall goal of strengthening the diagnostic capacity of clinical laboratories in our state. Topics covered during the meetings have ranged from bioterrorism to novel tuberculosis concerns to sexually transmitted disease diagnostics in abuse cases, just to name a few. Importantly, the NC LRF most often discussed the subject of influenza preparedness. Permanent members include director-level laboratory representatives from the 11 hospital systems hosting Public Health Epidemiologists, the Public Health Epidemiologist Program Coordinator, the Duke University Electron Microscopy Center, representatives from both the State Laboratory of Public Health and Communicable Disease Branch of the N.C. Division of Public Health, and the State Epidemiologist. Additional individuals/groups are invited if the agenda topics being discussed are pertinent to them. Since conception, the NC LRF has met in person approximately three times annually to discuss and improve the issues impacting North Carolina's clinical diagnostic laboratories.

Messaging Using Micronet Listserv

As more U.S. cases of the novel H1N1 influenza virus were being discovered this spring, Dr. Leslie Wolf, NCSLPH director, used Micronet on April 24 and 25

to email the case definition used by the NC Division of Public Health and the CDC's investigation, plus interim recommendations. A public health emergency was declared at the federal level on April 26, 2009 due to the spread of the novel H1 N1 strain. By Monday, April 27, nine guidance messages pertinent to H1N1 clinical laboratorians had been sent through Micronet by NCSLPH management.

The Micronet listserv was employed several times each day to communicate announcements during the week following the declaration of a public health emergency. These email notices included many CDC health alerts, draft guidance for collecting specimens, contact information, biosafety for laboratory workers, WHO primer & sequencing protocols, influenza surveillance reports, status reports of the Public Health Coordination Center, and other general/daily updates. During the initial days of the event, Micronet listserv user feedback was entirely positive and often noted that the information distributed was helpful to the clinical laboratorian.

Utilization of the N.C. Laboratory Response Forum

The N.C. Laboratory Response Forum (NC LRF) held seven conference calls during the first weeks of the event. Notes from every call (except the hastily arranged initial call held on May 1) were distributed through the Micronet listserv. The focus on the first calls centered on problem solving and creating transparency with state operations. Many forum members expressed confusion around the changes in the guidance of case definitions and sample submission requirements. The impact of the dynamic state and federal guidance was that many partners struggled to pass on testing guidance to their customers in a timely and helpful manner.

Another issue brought up was the relatively low capacity for H1N1 diagnostic testing in relation to the larger demand for laboratory testing on the part of the public and physicians. The NCSLPH was able to provide some flexibility for testing of patients with suspected atypical presentations and testing for individuals in settings with vulnerable populations. The importance of active

participation by Laboratory Response Forum members was made clear throughout the H1N1 response, because immediate feedback was received and clarification on guidance could be provided.

These NC LRF calls gave NCSLPH and Communicable Disease Branch representatives the opportunity to explain the goals of the Division of Public Health during this response. It also gave an opportunity to clarify guidance documents and understand their impact on sentinel clinical laboratories. It was communicated that testing was performed to support enhanced surveillance and characterize the transmission and severity of disease. Epidemiologists also used test results to implement public health measures such as isolation and quarantine.

The final conference call held on May 27 was devoted to giving all forum members a platform to articulate which efforts were particularly productive and what could have been improved. Sharing the information from these conference calls elicited additional questions from the greater Micronet community. The feedback gained from the participants stands to improve North Carolina's diagnostic strength as well as increase the utility of the LRF and Micronet. Even though the regular conference calls have ended, the Micronet electronic forum continues to be a valuable avenue of communication between the NCSLPH and its partners. In summary, the importance of both Micronet and the NC LRF in the response to the first wave of pandemic influenza was clearly demonstrated to all its members.

Submitted by:

Royden Saah, STEP Coordinator, SLPH

Naturally Occurring Asbestos (NOA) in North Carolina – Part Two

In March and July of 2007, the Environmental Protection Agency (EPA) conducted activity-based sampling (ASS) at the former Sapphire Valley Mine in Jackson County, N.C., an area once known for sapphires and asbestos. The special sampling protocols, called ASS, was developed by EPA and the N.C. Division of Public Health's (DPH) Health Hazard Control Unit to simulate the potential exposure to naturally occurring asbestos (NOA) that people might receive while participating in recreational gem hunting. The objective of the sampling was to determine if gem hunting at this location could result in inhalation exposures to airborne asbestos fibers. Inhalation of NOA may result in an increased risk of asbestos-related diseases for people living near or on deposits of NOA. EPA took a series of personal and area air samples during both of the site visits. The samples were collected during simulated tasks associated with recreational gem hunting, and included chiseling and hammering of the asbestos-containing rocks; and sieving, shoveling and raking the asbestos-containing soil. All of these tasks were performed over several hours for several days while wearing personal protective equipment.

The samples were analyzed and the results provided to DPH's Health Assessment, Consultation and Education (HACE) Program. The HACE program reviewed the data and developed exposure dose estimates associated with the simulated recreational activities.

The N.C. HACE Program includes specialists in the field of environmental toxicology, epidemiology, industrial hygiene, health risk assessment and health education. Together, these individuals review existing environmental and human health data, collect community health concerns and conduct health risk assessments. The final product produced by the HACE Program is called a "Health Consultation." A Health Consultation determines if people in a community have been or may in the future be exposed to harmful substances, estimates the exposure dose, and identifies what adverse health effects may result from exposure. The Health Consultation also specifically addresses health concerns that may be expressed by the local community.

In the case of Sapphire Valley Mine, the Health Consultation Report concluded that the potential to inhale asbestos fibers at the Sapphire Valley Mine is not expected to harm people's health while they participate in most recreational gem hunting activities at this site. The assessment did indicate that certain recreational gem hunting activities could result in the release of asbestos fibers into the air from the asbestos-containing soil and rock on the site. Participating in these particular activities that aggressively disturbed asbestos-containing rocks or soil could result in adverse health effects, if the exposures took place for many days per year over a number of years, especially if

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the exposures began in childhood. As a result, HACE recommended that gem hunting be prohibited at this location, along with any other activities that would substantially disturb the asbestoscontaining soil or rock.

In addition to the Sapphire Valley Mine Health Consultation, completed by the HACE Program, a list of NOA references and other materials are available on the internet at: www.epi.state.nc.us/epi/oe/oe/oe.html. The health consultation is listed under Jackson County.

This article is the second in a series prepared by OEEB on naturally occurring asbestos (NOA) [see EpiNotes v2007-1 (Mar-May)]. NOA is prevalent in Western N.C. and is an increasing concern due to increased development, and increased exposure potential, in the area.

Submitted by:

Jeffery W. Dellinger, Industrial Hygiene Consultant, Health Hazards Control Unit, OEEB; and Sandy Mort, Health Assessor, and Mercedes Hernandez-Pelletier, Health Educator, HACE, Medical Evaluation and Risk Assessment Unit, OEEB

New North Carolina Regulation Addresses Lead-Based Paint Hazards Created During Renovation, Repair and Painting Activities in Housing and Child-Occupied Facilities

Over 300,000 children in the United States have potentially harmful levels of lead in their bloodstream. Lead poisoning can affect nearly every system in the body, but it often occurs with no obvious symptoms. Lead poisoning in children can cause learning disabilities, behavioral problems, and at very high levels, seizures, coma, and even death. And yet, lead poisoning is widely considered to be the most preventable environmental disease of young children. Asking your health care provider to perform a blood lead test is the only sure way to determine if a child has been exposed to lead.

Children are exposed to lead primarily through lead-based paint in poor condition and lead-contaminated dust and soil found in facilities built before 1978. Common renovation activities that disturb lead-based paint and coatings may create lead dust and paint chips which can be harmful to children and adults.

To protect against this risk, North Carolina legislation (N.C. Gen. Stat. § 130A-453.12 – 453.21) was adopted in August 2009, creating the North Carolina Lead-Based Paint Hazard Management Program for Renovation, Repair and Painting (LHMP-RR&P). This legislation, and the Rules adopted to implement it (10 N.C.A.C. 41C .0900) became effective January 1, 2010. The rules will require the use of lead-safe work practices and other actions aimed at preventing lead poisoning when disturbing lead-based paint during renovation and remodeling work.

The use of lead-safe work practices to contain lead dust will help ensure a healthier living environment for children and families. It will also help ensure a healthier working environment for painters, carpenters, and other trades workers.

The NC LHMP-RRP Rules will affect paid renovators who work in single and multi-family housing built before 1978 and in child-occupied facilities. Child-occupied facilities may include, but are not limited to, day care centers, preschools, and kindergarten classrooms.

For housing and child occupied facilities built before 1978, prior to beginning renovation projects, renovation contractors must provide the lead hazard information pamphlet “Renovate Right: Important Lead Hazard Information for Families, Child Care Providers, and Schools” to owners and occupants of housing or owners of child-occupied facilities and to the parents of children under age six who attend child-occupied facilities.

Under the rule, beginning on January 1, 2010, firms and their contractors or employees performing renovation, repair and painting activities that disturb lead-based paint and coatings in housing and child-occupied facilities built before 1978, must be certified, must use trained workers and must follow specific work practices to prevent the creation of lead hazards.

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Reported Communicable Diseases, North Carolina, January-September 2009 (by date of report)*

Disease	Year-to-Date (Third Quarter)			3 rd Quarter 2009	Comments / Note
	2009	2008	Mean (2004-2008)		
Botulism, foodborne/wound	1	0	0	0	
Campylobacter	378	384	499	77	
Chlamydia, laboratory reports	32981	28313	24409	10299	
Creutzfeldt-Jakob Disease	6	4	2	0	
Cryptosporidiosis	59	29	60	11	
E. coli Shiga Toxin-producing	78	71	67	12	
Ehrlichiosis, Granulocytic	4	0	2	0	
Ehrlichiosis, Monocytic	27	26	29	10	
Foodborne, Other	30	12	160	0	
Foodborne, Staphylococcal	3	0	3	0	
Gonorrhea	11312	11339	11511	3739	
Haemophilus Influenzae	61	60	53	13	
Hepatitis A	25	52	60	3	
Hepatitis B	138	61	109	16	
Hepatitis B Carrier	1084	362	588	210	
Hepatitis B Perinatal	5	1	2	2	
Hepatitis C, Acute	13	37	17	1	
HIV/AIDS	1358	1690	1443	351	Note 1
Hemol.Urem.Syn/TTP	3	3	4	2	
Influenza Pediatric Mortality	3	1	0	0	
Influenza Novel Infection	431	0	0	290	
Legionellosis	39	24	28	9	
Listeriosis	10	14	18	3	
Lyme Disease	65	29	45	24	
Malaria	21	23	21	3	
Meningococcal Invasive Disease	18	12	21	2	
Meningitis, Pneumococcal	23	30	30	2	
Mumps	9	5	15	1	
Q Fever	1	2	3	0	
Rabies in animals	392	365	141	385	
RMSF	259	313	431	58	
Salmonellosis	842	908	1110	158	
Shigellosis	266	147	146	33	
Strep A	85	117	119	11	
Syphilis, Total	684	359	383	256	Note 2
Toxic Shock Synd. Non-Strep	1	0	3	0	
Toxic Shock Synd.,Strep	3	5	6	0	
Tuberculosis	162	231	225	77	
Typhoid, Acute	3	5	4	1	
Vaccinia	1	0	0	0	

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Disease	Year-to-Date (Third Quarter)			3 rd Quarter 2009	Comments / Note
	2009	2008	Mean (2004-2008)		
Vibrio, Other	7	4	8	3	
Vibrio vulnificus	2	3	2	0	
VISA/VRSA (Staph aureus)	2	2	1	0	
Whooping Cough	213	79	121	14	

* Preliminary data, as of 12/1/2009. Quarters defined as 13 week periods. Diseases reported in the first three quarters of 2009 define those listed in this table.

Notes: 1. Earliest report with HIV infection or AIDS diagnosis; 2. Includes primary, secondary and early latent syphilis.

As part of outreach and education efforts the Health Hazards Control Unit (HHCU) is providing articles and information to professional trade organizations for inclusion to their trade magazines, newsletters, and list serves. Our outreach and education efforts will continue over the next year or so and will include a mailing to the occupants of pre-78 housing stock most at risk for having lead-based paint.

For more information about the NC LHMP-RRP Renovation, Repair and Painting Rules, call the NC DHHS, Division of Public Health, HHCU at (919) 707-5950 or visit our website at www.epi.state.nc.us/epi/lead/lhmp.html.

Submitted by:
Donald F. Chaney
Industrial Hygiene Consultant
Health Hazards Control Unit

Published Study Shows Poor Air Quality in N.C. Restaurants That Allow Smoking

A national, peer-reviewed journal has published a North Carolina research study showing that restaurants that allow smoking in six counties have much worse air quality than restaurants that have smoke-free policies.

The study, conducted between October, 2005 and May, 2007, was carried out by local and state health department staff and local volunteers in Buncombe, Guilford, Mecklenburg, New Hanover, Wake and Watauga Counties. Participants visited restaurants and monitored the air, comparing results among restaurants that allow smoking anywhere, those with non-smoking sections and those that were smoke-free.

By using air quality monitoring equipment, the researchers determined that the average air quality in restaurants allowing smoking anywhere was 16 times worse than air in smoke-free venues and more than seven times the maximum considered safe by the Environmental Protection Agency (EPA).

“North Carolina’s new smoke-free restaurant and bar law will make all these venues smoke-free in January, 2010, so restaurant and bar workers and patrons can all breathe easier knowing that the air will be free of the serious health hazards found in secondhand smoke,” said Sally Herndon Malek, head of the Tobacco Prevention and Control Branch in the N.C. Division of Public Health, and one of the authors of the study.

The article, “Using Indoor Air Quality Monitoring in Six Counties to Change Policy in N.C.” appears in the July issue of *Preventing Chronic Disease*, a peer-reviewed journal published by the U.S. Centers for Disease Control and Prevention (CDC). Authors, besides Malek, include Scott Proescholdbell of the Injury Prevention Section of the N.C. Division of Public Health, and Dr. Adam O. Goldstein and Julea Steiner, both of the University of North Carolina School of Medicine, Department of Family Medicine.

The researchers used a well-established air monitoring protocol developed by Roswell Park Cancer Institute in New York. Using this method, air quality is monitored using the TSI SidePak AM510 Personal Aerosol Monitor. This sensitive machine measures particles suspended in the air that are both very small and released in large quantities by burning cigarettes. These particles, known as PM 2.5, serve as a good proxy for secondhand smoke and are associated with heart and lung disease and death.

The teams visited a total of 152 venues. As each county completed its research, the local health department released results to the community through presentations to boards of health, boards of county commissioners, as well as releases to local news media.

“Air quality monitoring provides a way to illustrate the high levels of hazardous exposure to secondhand smoke and increase support for smoke-free policies,” Malek said. “Using combined county data to educate the public and decision-makers may have helped build local support for House Bill 2 in participating counties across the state.”

Results showed that for the 45 smoke-free venues tested, the average particulate matter concentration was 15 $\mu\text{g}/\text{m}^3$, (expressed as micrograms per cubic meter of air). In the 67 venues with non-smoking sections, the average concentration was 67 $\mu\text{g}/\text{m}^3$. For the 40 places visited that allowed smoking everywhere, the average concentration was 253 $\mu\text{g}/\text{m}^3$. This level is 16 times the exposure in the smoke-free venues and seven times the maximum of 35 $\mu\text{g}/\text{m}^3$ considered safe by the EPA. The study can be accessed online at: www.cdc.gov/pcd/issues/2009/iul/080115.htm.

Syphilis Morbidity Increases Dramatically

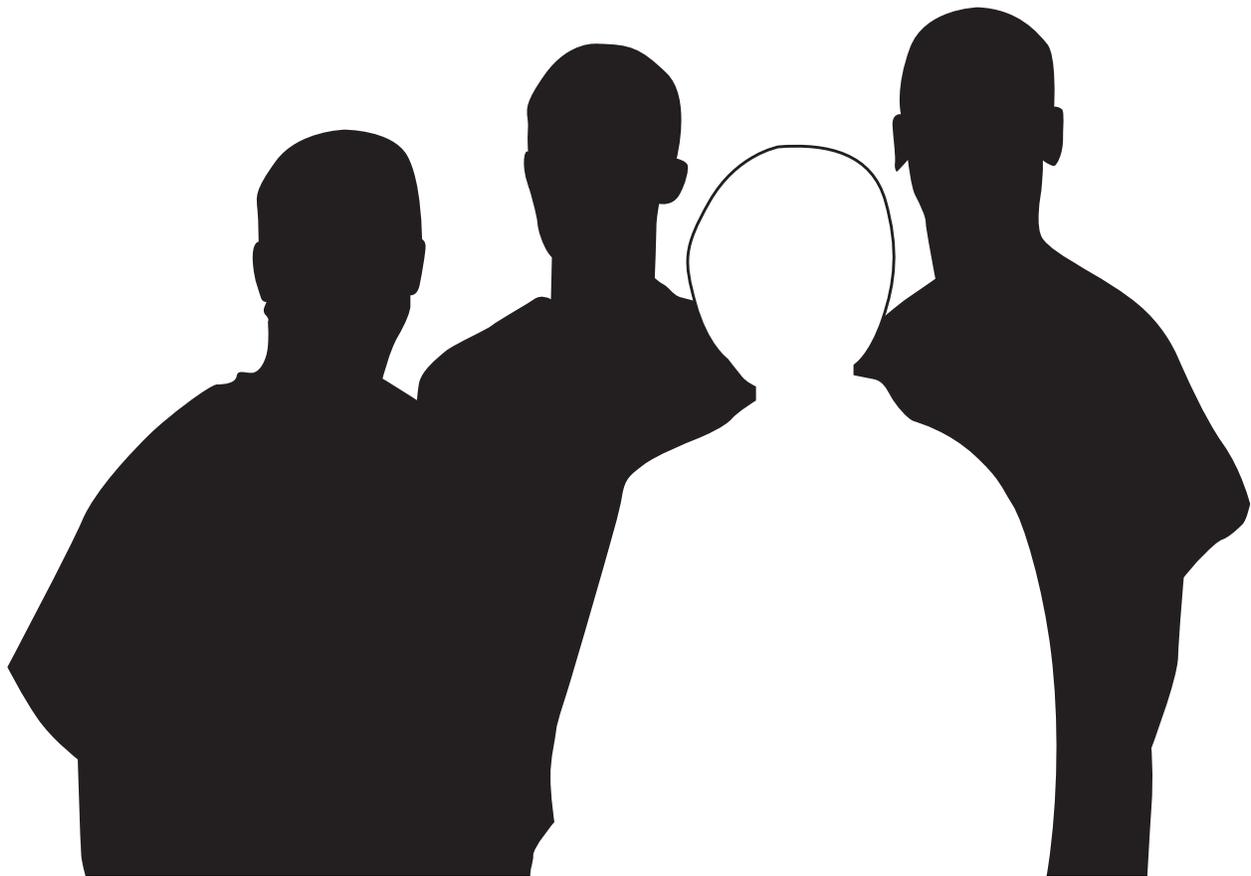
North Carolina is seeing a significant increase in syphilis morbidity for 2009. Statewide, a total of 684 cases of early syphilis (primary, secondary, and early latent) were reported for the first nine months of this year. For the more infectious stage of primary and secondary syphilis, 431 cases were reported through September, which is over twice the number of reports (201) in same time period for 2008. While many counties in the state have seen more syphilis reports this year than expected, Forsyth, Wake, Wayne and Mecklenburg counties have seen particularly substantial increases.

The demographic makeup for syphilis morbidity thus far has been similar to that of recent years. Statewide, over 75 percent of 2009 early syphilis cases have been in males, almost 40 percent of cases in 20- to 29-year-olds and almost 72 percent of cases in African Americans. While African Americans represent the

group most affected by syphilis, it is important to note that increases in case reports thus far for 2009 have been noted for almost all racial/ethnic groups.

Community awareness is a key factor to controlling outbreaks. Public health alerts have been sent to local health departments and medical providers across the state to be more proactive in diagnosing and treating syphilis. Also, large-scale testing events are being held in heavily impacted areas. Early detection, treatment and follow-up with contacts are essential to helping control the outbreak and reverse trends. For more information about syphilis, HIV and other sexually transmitted diseases, please go to www.epi.state.nc.us/epi/hiv/.

Submitted by:
Jan Scott,
Public Health Advisor



SLPH's New Molecular Diagnostic and Molecular Epidemiology Unit



(l-r) Dr. Shermalyn R. Greene, Shadia Barghothi Rath, Denise Griffin, Kate Volpe Sperry and Savitri Mullapudi

On March 1, 2009, the State Laboratory of Public Health (SLPH) welcomed onboard a new laboratory unit, the Molecular Diagnostic and Molecular Epidemiology Laboratory Unit. The unit will perform certain routine testing, provide technical support, and serve as a resource for any molecular test performed at the SLPH. This includes research, development and assay validation, troubleshooting, training and molecular testing surge capacity. The Molecular Unit comprises five members: Dr. Shermalyn R. Greene (program manager / public health scientist), Shadia Barghothi Rath (molecular medical laboratory supervisor), Denise Griffin (PFGE medical laboratory specialist), Kate Volpe Sperry (nucleic acid-based technologies medical laboratory specialist), and Savitri Mullapudi (medical laboratory technologist).

Current routine testing being performed by the Molecular Unit includes pulsefield gel electrophoresis (PFGE) of foodborne organisms (*Salmonella*, *E. coli*, and *Listeria*), multiple-locus variable-number tandem repeat analysis (MLVA-VNTR) of foodborne organisms (*Salmonella* and *E. coli*), and real-time RT-PCR for the detection and sequence analysis of norovirus. The unit currently provides back-up testing for real-time PCR for the detection of *M. tuberculosis* complex, real-time

PCR for the detection of *Bordetelia pertussis*, real-time RT-PCR for the detection of enteroviruses, and 16S sequencing of difficult-to-identify special and atypical bacteria, such as corynebacteria and actinomycetes.

The Molecular Unit provides technical laboratory support for foodborne epidemiology and the Women's and Children's Health Immunizations Branch, and it will contribute data for epidemiologic investigations conducted by CDC and APHL. Currently, the unit is working with the SLPH laboratory managers to determine priorities of future projects. Such projects include a shiga-toxin producing *E. coli* (STEC) PCR assay; a multiplex, bead-based assay for the molecular serotyping of *Salmonella*; and amplification assays for use in detection of sexually transmitted infections. The members of the Molecular Unit are very excited about the new unit and the opportunities they will have to serve other laboratory areas and the people of North Carolina.

Submitted by:

Shadia Barghothi Rath, Medical Laboratory Supervisor,
Molecular Epidemiology/Molecular Diagnostic Unit
Dr. Shermalyn R. Greene, Public Health Scientist, Manager,
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NCSLPH

Newborn Screening Panel to Include Cystic Fibrosis

Babies born in North Carolina are screened for cystic fibrosis (CF) when their newborn screening specimens are sent to the North Carolina State Laboratory of Public Health (NCSLPH). The addition of this common genetic disorder to the current panel of tests was approved by the state legislature in 2008. The new test began on April 13, 2009.

North Carolina joined a growing number of states currently screening newborns for CF in an effort to improve the quality of life for affected individuals. Babies were already screened for more than 30 disorders by the NCSLPH. The whole panel of tests requires just a few drops of blood from a small “heel stick,” or prick, before each baby leaves the hospital. The CF test does not require any additional drops of blood.

The NCSLPH works closely with follow-up personnel in the Children and Youth Branch, Division of Public Health to ensure all babies with abnormal CF newborn screening results receive appropriate follow-up and referrals. For the first six months, we have found 288 infants with abnormal CF newborn screening results that require follow-up and referrals. Eighteen (18) of these infants were confirmed with CF, consistent with projected numbers of anticipated cases for NC.

Cystic fibrosis is the most common genetic disease among Caucasian babies, with an incidence of one in 2,500 live births. The disease also occurs in one in 6,000 Hispanic births, one in 10,000 African-American births, and one in 90,000 Asian-American

births. Eighty-five percent of babies with CF do not show symptoms at birth, so without newborn screening, most would not be diagnosed until after one year of age.

The most serious complications of CF occur in the lungs. Thick, accumulated mucous causes frequent lung infections and blockages of the airway, often causing permanent lung damage. CF can also obstruct the pancreas and severely limit the organ’s ability to break down food and absorb nutrients. As a result, a child may have poor growth, weight loss, abdominal pain and other problems. These symptoms can be greatly improved through the replacement of pancreatic enzymes and careful diet planning.

The addition of CF to the state’s newborn screening panel will further improve the lives of North Carolinians with cystic fibrosis. Newborn screening for CF allows for early diagnosis and therapy intervention. Studies have shown that patients diagnosed soon after birth have improved nutritional status, growth, lung function and experience fewer hospital stays, resulting in longer, healthier lives. In 1955, children with CF were not expected to live beyond age six. Today, adults with this disease are living into their forties and have lives that include careers, marriage and families of their own.

Submitted by:

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NCSLPH*

Epidemiology Section Employee Recognition Fall 2009

Lisa Humbert

This fall, Lisa Humbert of the Office of the Chief Medical Examiner received the quarterly Employee Recognition Certificate from the Epidemiology Section Management Team. Lisa wears many hats at the OCME: personnel clerk, purchasing clerk, parking coordinator, medical legal seminar coordinator, building maintenance coordinator and back-up medical-legal transcriptionist. Over the past year and a half, while the lead transcriptionist has been on extended leave, Lisa carried the full load of transcribing autopsy reports, correspondence, lecture notes and other documents along with her other duties.

Medical transcription requires concentration, typing skills and knowledge of grammar, punctuation and spelling. Medical legal transcription also requires skill unlike other transcription because of its specialized vocabulary. The degree of difficulty goes even higher when you add in numerous authors with their individual speaking voices and styles; our sophisticated on-line autopsy report tool; 6-8 autopsies per day, 7 days a week; and the consequences of a misplaced word or phrase that might go unnoticed by the author. Not only does Lisa work through interruptions every day, she also had



to vacate her workstation several times because of construction in the building, even re-locating to the UNC Hospitals Pathology Department transcription office for two weeks over the Christmas holidays. Through it all, Lisa completed the transcriptions within 1-2 days.

Families of decedents depend on the final autopsy report and death certificate to settle personal and financial affairs following the sudden, unexpected death of a loved one. Law enforcement officials need a completed autopsy report as part of their investigation. Copies of autopsy reports go out to attorneys, insurance companies, the media, state and local agencies, researchers, and other interested parties every day. Lisa's dedication and commitment to outstanding performance insure that there is no delay transcribing the autopsy findings promptly and professionally.

Congratulations, Lisa. We're proud of you!

Dr. Megan Davies, State Epidemiologist



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