

Epi Notes



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Surveillance of Foodborne Diseases in NC: A study of testing and reporting practices of laboratories statewide and of clinicians and infection control practitioners in western NC.

Prepared by Michelle Torok, MPH, Pia D.M. MacDonald, PhD, MPH and Jean-Marie Maillard, MD, M.Sc



BACKGROUND AND METHODS

Foodborne diseases are responsible for an estimated 76 million cases of illness, 325 000 hospitalizations, and 5200 US deaths annually (1). Additionally, the food supply has been targeted in at least two successful deliberate releases of biological agents in the US (2). Sobel and colleagues at the Centers for Disease Control and Prevention (CDC) have noted that “preparedness for a bioterrorist event affecting the food supply... entails augmentation of the traditional public-health infrastructure to enhance disease surveillance, accelerate capacity of laboratory detection, rapidly investigate and control outbreaks, and develop capacity for response to mass-casualty disasters” (2).

Passive disease surveillance systems rely on reporting initiated by clinicians and laboratories, who are required to report by state laws and rules. (In North Carolina, NC GS § 130A-135, § 130A-139, and 10A NCAC 41A.) Clinicians report cases to local health departments, and laboratories report results under surveillance to the state health department. Although passive surveillance systems are known to have relatively low sensitivity (3), consistent reporting provides enough information to allow discerning unexpected changes in disease occurrence, e.g., outbreak “spikes” and changes in trends. In this study, we sought to assess the knowledge and practices of testing and reporting foodborne disease among laboratorians statewide and infection control practitioners (ICPs) and clinicians in western North Carolina.

All medical doctors, doctors of osteopathy, physician assistants, and nurse practitioners whose business address was located in the Public Health Regional Surveillance Team 6 region were invited to participate. The region consists of 19 counties and the Eastern Band of Cherokee Indians, for a total population of approximately 900,000. Clinicians were required to have at least eight hours per week of direct patient care to be included in the survey. Medical
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Broken Lamps Emit UV Radiation: Illness in Duplin County, NC

Prepared by Peter J. Costa, MPH, CHES, PH Epidemiologist and Ricky Langley, MD, MPH, Medical Epidemiologist of the Occupational and Environmental Epidemiology Branch and Paul Wolstenholme, Medical Logistician, Office of Public Health Preparedness & Response



Between Friday, March 4, and Sunday, March 6, 2005 at least eight people sought medical attention for symptoms of burning, scratchy eyes and facial irritations after attending the 2005 Duplin County Expo – an event for Duplin County businesses and merchants to showcase their products and services. The event was to take place at the New Duplin Tobacco Warehouse in Wallace from 6:00 p.m. -10:00 p.m. on Friday night and start up again at 9:30 a.m. Saturday morning. However, shortly after the activities began on Saturday morning, officials notified the event staff that several people who attended the event on the previous night had become sick and that there was no readily identifiable source or cause of the illness. With approximately 2,000 people having attended Friday night and no determination of why several individuals had become ill, the decision was made by 11:00 a.m. Saturday morning to evacuate the warehouse and completely cancel the remainder of the event.

The ill individuals from the Duplin County Expo presented at Duplin General Hospital, Sampson County Hospital, and Wallace Urgent Care. Through informal notification, the Office of Public Health Preparedness and Response (PHP&R) was informed of this event and alerted the Occupational and Environmental Epidemiology Branch (OEEB) on Monday, March 7. In collaboration with the local health department and the Public Health Regional Surveillance Team 2 (PHRST2), OEEB proceeded to communicate with the nurses and healthcare providers at these agencies to obtain and evaluate information on patients who had been seen on Friday, Saturday, and Sunday complaining of skin and/or eye symptoms. Concurrent with their medical investigation, epidemiologists and industrial hygienists from OEEB, acting on knowledge from similar previous events, suggested that officials re-enter the complex and look for any damaged mercury-vapor lamps. These lamps are a potential source of ultra-violet (UV) radiation and are capable of causing symptoms similar to those that were being reported. Upon re-entry, a walk-through of the warehouse revealed that one of the shields that protected a non-extinguishing mercury-vapor lamp was indeed missing over a display booth. The damaged lamp was also tilted and was facing in the direction of the area from which those that became ill had visited or were stationed. A review of the medical records and an epidemiologic investigation further confirmed the location of exposure at the Expo as well as the associated signs and symptoms. It was discovered that the unshielded lamp was above a glass-covered display case. Acting like a mirror, the glass reflected the light into the eyes

and faces of the individuals in proximity of that booth. Common acute symptoms from overexposure to UV light emanating from unshielded mercury vapor lamps include skin burns and eye irritation. Residual injury is very uncommon and the condition usually clears within one to five days, depending on the severity of the individual's exposure.

A mercury vapor lamp is a gas discharge lamp that utilizes mercury to produce light. The use of mercury vapor lamps is not uncommon, as they are frequently and preferably used to light streets, gymnasiums, sports arenas, banks, and stores due to their very long life span and the bright white rays they emit. However, due to their potential to emit hazardous short wavelength UV radiation, all mercury vapor lamps must have a feature that prevents the UV rays from escaping. This is usually accomplished by using an outer bulb comprised of borosilicate glass to envelope the inner vapor arc discharge tube. In this setting, preventative measures must be taken to ensure the outer bulb is not cracked or broken by a projectile such as a volleyball, likely to be present in a gymnasium environment. This is vital, as mercury vapor lamps can continue to operate even after the protective outer bulb is broken, thus allowing potentially dangerous UV rays to escape. Lamp fixtures are available that contain a strong outer lens to protect the bulb from being damaged and should be considered in all settings in which prolonged exposure might occur. Another option is special "safety" lamps that are designed to self-extinguish with the presence of air if the bulb is broken.

To reduce needless occupational and environmental exposure, self-extinguishing lamps should be installed indoors and non-extinguishing lamps should be limited to outdoor use or installation within a glass-enclosed fixture. When practicable, housings should be used that contain either a glass filter or another type of mechanical barrier to protect the bulb from breakage. Mercury vapor lamps should be periodically checked to ensure that the outer bulb has not been broken when installed without an additional glass filter within a fixture. Any broken lamps that continue to operate with no glass barrier should be removed from service to prevent exposure to potentially harmful ultraviolet emissions. Finally, lamp installers and personnel who routinely work around mercury vapor lamps should be informed of the potential hazards from ultraviolet radiation.

In a post-9/11 world, timely interagency involvement is vital for the early detection, recognition, and mitigation of threats to the public's health. In this event, despite normal air quality readings, numerous rumors of a potential chemical release and the possibility of terrorist activity had rapidly emerged. By contributing a public health perspective, earlier collaboration and communication with the North Carolina Department of Health and Human Services may have helped ease the concerns of terrorism at the Duplin County Expo through the expedited discovery of the point source of exposure. To adequately respond to any event, it is imperative that proper communication is relayed to the agencies

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Falls Lake is Planned Site of Study of Recreational Water Quality and Human Health

Prepared by Ann Chelminski, MD, MPH, Medical Epidemiologist, Occupational & Environmental Epidemiology Branch



The Harmful Algal Blooms program in the Occupational and Environmental Epidemiology Branch has chosen swimming areas on Falls Lake to be the sites for a planned study of recreational water

exposure and human health effects. Falls Lake was chosen because its freshwater beaches are easily accessible by road from Raleigh, potentially harmful algal blooms have occurred in the lake, and the N.C. Division of Water Quality has recently begun an environmental assessment of the lake.

The aim of the study is to assess whether there is a difference in the occurrence of illness between swimmers (defined as those who put their head underwater) and non-swimmers. Water sampling will be done to test for cyanobacteria (“blue-green algae”), cyanobacterial toxins, and microbial indicator organisms (e.g., enterococci) to see how the concentrations of these organisms in water correlate with illness in humans. The study will be similar in design to prior studies of recreational water exposure conducted by the Environmental Protection Agency (EPA) and by researchers in Australia (cyanobacteria) and California (microbes). Beach-goers will be asked to report whether they swam and how long they were in the water while at the beach. A follow-up telephone questionnaire will collect information about illness symptoms experienced during the week after their visit to the lake. It is hoped that this study will add to the growing body of research on health risks of swimming in natural (unchlorinated) waters and the health effects of exposure to cyanobacteria and their toxins. It is also anticipated that the water quality data collected at swimming beaches as part of this study will complement that collected in other parts of the lake by the N.C. Division of Water Quality. ♦

CORRECTION

Please note the following correction to the article on “State Laboratory Offers New Test for Algal Toxins” in the last issue of Epi Notes the article reads: “To date, treated drinking water concentrations of microcystins in NC have not exceeded **1.0 ug/ml**, the World Health Organization human health alert concentration.” The WHO human health alert concentration is 1.0 ug/liter.

North Carolina Adopts the National Incident Management System (NIMS)

Prepared by Barbara Callahan, Education & Training Coordinator, Office of Public Health Preparedness and Response

On May 11, 2005, the Proclamation for Adoption of National Incident Management System (NIMS) for North Carolina was signed by Governor Michael Easley. As part of this proclamation, all counties and departments have been directed to adopt and apply the NIMS for all routine, multi-company and agency incidents. NIMS has been endorsed by the North Carolina Emergency Response Commission for use in incident management and emergency prevention, preparedness, training, response, recovery, and mitigation programs and activities.

The Department of Homeland Security issued the National Incident Management System (NIMS) to provide a comprehensive national approach to incident management, applicable at all jurisdictional levels and across functional disciplines as a result of Homeland Security Presidential Directive (HSPD)-5 last year. The NIMS provides a consistent nationwide approach for federal, state, territorial, tribal, and local governments to work effectively and efficiently together to prepare for, prevent, respond to, and recover from domestic incidents, regardless of cause, size, or complexity. Implementation of and compliance with NIMS is critical to ensuring full and robust preparedness across the nation.

All federal, state, local, and tribal emergency agencies receiving federal money are required to adopt this system and integrate its principles, into response plans and standard operating policies/procedures, including incident command structure; standardized terminology; interoperable communications; unified command structures; uniform personnel qualification standards; uniform standards for planning, training and exercising; comprehensive resource management; standardized organizational structures; consolidated action plans; and designated incident facilities during emergencies or disasters.

Requirements for NIMS and ICS training are also found in Objective 2.51 of the North Carolina State Homeland Security Strategy (SHSS) 2004-2006 document which reads, “Require all state, regional and local entities to be trained in Incident Command System (ICS)/National Incident Management System (NIMS)”.

There are six NIMS and ICS training programs available through the Department of Homeland Security (DHS) and developed by FEMA, the Emergency Management Institute (EMI), and the National Fire Academy (NFA) that provide the knowledge and skills for responders at all jurisdictional levels and across all disciplines to work together more effectively and efficiently.

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The DHS ICS and NIMS training programs available are:

- ICS-100 Introduction to the Incident Command System for Federal Disaster Workers
- ICS-200 Basic Incident Command System for Federal Disaster Workers
- ICS-300 Intermediate Incident Command System
- ICS-400 Advanced Incident Command System
- IS-700 National Incident Management System (NIMS), An Introduction
- IS-800 National Response Plan (NRP), An Introduction

The NIMS Integration Center has defined three levels of response personnel requiring NIMS training. Specific training is required at each level to prepare individuals to perform within the Incident Command System. Training requirements for state, regional, and local public health personnel to successfully complete within a time frame are being defined at this time for compliance with federal guidelines.

- Executive Level – Political and government leaders, agency and organization administrators and department heads; personnel that fill ICS roles as commanders, incident commanders, command staff, general staff in either command or single incidents; senior level Multi-Agency Coordination System personnel; senior emergency managers; and Emergency Operations Center or General Staff.
- Managerial Level – Agency and organization management between the executive level and first-level supervision; personnel who fill ICS roles as branch directors, division/group supervisors, unit leaders, technical special strike team and task force leaders, single resource leaders and field supervisors; midlevel Multi-Agency Coordination System personnel, EOC section chiefs, branch directors, unit leaders; and other emergency management/response personnel who require a higher level of ICS/NIMS Training.
- Responder Level – Emergency response providers and disaster workers, entry level to managerial level including Emergency Medical Service personnel; firefighters; medical personnel; police officers; public health personnel; public works/utility personnel; and other emergency management response personnel.

A NIMS/ICS Public Health Workforce Credentials Database has been developed to centralize record-keeping. This will quickly provide NIMS/ICS credential validation information of the state, regional, and local public health workforce.

In order to assist the public health workforce in achieving completion of required NIMS/ICS training, the North Carolina Division of Public Health (NCDPH) will increase its NIMS/ICS training capacity by increasing the number of public health

state, regional, and local credentialed instructors that have attended DHS approved train-the-trainer programs. In addition to this, NCDPH will collaborate with the following agencies to coordinate local, regional, and state training programs provided by credentialed DHS-certified instructors:

- North Carolina Department of Crime Control and Public Safety Division of Emergency Management
Eastern Branch
Central Branch
Western Branch
- North Carolina Community College System (North Carolina has 58 comprehensive community colleges and one specialized technology center. The system serves all of North Carolina's 100 counties. Individual colleges have service areas that may include one or several counties.)
- Local fire departments

The implementation of a NIMS/ICS training program by federal fiscal year 2007 has been specified as a condition of eligibility for federal preparedness grants, contracts and other activities. This implementation plan, currently being developed, will ensure that North Carolina's public health workforce successfully meets that requirement. More importantly, this training plan will ensure that North Carolina's Division of Public Health personnel are adequately prepared to fulfill their response role in a unified command environment. ♦

(Broken Lamps Emit UV Radiation, cont'd from page 2) responsible for response and mitigation. Future interagency response planning and protocol development should further delineate and define possible scenarios like this that would require immediate, formalized public health notification. This event has revealed the need for continued training and growth in the area of preparedness and response while providing a real-life scenario upon which to base future educational inter-agency interventions. ♦

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- US Army Center for Health Promotion and Preventive Medicine: Laser/Optical Radiation Program. *Just the Facts...Mercury Vapor and Metal Halide Lamps Used for Illumination*. Record 25-011-0698, available at <http://chppm-www.apgea.army.mil>.
- US Army Center for Health Promotion and Preventive Medicine. *Sample Safety SOP for Mercury Vapor and Metal Halide Lamps*. Available at <http://chppm-www.apgea.mil/laser/RPO/SOP/Mervapor.htm>.

The North Carolina Sixth-Grade School-Site Hepatitis B Immunization Initiative School Year 2003-2004

Prepared by Patricia Poole, RN, Hepatitis B Coordinator,
NC Immunization Branch



Hepatitis B virus (HBV) infection is a serious public health threat in the United States, with approximately 79,000 new acute cases each year. Seventy percent of acute infections occur during adolescence and young adulthood. About 10 percent of newly infected adolescents and adults develop lifelong infections which result in complications such as chronic hepatitis, fibrosis, cirrhosis, and liver cancer. HBV infections can be prevented with vaccinations.

In 1994, the Centers for Disease Control and Prevention (CDC) added vaccination of adolescents to the national hepatitis B prevention strategy. In 1995, the North Carolina Immunization Branch launched a statewide initiative to offer hepatitis B vaccinations to susceptible sixth-graders in school-site clinics. Since adolescents attend less than one health care visit each year, the school-site initiative offers an effective plan to vaccinate this high-risk population before the age of greatest risk of exposure to HBV.

Over the past four years, there have been fewer children participating in the initiative. Decreasing participation rates are likely due to children being vaccinated by providers outside the school-based clinics. Insufficient data prevents determination of overall county vaccination rates. However, the initiative continues to be worthwhile, with the administration of 122,241 doses of hepatitis B vaccine and 17,592 routine Td booster vaccinations to 42,266 students during the SY 2003-2004 school-site initiative.

Recent state and national data reflect the effectiveness of hepatitis B vaccination:

- From 1982 to 1998, national data indicate a decline in new hepatitis B cases.
- The greatest decline is seen among persons 10-19 years of age (73% decline), followed by those 20-29 years of age (71% decline).
- In North Carolina, from 1991-2003, similar decline is seen with 96% fewer cases reported in persons 10-19 years of age and 68% fewer cases reported in persons 20 years of age and older.
- The decline of disease incidence in adolescents is thought to be related to immunization programs for infants, children and adolescents.

The initiative is slated to continue through SY 2005-2006, when students entering sixth grade should have been vaccinated, prior to school entry, as mandated by state law .

While data indicate vaccination programs have been very successful, the reduction of hepatitis B related liver disease will not be fully realized until these vaccinated children reach adulthood. The public health benefit of this immunization program will bring immeasurable dividends for years to come.

To access the complete summary report for the SY 2003-2004 initiative, go to www.immunizenc.org. ♦

GC/CT Testing in N.C. Historically Black Colleges and Universities

Prepared by Pete Moore, Unit Manager, Field Development,
NC HIV/STD Prevention and Care Branch

In the spring of 2005, the Region IV Infertility Prevention Project conducted a chlamydia awareness campaign targeting—among others—college students. March was declared “Chlamydia Awareness Month” in North Carolina by project representatives from the North Carolina IPP program, including the HIV/STD Prevention and Care Branch, the State Laboratory of Public Health, and Women’s and Children’s Health declared. In conjunction with this project, five historically black colleges and universities (HBCUs) in North Carolina agreed to participate in a chlamydia and gonorrhea testing and education campaign.

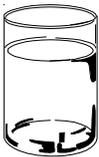
The campaign consisted of two strategies: education and testing. During the month of March, peer educators from the college/university campuses distributed flyers and brochures and provided education to students on gonorrhea (GC) and chlamydia (CT) transmission and prevention. For two weeks, the student health centers at the participating HBCUs also provided free testing for both GC/CT using a urine-based testing method. HIV and syphilis counseling and testing was also offered during this campaign. Supplies for this project were donated by the Region IV IPP project, and the testing was provided by the N.C. State Laboratory of Public Health.

A total of 275 GC/CT tests were conducted (186 female, 86 male and 3 unidentified). The positivity rate for CT was 11.3% (16 male, 15 female). Of the 31 persons who tested positive for chlamydia, 25 were black, 3 were white and 3 were other races. The positivity rate for GC was 3.6% (5 male, 5 female). Of the 10 persons who were positive for GC, 9 were black and 1 was Hispanic. Half of the GC cases identified (5 out of 10) were also positive for CT. Prevalence of both GC and CT decreased as the student age increased. All positive results were detected in students 24 years and younger.

Test results were returned within two weeks of collection. All identified positives were treated, counseled and were instructed to refer their partners in for treatment/testing. The North Carolina IPP project plans to conduct this screening event annually and will use lessons learned from this year’s event to increase the number of colleges participating and the number of tests done. ♦

Elevated Blood Lead Levels in Two Children from a Possible Sole Source of Lead in Drinking Water in Greenville, N.C.

Prepared by Ed Norman MPH, Children's Environmental Health Branch (DENR); Emily Robertson RS, Pitt County Health Department; and Kenneth Rudo Ph.D., Occupational and Environmental Epidemiology Branch (DHHS)



On May 3, 2005, a press release issued a warning to the public about lead-contaminated drinking water in Greenville, N.C. as a result of the investigation of two children – identified through routine screening – with elevated blood lead levels for whom the only identified source of lead exposure was drinking water. This was the first time in North Carolina that elevated blood lead levels in children had been identified potentially due solely to elevated lead levels in drinking water. The recommendations in the press release stated that pregnant women and children under 6 years of age should not consume water from the Greenville Utilities Corporation (GUC) until their water had been tested for lead. In addition, specific information for testing and flushing of water to remove lead, as well as contacting the Pitt County Health Department for testing children for lead poisoning, was in the press release. Previously, in November 2004, the GUC had issued a public notice regarding elevated water lead levels in 26 of 106 residential samples revealed through routine monitoring required by the U.S. Environmental Protection Agency and the N.C. Public Water Supply Section (DENR). These lead levels in the GUC drinking water supply were in exceedance of the 15 parts per billion (ppb) EPA limit for lead in public drinking water supplies. These elevated lead levels may have occurred due to a switch by the GUC from chlorine disinfection to a chloramine water treatment process over a year ago. In homes built before 1987 that used lead solder in copper pipes or those with new alloy faucet fixtures that contain lead, the switch to the chloramine treatment process may have lowered the pH and possibly increased the corrosivity of the GUC water supply enough to leach lead into the drinking water of some of these homes, including the cases discussed below. The determination of a potential source of lead in drinking water as the sole cause of the elevated blood lead levels in the two children necessitated the recommendations in the press release about consumption restrictions and follow-up environmental sampling and blood lead testing.

The first child with elevated blood lead levels was confirmed a year earlier, on April 27, 2004. At that time, the one-year-old child had a confirmed blood lead level of 15 micrograms per deciliter (ug/dL). The family was offered a home investigation in May. After contacting the child's mother, the Pitt County Health Department and the state's Childhood Lead Poisoning Prevention Program conducted a joint

(Elevated Blood Lead Levels in , cont'd from page 6)

investigation on August 11, 2004 at the primary residence (built in 1981) in Greenville. No significant environmental lead hazards were identified during this initial investigation, although a water sample was not collected. The residence received water from a public water system, which was presumed to be "lead safe" at that time.

On February 18, during a follow-up clinical visit, this child's blood lead level was confirmed to be 20 ug/dL. At this level additional environmental action is required by state law. On March 10, the investigation team inspected a supplemental address and returned to the child's primary residence. No significant sources of lead were identified at the supplemental address. However, the child's mother showed investigators GUC's recent water testing results, which were conducted in the wake of the November public notice. These results showed lead levels in water of 45 ppb at the primary residence, well above the EPA limit of 15 ppb for public drinking water supplies. The investigators recommended bottled water for cooking and drinking, and collected a grab sample, which later revealed a water lead level of 377 ppb.

The second case was a 3-year-old girl who was confirmed to have a blood lead level of 14 ug/dL on August 11, 2004. An initial investigation was conducted August 27, 2004. No significant lead hazards were identified at the child's primary residence. On November 8, the child was retested and had a blood lead level of 15 ug/dL. On December 10, a second investigation was conducted at a home day care (built in 1979) operated by the girl's maternal grandmother. No significant lead hazards were identified at this supplemental address. Four days later, the investigators returned to both the primary residence and home day care to collect first-draw water samples after learning about GUC's public notice issued the previous month. The lead levels in the water were below the detection limit at the primary residence but measured 101 ppb at the home day care. Bottled water was recommended for drinking and cooking.

To remediate the drinking water lead hazards at the home day care, filters have been installed. The water is being monitored, and lead levels in the water are currently below the detection limit. It is important to note that both residences were built after the ban on residential lead-based paint but prior to restrictions on lead-based solder. The blood lead levels in the affected children continue to be monitored. The Pitt County Health Department continues to monitor blood lead levels in children and analyze lead levels in drinking water for the residents of Greenville. Toxicologists with the North Carolina Division of Public Health are reviewing treatment and sampling data from other public water systems in North Carolina that are utilizing chloramine water treatment to ascertain whether the lead problem discovered in Greenville may be occurring in other areas of the state where this type of water treatment is currently being used. ♦

Electronic Field Data Collection Using Geographic Information Systems

Prepared by Mark Smith, PHD, Public Health Regional Surveillance Team 5 and William Service, MSPH, Office of Public Health Preparedness and Response

North Carolina's Office of Public Health Preparedness and Response (PHP&R), and Public Health Regional Surveillance Team (PHRST) 5 conducted a two-year pilot project to replace traditional paper-based field data collection methods with mobile Geographic Information Systems (GIS) applications. The methodology deploys multiple field teams equipped with handheld computers using Global Positioning System (GPS) receivers, and ArcPad and StreetMap USA software. Data collection forms are customized using Application Builder and installed on the handheld computers. Field teams are routed to their locations using StreetMap USA. When the geographic location is recorded using the GPS unit, the form opens automatically. Field teams return to the staging area where data are uploaded wirelessly to a database on a laptop computer for quick analysis. This method has been used for a Rapid Needs Assessment after Hurricane Charley and for a Legionnaire's disease outbreak in Western North Carolina. Because of the success of the mobile GIS approach to field data collection, N.C. is providing funding in 2005 to expand the pilot project into a special statewide public health preparedness project.

Implementing Electronic Field Data Collection Technology Statewide

The benefits of electronic field data collection to public health preparedness and response were demonstrated during the Triple Play plague exercise, and in live conditions during the the Hurricane Charley Rapid Needs Assessment, and the Cherokee County Legionellosis outbreak investigation. There are other applications of this technology relevant to bioterrorism or other public health emergencies. For example, the use of handheld computers could enhance surge capacity, improving the efficiency of mass vaccination and prophylaxis events. Should a mass epidemic or bioterrorism event require the mobilization of the Strategic National Stockpile (SNS), handheld computers equipped with bar code scanners could speed patient processing, protecting patient safety by reducing medication errors.

Geo-referenced electronic field data collection functions in the nexus of multiple cutting edge technologies including GIS software for Internet, desktop and handheld computers; Global Positioning System (GPS) capabilities; powerful handheld computers running Windows operating systems, , wireless data transmission technology including Bluetooth and WIFI (802.11b/g); and database systems and data analysis software. Fielding multiple outbreak investigation teams equipped with handheld computers, customized survey forms, and GPS units requires not only investments in the hardware and software but also extensive investments in application development, knowledge acquisition, and dissemination through training and education.

In early 2005, the N.C. Office of Public Health Preparedness and Response authorized funding to convert the two-year regional pilot project into a statewide demonstration project—called the Rapid Response Project, or Project 516 due to its budgetary designation—integrating GIS, GPS and electronic field data collection into public health preparedness and response at the local, regional and state levels. An advisory committee was established to guide numerous components of the project. With guidance from the committee, the team began work to extend electronic field data collection capability to all seven PHRST regions and the Raleigh office of PHP&R by conducting an assessment of each PHRST region to identify capacity in GIS, GPS, wireless communications systems, and database systems. The assessment identified potential collaborations between PHRST teams and universities, colleges, other regional agencies, and county agencies with GIS capabilities, helped determine where field data collection hardware and database systems should best be located, and which personnel should receive training.

Each PHRST region and PHP&R has been equipped with multiple handheld computers, GPS units, and GIS software for desktop and handhelds, along with training in the multiple technologies involved. The goal is that each of the seven PHRST regions will develop the capacity to provide GIS and field data collection and analysis services to local health departments and other health system or emergency response agencies.

The project team is in the process of developing and promoting protocols for accessing state public health and emergency response database and analysis systems. In particular, work with the N.C. Department of Agriculture and Consumer Affairs Emergency Programs Office is in process to develop regional and local access to the Multi-Hazard Threat Database, and to provide rapid transfer of geo-referenced field data to state health officials, epidemiologists and emergency response officials. Project staff will work with the Emergency Programs Office and technical consultants to develop a push-pull data capacity so that new data collection forms can be developed “on the fly” at the local level and then uploaded to regional or state databases after data collection, or state epidemiologists can work with PHPR and MHTD staff to create new data collection forms and then “push” them out via the Internet to be downloaded by local field data collection teams.

The project calls for active collaboration with two local universities. Public health GIS research assistantships have been established at the University of North Carolina at Greensboro and at North Carolina State University. The graduate research assistants will provide technical support, application development, and training services to the project. Project staff will also collaborate with faculty from UNC-Greensboro Department of Geography and others to develop training programs in GIS for public health and field data collection.

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(Electronic Field Data Collection, cont'd from page 7)

In mid-July, the project will be tested in an exercise at the quarterly meeting of PHP&R and the PHRSTs. As many as 50 interview teams will be deployed (on foot) to conduct a notional case-finding operation following a chemical spill resulting in numerous casualties. The exercise will test the ability of newly trained PHRST and PHP&R staff to collect and report field data using the new technology. Although additional exercises, including a multi-state exercise, are planned for late summer and the fall, the real tests may occur before then as new public health emergencies demand the support of these new systems. ♦

Customized ArcPad form installed on Pocket PC equipped with GPS Receiver, Expansion Pack and Wireless Aircard:



Local/State Partnership Leads to National Conference for N.C. Laboratorians

Prepared by Lisa Ballance, Regional Laboratory Improvement Consultant, NC State Laboratory of Public Health

Lisa Ballance, regional laboratory improvement consultant, State Laboratory of Public Health, and Ann McKenzie, laboratory supervisor, Wayne County Health Department, were co-presenters at the national laboratory conference, ThinkLab '05, held March 5-8, 2005 in Chicago. This annual event is a joint educational conference and exhibition between the Clinical Laboratory Management Association (CLMA) and the American Society for Clinical Pathology (ASCP). Their session, *QA Success: Make It Yours!* highlighted regulatory changes affecting today's clinical laboratories. It also provided a practical and proactive approach to laboratory quality assurance (QA) and assessment activities, showcasing examples and effective strategies employed by the Wayne County Health Department (WCHD) laboratory.

As the technical consultant for WCHD through the State Laboratory of Public Health's CLIA (Clinical Laboratory Improvement Amendments) Contract Program, Ms. Ballance is well aware of the innovative approach Ms. McKenzie has taken in establishing a robust and comprehensive QA program for laboratory operations within her agency. During a routine inspection of the laboratory in 2001, N.C. CLIA surveyor Carole Stevens acknowledged WCHD's outstanding laboratory QA program. Based on Ms. Stevens' recommendation to share WCHD's approach to QA on a national level, Ms. McKenzie and Ms. Ballance began their QA collaboration by co-authoring an article entitled *Everyday*

QA: A Case Study, which was published in the internationally circulated lab magazine, Medical Laboratory Observer (MLO), in March 2003. Since that time, Ms. Ballance and Ms. McKenzie have partnered in developing and presenting regional QA workshops for other local health department personnel and interested attendees.

The road to Chicago began in 2004, with Ms. McKenzie submitting an educational session proposal on quality assurance to ASCP for the ThinkLab '05 conference. With the acceptance of Ms. McKenzie's initial proposal by ASCP's review committee, she and Ms. Ballance went to work on developing a highly detailed program proposal, which was among those proposals ultimately selected through ASCP's competitive review process.

Under the daily supervision of Ms. McKenzie and the technical oversight of Ms. Ballance, the WCHD laboratory continues to serve as a best-practice model for its remarkable and effective QA program. By making quality assurance an integral part of its daily operations, fostering a positive team approach towards QA activities among its staff, and placing a high priority on overall quality, this laboratory has set a standard for excellence to which other labs can aspire. This partnership of state and local government laboratory professionals also demonstrates North Carolina Public Health has something to offer other laboratories within our state's borders and beyond. ♦

Update on N.C. Electronic Disease Surveillance System (NC EDSS)

Prepared by Allison Connolly, M.A., M.P.H., General Communicable Disease Control Branch

The most significant update on the N.C. Electronic Disease Surveillance Project since the last edition of EpiNotes is that the NC EDSS RFP (Request for Proposal) has been posted! Proposals were due back on June 14, so the evaluators have their work cut out for them until mid-August.

As far as the evaluation process, there will be approximately 12 people evaluating the bidders' written responses to the RFP. The bidders who emerge from this step of the evaluation process with the highest scores will be invited to give a live demonstration of their NC EDSS software in mid-August. A separate committee of about 15 people will see the live demonstrations and have Web access to each vendor's software for one week following the demonstrations. At the end of that week, each committee member will submit a score for each vendor's software. Scores will be based on several factors such as those related to ease of use. There are local health department employees on each of these committees. LHD involvement in the evaluation process is crucial, since LHDs will use NC EDSS in a different manner than most state-level employees.

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(Update on NC EDDS , continued from page 8)

The final decision on vendor selection will be made by the Product Selection Committee, which consists of Larry Forrister, DPH Information Technology Director; Dr. Steve Cline, Epidemiology Section Chief; and Drs. Jeff Engel and Jean-Marie Maillard in the General Communicable Disease Control Branch. To make their final decision, they will rely on all of the scores and scoring justifications provided by the aforementioned committees, as well as each vendor's cost proposal.

We are on track to award the contract for NC EDSS by mid-September. The vendor is scheduled to begin work later in the fall on the design, development and implementation of NC EDSS.

If you have any questions or comments, please contact Allison Connolly at 919-715-1642 or allison.connolly@ncmail.net . ♦

(Foodborne Disease, cont'd from page 2)

residents were not surveyed. The response rate for clinicians was 22% (319/1442). Infection control practitioners in this same area were surveyed. The response rate for ICPS was 52% (11/21). Laboratories statewide were identified using NC MicroNet, an electronic list of e-mail addresses for clinical microbiologists in North Carolina asked to participate and who were included if they received fecal specimens for bacterial screening in 2003. The laboratory response rate was 39% (42/108). Descriptive analyses were performed using EpiInfo and SAS.

RESULTS AND DISCUSSION

This survey of participants in the N.C. communicable disease surveillance system identified major gaps in the knowledge of foodborne diseases testing and deficiencies in reporting practices in general.

“Routine” laboratory screening, or is it?

All laboratories surveyed include *Salmonella* and *Shigella* in the routine stool culture screen, and 87% include *Campylobacter*, whereas only 60% of laboratories surveyed include *E. coli* O157:H7, 36% include *Vibrio* species, and 43% include *Yersinia* spp. The cost in material and labor of testing more stool samples may be a barrier to testing (4).

Clinicians and ICPs revealed that most stool cultures were performed at hospital facilities or independent laboratories. Data from laboratories show that cultures included in the screening of many laboratories do not include all those recommended to identify bacterial agents causing common foodborne diseases. For example, specific culture media intended to identify shiga-toxin producing *E. coli* (STEC) are not included in the routine screen of many laboratories. Additionally, we found that healthcare workers and ICPs had some uncertainty about which foodborne pathogens were included in a routine screen. Although there is no “official”

screen set of bacterial agents that should be identified by stool culture, all of the pathogens included in this survey (*Campylobacter*, STEC, *Listeria*, *Salmonella*, *Shigella*, *Vibrio* spp., and *Yersinia*) are part of the routine bacterial stool culture screen at the NC State Laboratory of Public Health, which also operates as a reference laboratory for the state. However, hospital and independent laboratories may include different foodborne pathogens in a routine screen. This lack of standardization across laboratories could result in significant under-diagnosis and under-reporting of foodborne pathogens. For example, clinicians may assume that certain laboratory diagnostic tests will be performed on stool samples because they are considered to be “routine,” when they are actually not part of the routine screen at their particular reference laboratory.

Reporting: Whose responsibility is it anyway?

The survey identified deficiencies in the participants' knowledge of reporting requirements. Although only 3% and 5% of laboratorians thought listeriosis, STEC and *Vibrio* infection are not reportable, and 8% of healthcare workers thought *Campylobacter* is not reportable, and more than 98% correctly indicated that salmonellosis and shigellosis are reportable, an average of only 57% of healthcare workers knew that the clinician is responsible for reporting notifiable diseases to the health department, and only 64% of laboratorians identified reporting as their own responsibility. Furthermore, fewer—just 6% of healthcare workers and 25% of laboratorians—know that both clinicians and laboratorians are required to report notifiable diseases.

Limited knowledge about reporting responsibility among laboratories and clinicians in hospitals may be due in part to their dependence on ICPs for reporting of communicable diseases diagnoses in admitted patients. Infection control practitioners were identified as the person who actually submits reports of disease to the health department by 9% of healthcare workers, 73% of infection control practitioners, and 57% of laboratorians. The vital role played by clinicians for detecting disease, outbreak, and potential bioterrorist events in passive surveillance systems is undisputed (5-7). Nevertheless, our study, as well as other studies in the United States and elsewhere, found that among physicians with low rates of reporting notifiable diseases, knowledge of the reporting requirements and to the methods of reporting is deficient (8, 9). In many circumstances, a reasonable diagnostic suspicion of a foodborne acute diarrheal illness may be difficult to define without laboratory confirmation unless a known outbreak is occurring. However, the N.C. “reporting rule,” rule 10A NCAC 41A .0101, specifically indicates that the listed diseases should be reported not only when diagnosed, but also when suspected, and cases of foodborne disease should be reported even when the causing agent is unknown.

CONCLUSIONS

A limitation of this study was the low response rate among healthcare workers (22%) and laboratories (44%). Those
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Reported Communicable Disease Cases, N.C., January-June 2005 (by date of report)*

Disease	Year-to-Date (Second Quarter)			2 nd Quarter 2005	Comments / Notes
	2005	2004	Mean (2000-2004)		
Brucellosis	1	0	0	0	
Campylobacter	312	241	236	141	
Chlamydia, laboratory reports	16899	14393	12393	8197	
Cryptosporidiosis	25	38	20	13	
Dengue	5	2	1	4	
E. coli, Shiga toxin-producing	19	6	15	10	Note 1
Ehrlichiosis, granulocytic	1	0	0	1	
Ehrlichiosis, monocytic	6	5	3	2	
Ehrlichiosis, unspecified	2	-	-	0	Note 2 & 3
Encephalitis, Eastern equine	1	0	0	0	
Foodborne, other	134	365	79	113	
Foodborne, staphylococcal	2	5	13	1	
Gonorrhea	7877	7621	8120	3433	
Haemophilus influenzae	52	35	23	28	
Hepatitis A	38	34	70	14	
Hepatitis B, acute	86	91	113	44	
Hepatitis B, chronic	487	378	394	259	
Hepatitis C, acute	9	6	9	2	
HIV/AIDS	940	883	854	486	Note 4
Legionellosis	14	15	10	7	
Listeriosis	11	8	-	5	Note 5
Lyme disease	24	49	26	10	
Malaria	15	9	8	7	
Measles	1	0	0	1	
Meningococcal disease	19	21	27	13	
Meningitis, pneumococcal	25	21	25	14	
Mumps	9	2	2	5	
Psittacosis	1	0	0	1	
Q fever	2	0	0	2	
Rabies, animal	251	337	329	144	
Rocky Mountain Spotted Fever	146	110	61	66	
Salmonellosis	580	388	436	271	
Shigellosis	88	137	196	44	
Strepto. A, invasive	79	82	77	54	
Syphilis, total	201	220	377	105	Note 6
Tuberculosis	101	126	157	64	
Toxic Shock Syndrome (TSS)	3	2	1	2	
TSS, streptococcal	6	2	0	6	
Toxoplasmosis, congenital	1	0	0	0	
Typhoid, Acute	2	3	2	1	
Vibrio, other	4	3	3	2	
Whooping cough	41	46	45	20	

*Preliminary data, as of 7/12/2005. Quarters are defined as 13-week periods. Only diseases with cases reported in the year 2005 are listed in the table.

Notes: 1. Including E. coli O157:H7 ("E. coli O157:H7" was disease name until 2/15/2003); 2. Not reportable, or not reportable as such, in this entire time period; 3. Became reportable effective 1/1/2005; 4. Earliest report with HIV infection or AIDS diagnosis; 5. Reportable since 7/2001; 6. Primary, secondary and early latent syphilis.

(Surveillance of Foodborne Diseases, cont'd from pg 9)

who responded to the survey may have interest in disease surveillance or foodborne disease, and may not be representative of the knowledge and practices of healthcare and laboratory professionals in N.C. The findings therefore, although identifying serious gaps in knowledge of the surveillance system, may be over-optimistic. The sample size of ICPs was small, but with a response rate over 50%, the findings for this group may be more representative of western N.C. infection control practitioners.

This survey is the first study to examine notifiable disease testing and reporting knowledge and practices in N.C. To our knowledge, it is the first assessment of the awareness of reporting requirements among several parties of the disease reporting system: ICPS, clinical diagnostic laboratorians, and primary care physicians. This surveillance system is where foodborne illness potentially due to a biological attack may first appear.

Our study results indicate the need to educate both laboratorians and clinicians about the communicable disease reporting requirements and process. Furthermore, the results indicate that ICPs play a significant role in reporting diseases, even though N.C. public health law currently does not require them, but allows them, to report. However, in practice, their authority to report as stated in NC GS § 130A-137, "Health facilities may report," typically only covers patients admitted in hospitals. Dissemination of surveillance information and training opportunities through well-established networks, such as that of N.C. infection control practitioners, and others targeting other professional organizations, may offer the ideal opportunity for improving foodborne disease surveillance in this state.

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Lana Deyneka Joins the General Communicable Disease Control Branch

Prepared by Jean-Marie Maillard, MD, M.Sc, General Communicable Disease Control Branch

Svetlana (Lana) Deyneka, MD joined the General Communicable Disease Control Branch on June 13, 2005 to take the position of public health epidemiologist specifically in charge of enhanced disease surveillance. Her primary responsibilities are related to the development of our early event detection system named NC-Bioterrorism and Emerging Infection Prevention System NC-BEIPS. The first data stream of this system is providing data from hospital emergency departments from across the state. Subsequent data streams will include ambulance data and poison center calls, among others. ♦

Employee Recognition: Laurie Burkhart Employee of the Quarter

Prepared by Patsy West, Administrative Assistant, Epidemiology Section Office

Laurie Burkhart received the Epidemiology Section's Employee Recognition Award for the second quarter of 2005. Ms. Burkhart was nominated in the category of Significant Contribution to Morale or Effectiveness of the Work Unit.

After teaching school for 14 years in Ohio, Ms. Burkhart relocated to North Carolina and began her career in state government in 1994 as a Medical Laboratory Technician II with the North Carolina State Laboratory of Public Health. In 1996, Ms. Burkhart was promoted to a Medical Laboratory Technologist I position in the Virology/Serology Unit of the Lab.

Ms. Burkhart is responsible for HIV testing for antibodies, Western blot confirmation testing for HIV, HEP A&B testing and rubella testing. According to her coworkers, Ms. Burkhart is an exceptional trainer and teacher. She has many special qualities such as confidence, professionalism, the gift of teaching others with patience, a positive attitude and dependability and is known in the Lab for her organizational skills. Ms. Burkhart is a great multitasker. There is no job too large or too small for her to tackle. If she sees that something needs to be done, she does it. Ms. Burkhart is a valuable member of the State Laboratory of Public Health team and is well respected by all those who know her.

Ms. Burkhart will receive a certificate of recognition for the significant contributions she has made to her work unit and a gift certificate to a local restaurant from the Epidemiology Section Management Team. ♦

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