Epi Notes

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

Volume 2006-3 September 2006- November 2006

IN THIS ISSUE:

The N.C. Disease Event Tracking Epidemiologic Collection Tool (NC DETECT) Version 4.0 is Available Now

Prepared by Amy Ising, NC Detect Program Director, UNC School of Medicine and Lana Deyneka, N.C. Syndromic Surveillance Coordinator, General Communicable Disease Control Branch

NC DETECT Version 4.0 rolled out on August 30, 2006.

NC DETECT is the Web-based system developed by UNC and N.C. Division of Public Health experts. The system provides real-time surveillance for the purpose of early detection of unusual events or trends, enhanced surveillance for cases and outbreaks of vaccine-preventable and other communicable diseases, of pesticide poisoning, and of other conditions of public health significance. The system uses several data sources, such as hospital emergency department data, ambulance data, and data from the Carolina Poison Center. NC DETECT data is available to authorized users at the local, regional and state levels.

The initial rollout of the Java-based NC DETECT system 4.0 was led by a great team of UNC programmers: Meichun Li, Raghu Havaldar and John Crouch, supported by database programmers Dennis Falls and Clifton Barnett. They have developed a great product in only four months. The newly redesigned site offers among other things faster performance, specific reports for syndromic surveillance, and age stratified reports. The NC DETECT team continues to develop this Java-based system to include additional functionality to meet expanding user needs.

The first NC DETECT 4.0 user training session is planned for the Public Health Regional Surveillance Teams during their quarterly October meeting.

For more information, please call Lana Deyneka, N.C. Syndromic Surveillance Coordinator at 919-715-0092, or visit NC DETECT web site: http://www.ncdetect.org. ◆

Medical Examiner's Office Teaches Medical Students

Prepared by Dr. Tom Clark, Associate Chief Medical Examiner, Office the the Chief Medical Examiner

North Carolina General Statutes provide for the Chief Medical Examiner to "provide instruction in health science, legal medicine and other subjects related to his duties at The University of North Carolina, the North Carolina Justice Academy and other institutions of higher learning." In fulfillment of this role, the pathologists and toxicologists of the Office of the Chief Medical Examiner (OCME) are involved in a number of teaching responsibilities in the UNC School of Medicine, as well as other venues.

Classroom Teaching

The second year UNC School of Medicine curriculum begins with a block called "Tools for Diagnosis and Therapy," during which students are exposed to the fundamentals of epidemiology, radiology, and pathology, including forensic pathology and autopsies. Dr. John Butts, Chief Medical Examiner, began the forensic pathology portion of this unit with a lecture on mechanisms of injury. Students learned about common injuries they may someday need to interpret, such as those produced by sharp and blunt trauma, and gunshot wounds. They learned about how such external forces may cause a death, and how such factors should be considered when categorizing deaths based on cause and manner. Dr. Ruth Winecker, Chief Toxicologist, presented a lecture on the kinetics of drug metabolism, exposing students to basic concepts of toxicology, including accidental and deliberate poisonings. In small group laboratory sessions, staffed by the OCME forensic pathologists, students worked through a set of cases involving deaths due to common injuries. With a little guidance, the students read the cases, interpreted injuries, and came to conclusions concerning the cause and manner of death. Although most of these students will not become forensic pathologists, many of them will be expected to recognize and interpret injuries, and almost all of them will sign death certificates. There is no other medical school training in death certification, and we like to think that our involvement in this area will reduce the number of certificates rejected for unacceptable causes of death such as "cardiac arrest."

Integrating Public Health

In a subsequent block, Clinical Medicine Cases, directed by Dr. Thomas Clark, an OCME pathologist, students are expected to begin to integrate the basic and clinical science facts they have learned, while developing clinical judgment. The judgment learning objective includes not only diagnosis and therapy, but a strong component of public health. This block includes ten cases, with topics ranging from hospital medication errors to acute bacterial meningitis in an infant.

Child abuse is an emotionally difficult area for many people, including medical students. Yet it is common, and can be subtle, so it is important for physicians to recognize and report suspected child abuse. In this Clinical Cases presentation, a child is evaluated at an emergency room, allegedly having fallen off of a couch. Specialists in pediatrics, radiology, ophthalmology, and genetics then analyze the case, each from their respective point of view. The case ends with a mock trial, in which Dr. Desmond Runyan (Pediatrics and Social Medicine) acts as an expert witness who is questioned by a prosecutor (Jim Woodall, Orange County District Attorney) and Allison Grine (who instructs defense attorneys at the School of Government.) Dr. Deborah Radisch, an OCME pathologist who serves as the director of the N.C. Child Fatality Prevention Program (a constituent program of the OCME), provided expert witness coaching for the district attorney, while Dr. Cynthia Gardner, also an OCME pathologist, helped the defense attorney prepare. Students thus learned about child abuse and the genetic diseases that can mimic it, as well as a forensic lesson in how to be an expert witness.

In a different case, the arrival of an unresponsive patient in an emergency room opens the door to a discussion of poisoning. Students learn to recognize the symptoms of common toxicological agents, and get exposure to resources such as poison control centers. To make this process a little more fun, Dr. Cynthia Gardner, OCME pathologist (and jokingly called the Vanna White of Toxicology), presided over a Toxicology Jeopardy game, complete with contestants, questions, prizes, and even signaling devices. (To be completely honest, the signaling devices were desk bells purchased at a local office supply store. They are not quite as sophisticated as the buzzers and flashing lights on the real Jeopardy game, but not a bad substitute.) Following each answer and question (remember, it's Jeopardy), a panel of experts, including Dr. Ruth Winecker, OCME Chief Toxicologist, Dr. Catherine Hammett-Stabler (UNC Hospitals Labs), and Dr. Russell Kerns (director of the poison control center at Carolinas Medical Center) provided additional background and insight.

Tuberculosis remains an important public health concern. In a case presentation, a previously healthy man begins to cough up blood, leading to the discovery that he has tuberculosis, but also an underlying HIV infection. His diagnosis and therapy are addressed, but in doing so, questions arise concerning how to balance his interests against those of society. In a panel discussion, Dr. David Wohl (UNC Infections Diseases), Dr. Jeffrey Engel (Section Chief, Epidemiology), Elizabeth Zeringue (Public Health Nurse, Epidemiology), and Dr. Amy Denham (UNC Family Practice) address these questions, helping students understand the role of public health agencies in managing communicable diseases. In a related HIV case, Evelyn Foust (HIV-STD Branch Head) led a lively discussion concerning the mechanisms and ethics of public funding of HIV therapy.

Forensic Autopsy Experience

In groups of four, each second year student participates in a forensic autopsy. Student cases are selected to be

(*continued on page 3)*

Dr. Engel, Miss Zeringue, and Dr. Denham

representative of diseases that cause sudden, unexpected death. Student participants read the case history, help formulate a differential diagnosis, and get a hands-on lesson in anatomy and pathology. Following a microscopic session at a later time, each student submits a report summarizing the autopsy findings, coming to a conclusion concerning the cause of death, and discussing how preventive medicine measures might have prevented the death. Ten to fifteen students per year come back for a one-month fourth-year elective in which they get to perform one or two autopsies from beginning to end (closely supervised, of course!).

Benefits to North Carolinians

In fulfilling its mission to teach, the OCME is providing a significant benefit to medical students. Forensic pathologists and toxicologists are uniquely suited to provide instruction in mechanisms of injury, poisoning, the value of the autopsy as a public health tool, and many other aspects of medicine. There is also a significant benefit to the citizens of North Carolina. When these students graduate, they become physicians and medical leaders, and they remember their experiences with the medical examiner's office. They remember how tricky it can be to interpret gunshot wounds in the emergency department. They remember that abuse has to be considered in any child who presents with an injury. They know not to put "cardiac arrest" on a death certificate. They understand the quarantine rules for communicable diseases. They become our volunteer medical examiners. They, along with North Carolinians, enjoy the benefits of providing a public health perspective in medical education.◆

Noroviruses in North Carolina

Prepared by Shermalyn R. Greene, PhD, Public Health Scientist, N.C. State Laboratory of Public Health

Noroviruses (previously known as Norwalk and Norwalk-like viruses) are small, round, structured RNA viruses that cause acute gastroenteritis. These viruses are the most common etiological agent for gastroenteritis outbreaks worldwide. Symptoms include sudden onset of vomiting accompanied by watery diarrhea, nausea, abdominal cramps, fever, or headache, lasting anywhere from 12-60 hours. The incubation period is approximately 24-48 hours. Transmission may occur person-to-person or through the fecal-oral route via fecally contaminated food or water. Noroviruses can also spread via a droplet route from vomitus. Fomite contamination may also act as a source of infection. Noroviruses are highly infectious and shedding usually begins with the onset of symptoms and may continue for two weeks after recovery. There is no treatment for the illness; only supportive therapy in cases of severe dehydration, as may occur with the very young, elderly, or immunocompromised patients, is recommended. Standard symptomatic therapy consists of replacing fluid losses and correcting electrolyte imbalances through oral and intravenous fluid administration.

The Center for Disease Control and Prevention (CDC) estimates that 23 million cases of acute gastroenteritis are due to norovirus infection. Currently it is thought that 50% of all foodborne outbreaks of gastroenteritis can be attributed to noroviruses. The N.C. State Laboratory of Public Health (NCSLPH) and General Communicable Disease Control (GCDC) Branch/Foodborne of the Epidemioloy Section collaborate to investigate suspected norovirus outbreaks. Over the past four years in North Carolina there has been an increase in confirmed foodborne outbreaks of gastroenteritis associated with noroviruses. Twenty-five percent of norovirus outbreaks in 2002 were associated with food. Sixty-two and a half percent of norovirus outbreaks were associated with food as of July 2006.

To date, noroviruses cannot be grown in tissue culture. Older methods for diagnosis include direct and immune electron microscopy of fecal specimens, and detection of a fourfold increase of specific antibodies in acute- and convalescent-phase blood samples. Currently reverse transcriptase polymerase chain reaction (RT-PCR) is used for diagnosis of acute gastroenteritis caused by noroviruses. Additionally, sequencing of norovirus strains found in clinical and environmental samples has been critical to conducting epidemiologic investigations by linking cases to each other or to a common source and by differentiating outbreaks that were mistakenly connected. Sequences can be entered into CaliciNet, a recently developed sequence database similar to the PulseNet model.

Since 2002, the NCSLPH, through coordination with GCDC, has provided norovirus RT-PCR testing for detection of norovirus in stool and vomitus samples obtained from patients during a suspected outbreak of acute gastroenteritis. Identification of the viruses can be best made from stool specimens taken within 48 to 72 hours after onset of symptoms, although good results can be obtained by using RT-PCR on samples taken up to five days after symptom onset. Viruses can sometimes be found in stool samples taken as late as two weeks after recovery. In 2002, the NCSLPH began submitting norovirus sequences to CaliciNet for epidemiologic investigations linking cases.

Since the implementation of RT-PCR for detection of noroviruses, the NCSLPH has collaborated with GCDC, local health departments, and CDC in epidemiologic investigations. In January and February of 2004 the NCSLPH collaborated with local health departments, university health services, the state epidemiologists, and CDC closely on several outbreaks of noroviruses. An outbreak at the University of North

(*continued on page 5*)

Mercury Spills in Three N.C. Schools Between October 2005 and May 2006

Prepared by Dr. Luanne K. Williams, Toxicologist, N.C. Occupational and Environmental Epidemiology Branch

What are the general sources of mercury in schools, homes, and work?

Mercury is a potentially toxic chemical that is used in a wide variety of products such as thermometers, thermostats, barometers, switches, fluorescent lighting, vaccines, flow meters, lamps, and laboratory reagents. Mercury spills can occur in schools when mercury is stored improperly and when persons mishandle mercury containing products. The Environmental Protection Agency (EPA) encourages schools to prevent spills by removing and discontinuing the use of all mercury compounds and mercury-containing products.

What agencies were involved in the three mercury spills that occurred between October 2005 and May 2006?

The police and fire department officials secured the spill sites to prevent exposure and worked with the Division of Social Services to locate places to stay for the families that had to evacuate their homes. The N.C. Division of Public Health worked closely with the local health department, school officials, EPA, and EPA consultants to determine which rooms, homes, and buses needed to be tested for mercury and ultimately cleaned up. The N.C. Division of Public Health also assisted by providing advice on what measures should be taken by the school, local health department, and parents to minimize spreading of the contamination and prepared fact sheets to inform all potentially exposed individuals of the symptoms and hazards associated with mercury exposure.

What was the source of the mercury in the three schools?

In the high school, a science teacher brought mercury to the school for instructional purposes. One student took the mercury from the class and shared it with other students. In the pre-k through middle school, the mercury was found in the sink trap of a classroom, but it is not known how the mercury was brought to the classroom. In the elementary school, a child brought the mercury to school and shared it with other children. This child had received the mercury from an adult at a local church. This adult had stolen the mercury from a work site. Neither the teacher at the high school spill nor the adult that gave the mercury to the elementary child were aware of the health risks associated with mercury vapor exposure.

How did the mercury air levels in the schools, homes, and buses compare to EPA's action level necessitating cleanup, to the health effect level, and to EPA's recommended level or re-occupancy level?

The EPA action level for cleaning up a mercury spill is 3,000 ng/m^3. When vapors are present at or above this level, cleanup of the mercury is needed. The health effect level of mercury vapors in air is 25,000 ng/m^3. Adverse health effects can occur above this concentration. The EPA recommended re-occupancy level is 1,000 ng/m^3. Before children or families return to the rooms, homes, or buses; the mercury level in air must be equal to or less than 1,000 ng/m^3.

In October 2005, a spill resulted in release of mercury vapors into high school classrooms in two wings of the school. This spill required closure of the school for an EPA-guided clean up. Additionally, two students each took home about 3 ounces of product necessitating investigation and cleanup of their residences. Mercury vapor levels in the homes were found to be greater than 50,000 ng/m^3 which exceeds the health effect level defined above. Buses were also checked but did not approach the EPA action level of 3,000 ng/m^3 . Of 75 classrooms in this school, 19 had average mercury vapor levels equal to or greater than the action level. However, the average mercury vapor level in the 19 impacted classrooms was <u>below</u> the health effect level of 25,000 ng/m3. The mercury vapor levels measured in air outside of the school, in non- impacted classrooms of the school, and in classrooms at a nearby elementary school were found to be 80 – 150 ng/m^3. The impacted school classrooms were cleaned up to the recommended EPA clean up level of 1,000 ng/m^3. No symptoms were reported among the children or adults in this school.

In April 2006, a mercury spill occurred at a pre-k to middle school classroom where levels were as high as 10,000 ng/m^3 which is below the health effect level but is greater than EPA's action level. No symptoms were reported among the children or adults using this classroom. Under an EPA guided cleanup, this classroom was cleaned to the EPA recommended clean up level for schools and homes of1,000 ng/m^3.

A third spill occurred in May 2006 at an elementary school. This spill required a cleanup of fewer than ten rooms. However, this incident involved contamination and ultimately evacuation of a dozen homes, a church, and a bus. The mercury levels reported for some of the homes, the bus, and church were over 50,000 ng/m^3. The mercury vapor levels reported for the school were less than 25,000 ng/m^3. Approximately 24 children and adults had symptoms of mercury exposure. Some people experiencing symptoms were pregnant. The exact symptoms were not disclosed. Under an EPA guided cleanup; the classrooms, bus, and homes were cleaned up to the EPA recommended level for schools and homes of 1,000 ng/m^3.

(*continued on page 5*)

(*Mercury Spills in N.C. Schools, continued from page 4*)

What are the expected symptoms from exposure to mercury vapor?

Mercury is highly toxic. Adverse health effects chiefly result from inhalation exposure to mercury. Mercury is not well absorbed through the skin or gastrointestinal (GI) tract unless a GI fistula or other GI inflammatory disease is present, or the mercury is retained for a prolonged period in the GI tract. Handling of mercury can result in allergic dermatitis. Symptoms which may appear within a few hours of mercury vapor exposure include weakness, chills, metallic taste, nausea, vomiting, abdominal pain, diarrhea, headache, tremor, visual disturbances, shortness of breath, cough, and chest tightness. Long-term exposure to mercury vapor can lead to more serious psychiatric effects including depression, loss of self confidence, shyness, anger, irritability, anxiety, insomnia, aggressiveness, nervousness, and/or impatience. Chronic vapor exposure can also cause kidney damage. Individuals with previous nervous disorders, impaired kidney, and respiratory function may be more susceptible to the effects of the mercury exposure.

What is involved in cleaning of mercury spills greater than the amount of mercury in a thermometer?

The cleaning of mercury spills greater than the amount of mercury in a fever thermometer may include the following:

- monitoring for mercury with a Lumex® device,
- removing all carpet and other porous furnishings that could absorb mercury vapors,
- cleaning hard surfaces with Mersorb® or similar product,
- vacuuming with a mercury vacuum cleaner, and
- heating and ventilating rooms to speed evaporation of mercury.

What can be learned from these three mercury spills?

Because of the complexities associated with these mercury spills, state guidelines are currently being developed. These guidelines will soon be available on the N.C. Occupational and Environmental Epidemiology website at http://www.epi.state.nc.us/epi/oee/index.html.

More Information

For more information regarding this article, call Dr. Luanne Williams, with the North Carolina Occupational and Environmental Epidemiology Branch at 919-707-5912.

For more information on EPA's guidance for cleaning up mercury in schools, visit http://www.epa.gov/mercury/schools.htm and information on cleaning up spills in general go to http://www.epa.gov/epaoswer/hazwaste/mercury/faq/spills.htm#less.

For suspected mercury poisoning, call the North Carolina Poison Control Center at 1-800-848-6946. ◆

(*Noroviruses in N.C., continued from page 3*)

Carolina at Chapel Hill resulted with over 300 cases of gastroenteritis. UNC Student Health Services, the Orange County Health Department, state epidemiologists, and the NCSLPH worked together to investigate this outbreak. Using molecular diagnostics (RT-PCR), the NCSLPH detected noroviruses in 55% of samples tested. Combining laboratory data and statistical data gathered by the clinicians and the epidemiologists, the source of the outbreak was determined to be a salad bar in a popular dining facility on UNC's campus. Sequence data submitted to CDC's CaliciNet indicated the same norovirus strain was present in the tested samples and the strain was consistent with the norovirus strain circulating during that period of time.

The number of samples submitted to the NCSLPH for norovirus testing has increased from 45 samples in 2002 to 90 samples between January and August 2006. Currently, state public health laboratories of 47 states have the capability to test for noroviruses by real time RT-PCR. The NCSLPH implemented a real time RT-PCR assay in January 2006. Implementation of the real time norovirus RT-PCR assay at the NCSLPH has allowed our reporting time for norovirus testing to decrease from three days to one day. Rapid reporting enables the appropriate measures to be put into place for infection prevention and control such as hand washing after using the bathroom and before handling food items, wearing masks when cleaning contaminated areas, handling soiled linens as little as possible, flush or discard any vomitus and/or stool in the toilet and make sure that the surrounding area is kept clean, and cleaning all surfaces with germicidal product (10% bleach).

If a healthcare provider suspects an outbreak of gastroenteritis possibly due to norovirus, please contact the N.C. General Communicable Disease Branch at 919-733-3419 for consultation and approval of patient samples for testing. After the NCSLPH has received a minimum of five approved patient samples from the outbreak, testing will begin promptly. For questions about proper sample types, specimen collection and shipping requirements, please contact Dr. Shermalyn Greene at 919-733-7834. ◆

Housing Opportunities for Persons with AIDS (HOPWA)

Prepared by Sandra Coley, HOPWA Administrator, HIV/STD Prevention and Care Branch

Since the beginning of the HOPWA program in 1992, the federal government has made available over $2.3 billion in HOPWA funds to support community efforts to create and operate HIV/AIDS housing initiatives. The HOPWA formula grant was first funded for the State of North Carolina in 1992 and served the entire state until 1998.

In 1998, Charlotte and Raleigh became eligible Metropolitan Statistical Areas (MSA) because they each had a population greater than 500,000 and more than 1,500 cumulative cases

(*continued on page 6*)

(***HOPWA,*** *continued from page 5**)***

of AIDS thus making them eligible to receive HOPWA formula allocations. Today, Charlotte serves Anson, Gaston, Cabarrus, Mecklenburg, Union and York (in South Carolina) counties and Raleigh serves Wake, Franklin and Johnston counties. The state serves eligible clients that live outside of these metropolitan areas.

The State HOPWA grant is administered by the AIDS Care Unit of the HIV/STD Prevention and Care Branch. During fiscal year 2005-2006 the program served 2,662 clients with the goal of assisting in providing stable and affordable housing for persons living with HIV/AIDS and their families. In so doing, the program helps reduce the risk of homelessness and increase housing stability in North Carolina for our clients. Currently the program funds eight consortia, four family care homes, four tenant-based rental assistance programs and one adult day care center for a total of 17 projects. These agencies serve HIV/AIDS-infected individuals and their families who are at or below 80% of the area's Median Family Income (MFI). Our total allocations for this fiscal year were $2,032,781.

HOPWA services include but are not limited to: Housing Information which provides the client with counseling, information, referral services and fair housing counseling; Resource Identification which establishes, coordinates and develops housing assistance resources; Tenant-Based Rental Assistance, which includes assistance for shared housing arrangements; Short-term Rent, Mortgage and Utility payments which prevents the homelessness of the tenant or mortgagor of a dwelling; Supportive Services which includes but is not limited to case management, assessment, drug and alcohol abuse treatment and counseling, day care, personal assistance, nutritional services and mental health; and Operating Costs for housing which includes maintenance, security, operation, insurance, utilities, furnishings, equipment, supplies, and other incidental costs.

The HOPWA program is one of four formula programs that form the North Carolina Consolidated Plan. The other three are the Department of Community Assistance (Community Development Block Grant Program), Office of Economic Opportunity (ESG Program) and the North Carolina Housing Finance Agency (HOME Investment Program). The Consolidated Plan is the application for the State to receive federal funds for the four programs. In addition to being an application, the Consolidated Plan serves as a five-year planning document that addresses the major housing and community development needs affecting North Carolina communities, determines priorities for addressing those needs, and lays out an annual strategy for using the resources available. The Consolidated Plan has three basic goals: to provide decent and affordable housing, to provide a suitable living environment and to expand economic opportunity. The HOPWA program also collaborates with the DHHS Housing Work Group Committee, Housing Coordination/Policy Council

(*continued on page 11**)***

Resource Typing: The Next Step After ICS

Prepared by Julie Casani, MD, MPH, Head of Office of Public Health Preparedness and Response

Many state and local agencies are well underway with efforts to train key response staff in Incident Command System (ICS) within the National Incident Management System (NIMS). This system provides the common language and organizational structure to allow multiple agencies to function together during a response. It is one step in the long process of integrating services through common language. An important next step is establishing a comprehensive, integrated national resource management system that provides the basis to type, order, and track federal, state, and local response assets.

During the Katrina response a request was made through the Emergency Management Assistance Compact (EMAC) for medical epidemiologists. There was a great deal of discussions in several states as to what exactly is a Medical Epidemiologist: what is the training, the certifications, the licensure, the equipment, etc. Local health departments are aware that a "case investigator" in one county may carry very different credentials and have a very different job classification than a "case investigator" in another county. For ease of requesting and tracking, response assets and resources can be categorized via "resource typing". Resource typing is the categorization and description of resources that are commonly exchanged in events and disasters via mutual aid, by capacity and/or capability. Through resource typing, we can examine resources and identify the capabilities of a resource's components (i.e., personnel, equipment, training). Analyzing capabilities and capacities and cataloging them can make filling requests for resources more expeditious and effective. Resource typing can also be used as an assessment tool for preparedness performance measures. Resources are for all hazard response.

An example of resource typing is as follows: Epidemiologist is a single type of resource (rather than a team). An Epidemiologist Type IV may have had basic training in case investigation and data analysis and a calculator as equipment. An Epidemiologist Type I may have an advanced degree in Epidemiology, more than 10 years of experience including managing a major outbreak and has equipment to support large scale data collection and data analysis.

The Office of Public Health Preparedness and Response, in conjunction with the Division of Public Health and our state and local partners in the Office of Emergency Medical Services and North Carolina Emergency Management, is working toward developing resource typing of North Carolina's Public Health preparedness resources. We are currently looking to "type" resources in Environmental assessment strike teams for building re-entry, community

(*continued on page 7**)***

(***Resource Typing,*** *continued from page 6**)***
needs assessment, mass dispensing sites, as well as others. These will then be shared with regional partners and then at the national level.

Further information can be obtained at http://www.nimsonline.com/resource_typing_system/index.htm◆

A Method to Improve Indoor Air Quality in N.C. Schools, Tools for Schools

Prepared by David Lipton, and the Industrial Hygiene Consultation Unit, Occupational and Environmental Epidemiology Branch

More than 1.3 million children attend and 180,000 full time personnel work in North Carolina Public Schools. The quality of the indoor environment can either assist or impede schools in meeting the core mission — educating students.

Failure to prevent problems in the indoor environment can:

- Accelerate deterioration and reduce efficiency of heating/cooling equipment
- Increase the potential for long-term and short-term health problems, such as asthma the number one cause of student absenteeism
- Increase student, teacher and staff absenteeism
- Reduce productivity of teachers and staff
- Have negative effects on students' ability to learn
- Strain relationships among school administration, staff and parents
- Create the potential for liability issues

Sources of Indoor Air Pollutants
Four basic factors affecting IAQ are indoor air pollutant sources; heating, ventilation, and air-conditioning (HVAC) systems; pollutant pathways; and occupants. Construction of tightly sealed buildings, reduced ventilation rates to save energy, use of synthetic building materials and furnishings, and increased use of chemical products such as pesticides, housekeeping supplies, and personal care products can also contribute to poor IAQ.

Typical sources of indoor air pollutants and conditions that impact IAQ in schools include:

- Moisture and biological/microbial agents
- Combustion Products
- Volatile Organic Compounds
- Pesticides
- Environmental Tobacco Smoke
- Poorly designed, maintained and operated HVAC systems
- Inadequate Temperature and Humidity Control

Indoor Air Quality Programs for Schools
For many years industrial hygienists in the Occupational and Environmental Epidemiology Branch (OEEB) have assessed, evaluated, and recommended methods to improve indoor air quality (IAQ) in schools and public buildings throughout the state. Partners have included the Department of Public Instruction, the Division of Environmental Health (DENR), the State Construction Office and the North Carolina State University Cooperative Extension Service as well as Local Health Departments. OEEB has actively promoted IAQ in the Division of Public Health's School Health Matrix.

Tools for Schools (TfS) is one method that several Public School Systems are using to improve school environments. *TfS* was developed and is sponsored by the United States Environmental Protection Agency (EPA). It has practical, hands-on recommendations, many of which are inexpensive and can be applied using in-house staff. However, some issues such as water damage leading to microbial growth and the need to repair or upgrade ventilation systems may involve significant costs. Following guidance in *TfS* may help schools to evaluate their facilities, correct existing conditions and prevent future problems. The free program includes a *TfS* Action Kit, training programs, and training videos.

TfS is based on a team approach involving administrators, maintenance personnel, custodians, teachers and students. A successful program develops in-house resources that have knowledge about IAQ issues, preventive actions and corrective measures.

To effectively implement *TfS,* the following elements should be in place.

- "Buy-in" from upper management and decision makers including Superintendents, School Boards, School Business Officers and Facilities Managers
- Appointing IAQ coordinators for the district and each school to serve as contacts and managers for IAQ concerns.
- Training and education for school IAQ coordinators, faculty, and staff to familiarize them with the *TfS*. A *TfS* kit should be available at each school for reference. People will be better advocates for promoting good IAQ if they understand the issues.
- Walkthroughs at each school using the checklists from the kit. A variety of staff including administrators, maintenance personnel, custodians,

(*continued on page 8**)***

(***Tools for Schools**, continued from page 7**)***

and teachers should participate in order to learn about the assessing IAQ. Findings should be forwarded to the district IAQ Team for review and to help prioritize recommendations for short-term and long-term IAQ improvement projects.

- Projects for each school should be prioritized into short-term and long-term categories based on health-related and financial considerations. Low-cost solutions should be implemented first. Many IAQ hazards can be fixed by educating the school staff and changing the current habits of the school occupants.

- A long-term plan for IAQ should be developed and implemented.

- There should be research into funding sources for the long term, more expensive IAQ improvements. If school business officials and other key decision makers have been involved from the beginning with *TfS*, there may be better understanding of potential funding mechanisms for working towards the goal of improved indoor air quality.

- IAQ Refresher classes should be periodically conducted so that staff understand how behavior can influence IAQ. This may be an opportunity for district IAQ coordinators to address and explain improvements.

- Active internal and external communications plans are needed to educate and raise awareness among school district employees and the community about the benefits of good IAQ.

- An ongoing preventive IAQ management plan should be developed and supported by district-wide decision makers. The plan should prioritize activities and identify areas needing special funding or attention.

- District-wide policies which support good IAQ should be implemented. Such policies may include:

- Implementing integrated pest management practices,

- Establishing a "No Animals in the Classroom" policy

- Establishing policies about securing food in the classrooms

- Prohibiting the use of chemical based air-fresheners

- Promoting good IAQ maintenance and repair practices, such as scheduling when the building is unoccupied and using low emission building materials and products

- Promoting cleaning programs that emphasize removal of soils and contaminants from the environment.

- Review and evaluation of the effects of the *TfS*.

OEEB staff will be assisting the Department of Public Instruction (DPI) to develop guidelines for preventing, controlling and mitigating moisture and mold problems in schools.

For more information about the *TfS* or indoor air quality, contact industrial hygienists in OEEB at (919) 707-5900 or review following the web based resources.

References

Indoor Environments www.epa.gov/iaq

Indoor Air Quality Tools for Schools Kit, http://www.epa.gov/iaq/schools/toolkit.html

Managing Asthma in the School Environment, http://www.epa.gov/iaq/schools/asthma/index.html

Indoor Air Quality in North Carolina, http://www.epi.state.nc.us/epi/air.html

Mold and Human Health, http://www.epi.state.nc.us/epi/pdf/Mold%20and%20Human%20Health%208-18-05.pdf

Integrated Pest Management for North Carolina Schools http://ipm.ncsu.edu/urban/cropsci/SchoolIPM/

North Carolina Tobacco Prevention and Control Branch, Tobacco Free Schools http://www.nctobaccofreeschools.com/

Trouble with Cats and Dogs

Prepared by John L. Neal, MS, Chemistry Manager, Environmental Sciences Unit, N.C. State Laboratory of Public Health

A consumer health alert was issued in early August 2006 by the Indiana State Health officials for bendable animal toys that were given away at public libraries during reading programs during the months of June and July. The rubber dogs and cats manufactured in China were found to contain 0.26 and 0.40 percent lead by the Indoor Air Laboratory at the Indiana State Department of Health. The federal safety limit for lead in toys is 0.06 percent. The Indiana State Department of Health requested a voluntary recall by the distributor and referred the matter to the U.S. Consumer Product Safety Commission for further investigation. In North Carolina, approximately 12,000 toys were purchased and distributed by 27 local libraries.

After consulting with our partners in the Children's Environmental Health Branch, Environmental Health Services Section, Division of Environmental Health, Department of Environment and Natural Resources, the North Carolina State

(*continued on page 9***)**

(***Trouble with Cats and Dogs,*** *continued from page 8**)***
Laboratory of Public Health (NCSLPH) decided to perform analysis of the toys distributed in North Carolina and submitted by local health departments. It was decided that a limited number of toys be tested for lead initially, but that if any children were identified as having elevated blood lead levels, the subsequent environmental investigation would include collecting toys, if applicable to the specific situation. Because young children are at highest risk of putting toys in the mouth, the age range of six months to six years for blood lead screening was not expanded.

In early August, the Onslow County Health Department submitted a package of ten rubber animals to the NCSLPH for analysis. Later in August, Cabarrus, Beaufort and Burke County Health Departments submitted additional toys from other distributors. Four sub-samples were leached in 100 mL of 4% acetic acid for 18 hours to determine the availability of lead on the surface of the toys. Eight toys were sub-sampled specifically for accent paint, body paint, rubber body and the frame wire. These samples were digested using trace metal grade nitric acid in the hot block at 100°C with a final volume of 50 mL. Analysis was performed on a Perkin Elmer Analyst 700 Flame Atomic Absorption Spectrometer (FAAS) and results confirmed on a Perkin Elmer Elan 9000 Inductively Coupled Plasma-Mass Spectrometer (ICP-MS).

The four samples leached with 4 percent acetic acid were found to have between <0.10 and 8.4 mg/L lead. Accent paint and body paint samples were found to have between <0.06 and 0.67 percent lead. The rubber body samples were found to have between <0.06 and 0.42 percent lead. All wire samples from the bendable frames of the toys tested showed <0.06 percent lead. Thus, the highest risk of lead poisoning came from the accent and body paint and rubber body on the toys.

The results from the NCSLPH confirmed the data from the Indiana State Laboratory. While the data varied based on body and/or accent color, the results do indicate that all toys could contain lead at levels of concern and pose a potential exposure hazard for young children who put objects in their mouths. ◆

N.C. Minority Gay Pride Behavioral Assessment

Prepared by Martha Buie, MA, Social Research Associate and Debra Bost, BS, CHES, Social Research Associate, N.C. HIV/STD Prevention and Care Branch

Participation in the National HIV Behavioral Surveillance (NHBS) system is restricted to 25 metropolitan statistical areas that have the highest HIV/AIDS prevalence. As a result, localities with low HIV morbidity are not eligible to receive NHBS funding, even though the prevalence of HIV infection among groups at risk, especially men who have sex with other men (MSM) may be high. To address the deficiency of HIV behavioral risk information from low and moderate HIV/AIDS morbidity areas, the Behavioral and Clinical Surveillance Branch (BCSB) of the Centers for Disease Control and Prevention provided the North Carolina HIV/STD Prevention and Care Branch funding and technical assistance through the Behavioral Assessment Project to collect local behavioral risk information from minority MSM during the Charlotte Black Gay Pride Expo on July 22, 2006 at Spirit Square.

African Americans experience the highest levels of HIV/AIDS and STD prevalence, HIV/AIDS-associated mortality, and years of potential life lost. MSM make up the largest group of HIV-infected individuals and minority MSM are disproportionately affected. North Carolina is experiencing a dramatic increase in HIV infections among young black men (CDC, MMWR, 2004). The purpose of the Minority Gay Pride portion of the Behavioral Assessment Project is collection of behavioral data and conduct of rapid HIV testing at selected public events targeted to groups not traditionally reached by behavioral surveillance activities or HIV testing services. By collecting behavioral data at Minority Gay Pride events, our understanding of risk behaviors of the MSM attending these events will increase.

The goals of the Minority Gay Pride portion of the Rapid Behavioral Assessment were to (1) collect information about behavioral risk factors associated with the acquisition and transmission of HIV, knowledge, attitudes and beliefs of HIV among high-risk MSM and ethnic and racial minorities; (2) offer rapid HIV testing and increase knowledge of HIV serostatus among high risk ethnic and racial minorities and; (3) use information collected to craft a targeted risk reduction message, evaluate local HIV prevention programs for minority MSM, and better target HIV prevention activities accordingly.

The North Carolina HIV/STD Prevention & Care Branch collaborated with volunteers from community-based organizations (CBOs) and the Mecklenburg County Health Department to conduct the behavioral survey and offer rapid HIV testing at Spirit Square in downtown Charlotte on July 22. Prior to the event, CDC staff conducted training for the volunteers on interviewing techniques and operation of handheld computers used to collect data. Potential respondents were systematically sampled and recruited for participation using the following criteria: (1) if they were least 18 years old at the time of interview, (2) were born male, and (3) were members of a racial or ethnic minority group. One hundred and thirteen minority men enrolled in the survey; objectives were fully explained to them and informed consent was obtained orally. Men who agreed to participate were asked about HIV risk and prevention behaviors using a standard questionnaire; responses were directly entered in the handheld computer.

Information collected included demographics, sexual behavior (number of partners, types of sex acts, and condom use), drug use (injection and non-injection), number and results of HIV tests, and exposure to and use of prevention services.

(*continued on page 11**)***

Reported Communicable Diseases, North Carolina, January-September 2006 (by date of report)*

	Year-to-Date (Third Quarter)			3rdQuarter 2006	Comments / Note
	2006	2005	Mean (2001-2005)		
Botulism Food	**1**		0	0	
Brucellosis	**2**	3	1	0	
Campylobacter	**653**	524	493	249	
Chlamydia, laboratory reports	**24903**	24468	20111	7082	
Creutzfeldt-Jakob Disease	**1**	0	-	1	Note 1 and 2
Cryptosporidiosis	**71**	67	43	35	
Cyclosporiasis	**1**	1	1	0	
Dengue	**2**	9	1	1	
E. coli Shiga Toxin-producing	**83**	43	14	50	Note 3
Ehrlichiosis, Granulocytic	**1**	2	2	0	
Ehrlichiosis, Monocytic	**40**	16	15	21	
Ehrlichiosis, Other	**1**	3	-	1	Note 4
Encephalitis, California Group	**4**	0	7	3	
Foodborne, C. Perfringens	**8**	1	2	1	
Foodborne, Other	**109**	177	138	11	
Gonorrhea	**12760**	11677	11879	4443	
Haemophilus Influenzae	**46**	67	44	23	
Hepatitis A	**67**	65	110	22	
Hepatitis B, acute	**124**	128	142	38	
Hepatitis B, chronic	**652**	696	638	147	
Hepatitis B Perinatal	**2**	1	-	0	Note 1 and 5
Hepatitis C, acute	**12**	15	15	12	
HIV/AIDS	**1487**	1280	1304	312	
HUS	**3**	4	2	2	
Influenza Pediatric Mortality	**1**	0	-	1	Note 1 and 4
Legionellosis	**29**	23	20	10	
Leptospiosis	**1**	0	0	0	
Listeriosis	**19**	20	-	6	Note 1 and 6
Lyme Disease	**24**	42	69	13	
Malaria	**24**	24	18	11	
Measles	**1**	0	0	0	
Meningococcal Invasive Disease	**24**	28	34	5	
Meninigitis, Pneumococcal	**32**	29	29	4	
Mumps	**30**	9	4	28	
Q Fever	**3**	6	2	1	
RMSF	**663**	356	241	336	
Salmonellosis	**1146**	1168	1067	586	
Shigellosis	**125**	149	353	33	
VISA/VRSA (Staph aureus)	**1**	0	-	0	Note 1 and 7
Strep A	**138**	103	105	45	
Syphilis, total	**456**	355	445	152	
Tetanus	**1**	0	0	0	
TSS	**6**	3	3	5	
TSS Streptococcal	**10**	8	2	3	
Tuberculosis	**230**	203	234	74	
Tularemia	**1**	0	1	0	
Typhoid, Acute	**3**	3	4	1	
Typhus Epidemic	**2**	0	0	1	
Vibrio Vulnificus	**4**	2	3	2	
Vibrio, Other	**11**	10	0	7	
Whooping Cough	**154**	77	67	53	

* Preliminary data, as of 9/30/2006. Quarters defined as 13 weeks periods. Diseases reported in 2006 define those listed in this table. Notes: 1. "-" = Not reportable, or not reportable as such over this entire time period; 2. Became reportable 2/2003; 3. Including E. coli O157:H7 ("E. coli O157:H7 infection" was the reportable disease until 2/15/2003; 4. Became reportable 9/2004; 5. Reported as such since 12/2001; 6. Became reportable 7/2001; 7. Became reportable 1/2005.

(***Minority Gay Pride**, continued from page 9**)*
No personal identifiers were collected and messenger bags with prevention materials were given as incentive to participate in the survey. All participants were offered a free rapid HIV test. Seventy-two persons were tested for Human Immunodeficiency Virus (HIV) using the OraQuick® rapid antibody test. One specimen was found to be preliminarily positive for HIV. Forty individuals attending the event received syphilis testing, and two tested positive for syphilis. Over all, an estimated 600 persons attended the event. Results from the questionnaire will be provided to the HIV/STD Prevention and Care Branch for local analysis. In addition, the CDC will compile the nationally collected data to be used to inform prevention efforts on a larger scale.

A special thanks is extended to Metrolina AIDS Project, Project STYLE (UNC School of Medicine), Mecklenburg County Health Department, Region 2 Consortium, Brother 2 Brother, Present Day Cares, Southlight, North Carolina Central University, HIV/STD Branch staff, and, Charlotte N.C. Black Gay Pride Planning Committee for their high degree of professionalism and diligent work ethic. This project would not have been made possible without their collaboration and dedication toward working to eliminate this health disparity among minorities.◆

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

Prepared by Allison M. Connolly, M.A., M.P.H., NC EDSS Coordinator, General Communicable Disease

A lot of progress has been made on the NC EDSS project since I last updated you in winter 2006!

You may recall that TB is the first disease that will convert to NC EDSS. Pilot testing of the system for TB has just begun the following five health departments: Wake; Pitt; Mecklenburg; Wilkes; and Forsyth. Local health departments (LHDs) are using the system for TB surveillance and reporting, latent TB infection, documenting directly observed therapy administration, skin testing, and for follow up on contacts to active TB cases. Currently, data are being collected and reported to Centers for Disease Control and Prevention through NC EDSS, as well as through the pre-existing data collection and reporting methods. After it has been determined that the new system is accurately collecting and reporting data, the parallel collection and reporting processes will cease.

Pilot testing for general communicable diseases, sexually-transmitted diseases (with the exception of syphilis and HIV) and vaccine-preventable diseases (VPD) is scheduled for late spring 2007. The first statewide rollout, due to begin in fall-2007, will encompass TB, general communicable diseases, STD, VPD, contact tracing and outbreak management. Rollout of HIV, syphilis, and childhood lead will follow in late 2007 and 2008.

I am pleased to announce that Judy Owen-O'Dowd joined the NC EDSS Project Team in June 2006 as the LHD liaison. Some of you know Judy from her long career in the HIV/STD Prevention and Care Branch, and prior to that at Wake Human Services. One of Judy's activities over the next nine months will be to conduct NC EDSS assessments in all local LHDs. The purpose of these assessments is to help LHDs prepare for implementation of NC EDSS in 2007 and to provide LHD staff an opportunity to learn about the project in greater detail. You many contact Judy at Judy.Owen.Odowd@ncmail.net

If you have questions or would like more information, please contact Allison Connolly at 919 715-1642 or allison.connolly@ncmail.net.◆

(***HOPWA**, continued from page 6**)*
and is a member of the North Carolina Homeless Conference Planning Committee.

This year Housing and Urban Development (HUD) has implemented new performance measures and, beginning October 2006, the HOPWA program will began reporting data pertinent to housing stability and access to care. The information received will help us to better serve the housing needs of our clients and inform them of other services that are available to them.

We are excited about our program and are looking forward to working with the housing community to increase the **H**ousing **O**pportunities for **P**ersons **W**ith **A**IDS.◆

DHHS Receives Designation for "Best Workplaces for Commuters"

Prepared by Patsy West, Administrative Assistant, Epidemiology Section

Through the efforts of Public Health, in September of this year, DHHS was named as one of the "Best Workplaces for Commuters" by the U.S. Environmental Protection Agency (EPA). This honor recognizes the Department for encouraging employees to take the bus, carpool, vanpool, walk or bike to work.

"Best Workplaces for Commuters" is a nation wide program coordinated by the US EPA and the US DOT to encourage employees to take alternative routes to work rather than the traditional way of driving alone in their vehicles. This distinction identifies the DHHS as one that provides excellent commuter benefits for employees.

This is a national recognition and is a distinction for which we can all be proud.◆

State of North Carolina · Michael F. Easley, Governor
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Epidemiology Section · www.epi.state.nc.us/epi/

Dr. Jeffrey Engel, Chief
Managing Editor, Jeffrey Engel
Layout and Typesetting, Angela Green

Epidemiology Section Office (919) 733-3421
General Communicable Disease Control Branch (919) 733-3419
HIV/STD Prevention and Care Branch (919) 733-7301
Occupational and Environmental Epidemiology Branch (919) 707-5900
State Laboratory of Public Health (919) 733-7834
Office of the State Medical Examiner (919) 966-2253
Office of Public Health Preparedness and Response (919) 715-0919
Rabies Emergency Number - Nights, Weekends, Holidays (919) 733-3419
EMERGENCY NUMBER - Nights, Weekends, Holidays (919) 733-3419

500 copies of this public document were printed at a cost of $265.17, or $.53 per copy, using non-state funds. 10/06