

Eastern North Carolina – The Lead Poisoning Persistence

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In 2006, 504 children in North Carolina tested positive for elevated blood lead levels – down from 921 in 2002. Although elevated blood lead levels in U.S. children have dropped from 88 percent in the late 1970s to 2 percent during 2000, blood lead levels remain a major health concern in children.

Online data from the Centers for Disease Control and Prevention shows many eastern North Carolina counties consistently contain the highest number, per capita, of children with elevated blood lead levels and blood poisoning in the state. On average from 2002 to 2006, 10 of the 15 counties with the highest rates were consistently in eastern North Carolina. However, the county having the highest percentage of children with elevated blood lead levels dropped from 6.3 percent in Gates County to 3.3 percent in Northampton County in the same time frame.

The general explanation for high blood lead levels in eastern North Carolina, according to Ed Norman, is the concentration of older housing and low-income families occupying them. Norman is the program manager of the Children's Environmental Health Branch Lead and Child Care Program in Raleigh.

Eastern North Carolina has a background of economic suffering, which provides the simplest explanation for the lead problems.

A study by the North Carolina Center for Public Policy Research revealed that eastern North Carolina ranks behind the rest of the state in many ways, particularly in education levels, income and poverty rates. At 17.6 percent, the average poverty rate for eastern counties greatly exceeds the North Carolina average of 12.6 percent and the U.S. average of 13.3 percent. Online data from www.city-data.com revealed that eastern North Carolina counties with the highest lead levels have a median household income of \$32,000, as opposed to a statewide \$40,000 average.

Eastern North Carolina trails the state in education, owning the highest dropout rates, lowest levels of adult literacy and the lowest percentage of residents with high school and college degrees, according to the Public Policy Research study.

Eastern North Carolina's disparity has a distinct relationship to the lead hazards.

“Deteriorating lead based paint in older homes is the biggest cause, accounting for 80 percent of lead poisoning,” said the state's Norman. Another 10 percent is from minor sources – mostly toys, water and some Mexican candies. He added that unknown causes account for the remaining 10 percent of lead poisoning.

Dr. Carol Hanchette, a geoscience professor at the University of Louisville, takes a political ecology approach to explain the existence and persistence of the high childhood lead poisoning rates in eastern North Carolina. Lead poisoning in eastern North Carolina was the focus of Hanchette's Ph.D. dissertation at the University of North Carolina-Chapel Hill in the late 1990s.

Hanchette suggests that higher rates of lead poisoning in the region are linked to transitions taking place beginning in the civil rights movement. These transitions "resulted in changes in social and demographic characteristics of neighborhoods in eastern North Carolina.

"Historic, political and economic processes resulted in the movement of many rural African-Americans to small towns in the tobacco production heartland of eastern North Carolina," she wrote. "With desegregation came 'white flight' to the suburbs, and African-Americans moved into vacated neighborhoods with older housing that contained lead-based paint. "Over time, economic conditions deteriorated, as did the condition of the homes. Ultimately, African American children in these towns became a high-risk population for lead exposure."

In 1994, North Carolina implemented its Childhood Lead Poisoning Prevention Program, a screening program that provides health departments, clinics and private physicians free blood lead analysis through a state laboratory.

Online data revealed that in North Carolina during 2006, 136,000 of nearly 850,000 children under age 6 were tested. The population of this age group has grown 6 percent since 1997, but children receiving testing have increased 40 percent (from 97,000) in the same time period.

More than half of the children tested are poor. Children who have Medicaid are required to be tested for elevated blood lead levels, and comprise about 56 percent of the number of children screened from 2002-2006. This data was gathered online from the Centers for Disease Control and Prevention, North Carolina State Demographics, and Children's Environmental Health Branch Web sites.

Many county health departments would not respond to questions about lead poisoning. Health officials who did reply seemed somewhat unconcerned, possibly because the number of lead cases has dropped so much over time. A Polk County Health Department employee who asked not to be named simply said, "We really don't have a high incident rate in Polk County at all."

Polk County is on the western tip of the state, but lead incident rates per child are among the highest in North Carolina. The number of children affected may be dropping, but lead remains a hazard that still causes problems in children.

Minute lead traces in the human body can cause damage. Therefore, the concentration of lead in the blood is measured in minuscule amounts: micrograms per deciliter. A

microgram is only one-millionth of a gram, and a deciliter only 1/10 of a liter. If the body's lead level is greater than 10 micrograms per deciliter, the blood is considered to have an elevated blood lead level, and may be harmful. Elevated blood lead levels are considered to be blood poisoning if lead in the blood reaches a concentration greater than 20 micrograms per deciliter.

“Lead poisoning is an asymptomatic disease, meaning there aren't any symptoms. It affects the brain, reducing the IQ,” said Norman. Lead poisoning is an insidious disease that also can result in developmental delays, behavioral disorders, irreversible brain damage and in the worst case, death.

Medical treatments include chelation therapy, but it is administered only in severe lead poisoning cases. Chelation therapy removes all metals – not just lead – from the body. These metals include mercury, iron, arsenic, calcium and more, some of which are needed. Child and adult deaths have been linked to chelation therapy by causing cardiac arrest and calcium depletion.

In a 2006 interview with MSNBC, Mary Jean Brown, chief of the Centers for Disease Control and Prevention's Lead Poisoning Prevention Branch, said since at least 1978, federal health officials have warned against giving Endrate (a chelation drug) to children with lead poisoning.

The main prevention and treatment to lead exposure is to remove the source by making surroundings lead free. Norman described this as a long, tedious undertaking that sometimes includes remodeling entire houses.

The steps with the biggest impact in reducing lead poisoning were phasing out leaded gasoline in the 1970s and the ban on lead based paint in 1978. In June 1986, President Reagan signed amendments to the Safe Drinking Water Act, requiring lead-free pipe, solder and flux to be used when installing or repairing public water systems and facilities connected with public water systems, including residential homes and apartments.

While the act does produce safer drinking water in new facilities, replacing old plumbing hardware which contains lead is not required in existing buildings. When asked how difficult it is to replace such problems, East Carolina University construction professor Danny Morton said in general plumbing is “expensive, and replacing old pipes in homes built prior to those amendments is expensive, considering that pipe runs through existing walls among other things.”

Utilities such as the Greenville Utilities Co. are mandated by the Environmental Protection Agency to audit and test the water supply and maintain it to guidelines. Lead poisoning from water is rare, but in May 2005, two Pitt County children were found to have extremely high blood lead levels. According to Emily Robertson, an environmental health specialist at the Pitt County Health Department, Greenville was the first city in North Carolina to have a child diagnosed with lead poisoning solely from drinking water.

Yet Greenville Utilities uses extensive precaution and testing to ensure water is as safe as possible, says Drew Underwood, an intern at the Office of Environmental and Health Safety at East Carolina University. Underwood explained how water becomes tainted with lead and the steps taken to correct it at ECU.

“The way that lead gets into water is by the corrosion of pipes in a certain facility, such as a home or a business. The water is tested in four different spots to make sure that it is not Greenville Utilities that is pumping the lead into the water. The tests that are done are at the facility, at the actual faucet, at a freshwater main anywhere along the water pipes from the facility to the faucet, and at the pipe just before the faucet. From doing these tests, you can figure out where the lead is actually entering the water and fix the problem.”

If a location is tested and has high lead content, “we have to go back and test again in about a week to make sure that there was not a problem with the first sample,” Underwood said. Each time testers go to a location, they take samples of the water after one minute running, two minutes running, five minutes running and 10 minutes running. If the second sample is tested and it is still high, testers have to go back a third time. “However, the third time, we have to let the water run constantly for 10-12 minutes so that we are sure we get a pure water sample and it is not just lead from the pipes.”

Identifying lead sources in the environment can be an ambiguous and tedious task. This is why efforts to eliminate lead hazards have been taken on a national, statewide, local and personal level. Health organizations administer numerous varieties of tests, implement measures and promote awareness of lead poisoning that have blotted out countless incidences.

Clearly, vast improvements have been made, yet blood lead levels – elevated or not – are among health issues to be resolved. The Department of Health and Human Services Healthy People 2010 objective for lead poisoning is to totally eliminate elevated blood lead levels in children.

“Unfortunately, this objective may not be achieved, in spite of widespread screening and intervention programs,” Hanchette wrote in her academic paper.

“It’s hard to say when we will completely eradicate the problem,” says the state’s Norman. While eastern North Carolina’s blood lead level rates are high, Norman replied, “North Carolina tests a lot of kids compared to many other areas in our nation. Some northeastern U.S. cities have lead poisoning rates many times higher than eastern North Carolina counties.”

Martin Lorin, MD, professor of pediatrics at the Baylor College of Medicine, provided the following recommendations to protect children from lead exposure to the Houston-based Citizens League for Environmental Protection Now in 2005:

- Have the paint tested if your home was built before 1978, especially before doing construction that might stir up paint dust
- Clean up chipping and peeling paint inside and outside your home
- Do not let your child chew or suck on anything that has paint on it – check for teeth marks on window sills and other wood work
- Damp mop floors and wipe counters and other surfaces often
- Wash bottles, pacifiers and teething rings with soap and water, and rinse with distilled or filtered water
- Wash toys with soap and water at least once a week
- Wash children's hands with soap and water before eating, naps and bedtime
- Never use hot tap water for preparing formula, drinking or cooking – hot water dissolves more lead than cold water
- Even with cold water, let water run for a minute to clear out the water that may have been sitting in lead-containing pipes
- Make sure your child has a balanced diet with enough calcium and iron to decrease absorption of any lead the child does ingest (foods high in iron and calcium include: potatoes, fruit, greens, raisins, eggs, milk, cheese and lean meats)
- Wash fruits and vegetables before eating them
- Do not store or serve food in glazed pottery, glazed ceramics, pewter or lead crystal
- Do not give your child candy from Mexico – some candy from Mexico contains lead
- Do not allow your child to play in soil near old buildings or busy streets
- If you work with lead, shower and change clothes before coming home, and remove shoes before entering your home

Leslie Ingram and Rachel Overdorf contributed to the reporting of this story.