Macon County [N.C.] Sheriff Robert Holland had one simple question. How many of you know someone who does meth? *Just about every student listening to an anti-drug program in Franklin High School's 780-seat auditorium raised a hand.*

It didn't come as a surprise. Moving east from California, the methamphetamine scourge has swept across rural America, settling within the past few years in Western North Carolina, ruining lives and costing taxpayers hundreds of thousands of dollars. —Lindsay Nash, *Asheville Citizen-Times*

The following articles offer four perspectives on the North Carolina dimensions of the methamphetamine problem. J. Steven Cline reports on how methamphetamine is made, how users are affected, and what new regulations are in force for decontamination of methamphetamine laboratories. Laura Elmore examines the strain on local social services of handling children affected by methamphetamine. F. R. Hetzel explains the law enforcement view of this drug abuse epidemic. Finally, Danny Staley describes the scene on public health's front line. —*Editors*

Illegal Methamphetamine Laboratories as a Public Health Hazard

J. Steven Cline

The number of illegal, clandestine methamphetamine laboratories in North Carolina is shocking, and it is growing. In 1999 the State Bureau of Investigation (SBI) busted fewer than 10 laboratories. In 2004 it made more than 300 methamphetamine arrests, and for 2005 it expects arrests to exceed 400.

Although this problem is new to North Carolina, it is not new to the United States. Homegrown methamphetamine laboratories started on the West Coast more than twenty years ago and have been moving east ever since. Law enforcement reports show that methamphetamine busts account for more than 90 percent of all illegal drug seizures in the United States.[1]

This article reviews what methamphetamine is, how it is made, and what its effects are on users. The article also describes the public health problem that methamphetamine laboratories present, including the risks to people coming in contact with the materials and the process of producing illegal methamphetamine. Finally, it describes new requirements for decontaminating these makeshift drug laboratories. Related articles present the problem from the perspectives of social services departments (page 28), law enforcement agencies (page 31), and local health departments (page 35).

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What Is Methamphetamine?

Methamphetamine is a member of a class of drugs with an amphetamine base. The most commonly synthesized controlled substance in the United States, it is a powerful stimulant of the central nervous system that can be snorted, smoked, taken orally, or injected. Street names include meth, crystal meth, crank, chalk, ice, go, pep pills, speed, uppers, zip, and more.

Methamphetamine produces an intense, long-lasting high characterized by increased physical activity, wakefulness, and decreased appetite. The user's rush is described as extremely pleasurable, and it contributes to the highly addictive nature of the drug. Long-term abuse often results in anxiety, confusion, insomnia, and compulsive drug-seeking behavior, even violence.

How Is Methamphetamine Made?

Anyone with access to the Internet (for the recipe), several easily obtainable household chemicals, and a place to "cook" (produce) it can illegally manufacture methamphetamine. A recent Internet search for "methamphetamine recipe" produced 51,000 references in less than one second. With minimal training, usually from another methamphetamine cooker, a person can quickly produce enough methamphetamine to satisfy his or her own need and to sell on the side in order to finance the next batch.

The process involves extracting the amphetamine base from a popular and relatively inexpensive over-the-counter cold medication, pseudoephedrine. The cook can use a number of different solvents, heat, and coffee filters to convert pseudoephedrine to methamphetamine. Some common brand names of over-the-counter cold medications containing pseudoephedrine are Advil Cold and Sinus, Bromfed, Claritin D, and Sudafed.

The two most popular methods of manufacturing methamphetamine at home are the red phosphorus method, also called "Red P" or "Tweaker," and the ammonia method, sometimes called "Nazi" or "Birch." The red phosphorus method, predominant in western North Carolina, requires the use of iodine crystals. Methamphetamine cooks extract red phosphorus from the striker plates on matchbooks or from road flares. They obtain iodine crystals from household items such as hydrogen peroxide, tincture of iodine, and common plumber's acid.

Predominant dangers in this cooking method include phosphine gas, hydrogen chloride gas, and iodine vapors.

Robert Willett / News & Observer

Phosphine gas is produced during the chemical process used to manufacture methamphetamine. It may reach a concentration of 50 parts per million, or ppm (50 parts of gas to 1,000,000 parts of air) or higher. At 50 ppm it is immediately dangerous to life and health. Its possible effects include pulmonary edema (accumulation of fluid in the lungs), kidney failure, liver damage, and death. Hydrogen chloride gas, produced during the final stage of methamphetamine production, is acidic and causes severe chemical burns to the skin and the mucous membranes of the nose, the mouth, and the throat. Iodine vapors, produced any time that the environmental temperature exceeds 75 degrees Fahrenheit, are immediately dangerous to life and health at only 2 ppm. They irritate the eyes and the skin, cause breathing to become shallow or stop, and damage the central nervous system.

The ammonia method, found predominantly in eastern North Carolina, calls for anhydrous ammonia and highly reactive lithium or sodium metal. Methamphetamine cooks may acquire the anhydrous ammonia by stealing it from large commercial tanks used by farmers and other industries. Cooks can purchase it legitimately through businesses such as National Welders. Some entrepreneurial criminals do not manufacture methamphetamine but purchase large quantities of anhydrous ammonia and illegally sell it to methamphetamine manufacturers.

With minimal training, usually from another methamphetamine cooker, a person can quickly produce enough methamphetamine to satisfy his or her own need and to sell on the side in order to finance the next batch.

Another method of obtaining this type of ammonia is to manufacture clandestinely a similar product, condensed ammonia. The ammonia cook combines sodium hydroxide (for example, Red Devil Lye), ammonium nitrate, and water, and distills the combination, producing the condensed ammonia.

Cooks obtain lithium metal illegitimately by harvesting it from camera batteries.

Predominant dangers in this cooking method include ammonia vapors, hydrogen chloride gas, and lithium metal. Ammonia vapors are immediately dangerous to life and health at 300 ppm. Their possible effects are severe skin damage (including burns, blisters, and frostbite), blindness, and death. As noted earlier, hydrogen chloride gas causes severe chemical burns to the skin and mucous membranes. Lithium metal ignites immediately on contact with moisture, including that found in air. The ignition can be explosive, leading to loss of limbs or death.

Law enforcement busts of illegal methamphetamine laboratories in North Carolina yield large volumes of potentially hazardous waste generated to produce relatively small amounts of the drug itself. The average user-based methamphetamine laboratory produces 11 pounds of methamphetamine per year. (A "user-based" laboratory is one in which the cook makes enough for his or her personal use, plus some to sell in order to buy more supplies and precursor ingredients for another batch.) With this comes about 77 pounds of toxic waste.[2]

What Happens to Methamphetamine Users?

The physical and medical complications of methamphetamine abuse on the user are numerous and well documented. Methamphetamine is both physiologically and psychologically addictive. The addiction is stronger than heroin addiction, with a recovery rate of only 6 percent. The drug can cause life-threatening cardiovascular problems, including heart attacks, strokes, and convulsions, as well as a multitude of psychosocial problems, including anxiety, paranoia,

and violent behavior. Its long-term effects include gross weight loss, tooth decay, skin lesions, and a continuously increasing need for it.

Chronic methamphetamine users, called "tweakers," often behave violently. Their behavior becomes unpredictable from moment to moment. Also, they may start doing something over and over—taking apart televisions, computers, radios, and the like; looking for something for hours at a time; walking around stores at length and buying nothing; or continuously picking at imaginary bugs, called "crank bugs," on or under their skin. They also have visual and auditory hallucinations, such as seeing "shadow people" out of the corners of their eyes and hearing movement or police sirens outside their houses when none exist.

In addition to damaging users' personal health, methamphetamine affects the people around users. Long-term users often lose the ability to manage almost all other aspects of their lives, including family, work, and daily living. The impact of raising children in this type of environment is devastating (see the article on page 28). The process of manufacturing methamphetamine in clandestine laboratories presents serious exposure and safety hazards for the cook, the occupants of the building, and the first responders. Numerous news reports, case reports, and studies have documented potentially life-threatening exposure, fire, and explosion risks that occur during the cooking process.[3]

The process of manufacturing methamphetamine in clandestine laboratories presents serious exposure and safety hazards for the cook, the occupants of the building, and the first responders.

Why Is Methamphetamine a Public Health Problem?

Methamphetamine laboratories are foremost a law enforcement problem because they support illegal manufacturing and use of a controlled substance. Methamphetamine use is certainly detrimental to the health of the user and to the people around him or her. However, it also has an important public health impact. The process of producing methamphetamine in an uncontrolled environment using unsophisticated methods and poor disposal practices results in numerous safety and health hazards. Raw materials, hazardous by-products, and dangerous trash left behind after the laboratory is no longer in use present a significant risk to people who may enter the site. Public health professionals are being asked how to clean these illegal sites and what the risk is to people who reoccupy a residence that once served as a methamphetamine laboratory.

Possible risks to human health include lung damage, chemical burns, fires or explosions, cuts, and even an increased chance of cancer or brain damage from chronic exposure. A partial list of methamphetamine laboratory by-products that may pose a risk to humans includes acetone, ammonia, benzene, ephedrine, ethyl ether, freon, hydrochloric acid, iodine, isopropanol, lithium, methanol, phosphine gas, phosphoric acid, red phosphorus, sodium, sodium hydroxide, and toluene. Any of these chemicals in the right amount for the right length of time could cause significant health problems.

What Is the Exposure Risk for Occupants?

A recently published study conducted by the National Jewish Medical and Research Center offers the most thorough exposure data to date on illegal methamphetamine laboratories.[4] The investigators measured exposures to selected contaminants in active laboratories where the investigators conducted the cooking in controlled environments. They also measured exposures for similar contaminants in inactive clandestine laboratories where cooking had recently occurred. Airborne concentrations of hazardous chemicals measured in active laboratories during the cooking exceeded occupational exposure limits and in some cases exceeded levels that are considered immediately dangerous to life and health. For example, measured concentrations of airborne iodine during the controlled cooking process were as high as .37 ppm. The safe limit for occupational exposure to iodine is .1 ppm.

By contrast, concentrations of iodine and other potentially harmful chemicals in inactive laboratories were either below the detectable limit or not considered hazardous in all samples. These data suggest that risk of exposure to airborne contaminants is greatly reduced, and perhaps eliminated, once a laboratory has been successfully decontaminated.

In the same study, the investigators tested for measurable concentrations of methamphetamine in ninety-seven surface (wipe) samples in the inactive laboratories. No methamphetamine was detectable in fourteen samples, but some level of the drug was detectable in the majority of samples. These data are consistent with reports from states where methamphetamine sampling is required as a part of laboratory decontamination protocols.

The health risk from residual contamination in former methamphetamine laboratories is not known for certain. There have been only rare reports of adverse health effects resulting from methamphetamine exposure in inactive laboratories, such as a child with chronic asthma who experienced an asthma attack in a site in Utah.

Active laboratories (where cooking is in progress) certainly present enormous risks to building occupants and first responders. Also, inactive laboratories certainly may present numerous health hazards, including used hypodermic syringes, undetected containers of chemicals, spilled chemicals, and chemically contaminated cooking surfaces. However, various studies do not document clear risks in inactive laboratories that have been cleaned, nor do they define an agreed-on standard to which contaminants should be cleared.

A New Public Health Law

During its 2004 session, the North Carolina General Assembly passed legislation to strengthen the penalties for illegal activity involving methamphetamine. As a part of this effort, it amended the public health law (Chapter 130A, Article 8,

of the North Carolina General Statutes), to regulate the decontamination of methamphetamine laboratories. The new law clearly gives the property owner the responsibility of decontaminating the property according to rules adopted by the North Carolina Commission for Health Services (NCCHS) before the property can be reoccupied. Further, it gives the NCCHS the authority to adopt rules that establish the decontamination standards. The new law became effective on December 1, 2004. The NCCHS adopted temporary rules effective January 1, 2005, which became permanent on April 1, 2005.[5] Failure to follow the decontamination rules promulgated by the NCCHS can result in criminal or civil penalties.

Under the new rules, law enforcement personnel must immediately notify the local health department when a property used as an illegal methamphetamine laboratory is released from the law enforcement investigation. Law enforcement personnel also must post a notice on the site that the property has been used for the manufacture of methamphetamine.

The local health department then must immediately notify the property owner of record or the responsible party that the property has been used as a methamphetamine laboratory, that it must be vacated, and that it must be cleaned in accordance with public health rules before being reoccupied.

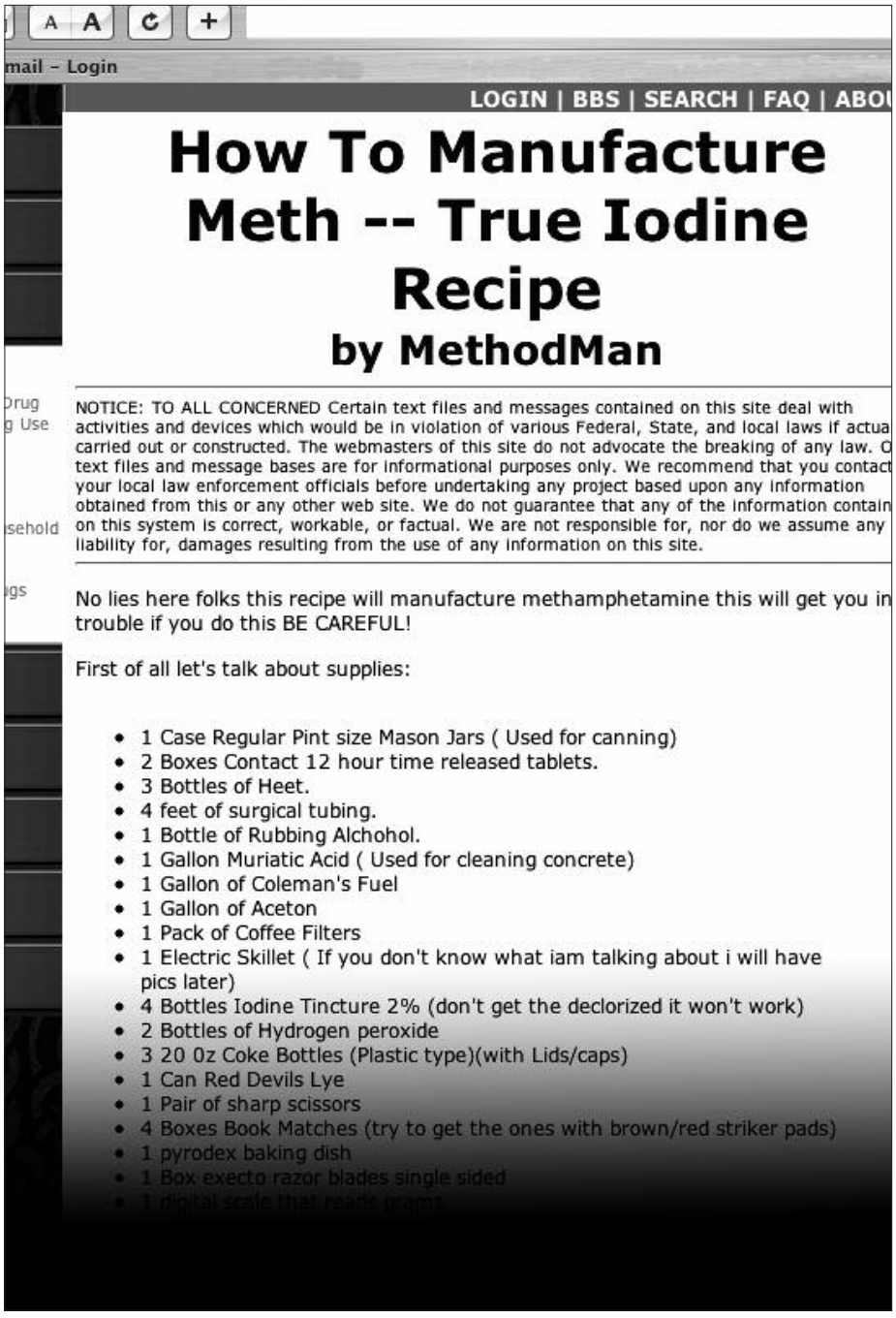
The responsible party must perform an assessment of the extent of contamination before he or she decontaminates the property. Next, decontamination occurs according to the rules and published guidelines. On completion of the decontamination, the responsible party must submit to the local health department documentation of the decontamination assessment and the decontamination activities performed.

The local health department is required to review the documentation for completeness. It may choose to inspect the property at any point during this process, though it is not required to do so by state law.

Public Health Training

Education of local public health personnel to address the growing problem of methamphetamine laboratories is a priority. To date, about 350 public health professionals have been educated through three regional workshops and multiple local training sessions conducted across the state. Local health directors and environmental health specialists have become part of a team that also includes law enforcement officers, firefighters, rescue workers, property owners, and concerned citizens.

A group of thirty state-level public health professionals received specialized training to provide technical assistance to local health departments responding to issues in their county related to decontamination of methamphetamine laboratories. In addition to the public health employees who are directly involved with decontamination, public health and other professionals who work in the community making home visits or tracking patients must be able to recognize signs of an illegal laboratory in operation. Awareness training is important for employee safety.



Conclusion

North Carolina is facing a crisis of escalating illegal manufacture and abuse of methamphetamine. The impact of

illegal drug use is devastating and speaks for itself. Homegrown methamphetamine laboratories compound the problem by creating risks associated with hazardous materials and chemical residues left behind for the next occupant, who may be unaware that a site was ever used for such a purpose. A new North Carolina law has been enacted, and rules have been adopted to require appropriate cleanup of these sites and thereby reduce the risk to future occupants. The public health system in North Carolina has risen to this new challenge in protecting the health of citizens, even though no new resources have been appropriated to support this program.

Notes

1. Office of Nat'l Drug Control Policy, Executive Office of the President, National Synthetic Drugs Action Plan: The Federal Government Response to the Production, Trafficking, and Abuse of Synthetic Drugs and Diverted Pharmaceutical Products (Washington, D.C.: ONDCP, 2004), available at www.whitehousedrugpolicy.gov/publications/national_synth_drugs/.

2. James M. Valle, Summary Results of the Methamphetamine Lab Cookers Survey, June 2001–2002 (Los Angeles: Inland Narcotics Clearinghouse, Jan. 2003).

3. Arizona Coll. of Pub. Health, *Illicit Amphetamine and Methamphetamine Laboratories*, available at www.publichealth.arizona.edu/divisions/envirocom/meth_literature.htm; Centers for Disease Control and Prevention, *Public Health Consequences among First Responders to Emergency Events Associated with Illicit Methamphetamine Laboratories—Selected States, 1996–1999*, 49 Morbidity and Mortality Weekly Report 1021 (Nov. 17, 2000); J. Martyny et al., Chemical Exposures Associated with Clandestine Methamphetamine Laboratories (Denver: Nat'l Jewish Medical and Research Ctr., 2004); Natalie Vandeveld, *Clandestine Methamphetamine Labs in Wisconsin*, 66 Journal of Environmental Health 46 (2004); Lynn J. Willers-Russo, *Three Fatalities Involving Phosphine Gas, Produced as a Result of Methamphetamine Manufacturing*, 44 Journal of Forensic Sciences 647 (1999).

4. J. Martyny et al., Chemical Exposures.

5. The new methamphetamine decontamination law and rules can be viewed at www.epi.state.nc.us/epi/oii/meth/index.html/.

Protection of Children Exposed to Methamphetamine Production

Laura Elmore

A little boy told a social worker that his mother made "red paint." The social worker asked him where the paint was being made. He told the social worker about the "secret wall" in his room behind which his mother made it. This started a chain of events that caused the boy to be removed from his home, left him without his own clothes and toys, and put his parents in jail for manufacturing methamphetamine.

With the rise of the methamphetamine problem, departments of social services must coordinate their child protection efforts with law enforcement's efforts to prepare adequately for a raid, capture offenders swiftly, collect evidence, and deal with the noxious environment of methamphetamine production. Children caught up in the methamphetamine problem are living in chemically toxic surroundings. They are in increased danger from their parents' neglect and abuse. Staff of departments of social services must intervene in a way that protects the children from parental and chemical dangers and protects staff themselves from chemical exposure.

This article summarizes the threats to children from methamphetamine laboratories and the role of department of social services staff in identifying such laboratories. Further, it describes the multi-agency teams necessary to deal with methamphetamine laboratories successfully and the change in departments of social services' approach to assessing child neglect and abuse when social workers are dealing with methamphetamine laboratories.

Ingesting the ingredients of methamphetamine—or the drug itself—may result in potentially fatal poisoning and harm neurological and immunological functioning.

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Threats to Children

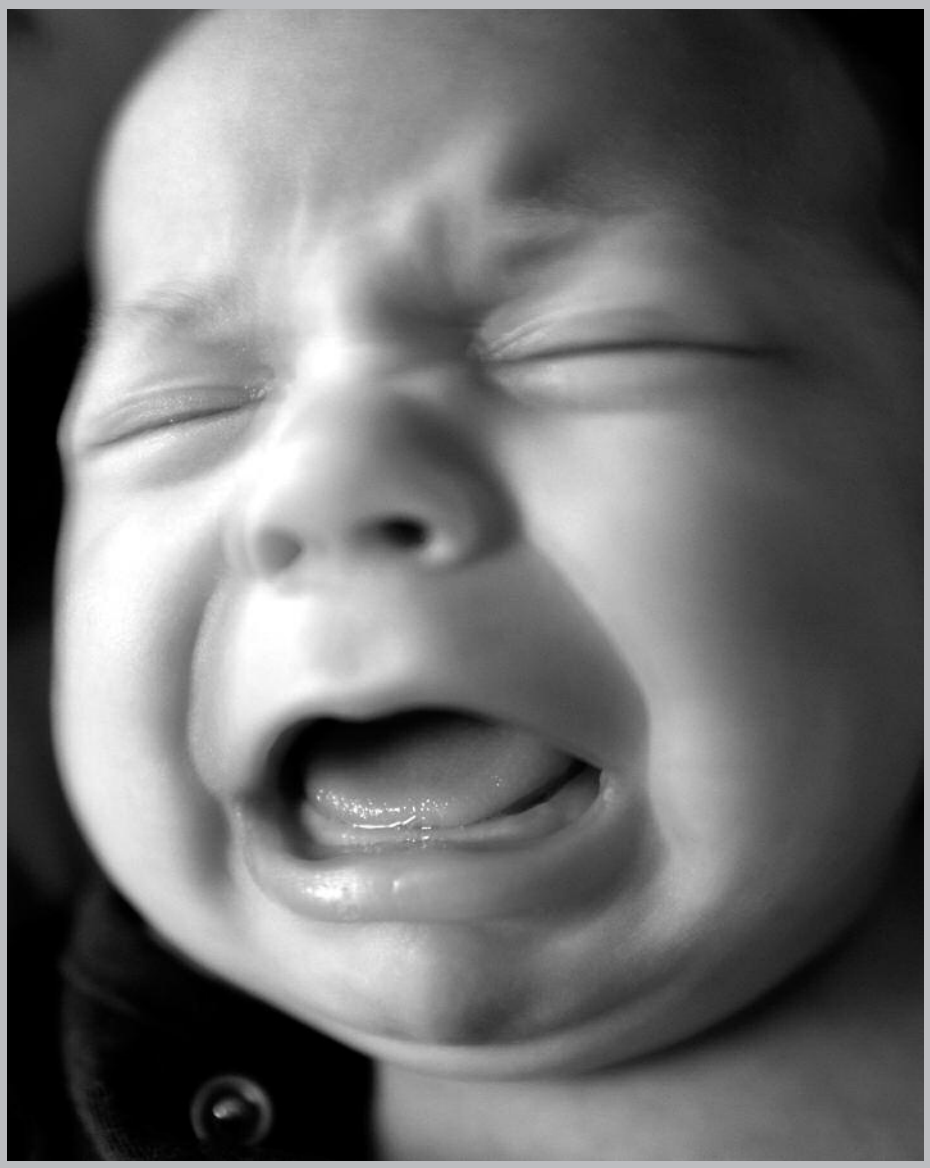
Children have been found in about 25 percent of methamphetamine laboratories in North Carolina.[1] Young children are at high risk of harm in these settings because of their developmental stage: they put things in their mouths, mimic adults, have faster heartbeats and respiration (and therefore absorb toxins at a higher rate), and have more physical contact with the environment. They also are at high risk of harm because of the abuse and neglect that their parents, caretakers, and others who frequent the home inflict on them, and their inability to protect themselves. Children whose parents produce or use methamphetamine typically lack nurturance, predictability, stimulation, immunizations, medical and dental care, and basic necessities such as food, water, and appropriate shelter. When users "crash," the methamphetamine no longer keeps them awake. They feel bad and fall asleep, often for days. Sometimes they cannot be awakened. That makes them incapable of providing care and supervision to any children in the home.

Older children in these homes may be used in, or made to help with, making the methamphetamine. They are asked to pop the pills out of the blister packs and to stand guard when the parents are cooking; they are even made to sell the drug. These older children also imitate their parents' behavior. Such imitation may lead to substance use and abuse and involvement in other criminal activities that they may witness.

The abuse and neglect of children comes from the effects of methamphetamine on the adult users. Long-term use causes a person to be irritable, violent, paranoid, and sexually aroused. This increases the chances that children will witness or become the victims of physical violence or sexual abuse.

When a person first tries methamphetamine, he or she is usually given the drug by a friend or an acquaintance. The person uses a small amount, uses it only occasionally, and is able to sleep at night. By the third or fourth month, although the person may still use methamphetamine infrequently, a pattern of drug abuse begins to develop. By the fifth month the person begins using the drug daily, with several days of crashing in between. At this point the person may begin to make methamphetamine both to use and to sell for money to buy more products for the next batch.

Simply being exposed to the toxic chemicals used to produce the drug poses a variety of health risks to children, including intoxication, dizziness, nausea, disorientation, lack of coordination, pulmonary edema (accumulation of fluid in the lungs), serious respiratory problems, severe chemical burns, and damage to internal organs. Young children present at laboratory sites are at particular risk of ingesting chemicals used to produce methamphetamine. Ingesting toxic chemicals—or methamphetamine itself—may result in potentially fatal poisoning, internal chemical burns, damage to organ function, and harm to neurological and immunological functioning.



The Role of Departments of Social Services in Identifying Laboratories

The majority of methamphetamine laboratories in North Carolina have been discovered because of explosions or because they were "stumbled on." In 2004, Rutherford County had one of the largest numbers of methamphetamine laboratories discovered in the state, at forty-three.[2] In numerous situations in Rutherford County, a social worker visiting a home because of a report of neglect that also involved head lice and lack of school attendance has detected signs of a methamphetamine laboratory. A smell—whether sweet or bitter, of ammonia or of solvents—often is the first clue for some social workers. For other social workers, clues emerge from talking with children, as in the "red paint" example described earlier. This mother was using the red phosphorus method of making methamphetamine. The allegations that the social worker was investigating did not mention methamphetamine or a methamphetamine laboratory.

Social workers are becoming skilled at recognizing the signs of a methamphetamine laboratory and the "tweaking" phase that methamphetamine addicts go through. For example, in one home a social worker observed a room full of computers, televisions, and other electronic devices that had been taken apart. At another home a social worker smelled methamphetamine. The father was in a back bedroom with an assault rifle, but the social worker was not aware of this at the time. Law enforcement personnel later discovered that methamphetamine had been made in the home in the previous forty-eight hours.

A Multi-Agency Response

Responding to suspicions of a methamphetamine laboratory where children are involved requires a coordinated approach involving a multidisciplinary team and a multidisciplinary protocol to ensure everyone's safety. The purpose of the protocol is to provide local professionals with specific procedures to follow in situations where children are endangered as a result of secret methamphetamine laboratories or other drug production, trafficking, and abuse.

In early 2004, representatives from several county and state agencies created a work group to address the issues of methamphetamine laboratories and safety for the children and the professionals who investigate suspicions about these sites. Members of the work group included staff from county depart-

ments of social services; the State Division of Social Services; the Attorney General's Office; the State Bureau of Investigation; the State Division of Public Health; the University of North Carolina at Chapel Hill; the North Carolina Association of County Directors of Social Services; the State Department of Justice; and the State Division of Mental Health. The State Division of Social Services took the lead in writing a Drug Endangered Children policy for local departments of social services with the help of this work group. The policy became effective on January 1, 2005.

The policy requires that memoranda of agreement among the local multidisciplinary teams that respond to the laboratory sites include personnel from at least departments of social services, law enforcement, local management entities (formerly area mental health agencies), emergency management services, hospitals, county health departments, and hazardous material agencies. These agreements should be developed to formalize roles and relationships at the local level. A protocol for drug-endangered children that has been developed in accordance with local community requirements ensures that children who may be at risk for exposure to methamphetamine and methamphetamine laboratories receive protection, advocacy, and support.

A protocol for drug-endangered children that has been developed in accordance with local community requirements ensures that children who may be at risk for exposure to methamphetamine and methamphetamine laboratories receive protection, advocacy, and support.

Changes in the Standard Approach

In methamphetamine cases, departments of social services balance their standard approach to child welfare with the unique requirements of law enforcement and threats of violence. First, state law requires that an assessment by the child protective services unit be initiated within twenty-four hours for allegations of abuse, or seventy-two hours for allegations of neglect. "Initiation" is defined as face-to-face contact with the alleged victim within the prescribed time. Some situations require immediate initiation. For example:

- When a child under the age of six or a child limited by a disability is unsupervised
- When a sexual abuse report has been received and the alleged perpetrator has access to the child

The Drug Endangered Children policy states that social workers shall not visit a suspected or confirmed methamphetamine laboratory site without a law enforcement officer present, preferably an officer certified by the Drug Enforcement Administration. Because of the necessary coordination with law enforcement, the initiation standards of twenty-four and seventy-two hours may not always be possible. If the coordination with law enforcement causes the assessment by child protective services to be delayed, department of social services staff must record this fact.

Second, instead of interviewing children at school and then making a home visit to interview the parents or calling them to arrange a visit with the family, the social worker attends a briefing with law enforcement officers before the raid on the laboratory. The social worker then goes to the home with law enforcement officers but does not enter the laboratory site. In all assessments by child protective services involving methamphetamine laboratories, law enforcement officers take the lead.

Third, direct contact by departments of social services with the children begins after law enforcement officers have physically removed them from the site, assessed them for contamination, and decontaminated them, if necessary. If there is no need for on-site decontamination and the children do not require emergency medical treatment, the social worker is responsible for seeing that they receive a medical evaluation (which must include a urine sample to test for methamphetamine or other chemical exposure) and for locating safe housing for the children, which may be with suitable relatives or in foster care. The children are not allowed to remain in the home, even if the department of social services does not take custody, because of state law.[3] If the laboratory is located in the children's home, they may not leave the home with any of their clothes, toys, stuffed animals, shoes, and other personal belongings. Departments of social services are responsible for having a change of clothes for the children at the scene. If the children are placed in foster care, departments of social services also are responsible for replacing their clothes and other belongings. If the children are placed with relatives, departments of social services should assist in any way possible to provide the relatives with clothing for the children.

Conclusion

Children's involvement in the methamphetamine problem shows the necessity of prompt action to protect children, the complexity of interagency cooperation, and the social worker's role in identifying suspicious signs that can lead to a methamphetamine laboratory investigation. North Carolina recognizes the dangers that children face from exposure to methamphetamine use and laboratories, and the state is making efforts to address these dangers as quickly as possible.

Notes

1. E-mail from Van Shaw, Assistant Special Agent in Charge, Clandestine Laboratory Response Program, N.C. State Bureau of Investigation, to author (July 13, 2005).
2. *Id.*
3. Section 130A-284 of the North Carolina General Statutes states, "[F]or the protection of the public health, the [North Carolina Commission for Health Services] shall adopt rules establishing decontamination standards to ensure that certain property is reasonably safe for habitation . . . The contaminated property shall not be occupied prior to decontamination of the property in accordance with these rules."

Law Enforcement's Response to the Spread of Methamphetamine Use

F. R. Hetzel

Methamphetamine production is growing at an astounding rate in North Carolina. In 1999 the State Bureau of Investigation (SBI) identified and closed down only 9 "clandestine laboratories" (sites where methamphetamine is illegally manufactured, or "cooked") in widely scattered parts of the state. By 2004 the number of clandestine laboratories busted per year had reached 322. They were concentrated in western North Carolina but had spread to many more parts of the state. Through October 26, 2005, the SBI had taken 280 actions against laboratories (see Figure 1). The number is running about 25 percent higher than for the same period in 2004 (see Table 1).

Nationally there were almost 16,000 busts in 2004. That compares with 912 in 1995, according to the U.S. Drug Enforcement Administration.[1]

This article characterizes North Carolina's methamphetamine problem from a law enforcement perspective. It also describes the steps that law enforcement agencies have taken to address the problem.

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The Nature of the Problem

Most methamphetamine producers have been found in rural areas. "The drug is often manufactured in rural areas to hide its pungent smell, increasing its threat in Western N[orth] C[arolina], a region that has dealt with the bulk of the meth lab busts in the state," writes reporter Lindsay Nash of the *Asheville (N.C.) Citizen-Times*.[2] This fact helps explain the large number of raids in the more mountainous areas of the state—for example, 56 in McDowell County and 35 in Rutherford County so far in 2005.

However, the methamphetamine scourge is spreading from west to east. To date in 2005, Sampson County has seen eleven busts, and labs have been found in Brunswick, Carteret, Craven, Duplin, Johnston, Pitt, and Wayne counties.

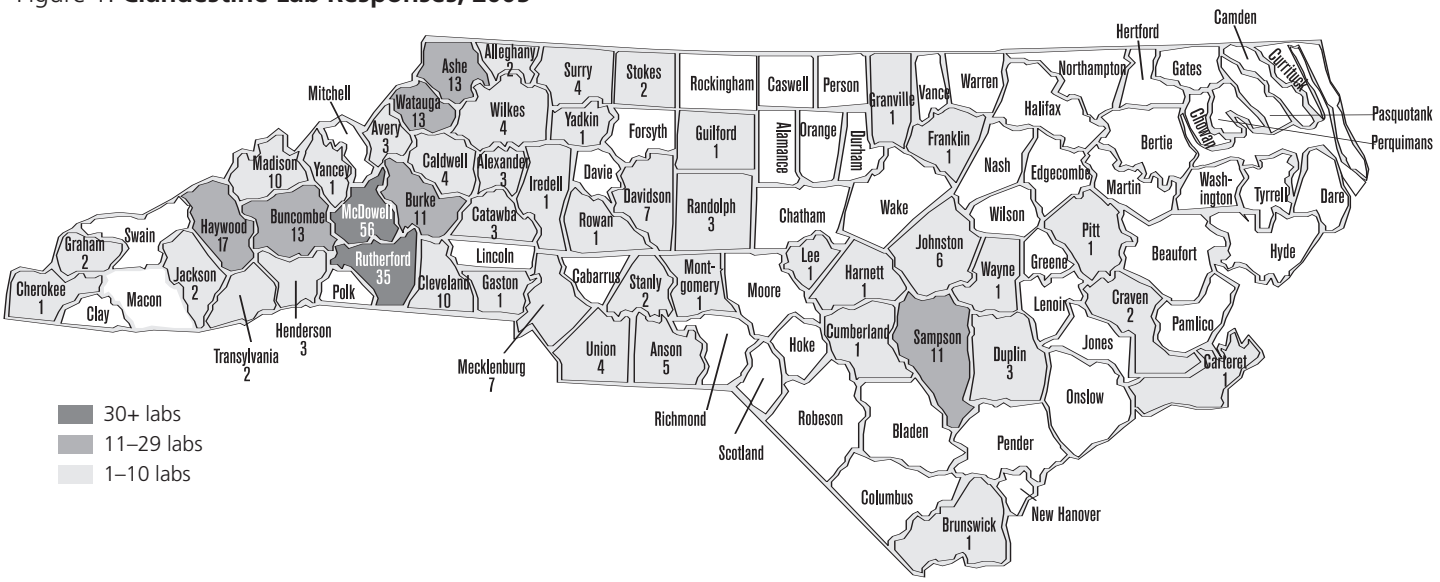
Methamphetamine production is not limited to rural areas, though. Attorney General Roy Cooper notes that labs have been discovered in Raleigh and Greensboro. "'We have found them in hotel rooms, cars and apartment complexes,'" he says.[3]

Unlike large-scale operations in states like California and Georgia, "[i]n Western N[orth] C[arolina], the meth manufacturers operate on a small scale," writes reporter Nash. "They're making the drug for themselves, and then selling whatever is left to other users to foot their bill."[4] This makes methamphetamine manufacturing unique in law enforcement investigation and arrest: a single methamphetamine cook is actually the kingpin of an operation, rather than just one of many operators in a drug ring. Methamphetamine cooks and their criminal associates frequently have close-knit relationships forged through lifetimes of living in the same rural area and through family ties. The cooks themselves teach others how to manufacture methamphetamine. Unlike the case with any other drug, with methamphetamine it is beneficial to a cook to have other cooks in the area. The cooks share chemical ingredients and at times assist one another in manufacturing the drug. Because of this clannishness, undercover operations are extremely difficult.

Another challenge is the relatively cheap production of methamphetamine from common ingredients. "[Its cheapness] makes it sometimes called 'the poor man's cocaine,'" says Nash.[5]

The most important ingredient is a cold medicine that contains pseudoephedrine, without which the methamphetamine cannot be manufactured. All the other materials to make methamphetamine have ready substitutes. For example, solvents allow the chemical

Figure 1. **Clandestine Lab Responses, 2005**



Source: Clandestine Laboratory Response Unit, N.C. State Bureau of Investigation.

reaction to take place. One methamphetamine cook may use Coleman fuel, and another may use acetone, ether, methanol, or toluene. All the solvents can be found in hardware stores or large retail stores.

At the very beginning of a user's addiction to methamphetamine, he or she still will appear normal and be able to function normally in society. However, once a person is caught in the cycle of manufacture and use, all things, including his or her own children, become secondary at best. Law enforcement officials often find proof of this at clandestine laboratories, where the hazardous chemicals used are within arms' reach of small children. When dismantling the laboratories, law enforcement officers frequently discover that the cook has a gas mask and protective gloves, but they never find any protective gear for the children. (For more information about the effects of methamphetamine production on children, see the article on page 28.)

White blue-collar males traditionally have used the drug. However, it increasingly is becoming a choice for diverse groups, including people in occupations that demand long hours, mental alertness, and physical endurance.[6]

"We know that anyone in any demographic group can get hooked on this drug because it is the most highly addictive drug out there," says Attorney General Cooper.[7] However, in the United States, the most affected group now appears to be white females between the ages of nineteen and thirty-five, followed by white males in the same age range. These statistics hold true for North Carolina.[8]

Methamphetamine users experience many physical and psychosocial debilitations (see the article on page 24). Among the long-term health effects is exposure to various communicable diseases, most commonly HIV/AIDS, herpes, hepatitis, and tuberculosis. Many sexually transmitted diseases are associated with methamphetamine addiction because of the promiscuous and often rampant sexual activity accompanying its use. During searches of methamphetamine laboratories and users' dwellings, I routinely find massive amounts of pornography. Like the chemicals, the pornography almost always is within arms' reach of children.

Table 1. **Methamphetamine Laboratories Discovered in North Carolina, by Month, 2002–2005**

	2002	2003	2004	2005
January	NA	13	20	26
February	NA	11	28	38
March	NA	12	33	42
April	NA	18	33	46
May	NA	14	22	34
June	NA	12	30	18
July	NA	17	31	24
August	NA	16	20	27
September	NA	20	21	12
October*	NA	20	34	13
November	NA	17	23	
December	NA	7	27	
Total	**98**	**177**	**322**	**280**

Source: Clandestine Laboratory Response Unit, N.C. State Bureau of Investigation.

Note: NA = not available.

*Figure for 2005 is as of October 26.

Law Enforcement's Response

Working with sheriffs, police chiefs, U.S. attorneys, local district attorneys, the U.S. Drug Enforcement Administration, and the federal Bureau of Alcohol, Tobacco, Firearms, and Explosives, the SBI has had an impact on the methamphetamine problem in North Carolina. Their efforts have several aspects: training and certification, investigations, prosecution and sentencing, special responses, and cost.

Training and Certification

The SBI has conducted two levels of training and certification: awareness and decontamination. At the awareness level of certification, it has trained about 10,000 local law enforcement officers, firefighters, and emergency medical service workers to detect the presence of a clandestine laboratory. Before the training, many of these personnel were dangerously unaware when they were in or near a clandestine laboratory. Now they can recognize one and call for a proper law enforcement response using the SBI. The training is somewhat responsible for the increases in methamphetamine laboratories discovered and enforcement actions taken against them.

At the decontamination level of training and certification, the SBI has been instrumental in ensuring that local law enforcement personnel in some of the most hard-hit counties become fully certified in Hazardous Waste Operations and Emergency Response (HAZWOPER). HAZWOPER is the only certification that authorizes law enforcement officers to work inside methamphetamine laboratories. To obtain the certification, law enforcement officers must attend a forty-hour course. They can take it through the U.S. Drug Enforcement Administration, the California Bureau of Narcotics Enforcement, or a private company such as Network Environmental Services. The course covers recognition and evaluation of hazards (chemical and physical), including toxicology, guidelines for exposure, field monitoring, and assessment and control. It includes some practical exercises in wearing and using personal protective equipment. The course is similar to and as intense as the Hazardous Materials Technician course used by fire departments across the country. Follow-up training is available, which includes a Confined Space Operator/Technician course.

The HAZWOPER certification enables officials of local departments to conduct preliminary investigations safely when the possibility of a laboratory exists at a location. It also enables

them to assist SBI forensic chemists in sampling substances and fully dismantling laboratories. In North Carolina, approximately 200 officers are certified, about half of whom are SBI agents.

Additionally the SBI is responsible for and conducts at its own expense a yearly recertification that includes about twenty hours of training. This class is required to maintain HAZWOPER certification.

Investigations

Investigations of sites commence on the basis of several kinds of suspicions. Sometimes the suspicion is as simple as a person's complaint about strange and strong chemical odors coming from a neighbor's residence or outbuilding. Other times, allegations of child abuse or neglect have led child protective services personnel to suspect methamphetamine use or production and report their suspicions (see the article on page 28). Occasionally, patrol officers answer a domestic disturbance call and, once in the residence, realize that they are in a methamphetamine laboratory. These situations are particularly dangerous to a patrol officer who has not had any awareness training. Trained patrol officers, experienced in dealing with methamphetamine users, often notice behaviors associated with the drug's use. Such behaviors include increased energy, overactive talking, tremors, and fidgeting. Dangerous aggressiveness, nervousness, irritability, and paranoia are additional behaviors attributed to the use of methamphetamine. Physiological symptoms can be seen in the user, including dilated pupils, excessive weight loss, tooth loss, sweating, chemical-type body odors, and open lesions on the skin.

"We know that anyone in any demographic group can get hooked on this drug because it is the most highly addictive drug out there," says Attorney General Cooper.

Investigations most often begin with a vehicle stop. Sometimes officers pull over a vehicle in the course of normal duties and discover that it contains items ranging from recently purchased precursor chemicals to a full-blown mobile methamphetamine laboratory. Other times officers stop a vehicle on the basis of an informant's tip that the occupants are transporting precursor chemicals to a cooking location.

Law enforcement personnel use information obtained from the occupants of such a vehicle, as well as information about the vehicle's owner, to discover the location of the stationary cooking operation. The occupants of the vehicles often have finished products on their persons as they obtain precursor chemicals for the next batch.

Prosecution and Sentencing

In northwestern North Carolina, local law enforcement officers in Ashe, Watauga, and Wilkes counties have joined with the SBI and the federal Bureau of Alcohol, Tobacco, Firearms, and Explosives to form a methamphetamine investigative task force. This combination of agencies, along with the U.S. attorney's office, has been an effective tool in the investigation and prosecution of methamphetamine cooks in that area.

Firearms have been a major factor in the prosecution and sentencing of the methamphetamine cooks and their criminal associates. A large majority of cooks are armed for a variety of reasons, including protection of their laboratories, protection during the sale of methamphetamine, and increased paranoia associated with the use of the drug. Their being armed has allowed for much stronger sentencing in the federal system.

As of December 1, 2004, stricter sentencing guidelines were established in North Carolina for the manufacture of methamphetamine. The offense has been raised to a Class C felony, with a sentencing range of 58–97 months. Additional time can be added to sentences if children are present in the laboratories or if a law enforcement officer is injured. An "active sentence" (time that must be served in a confined facility—for example, a prison) can range from 44 to 120 months depending on mitigating and aggravating circumstances involved in the case.

As stated earlier, the U.S. attorney's office in North Carolina, along with federal law enforcement agencies, is taking an active role in assisting with the prosecution of methamphetamine offenders. As the problem has grown, so has the state's combined response. The State Department of Social Services and the State Department of Health and Human Services have become involved in helping provide solutions.

Special Responses

Search and seizure operations are complex because of the chemical hazards that are encountered. Once an investigation has uncovered a methamphetamine laboratory, if a search warrant is to be executed, an SBI Special Response Team must execute it. The team members are all highly trained SWAT (Special Weapons and Tactics) operators as well as hazardous material technicians. Each member responds from a different area of the state to execute search warrants. Each member then returns to his or her assigned duty station and resumes normal responsibilities as a special agent.

One or two forensic chemists from the SBI must be deployed to the crime scene, usually from Raleigh. These chemists remove all hazardous and clandestine-laboratory-related items from the crime scene and take samples of evidence for analysis to prove chemically that precursor materials or finished methamphetamine is present. District SBI agents and certified local officers assist the chemists and conduct regular crime-scene-related duties at the laboratory. They also are responsible for interviewing suspects and conducting follow-up investigations.

SBI also deploys a site safety officer to the crime scene, to ensure that all activities are conducted safely.

Emergency workers must wear protective suits and masks. The consequences of not doing so can be serious. For example, as reporter Nash writes, "Watauga County volunteer firefighter Darien South nearly died while containing a fire in a meth lab in 2003. He lost half of his lung capacity from being exposed to the drug's fumes and now takes 10 to 12 medications a day to keep his oxygen levels up."[9]

North Carolina State Bureau of Investigation

Cost

The site safety officer keeps local fire and emergency medical personnel at the crime scene during all activities. This ties them up for 3–24 hours. The SBI provides all certified agents and officers with personal protective equipment at each scene. Doing so is very costly, the price of one disposable protective suit being about $12.50. The suits must be destroyed as hazardous waste after one use. The SBI purchases and maintains all air monitoring equipment, self-contained breathing apparatus, and vehicles specially equipped to respond to clandestine laboratories. The price of one vehicle is about $135,000. To keep up with the methamphetamine problem, North Carolina has had to purchase five such vehicles. Federal grants have assisted in some of these purchases.

Finally, a federally contracted hazardous waste disposal company is deployed to the crime scene. This company takes away the hazardous waste created from production of methamphetamine. The final cleanup can cost anywhere from $3,000 to $25,000, sometimes more, depending on the size of the laboratory.

The cost associated with the production of methamphetamine does not start or end with the final clean-up cost. Local law enforcement officers use a significant amount of overtime securing the laboratory crime scene until it can be properly processed. The SBI sends agents from the Special Response Team, forensic chemists, and district agents, all of whom will most likely use overtime while processing a crime scene. Local fire, emergency medical service, and rescue units all put time and equipment into the effort.

There never are large assets seized from the clandestine laboratories. Rarely do the methamphetamine cooks have any monetary assets, and all property assets are contaminated and considered unusable.

More Tools for Prevention and Enforcement

Methamphetamine use has spread so rapidly that tools for prevention and enforcement have lagged. Policy makers have taken some steps to help law enforcement agencies, but they need to take more.

As noted earlier, in 2004, penalties for producing methamphetamine and for endangering children by producing methamphetamine were increased (see page 33).

This year North Carolina state legislators restricted access to pseudoephedrine. According to an article in *USA Today*, as of April of this year, 11 states had placed limits on access to common over-the-counter medicines containing pseudoephedrine, and 20 states (North Carolina among them) were considering legislation to that effect. In May 2005, Lonnie Wright, director of the Oklahoma Narcotics Bureau, testified before the North Carolina Senate Judiciary Committee about the success of an Oklahoma law that places all pseudoephedrine and pseudoephedrine-combination products behind the pharmacy counter. The law also makes pseudoephedrine a substance that can be distributed only by a pharmacist, and it requires the purchaser to sign a log at the time of purchase. According to Wright, since 2004, when the state passed these restrictions, there has been an 80 percent decrease in laboratory seizures. Oregon saw a 50 percent drop after adopting similar restrictions in October 2004.

On August 31, 2005, the North Carolina General Assembly passed the Methamphetamine Lab Prevention Act of 2005.[13] Effective January 15, 2006, cold medicines in tablet or caplet form containing pseudophedrine may be sold only from behind a pharmacy counter. Unless otherwise ordered by the Commission for Mental Health, Developmental Disabilities, and Substance Abuse Services, any pseudophedrine product that is in the form of a liquid, a liquid capsule, a gel capsule, or a pediatric product is exempt from this restriction and may continue to be directly accessible to consumers.

The law requires retailers to record information about each purchaser of pseudoephedrine on a form developed by the state. The form must be compatible with electronic data entry. Sales records must be maintained for two

years from the date of sale, and information about the sale and the purchaser must be accessible to law enforcement officers within forty-eight hours of the time of the transaction.

Finally, the law establishes a Legislative Commission on Methamphetamine Abuse, which will examine a variety of issues related to methamphetamine precursors, abuse, and production. Its first report was due to the General Assembly by November 1, 2005.

A few retailers already have restricted access. Target, the nation's second-largest discount retailer, has pulled many cold medicines from regular shelves and now sells them only behind pharmacy counters. About 60 percent of Wal-Mart stores have placed the most abused medications behind the counter. Wal-Mart plans to move all products in which pseudoephedrine is the single active ingredient behind pharmacy counters. Walgreen and Kmart already limit sales to two packages per customer per transaction.[14]

Notes

1. Lindsay Nash, *Meth: The Rural Plague*, ASHEVILLE (N.C.) CITIZEN-TIMES, Apr. 24, 2005.
2. Lindsay Nash, *Meth: "A Drug That Ruins Lives*," ASHEVILLE (N.C.) CITIZEN-TIMES, Apr. 25, 2005, at A4.
3. Lindsay Nash, *Attorney General Takes Aim at State's Meth Problem*, ASHEVILLE (N.C.) CITIZEN-TIMES. Apr. 24, 2005, at A7.
4. Nash, *Meth: "A Drug That Ruins Lives*," at A4.
5. Nash, *Meth: The Rural Plague*, at A7.
6. Nash, *Meth: The Rural Plague.*
7. *Id.* at A7.
8. JAMES M. VALLE, SUMMARY RESULTS OF THE METHAMPHETAMINE LAB COOKERS SURVEY, JUNE 2001–2002 (Los Angeles: Inland Narcotics Clearinghouse, Jan. 2003).
9. Lindsay Nash, *Who's in Danger?* ASHEVILLE (N.C.) CITIZEN-TIMES, Apr. 24, 2005, at A1.
10. Lonnie Wright, Director, Oklahoma Narcotics Bureau, Testimony Before the North Carolina Senate Judiciary Committee (May 2005).
11. Larry Copeland, *States Limiting Sale of Cold Remedies*, USA TODAY, Apr. 26, 2005.
12. *Id.*
13. Methamphetamine Lab Prevention Act of 2005, SL 2005-434.
14. Larry Copeland, *States Hope Laws Will Curtail Meth Labs*, USA TODAY, Apr. 26, 2005.

Public Health's Front Line on the Methamphetamine Problem

Danny Staley

Consistent with the nationwide trend of methamphetamine laboratories moving gradually from the West to the East, western counties in North Carolina were the first to encounter the problem. In Watauga County we discovered our first methamphetamine laboratory in 2002. In 2004, law enforcement officials identified 34 laboratories in Watauga County and 15 more in the other two counties (Allegheny and Ashe) served by our district health department.[1]

When the public health department was called in to help, it had no state laws, regulations, guidelines, or recommendations. No one else in the state had experience with the kinds of complex issues that we were facing. Among other challenges we had to develop new expertise in the environmental impact of methamphetamine, learn how best to help the children affected by methamphetamine laboratories, and evaluate and respond to the potential risks to our own lives and health. This article discusses our experience with these three challenges.

In the near future, we want a close scientific review of the regulations' implementation, to ensure that they go far enough in addressing the department's and the public's concerns about the safety of the property.

Environmental Impact

After a methamphetamine laboratory has been discovered in a house, a hotel, or another building, community members have asked, "When is it safe to enter the building again?" They have turned to us for answers. We initially had little to guide us. We consulted with professionals who cleaned up hazardous waste sites and crime scenes. We consulted with officials in states west of North Carolina to learn how they were dealing with cleanup. Ultimately we collaborated with the State Division of Public Health to develop some initial cleanup recommendations.

The regulations discussed in J. Steven Cline's article followed a few years later (see page 24). They provide each local health department with some flexibility regarding its level of oversight in cleanup. We still are trying to determine the impact of these new regulations at the local level. In the near future, we want a close scientific review of their implementation, to ensure that they go far enough in addressing the department's and the public's concerns about the safety of the property.

One of our greatest challenges was to respond to community concerns and the demand for information. Our environmental health staff was bombarded with questions. To keep the public informed about potential contamination, we instituted a system of posting a placard on contaminated property. Once we post a property, we add it to a roster of such properties. This roster serves several important purposes: it allows us to track the cleanup of each property; it provides valuable data as we try to evaluate trends and conduct epidemiological studies; and it allows us to keep the community informed about the habitability of properties within our jurisdiction. Although the system is resource-intensive, it has helped us meet some of the community's expectations and apply the science and art of public health to an emerging problem.

Help for Children

Perhaps the most innocent victims in the methamphetamine epidemic are children.

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As discussed elsewhere in this issue (see page 28), children must be removed from homes with laboratories, and they may not take anything with them, not even a favorite doll or blanket. The public health community is part of the team that follows up with these children once they have been removed from their homes.

Within twenty-four hours of removal, every child is taken to the emergency department of a local hospital for a complete medical history and physical examination. As part of the examination, the child undergoes a developmental assessment (to determine whether he or she has reached certain milestones), a neurological screening (to ascertain the status of the child's brain and nervous system functioning), an evaluation of various systems (circulatory, respiratory, digestive, etc.), and an assessment for abuse and neglect. Proper follow-up and referral are expected to occur within thirty days.

Many of the children need medical attention or other assistance from the public health system. For example, quite a few have asthma and other physical conditions. Others need to be connected with public health professionals to receive comprehensive developmental assessments as well as services to help them get back on track developmentally. Often we make the connections through the Child Service Coordination program, which provides education, guidance, and links to community resources to assist caregivers in addressing delays in development.

In addition to the services and the support that these children receive from local governments, they have gotten a significant amount of help from the community as a whole. Many community members have donated clothes and toys to the department of social services for children removed from homes where methamphetamine was produced. Numerous churches and community groups have picked up on the "shoebox gifts" concept and put together "meth boxes" for children in need. Every donation helps.

Safety

As a department head, I have been concerned about the safety of my department's staff as they enter properties once used as methamphetamine laboratories. At the beginning of this epidemic, little information was available regarding the risks to the health of our front-line staff. We took precautions, but we realized that we needed to educate ourselves as much as possible, not only to help the community but to protect ourselves.

After learning the basics, we developed comprehensive policies governing staff visits to private homes. We have learned more over time, but my staff, staff of the local social services agencies, and others still have significant concerns about their exposure to the ingredients and by-products of methamphetamine production.

Conclusion

The three challenges that I have discussed highlight some of the impacts that the methamphetamine epidemic is having on the local public health community. To respond appropriately, we must seek new funding, redirect the efforts of some of our staff, and develop expertise in this complex and evolving area. We recognize that the methamphetamine epidemic is a critical problem in our state and that public health plays an important role. We will continue to work with our partners in law enforcement and social services to serve our communities as well as we can.

Our state has recognized the seriousness of this issue by stepping up enforcement, increasing criminal penalties for manufacturers, and adopting regulations governing cleanup. In the near future, I hope that we will have even more tools available to crack down on this emerging problem. If local communities can work with the state to get this epidemic under control, we will be able to direct our attention to the many other pressing concerns facing our citizens.

Note

1. *See* N.C. State Bureau of Investigation, 2004 Clandestine Lab Responses (as of December 31, 2004), available at http://sswnt7.sowo.unc.edu/fcrp/Cspn/vol10_n2/SBI_maps_2001-2004.pdf.