



Mercury Facts

Significance of Inorganic Mercury (Hg) in the United States

CAS # 7439-97-6

Mercury is a naturally occurring metal which has several forms. At room temperature, metallic mercury is a heavy, shiny, silver, odorless liquid. When heated, mercury becomes a colorless, odorless gas. Metallic mercury is used to produce chlorine gas and caustic soda. Mercury is also used in thermometers, dental fillings, batteries and switches.

Mercury Releases in North Carolina

The information in this report was collected by staff in the North Carolina Hazardous Substances Emergency Events Surveillance (HSEES) Program. Mercury releases in North Carolina have resulted in injuries and hospitalizations (Table 1). Some examples of mercury releases in N.C. include:

- *A group of children found a small baby food jar of mercury. They spilled the contents, causing several children and adults to be contaminated with mercury. All were transferred to a local medical facility for evaluation.*
- *A nurse was decontaminated after a wall-mounted blood pressure unit was broken and mercury was released onto her hands. She was not injured, but the mercury destroyed her wedding ring.*
- *Old mercury-containing switches at a water treatment plant leaked. No one was injured or required decontamination, but contaminated soil was removed and disposed of properly.*
- *An airline passenger had one pound of mercury packed in his luggage. During baggage handling, the luggage was dropped and the container of mercury was broken. Fifteen employees had to be decontaminated, and five were taken to the hospital and treated for skin irritation.*

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Of the 21 mercury releases that occurred between 1993 and 2001 in North Carolina, 20 (95%) occurred in fixed facilities and one (5%) took place in transit. Most of the fixed-facility events resulted from unintended releases involving either material handling or above-ground storage vessels.

Efforts to identify the factors contributing to chemical releases were initiated in mid-1995. Since then, human error (N=8, 42%) and equipment failure (N=4, 21%) have been cited as the major contributing factors, responsible for 63% (12) of the 19 mercury events for which this information is available. The 21 events occurring between 1993 and 2001 are summarized in Table 1. Table 2 lists the types of industries involved in mercury releases. Locations of mercury releases are shown in Map 1.

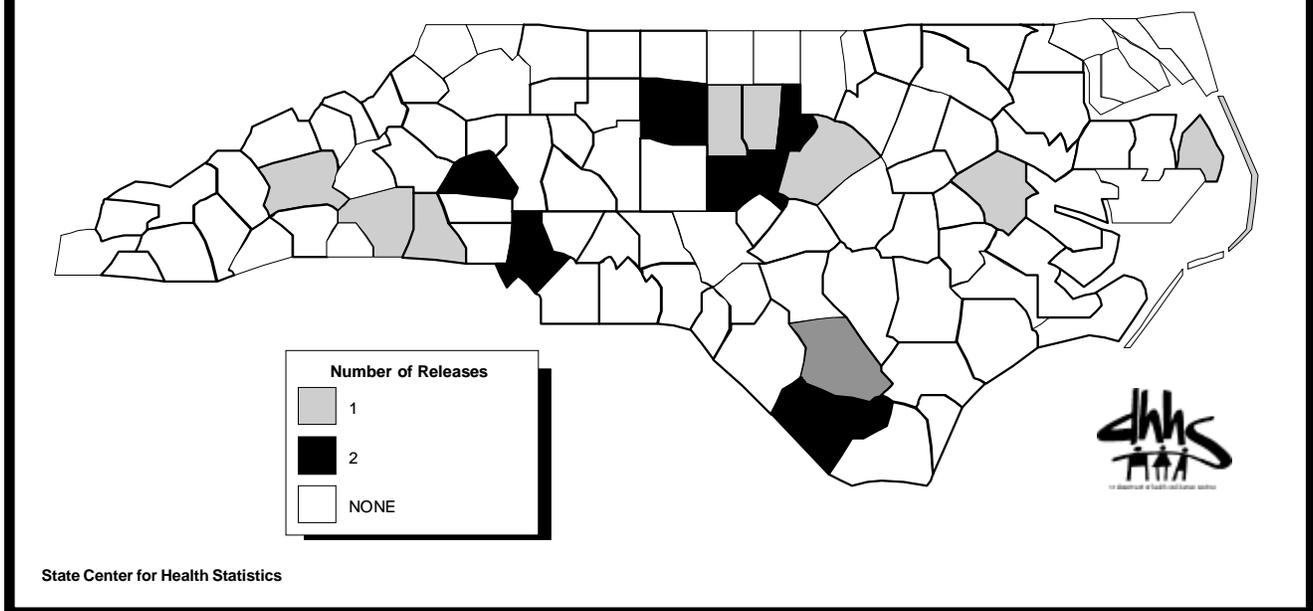
Table 1: Summary of HSEES Data on Mercury Releases in North Carolina, 1993-2001

Data	No.
Number of mercury releases spills	21
Number of events involving victims	1
Number of victims	5
Types of injuries	
▪ Skin irritation	5
Range of amounts released (pounds)	>1 to 5
Events with decontamination	
▪ No. of events with general public decontaminated	5
▪ No. of events with employees decontaminated	20
Number of events following a contingency/preparedness plan	21
Type of response	
▪ HAZMAT/response team's standard operating procedure	11
▪ Company's operating procedures	4
▪ Incident-specific	4
▪ Other	1
▪ Unknown	1
Total	21

Table 2: Industries Involved in Mercury Releases in North Carolina, 1993-2001

Type of N.C. Industry Releasing Mercury	No. of Events	Percentages
Air transportation	2	9.5
Schools – Elementary, secondary, colleges and universities	3	14.3
Hospitals	5	23.8
Industrial and miscellaneous chemicals	2	9.5
Nursing and personal care facilities	3	14.3
Other	6	28.6
Total	21	100

Map 1: Location of Mercury Releases across North Carolina, 1993-2001 (N = 21)



Common Routes of Mercury Exposure

- **Inhalation.** Mercury may enter the body through the respiratory system. Serious respiratory disturbances result from inhalation exposure to mercury.
- **Contact with the Skin.** Mercury can irritate the skin. Mercury may also be absorbed through the skin.
- **Contact with the Eyes.** Mercury or mercury vapor can be absorbed into the body through the eyes. Mercury may irritate the eyes.

Acute Health Effects of Mercury Exposure

Acute exposures to high levels of mercury can cause headaches, nausea, diarrhea, cough, chest pains, chest tightness, and difficulty breathing depending on the route of exposure. Exposure to high levels of mercury damages the brain, kidneys and developing fetus. Liquid mercury may irritate the skin.

Chronic Health Effects of Repeated Exposure to Mercury

Effects develop gradually with chronic low-level exposure. Fine tremors of the hands, eyelids, lips and tongue are often signs of chronic mercury liquid or vapor exposure. Psychic disturbances such as insomnia, irritability and indecision may occur. Headache, excessive fatigue, anorexia, digestive disturbances, and weight loss are common. Skin rashes, sores in the mouth, sore and swollen gums, loose teeth, and excess salivation may also occur with repeated exposures to mercury liquid or vapor.

Proper Handling and Storage Procedures for Mercury

Before working with mercury, individuals should be trained in its proper handling and storage and know how to use proper personal protective equipment.

Mercury should be stored in a cool, dry, well-ventilated area in tightly sealed containers protected from exposure to weather and physical damage. Mercury is incompatible with acetylenes, ammonia, ethylene oxide, chlorine dioxide, azides, metal oxides, methyl silane, lithium, rubidium, oxygen, strong oxidants, and metal carbonyls. Contact with these substances may produce hazardous vapors or form solid products that are sensitive to shock, which can initiate fires of combustible materials. Mercury may also attack copper and copper alloy materials.

Personal Protective Equipment

- **Clothing**

Avoid skin contact with mercury. Wear impervious clothing, boots, and protective gloves.

- **Eye Protection**

Employees should use a minimum eight-inch face shield or chemical safety goggles when there is any possibility of mercury exposure.

- **Respiratory Protection** (respirators)

Engineering controls should be implemented to reduce environmental concentrations to the OSHA permissible exposure level (0.1 mg/m³). Respirators with a mercury vapor or chlorine gas cartridge should be used when engineering and work practice controls are not feasible or are being installed. Respiratory protection should be approved by NIOSH or the Mine Safety and Health Administration and used in accordance with the OSHA Respiratory Protection Standard, 29 CFR (Code of Federal Regulations) 1910.134. Respirator use must be limited to individuals who have been medically cleared, adequately trained, and fitted for the respirator face-piece.

First Aid Management

Prompt action is essential if there is a mercury spill. If a mercury spill occurs, take the following actions:

- **Breathing**

If mercury is inhaled, move the person to fresh air at once. If breathing stops, perform artificial respiration. Keep the affected person warm and resting. Seek medical attention immediately.

- **Eye Exposure**

Wash eyes immediately with large amounts of water for at least 15 minutes, lifting the upper and lower lids. Seek medical attention immediately. Contact lenses should not be worn when working with mercury.

- **Skin Exposure**

Skin contaminated with mercury should be flushed with soap and water for at least 15 minutes. If irritation persists after washing, seek medical attention.

- **Swallowing**

If a person has swallowed mercury, do not induce vomiting. Rinse out the mouth with water and seek medical attention by contacting a physician or calling the poison control center (1-800-222-1222).

Spill Management

Small Spills (Less than 10 grams [a pool about the size of a quarter])

- Prevent the mercury from spreading with towels or tissues.
- Remove contaminated clothing or shoes and place in a trash bag.
- Evacuate and restrict people from the area of the mercury release.
- Do **NOT** use household vacuum cleaners for cleanup.
- Do **NOT** use a broom or paint brush for cleanup as this will break the mercury beads and cause them to spread.
- Do **NOT** use household cleaning products to clean the spill. Many products contain chemicals that react with mercury and cause a toxic gas to form.
- Collect the spilled material for reclamation using commercially available mercury vapor depressants, sulfur compounds to coat and make an amalgam of the spilled mercury, or specialized vacuum cleaners.

Useful Items for Small Spill Cleanup
<ul style="list-style-type: none">▪ Commercially available “Mercury Spill Kit” or▪ Rubber squeegee▪ Plastic dust pan▪ Plastic trash bags▪ Zipper-shut plastic bags▪ Wide-mouth plastic container with tight lid▪ Large tray or box▪ Facial tissues, toilet paper, or paper towels▪ Eye dropper▪ Index cards, playing cards, or other disposable heavy paper▪ Plastic wrap▪ Sulfur powder▪ Zinc or copper flakes▪ Tape (for picking up very small particles)

Large Spills (More than one pound or two tablespoons)

- Untrained persons or those without proper personal protective equipment and clothing must not enter areas until the mercury spill has been cleaned up.

- For large spills of more than one pound (two tablespoons), notify the National Response Center at **1-800-424-8802** and your local emergency planning committee (LEPC) of the spill.
- A professional should handle the clean-up procedure for large mercury spills.
- Evacuate and restrict people from the hazardous area of a mercury release.
- Ventilate contaminated area to the outdoors.
- To prevent evaporation of the mercury, lower the room temperature.

North Carolina HSEES Program

The North Carolina Department of Health and Human Services - Division of Public Health studies and describes the public health effects associated with releases of hazardous substances such as mercury, as part of the Agency for Toxic Substances and Disease Registry's (ATSDR) Hazardous Substances Emergency Events Surveillance (HSEES) system. North Carolina is one of 16 participating states. Data are analyzed to determine trends and areas for prevention. The information is then used to develop ways to protect health and prevent or minimize hazardous substance releases.

The HSEES staff is notified about spills by several sources. The primary sources of information are the N.C. Division of Emergency Management, the U.S. Coast Guard's National Response Center, and the U.S. Department of Transportation's Hazardous Materials Information System (HMIS). To gather specific information about each spill, staff contact local emergency management personnel, fire department personnel, emergency medical personnel, and/or industry representatives.

To plan appropriate prevention strategies, we rely on accurate and timely reporting. If you are contacted about a hazardous chemical spill, please answer the questions as precisely and accurately as possible. The information you provide is critical to preventing future spills and reducing the risk of injury to employees, responders and the public. Contact the N.C. HSEES Program at 919-733-1145 or visit our web site at www.schs.state.nc.us/epi/oii/hsees.html.

Resources and Information

Occupational Safety and Health Administration (OSHA)

OSHA provides specific information about proper handling, storage, and safety and health management of mercury. Publications can be obtained by written request or through the OSHA web page.

OSHA Publications Office

200 Constitution Avenue NW
 Room N3101
 Washington DC 20210
 (202) 219-8151
www.osha.gov

North Carolina OSHA

4 West Edenton St
 Raleigh NC 27601-1092
 (919) 807-2860
www.dol.state.nc.us/osha/osh.htm

National Institute of Occupational Safety and Health (NIOSH)

NIOSH Publications
 4676 Columbia Parkway, Mail Stop C-13
 Cincinnati OH 45226-1998
 1-800-35-NIOSH (1-800-356-4674)
<http://www.cdc.gov/niosh/homepage.html>

Environmental Protection Agency (EPA)

Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington DC 20460
(202) 260-2090
www.epa.gov

Region IV EPA (includes North Carolina)

Atlanta Federal Building
61 Forsyth Street, SW
Atlanta GA 30303-3104
(404) 562-9900
1-800-241-1754

North Carolina Department of Health and Human Services Occupational and Environmental Epidemiology Branch

HSEES Program
1912 Mail Service Center
Raleigh NC 27699-1912
(919) 733-3410
www.schs.state.nc.us/epi/oii/hsees.html

References

U.S. Department of Health, Education, and Welfare. Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health. Occupational Diseases - A Guide to Their Recognition. Ed. Marcus M. Key, M.D., et al. Washington, D.C.: DHEW (NIOSH), 1978.



State of North Carolina ▪ Michael F. Easley, Governor
Department of Health and Human Services ▪ Carmen Hooker Odom, Secretary
Division of Public Health
<http://www.dhhs.state.nc.us/dph>

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