

## **Environmental Health Nursing Case Studies**

### **Study #1: Chemical Plant**

#### **Observed Indications of Potential Problems**

A chemical plant operates on the outskirts of town, on the river's edge. It operates 24 hours a day and has two large smoke stacks. Community members observe several tanker trucks with hazardous materials placards arriving at the plant on a regular basis. There are also railroad tanker cars that deliver chlorine gas to the plant. Next to the chemical plant is an abandoned industrial site. Fifty-five gallon drums have been left next to one of the outbuildings. Periodically young boys from the neighborhood ride their bikes on this site.

#### **Concerns Expressed by Community Members**

- What chemicals are being transported through the community en route to and from the plant? What are the health risks associated with those chemicals?
- What are the occupational exposures for those who work in the plant? What are the risks associated with those exposures?
- What air pollutants are in the emissions from the smoke stacks? What are the health risks associated with those pollutants?
- Is the river in jeopardy because of its proximity to the plant? Should children swim in the river?
- What is in the abandoned industrial site? Are there any remaining hazards about which the community should be concerned?

#### **Assessment**

What information about potential health risks are you able to find from the resources cited below, or other resources? (When necessary, use your own zip code to practice using the database.) What information is missing? What would be possible approaches to obtaining further information?

For the purposes of this project, assume that you have determined that the smoke stacks are emitting cadmium and hexachlorobutadiene, and the tanker trucks are carrying trichloroethylene. The drums in the abandoned industrial site used to contain PCB's (polychlorinated biphenyls).

#### **Planning and Intervention**

Based on your research and assessment, write a brief report for the community members. Explain the basic concepts of risk and risk assessment. Give them the information that you have found related to their concerns, citing and describing your sources. You'll have to be a little creative to do this; for example: "The Toxics Release Inventory, a computer database of the federal Environmental Protection Agency, was consulted and revealed that cadmium was being emitted from the smoke stacks from this plant..." Make suggestions to them for next steps. What further information do you think they need, and how can they get it? What steps do they need to protect their health? How would they approach these issues? Who in the community might be of assistance?

## Internet Resources

*Note: Any research should include a literature search of professional journals. You may wish to use PubMed and other resources at [www.toxnet.nlm.nih.gov](http://www.toxnet.nlm.nih.gov), or perform a search at your school library.*

### *Local sources of pollution:*

- Environmental Protection Agency – [www.epa.gov](http://www.epa.gov) (see “Where You Live”)
- Environmental Protection Agency – Toxics Release Inventory (TRI): [www.epa.gov/tri](http://www.epa.gov/tri)
- Agency for Toxic Substances and Disease Registry (ATSDR): [www.atsdr.cdc.gov](http://www.atsdr.cdc.gov) (see “Hazardous Waste Sites”)

### *Specific chemicals:*

- Agency for Toxic Substances and Disease Registry (ATSDR): [www.atsdr.cdc.gov](http://www.atsdr.cdc.gov) (see “ToxFAQ’s” and “Toxicological Profiles”)
- National Library of Medicine – TOXNET: [www.toxnet.nlm.nih.gov](http://www.toxnet.nlm.nih.gov)
- National Institute of Environmental Health Sciences (NIEHS): [www.niehs.nih.gov](http://www.niehs.nih.gov) → National Toxicology Program → Chemical Health and Safety Information)

### *Risk assessment:*

- Environmental Protection Agency (EPA) – Integrated Risk Information System (IRIS): [www.epa.gov/IRIS](http://www.epa.gov/IRIS) (see “Introduction”)
- National Library of Medicine – Toxicology Tutorial: [www.sis.nlm.nih.gov](http://www.sis.nlm.nih.gov)

### *Transportation of hazardous materials:*

- U.S. Department of Transportation (DOT) Office of Hazardous Materials Safety: [www.hazmat.dot.gov](http://www.hazmat.dot.gov) (search information on “placards” under Rules and Regulations [Section 172.504] and Training Modules)

### *Occupational Exposures:*

- University of Vermont Safety Information Resources Inc. – Material Safety Data Sheets (MSDS): [www.hazard.com/msds](http://www.hazard.com/msds)
- National Institute of Occupational Safety and Health (NIOSH): [www.cdc.gov/niosh](http://www.cdc.gov/niosh)
- Occupational Safety and Health Administration (OSHA): [www.osha.gov](http://www.osha.gov)
- National Library of Medicine – HazMap: [www.sis.nlm.nih.gov](http://www.sis.nlm.nih.gov)

***This case is from the Kellogg Faculty Development in Environmental Health Workshop materials. The case study was developed at the Environmental Health Education Center of the University of Maryland School of Nursing. For more information, see [envirn.umaryland.edu](http://envirn.umaryland.edu).***