Environmental Health Nursing Case Studies
Study #4: Pesticides

Observed Indications of Potential Problems

Sangus County is rural and agricultural. Most farming operations in the area utilize pesticides and fertilizers. The pesticides include insecticides for insect control, and herbicides for weed control. As public health nurses, you have been alerted by farmer friends and the local League of Farmers' Wives about problems associated with pesticide application. Several emergencies have occurred recently in which migrant farm workers were burned from exposure during pesticide applications. The League of Farmers' Wives suspects that the burns were associated with improper mixing of pesticides, which created mixtures that were too concentrated, as well as unsafe spraying and returning to sprayed fields too soon. Other workers have complained of headaches, nausea and breathing difficulties which their supervisors attributed to heat stress.

Because of low education and language barriers, many farm workers and pesticide applicators are unable to read and understand pesticide labels. A telephone survey of farm supply companies in Sangus County revealed that personal protective equipment (such as overalls, long-sleeve shirts and chemical-resistant gloves) was not stocked because there was no market for the equipment.

Concerns Expressed by Community Members

- What are the health effects of pesticides? Is it likely that the burns were associated with pesticide application? How about the headaches, nausea and breathing difficulties?
- What can farmers and workers do to decrease the risks associated with pesticide use? Are there laws and guidelines available? If so, where? Is material available in Spanish?
- Are there possible problems with pesticides and fertilizers getting into drinking water? If so, what can community members do about it?

Assessment

What information about potential health risks are you able to find from the resources cited below, or other resources? What information is missing? What would be possible approaches to obtaining further information?
(Assume that you have found out that the pesticides being used are: paraquat, acephate and carbaryl.)

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. 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 take 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, or perform a search at your school library.

Local sources of pollution:

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

Specific chemicals:

- Agency for Toxic Substances and Disease Registry (ATSDR): www.atsdr.cdc.gov (see "ToxFAQ's" and "Toxicological Profiles")
- National Library of Medicine – TOXNET: www.toxnet.nlm.nih.gov
- National Institute of Environmental Health Sciences (NIEHS): 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 (see "Introduction")
- National Library of Medicine – Toxicology Tutorial: www.sis.nlm.nih.gov

Pesticides (including regulations, worker protection):

- Environmental Protection Agency (EPA): www.epa.gov/pesticides (see "Safety Programs": Worker Protection, Pesticide Poisoning Handbook)
- National Pesticide Information Center and Extoxnet: www.ace.orst.edu

Fertilizers:

- Environmental Protection Agency (EPA): www.epa.gov/seahome → agriculture/fertilizer storage and handling

Nitrates:

- Centers for Disease Control and Prevention (CDC): www.cdc.gov (search "nitrate")
- University of Nebraska: www.ianr.unl.edu (search "nitrate and drinking water")

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.