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The Invisible Environment Fact Sheet Series

Understanding Environmental Risk

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People take risks every day. Even crossing the street on the way to the grocery store or driving to work involves an element of risk. People consider these risks worth taking and these are part of daily routines.

The term “environmental risk” refers to the likelihood, or probability, of injury, disease, or death resulting from exposure to a potential environmental hazard. This fact sheet discusses ways to assess risks and make decisions that minimize risks while maximizing benefits.

Factors that Affect How People Perceive Risks

Certain conditions affect the way an individual perceives risks. Understanding these factors helps us make good decisions.

Source of the Information

It is always important to determine whether the source of the information is credible. For example, suppose an industry spokesperson encourages a community to cooperate with plans to build a waste incineration plant in the vicinity by stressing that the plant will generate employment. An environmentalist might present it differently by emphasizing the negative effects the smokestack fumes will have on the same community, and the potential for greater incidence of cancer. A news reporter might hype the risks to sensationalize the story to grab viewer interest. Clearly, different people may present the same risk differently depending on their stake in the issue.

Presentation of Risks

Information may also be framed in a manner that leads to misperceptions about the actual risk. For example, while describing a solution to a problem, simply presenting the

same information using a positive frame, such as “benefits gained,” instead of using a negative frame, such as “costs involved,” can affect people’s perception of the situation. In addition, words like “cancer” and “death” inherently evoke fear and thereby distort risk perception, even if the actual possibility of occurrence is very small. This is often the basis of poor risk perception.

Use of Data

The use or misuse of statistics and technical jargon is an important factor in the way we perceive the risk involved in a situation. When technicians or news broadcasters talk about so many parts per million or billion of a toxic gas in the air, people are alarmed by the information. These numbers are confusing and meaningless without reference points, such as safe levels and dangerous levels. In addition, the population at risk of exposure may be very small and it may thus not even be an issue of concern for people in your neighborhood. Thus, it is important to ensure that you understand the risk in terms of who will be affected and to what extent.

Familiarity with Risk

How often you hear or read about a threat can affect your perception of the risk involved. For example, the risk of being struck by lightning is much greater than that of being attacked by a shark. In fact, you are more likely to die from a dog attack than a shark attack. However, most of us are more familiar with incidences of shark attacks due to extensive news coverage of such events. Movies such as *Jaws* also reinforce fear of shark attacks. However, people’s perceptions of the risk of being attacked by a shark are much greater than the actual risk.

Pre-existing Biases

Stereotypical images and pre-existing biases may complicate matters, and perceptions of risk. For example, suppose a developer aims to build an industrial park close to a residential area. The residents of that area reject the development before they study the industrialist's proposals. Their response is defensive. They see the proposal as a threat because of a preconceived or stereotypical view of the developer as the "exploiter." Of course, this does not happen in all situations, but it is useful to understand the extent to which stereotypes can affect people's perceptions. Both the residents' and the developers' actions become defensive, resulting in a situation that hinders cooperation and harbors conflict. The residents' mistrust and the perceived threat stifle communication, and the chances of either party reaching a resolution are reduced, if not impossible. When individuals and groups are aware of their biases, they are in a better position to assess a situation and work towards a solution.

Group Decision Making

People in groups are often influenced by the reaction of other members in the group. It is thus important for individuals in groups to remain open-minded and not feel pressured into making particular decisions.

Power and Control

Individuals perceive a risk to be critical if they do not have control over the risk, or if the impact of the risk is close by. For example, when local authorities allow a company to set up an electric power plant at the edge of a small town, the townspeople may react against the decision because they were not consulted, or they were not the ones to initiate interest in the project. The proximity of the proposed site also threatens the residents. However, if the plant is built, the community may stand to gain from an improved electricity supply and an increase in work opportunities.

Series edited by Joe E. Heimlich and Jacqueline LaMuth, OSU Extension.

Understanding the Risk

Official reports often identify an environmental risk in terms of x in y being affected. For example, the report might say, "3 people in 100 are likely to be affected," or "26 in 1,000 people are at risk." This is a statistical *probability*. This does not mean 3 out of 100 people will or will not be affected. Rather, the *likelihood* of 3 additional cases of reaction, in a group of 100 people similar to the test group but not exposed to the toxin or disease, will be affected.

Remember, statistical risk is a prediction comparing people exposed to a toxin with people not exposed to that toxin. Risk is *not* a guarantee of occurrence. Individual life choices change the likelihood of risk for the individual. Making changes to minimize risk from controllable sources in the home, office, school, yard, and other environments is a useful and wise activity.

Fully Assessing the Risk

Dealing with environmental risk often involves identifying the trade-offs. Before making decisions, consult different sources of information to ensure that you have a complete and unbiased understanding of the risks involved. For example, the presence of asbestos insulation in your home may put you at risk of asbestos exposure. Attempting to remove it may increase the risk of exposure rather than decreasing it. As a result, it may be safer to leave it as it is, or seal it off.

Identify alternative solutions to the problem at hand and evaluate risks associated with each option. This will help to determine a course of action that minimizes the risks and maximizes the benefits. When the stakes are high—when decisions you make will affect your health and that of your family—it pays to understand environmental risks.

Additional Reading

Kolsky, K. (2004). Understanding Risk: What do those headlines really mean? *The NIH Word on Health*. Available online [<http://www.nih.gov/news/WordonHealth/apr2004/risk.htm>].

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