

Risky Business

What is risk?

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Risk is part of everyday life and comes in many forms. Different kinds of risks have the potential to **harm human health, the environment, or the economy**. It is helpful to examine the factors that contribute to risk.

Three factors, **hazard, exposure, and vulnerability**, determine risk, its seriousness, and the likelihood of a risk causing harm (fig. 1). Risk can affect people, property, and the environment including plants and animals.

Hazard is a basic quality of a material or event that causes physical or economic harm. Hazard accounts for the amount of material needed to cause harm. With medicine, the right amount can be helpful, while too much can be harmful.

Exposure is the frequency, duration, and route of contact that a person, property or the environment has with a hazard. Without exposure, even extremely hazardous substances produce no risk. A shark is a risk only if you are in the ocean.

Vulnerability relates to the sensitivity of an individual. Education, income, occupation, and physical factors such as weight, health, and age influence vulnerability. For example, children are often considered to be more vulnerable to certain hazards (fig. 2).

A **human health** example of risk is sun poisoning. Sun exposure can lead to chronic (cancer) or acute (heat exhaustion) effects. Acute risk poses an immediate threat. Chronic risk is long term

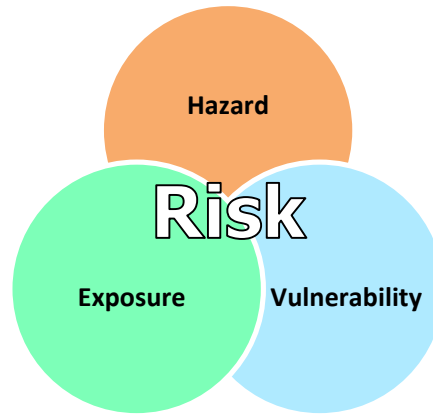


Figure 1. The three elements of risk include **hazard, exposure, and vulnerability**. All three elements are independent, yet once taken together as a whole they determine the severity and likelihood of the risk causing harm.

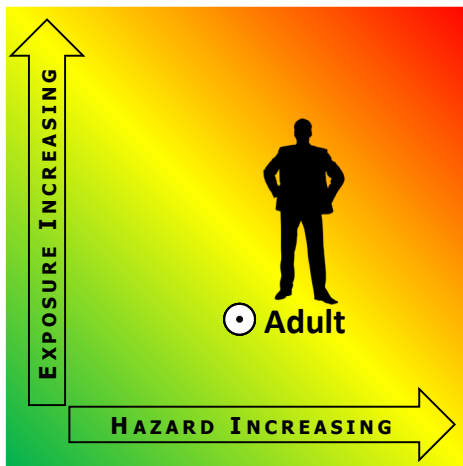
and may be based on on-going or repeated exposures. The **hazard** is the sun. The **exposure** is the frequency and amount of time a person comes in contact with the sun's rays. **Vulnerability** is a person's sensitivity to being harmed by the sun. The area in the world where someone is located is also a vulnerability factor.

An **environmental** risk can occur when bees come in contact with certain pesticides that are harmful. The pesticide and amount used are the **hazards**. How much the bee comes in contact with the pesticide is the **exposure**. The **vulnerability** is based on the bee's food-gathering behavior and its overall health.

Economic risk can cause harm in the form of yield loss and increased control costs. Growers often need to protect their crops from pests (**hazard**). The duration and timing of the pest in the crop is the **exposure**. **Vulnerability** includes the susceptibility of the crop to the pest, and the place and time where the crop is grown.

Risk is an inevitable part of life. We can help minimize risk by understanding hazard, exposure, and vulnerability.

Risk of Harm to an Adult



Risk of Harm to a Child

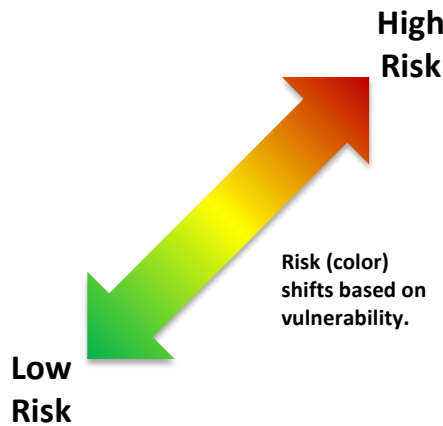
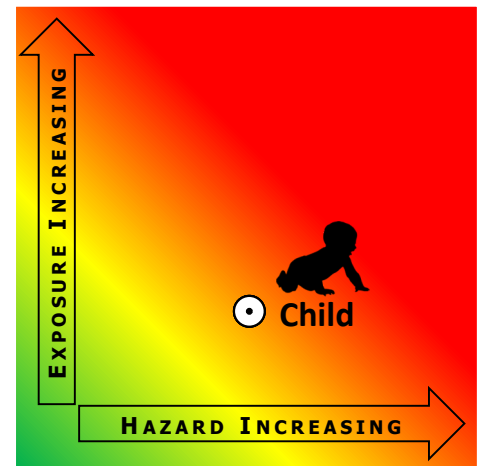


Figure 2. Risk is determined by hazard and exposure as well as vulnerability. Vulnerability can vary from person to person, location to location, and situation to situation. A healthy adult exposed to a hazard (left) may have a very low risk of harm. In the same situation, a more vulnerable child (right) may be at much greater risk of harm.