WHAT IS RISK ASSESSMENT

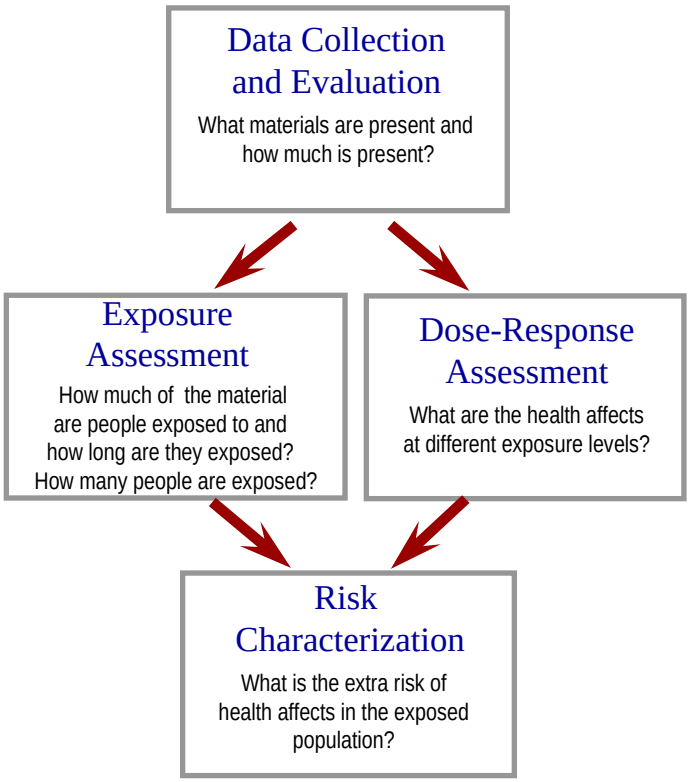
- **Risk Assessment is a scientific process used to evaluate the chance that health effects could result from exposure to substances in the environment.**
- **Risk Assessment is one tool used to make risk management decisions.**
- **Risk Assessment is a four step process.**

The 4-Step Risk Assessment Process

Risk Assessments combine

- **information from environmental testing,**
- **results of studies on the health effects of substances found in the environment, and**
- **information and/or models which determine the level of exposure to substances in the environment**

to estimate the increased lifetime risk of cancer and/or chance of non-cancer health effects in those exposed.



- **To determine if risk management action at a site is needed.**
- **To determine where and how much action is needed.**
- **To assist in determining what kind of action should be taken.**

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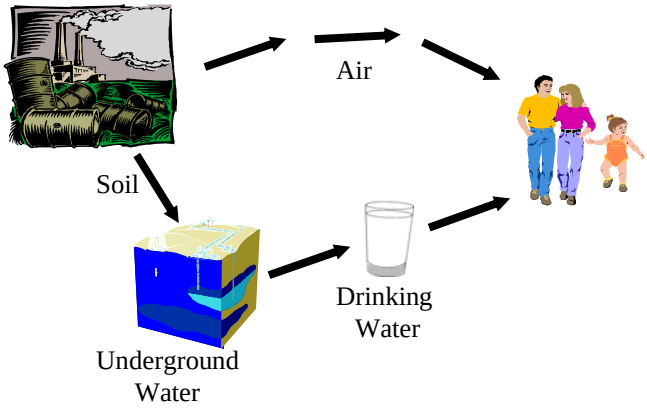
RISK ASSESSMENT

Data Collection and Evaluation

- **Identifies what materials have been released into the environment.**
- **Identifies how much material is being or has been released and to which environmental media (air, soil, or water).**
- **Defines the potential for materials released into the environment to move within the environment.**

Environmental Pathways



Exposure Assessment

- **Determines who is exposed and by what environmental pathways.**
- **Estimates the range of possible exposures.**
- **Determines the reasonable maximum exposure that is likely to occur at a site.**

Dose-Response Assessment

- **Determines what health effects a substance may cause in people.**
- **Determines how much is required to cause those effects.**
- **Evaluates both cancer and non-cancer outcomes.**

Sources of Dose-Response Information


Laboratory Animal Studies


Industrial Accidents


Epidemiological Studies

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RISK ASSESSMENT

Risk Characterization

Risk Characterization is the summarizing step in risk assessment. It combines information from the previous three steps to determine the likelihood that health effects could occur in people who come in contact with substances present at a site. There are two stages in characterizing risk- quantifying risks and analyzing uncertainty.

Quantifying Risks

The calculation for Cancer Risk determines the increased risk of getting cancer over a lifetime. Individual calculations are made for each substance present and for all environmental pathways. These individual values are added to arrive at the overall risk for the exposed population.

Non-cancer Risk is evaluated by calculating ratios called Hazard Quotients. Hazard Quotients are calculated by comparing levels of substances found at a site to known safe levels of these substances. Individual calculations are made for each substance present and for all potential routes of exposure. These individual values are added to produce an overall Hazard Index for the exposed population. A Hazard Index greater than 1 indicates a possible increased health risk.

Analyzing Uncertainty

Uncertainty exists in assessing health risks because scientists do not have complete information. When information is missing, scientists make assumptions that will prevent them from underestimating the health risk. When Uncertainty Analysis is performed the scientists' assumptions and key site-related variables that contribute to uncertainty are identified. This is done so that risk estimates can be placed in proper perspective for risk managers.

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