DEVELOPING RISK ESTIMATES FOR TOXIC AIR POLLUTANTS THROUGH PROBABILISTIC RISK ASSESSMENT

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ABSTRACT

The Environmental Protection Agency has recently accelerated its efforts to determine the need to regulate toxic air pollutants. A key input in determining the need for regulation is the characterization of estimated public health risks. This paper examines some aspects of the feasibility of using probabilistic methods for this purpose.

A probabilistic approach provides for the explicit characterization and consideration of uncertainties in exposure estimates, exposure-dose relationships, and dose-response relationships in developing health risk estimates. The methodology under consideration uses available scientific information in developing the risk estimates. The incorporation of expert judgment would be used to address limitations and uncertainties in the available scientific information.

KEY WORDS: probabilistic risk assessment, toxic air pollution.

INTRODUCTION

Late in 1983, former Environmental Protection Agency (EPA) Administrator William Ruckelshaus made a commitment to Congress to decide, by the end of 1985, on the need to regulate 20 to 25 potentially toxic air pollutants This commitment reflected the Agency's decision to place a greater emphasis on air toxics and formalized the role of risk assessment in regulatory decision-making for air toxics. While meeting this commitment, several aspects of the assessment process were identified for future improvement. For example, the approach used to support decisions did not explicitly deal with both the probability of risk and associated uncertainty in a quantitative manner. This has led to beginning efforts to improve the presentation of risk and associated uncertainties in order to better support decisions for potentially toxic air pollutants.

An important part of estimating risk to populations is an examination and assessment of uncertainties in the information and the models employed in assessing risks. Once each of these uncertainties is characterized, they should be examined collectively to estimate risk to populations. Examples of uncertainty that will affect the population risk estimates include: