RISK ASSESSMENT FOR CHEMICALS IN DRINKING WATER

Edited by

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RISK ASSESSMENT FOR CHEMICALS IN DRINKING WATER
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FOREWORD

People have a right to expect that the water they drink, the food they eat, the air they breathe, and the environments where they live and work promote the highest possible level of health. They rely on their health agencies to identify hazards in these environments and to prevent avoidable exposures that are inconsistent with this objective.

Public health systems work best when they prevent hazardous exposures without waiting for epidemiologic studies to measure the adverse effects. This is possible through consideration of experimental studies and models that can identify health risks before they can be observed in humans. This means, however, that risk assessment models often cannot be validated by direct observation, as can models in other fields such as demographics, economics, or weather.

Accordingly, the methods of risk assessment are as important as the results of any one risk assessment. Continuous examination is necessary to ensure that risk assessment methods reflect current scientific understanding and benefit from new experimental systems and models. At the same time, public health agencies are facing new demands, for example, to evaluate the cumulative effects of multiple hazards on susceptible populations and life stages. Risk assessors are meeting this challenge by developing methods that go beyond single-chemical, general-population scenarios to address more complex, but also more realistic, situations.

This volume, which examines current risk assessment methods for chemicals in drinking water, should facilitate understanding and improvement of these methods. It includes perspectives from scientists who are grappling with contemporary risk issues at the California EPA, Health Canada, and the U.S. EPA’s program, regional, and research organizations.
The existence of vigorous, independent risk assessment programs in many countries and also in state agencies is essential to the public health infrastructure. These programs can be viewed as laboratories where innovations in risk assessment methods are developed, implemented, and tested. The best of these ideas receive wider discussion en route to refinement and adoption by other state, national, and international agencies. Such innovation and examination ensures that risk assessment methods continue to reflect emerging scientific understanding and to meet the needs of health agencies worldwide.

The California risk assessors who have edited this book have a unique and valuable perspective in that California has committed to an independent risk assessment of all regulated chemicals in drinking water. In an effort to share their knowledge gained through years of experience in drinking water risk assessment, they have assembled a stellar list of co-authors to address critical regulatory and risk assessment issues. Although not every important subject can be covered in depth in a single volume, this book represents an important compilation of observations and documentation of risk assessment methods, plus a useful guide to the rest of that voluminous literature.

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Risk assessment for chemicals in drinking water has much in common with risk assessment for other purposes, together with some elements that are unique. This book is intended to cover both aspects, to provide an integrated source of information on the current principles and practices. It is based on many years of experience in the practice of risk assessment, by the editors and the authors. The perspective taken is that of public health protection, as practiced by federal and state governments, mainly within the United States. The most important source of risk assessment guidance available is the United States Environmental Protection Agency (U.S. EPA). However, information relevant to risk assessment of chemicals in drinking water is scattered across dozens if not hundreds of publications, some not readily available, spanning over the last twenty years. For this book we have attempted to assemble and summarize this information to provide a more comprehensible and up-to-date resource.

In taking on the task, we have also attempted to capture current thinking on major risk assessment issues, uncertainties, and ongoing controversies. We acknowledge that our perspectives do not encompass the entire spectrum of toxicology and risk assessment opinion and practices, and we stand by the use of health-protective assumptions in risk assessment. That is a basic requirement for a public health agency. Our intent in pointing out the uncertainties and controversies is to address the health protectiveness of current practice as well as to indicate areas where current practice might be improved by obtaining information to more adequately address or reduce these uncertainties.

However, when the uncertainties in risk assessment of chemicals in drinking water are acknowledged, risk assessors may face certain criticisms. The general public dislikes being told about uncertainty in protecting their health; the purveyors of drinking water who want to assure the public that their water is safe to