



Chinese Research Academy of Environmental Sciences
State Key Laboratory of Environmental Criteria and Risk Assessment

HIGHLIGHTS OF THE CHINESE EXPOSURE FACTORS HANDBOOK (ADULTS)

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Preface



Exposure assessment is the central component of environmental health sciences. It lies in the middle of the causal pathway leading from the sources of pollution at one end to the health effects of concern at the other. It thus is the best single indicator both of the potential risk of the pollutant and of the efficacy of alternative ways of controlling the pollution. Ideally, of course, exposure assessment is done by measurements in the population of concern doing their normal daily activities that bring them into contact with the pollutants. In practice, however, it is not possible to conduct individual assessments for every situation or to model changes in exposure in detail based on future scenarios.

An exposure factor handbook such as this provides a convenient and practical solution to obtaining reasonable estimates of exposure to important pollutants in various populations. It provides estimates of the exposure in different settings that have been derived from past studies linked to standard metrics, such as emissions. It can be used to scope the potential extent of the exposure and health impacts of a wide variety of situations quickly and at low cost to evaluate whether more detailed assessments and modeling might be warranted. It serves a range of users, from regulators, industry environmental and occupational control departments, researchers, and citizen groups.

Although there are similarities across populations, exposure factors vary throughout the world according to local circumstances. Given the growing concern with the health implications of environmental pollution in China, it is very appropriate, therefore, that this Chinese

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exposure factor handbook be published now. It will serve many useful purposes, although of course will need to be revisited as conditions change and knowledge improves.

It takes much dedication and perseverance to collect all the many types of data needed and to put them into a useful form for this kind of handbook. Dr. Duan and her many colleagues are to be highly commended for accomplishing this major effort for the first time in China.



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US National Research Council Report, 2012

July, 2014

Foreword

In the last three decades, China has achieved rapid economic growth, which has brought hundreds of millions of people out of poverty. However, at the same time the country is facing increasingly severe environmental challenges, which threaten not only sustainable economic and social development, but also human health. Policies of “modifying industrial structure” and “scientific development” have been proposed by the central government in recent years, to balance economic development and environmental protection. Environmental health risk assessment (EHRA), an essential tool for scientific decision-making, has a vital role in the process of environmental management.

Exposure factors are basic parameters for assessing the potential risk of exposure that are based on the physiological and behavioral characteristics of humans. With regard to *The 12th five-year plan for the environmental health work of national environmental protection* (MEP, 2011), the Chinese Research Academy of Environmental Sciences (CRAES), entrusted by the Department of Science, Technology and Standards of China’s Ministry of Environmental Protection (MEP), had conducted the *Environmental exposure related activity pattern research for the Chinese population (Adults)* (CEERHAPS-A) from 2011 to 2012. Based on this survey, the *Exposure factors handbook of Chinese population (Adults)* (CEFH-A) and *Report of environmental exposure related activity patterns for the Chinese population* were compiled, and published in 2013. The *Highlights of the Chinese exposure factors handbook (Adults)* is a brief introduction to the content of the CEFH-A, designed to provide a reference for assessors, scientists, and managers, in which exposure factors such as inhalation rates, water ingestion rates, food intake, time-activity related to exposure, body weight, surface area, life expectancy, and residential factors are discussed.

CRAES was responsible for the preparation of the CEFH-A, and the *Highlights of the Chinese exposure factors handbook (Adults)*. Dr. Xiaoli Duan served as the principal investigator and the chief editor for both books, providing overall direction and assistance on the organization and execution of the work. The Chinese Centers for Disease Control and Prevention (CDC) made important contributions to the site studies and data collection. The advisory committee consisted of more than 30 experts from 17 academic institutes, offered technical support, scientific advice, and critical comments throughout the entire project.

Since the CEFH-A is the first exposure factors handbook for Chinese population, there are some unavoidable deficiencies due to the limited time and experience available. Continuous revisions and data updates will be required in the future, and data for soil ingestion, air exchange rates, and the exposure of special populations are also required. More details are available in the *Exposure Factors Handbook of Chinese Population (Adults)*. Your suggestions and comments would be greatly appreciated.



President of Chinese Research Academy of Environmental Sciences,

Member of Chinese Academy of Engineering

June, 2014



Synopsis



The *Highlights of the Chinese exposure factors handbook (Adults)* is a brief introduction to the content of the *Exposure factors handbook for the Chinese population (Adults)* (CEFH-A), which is designed to provide a reference for assessors, scientists, and decision makers, who concern about environment and health. The handbook considers exposure factors such as inhalation rates, water ingestion rates, food intake, time-activity related to exposure, body weight, surface area, life expectancy, and residential factors.

In each chapter, definitions, possible influencing factors, and the survey methods used to determine the factors are introduced. Information is given for urban/rural location, gender, age group, and region, with recommended values provided for the mean, median and 5th, 25th, 75th, and 95th percentile values.

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