Environmental Burden of Disease Series, No. 1

Introduction and methods

Assessing the environmental burden of disease at national and local levels

Annette Prüss-Üstün
Colin Mathers
Carlos Corvalán
Alistair Woodward

Series Editors
Annette Prüss-Üstün, Diarmid Campbell-Lendrum, Carlos Corvalán, Alistair Woodward

World Health Organization
Protection of the Human Environment
Geneva 2003

WHO Library Cataloguing-in-Publication Data

Assessing the environmental burden of disease at national and local levels : introduction and methods / edited by Annette Prüss-Üstun … [et al.]

(Environmental burden of disease series ; no.1)

1.Environmental health 2.Environmental exposure 3.Risk factors 4.Cost of illness 5.Disability evaluation 6.Health status indicators 7.Risk assessment - methods 8.Manuals I.Prüss-Üstün, Annette. II.Series.

ISBN 92 4 154620 4 (NLM Classification: WA 30)
ISSN 1728-1652

Suggested citation

Prüss-Üstün A, et al. *Introduction and methods: assessing the environmental burden of disease at national and local levels*. Geneva, World Health Organization, 2003. (WHO Environmental Burden of Disease Series, No. 1).

Printed by the WHO Document Production Services, Geneva, Switzerland.

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Preface

To prevent disease and injury it is essential that their underlying causes (health risks) are quantitatively attributed. Together with information on the costs of interventions, their effectiveness and the socioeconomic context, such knowledge provides a rational basis for policy-setting. While quantitative studies have been performed for some health risks, few have assessed the disease burden from environmental risk factors and, traditionally, the studies have focused on a single risk factor. Recently, however, WHO analysed the global burden of disease from 26 risk factors, and the results were published in the World Health Report 2002 (WHO, 2002). The Environmental Burden of Disease (EBD) series of guides is based on the same methodological framework as used in the World Health report, and provides practical guidance on assessing the health impacts of environmental risk factors. The guides, together with accompanying material, such as the spreadsheets available for certain risk factors at web site www.who.int/phe, should provide sufficient methodological information to perform the EBD assessments.

The EBD series of guides is composed of an introductory volume, and volumes that provide detailed guidance for assessing the health burden of specific environmental risk factors. Most of the guides focus on assessments of national and local populations, which are most relevant for policy-making. In some volumes, however, the global disease burden is assessed for certain health risks. All the guides take a practical, step-by-step approach and use numerical examples. The methods described in the guides can be adapted both to local and national levels, and can be tailored to suit data availability. In this introductory volume, the methodological framework for quantitatively assessing health impacts at population level is described. It is recommended that the framework be adopted by other EBD studies, to ensure that estimates are both reliable and comparable.

Affiliations and acknowledgements

Annette Prüss-Üstün, Colin Mathers, Carlos Corvalán and Diarmid Campbell-Lendrum are from the World Health Organization, and Alistair Woodward is from the Wellington School of Medicine, New Zealand.

We would like to acknowledge the many experts around the world who, over several years, have contributed to the development of methods for estimating the disease burden of environmental risk factors. In particular, we would like to thank participants of the meeting, *Methodology for assessment of environmental burden of disease* (held in Buffalo, NY, USA in 2000), and participants of two regional meetings on the environmental burden of disease (Curitiba, Brazil in 2002; and Damascus, Syria in 2002). Peer reviewers of the sections have also provided invaluable comments.

The financial support of the US Environmental Protection Agency is also greatly appreciated. We gratefully acknowledge the editing by Kevin Farrell, and layout by Eileen Brown, who have put this document into its final form.

Abbreviations used

BoD Burden of disease.
EBD Environmental burden of disease.
GBD Global burden of disease.
NBD National burden of disease.
YLL Years of life lost due to premature mortality.
YLD Years lived with disability.

Summary

This introductory guide provides the background to, and a description of, the general method for assessing the disease burden caused by environmental risk factors. Subsequent guides address the disease burdens of specific environmental risk factors. To assess a disease burden, the health impact of disease and injury needs to be assessed quantitatively at population level. This may be measured in terms of the number of deaths, or as a summary measure of population health, such as the disability-adjusted life year (DALY). Environmental burden of disease (EBD) studies assess the disease burden attributable to environmental risk factors, and are closely linked to assessments of the disease burden for individual diseases and injuries. Indeed, the burden of disease from disease and injury has been assessed at global level, and national level data are becoming available, which can be used in EBD studies. The results of disease burden studies are generally presented by gender and by age group, and are measured in terms of deaths and DALYs. The actual calculations for an EBD assessment are relatively simple once the input data (exposure and health outcomes) have been collected in a suitable format. The method can also be adapted to the health statistics that are available for the study population.

EBD assessments do not necessarily entail large costs. In many countries and regions, environmental health indicators are already routinely assessed, but are not yet processed into health information. Certain of these indicators can be used directly as input for EBD assessments, so additional assessments may not be necessary. The accuracy of EBD assessment will, however, depend on the quality of the data used as input.

Attributing the health impacts of environmental risk factors at population level can serve several public health activities. It can help to prioritize actions for preventing or reducing health impacts in the population, and by allowing the future health burden to be estimated, an EBD assessment can inform planning for preventive action. EBD assessments can also be used to estimate performance indicators for health-supporting environments, and identify high-risk groups in the population. Finally, EBD information can also be used to predict the health gains that interventions (including regulations) will bring to a population.