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Considerations in evaluating the cost-effectiveness of environmental health interventions

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FOREWORD

This document has been developed with the aim to provide an overview of currently used methods for economic evaluation and to discuss implications of using these methods for evaluating environmental health interventions. It aims at formulating recommendations for future evaluations in environmental health. The document is intended to contribute to the methodological discussions, and in particular the development of guidelines for evaluation of cost-effectiveness in the framework of WHO's initiatives, and other ongoing work in this area. This work constitutes a background document with preliminary considerations of methods for economic evaluations in environmental health.

This document in particular focuses on what is peculiar to environmental health interventions, and therefore how the conduct of economic evaluations may need to be different to other health interventions. The main peculiarity, or difference, is that environmental health is a cross-cutting area. Environmental health interventions may need to be addressed, funded and implemented by various sectors (the health sector, the environment sector, the industrial sector, the transport sector, water or infrastructure services). In return, the benefits from environmental health interventions also accrue to various sectors and sometimes also to fulfil basic needs and increase the comfort or quality of life of the receiver (such as improved water supply). This issue raises the question: "*Who will pay for (which part of) the intervention?*". In relation to economic evaluation, therefore, it should be decided how the benefits should be accounted for in the cost-effectiveness (or cost-benefit) ratio.

Furthermore, environmental health also deals with some exposures with very long-term effects, such as climate change, certain occupational exposures, changes in ecosystems with (short and) long-term effects on health, for example through the change in vector populations. Discounting health, even at very small rates, would make almost any impacts with very long latencies seem negligible, thus raising the question "*how can discounting for long-term health effects be compatible with the concepts of prevention and sustainability?"*

This document represents a work-in-progress, and comments are gratefully received:

Guy Hutton, MSc, PhD,
Swiss Centre for International Health,
Swiss Tropical Institute,
Socinstrasse 57,
4002 Basel,
Switzerland.

Email : guy.hutton@unibas.ch
Telephone : ++41 (0)61 284 8243
Facsimile : ++41 (0)61 271 8654

EXECUTIVE SUMMARY

The motivation for this review and discussion paper arose from the current development and pending publication of the WHO guidelines on cost-effectiveness analysis (CEA), and the interests of certain groups to feed into these guidelines. The influence and impact of such CEA guidelines is potentially considerable, due to the current gap in comprehensive cost-effectiveness guidelines that are applicable to a wide range of health interventions *in developing countries*; also, through the influence of the WHO in research and policy making in these countries, the WHO guidelines are guaranteed a wide usage. Within this context, the Department of Protection of the Human Environment (PHE), contained within the Cluster of Sustainable Development and Healthy Environments, commissioned this study, to examine the implications of the cost-effectiveness guidelines for health interventions related to changes in the environment. The Terms of Reference for this study mentioned, among other things: how non-health costs and benefits should be taken into account in cost-effectiveness analysis to reflect the efficiency of environmental health interventions; how regulatory mechanisms can potentially be evaluated using CEA guidelines; the optimal valuation methods for quantifying costs and benefits in monetary units; the appropriate interest rate for discounting future costs and benefits of environmental health interventions; and how to deal with the uncertainty surrounding the cost-effectiveness of environmental health interventions.

Several important findings have arisen from this review. The first finding is that there is a serious lack of cost-effectiveness studies for all types of environmental health interventions, and therefore decision makers have limited information on the relative cost-effectiveness of health interventions from which to make evidence-based decisions. Also, there is lack of clarity in the current literature about which methods should be used for evaluating environmental health interventions. The second finding is that the Ministry of Health is unlikely to consider the costs and benefits arising to other agents or ministries, despite the importance of these cost and benefits arising from many environmental health interventions. However, the Ministry of Health could be persuaded to include costs and benefits which have implications for the financing or implementation of these interventions. The implication of this is, however, that when adopting the Ministry of Health perspective in evaluating cost-effectiveness, the true efficiency of many environmental health interventions is not measured, resulting in a cross-sectoral misallocation of resources. One possible, although data-intensive, solution proposed is to first define a range of perspectives (each one containing different types of cost and benefit), second to collect data for all relevant perspectives and present them separately, and finally, and third leave it for politicians to decide which viewpoint to adopt for decision making.

The third finding is that the valuation methods for valuing non-health environmental benefits in monetary units are underdeveloped, especially for application in developing country settings. However, there is a base of research to start with and further research can draw on findings in the economics literature. The fourth finding is that there is widespread disagreement about what discount rate should be applied to environmental projects. Although a number of solutions are proposed, it is recommended to use the positive discount rates given in CEA guidelines, as well as a 0% discount rate, and again leave it to the politicians to decide. The fifth finding is

that the impact of environmental health interventions in terms of cost-effectiveness is highly uncertain, due to methodological difficulties, lack of reliable data and non-generalisability of data between settings. Therefore, once the CEA framework is defined for evaluating environmental health interventions, further research should be commissioned not only in collecting primary data but also in adapting the results to increase relevance for decision makers in a range of settings.

In conclusion, this document has served to pinpoint critical issues in the economic evaluation of environmental health intervention, it has proposed a range of solutions, and discussed their appropriateness from a range of viewpoints. In particular, possible problems that may occur in applying currently used CEA guidelines to the economic evaluation of environmental health interventions are raised, and solutions proposed. In formulating the WHO CEA guidelines, these issues should be taken seriously, due to the wide range of health risks and hazards from environmental sources affecting large parts of the world population. Where satisfactory solutions for those working in the field of environmental health cannot be agreed, it is recommended that special provisions are drawn to allow a 'fair' evaluation of environmental health interventions. However, this document is only seen as one of many documents and viewpoints that will feed into the final WHO CEA guidelines.

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