



**If your mission includes „foresight“,
efficient modeling tools are needed**

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North Rhine-Westphalia

- area: 34,110.40 km²
- population: 17,638,098 (31/12/2014)
- 53 local public health authorities, administratively situated on district level (population: min. 109,009; average 337,085, max. 1 million)





Modelling purposes

Environmental health
Consumer protection



Risk assessment models

Public health



Population based models



Risk assessment models

Focus: exposure modelling

$$ADD = \frac{(C \times IR \times EF \times ED)}{(BW \times AT)}$$



ADD average daily dose = Exposition (mg/kg-day)

C contaminant concentration (e.g. inhaled air) (mg/kg)

IR intake rate (e.g. kg/day)

EF exposure frequency (e.g. 2x/week)

ED exposure duration (months)

BW body weight (kg)

AT averaging time (years)



Exposure modelling

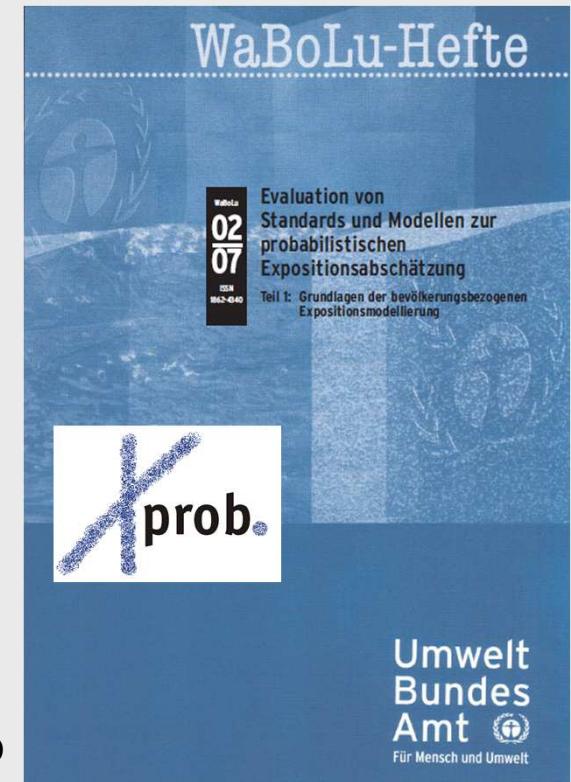
Point estimates
(high-end estimates
e.g., 95 percentile)



Probabilistic approaches

- Development of reference distributions for exposure factors (RefXP)
- Guidance on probabilistic exposure assessment
- Working group probabilistic exposure and risk assessment (AK PQRA)

www.uba.de/xprob





Population based models

Modelling attributable cases

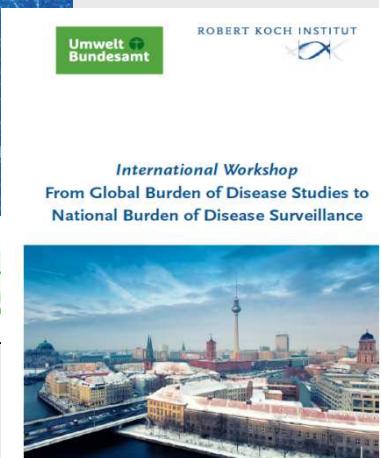
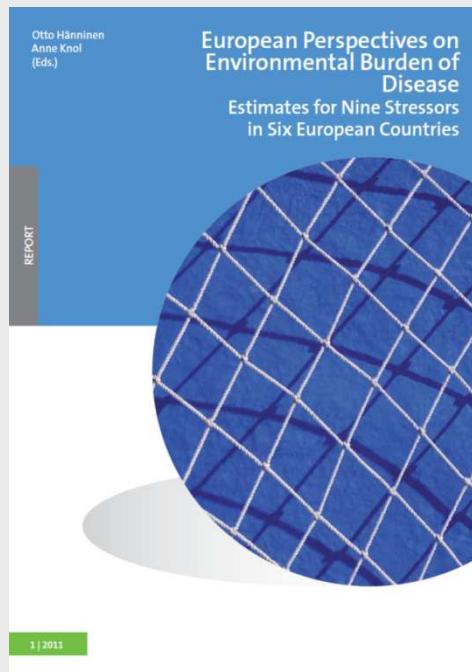
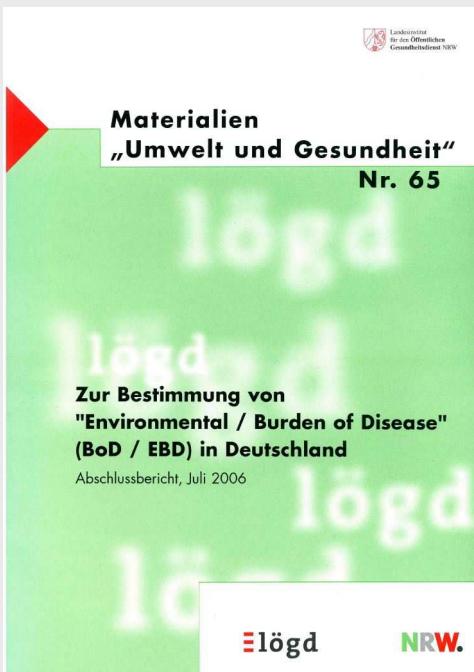
- Feasibility study of adaption of the tri-lateral project on health impacts costs of road-traffic related air pollution to NRW (2002)
- Health impacts of the European Employment Strategy (EES) (EPHIA project)
- Health impacts of road transport noise on children (ENHIS project)
- Health impacts of a NRW housing policy (RAPID project)

(Environmental) Burden of Disease approaches

- Forecast of disease burden in the Ruhr Area
- PM 10
- Second hand smoke / ETS
- Traffic noise



Burden of Disease approaches



Berlin, December 1–2, 2015



Workshops with and survey amongst model developers and model users



Scientific Expert Workshop.

Quantifying the health impacts of policies –
Principles, methods, and models.
Düsseldorf, Germany, 16 - 17 March 2010.
LIGA.Fokus 11



Update 5 April 2011: Pre-conference Workshop 1.3

"Health Impact quantification"

PART 2. HEALTH IMPACT QUANTIFICATION: STATUS AND PERSPECTIVES (14:00-18:00)

CHAIRS Johan Mackenbach, Rainer Fehr, Fintan Hurley

JECH Online First, published on July 7, 2012 as 10.1136/jech-2011-200835
Commentary

Quantitative health impact assessment: taking stock and moving forward

Rainer Fehr,¹ Fintan Hurley,² Odile Cecile Mekel,¹ Johan P Mackenbach³

Over the past years, application of health impact as there has been a strong growth of tools that allow c health relevant policies. We review these development is no longer a main priority, although several a: methods to assess impacts on health inequalities ar challenges are, first, to conduct a comparative evalu the maintenance and continued availability of the to

INTRODUCTION

Health impact assessment (HIA)—estimating the health impacts of policies, especially those outside the health sector, before they are implemented—is one of the key tasks of public health, and central to WHO vision of Health In All Policies.¹ Its purpose is to inform public debate and political decision-making, and to help

qualitative analysis, the benefits of quantification in this effect analysis are several. Health impact quantification allows a much more specific description of health effects than would a qualitative analysis only. Quantitative effect estimates are also likely to carry more weight in policy discussions, particularly when the non-health benefits of the proposed policies are also presented in quantitative (eg, economic) terms.

On the other hand, one should also be

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Health impact assessment – A survey on quantifying tools

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ABSTRACT

Integrating human health into prospective impact assessments is known to be challenging. This is true for both approaches: dedicated health impact assessments (HIA) as well as inclusion of health into more general impact assessments. Acknowledging the full range of participatory, qualitative, and quantitative approaches, this study focuses on the latter, especially on computational tools for quantitative health modelling. We conducted a survey among tool developers concerning the status quo of development and availability of such tools; experiences made with model usage in real-life situations; and priorities for further development. Responding toolmaker groups described 17 such tools, most of them being maintained and reported as ready for use and covering a wide range of topics, including risk & protective factors, exposures, policies, and health outcomes. In recent years, existing models have been improved and were applied in new ways, and completely new models emerged. There was high agreement among respondents on the need to further develop methods for assessment of inequalities and uncertainty. The contribution of quantitative modeling to health foresight would benefit from building joint strategies of further tool development, improving the visibility of quantitative tools and methods, and engaging continuously with actual and potential users.

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DYNAMO-HIA

Software developed within the framework of an
EC-funded research project
(www.dynamo-hia.eu)

Explore use for NRW

- BMI
- Physical activity

Workshop with developers and users



DYNAMO-HIA –
International experiences, results & further perspectives.
Workshop-documentation, 27 - 28 May 2015, Bielefeld, DE.



www.lzg.nrw.de



Conclusions

- Quantitative modelling useful
- Invest time and ressources
- Multiple models / tools available: potential users still not aware of them
- Need for simple and more complex models, depending on the question
- Comparative work could help
- Translation of (policy) question into models is challenging
- Still areas in public health which are hard to model (lack of data etc.)
- Reach and uptake of modelling results for decision making still underdeveloped



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