International Public Health Symposium on Environment and Health Research

Science for Policy, Policy for Science: Bridging the Gap

Madrid, Spain, 20–22 October 2008

Report
ABSTRACT

The WHO Regional Office for Europe and the Carlos III Institute of Health of the Spanish Ministry of Science and Innovation, with the support of the Spanish Ministry of Health and Consumer Affairs and the European Commission’s Directorate-General for Research, organized the International Public Health Symposium on Environment and Health Research. The Symposium provided a platform for mutual collaboration between public health professionals and researchers in the field of public health in general, as well as environment and health, contributed evidence for use in the preparations for the 2010 Ministerial Conference on Environment and Health and helped set priorities for future policy-oriented environment and health research in the European Union under the Seventh Framework Programme. Concluding that much remained to do to close the science–policy gap, the Symposium participants recommended a range of tools and institutional structures to bridge it.

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Foreword

Many studies have been undertaken in the last decade to provide scientific evidence for policies to reduce the threats to health posed by the many environmental hazards to which people are exposed in their daily lives. A recent WHO survey, conducted in relation to the International Public Health Symposium on Environment and Health Research, concluded that while studies on the association between health and outdoor air pollution and extreme weather events linked to climate change have made important progress, much study is needed in other areas, whether newly identified or neglected.

The European Commission recognizes the need for and supports further research on the environment and health; the Directorate-General for Research has allocated a significant budget for research activities in this area in its fifth, sixth and seventh framework programmes for research. The current Seventh Framework Programme (2007–2013) has a dedicated environment and health subactivity from which a number of projects have already been selected for funding.

One of the projects funded under the Sixth Framework Programme, SPHERE (Strengthening Public Health Research in Europe), provided a bibliometric analysis of six public health research fields, including environment and health, in 29 European countries for the period 1995–2005. A remarkable finding was that most environmental health research addressed solely technical issues, while only 1.2% of publications addressed environmental health policy. This illustrates the need for a more collaborative approach in environmental health research to build bridges between scientific results and policy initiatives.

Further, the history of environmental crises and their effects has taught that science needs to be better used to support policy-making. The health effects of toxic oil syndrome and current issues such as climate change, for example, strikingly show that countries’ leaders need readily available research results to help them identify the most effective measures to reduce risks and address public concerns. The ad hoc collaboration between the Spanish Government and the WHO Regional Office for Europe through the Scientific Committee for the Toxic Oil Syndrome, established in the aftermath of the outbreak in the 1980s, is a good example of how decisions for public health interventions, based on limited but sound evidence, can be made using a multidisciplinary approach and can serve as a model for managing food safety and future environmental disasters and outbreaks of previously unrecorded diseases.

The Symposium – which brought a group of international experts from the environment and health research community together with key European decision-makers in Madrid, Spain – provided a unique opportunity and a step towards better cooperation between all stakeholders. While the lively two-and-a-half days of debate in Madrid were not exhaustive, this publication collates the participants’ main ideas on future needs in environment and health research and their suggestions for improving the interaction of science and policy in this field. It can be used as a basis for considering new initiatives in the European Commission framework programmes and the European environment and health process, and to support research at the national level aiming to bridge the gap between science and policy-making.

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Introduction

The WHO Regional Office for Europe has always recognized two needs that must be met to increase the effectiveness of countries’ responses to environmental health challenges: to close the gaps between research and policy-making and to strengthen multidisciplinary research approaches for public health, especially environmental health practice. It also recognizes the need for communication strategies to address the general public in emerging environmental health crises. The Regional Office and the Carlos III Institute of Health of the Spanish Ministry of Science and Innovation in cooperation with the Spanish Ministry of Health and Consumer Affairs, with the support of the Environment Directorate of the European Commission (EC) Directorate-General for Research, therefore organized the International Public Health Symposium on Environment and Health Research in Madrid, Spain on 20–22 October 2008 (1).

The Symposium provided an opportunity for discussion of the most recent developments in research since the conference held in Aarhus, Denmark in preparation for the Fourth Ministerial Conference on Environment and Health in Budapest, Hungary in 2004. The Fifth Ministerial Conference on Environment and Health (2) is to take place in Parma, Italy in 2010; it will review countries’ progress towards creating healthier environments for children by tackling unsafe and inadequate water supplies, and exposure to air pollution, and physical, chemical and biological agents. It will also focus political efforts on emerging or inadequately addressed priorities. As part of the preparation for the Conference, the Symposium aimed to bring together a wide range of scientists, research professionals, policy-makers and representatives from nongovernmental organizations in the WHO European Region to discuss how to translate research into policy-making while continuing to identify emerging issues and research needs. The Symposium was intentionally organized back to back with the second high-level meeting organized to prepare for the 2010 Conference (3) in order to ensure conclusions and recommendations of scientists were immediately discussed.

Owing to the important role of public opinion in emerging environment and health crises, the Symposium programme (Annex 1) included a workshop for representatives of the media to train them to write about the health protection from environmental risks, particularly those discovered through research, in a way that would be best understood by the general public, thereby raising awareness, improving understanding and promoting action at ground level.

The Symposium provided a platform for discussion and further collaboration between public health professionals and researchers, with particular emphasis on environment and health. It also identified priorities for possible future policy-oriented environment and health research in the European Union (EU) Seventh Framework Programme for research and technological development (4). The Symposium’s specific objectives were:

- to present recent environment and health research and related studies and projects;
- to illustrate countries’ experiences in responding to emerging environmental health challenges by looking at different national research activities;
- to identify missing information and knowledge for adequate policy development in response to environmental hazards (including risk communication and policy in the presence of scientific uncertainties and public concern); and
- to evaluate and discuss different approaches to studying interlinked health determinants.

In the opening session of the Symposium, Dr Marc Danzon, WHO Regional Director for Europe, Mr José Manuel Silva Rodríguez, Director-General of the EC Directorate-General for Research,
Dr Bernat Soria Escoms, Minister of Health and Consumer Affairs, Spain; and Dr Cristina Garmendia Mendizábal, Minister of Science and Innovation, Spain welcomed the participants (Annex 2), stressing the need for better cooperation between stakeholders and advocated for improving the links between research and policy-making on the environment and health. They augured that all participants would have successful discussions in order to meet these needs.

Discussion

The participants met in plenary sessions to discuss the achievements and needs of research in environment and health, and the latest research and trends in the science–policy interface. Four parallel sessions on: emerging issues, using findings to identify priorities for policy; tools for assessing health risks as a means for policy-making and bridging the gap between science and policy-making, prompted more focused discussion. Poster sessions on a range of scientific topics helped to identify priorities for research, as described in the later parts of this publication. The symposium concluded with a round table discussion on policy-makers’ needs and research findings, in which a panel composed of various stake holders was invited to reflect on of the discussions of the other days and to share their own experience with efforts to bridge the gap.

Approaches to research for policy-making

Policy-making in public health develops and implements effective and efficient action to benefit health. Because most problems are multi-causal and action is expensive, research is needed to provide the basis for policy development by identifying problems and their causes and predicting the causes and effects of action in quantifiable terms and with acceptable confidence. For example, cost–benefit studies predicting the life-years gained through applications of different options helped policy-makers in the United Kingdom to choose the measures to apply in their air quality strategy.

Coping with current issues such as climate change requires a new scientific paradigm, and a more complex, whole-system approach. New alliances are needed both within and between science and policy-making; each needs more of the other’s expertise to work together effectively. Cost–effectiveness analysis is a useful tool in this approach, as shown by examples from the United States of America of choosing policy options to reduce dioxins in food, using quality-adjusted life-years (QALYs) to measure the health effects of policies and changing industrial methods to benefit health and the environment.

Achievements and needs

The preparations for the Fifth Ministerial Conference on Environment and Health in 2010 include assessing the progress made in closing the knowledge gap. An informal poll taken by the Regional Office in summer 2008 asked researchers and policy-makers to name the most significant achievements of the previous 10 years in improving understanding of the links between health and the environment, as called for by the Third Ministerial Conference on Environment and Health in London, United Kingdom in 1999 (5). Responses were received from 96 experts. They identified significant progress in improving the understanding of health risks of ambient air pollution, especially particulate matter, and in developing and applying risk assessment methodology. These were 2 out of the 10 research areas identified as needing more study by a programme of the European Science Foundation, the WHO Regional Office for Europe and the Directorate-General for Research, which was carried out in 1995–1999 in preparation for the Third Ministerial Conference on Environment and health. In addition, understanding of the links between noise and cardiovascular diseases has markedly improved, although this subject was not included on the priority list. While much research information on which policy-makers can act is already available, targeted funds and further study are still needed to fill the gaps.
A case study of occupational and environmental cancer in Azerbaijan provided examples of both achievements in confirming the cancer burden and involving all stakeholders, and needs for greater scientific capacity and stronger links between science and policy-making (6). The study showed the needs for better-quality data and local research expertise, particularly in environmental epidemiology, to support decision-making, particularly in countries with emerging economies and limited resources. An integrated approach, supported by international partners and the national government, is needed to bridge the science–policy gap.

NGOs can help strengthen this bridge by helping to identify problems, providing independent data, ensuring communication with stakeholders, demonstrating appropriate interventions and proposing cost-effective policy solutions. Ensuring sustained funding towards a particular research objective would help NGOs to participate throughout the life of a project or study.

**Latest research and trends in the science–policy interface**

Recent research on air pollution, climate change and the emerging issue of cumulative exposure to chemicals shows the need for more comprehensive approaches by both policy-makers and scientists. The traditional unicausal paradigms for research approaches and the evaluation of evidence are insufficient to deal with both the complexity of the links between risk factors and health, and uncertainty about the mechanisms of effects and the impact of actions or policies. As policies may have unintended consequences, more comprehensive studies are needed on their effects.

Research shows that reducing air pollution improves health and that action by all stakeholders – scientists, policy-makers, health professionals, NGOs and the public – can benefit health and the economy. Studies of climate change show the needs for comprehensive action for mitigation and adaptation, including a focus on meeting the energy needs of the poor, ensuring the decarbonization of energy supplies and increasing political pressure on the transport sector to reduce greenhouse gases and improve health. Science needs to expand its approach to address the cumulative effects of chemicals, including the effects of mixtures of endocrine disrupters, to be able to make a cumulative risk assessment of chemicals that act in similar ways.

Other important topics for research include developing hazard-assessment methods for newer technologies, such as nanotechnology and the effects of nanoparticles, and prioritizing research on a range of issues related to global climate change, such as increased risk of exposure to infectious diseases and allergies. Further attention is also needed to improve understanding of and apply the tools required for large-scale impact assessment of energy sources and long-term biomonitoring of human populations in Europe. Other valuable tools that need to be prioritized include mechanisms to ensure that policy-makers receive the right information for effective early warning and risk assessment and management, thereby allowing appropriate application of the precautionary principle. All these topics need more study.

Both scientists and policy-makers need better ways to deal with uncertainty, which cannot be eliminated and is sometimes promoted to impede action. As pledged in the Rio Declaration on Environment and Development (7), the precautionary principle should be used to enable action in conditions of uncertainty.

Further, science and policy have a cyclical relationship. As science feeds information into policy, policy calls forth additional study to evaluate the action taken and help choose among future options. Policy developments – such as the adoption of EU thematic strategies and action plans, the publishing of reports such as the fourth assessment of the Intergovernmental Panel on Climate Change (8) and the WHO environment and health process (9) – have driven the progressive increase in the environment and health research conducted under the framework of the Fifth, Sixth and Seventh EU framework programmes of research (4).
To promote efforts to bridge the gap between science and policy, support for environment and health research and monitoring needs to be maintained at the national and international levels. Communication between research disciplines remains poor, despite the need for cooperation.

Conclusions and recommendations

Much work is still required to close the science–policy gap. The Symposium participants made a number of recommendations in contributing to preparations for the Fifth Ministerial Conference on Environment and Health, including a range of tools and institutional structures for this task.

1. Paradigms should be revised and supportive tools developed to capture the complexity and interdependence of environmental health issues.
   - Assessment of the health effects of policies should be broadened to consider all their implications, including transboundary and unintended effects.
   - Risk-assessment methodology should be extended to deal with multiple exposures and mixtures of chemicals, and focus on vulnerable groups.
   - Scientists should:
     - while working to reduce uncertainty, learn how to make decisions in its presence; and
     - reframe the sufficiency of evidence required for action, applying the precautionary principle in situations involving potentially irreversible effects and uncertainty.
   - A dynamic informal system to gather relevant information on risks in general and a new robust and transparent paradigm for the assessment of emerging risks need to be developed. Existing Region-wide information platforms, such as the Environment and Health Information System in Europe (ENHIS), should be used and expanded, to make the information more transparent and comparable.
   - Scientific evidence on cause–effect relationships between environmental factors and health needs regular systematic review.
   - Criteria to identify hotspots in the European Region and a register of hotspots should be developed.
   - Further research initiatives should seek potential future problems, such as emerging risks of emerging infectious diseases.

2. Efficient structures should be created and maintained to facilitate and stimulate interaction between scientists, policy-makers and the public.
   - Greater integration and collaboration should be promoted between ministries of health and the environment, and public health should be placed at the core of policy-making for all sectors that affect it.
   - Different disciplines, sectors and countries should collaborate on research, and mechanisms should be developed to optimize human and financial resources for such collaboration, within and beyond the WHO European Region.
   - The stakeholders in environmental health issues – including civil society and the mass media – should be involved in appraising the health effects of policies. Information on risks and research outcomes should be communicated more clearly to policy-makers and the public. Policy-making processes should be more transparent.

3. WHO should contribute to bridging the science–policy gap by:
   - helping countries to take account of the latest scientific developments in addressing policy questions that interest them; and
• acting as a knowledge broker: facilitating access to the best available research and working with countries’ policy-makers and scientists to support decision-making where and when needed.

References

Annex 1. Programme

Welcome and opening session
Dr Cristina Garmendia Mendizábal, Minister of Science and Innovation, Spain (Chair)
Dr Bernat Soria Escoms, Minister of Health and Consumer Affairs, Spain
Mr José Manuel Silva Rodríguez, Director-General, Directorate-General for Research, European Commission
Dr Marc Danzon, Regional Director, WHO Regional Office for Europe

Keynote presentations
Dr Manuel Posada de la Paz, Head, Rare Diseases Research Centre, Carlos III Institute of Health, Madrid, Spain (Co-Chair)
Dr Isabel Noguer, Deputy Director, International Research Programmes and Institutional Relations, Carlos III Institute of Health, Madrid, Spain (Co-Chair)

What we need from research and how to effectively translate research findings into policy-making?
Dr Robert Maynard, Health Protection Agency (England and Wales), Chilton, United Kingdom

Is science serving policy-makers’ needs?
Professor Robert Lawrence, Centre for a Livable Future, John Hopkins Bloomberg School of Public Health, Baltimore, Maryland, United States

Questions and answers

Session I. Achievements and needs of research in environment and health
Dr Manuel Posada de la Paz, Head, Rare Diseases Research Centre, Carlos III Institute of Health, Madrid, Spain (Co-Chair)
Dr Isabel Noguer, Deputy Director, International Research Programmes and Institutional Relations, Carlos III Institute of Health, Madrid, Spain (Co-Chair)

Closing the knowledge gap: Progress made in research since the Third Ministerial Conference on Environment and Health (1999)
Dr Michal Krzyzanowski, European Centre for Environment and Health, WHO Regional Office for Europe

Models of science and policy: From expert demonstration to participatory dialogue
Dr Silvio Funtowicz, Institute for Protection and Security of the Citizen, European Commission Joint Research Centre, Ispra, Italy

Bridging the gap between science and policy-making: A case study of occupational and environmental cancer from Azerbaijan
Professor Colin Soskolne, School of Public Health, University of Alberta, Edmonton, Canada

Have the gaps between the science and policy decreased? The role of NGOs in identifying knowledge gaps and policy-making
Ms Genon Jensen, Executive Director, Health and Environment Alliance (HEAL), Brussels, Belgium and Ms Sascha Gabizon, Executive Director, Women in Europe for a Common Future (WECF) and European Eco-forum, Munich, Germany

Questions and answers
Session II. Latest research and trends in the science–policy interface
Dr Silvio Funtowicz, Institute for Protection and Security of the Citizen, European Commission Joint Research Centre, Ispra, Italy (Co-Chair)
Professor James Bridges, Chair of EU Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), Brussels, Belgium (Co-Chair)

Ambient air pollution and health: Should we do more?
Dr Sylvia Medina, French Institute of Public Health Surveillance (InVS), Saint Maurice, France

Climate change, energy and health
Professor Andy Haines, London School of Hygiene and Tropical Medicine, United Kingdom

The emerging issue of cumulative exposure to chemicals – reason for concern?
Professor Andreas Kortenkamp, School of Pharmacy, University of London, United Kingdom

EU Commitment to environment and health research: from the Fifth to the Seventh Framework Programme
Dr Tuomo Karjalainen, European Commission, Research Directorate General, Brussels, Belgium

Questions and answers

Session III. Parallel sessions

A. Emerging issues in environment and health
Mr Peter Pärt, Advisor, Institute of Environment and Sustainability, European Commission, Directorate-General Joint Research Centre, Ispra, Italy (Co-Chair)
Mr Paul Lincoln, Chief Executive, National Heart Forum, London, United Kingdom (Co-Chair)

Emerging issues and the role of the Scientific Committee for Emerging and Newly Identified Health Risks (SCENIHR)
Professor James Bridges, Chair of EU Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), Brussels, Belgium

Nanoparticles and health
Professor Vyvyan Howard, Centre for Molecular Bioscience, University of Ulster, United Kingdom

Emerging issues in environment and health – The case of vector-borne diseases in Europe
Dr Guy Hendrickx, Avia-GIS, Zoersel, Belgium

Chemical hot spots and environmental health: from assessment to action in the Russian Federation
Professor Boris Revich, Institute of Forecasting, Russian Academy of Sciences, Moscow, Russian Federation

Strategy for scientific cooperation and networking on emerging risks in food safety
Dr Hubert Deluyker, European Food Safety Authority, Parma, Italy

Energy choices and health
Dr Paul Wilkinson, London School of Hygiene and Tropical Medicine, United Kingdom

Health impact of the waste cycle in the provinces of Naples and Caserta (Italy)
Dr Pietro Comba, Italian National Health Institute, Rome, Italy

Discussion
B. Using research findings to identify priorities for policy

Professor Wim Passchier, Department of Health Risk Analysis, University of Maastricht, Maastricht, Netherlands (Co-Chair)

Mr David Gee, Project Manager, Emerging Issues and Scientific Liaison, European Environment Agency, Strategic Knowledge and Innovation, Copenhagen, Denmark (Co-Chair)

Knowledge evaluation: the Health and Environment Network (HENVINET)
Dr Alena Bartonova, Norwegian Institute for Air Research (NILU), Kjeller, Norway.

EnVIE – EU policies on indoor air quality and health
Dr Eduardo de Oliveira Fernandes, University of Porto, Portugal.

The dioxin crisis in Belgium: from crisis to scientific knowledge and a new policy
Dr Herman Diricks, Belgian federal agency for the safety of the food chain, Brussels, Belgium

London congestion charging scheme
Professor Ross Anderson, St George’s University of London, United Kingdom

Policy interpretation of human biomonitoring research results in Belgium: priorities and complexity, politics and science
Mr Hans Keune, Centre for Health and Environment, University of Antwerp, Belgium

Soil contamination resulting from transport related pollution and its implications for public health
Dr Mirza Kazimov, Medical State University, Baku, Azerbaijan

Toxic oil syndrome: lessons learned from an interdisciplinary collaboration
Dr Manuel Posada de la Paz, Head, Rare Diseases Research Centre, Carlos III Institute of Health, Madrid, Spain

Discussion

C. Tools for assessing health risks as a means for policy-making

Professor Andreas Kortenkamp, School of Pharmacy, Centre for Toxicology, London, United Kingdom (Co-Chair)

Dr Jouko Tuomisto, Department of Environmental Health, National Public Health Institute (KTL), Kuopio, Finland (Co-Chair)

Using a sufficiency of evidence for timely prevention in multi-causal complex and uncertain biological systems
Mr David Gee, Project Manager, Emerging Issues and Scientific Liaison, European Environment Agency, Strategic Knowledge and Innovation, Copenhagen, Denmark

Integrated assessment of systemic risks to human health
Professor David Briggs, Imperial College of Science, Technology and Medicine, London, United Kingdom

Russian experience on risk assessments in environment and health
Professor Simon Avaliani, Centre for Risk Assessment, Russian Academy of Advanced Medical Studies, Moscow, Russian Federation

Novel methods for human and ecological risk assessment of combinations of stressors
Dr Hans Lokke, National Environmental Research Institute, University of Aarhus, Denmark

Health and environment integrated methodology and toolbox for scenario assessment (HEIMTSA) – an overview
Dr Fintan Hurley, Institute of Occupational Medicine, Edinburgh, United Kingdom
Strengthening technical capabilities for health impact assessment: the case of HIAir
Dr Piedad Martin Olmedo, Andalusian School of Public Health, Granada, Spain

Using health impact assessment to compare risk as an illustration of the interface between science and policy
Dr Daniel Greenbaum, Health Effects Institute (HEI), Boston, United States

Discussion

D. Bridging the gap between science and policy-making
Professor Professor Philippe Grandjean, University of Southern Denmark, Odense, Denmark (Co-Chair)

Dr Hilary Walker, Branch Head, Radiation, Chemical and Environmental Hazards Branch, Department of Health, London, United Kingdom (Co-Chair)

Evaluation of scientific evidence to support policies
Dr Michal Krzyzanowski, European Centre for Environment and Health, WHO Regional Office for Europe, Bonn, Germany

Multifaceted consequences of the Chernobyl accident: lessons learned and ways forward
Dr Mikhail Balonov, Institute of Radiation Hygiene, St Petersburg, Russian Federation

Role of industry and business community in bridging the gap between science and policy-making
Dr Loredana Ghinea, European Chemical Industries Council (CEFIC), Brussels, Belgium

European Conference on Human Biomonitoring: from biomarkers to human biomonitoring as a policy support tool in environmental health
Dr Anne-Catherine Viso, French Public Health Institute (InVS), Saint-Maurice, France

Health at work and healthy environment
Dr Jadranka Mustajbegovic, School of Medicine, University of Zagreb, Croatia

An environmental and occupational health research programme to respond to policy-makers’ needs: AFSSET’s experience
Dr Jean Lesne, French Agency for Environmental and Occupational Health Safety (AFSSET), Maisons-Alfort, France

Environmental public health research in Europe: bibliographic analysis of literature
Professor Stanislaw Tarkowski, School of Public Health, Nofer Institute of Occupational Medicine, Lodz, Poland

Discussion

Session IV. Bridging the gap between science and policy-making
Dr Argelia Castaño Calvo, National Centre for Environmental Health, Carlos III Institute of Health, Madrid, Spain (Co-Chair)

Dr Isabel Noguer, Deputy Director, International Research Programmes and Institutional Relations, Carlos III Institute of Health, Madrid, Spain (Co-Chair)

Keynote presentations
The gap between science and policy-making: the seven deadly sins of science
Professor Philippe Grandjean, University of Southern Denmark, Odense, Denmark

Climate change: bridging the gap between science and policy-making
Professor Jean-Pascal van Ypersele, International Panel on Climate Change (IPCC)
Plenary: reporting back by chairs of parallel sessions
Mr Peter Pärt, Advisor, Institute of Environment and Sustainability, European Commission, Directorate-General Joint Research Centre, Ispra, Italy
Mr Paul Lincoln, Chief Executive, National Heart Forum, London, United Kingdom
Professor Wim Passchier, Department of Health Risk Analysis, University of Maastricht, Maastricht, Netherlands
Professor Andreas Kortenkamp, School of Pharmacy, Centre for Toxicology, London, United Kingdom
Dr Jouko Tuomisto, Department of Environmental Health, National Public Health Institute (KTL), Kuopio, Finland
Dr Hilary Walker, Branch Head, Radiation, Chemical and Environmental Hazards Branch, Department of Health, London, United Kingdom

Round-table: policy-makers’ needs and research findings
Dr Franklin Apfel, Managing Director, World Health Communication Associates, Compton Bishop, United Kingdom (Moderator)
Professor Frank Ackerman, Global Development and Environment Institute, Tufts University, Medford, United States of America
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Closure of the Symposium
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