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Joint reflection on environment & health-data

The Flemish Centre for Health and Environment, working directly for the Flemish government, investigates the relation between environmental pollution and human health by measuring pollutants and health effects in (over 4000) Flemish inhabitants. The big question is: What should be done with this vast amount of information? Medical, environmental and social experts and policy representatives developed an action-plan. At first this was thought of as a merely scientific quest: with the right group of experts the interpretation with regard to policy priorities will follow automatically. This was not the case though. The social scientists therefore introduced a jury that will give advice to the government.

INTRODUCTION

This paper describes the development of an action-plan for policy interpretation of data on environmental pollutants and health effects. These data are monitored in human beings within the framework of the Flemish Centre for Health and Environment. We will especially focus on the involvement of a diversity of actors in the development of this action-plan and the role of social scientists.

Complex relation Health & Environment on the societal agenda

At the international level experts more and more come to the conclusion that environmental problems have serious consequences for public health (McCally, 2002; Harremoës et al., 2002). The number of environmentally related cancers is rising, an increasing number of people suffer from respiratory problems, fertility problems are on the rise, and so on. In Flanders (Dutch speaking part of Belgium) also the emergency bells have sounded. The (causal) relation between environment and health is very complex though and to a large extent unknown. In the European Union tens of thousands of chemical substances are on the market (Milieu- en Natuurraad van Vlaanderen, 2001). For a number of individual toxic substances the health effects from high doses are well known. Unknown are the effects of small doses of different substances over a longer period. Also unknown are the combined effects of different substances. There are clues though about DNA-damage, hormone disruptions and loss of sperm quality.
It is not always possible to prove unambiguously that a relation exists between environmental pollution and specific health effects (Ravetz, 2002; McCally, 2002; Harremoës et al., 2002). Furthermore, scientists can

and do differ in opinion about these issues. The question how to organise research and policy on these topics is difficult to answer because of complexities. This does not only relate to the complex relationship between environment and health, but also to societal choices. Next to toxic substances, different societal perspectives and interests play an important role.

Centre for Health and Environment

The Centre for Health and Environment is a project funded by and working directly for the Flemish government. In 2001 twelve Centres for policy relevant research were started in Flanders. Their main task is scientific research on priority issues for government policy. A steering group, in which representatives of governmental institutions are seated, is attached to each Centre. In the steering group policymakers discuss the knowledge production and valorisation with the researchers.

In the Centre for Health and Environment mainly environmental health experts from all Flemish universities and the Dutch University of Maastricht jointly investigate the complex relationship between Health and Environment. In addition a social scientific expert unit is part of this Centre: they focus on risk communication, risk perception, and on processes of knowledge production, interpretation, deliberation and cooperation between different scientific disciplines and other social actors.

Biomonitoring

The core research activity of the Centre for Health and Environment is biomonitoring: measuring some selected pollutants and certain health effects in human beings. The focus lies on three different target groups, each investigated in a separate campaign: newborn babies, adolescents and adults. Each campaign is carried out in eight areas of Flanders. These areas have different environmental characteristics, such as industrialized, rural (the countryside), urbanized, near waste incinerators, and near fruit orchards. Part of the objective of this biomonitoring is to focus on a comparison of exposure and health effects associated with these different types of environmental situations.

One of the big challenges of biomonitoring is answering the question: What should be done with this vast amount of information on the complex and important issue of health and environment? A group of scientists, governmental experts and policy representatives, most of them involved in the work of the Centre for Health and Environment, worked on the preparation of an action-plan for the interpretation and use for policy of the biomonitoring results.

THEORY AND METHODOLOGICAL APPROACH

Science and policy

The role of science in society seems to have changed in recent decades. This change is paradoxical. On the one hand, faith in science appears to be in crisis; on the other hand, science is called upon more and more (Hoppe, 2002; Bal et al., 2002). Rotmans (1999) complains that policymakers expect scientists: a) to provide transparent models that are easy to use, and b) to do justice to the complexity of the issues analysed in the models; a difficult exercise to combine. Since the last quarter of the twentieth century, the development of knowledge has become a subject of critical study itself. Knowledge is considered a social construction, and society itself seems to be partly the result of scientific construct. A strict division between science and society disappears. This causes problems for the standard view on science for policy: here also the strict division between science and society vanishes. This does not mean that this division disappears in daily life. Both in language and institutionally, this division is real (Bal, 1998).

An interesting concept for the dynamic relationship between science and policy is 'boundary work' (Gieryn, 1983; Jasanoff, 1990; Hoppe, 2002). Hoppe (2002) describes several models of boundary traffic between science and policy. Two dimensions are central. The first entails influence and authority between science and policy. Two extremes are the primacy of science (technocracy) and the primacy of politics. Hoppe distinguishes a third, middle ground typology: more dialogical, pragmatic. The second central dimension concerns the divergence or convergence in the way of working between science and politics. The division between the two domains has grown bigger and bigger over time: 'science and policy are social

activities that have different aims and therefore are incompatible ways of life', according to Hoppe.

Plead for the involvement of a diversity of actors

Rotmans (1999) evaluates integrated assessment models on complex societal problems as follows: 'There are enough molecules in our models, but almost no human beings.' He refers to the importance of involving different perspectives, visions, for example by cooperation with a diversity of actors when building a model. One example is 'community based research' that is increasingly becoming popular in the USA. An example concerning environment and health is the work of the National Institute of Environmental Health Sciences (NIEHS) in the USA (O'Fallon & Dearry, 2002). Main advantages of involving local communities in research according to NIEHS are the broadening of the knowledge base on complex problems and dealing with concern amongst the citizens on environmental and health problems.

Another advocate of the involvement of local knowledge is Fisher (2000). He sees three main goals for involving citizens in policy relevant research. Firstly, it is a way of implementing democracy. Secondly, it may support the legitimacy of development and implementation of policy. Thirdly, it may contribute to science: this new knowledge may be of added value. Fisher advocates a change in attitude from the experts towards lay people. He proposes to accept the citizen as an expert, and to look at the professional expert as a specialized citizen. Marris et al. (2001) prove in an extensive experiment that citizens are able to cope with complex issues, in the case of biotechnology in agriculture.

Cooperative action research: learning by doing

The research procedure that emerged during the project under discussion may be qualified as a form of action research (Boog, 2002; Boog et al. (eds), 2001; Coenen, 1987): direct intervention into practice is part of the process, the research is action-oriented. This ensures, to some extent, practice-relevance. This also means that complexities that are present in practice will have an effect on the development of the research procedure. Moreover, researcher and research subjects work together, neither separately, nor in any hierarchical relationship and interaction and participation are central concepts. From the perspective of the social scientist, in the case of the Flemish Centre for Health and Environment it concerns two-layered interactive research. Firstly, the cooperation of the social scientists with other actors in the Centre: different scientific disciplines and policy representatives. Secondly, one of the goals is to involve actors external to the Centre. The social scientists support this process.

Research from the Pastille Consortium (2002) tells us that no best practices are available. Researchers and research subjects are free to choose the approach they think is best suitable for the research context. The Pastille Consortium points out that in action research a number of factors influence the interaction between scientists and policymakers. The extent to which policymakers are familiar with social sciences, by education or experience, may make the interaction easier. The pressure for results is yet another factor. This is valid for both researchers and policymakers. The Pastille Consortium emphasizes the need for usable knowledge. This will never be objective knowledge because the researchers take part in the (hermeneutic) creation process. A main quality criterion for interactive research is knowledge based on many knowings. The main result of the research process of the Pastille Consortium was the mutual learning of the participants. A joint process of learning by doing in which a diversity of actors contribute from their own expertise, views, background, is perhaps the best way to describe the practical approach within the framework of the Centre for Health & Environment. We will describe here some results of this process from the viewpoint of the social scientist.

RESULTS: PRACTICE

Phased evaluation

Together with medical and environmental scientific experts and policymakers, social scientists worked on the preparation of an action-plan for interpretation and policy measures with regard to the biomonitoring results (Koppen et al., 2005). In the beginning the discussions in the working group mainly focussed on environmental and medical scientific interpretation of

the monitoring data. Consultation of scientific experts as well as desk research was considered to provide the necessary knowledge and answers. The biomonitoring results are assessed in three successive phases, each focussing on different aspects.
The first phase focuses on the question: How severe are specific results with regard to public health risks? To a large extend in this phase the discussion focuses on reference values for interpreting the data. This is quite problematic since knowledge on these issues is still rather limited. Only with regard to lead (international) norms are available. Therefore an average reference value per pollutant or health effect is used to decide which monitoring results are relatively high. Also a comparison is done with research outcomes from other studies e.g. from abroad. The second phase focuses on the question: What are causes for a specific monitoring result? For example causes may be environment related or life style related. In the third and final phase the focus is on the question: Can we identify a (local) source for the pollution?
At first this was thought of as a merely scientific quest: with the right group of experts the interpretation with regard to policy priorities will follow automatically. While trying to build bridges towards policy interpretation though the limitations of an exclusively scientific endeavour clearly showed: no scientist or group of scientists dared claiming to possess the necessary and overarching knowledge for answering difficult questions. Questions e.g. on policy priorities when also other than (medical and environmental) scientific factors had to be taken into account (economics, social preferences, feasibility of policy measures; issues introduced by the social scientists). The social scientists therefore proposed the formation of a jury that will judge relevant data and knowledge in order to give advice to the government. Furthermore the need for a procedure 'from data-interpretation to decision making' clearly showed.

Practice cycle

The social scientists developed a practice cycle with the different procedural steps, actors and roles for each phase: from assessment to decision making. The main questions we wanted to answer with this practice cycle are related to both process and content:

- Who is responsible for the research based on the results from the biomonitoring? This question relates to interpretation of the biomonitoring results with regard to existing scientific knowledge and other relevant information such as likewise monitoring research in other countries.
- Who is responsible for steering the process? This question relates to the coordination of the process and the division of labour between the actors involved in the action-plan.
- Whose knowledge or opinion is relevant? Next to scientific knowledge also other knowledge may be relevant, e.g. lay-knowledge. Furthermore, the assessment of biomonitoring data is not necessarily limited to knowledge but may also take into account differences of opinions, interests, norms and values in relation to risks.
- Who decides on policy options? This question relates to the final political decision making process.
- Who should be informed about the developments and outcomes during the process? This question relates to issues of communication.
- What are important points of interest during the process? This question relates to issues that might be considered to be of importance, such as:
  - The principle of external transparency about the ongoing activities and the outcomes of the process.
  - Te importance of stakeholder support and/or involvement.
  - The need to take into account scientific uncertainties.
  - The choice between a consensus building approach or a deliberative approach.

The social scientists investigated the preferences for this by means of a short questionnaire among the participants of the working group. On the basis of the outcomes, proposals were designed for organizing the process and for involving different kinds of actors. Also a more precise definition of the main questions resulted, especially with regard to the first phase. The central question of the first phase became: What relative priority do different biomonitoring results have for policy? The outcome will be a ranking of biomonitoring results for policy.

The practice cycle is made up of cyclical steps, to be taken during each phase of the action-plan:

- Step 1: Deciding how to operate and which actors to involve during the process.
- Step 2: Desk research on the biomonitoring results and expert consultation.
- Step 3: Bringing a synthesis of the desk research and expert consultation before a jury; main focus on recommendation of priorities for further steps.
- Step 4: Synthesis of desk research, expert consultation and jury advice for the administration.
- Step 5: The administration translates a synthesis of the above into policy options.
- Step 6: The government decides on next steps.
- Step 0-7: External communication.

Another outcome of the questionnaire was a reservoir of potentially relevant actors for different steps during the practice cycle. This varied from scientific experts to be consulted for scientific interpretations, to stakeholders for input on societal issues, to the broader public for communication purposes. Furthermore the relevance of taking into account social, economical and policy issues was accorded.

Jury and multi criteria analysis

The fact that no scientist or group of scientists dared claiming to possess the necessary and overarching knowledge for answering all difficult questions, formed the occasion for the social scientists to propose to work with a jury. The jury will be made up of experts, stakeholders and (other) citizens. The reservoir of potentially relevant actors will form the basis for selecting candidates.

For the jury in the first phase of the action-plan, we are developing a multi criteria analysis. The three main (groups of) criteria are:

- Seriousness of health risks; e.g. with regard to:
  - Type of health effect (e.g. cancer or itching).
  - At what period in time do health effects occur? (long term, short term).
  - How big is the risk (chance) for people to suffer health effects?
  - Characteristics of the most vulnerable groups (e.g. age, size of the group/proportion of the population).
  - Available scientific knowledge about the health risks (scientific uncertainties, agreement or disagreement between expert assessments).
- Feasibility of policy measures; e.g. with regard to:
  - Feasibility of limiting the pollution or prevention of exposure to pollutants.
  - Feasibility of prevention or treatment of health effects.
  - Current policy priorities (Flemish, Belgian and European Union level).
  - Relation between different policy levels within Belgium and Flanders.
- Societal aspects; e.g. with regard to:
  - Level of societal concern about the risk.
  - Balance between the societal costs and benefits of risk generating activities.
  - Level of societal support for policy measures.

  The content of these three criteria will be gathered during the second step of the practice cycle: desk research and expert consultation. In the multi criteria analysis the jury for each biomonitoring result discusses the relative importance (weight) of each criterion. The outcome will be more than merely a numeric ranking of policy priorities though. The jury process will be a group discussion in which participants can learn from each other and where views, arguments and concerns will be exchanged and monitored. The multi criteria analysis functions as a method for structuring discussions and for supporting reflection during the deliberations. Transparency and practical employability therefore are essential features.

On the basis of its deliberations, the jury will formulate a policy advice for the government. Of course the government may decide otherwise. But part of the process is the commitment of transparency: once the government decides, it will communicate not only the decisions, but also the arguments for it. Also the government promises to respond to the suggestions, arguments and concerns raised during the process that led to the jury advice.

Action-plan in policy practice

The action-plan was accorded by both the Centre for Health and Environment and policy representatives,

and was adopted by the government. With regard to the first wave of biomonitoring results (newly born babies) a first pilot project is started in 2006. It is impossible to foretell how this action-plan will work out in practice. The fact that the government is prepared to test the procedure in practice is promising though. Moreover will the Flemish experience be of inspiration for a European Union pilot project with regard to biomonitoring.

CONCLUSIONS

Boundary work

In Hoppe's (2002) words, a dialogical, pragmatic model of interaction between experts and policy representatives was established during the development of the action-plan. Most of the policy representatives and policy experts involved from the start were medical, technical or environmental specialists by training, as are most of the scientists involved in the Centre for Health and Environment. In that sense no big divergence in ways of approaching the issues under discussion was present. The bridge towards political interpretation nevertheless showed to be problematic: an obvious discrepancy in issue framing between experts and policymakers emerged. In order to bridge this gap the contribution of the social scientists proved to be helpful. A reflective contribution paved the way for the involvement of a diversity of actors, enriching the assessment with other than technical medical and environmental criteria, and procedures for cooperation, deliberation and decision making were introduced.

Cooperative action research

The effort sketched in this paper turned out to be a rather labour intensive exercise. The time available for reflection on the work in progress is rather limited. Moreover do most actors involved in the process have overloaded agendas. Discussing complex issues takes time and energy, and often goes hand in hand with a lot of 'paperwork'. Part of the work also goes to unforeseen complexities.

Quite some time is spend on actors getting used to working together: looking for good procedures and divisions of labour in the process of cooperation. This especially was the case for the scientific disciplines working together and the cooperation between scientists and the policy representatives. Luckily within the framework of the Centre the actors are willing to cooperate and show very constructive attitudes. Partly a good working atmosphere depends simply on the chemistry between the people involved, something that cannot be predicted. During the work of the Centre elections were held in Flanders, and a change of government took place: from two Ministers of the Green Party on respectively Health and Environment, to two Christian Democratic Ministers. Luckily the atmosphere was not affected negatively with the introduction of new (political) representatives of the government working with the Centre, even though they represented a different political attitude to the issues at hand. If this would have been not so fortunate, consequences to the work of the Centre might have been completely different, and it would have affected the work in progress strongly. Getting used to one another has to do with roles and tools, but also with trust. Trust building takes time and effort and is an important part of the work. For example this was clear with the change of government: similar mechanisms that showed in the beginning of the Centre with regard to the Green Parties' representatives reappeared with the new political representatives after the elections.

Actors also have to find new roles for themselves to some extend. In the case of the Centre for Health and Environment scientists suddenly have to discuss work with (sometimes totally) different disciplines. They also have to talk (to) politics. Government representatives suddenly have to discuss science and different fields of policy expertise (the Ministries of Health and Environment) also have to come to terms. Apart from role seeking, this also demands (new) procedures. Furthermore common vocabularies need to be developed: different scientific disciplines, policy makers and other actors use different (technical) language, have different cultural backgrounds and a different knowledge base.

Social science

Daily practice of the Centre for Health and Environment clearly differs from a laboratory situation.

In laboratory research conditions are controlled to a large extend (or controllable) and complexities are limited to a certain degree. The research practice of a social scientist in a setting such as the Centre is something completely different. In the laboratory atoms and molecules more or less do what they are expected to do. In social practice research subjects will go into discussion with the researcher, they talk back (Bal et al., 2002). We can therefore speak of a 'stubborn' practice.

The appreciation of and openness towards other views, other disciplines, and transdisciplinary knowledge seems to have increased. More or less this runs parallel with the development of the work of the social scientists. Fisher (2000) uses the concept of coordination when describing the role of social scientists. He speaks of the necessity of developing innovative methods for coordinating between different discursive processes and institutions. This role of the social scientists within the framework of the Centre for Health and Environment can be characterized as 'emancipating'. In the beginning the role of social scientists according to other actors within the framework of the Centre more or less was limited to communication issues: work to be done after the scientific conclusions were drawn. Gradually other scientific disciplines as well as policy makers showed more appreciation for 'other' capabilities and forms of knowledge: from complicated knowledge from 'another planet', gradually the contribution of social scientific insights and methods was taken more seriously as a necessary asset for the complex scientific and policy endeavour.

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