Assessing environmental health impacts in a complex world

A recent study suggests that a more inclusive and integrated approach to assessing environmental health risks and policies is needed to deal with the increased complexity and systemic nature of the risks.

Two EU-funded projects, INTARESE¹ and HEIMTRA², have developed new methods for integrated environmental health impact assessment. Integrated assessment takes into account the interconnected nature of health problems, rooted in environmental, social and political systems and the precautionary nature of resulting policies. The study proposes a four-stage process for integrated environmental health impact assessment: issue framing, design, execution and appraisal (IDEA).

Issue framing is the initial stage, from which the rest of the process develops. It addresses the scope of the assessment and results in a conceptual model of the problem. It involves all stakeholders, including scientists and policy makers, communicating with each other through different means, such as mind maps and systems diagrams. This process is reiterative, with each cycle coming closer to identifying the causal links between exposure and health outcomes.

During the design stage, a protocol is developed which defines the methods to be used for assessment. Crucially, this includes specifying the scenarios on which the assessment will be based. These may take different forms, depending on the purpose of the assessment, e.g. whether to assess the impacts of existing policies or help choose between new policy options.

Execution refers to the actual process of assessment. Because most problems are complex and systemic, it typically involves applying a range of different models to analyse the combined impact of multiple environmental factors on a number of different health outcomes. Combining toxicological and epidemiological approaches, the ‘exposure-response function’ is a critical step. This leads to a set of indicators chosen by the stakeholders, in order to give meaningful measures of health impact.

During appraisal, stakeholders evaluate the alternative scenarios by linking back to the original goals, thus ensuring greater acceptance by all stakeholders. Specific challenges of this approach include:

- the difficulty of identifying and engaging representative stakeholders
- how to handle multiple types of risk that cause wide-ranging health effects. Integrated assessment attempts to model this complexity rather than isolate individual causes. It is critical to tailor the process to the needs of the users, including, for example, how much uncertainty is acceptable
- defining the multi-layered relationship of risk exposure and health
- capturing the dynamic, time-dependent interactions between the environment and health

Despite the many uncertainties associated with this approach, such as assessing the impacts of resulting policies, the authors warn that the consequences of not evaluating all relevant factors can be serious. To take a non-health related example, the use of land for biofuel crops rather than for food production has had substantial unintended consequences, affecting the global supply and price of food.

1. See: http://www.intarese.org
2. See: http://www.heimtsa.eu/


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