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The future for our children

Dealing with uncertainty – how can the precautionary principle help protect the future of our children?

Working paper

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"We will develop initiatives in our countries to give greater emphasis in all relevant programmes to the need to prevent the exposure of children to environmental threats … We request the European Environment and Health Committee to identify methods and mechanisms to: promote and encourage public health measures in areas of emerging concern about environmental impacts on children's health, on the basis of the precautionary principle."

London Declaration on Action in Partnership (paragraph 50d), adopted at the Third Ministerial Conference on Environment and Health (London, 16–18 June 1999)

Introduction

1. The precautionary principle has arisen as part of the discussions on the most effective ways to protect health and the environment in the face of highly uncertain risks. Since at least the early 1980s, European policy-making on issues of considerable concern and acknowledged scientific uncertainty has progressively adopted precautionary approaches, in order to achieve high levels of public health, environmental protection and consumer safety without compromising science or technological innovation. The European Commission's communication on the precautionary principle of February 2000[1] was a first and critical step in describing the purpose and use of the precautionary principle in European policy-making over the previous 20 years.

2. During the past three years there have been significant developments in the interpretation and application of the precautionary principle, particularly by the European Court of Justice (ECJ), the World Trade Organization (WTO), WHO and some of its Member States. For example, the ECJ cases on antibiotics in animal feed, the European Environment Agency's report *Late lessons from early warnings*,[2] and the scientific and constitutional discussions on the precautionary principle in France have all considerably enriched debates on its use and application. In addition, some of these developing insights have been codified in international agreements signed since 2000, notably the Cartagena Protocol on Biosafety[3] and the Stockholm Convention on Persistent Organic Pollutants.[4] Some of these efforts have raised questions as to how application of the precautionary principle can more effectively stimulate decisions aimed at protecting health and ecosystems under conditions of uncertainty, while stimulating innovation in science, technology and policy.

3. It therefore seems relevant and timely to extend the foundations laid by the European Commission's communication and to address the broader needs of the 52 Member States in the European Region of WHO, including countries in transition that will be represented at the Fourth Ministerial Conference on Environment and Health in Budapest in 2004.

4. In line with the mandate given by the WHO Third Ministerial Conference on Environment and Health, protecting children and future generations from environmental impacts should be a priority. The precautionary principle can be an important tool in protecting children from

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[1] *Communication from the Commission on the precautionary principle*. Brussels, Commission of the European Communities, 2000 (COM(2000) 1).

[2] European Environment Agency. *Late lessons from early warnings: the precautionary principle 1896–2000*. Luxembourg, Office for Official Publications of the European Communities, 2001 (Environmental issue report No. 22).

[3] *Cartagena Protocol on Biosafety to the Convention on Biological Diversity*. Montreal, Secretariat of the Convention on Biological Diversity, 2000.

[4] *Stockholm Convention on Persistent Organic Pollutants*. Nairobi, United Nations Environment Programme, 2001 (http://www.pops.int/documents/convtext/convtext_en.pdf, accessed 13 November 2003).

uncertain environmental risks, as it can be in developing policies to protect adults. Pursuant to that mandate, this document is the first to develop an approach that will promote and encourage protective public health measures in areas of emerging concern about environmental impacts on children's health, based on the precautionary principle. It focuses on how the precautionary principle can be applied to the protection of children's health and that of future generations. In doing so, the goal of this document is to orient and improve environment and health decisions designed to protect children and future generations under conditions of uncertainty and complexity, while stimulating more sustainable forms of development. It presents a decision-making approach to the precautionary principle that is sufficiently flexible to be applied by all countries in WHO's European Region, regardless of their available resources. It provides technical and policy background to the Declaration due to be adopted at the Fourth Ministerial Conference on Environment and Health.

5. In addition, as the policy agenda evolves from "environment" to "sustainable development", with the associated aim of protecting both vulnerable ecosystems and vulnerable people from inappropriate economic activities, there is a need for the precautionary principle to evolve in the face of these new challenges. It is hoped that this document represents another step in the evolution of the precautionary principle and its use in Europe by outlining a process, research needs and policy steps for decision-making aimed more at protecting health under conditions of uncertainty, while promoting sustainable economic development.

The context of precautionary action to protect children

6. The precautionary principle is a tool for policy- and decision-making designed to ensure that people or entities bear political responsibility for taking action to prevent damage to health and ecosystems in the face of uncertain scientific information about health and ecosystem risks. A common definition of the principle is to be found in the Rio Declaration on Environment and Development of 1992: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation". Based on the European Environment Agency's work and other developments in thinking about the precautionary principle, a broader, more proactive definition of precaution helps clarify its application to children's health and sustainable development: the precautionary principle provides a framework, procedures and policy tools for public policy actions in situations of scientific complexity, uncertainty and ignorance, where there may be a need to act before there is strong proof of harm in order to avoid, or reduce, potentially serious or irreversible threats to health or the environment, using an appropriate level of scientific evidence, and taking into account the likely benefits and drawbacks of action and inaction.

7. There are many well established environmental risks, such as unsafe drinking-water, indoor and outdoor air pollution and inadequate sanitation, which are at present arguably among the most serious risks to public health. It is important that public health interventions are strengthened to prevent them. However, there are other, often highly uncertain and complex risks associated with industrialization, which affect society at large and children in particular, such as exposure to dangerous chemicals, radiation, hazardous waste and industrial pollutants through food, water, air and direct exposure from everyday products. These threats can result in effects that take place long after exposure, making the establishment of causal links all the more difficult. Exposures to these agents can result in effects that are irreversible or take many generations to remediate and are costly to health and the environment. Limitations in the ability

to characterize causal relationships are occasionally misinterpreted as evidence of safety. Thus, the need for more accurate scientific information has sometimes been used as a reason for inaction. The combination of rigid policy structures requiring strong evidence of risk, social attitudes and interference by vested interests often result in policy-makers having to wait unreasonable lengths of time before they can commit themselves to preventive action. The past cases of lead, tobacco, asbestos and many other agents provide ample evidence of the high costs associated with waiting for convincing proof of harm. It is equally important that inadequate application of the precautionary principle should not prevent or preclude action producing important benefits for society.

8. Protecting children and future generations (as well as other vulnerable subpopulations) from environmental health risks is a compelling reason for developing precautionary approaches that are rational, consistent with available scientific information, and mindful of society's needs and values. Application of the precautionary principle is particularly appropriate for the protection of children's health because:

- the science underlying the impacts of environmental stressors on children (from the stage of the fetus to the age of 18) is more complex, less researched and less understood than that of such impacts on adults;
- the likelihood of serious harm to children from such impacts can be greater than for adults because of their different and changing stages of biological development, their behaviour and their greater exposure in relation to body weight;
- children are involuntarily exposed to a greater proportion of the risks caused by society's activities than adults, yet they have less power to avoid them;
- children benefit proportionally less than adults from society's risk-generating activities, such as employment, car driving, many consumer products, etc;
- the risks and the benefits of avoided risks have more time to impact on children and society than on adults;
- many of today's serious environmental threats, such as water shortages, climate change, developmental and reproductive effects of toxic substances, endocrine disruption and biodiversity loss, may impinge proportionately more on children and their children than on this generation of adults.

9. The concept of precaution is premised on the principle of protecting society from the adverse consequences of erroneous decisions. Such unintended consequences often affect the most vulnerable groups in the population, and particularly those who do not have the power to change their environments. Hence the special relevance of the precautionary principle for children and future generations. By applying precautionary approaches to children and future generations, we are also contributing to decisions which ensure that all the population is more effectively protected. An approach designed to stimulate more precautionary decisions, with the aim of protecting the health of children and future generations and achieving sustainable development, is particularly important given the growing interdependence of global economies and long-term global threats, such as climate change, caused by industrial and human activities.

A historical perspective

10. The concept of precaution has a long history in medicine and public health, but as a principle it was established by the German *Vorsorgeprinzip* (literally, the "foresight principle") to deal with serious, emerging though not proven risks to ecosystems and health. It is based on the concept that society should seek to avoid environmental damage by carefully planning ahead to stimulate innovation, job creation and sustainable development. The 1992 Maastricht Treaty on European Union established precaution, along with prevention of pollution at source, as central elements of European environmental health policy. The precautionary principle is now widely accepted as an underlying principle of international environmental policy. According to most interpretations of the principle, precautionary decisions are those that prevent damage to health or ecosystems in the face of uncertainty, stimulate the development of more health-protective technologies and activities, and place greater responsibility on proponents of potentially damaging activities. The precautionary principle is particularly relevant to countries with economies in transition because of their greater political, economic, and social uncertainties, lower public confidence, lower research and innovation capacities, and existing high burdens on health and the environment. With adequate international support, such countries have a unique opportunity to develop in a more environmentally sensitive and sustainable manner, avoiding the problems of the past.

11. The Treaty on European Union, as amended in 1996, does not define the "precautionary" and "preventive" policies that must be adopted. The distinction is important: prevention consists of actions taken to reduce known risks, while precaution aims to anticipate and reduce more uncertain risks. This area of policy-making is constantly evolving in response to new scientific, technological and political challenges. The European Commission has published guidelines on the consistent and proportional application of the precautionary principle, in order to avoid unwarranted trade restrictions and to help trading partners better understand European policy-making. In its communication, the Commission states that application of the precautionary principle is of critical importance for its policy of achieving a high level of protection for human health and the ecosystems, particularly under conditions of uncertainty. The communication establishes several criteria to be applied in the risk management phase for deciding on when and how to apply precaution, such as non-discrimination and consistency of actions. The communication emphasizes that it is a first step in an ongoing debate on precaution.

12. The Commission's approach to application of the precautionary principle has the advantage of offering a clear set of guidelines that ensure consistency with international trade rules, establish a relatively clear threshold for applying precaution (reasonable scientific grounds for concern), and identify the aspects that need to be considered before precautionary actions are undertaken. Importantly, it provides a policy tool to legitimize timely action when there is reasonable scientific evidence to cause concern. As it is necessary to ensure that decisions aimed at protecting health under conditions of uncertainty are taken, the Commission communication is focused on responding to potential threats as they arise. To further address an aspect central to the London Declaration mandate, i.e. the question of how to create the conditions for sustainability for current and future generations, it is important to describe the steps for improving preventive decision-making under conditions of uncertainty and complexity. Recent elaborations of the precautionary principle, as well as innovations in risk assessment and risk management, have indicated the need to ensure transparency throughout the decision-making process, to include affected communities in defining risk assessment questions, and to integrate assessment of risks with assessment of alternative policy options.

13. Based on these developments in applying the precautionary principle, developments in risk management, and the needs of the broader WHO European Region, this document builds on the European Commission communication by elaborating, for the first time, a process for applying precaution to effective protection of the health of children and future generations and achieving sustainable development. Applying precaution to achieve more health-protective decisions in this context requires a set of precautionary considerations throughout the whole cycle from problem framing, knowledge production, identification and characterization of risk, risk management, post-implementation follow-up, identification of knowledge gaps and research needs and back again. Such instruments as analysis of alternative courses of action, expanded scientific tools, incentives for research and innovation and enhanced public participation can in fact ensure a more proactive and positive approach to health protection, while improving decision-making. These steps are outlined in the following sections.

A proposed framework for applying precaution in the context of the health of children and future generations and sustainable development

14. As discussed in the previous section, and given the increasingly complex nature of risks and the growing interconnections between people and ecosystems in a globalizing world, it has become necessary to develop an approach for applying precaution in decision-making on environmental and health risks to children. Such an approach should be consistent with public health values and WHO's mission to promote health. The goal of this approach is to describe steps for improving preventive public health decision-making under conditions of complexity and uncertainty in a transparent and democratic manner. It provides guidance for decision-makers and society at large, so that they can proactively apply precaution to protect the health of children and future generations and make rational decisions under conditions of uncertainty. The following guidelines are designed to be flexible, to outline a series of points that should be considered in all good decisions taken under conditions of uncertainty, and to be widely applicable by countries with differing levels of resources.

15. Given the complex nature of environmental risks to children, this approach is necessary to identify and prevent such risks (particularly those that may occur in the future) more effectively, characterize uncertainties, and stimulate research and development of preventive alternatives. Thus, an effective approach to applying the precautionary principle in these areas can be based on simple steps, scientific research and policy actions, such as:

- improving and expanding the range of scientific tools and perspectives in decision-making; developing methodologies capable of analysing complex systems, including cumulative and interactive effects, and their relationships with health;
- advancing our understanding of the relationship between ecosystems and human health and the long-term implications of ecosystem degradation;
- increasing the transparency of decision-making by more explicitly characterizing the nature and extent of uncertainties; making scientific and ethical assumptions explicit; and expanding the range of stakeholders and values involved;
- strengthening the ability of public health professionals to identify early warnings of risks and understand the effectiveness of interventions through the integrated establishment of surveillance programmes;

- ensuring adequate support for establishing research and education programmes to identify gaps in knowledge and develop and implement safer and cleaner production processes, products, consumption patterns and preventive interventions.

16. When uncertain and complex risks are being addressed, attention should not be diverted from existing public health actions related to well established risks. Indeed, opportunities for more efficient tools to address both well established and uncertain risks should be explored. The approach proposed here is designed to contribute to more efficient preventive action, as it may be instrumental in anticipating the emergence of possible threats, through their early identification. It can draw the attention of scientists and decision-makers to the need to identify and develop options to anticipate and prevent risks before they occur. Analysis of alternatives is essential and can help prevent the often contentious debates over what constitutes an acceptable level of risk, as well as conflicts between environment and health protection and economic interests. This approach thus serves as a "compass", pointing towards more health-protective decisions under conditions of uncertainty. Under this approach, what constitutes a threat to health should be broadly interpreted, using WHO's definition of health, to include aspects such as the indirect effects of interventions or technologies.

Application of precaution in the context of the health of children and future generations and sustainable development

17. Applying this approach should encourage decision-making using the broadest possible range of information, stakeholders and scientific and policy tools in identifying and preventing risks and examining alternative courses of action. The approach focuses on a series of procedural steps to ensure sound health and environmental decision-making, examining all the evidence on threats as a whole and learning from accumulated experience and understanding. Flexibility in applying precaution to the area of the health of children and future generations is critically important, since each decision is different – with different types of risks, evidence, uncertainty, affected communities, availability of alternatives, and technical and financial resources. In this case, consistency comes from using the same precautionary framework and process in each case. Although outcomes will differ with the facts of each case, the approach will be the same. Policy-makers should encourage entities creating risks to be responsible for providing full information on those risks and alternatives. The goal is for governments and entities handling risks to internalize this heuristic approach in their decision-making processes, instituting a precautionary "mindset" with regard to uncertain environmental and health risks.

18. The steps in such an approach for applying precaution to the health of children and future generations include:

(i) determining whether an uncertain risk/problem merits a more thorough review – whether there is sufficient evidence to indicate a potential problem, or whether the cost of review is disproportionate to the cost of considered actions, including inaction. Sometimes a screening process may be useful;

(ii) broadly defining problems to capture root sources of risks, where appropriate;

(iii) considering and examining all available relevant evidence on exposure, hazard and risk in an interdisciplinary manner and taking account of variability as well as relevant direct, indirect, cumulative and interactive effects; this can include

conducting routine health and environmental monitoring to provide a baseline understanding of health and ecological impacts, as well as health trends;

(iv) considering the application of simplifying rules of thumb, safety factors, default values, or proxy indicators of exposure and effects when information is lacking;

(v) comprehensively examining uncertainty and gaps in information, performing sensitivity analyses and identifying research and other ways to reduce uncertainties and gaps in knowledge where appropriate;

(vi) examining a wide range of options to reduce risks, as well as their trade-offs, advantages and disadvantages;

(vii) determining an appropriate course of action based on the scientific evidence, the examination of alternatives, and public input. A wide variety of policy tools to implement preventive or protective actions should be considered, along with their economic, technical and political feasibility;

(viii) instituting post-implementation follow-up measures, to ensure continuous risk reduction and understand the positive and negative impacts of interventions and possible unintended consequences. This should include an evaluation of measures taken and not taken, so as to minimize unexpected adverse impacts and to maximize learning.

19. Under this approach, there is no single recipe for taking precaution. What is considered an "acceptable risk" or sufficient evidence to act is a function not only of the level of risk and the strength of evidence and uncertainty, but also of the magnitude, reversibility and distribution of the risk, the availability of opportunities to prevent risk, the public's risk aversion, and society's culture and values. In the case of countries in transition, this process can provide a tool for prioritization, continuous improvement in human and ecosystem health, and identification of cost-effective means for multi-risk reduction.

20. Decisions made using the proposed approach should be based on the best available evidence, in addition to informed judgment and common sense. Rigorous, high quality science, which is explicit about its limitations and gaps, is critical in the application of precaution to the protection of the health of children and future generations. Scientific methods and tools must be chosen to fit the nature and complexity of the problem. Thus applying precaution does not exclude but rather advocates for the need to improve the scientific basis for decisions, including tools for assessing risks, improving surveillance of health and interventions and evaluating alternative technologies and activities.

Types of precautionary actions

21. Application of the precautionary principle to protection of the health of children and future generations does not necessarily mean stopping an activity. While always taken in the face of acknowledged uncertainties, precautionary actions can range from informing the public about risks and uncertainties while further study is undertaken to characterize them, to imposing restrictions on potentially harmful activities and phasing out activities where evidence indicates that they might be particularly problematic. One important aspect of precautionary action entails placing responsibility and incentives in ways that stimulate proponents of potentially hazardous activities to understand the risks associated with those activities and to take protective actions.

The actions taken in applying precaution can differ from country to country, depending on capacities and the groups at risk, and other economic, social and political factors. The types of precautionary action should be multiple in nature and case-specific, depending on:

- the nature of the risk, its level of uncertainty, magnitude and reversibility;
- who is exposed (for example, disproportionately affected or highly vulnerable communities);
- issues of technological and economic feasibility, benefits, proportionality and non-discrimination;
- preventability of the risk;
- social values.

22. Precautionary actions ultimately aim at continuously reducing and if possible removing exposures to potentially harmful substances, activities and other conditions. If progress is to be made in this direction the following goals should be pursued: 1) encourage the substitution of dangerous substances and activities by less dangerous substances or technologies where suitable alternatives are available; 2) improve production processes, products and human activities so as to minimize significant adverse effects to health and the environment, for example through the use of integrated pest management strategies, land use planning, and life-cycle analysis; 3) establish public health goals for protecting and restoring human and ecosystem health; 4) provide information and education to citizens to promote empowerment and accountability; 5) integrate precautionary considerations in the research agenda to make possible rapid interventions to prevent damage to health; and 6) minimize, so far as possible, unintended adverse consequences that may be caused by precautionary actions.

Conclusions

23. In conclusion, applying precaution in the context of protecting the health of children and future generations and achieving sustainable development should be a continuous, iterative process of seeking out sustainable ways of reducing the adverse impacts of economic activity on public health. The precautionary principle needs to remain an important risk management tool, as defined by the European Commission, to encourage protective actions when risks cannot be thoroughly quantified on a scientific basis. The proposed approach builds on the European Commission's communication by incorporating recent developments in application of the precautionary principle, considering the needs of the entire WHO European Region and focusing on establishing a set of considerations designed to stimulate effective decision-making to protect the health of children and future generations in the face of uncertainty. Such an approach is also important for protecting adults and ecosystems from the adverse effects of human activities. It is an evolving approach, for which communication between Member States in sharing research results, lessons learned from applying the framework, and scientific and technological best practices will ensure its improvement over time. It requires institutional development to improve transparency, apply new scientific tools and assess alternatives.

24. Implementing precautionary actions that are cost-effective (i.e. least costly to achieve a particular goal) and that have synergistic impacts (addressing several risks at once) can often result in a "win-win" situation for the policy-maker and the public at large. This requires incentives and support for research, development and innovation in safer and cleaner technologies and human activities that can help avoid risks in the first place and restore health

and ecosystems. A proactive approach to precaution, directed towards creating the conditions for sustainability and health rather than simply responding to problems after they have occurred, is invaluable as we strive for a world that protects children and future generations, as well as adults and the ecosystems on which we depend, without compromising science, economic development or innovation.