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Children's environment in Central Europe: Threats and chances

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Abstract

Many of the "classical" environmental hazards and risks (such as anthropogenic chemical and physical factors, e.g., asbestos, dioxin, electromagnetic fields and "pesticides") are in our countries not major determinants of children's health and well being; however, there may exist unseen or unrecognized causal contexts. Some hazards, such as UV light, noise, fine particles, tobacco smoke, legal and illegal drugs, and radon, are considered important by experts, but are still largely ignored by the public. In our society, despite of, or maybe because of the multitude of information and disinformation, adequate risk perception continues to be a problem. Furthermore, ever-new environmental toxicants will come to the surface and occupy medial interest, and thus, continuing attention is warranted. Of our children's environment, yet other facets are of prime importance: nutrition, housing and traffic and public media. Most important, however, is the fact that society (governments, administration, industry and consumers) are disregarding the long-term sustainability of their actions and behaviour, thus endangering the future of our children and grandchildren. This is in contrast with the existing declarations and official action plans. In future, ranking of priorities for research and actions will be necessary, taking into account costs and effectiveness since resources to be invested into these issues certainly will remain limited.

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Introduction

Health and disease always result from the interaction of endogenous factors (individual disposition) and exogenous influences. In phenylketonuria, heredity is the important determinant, but diet is also of importance. Traumatic fracture most often is due to exogenous physical forces, but bone fragility is not to be neglected. The sum of exogenous factors that always

play a role whenever health and disease, salutogenesis and pathogenesis are concerned can be termed environment. In environmental medicine, this is called gene-environment interaction.

This issue of IJHEH, reflecting the proceedings of a workshop held in Osnabrück in November 2006, deals with environmental health in children. While environment, in its larger sense, comprises the climate as well as molds, ticks and bacteria, the macroscale environment around the living areas and microenvironmental factors as indoor air, environmental medicine in its stricter sense deals with a limited set of physical and chemical anthropogenic factors that may threaten or harm human health.

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Definitions

Environmental medicine is concerned with three rather distinct fields:

- (1) Environmental medicine is a clinical discipline, caring for individuals, offering diagnostic and therapeutic procedures. Environmental medicine is taking environmental hazards as a potential influence on the pathogenesis of diseases. Environmental medicine cares as well for individuals that fear environmental hazards as a reason of their symptoms, but where there is no evidence that the environmental hazards are the causing factor of the symptom. Serious cases of environmentally related intoxication are rare in Central Europe. This could be because cases are not diagnosed due to a severe lack of knowledge of paediatricians. Another major reason is that within the last decades many environmental hazards have become rarer in Europe due to legislation and increased attention from many parts, to the benefit of the children's health. One has to be, however, on the qui vive, since there are many things between heaven and earth that we do not see or recognize or appreciate correctly. There are large scientific gaps regarding distinct or suspected or yet entirely unnamed environmental factors. Examples that have only recently surfaced are: acrylamide, bisphenol, carbon monoxide, DEHP (phthalates), fine particles, and fungous toxins, to spell just a few from the beginning of the toxicological alphabet.
- (2) Environmental *health* means primary prevention regarding exposure to well identified environmental toxicants or conditions. Prevention often is seen as a task of public health services, of government, legislation, and administration. This can concern fields as different as chronic lead intoxication, fine particles and smog, or noise prevention. This is a wide area where yet much has to be done, also in Central Europe.
- (3) Finally, ecopolitical concerns, environmental health *policy* are the crucial field where environmental medicine has and will retain an everlasting task. This challenge is a very specifically paediatric aspect. Differently from the tasks of, say, physicians treating orthopaedic or ophthalmologic patients, our nowadays paediatric clientele will want to live in a sustained world for more centuries to come.

Activities, initiatives, statements, reviews

The [Convention on the Rights of the Child \(1989\)](#) has been signed and ratified by practically all nations. It stresses “the right of the child to the enjoyment of the highest attainable standard of health” (Article 24) and

asks “to combat disease and malnutrition ... taking into account ... the dangers and risks of environmental pollution”.

There have been numerous local and several international initiatives, on very different levels, to focus and promote children's environmental health. Their contents are not going to be cited here in extenso; many of these manifests, documents, declarations are repeating very similar statements and calls for action: Children are more vulnerable than adults, it is society's task to protect them from hazards and to ensure to the possible utmost their well being etc.

Nearly 10 years ago, the G8-group issued a “1997 Declaration of the Environment Leaders of the Eight on Children's Environmental Health” in Miami, Florida. Points for implementation actions on a world wide scale were: Risk assessment and standard setting; lead; safe drinking water; endocrine disruptors; air quality ([G8-Group, 1997](#)).

Within the frame of the Ministerial Conferences on Environment and Health (Frankfurt 1989, Helsinki 1994, London 1999, Budapest 2004) ([G8-Group, 1997](#)) attention has been centred to children's issues, and in Budapest a “Children's Environment and Health Action Plan” for Europe (CEHAPE) ([World Health Organisation, 2004](#)) was issued, defining four “Regional Priority Goals”: Water and sanitation; accidents and injuries; outdoor and indoor air pollution; and hazardous chemicals and physical and biological agents; with commitments of “developing and starting to implement national children's environment and health action plans by 2007 at the latest”. Previously, for the London Conference, the European Environment Agency (EEA), had prepared a background briefing “Children in their environment: vulnerable, valuable, and at risk” ([EEA, 1999](#)).

The World Health Organisation (WHO), Regional Office for Europe, jointly with the EEA, in its Environmental Issue Report No. 29 centres on “Children's Health and Environment: A Review of Evidence” ([WHO and EEA, 2002](#)).

The WHO recently has edited an extensive review: “Principles for Evaluating Health Risks in Children Associated with Exposure to Chemicals”, at the time available only as an unedited draft, 301 pages long ([World Health Organisation, 2006](#)).

The US Environmental Protection Agency (US EPA) has focused their attention to children's environmental problems and hazards in North America: “America's Children and the Environment: Measures, Body Burdens, and Illnesses”. Their “Strategic Plan” foresees 7 goals: clean air; clean and safe water; safe food; preventing pollution and reducing risks in communities, homes, workplaces, and ecosystems; better waste management, restoration of contaminated waste sites, and emergency response; quality environmental information ([US EPA, 2003a, b](#)).

At the same time, the Commission for Environmental Cooperation (CEC) has issued a report: "Children's Health and the Environment in North America. A first report on available indicators and measures" (CEC, 2006).

The European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC) with its task force and scientific committee comprising mainly industry and producer's scientists, has issued in 2005 a Technical Report No. 96: "Trends in children's health and the role of chemicals: state of the science review" (ECETOC, 2005).

The US EPA is developing a toxicity and exposure assessment for children's health (TEACH) website (US EPA, 2006) which, at the moment, contains only scarce information, but is promising to become a useful tool in the future, whilst the German Paediatric Commission on Environmental Health maintains an active and much used website for health professionals in German language (www.uminf.de), as well as a website for the general public (www.allum.de).

German paediatricians as well as their Commission on Children's Environmental Health together with the Robert Koch-Institut (RKI) and Kinderumwelt previously have organised workshops on this topic (Bilger and Petersen, 2000; RKI and Kinderumwelt, 2002).

The German Health Authorities (RKI and Umweltbundesamt (UBA)) have conducted in the last 3 years an important children's and youth's health survey (KiGGS) and an environmental survey (KUS), including some 17,000 and 1800 participants, respectively. Results of these surveys have been published recently and will finally be available over the internet before the end of 2008 (RKI, 2006; UBA, 2006; *Bundesgesundheitsblatt (Sonderheft)* 2007).

Paediatric environmental medicine: some peripheral issue, or a central point of crucial importance?

Fifteen years ago, when there was a deep and widespread concern about environmental risks for human health and more generally – for the entire world ("ecological concerns") – many public health researchers had the impression that environmental medicine would develop into a thriving medical discipline of its own standing, and in some countries, including Germany, educational courses and certificates for environmental medicine were developed, offered and eagerly accepted. In Germany, about 100 paediatricians have entered and finished 200 h of postgraduate education in environmental medicine. With fading general interest concern of people and public media has been turning to other items, and physicians found out that

there is not much money to be earned on this field – there are concerns that environmental medicine might become more or less a borderline subspecialty.

But public attention, from time to time, rises anew, as certain substances, threats, disasters are coming up to the surface, are spotlighted by medical science or, more so, by public media. Recent acutely discussed topics have been acrylamide, bisphenol, perfluorated tensides, phthalates, avian flu, and electromagnetic fields, to name just some chemical and some other toxicants or environmental threats. In our media-driven society the proper (science based) information and, as a result, allocation of financial and other resources to priority issues in environmental health continues to be difficult.

Paediatric environmental medicine, at the moment, appears not to be one of the priorities for paediatricians. A previous enquiry had shown that only the Deutsche Akademie für Kinder- und Jugendmedizin (German Academy of Paediatrics) and the Spanish Paediatric Association, but none of the other European societies, has an Environmental Committee. In planning and organising the Osnabrück workshop, we had informed and invited the chairman, presidents or secretaries of the paediatric societies in Austria, Belgium, Denmark, Germany, Luxembourg, Netherlands and Switzerland. We have received no answer whatsoever. This is in contrast with the intense attention given to environmental issues some 15 years ago.

Necessity of political dialogues

The International Workshop in Osnabrück from 21–24 November 2006 comprised nearly exclusively medical and scientific presentations and participants. This does not imply that we deem unnecessary the dialogue with e.g. such Non Governmental Organisations (NGOs) that engage and work for the protection of our environment, as Greenpeace, Bund für Naturschutz und Umwelt in Deutschland (BUND), or World Wildlife Fund (WWF).

These organisations recently have published several large reviews (Cameron and Smolka, 2005; Greenpeace, 2005; WWF, 2005), including results from measurements of xenobiotics (as pesticides and a number of other chemical contaminants) in the blood of politicians, thereby aiming at large medial attention. The tenor of the cited papers was: We can measure over 300 "chemicals" in the human body that threaten or may harm our health. Similarly, Grandjean and Landrigan (2006) have quite recently published a review, giving a list of over 200 substances with proven neurotoxicity to humans, reminding of possibly many unknown toxicants and asking for continuing watchfulness. These are not useful approaches for scientific or even political discussions because they are based upon a melange of

correct, of partly correct, and misleading data. They might be seen as an incentive to find common starting points for the discussion. With progressing refinement of analytical methods, we doubtlessly will be able to detect even more substances. The relevance for human health depends largely on toxicity and on the dose of the supposedly noxious substance, on duration and way of exposure, and on susceptibility.

Psychosocial environmental factors

The psychosocial factors of children's environment doubtlessly constitute at the moment the most important pathogenetic factor for children's well being and health. Also, some of them are accessible to melioration. If we consider that there are limited financial resources, a thoughtful attribution of the available means will be essential in the future. In this context, an important part of the workshop was concerned with such issues: poverty, migration status, environmental justice; nutrition and obesity; public media and violence; consumption of legal and illegal drugs.

Long-term sustainability

But also the "environment" sensu strictiori, i.e. the anthropogenic chemical and physical factors and conditions, need critical attention. Good data, knowledge and expertise are needed for correct risk assessment and risk management of nowadays pollutants and of those to be expected in the future, resulting from the implementation of new technologies. Thorough risk communication is mandatory in order to avoid expensive and ineffective measures. Thus, one may keep in mind the statement of the former EPA administrator William K. Reilly: "Huge sums of money are being spent on hypothetical risks experienced by few individuals while ecological matters affecting millions of people are not adequately addressed." (cited from Abelson, 1994).

Here we have one issue that subsequently will have to be discussed with NGOs, with engaged ecopolitical activists, with all those serious citizens who are worried about the future of our world. While in Central Europe the individual health of our children is endangered by factors as second hand smoke, car exhausts, fine particles, traffic, and noise, we must be deeply worried about what we do to the future of our children and grandchildren. Our generation with our consumer's mentality put at stake their future. Tropical and boreal deforestation, loss of biodiversity, climate change, scarce resources of safe drinking water, chemical and nuclear waste deposits and chemical contamination may prove to

be unidirectional developments. We have to adjust our behaviour, our producer's output and consumer's wastes under the aspect of "Enkeltauglichkeit" (aptitude for the grandchildren's generation): will it harm, or will it suit the world of our grandchildren and our descendants beyond? This is the essence of an old tale from Karelia: floods were rising, and the old raven father, being able to rescue only one of his children, carried his first son across toward the shore. "I will care for you in your old age, you shall be safe and sure" – said the first one. The father dropped him and let him drown in the water. – "I will study and learn, so that you will be proud of me" – promised the second son, which did not save him. "I will, just as you do now, have in mind the future of my grandchildren" – said the third child. This one the old raven father carried to the safe shore.

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