INTARESE

Approaches to Integrated Monitoring for Environment and Health Impact Assessment

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Rationale and introduction

The challenges of climate change dramatically underline the connection between environmental and health processes, and bring about the need for integrative approaches to management of environmental health challenges in regional, national and international level. A systematic, repeated monitoring process is needed as the problems themselves have many interconnected causes, and combined wide-ranging and diverse effects. Repetition of information gathering is essential because the effects of the problems are often long-lasting.

Making an effective, systematic and repeated monitoring is inevitably challenging, because of the complexity of problems due to the interaction of multiple parameters at each level of organization (anthropogenic or biological, individual or population) and scale (regional or local). Interactions create major demands in the ways of integrating and connecting the various information sources.
A number of initiatives already exist that link different types of data for different purposes.

Monitoring and Assessment Systems in Europe - Integration of Environment and Health

Project acronym	Location	Period	Data information	Integrated methodology
AMAP	The terrestrial and marine areas north of the Arctic Circle	1991-2012	**Environment** Atmospheric contaminants Marine contaminants Radioactivity Freshwater and terrestrial contaminants **Health** UV radiation and climate change	Guideline and methodology were developed for each monitoring system, quality control and general monitoring issues
EHIS	Europe	2008-	**Environment** Air quality Food safety Chemical safety Water and sanitation Mobility and transport Housing UV and ionizing radiation Occupational hazards **Health** Exposure of population to environmental stressors	Methodology was developed for thirty indicators giving the rationale, definitions, required data elements, calculation methods, data sources, interpretations and policy-relevance.
EHMS	Czech Republic	1994-2006	**Environment** (136 contaminant factors) Air pollution Drinking water pollution Noise Soil contamination **Health** Dietary exposure and human bio-monitoring	Methodology was developed for monitored factors and indicators and their limits, information system and data processing, and QA/QC system
GerES	East-, West-Germany	1985-2006	**Environment** Domestic environment: tap water, dust deposit, content of vacuum cleaner bag and indoor air. Community: water works sample and dust fall outdoors. **Health** Human bio-monitoring, diet and personal air	Methodology was developed for fieldwork, experimental chemical analysis, and data analysis (including checking and revising data, matching different data files, weighting etc.).

Project acronym	Location	Period	Data information	Integrated methodology
KiGSS	East-, West-Germany	1990-1992 2003-2006	**Health** (1990-1992, 4730 participants; 2003 -2006, 17,641 participants) Measure: physical and mental health Questionnaire: health status, health behavior, health care utilization, social and migrant status, living conditions **Environment** Environmental determinants of health.	Methodology was developed for the participants interviews, physical examinations, blood and urine samples, and data processing
ONERC	France	2001	**Climate change (15 indicators)** Different sources Several datasets **Population data** Exposure of population to climate risk	Report on specific themes, e.g. human health, relying on the indicators.
PCBs	Michalovce and Svidnik/Stropkov regions, Eastern Slovakia	2001-	**Pollutants** PCBs and toxic metals. **Health (8 indicators)** Thyroid gland, glucose homeostasis and neurodevelopmental disorders	Report on specific themes, e.g. human health, relying on the indicators.
HWWS	France	2003-	**Environmental variables** Temperature and air quality (O_3, PM_{10}) **Health** Mortality	I. Analysis of the temperature data, including the probability of being above threshold II. If the probability are medium to high, analysis of additional risk factors III. During a heat wave or immediately after, analysis of the health data to orientate the actions.

Components (left) and Steps (right) of an Integrated Environment and Health Monitoring System