

Integrated Assessment of Health Risks of Environmental Stressors in Europe



The INTARESE Project

A 5-year Integrated Project

Funded under the Sixth Framework Programme of the European Union

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The INTARESE Project



The aim:

- To develop, test and apply a methodology for integrated assessment of health risks from environmental stressors, in order to support policy in the EU

Deliverables:

- Conceptual framework for assessment
- Generic methods and tools
- Testing and demonstration of integrated assessments
- Operational toolbox (assessment system)
- User network and training

The partnership:

- 33 partner institutions from 14 countries
- Universities, national ministries/government agencies, industry
- 7 sub-projects, 24 work packages



1. Modern environmental health problems are complex

- Multiple hazards, pathways and primary/secondary effects
- Combined and cumulative exposures
- Low relative risks but potentially large public health effects
- Nesting of local and global problems
- Entanglement of acute and chronic effects
- Variations in susceptibility and adaptability of population

2. Traditional methods of risk assessment are inadequate

- Assessments must cross traditional boundaries of policy, science and expertise
- Assessments must show links within environment-health system and opportunities to intervene
- Assessments must be comprehensive and consistent but adaptable to local circumstance

Principles



1. Implies capability to integrate assessment of risks

- Source to ultimate impact
- Different environmental hazards, pathways and media
- Different health effects and population groups
- Different policy areas and responsibilities
- Different spatial and temporal scale

2. Knowledge and data are imperfect

- Make best possible use of available data and knowledge
- Recognise and report uncertainties
- Users must be willing to face up to complexity and uncertainty (precautionary approaches)

3. Perceptions of, and responses to, risk depend on the perspective of the observer

- Issue framing is crucial – how we define a problem defines the assessment
- Stakeholders must be involved if they are to trust outcomes of assessment

Who Needs Integrated Assessment and Why?



1. Key users

- EU policy-makers
- International agencies (e.g. WHO, UNEP, World Bank)
- Voluntary organisations (e.g. FoE)
- National governmental agencies, environment/health ministries
- Industry (e.g. oil, chemicals, insurance)
- Researchers and risk assessors (e.g. epidemiology, toxicology, environmental science, risk management)

2. Applications

- Environmental burden of disease assessment
- Priority setting
- Performance analysis (policy, technology etc)
- Scenario analysis (policy, technology etc)
- Liability assessment
- Risk management
- Public information and participation

Some Working Definitions



1. Integrated assessment

- The assessment and reporting of collective (health) risks and impacts across different hazards, exposure pathways, spatial areas or scales, time periods and/or policy areas, in a consistent and comparable manner

2. Health risks

- Probability and distribution across the population of possible adverse health effects arising from exposures to environmental stressors

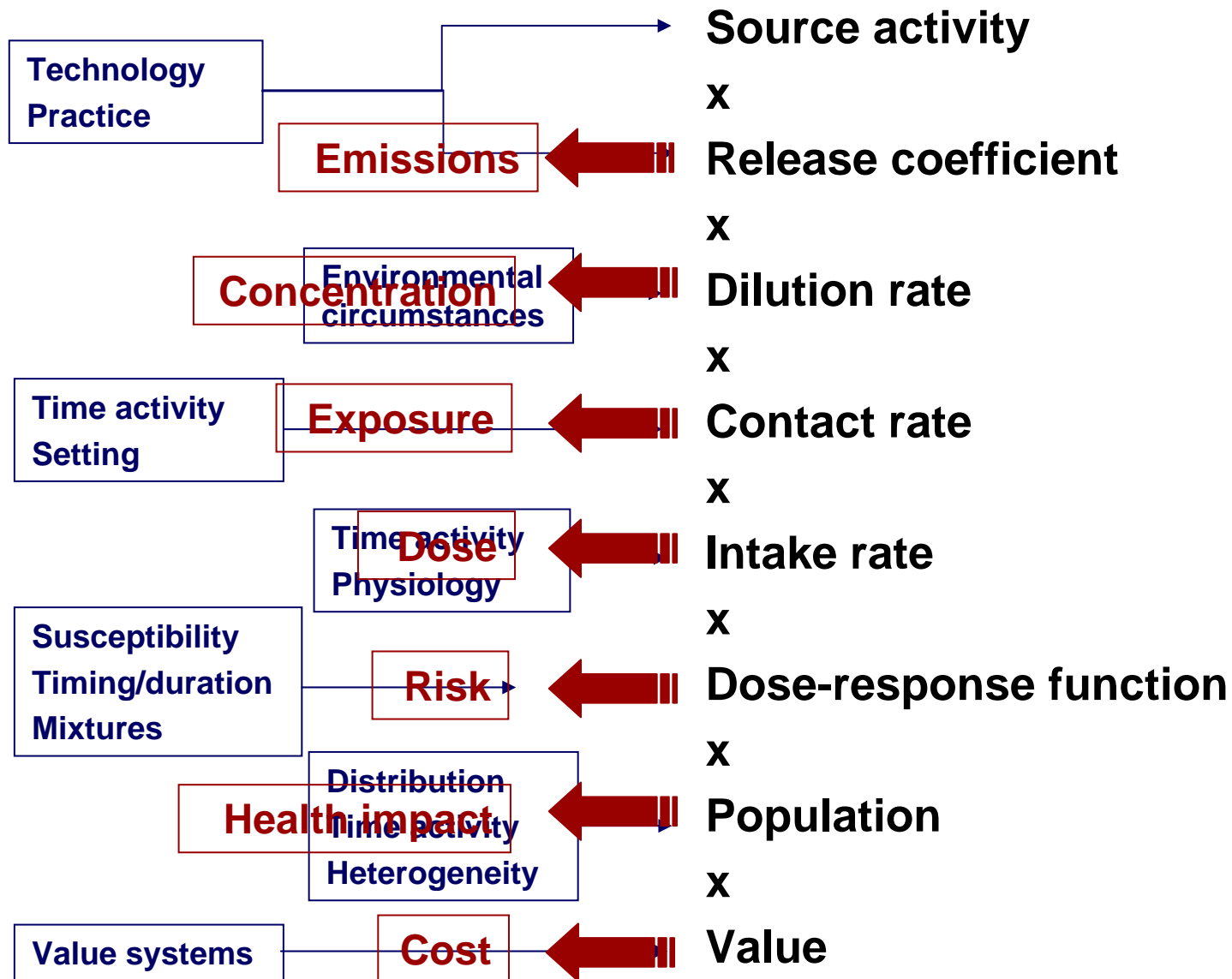
3. Health impacts

- The potential public health burden and associated social consequences, in terms of morbidity, mortality and monetary or other costs

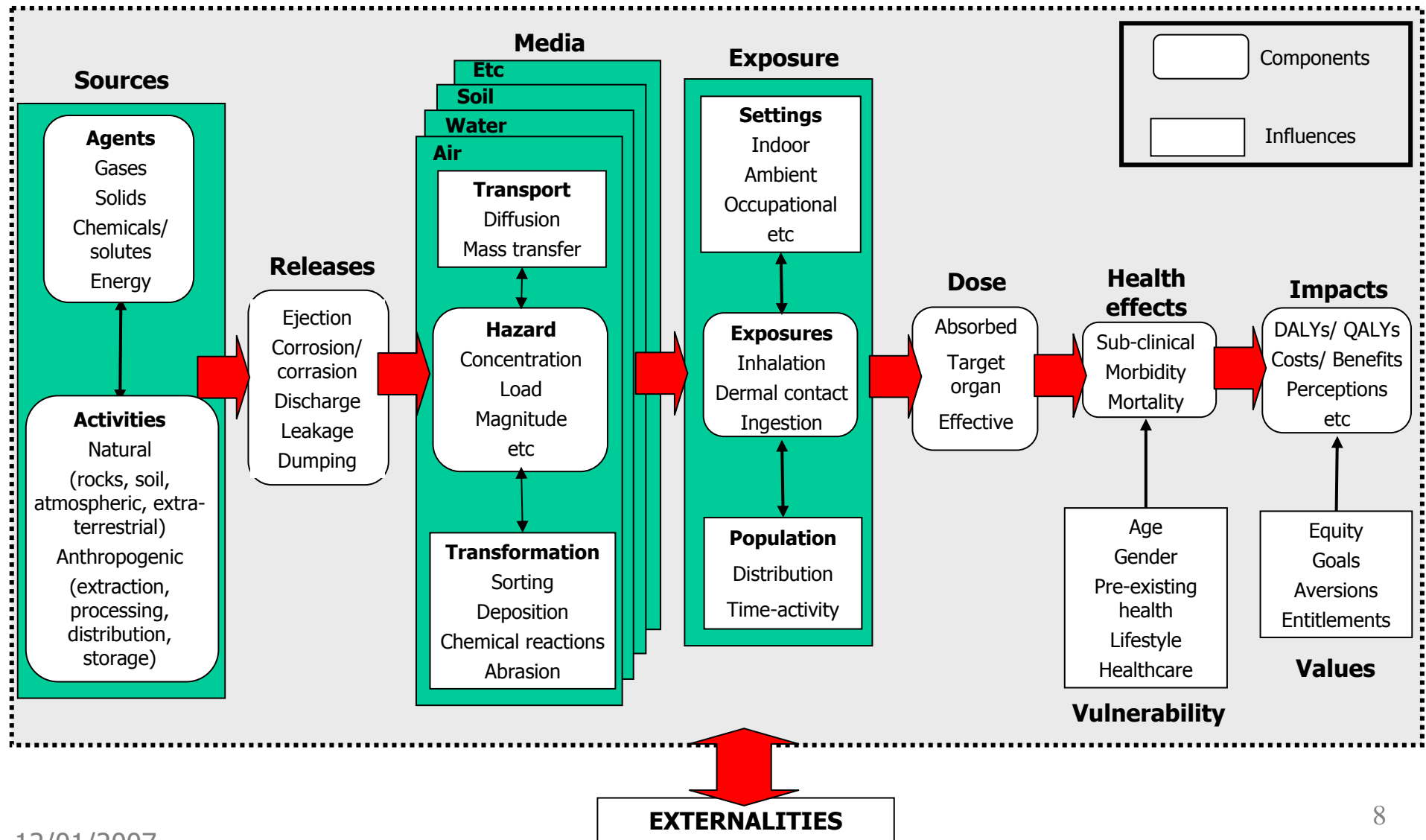
4. Environmental stressor

- Any environmental source, agent or process that has the potential adversely to affect human health

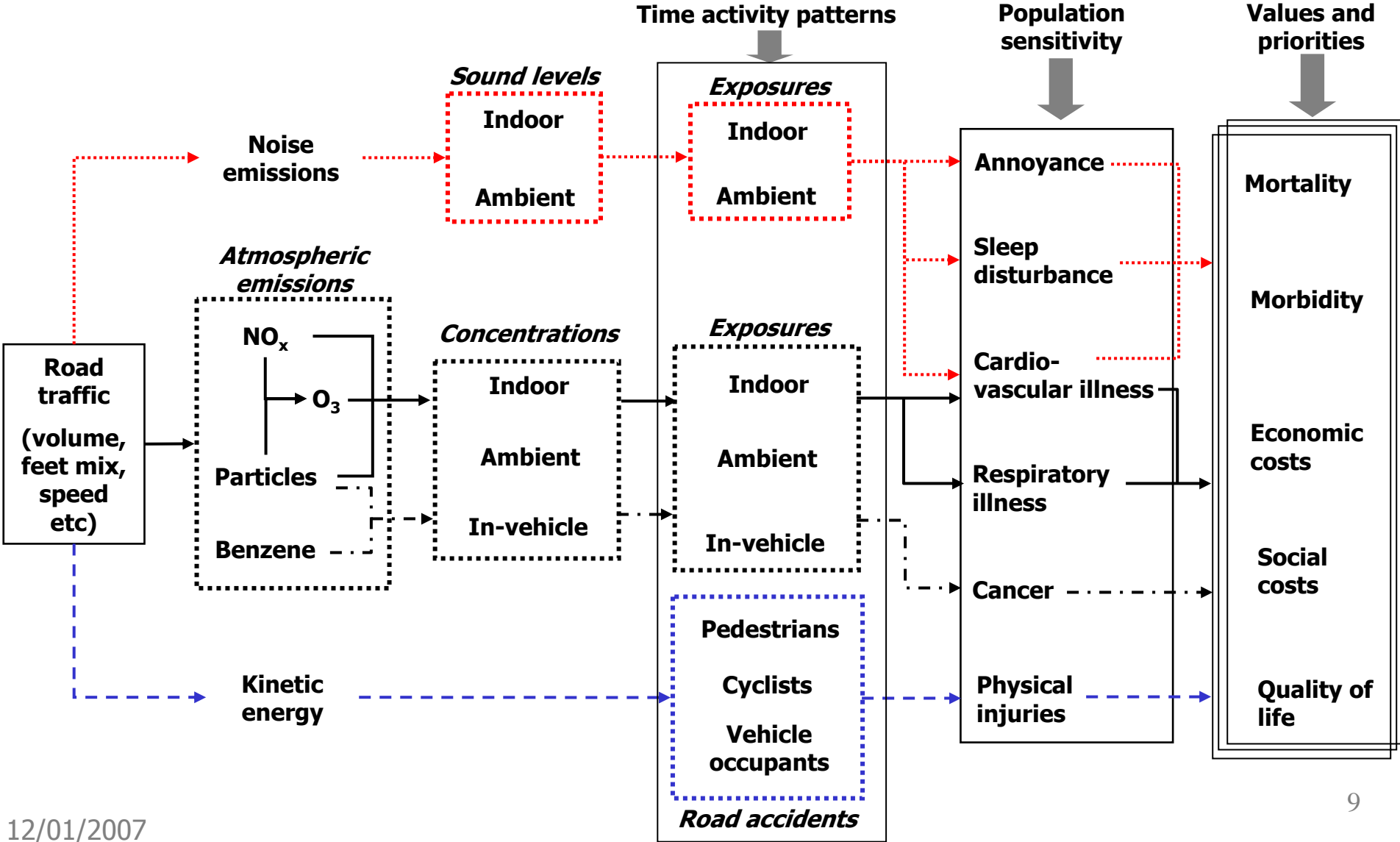
The integrating principle



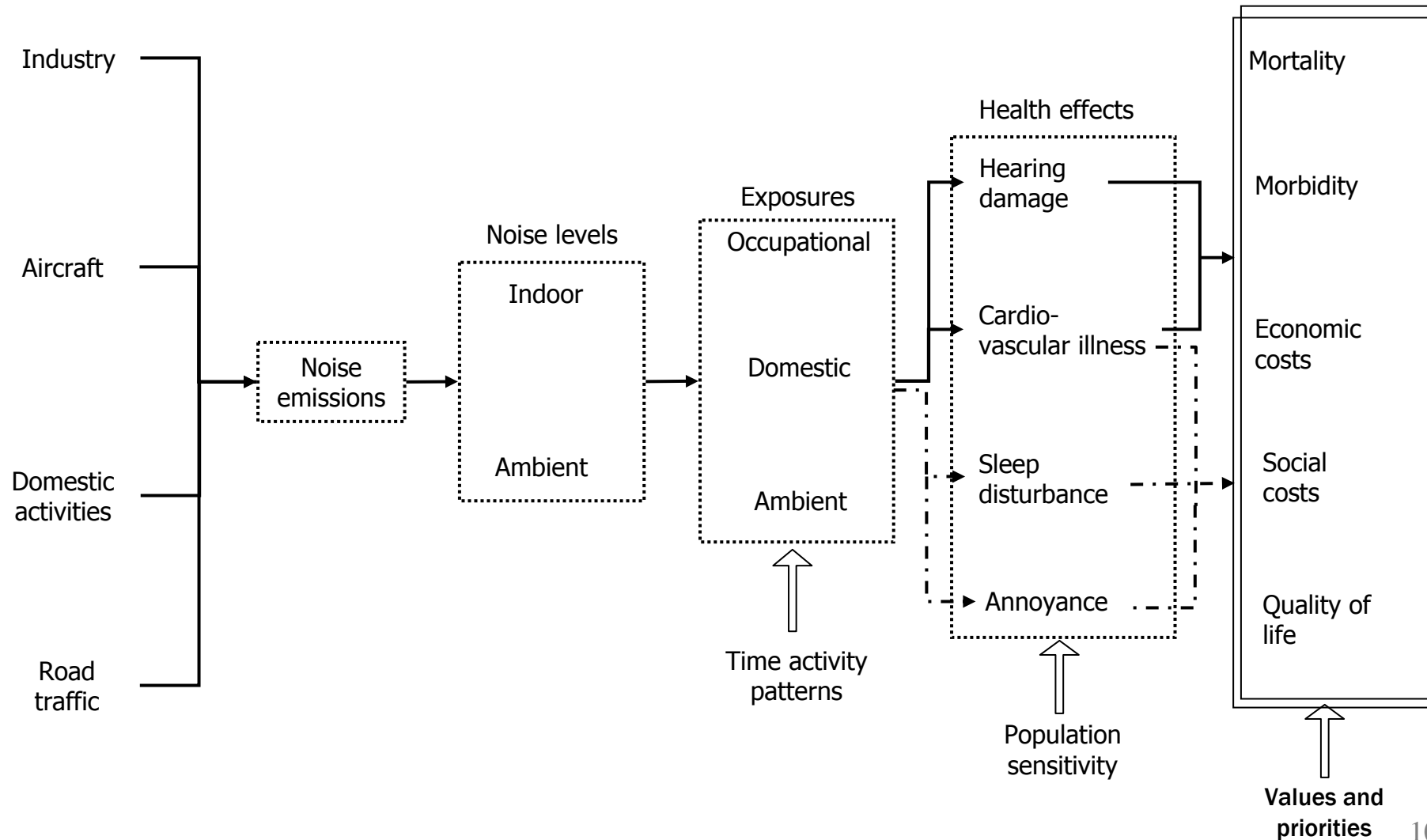
The Full Chain Framework



An Example of the Full Chain Framework: Road Traffic



An Example of the Full Chain Framework: Noise



Assessment Methodology



1. Source-exposure

- Source activity + Release + Dispersion/decay + Exposure + Intake
- Exposure modelling
- Source attribution

2. Exposure-health effect

- Dose-response functions, toxicology
- Systematic review)
- Expert elicitation

3. Risk characterisation

- Exposure – health effect – secondary impacts (e.g. costs)
- Indicator specification
- Risk communication

4. Uncertainty analysis

- Conceptualisation – measurement – modelling – reporting - interpretation
- Error propagation
- Uncertainty reporting

Monitoring and Surveillance



Integrated risk assessment depends on the availability of reliable and consistent data throughout the source-impact chain

1. Monitoring and modelling

- Environmental - personal, in-situ, satellite
- Biomonitoring – biomarkers of exposure, susceptibility and effect
- Health surveillance – baseline rates, verification

2. Adequacy assessment

- Relevance and sensitivity – links to health
- Quality – accuracy, representativeness, coverage, resolution
- Inter-operability – consistency, comparability, connectivity
- Accessibility – access facilities, costs, confidentiality

3. Enhancement

- Good practice guidance
- Linkage and inter-conversion
- Gap-filling
- New technologies

Policy Assessments: Rationale and Themes



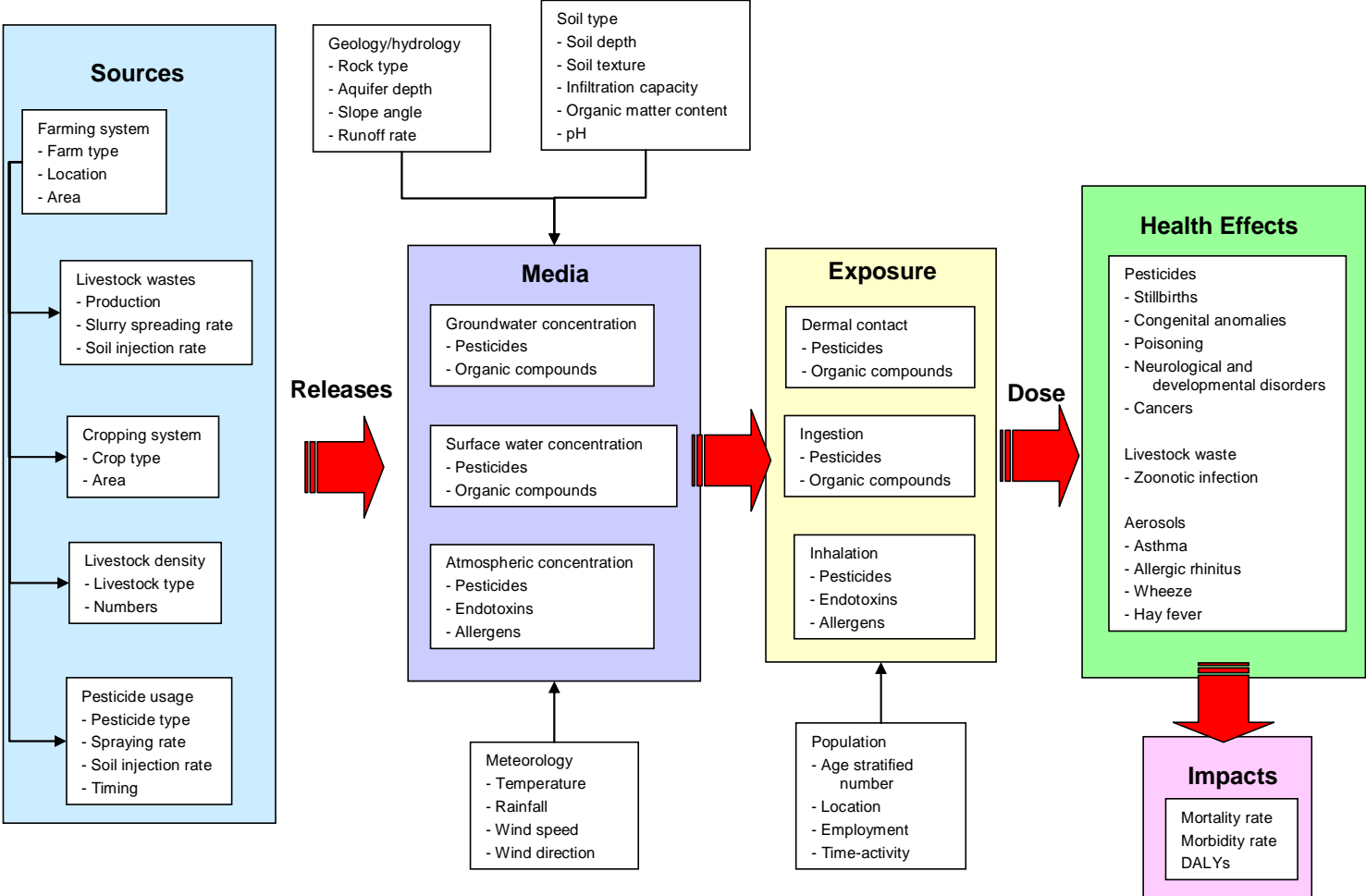
1. Rationale

- Test and enhance assessment methodology
- Demonstrate assessments
- First approximations for policy issues
- Selected to represent different types of issue from different perspectives

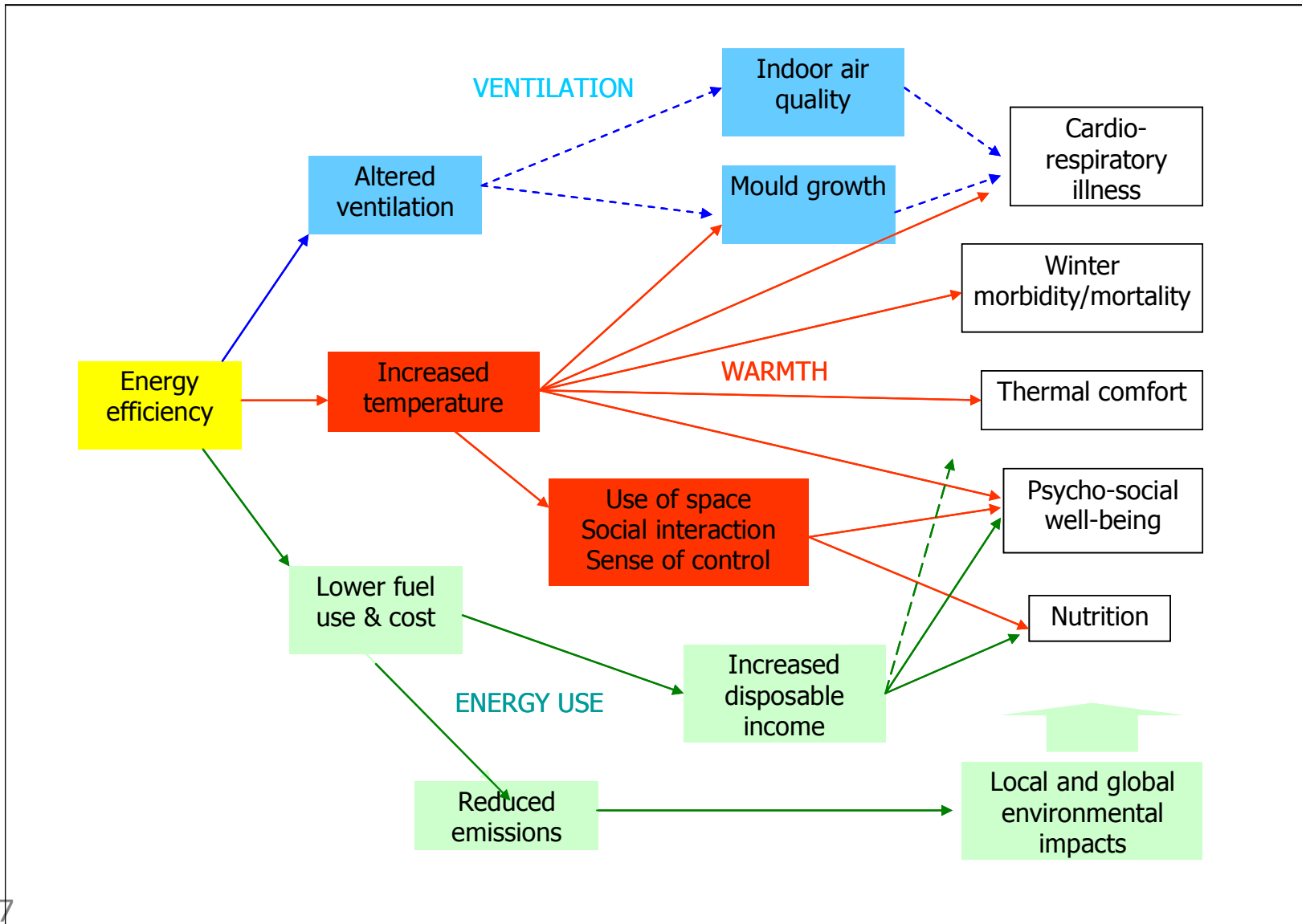
2. Policy themes

- Road transport
- Housing
- Agriculture
- Drinking water
- Household hazardous chemicals
- Solid waste
- Climate

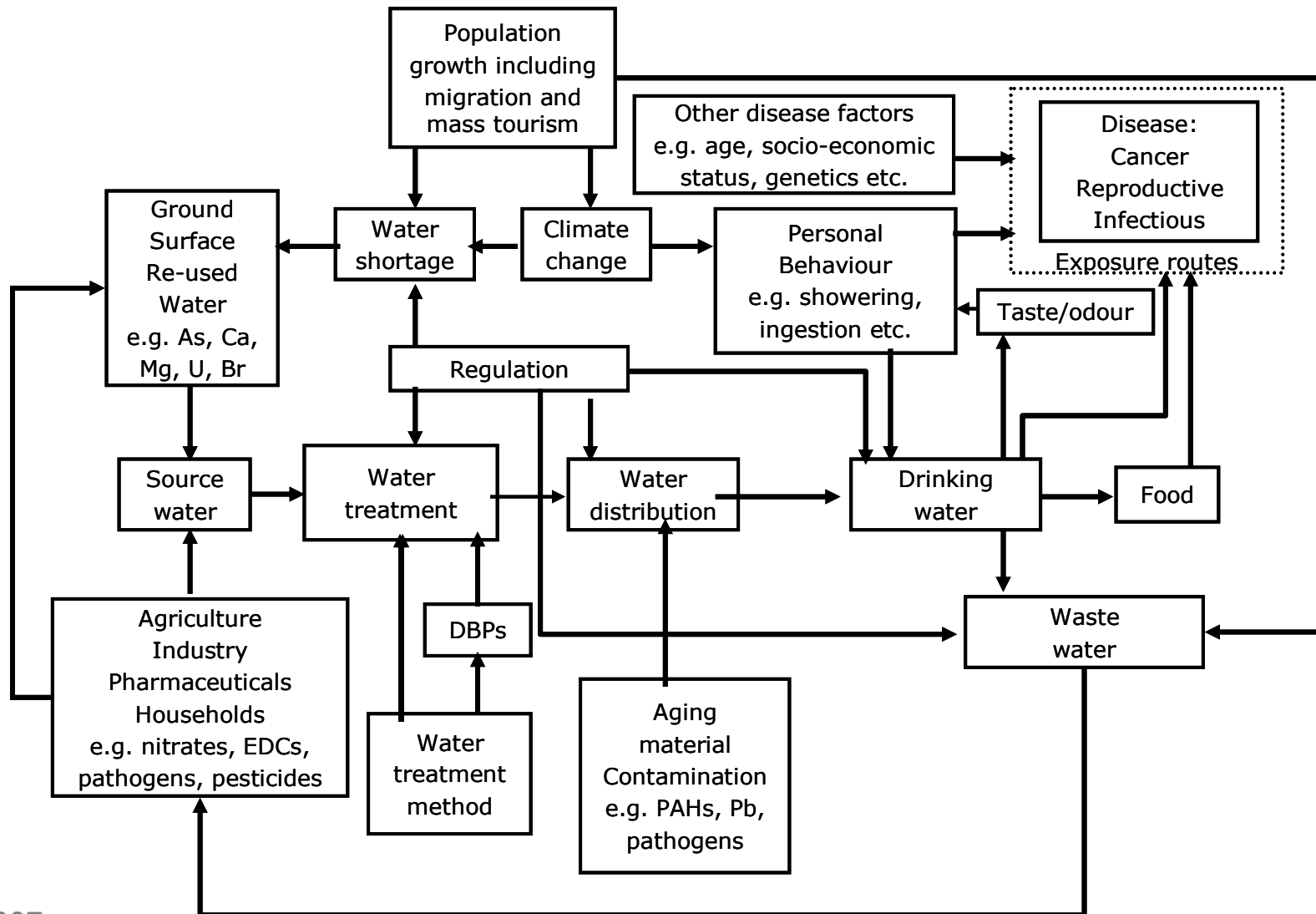
Policy Assessments: Agriculture



Policy Assessments: Housing



Policy Assessments: Drinking Water



The Assessment Toolbox: Purpose



To provide a means of doing integrated risk assessment long after the INTARESE project has been completed:

- a guidance system for integrated risk assessment
- access to generic information and knowledge
- examples and case studies of integrated risk assessment
- a set of tools for integrated risk assessment
- a platform for risk communication and stakeholder participation

The Assessment Toolbox: Description



1. Components and functionality

- Manual/tutorial for integrated risk assessment
- Descriptions/results of previous studies
- Core data (population, baseline health data etc)
- Exposures (population distributions/profiles, hazard maps etc)
- Dose-response functions
- Links to external data and models
- Framework builder (for issue framing)
- Indicator calculator (DALYs, attributable risks, intake fractions etc)
- Display system (maps, graphs, tables etc)

2. Operational design

- Web-based or stand-alone
- Menu driven

The Assessment Toolbox?



INTARESE
Assessment> PM10> Models and data> Preference

Output: overview, exposure, health, perception, *policy*, costs/benefits
Input: view, edit, home, help

Country	Total score (max. 20)
Austria	15
Czech Republic	16
Finland	19
France	18
Germany	10
Hungary	19
Netherlands	19
Poland	19
Romania	17
Spain	14

The Assessment Toolbox?



Output: overview, exposure, **health**, perception, policy, costs/benefits

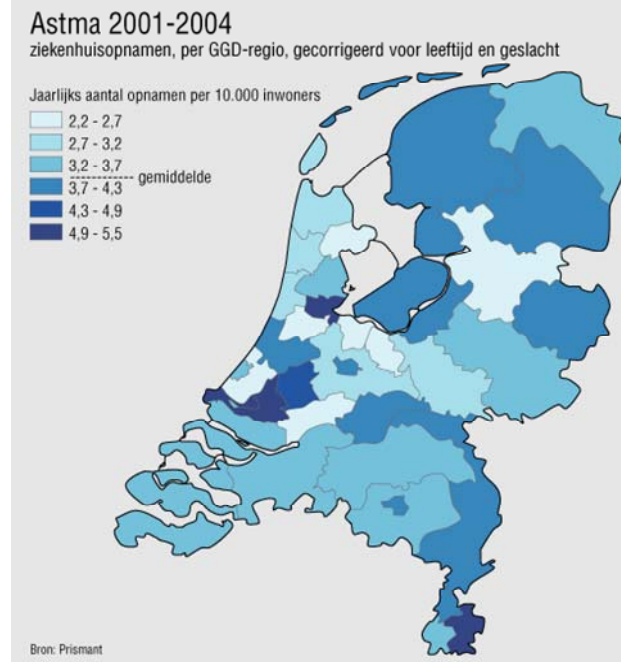
Input: view, edit, home, help

PM10 Netherlands

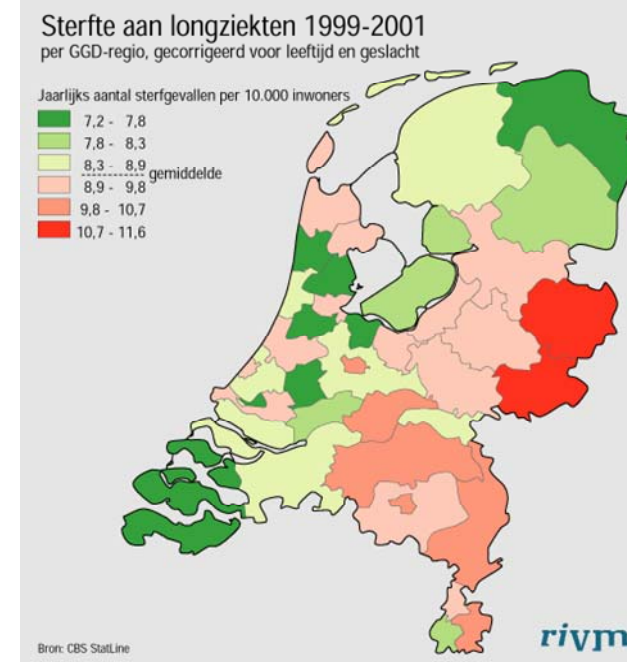


- information
- charts/graphs
- maps
- data
- methods
- OPTIONS

PM10 - Health - Maps



[More info](#)



[More info](#)

Challenges and Issues



1. The limits of science

- Dose-response functions
- Linkage of epidemiological and toxicological data
- Combined exposures
- Quantifying uncertainty in a complex world
- Early warning and emerging issues

2. The limits of monitoring

- Sampling density and coverage (e.g. personal monitoring, biomarkers)
- Specificity versus generality (e.g. biomarkers)
- Spatial and temporal resolution (e.g. health data, environmental surveys)
- Consistency of practice (e.g. personal monitoring, exposure modelling)

3. The limits of risk communication and use

- Indicators: the 'cart before the horse'
- Understanding of uncertainty: precaution or prevarication
- Evidence-based policy: from evidence to action

For More Information



Visit the INTARESE website

www.intarese.org

And if you would like to be involved as a user

Contact s.udondem@imperial.ac.uk

This paper was produced for a meeting organized by Health & Consumer Protection DG and represents the views of its author on the subject. These views have not been adopted or in any way approved by the Commission and should not be relied upon as a statement of the Commission's or Health & Consumer Protection DG's views. The European Commission does not guarantee the accuracy of the data included in this paper, nor does it accept responsibility for any use made thereof.