Linking scientific evidence across disciplines

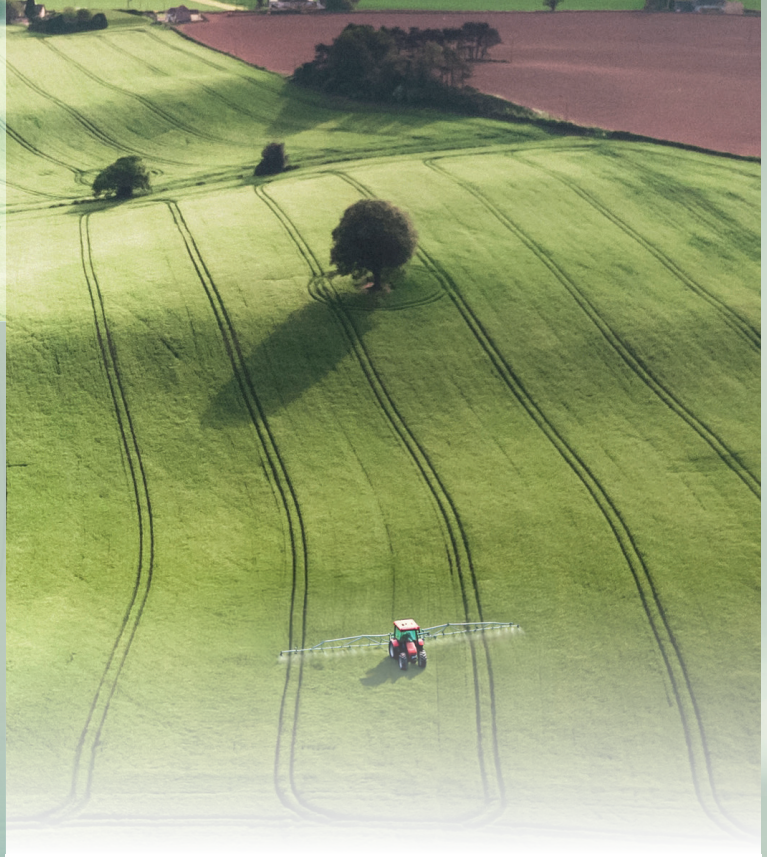
The MARCHES project bases its assessments on scientific evidence drawn from systematic reviews on the specific health impacts of the pollutants chosen.

Air pollution has an impact on **respiratory** and **cardiopulmonary** chronic diseases, as well as on other diseases. Drinking water nitrate has been linked to **cancer** and reproductive outcomes after long-term exposures.

For all the relevant health impacts, MARCHES project studies how pollution levels relate to health risks using data and statistics.

To accurately analyze the health costs, exposure modeling is undertaken in MARCHES, capturing the complexities of transport, dispersion and chemical transformation of the emissions. Specifically, the MARCHES project uses two highly recognized modeling tools: the **DEHM model** (Danish Eulerian Hemispheric Model) and the **SWAT model** (Soil and Water Assessment Tool).

Application of these tools allow for a better understanding of which sources, sectors and pollutants are responsible for the greatest health burdens, and thus should be targeted with appropriate mitigation measures.



Find out more:

MARCHES project

projects.au.dk/marches

PARTNERS

ISGlobal Barcelona Institute for Global Health

BSC Barcelona Supercomputing Center Centro Nacional de Supercomputación

MENON ECONOMICS

NIBIO Norsk institutt for bioøkonomi

Umeå Universitet

Helsingin yliopisto

Tartu Ülikool

Universitas Aboensis

MUSINE KOKALARI Instituti per politika sociale

GEUS De Nationale Geologiske Undersøgelser for Danmark og Grønland

OÜ Eesti Keskkonnauuringute Keskus

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HORIZON | HEALTH MARCHES

MARCHES project

Methodologies for Assessing the Real Costs to Health of Environmental Stressors

Protecting human health from polluted air and water

The **air we breathe** and the **water we drink** are an essential life-support and are critical to maintaining good health throughout a lifetime.

Air pollution is currently considered the largest environmental burden in Europe causing about **350,000 premature deaths annually.**

Drinking water quality is compromised in many parts of Europe fromleaching of nitrate from **agricultural fertilizers**, that may trigger cancers and perhaps birth defects from long-term exposures even at low concentrations.

Air and water stressors are intricately interlinked via ammonia evaporation from fertilizers, interacting with sulfates and nitrate in the atmosphere, causing air pollution in terms of secondary particles.

O_3

$PM_{2.5}$

NH_3

Nitrate

The **MARCHES project** aims to advance the methodologies applied to account for the welfare economic **health costs from the sources of pollution,** including the morbidity costs generated by chronic diseases associated with pollution.

Demonstrations of results

The methodologies of MARCHES are demonstrated in **six regional case studies across Europe** which aim to provide support to the relevant public authorities.

Air pollution's case studies:

- Catalonia (Spain)
- Estonia
- Kosovo
- Øresund region (southern Sweden and Denmark's capital, Copenhagen)

Nitrate in drinking water case studies:

- The Zelivka catchment (Czechia), that supplies water to Prague.
- The Himmerland catchment (Denmark), that supplies water to Aalborg.

Stakeholders' workshops in each region allowed the **selection of the relevant mitigation measures** to be analyzed in MARCHES.

The application of **health costs from pollution for implementation purposes** (and not only during the preparation of new legislation) in collaboration with jurisdictional authorities **represents an innovation** that is being undertaken by the MARCHES project.

Support to decision-makers

To support public authorities across Europe to improve public health, specifically in their implementation of the EU's ambient air quality and cleaner air for Europe Directive (2024/2881), the EU's quality of water intended for human consumption Directive (2020/2184) and relevant national legislations, the MARCHES project will **produce two major guidance documents at the end of the project:**

- **Guidance document on air pollution:** will provide the health costs per unit of emission for each sector (transport, energy, agriculture, etc.).
- **Guidance document on drinking water nitrate pollution:** will detail available datasets and modelling tools to undertake site-specific analysis of health burdens, as well as how to price the co-benefits, e.g. from reductions in ammonia emissions.