Environment and health research supported by the EU Research and Innovation Framework Programmes

Due to persistent public concerns about the impact of environmental factors on health and the need to provide a solid scientific evidence base for evolving policies, the European Union (EU) has supported a wide range of research in the area of environment and health. Since 1998 approximately over 400 collaborative environment and health research projects have been funded (EUR ~1.2 billion) under the EU Research and Innovation Framework Programmes. Environment and health research plays an important role in contributing to the EU’s political commitments to the Sustainable Development Goals, in particular for ‘Good health and well-being’. Furthermore, it underpins the implementation of the EU’s 7th Environmental Action Programme, a wide range of specific EU sectoral policies and global environment and health actions under the auspices of the World Health Organization’s European Region and the United Nations Environment Programme.

The main policy objective behind the research funded is to provide evidence to justify the cross-sectoral political and societal changes required to enable cost effective, preventive actions. The research undertaken provides new knowledge of how factors external to the human body and to health and healthcare systems impact human health and well-being and evidence of the associated socio-economic burden.

Some examples of research projects and initiatives funded under Horizon 2020 (2014-2020) and the 7th Framework Programme for Research and Innovation (2007-2013) are:

**Exposures to chemicals**
- **HBM4EU**, the European Human Biomonitoring Initiative, is a joint programme of 28 countries and the European Commission, which started in January 2017. The objective is to use human biomonitoring to better assess exposures of people to chemicals in Europe, to understand the associated health impacts and to improve chemical risk assessment.
- **EDC-MIXRISK** is developing methods for risk assessment of mixtures of endocrine disrupting chemicals.
- **EUROMIX** is delivering a mixture test strategy and instruments for food to obtain the data needed to refine the risk assessment of chemical mixtures.
- **EU-TOXRISK** is driving a paradigm shift in toxicological testing away from ‘black box’ animal testing towards a toxicological assessment based on human cell responses and a mechanistic understanding of cause-consequence relationships of adverse chemical effects.
Clean air and sustainable urban environments

- **BLUEHEALTH** is researching how water-based environments in towns and cities affect health and wellbeing.
- **CLAIR-CITY, ICARUS** and **iSCAPE** deal with air pollution in cities: CLAIR-CITY is looking at how citizens can be involved in decisions on the local options for cleaner air and lower carbon emissions; ICARUS aims to develop a transdisciplinary methodology and toolkit for an integrated impact assessment of air quality improvement, climate change mitigation and health promotion; iSCAPE is developing and evaluating an integrated strategy for air pollution control in European cities grounded on evidence-based analysis.
- **IN-BEE** assesses the socio-economic benefits of energy efficiency.

Health impacts of lifelong environmental exposures

- **HEALS, HELIX** and **EXPOSOMICS** aim to develop a conceptual and practical framework to improve our understanding of all the environmental exposures of an individual over their lifetime and their effect on the individual’s health (‘the exposome’). HELIX and EXPOSOMICS are now finished, while HEALS continues until 2019.
- **LIFEPATH** is investigating the biological pathways underlying social differences in healthy ageing.
- **LIFECYCLE** is focused on the developmental origins of disease, i.e. how early exposures lead to late health effects. One of its main aims is to set up a sustainable EuroCHILD Cohort Network.

Foresight and health promotion

- **FRESHER**, focusing on the burden of non-communicable diseases, aimed to identify alternative future health scenarios for Europe, taking into account structural long-term trends in demography, technology, economic, environmental, and societal factors up to 2050.
- **INHERIT** aims to identify ways of living, moving and consuming that protect the environment and promote health and health equity.
- **EURO HEALTHY** aimed to promote health equity through a systematic analysis of health determinants and health outcomes, following a holistic understanding of population health. It produced the Atlas of Population Health in European Union Regions. The findings demonstrate a high degree of variation in the geographical distribution of health determinants and health outcomes, emphasizing that inequalities still persist in Europe.

Future strategy

Recent technological and scientific advances in fields such as molecular analysis and exposure assessment are strong drivers for a fundamental shift in environment and health research, moving away from ‘one exposure, one disease’ towards a more overarching approach taking into account concurrent environmental factors. The final calls for proposals of Horizon 2020 will continue to fund research on (i) safety of chemicals; (ii) the exposome; (iii) nature based solutions; (iv) climate change and (v) urbanisation. Support will also be provided for preparing the future environment and health research and innovation agenda in view of preparing research calls and actions under the next Framework Programme – Horizon Europe.

Web-sites and contact

For more information see ‘Environment and Health’ under Policies on: [http://ec.europa.eu/research/health/](http://ec.europa.eu/research/health/) or contact [Tuomo.Karjalainen@ec.europa.eu or Sofie.Norager@ec.europa.eu](mailto:Tuomo.Karjalainen@ec.europa.eu or Sofie.Norager@ec.europa.eu)

For information on Horizon 2020 see: [https://ec.europa.eu/programmes/horizon2020/](https://ec.europa.eu/programmes/horizon2020/) For Horizon Europe see: [https://ec.europa.eu/info/node/71880](https://ec.europa.eu/info/node/71880)
Sampling of EU-funded environment and health projects

### Chemical safety

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
<th>Website(s)</th>
</tr>
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<tbody>
<tr>
<td>HBM4EU</td>
<td>European Human Biomonitoring Initiative (2017-2021)</td>
<td><a href="http://www.hbm4eu.eu">www.hbm4eu.eu</a></td>
</tr>
<tr>
<td>EDC-MIXRISK</td>
<td>Integrating epidemiology and experimental biology to improve risk assessment of exposure to mixtures of endocrine disrupters (2015-2019)</td>
<td>edcmixrisk.ki.se</td>
</tr>
<tr>
<td>EU-TOXRISK</td>
<td>An European 'flagship' program driving mechanism-based toxicity testing and risk assessment (2016-2021)</td>
<td><a href="http://www.eu-toxrisk.eu">www.eu-toxrisk.eu</a></td>
</tr>
<tr>
<td>NANOSAFETY CLUSTER</td>
<td>Platform of exchange for nanosafety projects (2008-2021)</td>
<td><a href="http://www.nanosafetycluster.eu">www.nanosafetycluster.eu</a></td>
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</table>

### Air quality

<table>
<thead>
<tr>
<th>Project</th>
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<tbody>
<tr>
<td>ESCAPE</td>
<td>European study of cohorts for air pollution effects (2008-2012)</td>
<td><a href="http://www.escapeproject.eu">www.escapeproject.eu</a></td>
</tr>
<tr>
<td>ICARUS</td>
<td>Integrated climate forcing and air pollution reduction in urban systems (2016-2020)</td>
<td>icarus2020.eu</td>
</tr>
<tr>
<td>iSCAPE</td>
<td>Improving the smart control of air pollution in Europe (2016-2019)</td>
<td><a href="http://www.iscapeproject.eu">www.iscapeproject.eu</a></td>
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### Sustainable and healthy cities

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<thead>
<tr>
<th>Project</th>
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</thead>
<tbody>
<tr>
<td>FLOW</td>
<td>Lowering congestion by creating more opportunities for walking and cycling (2015-2018)</td>
<td><a href="http://www.h2020-flow.eu">www.h2020-flow.eu</a></td>
</tr>
<tr>
<td>TRACE</td>
<td>Tracking movement to promote cycling and walking in cities (2015-2018)</td>
<td>h2020-trace.eu</td>
</tr>
<tr>
<td>CLAIR-CITY</td>
<td>Citizen led air pollution reduction in cities (2016-2020)</td>
<td><a href="http://www.claircity.eu">www.claircity.eu</a></td>
</tr>
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</table>

For more information on projects see also: [www.cordis.europa.eu](http://www.cordis.europa.eu)
### Climate change adaptation/resilience

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<tr>
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</thead>
<tbody>
<tr>
<td><strong>ATOPICA</strong></td>
<td>Atopic diseases in changing climate, land use and air quality (2011-2014)</td>
<td><a href="http://www.atopica.eu">www.atopica.eu</a></td>
</tr>
<tr>
<td><strong>HEAT-SHIELD</strong></td>
<td>Inter-sector framework to increase workers thermal resilience in the context of global warming (2016-2020)</td>
<td><a href="http://www.heat-shield.eu">www.heat-shield.eu</a></td>
</tr>
<tr>
<td><strong>PURGE</strong></td>
<td>Health impact of greenhouse gas reduction strategies in urban environments (2011-2014)</td>
<td>purge.lshtm.ac.uk</td>
</tr>
</tbody>
</table>

### Water use, sanitation and hygiene

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>CYTO-WATER</strong></td>
<td>Integrated and portable image cytometer for rapid response to Legionella and Escherichia coli in industrial and environmental waters (2015-2018)</td>
<td><a href="http://www.cy%D1%82%D0%BE%D0%B2%D0%B0%D1%82%D0%B5%D1%80.eu">www.cyтоватер.eu</a></td>
</tr>
<tr>
<td><strong>PHARMAS</strong></td>
<td>Ecological and human health risk assessments of antibiotics and anti-cancer drugs (2011-2014)</td>
<td><a href="http://www.pharmas-eu.net">www.pharmas-eu.net</a></td>
</tr>
<tr>
<td><strong>SOLUTIONS</strong></td>
<td>Solutions for present and future emerging pollutants in land and water resources management (2013-2018)</td>
<td><a href="http://www.solutions-project.eu">www.solutions-project.eu</a></td>
</tr>
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### Waste/contaminated sites

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>HIA21</strong></td>
<td>Participative assessment of the health, environmental and socio-economic impacts deriving from urban waste (2011-2014)</td>
<td><a href="http://www.hia21.eu">www.hia21.eu</a></td>
</tr>
</tbody>
</table>

### Other projects of interest

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>PHENOTYPE</strong></td>
<td>Positive effects of natural environment for human health and wellbeing (2012-2016)</td>
<td><a href="http://www.phenotype.eu">www.phenotype.eu</a></td>
</tr>
<tr>
<td><strong>LIFECYCLE</strong></td>
<td>Early-life stressors and lifecycle health (2017-2021)</td>
<td>lifecycle-project.eu</td>
</tr>
<tr>
<td><strong>EURO-HEALTHY</strong></td>
<td>Shaping European policies to promote health equity (2015-2017)</td>
<td><a href="http://www.euro-healthy.eu">www.euro-healthy.eu</a></td>
</tr>
</tbody>
</table>