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# HEALTH AND THE ENVIRONMENT IN THE WHO EUROPEAN REGION

Creating resilient communities and supportive environments

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# **HEALTH AND THE ENVIRONMENT IN THE WHO EUROPEAN REGION**

Creating resilient communities and supportive environments

## Introduction

# Creating resilient communities and supportive environments

In the early years of the 21st century, the WHO European Region has attained notable progress on environment and health issues. However, significant cause for concern remains. The environmental burden of disease has persisted in some geographic areas, and is either newly emerging or re-emerging in others. Environmental determinants of health are estimated to account for approximately 20% of total mortality and up to 25% of the total burden of disease,<sup>1</sup> much of it unevenly distributed across geographic, demographic, sociocultural and socioeconomic subgroups. This generates large costs, consumes important resources, prevents the attainment of optimal health and wellbeing, and undermines societal and economic development.

Many public health challenges of our times, such as those associated with demographic changes, growing health inequalities and increasing incidence of non-communicable diseases, have complex connections to the physical environment. The environment must be recognised as not only a source of potential hazards, but also a health-promoting and health-protecting asset that can extend life, improve its quality and increase overall well-being. A comprehensive understanding of the relationship between health and the environment

requires a forward-looking perspective and insight into the composite interactions among the physical, biological and social spheres.

The WHO Regional Office for Europe supports the efforts of its Member States and partners to understand and navigate this complexity and to identify policies and actions that can benefit the environment and human health, using the best available evidence to guide national and international decision-making in different sectors. Great opportunities for progress lie in changing consumption patterns and fostering healthy and environmentally friendly approaches in energy, transport, housing, urban management and agriculture, as well as in the health sector itself. Yet there is a need to further develop the evidence and arguments in support of these changes, along with the guidance to address new and emerging issues, which are often characterized by a high degree of uncertainty.

“Health 2020” – the European health policy framework adopted in 2012 – recognizes that environmental determinants of health are as important as biological, social and behavioural determinants for creating, maintaining and restoring health.<sup>2</sup> It identifies the creation

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1 Preventing disease through healthy environments: Towards an estimate of the environmental burden of disease. Geneva, WHO, 2007 ([http://www.who.int/quantifying\\_ehimpacts/publications/preventingdisease/en/index.html](http://www.who.int/quantifying_ehimpacts/publications/preventingdisease/en/index.html)).

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2 Health 2020. A European policy framework supporting action across government and society for health and well-being. Copenhagen, WHO Regional Office for Europe, 2013 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0006/199536/Health2020-Short.pdf](http://www.euro.who.int/__data/assets/pdf_file/0006/199536/Health2020-Short.pdf)).

of resilient communities and supportive environments as one of four priority areas for action in the WHO European Region. Its goals are to improve the health and well-being of populations, reduce health inequalities, strengthen public health and ensure sustainable people-centred health systems that are universal, equitable, of high quality and guided by good intersectoral governance.

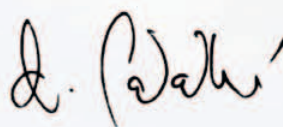
Furthermore, some of the key functions and domains of public health services address environmental determinants of health through various pathways, such as monitoring, assessing and responding to health hazards; promoting and protecting health; and advancing public health research.

“Health 2020” also reflects the growing understanding of the relationship between health and development. Health is an important investment and driver for development, as well as one of development’s most important results. Investment in health is critical to the successful development of modern societies, and to their political, social and economic progress.

Sustainable development calls for a new approach to governance – one that introduces the health dimension into decision-making processes in all areas of public policy. The global sustainable development agenda, reflected in the outcomes of the United Nations Global Conference on Sustainable Development in 2012

(Rio+20) and in current efforts to formulate the post-2015 Sustainable Development Goals, is thus an important framework for public health action. Pursuit of a sustainable development agenda should include a better understanding of the health implications of sectoral policies, particularly in the context of the “green economy”.

Recognition of the health benefits of a sustainable, low-carbon economy and sound environmental policies should drive the development of policies that will ensure both the health of people and the health of our planet. In turn, this requires collaboration among different sectors. The Regional Office is actively pursuing this direction, as demonstrated in this publication and notably through the European Environment and Health Process, the policy platform that brings together key sectors and stakeholders in a unique governance mechanism established at the first Ministerial Conference on Environment and Health, in Frankfurt, Germany, in 1989.



**Zsuzsanna Jakab**  
WHO Regional Director for Europe

# Intersectoral governance: the European Environment and Health Process



*Good health and wellbeing require a clean and harmonious environment in which physical, psychological, social and aesthetic factors are all given their due importance. The environment should be regarded as a resource for improving living conditions and increasing wellbeing.*

– European Charter on Environment and Health, 1989

In 1989, concerned about the growing evidence of the impact of hazardous environments on human health, the WHO Regional Office for Europe initiated the first-ever international environment and health process, developing a broad-based primary prevention public health approach for addressing environmental determinants of health.

The European Environment and Health Process (EHP) is steered by ministerial conferences that are unique

for bringing together different sectors and stakeholders to identify environment and health challenges, set priorities, agree on commitments and shape shared European policies and actions on environment and health.

Representatives of WHO European Member States, the Commission of the European Union and their partners adopted the European Charter on Environment and Health at the first Ministerial Conference in Frankfurt in 1989, committing to basic principles, mechanisms and priorities for future action.<sup>1</sup> The conference also called on WHO to establish the European Centre for Environment and Health, which remains the key institution of the EHP to this day.

The Second Ministerial Conference in Helsinki (1994) established the European Environment and Health Committee as the EHP coordinating body. It included representatives of health and environment sectors and major stakeholder groups.<sup>2</sup> The environment and health agenda was firmly linked to Agenda 21 of the United Nations Conference on Environment & Development (Rio de Janeiro, 1992),<sup>3</sup> the Environment for Europe process started at Dobris Castle in 1991<sup>4</sup> and the Global Strategy on Health and Environment of the World Health Assembly (1993), which recognized that the coexistence of people and nature is a prerequisite for the future of humankind.

The London Conference in 1999 resulted in the adoption of the Protocol on Water and Health to the 1992 Convention on the Protection and Use

## Key Developments

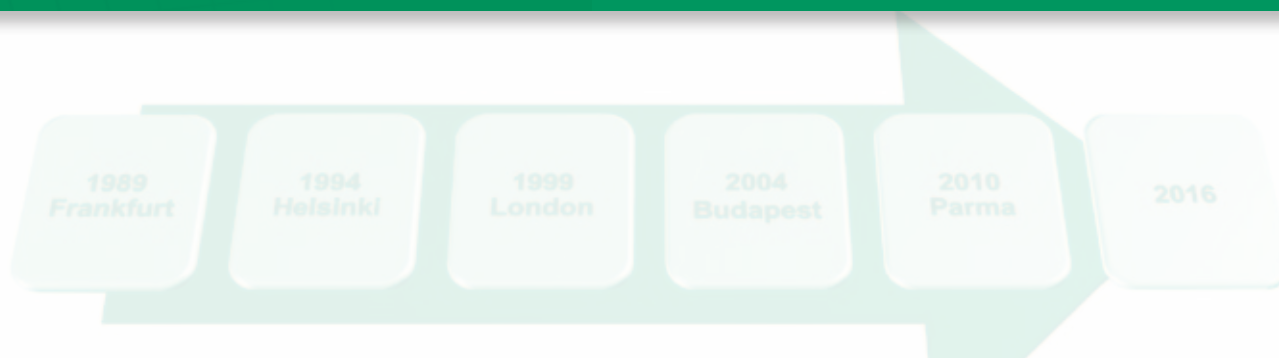
- 1989 First Ministerial Conference, Frankfurt: European Charter on Environment and Health
- 1990 WHO European Centre for Environment and Health established
- 1994 Second Ministerial Conference, Helsinki: Environmental health action plan for Europe (EHAPE)
- 1999 Third Ministerial Conference, London: Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes and of the Charter on Transport, Health and Environment
- 2004 Fourth Ministerial Conference, Budapest
- 2010 Fifth Ministerial Conference, Parma: five time-bound commitments and a new institutional framework for EHP

1 European Charter on Environment and Health. Copenhagen, WHO Regional Office for Europe, 1989 (<http://www.euro.who.int/en/what-we-do/conferences/fifth-ministerial-conference-on-environment-and-health/past-conferences/first-ministerial-conference-on-environment-and-health,-frankfurt-am-main,-1989/european-charter-on-environment-and-health>).

2 European Environment and Health Committee [website] (<http://www.euro.who.int/en/what-we-do/health-topics/environment-and-health/european-process-on-environment-and-health/governance/european-environment-and-health-committee>).

3 United Nations Division for Sustainable Development, 1992 (<http://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>).

4 "Environment for Europe Process". Geneva, United Nations Economic Commission for Europe [website] (<http://www.unecp.org/env/efe/welcome.html>).



of Transboundary Watercourses and International Lakes<sup>5</sup> and of the Charter on Transport, Health and Environment,<sup>6</sup> emphasizing the usefulness of legally binding and voluntary multilateral agreements for promoting health and directly engaging other relevant sectors in the EHP. The conference reinforced the importance of implementing national environment and health action plans and requested strong action to ensure public access to information, public participation and access to justice in environment and health matters.

At the conference in Budapest (2004), Member States adopted the Children's Environment and Health Action Plan for Europe<sup>7</sup>, closely linked the European health and environment agenda to the Millennium Development Goals, and focused on the global environmental threats from climate change and from the increasing production and consumption of chemicals in the European context.

For the first time, the Environment and Health Process adopted time-bound targets to reduce the adverse health impact of environmental threats at the Fifth Conference, in Parma (2010). Significant and growing environment and health inequalities were brought to the centre of attention, reinforcing the need to address the EHP agenda in the wider context of social

determinants of health. Member States also agreed on a new institutional framework for EHP governance. This change was intended to strengthen the leadership role of the EHP within a complex policy environment.

EHP governance continues to draw its legitimacy from the consensus of the 53 WHO European Member States governing the process through the WHO Regional Committee for Europe on the health side and the Committee on Environmental Policy of the UN Economic Commission for Europe on the environmental side. They elect the members of the European Environment and Health Ministerial Board (EHMB), which is the political face and driving force of international policies in environment and health between ministerial conferences. The EHMB is composed of four ministers of health, four ministers of the environment, four representatives of intergovernmental organizations and the Chair and Co-chair of the European Environment and Health Task Force.

The European Environment and Health Task Force is the leading international body for implementation and monitoring of the European Environment and Health Process. It meets annually and consists of leading officials from all Member States in the WHO European region, as well as intergovernmental and nongovernmental organizations representing key partners, scientific community, civil society, youth and the private sector.

The WHO Regional Office for Europe serves as the secretariat to the entire Environment and Health Process and is also a key stakeholder in the EHP, having a seat on the Ministerial Board and a seat on the Task Force.

5 Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Geneva, United Nations Economic Commission for Europe and WHO Regional Office for Europe, 2006 (<http://www.euro.who.int/en/what-we-do/conferences/fifth-ministerial-conference-on-environment-and-health/past-conferences/third-ministerial-conference-on-environment-and-health,-london,-united-kingdom,-1999/protocol-on-water-and-health-to-the-1992-convention-on-the-protection-and-use-of-transboundary-watercourses-and-international-lakes>).

6 Charter on Transport, Environment and Health. Copenhagen, WHO Regional Office for Europe, 1999 (<http://www.euro.who.int/en/what-we-do/conferences/fifth-ministerial-conference-on-environment-and-health/past-conferences/third-ministerial-conference-on-environment-and-health,-london,-united-kingdom,-1999/charter-on-transport,-environment-and-health>).

7 Children's Environment and Health Action Plan for Europe. Copenhagen, WHO Regional Office for Europe, 2004 (<http://www.euro.who.int/en/what-we-do/conferences/fifth-ministerial-conference-on-environment-and-health/past-conferences/fourth-ministerial-conference-on-environment-and-health,-budapest,-hungary,-2004/childrens-environment-and-health-action-plan-for-europe>).

For more information, please contact Srđan Matić (Coordinator, Environment and Health, WHO Regional Office for Europe) at [CEH@euro.who.int](mailto:CEH@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health > European process on environment and health.

# WHO European Centre for Environment and Health

*The World Health Organization's European Centre for Environment and Health (WHO/ECEH) is the primary source of knowledge, technical expertise and normative guidance relating to the environment and health in the WHO European Region (See Box). WHO/ECEH is an international centre of excellence in this area and its scientific output serves as key evidence for the development of legislation and policies in Member States including in the European Union.*

WHO/ECEH closely cooperates with the 69 WHO Collaborating Centres in the European Region working on environment and health and with the international scientific community. It is involved in advancing the implementation of several important multilateral health and environmental agreements and programmes, including those that address chemical and nuclear safety and the International Health Regulations (IHR) (2005).

A special focus of the work of WHO/ECEH is its support to the European Environment and Health Process (EHP). This is an international governance platform that, since 1989, brings together ministries of health

and environment of the WHO European Region, along with key intergovernmental organizations and non-governmental organizations. The EHP is governed by decisions and commitments taken through a series of ministerial conferences on environment and health, the last of which took place in Parma, Italy, in 2010. In particular, WHO/ECEH delivers work in technical areas related to the commitments made through the Parma Declaration on Environment and Health, provides technical information to the European Environment and Health Ministerial Board and Task Force, which govern the EHP, and supports the activities of those bodies.

WHO/ECEH is furthermore an important source of knowledge and institutional capacity for WHO globally. One third of all WHO staff working on environment and health are at WHO/ECEH, and the office provides crucial technical support to other WHO Regional Offices on specific issues as well as playing a lead role in WHO global activities. For example, WHO/ECEH was instrumental in the development of WHO guidelines on air quality, noise, small-scale water supplies, and impact assessments of black carbon, nanotechnologies and other environmental threats to health.

## Organization of the European Centre for Environment and Health

At the First Ministerial Conference on Environment and Health in 1989, Member States of the World Health Organization (WHO) European Region called on the WHO Regional Office for Europe to establish the European Centre for Environment and Health (WHO/ECEH). They issued this recommendation in the European Charter on Environment and Health, which recalled resolutions 42/187 and 42/186 of the United Nations General Assembly as well as World Health Assembly resolution WHA42.26.

From 1989 to 2012, WHO/ECEH operated at different times from the following locations: Bilthoven, Rome, Athens, Nancy, Helsinki and Bonn. After the closure of the Rome office in 2011, the entire area of work on environment and health was consolidated in Bonn, within the Division of Communicable Diseases, Health Security and Environment (DCE).

The German Federal Ministry of Health and German Federal Ministry of Environment, Nature Protection and Nuclear Safety

inaugurated the expanded WHO/ECEH in Bonn, in February 2012. WHO/ECEH is fully integrated into the WHO Regional Office for Europe, under the authority of the Regional Director in Copenhagen.

Work has been organized into four technical programmes supervised by the Head of WHO/ECEH (Executive Manager), who reports to the Director, DCE through the Coordinator, Environment and Health. The programmes are:

1. Climate Change, Sustainable Development and Green Health Services;
2. Management of Natural Resources – Water and Sanitation;
3. Environment and Health Intelligence and Forecasting; and
4. Environmental Exposures and Risks (including air quality, chemicals, noise and occupational health).

As of September 2013, WHO/ECEH had a staff of 32.



WHO/ECEH's outputs have had a major impact on a wide range of issues (Table). This work has increased general awareness of and drawn policy-makers' interest to issues such as environment and health inequalities, black carbon, inadequate housing, environmental noise, and dampness and mould. WHO/ECEH's 2012–2013 review of evidence on the health impact of air quality underpins revisions of WHO air quality guidelines and of the European Union Clean Air Directive. WHO/ECEH has supported national efforts to eliminate asbestos-related diseases by helping Member States to estimate the related burden of disease and develop appropriate national policies. WHO/ECEH also conducts capacity-building activities on core IHR capacities on chemical safety as well as on the implementation of health impact assessment. WHO/ECEH was a driving force in the establishment of both the Environment and Health Economics Network and the European Chemical Safety Network in 2012; these networks are crucial for facilitating collaboration in two key environment and health areas.

WHO/ECEH's extensive work on climate change and health is also notable. WHO/ECEH has produced a

series of country-specific assessments supporting the development of national adaptation policies, a systematic review on the health effects and prevention of floods in the European Region, a toolkit to estimate health and adaptation costs related to climate change, and a number of tools used widely by Member States to remedy challenges such as extreme weather events. The main findings of the Climate, Environment and Health Action Plan and Information System (CEHAPIS), a project led by WHO/ECEH with financial support from the European Union, underpin the health component of the European Union policy on climate change, introduced in April 2013.

Between 2002 and 2010, the Bonn and Rome offices of WHO/ECEH produced 244 and 403 scientific publications, respectively, including global and regional guidelines, assessments, evidence reviews, peer-reviewed articles and databases. Another 77 publications have been produced since 2010.

**Table: Selected recent WHO/ECEH publications**

Environment and health issue	Publication
environment and health inequalities	Environmental health inequalities in Europe: assessment report (WHO Regional Office for Europe, 2012)
inadequate housing	Environmental burden of disease associated with inadequate housing (summary report) (WHO Regional Office for Europe, 2011)
environmental noise	Burden of disease from environmental noise: quantification of healthy life years lost in Europe (WHO Regional Office for Europe, 2011)
air quality	Review of evidence on health aspects of air pollution – REVIHAAP (WHO Regional Office for Europe, 2013)
	Health effects of black carbon (WHO Regional Office for Europe, 2012)
	Technical and policy recommendations to reduce health risks due to dampness and mould (WHO Regional Office for Europe, 2010)
climate change and health	Floods in the WHO European Region: health effects and their prevention (WHO Regional Office for Europe, 2013)
	Climate change and health: a tool to estimate health and adaptation costs (WHO Regional Office for Europe, 2013)
water and sanitation	Guidance on water supply and sanitation in extreme weather events (WHO Regional Office for Europe, 2011)

# Health in multilateral environmental agreements and programmes



The WHO Regional Office for Europe seeks to promote better health for all by enhancing the level of ratification and implementation of relevant multilateral environmental agreements (MEAs) and programmes across all European Member States. Specific objectives include strengthening capacities for implementation and monitoring achievements attained through MEAs, as well as supporting international collaboration and exchange of experience.

The Regional Office works with the United Nations Economic Commission for Europe (UNECE), the United Nations Environmental Programme (UNEP), and Member States to advance the implementation of a number of MEAs. Emphasis is given to MEAs identified in the [Parma Declaration on Environment and Health](#), since these are considered to be of special relevance for the attainment of the declaration's Regional Priority Goals and targets (Table).

Together with UNECE, the Regional Office serves as co-secretariat for the [Protocol on Water and Health](#)

to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes and to the [Transport, Health and Environment Pan-European Programme](#). The Regional Office also chairs the WHO/UNECE [Task Force on the Health Aspects of Air Pollution](#) of the 1979 Convention on Long-Range Transboundary Air Pollution and its Protocols.

By supporting Member States in the development of national action plans to reduce asbestos-related diseases, the Regional Office contributes to making more informed decisions in the context of the UNEP's [Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade](#). It also supported the negotiations of the 2013 Minamata Convention on Mercury. Further, the Regional Office collaborates with WHO Headquarters and other Regional Offices on the United Nations Framework Convention on Climate Change by providing methods, tools and evidence to support negotiations.

**Table: Multilateral environmental agreements and programmes that are relevant to the implementation of the Parma Declaration on Environment and Health**

Multilateral Environmental Agreements and Programmes	Date
Strategic Approach to International Chemicals Management (SAICM)	2006
Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context	2003
Transport, Health and Environment Pan-European Programme	2002
Stockholm Convention on Persistent Organic Pollutants	2001
Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes	1999
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	1998
Convention on Access to Information, Public Participation in Decision-making, and Access to Justice in Environmental Matters	1998
United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa	1994
Convention on Biological Diversity	1992
United Nations Framework Convention on Climate Change (UNFCCC)	1992
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	1989
Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol	1985
Convention on Long Range Transboundary Air Pollution	1979
Marine pollution assessment and control component (MED-POL) of the Mediterranean Action Plan (MAP) to the Barcelona Convention For the Protection of the Marine Environment and the Coastal Region of the Mediterranean	1975

For more information, please contact Francesca Racioppi (Senior Policy and Programme Adviser, Environment and Health Governance and Multisectoral Partnerships, WHO Regional Office for Europe) at [CEH@euro.who.int](mailto:CEH@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health.

# Environment and Health Information System (ENHIS)

ENHIS provides a platform for quantifying levels of exposure to contaminants and rates of environmentally-mediated diseases across the WHO European Region. It serves as a one-stop access point for information on priority environmental health issues related to the [European Environment and Health Process](#). The system emerged from a series of European-wide projects that started in 1999 under the management of WHO/ECEH with funding from the European Commission. Information from ENHIS contributed to the progress assessment report that was prepared for the [Fifth Ministerial Conference on Environment and Health](#), held in Parma, Italy, in 2010.<sup>1</sup>

ENHIS includes more than 20 indicators, which reflect regional priority goals identified and reaffirmed at the latest Ministerial Conferences on Environment and Health. The indicators are regularly updated using data from WHO databases and other international databases, the WHO/UNICEF Joint Monitoring Programme, the European Environment Agency, EUROSTAT, international surveys and national data sources.

The topics covered by ENHIS include waterborne diseases; access to water and sanitation; unintentional injuries; physical activity and obesity; exposure to selected air pollutants; tobacco smoking; mould and dampness in homes; exposure to persistent organic pollutants and metals; mortality due to specific cancers; occupational injuries; exposure to radon; and noise.

## Indicators for Monitoring Parma Declaration Commitments

WHO/ECEH has been working on developing additional ENHIS indicators, which are necessary for monitoring progress towards specific commitments of the Parma Declaration. Some of the new indicators, such as access to green spaces in cities, exposure to allergenic pollen and mortality due to heat waves,

can utilize existing data sources. Other new indicators require harmonized efforts to collect new data. In particular, data on indoor air pollution and sanitation in children's facilities as well as data on early life exposures to specific pollutants are not sufficient in many countries.

To close these critical data gaps, WHO/ECEH has developed two new surveys: a cross-cutting exposure assessment survey for schools and a human biomonitoring survey for maternity wards. Information on regulatory environment and national environmental health policies will also be collected using a questionnaire directed at national environmental health focal points. The questionnaire covers selected priority issues such as indoor air quality in schools and sanitation in children's facilities. Data on policies will be interpreted in conjunction with data on exposure and health effects in order to identify policy deficiencies and priorities for action.

## Key Resources

- [The European Environment and Health Information System \(ENHIS\) database](#) (WHO Regional Office for Europe).
- [Health and environment in Europe: progress assessment](#) (WHO Regional Office for Europe, 2010).

For more information, please contact Andrey Igorevich Egorov (Manager, Environment and Health Information System, WHO European Centre for Environment and Health) at [egorovan@euro.who.int](mailto:egorovan@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Data and evidence > Environment and Health Information System (ENHIS).

<sup>1</sup> Health and environment in Europe: progress assessment. Copenhagen, WHO Regional Office for Europe, 2010 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0010/96463/E93556.pdf](http://www.euro.who.int/__data/assets/pdf_file/0010/96463/E93556.pdf)).

### Environment and Health Information System (EHIS)

Select indicator:

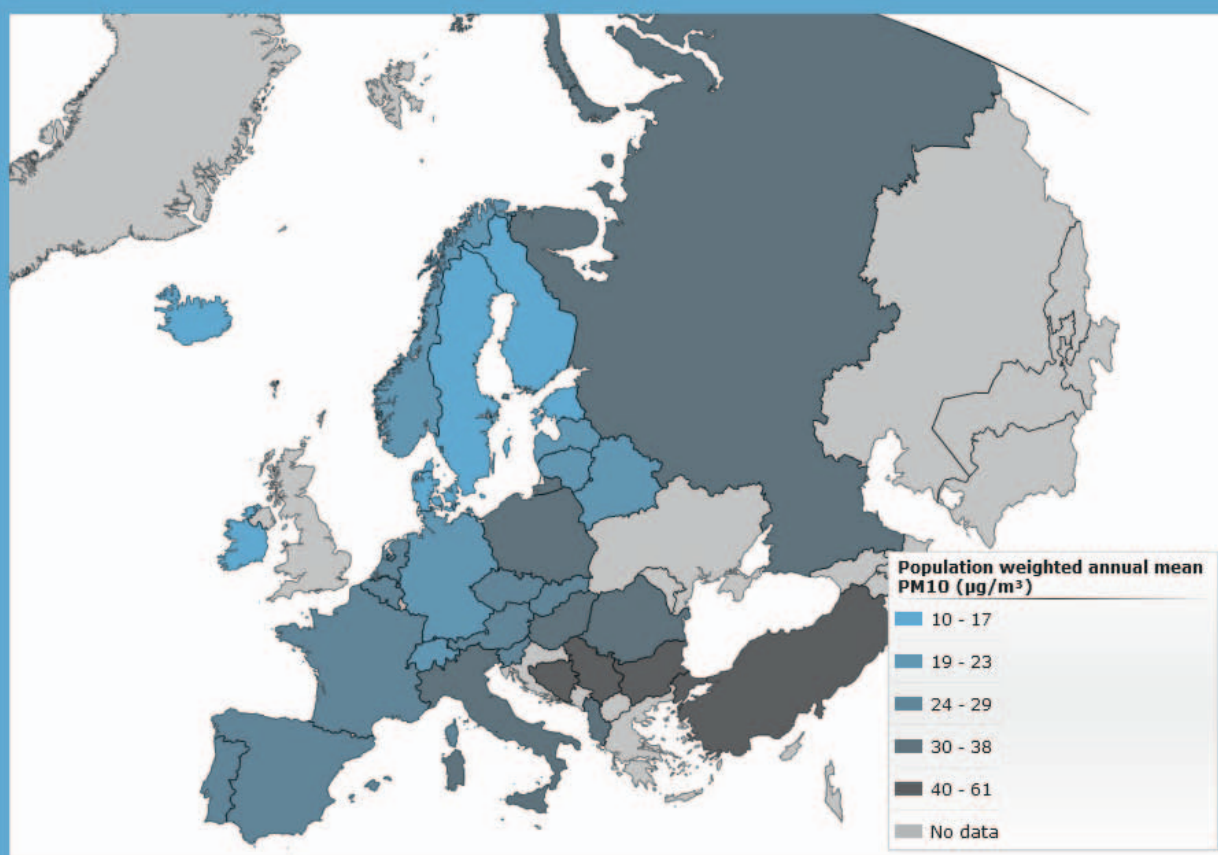
Select subindicator:

Select type:

Select period:

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#### Population weighted annual mean PM10 in cities



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Environment and Health Information System (EHIS)

# Environmental health impact assessment



Impact assessment – the application of comprehensive and systematic foresight in policy-making – is a familiar approach in the environmental field. Many countries have legislation mandating practices such as environmental impact assessment, strategic environmental assessment and sustainability appraisal. These are routinely applied in the course of formulating and implementing policy at the local, national and supra-national level.

Health impact assessment (HIA), which employs several of the same principles as other impact assessment approaches, has gained recognition as an equally important component of the policy process. HIA is now firmly established as a key tool for the implementation of the “health in all policies” agenda, and has greatly encouraged the inclusion of health considerations in policy decision-making in other sectors through open and participatory processes.

The integration of HIA with various forms of environmental assessment gives policy-makers insight into the health implications of policies in sectors such as transport, energy and agriculture. HIA is thus a

mechanism for maximizing the potential of other sectors to promote health and reduce health threats through evidence-informed policy-making.

## WHO/ECEH’s Role

WHO/ECEH promotes HIA through its engagement in activities that have the following aims:

- To further develop methods and tools for conducting health impact assessments and for including health considerations in other forms of impact assessment;

### What is health impact assessment?

WHO defines health impact assessment as “a combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population.”<sup>1</sup>

<sup>1</sup> Health impact assessment: main concepts and suggested approach. Gothenburg consensus paper. Brussels, WHO European Centre for Health Policy, 1999.

- To support the implementation of norms and multi-lateral agreements relating to impact assessment;
- To support policy dialogues and impact assessments in Member States; and
- To strengthen the capacity of Member States to apply HIA to environmental issues.

WHO/ECEH has been pursuing several lines of work to meet these objectives, often in collaboration with Member States and partners such as the European Commission, the United Nations Economic Commission for Europe (UNECE), the European Public Health Association and the International Association for Impact Assessment. In 2012, an international training workshop developed by WHO/ECEH brought together 70 experts from the environment and health sectors in eight countries.<sup>2</sup> Workshop participants discussed the state of the art in environment and health impact assessment; analyzed country-specific case studies; and engaged in various training modules.

Work is also carried out at the national level in Estonia, Latvia, Slovenia and several other Member States to review current institutional arrangements and legislation relevant to HIA and to identify steps for promoting HIA practices.

At the regional level, WHO/ECEH has collaborated with UNECE to support the development and ratification of the [2003 Protocol on Strategic Environmental Assessment](#), which supplements the 1991 Convention on Environmental Impact Assessment in a Transboundary Context. Efforts are underway to clarify methods, tools and opportunities for the inclusion of health in strategic environmental assessments as prescribed by the Protocol.<sup>3</sup>

## Key Resources

- [Using impact assessment in environment and health: a framework](#) (WHO Regional Office for Europe, 2013).
- [Health in all policies: prospects and potentials](#) (Ministry of Social Affairs and Health, Finland, 2006).
- [Health impact assessment: Main concepts and suggested approach](#). Gothenburg consensus paper. WHO European Centre for Health Policy. Brussels 1999.

<sup>2</sup> Capacity Building in Environment and Health (CBEH) project: Report of the international training workshop, 19–23 March 2012 Riga, Latvia. Copenhagen, WHO Regional Office for Europe, 2013 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0005/189743/e96848-Eng.pdf](http://www.euro.who.int/__data/assets/pdf_file/0005/189743/e96848-Eng.pdf)).

<sup>3</sup> Using impact assessment in environment and health: a framework. Copenhagen, WHO Regional Office for Europe, 2013 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0007/190537/e96852-final.pdf](http://www.euro.who.int/__data/assets/pdf_file/0007/190537/e96852-final.pdf)).

For more information, please contact Julia Nowacki (Technical Officer, WHO European Centre for Environment and Health) at [jno@euro.who.int](mailto:jno@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health > Health impact assessment.

# Environmental health inequalities



Environmental health risks are not evenly distributed between and within countries and populations, nor does everyone have the same means to cope with these risks. A compelling body of evidence documents how environmental health issues such as pollution, poor sanitation, and unsafe homes and workplaces have disproportionately negative consequences for disadvantaged groups in the European Region and elsewhere.

Awareness of environmental health inequalities is not new, but the tools for identifying and addressing environmental health inequalities have recently become more sophisticated. Researchers are engaged in increasingly systematic efforts to quantify inequalities in environmental exposure caused by socioeconomic and demographic determinants, enabling policy-makers to develop better and more targeted approaches to environmental protection.

## Health Issues

Environmental health inequalities have implications for a wide range of health issues, such as those associated with pollution, workplace safety, road traffic safety, noise exposure, second-hand smoke exposure, inadequate sanitation and household exposure to mould and other harmful substances. Environmental health inequalities thus can be linked to many different health

## Key Developments

- 2008 The WHO Commission on Social Determinants of Health published its final report, which identified unequal access to favourable daily living conditions, including those in the physical environment, as a major determinant of differences in health outcomes.
- 2010 In the Parma Declaration on Environment and Health, European governments recognized socio-economic and gender inequalities in the human environment as one of “the key environment and health challenges of our time.”
- 2011 The WHO World Conference on Social Determinants of Health concluded with a Declaration calling for intersectoral action to tackle health inequality challenges.
- 2012 The Health 2020 policy framework adopted by the WHO European Region identified the reduction of health inequalities as one of its key strategic objectives.
- 2012 The WHO Regional Office for Europe published *Environmental health inequalities in Europe: assessment report*, a baseline assessment of the magnitude of environmental health inequality in the European Region based on a core set of 14 inequality indicators related to housing, injuries and the environment. A key finding was that socioeconomic and demographic inequalities in risk exposure are present in all countries.



outcomes, ranging from cardiovascular, infectious and respiratory diseases to injuries and mental health problems.

## The Way Forward

By integrating public health and equity considerations across all of the sectors that help to shape the environment, policy-makers have the potential to significantly reduce disparities in health outcomes. Devising effective strategies for achieving the desired goals will require a much more nuanced understanding of how environmental health inequalities vary within and across countries and regions. Refining indicators and methodologies for measuring inequalities and for measuring the effects of interventions will continue to be a high priority. Standardizing approaches across countries and across environmental health domains will allow for broader analysis.

## WHO/ECEH's Role

- Assess the magnitude of environmental health inequalities within Member States.
- Identify the population groups that are most affected or most vulnerable.
- Provide advice on suitable interventions to reduce existing inequalities and prevent future inequalities.
- Advance the state of the science regarding the measurement of environmental health inequalities and the evaluation of interventions.

## Key Resources

- [Environmental health inequalities in Europe: assessment report](#) (WHO Regional Office for Europe, 2012).
- [Social and gender inequalities in environment and health](#) (WHO Regional Office for Europe, 2010).
- [Environment and health risks: a review of the influence and effects of social inequalities](#) (WHO Regional Office for Europe, 2010).

For more information, please contact Matthias Braubach (Technical Officer, Housing, Land Use and Urban Planning, WHO European Centre for Environment and Health) at [mbr@euro.who.int](mailto:mbr@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health > Social inequalities in environment and health.

# Sustainable development



Sustainable development, or “development that meets the needs of the present without compromising the ability of future generations to meet their own needs,”<sup>1</sup> is an important cross-cutting theme in the work of the WHO Regional Office for Europe:

- *Through the achievement of universal health coverage.* The goal of universal health coverage is to ensure that all people obtain the health services they need without suffering financial hardship when paying for them. Healthy people are better able to learn, earn and contribute positively to their societies.<sup>2</sup>
- *Through the enhancement of health gains from sustainable development investments and decisions.* Health can contribute to, and benefit from, greener and more efficient developments in energy, transport, agriculture, housing, and urban and rural

development. WHO estimates that healthier environments in homes and workplaces, in rural settings and cities, could prevent up to one quarter of deaths annually worldwide.

- *Through the adoption of health indicators to measure progress and achievements in sustainable development.*<sup>3</sup> Examples of health-relevant indicators include urban air quality, improved housing, occupational injuries, access to reliable and continuous energy, disaster preparedness and response plans, and obesity in children.

WHO/ECEH assesses the health benefits or damages of action in a wide range of economic sectors and technology development, measuring trends over time, anticipating major challenges and providing guidance to promote healthy practices in relation to energy, transport, the urban environment, food production and consumption (Box).

1 United Nations. “Report of the World Commission on Environment and Development.” General Assembly Resolution 42/187, 11 December 1987 (<http://www.un.org/documents/ga/res/42/ares42-187.htm>).

2 Universal health coverage [website]. Geneva, WHO, 2013 ([http://www.who.int/universal\\_health\\_coverage](http://www.who.int/universal_health_coverage)).

3 Measuring health gains from sustainable development. Geneva, WHO, 2012 ([http://www.who.int/hia/green\\_economy/sustainable\\_development\\_summary2.pdf](http://www.who.int/hia/green_economy/sustainable_development_summary2.pdf)).

## Examples of how greener development can have a positive health impact

**Energy.** The United Nations “Sustainable Energy for All” initiative seeks to mobilize all stakeholders to achieve three critical objectives by 2030: ensuring universal access to modern energy services; doubling the global rate of improvement in energy efficiency; and doubling the share of renewable energy in the global energy mix. For example, in the European Union it has been estimated that a 20% reduction in greenhouse gas emissions, through a mixture of renewable energy and legal measures, would lead to a 10% to 15% reduction in harmful toxins, including sulphur dioxide and nitrogen oxides, by 2020 compared with the 1990 baseline. This greenhouse gas reduction would improve life expectancy by 3.3 months and reduce health damage costs by between €12 billion and €29 billion.<sup>5</sup> In the WHO European Region, the current challenge is to ensure the availability of clean, reliable and affordable energy to maximize health benefits for everyone. WHO/ECEH contributes by assessing the health co-benefits of energy choices.

**Transport.** The promotion of active mobility and public transport reduces air pollution, noise, greenhouse gas emissions, energy consumption and congestion. It also improves road safety and offers better protection of landscapes and urban

cohesion. Increasing physical activity through active mobility contributes to reducing the risk of cardiovascular disease, type 2 diabetes, some forms of cancer and hypertension.

**Housing.** Improving energy efficiency is not enough for sustainability in housing: indoor air quality is a key consideration. More effective use of active and passive natural ventilation for cooling, measures to reduce mould and damp, energy-efficient home heating, appliances and cooking, the provision of safe drinking water and improved sanitation and stronger buildings are all essential components to promote sustainability.

**Green space.** Green spaces have been shown to have a positive impact on health. Where there are public green spaces and forests, people use them to walk, play and relax, reducing stress levels and noise pollution, and increasing social life. Green spaces can also contribute to flood management.

<sup>5</sup> Industrial relations in Europe 2008. Brussels, European Commission, 2008 (<http://ec.europa.eu/social/BlobServlet?docId=2535&langId=en>).

Through cooperation with other WHO programmes and United Nations agencies, the WHO Regional Office for Europe provides evidence and guidance and contributes to the Rio+20 and Sustainable Development Goals agendas. Particularly important recent activities have involved United Nations interagency developments for Europe;<sup>4</sup> tools developed for transport, environment and health; the assessment of the health impacts of energy choices; and the assessment of new technologies.

<sup>4</sup> From Transition to Transformation: Sustainable and Inclusive Development in Europe and Central Asia. New York, United Nations, 2012 (<http://www.unep.org/roe/Portals/139/Moscow/From-Transition-to-Transformation.pdf>).

For more information, please contact Bettina Menne (Programme Manager, Climate Change, Sustainable Environment and Green Health Services, WHO European Centre for Environment and Health) at [bme@euro.who.int](mailto:bme@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health.

# Environmental health and economics



In many sectors, evidence on the burden of disease associated with environmental health factors informs policies that are intended to improve health outcomes. But what are the economic costs of such policies? And which policy options are likely to provide the best health returns?

## Health Issues

In many cases, information on the costs and benefits of environmental health policy options – including the cost of inaction – provides compelling evidence about the overwhelming advantages of investing in

prevention. For example, [The Clean Air for Europe Programme \(CAFE\) of the European Union](#) estimates a high benefit–cost ratio of 6 to 19 for achieving European air quality targets. To give another example, a recent WHO study in the former Yugoslav Republic of Macedonia showed that the health costs of climate change strongly outweighed the adaptation costs: the annualized costs of heat-health adaptation measures were estimated at €193,000 compared to health damage costs of €2.7 million.<sup>1</sup>

In areas such as climate change, outdoor air pollution and transport, WHO/ECEH and other organizations are increasingly utilizing economic methods such as cost-benefit studies and cost-effectiveness analyses to inform policy-making in relation to the environment and health. However, economic assessments are not always robust: when the underlying scientific evidence is uncertain, assumptions and limitations regarding data, methods and interpretation often result in substantial uncertainty about policy implications.

## WHO/ECEH's Role

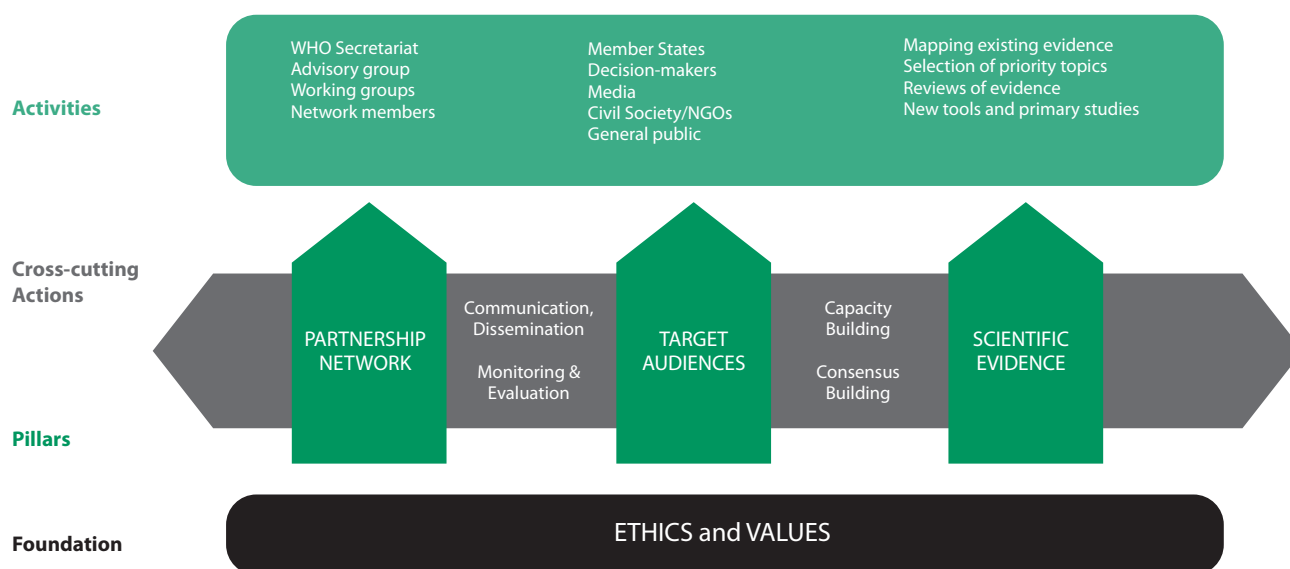
WHO/ECEH has stepped up its efforts to inform the regional and global dialogue about the economic

### Key Developments

- 2004 and 2010 Ministerial Conferences on Environment and Health discussed the need to consider the economic dimensions of environmental health policies.
- 2010 The [Parma Declaration on Environment and Health](#) called for “all relevant international organizations to further develop common tools and guidelines to address the economic impacts of environmental risk factors to health, including the cost of inaction, thereby facilitating the development and enforcement of legal instruments.”<sup>2</sup>
- 2012 The outcome document of the United Nations Conference on Sustainable Development, “[The Future We Want](#)”, further developed the concept of “green economy” in the context of sustainable development and poverty eradication.

<sup>1</sup> Protecting Health from Climate Change in the Former Yugoslav Republic of Macedonia. Copenhagen, WHO Regional Office for Europe, forthcoming 2013.

<sup>2</sup> Parma Declaration on Environment and Health, EUR/55934/5.1 Rev. 2 (Fifth Ministerial Conference on Environment and Health). Copenhagen, WHO Regional Office for Europe, 2010 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0011/78608/E93618.pdf](http://www.euro.who.int/__data/assets/pdf_file/0011/78608/E93618.pdf)).

**Figure: EHEN Strategic Framework on Environmental Health and Economics**

dimensions of environment and health issues, in part by bringing together experts and key stakeholders in this realm. WHO/ECEH held a technical consultation on environmental health economics in late 2012. This consultation kick-started the development of a strategic framework for environmental health economics and established the Environmental Health Economics Network (EHEN) to support implementation of the framework.

The strategic framework for environmental health and economics identifies three key pillars: developing and sustaining cross-sectoral collaboration; responding to the needs of and influencing target audiences; and compiling and developing scientific evidence (Figure). EHEN priorities include developing joint projects, advocacy materials, case studies and a literature database, as well as mobilizing resources for this field of activity.

### The Way Forward

WHO/ECEH will continue to support EHEN's efforts to advance the field of environmental health economics and will help to foster and broaden the network. In May 2013, WHO/ECEH established a small advisory

group to develop a joint 2013–2017 implementation plan for WHO and other stakeholders. The advisory group included core partners such as the European Environment Agency and the Organisation for Economic Co-operation and Development, along with nongovernmental organizations such as the Health and Environment Alliance and the European Public Health Alliance as well as key individual technical experts. An integral component of the implementation plan is a series of advisory group meetings addressing specific steps and issues that are crucial for the process. The meetings will also provide a forum for planning an annual network symposium that addresses priority environmental health economics issues for a broader audience.

For more information, please contact Frank George (Technical Officer, Environmental Health and Economics, WHO European Centre for Environment and Health) at [georgef@euro.who.int](mailto:georgef@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health.

# Chemical safety



Almost five million deaths worldwide are attributable to chemical exposure annually according to available estimates.<sup>1</sup> People are exposed to toxic chemicals through workplace activities, use of consumer products, breathing in air, consumption of food and water, and contact with hazardous substances in wastes and soil. Toxic chemicals can also pass from a pregnant woman to her developing baby.

Some toxic chemicals are manufactured and some are byproducts of manufacturing processes; others occur naturally. Because chemicals may be involved in accidents or result in dangerous exposures, some of which could have transboundary implications, several multilateral environmental agreements as well as the International Health Regulations<sup>2</sup> include chemicals in the scope of their work for international collaboration.

## Health Issues

The health effects of toxic chemicals may be immediate, or they may emerge gradually over years or decades. Exposure to chemicals has been linked to cancers; respiratory, cardiovascular and autoimmune diseases; developmental disorders; perinatal conditions such as premature birth and low birth rate; congenital anomalies; and other health problems.

<sup>1</sup> Prüss-Ustün A et al. Knowns and unknowns on burden of disease due to chemicals: a systematic review. *Environ Health*. 2011;10:9.

<sup>2</sup> International Health Regulations. Geneva, World Health Organization, 2005.

## Examples of chemicals known to be harmful to human health

Chemicals	Exposure pathway
volatile organic compounds, particulate matter, ozone, black carbon	Outdoor and indoor air
persistent organic pollutants (PCBs and dioxins), heavy metals, phthalates	Food and drinking water
perfluorinated chemicals, bisphenol A, toxic flame retardants (PBDEs)	Consumer products
heavy metals, polyaromatic hydrocarbons	Soil
asbestos	Occupational exposure

## Key Developments

- 1995 WHO, other United Nations agencies and the Organisation for Economic Co-operation and Development established the Inter-Organization Programme for the Sound Management of Chemicals.
- 2006 Delegates to the International Conference on Chemicals Management established the Strategic Approach to International Chemicals Management, a policy framework for the worldwide promotion of chemical safety.
- 2010 In the Parma Declaration on Environment and Health, European governments declared one of four regional priority goals to be “preventing disease arising from chemical, biological and physical environments,” with particular attention to children.

## Asbestos

In 2005, World Health Assembly Resolution 58.22 on cancer prevention and control urged Member States to pay special attention to cancers for which avoidable exposure is a factor, particularly exposure to chemicals in the workplace and in the environment. All forms of asbestos are carcinogenic to humans<sup>3</sup> and halting the use of all forms of asbestos is the most efficient way to eliminate asbestos-related diseases.<sup>4</sup> Asbestos is one of the most potent occupational carcinogens, causing approximately half of all deaths from occupational cancer.<sup>4</sup> Beside mesothelioma, asbestos causes lung, laryngeal and ovarian cancer as well as asbestosis.

In the [Parma Declaration on Environment and Health](#) (2010), all 53 WHO European Member States committed themselves to contributing to the implementation of the [Global Plan of Action on Workers' Health](#) (WHA 60.26) and to the development of national programmes for the elimination of asbestos-related diseases (ARDs) by 2015. In order to facilitate incorporation of these policies into national legislation in Member

States, WHO/ECEH organized two meetings in 2011 and 2012: "National programmes for the elimination of asbestos-related diseases: review and assessment," and "Meeting on Human and Financial Burden of Asbestos in the WHO European Region in 2012." While many countries in the Region have successfully implemented international guiding policies to eliminate ARDs, appropriate policies are still absent in some Member States. WHO/ECEH is working with countries to develop national asbestos profiles as a starting point in the development of national plans for the elimination of ARDs.

3 IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100 C. Lyon, France, International Agency for Research on Cancer, 2012 (<http://monographs.iarc.fr/ENG/Monographs/vol100C/>).

4 Elimination of asbestos-related diseases. Geneva, World Health Organization, 2006 ([http://whqlibdoc.who.int/hq/2006/WHO\\_SDE\\_OEH\\_06.03\\_eng.pdf](http://whqlibdoc.who.int/hq/2006/WHO_SDE_OEH_06.03_eng.pdf)).

## The Way Forward

Given the ubiquitous presence of chemicals in all realms of human life, understanding their potential effects on health and minimizing the health risks they may pose is a complex undertaking. Promoting chemical safety requires collecting and sharing information and expertise across many sectors, disciplines and countries. It is crucial for knowledge to be translated into effective risk reduction measures that are implemented on a widespread basis.

## WHO/ECEH's Role

- Assist countries in addressing all health-related aspects of chemical safety.
- Issue assessment reports and develop tools and guidance for risk assessment and management.
- Increase the capacity of governments and organizations to respond to existing and emerging health risks as well as to emergencies related to hazardous chemicals.
- Facilitate implementation of international agreements pertaining to chemical safety.

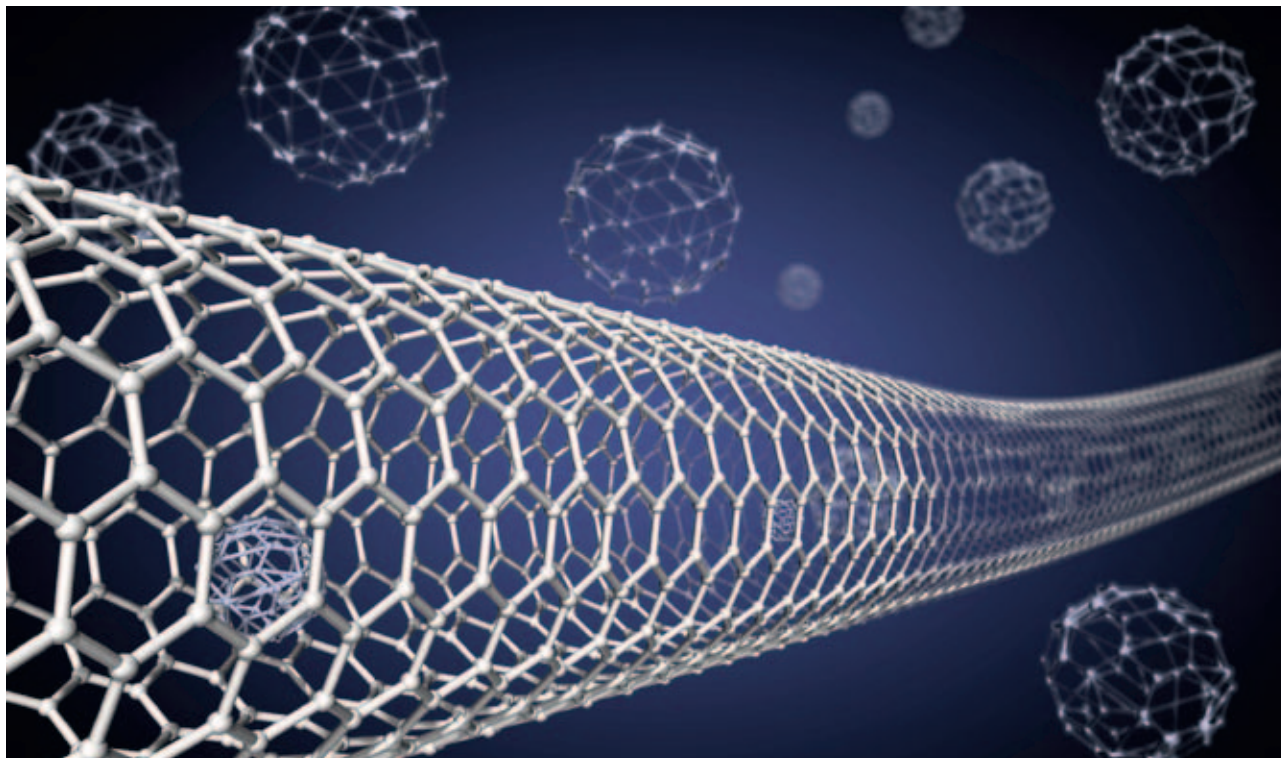
## Key Resources

- [State of the science of endocrine disrupting chemicals – 2012](#) (WHO, United Nations Environment Programme, 2013).
- [International Chemical Safety Cards](#) (WHO, 2013).
- [WHO manual: the public health management of chemical incidents](#) (WHO, 2009).
- [Guidelines on the prevention of toxic exposures: education and public awareness activities](#) (WHO, United Nations Environment Programme, International Labour Organization, 2004).

For more information, please contact Irina Zastenskaya (Technical Officer, Chemical Safety, WHO European Centre for Environment and Health) at [zastenskayai@euro.who.int](mailto:zastenskayai@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health.

# Nanotechnology



Historically, technological innovation has brought about remarkable advances for health, quality of life and well-being, while at the same time introducing potential health hazards. This pattern appears to be persisting with nanotechnology, the development and use of matter at a scale below 100 nanometres.

Research and commercial applications for nanotechnology are already widespread, and nanotech products currently in use in everyday life include medicines, fabrics, cosmetics, food additives and many consumer products. The safety of nanotechnology, however, remains a matter of concern. Nanoparticles can enter the body with relative ease through multiple pathways, and little is known about the extent of human exposure to different kinds of nanomaterials and the possible health effects. Some of those effects may only become apparent after long latency periods.

## Health Issues

Occupational and consumer exposure to nanomaterials can occur through multiple pathways, including inhalation, ingestion and skin absorption. Once inside

the body, it appears that nanoparticles are highly mobile. As for their biological effects, current evidence is inconclusive. Traditional toxicology and risk assessment methodologies have limitations, and innovative models and frameworks for risk governance are needed to inform policy.

Available evidence suggests that a cautionary approach may be appropriate for several reasons:

### Key Developments

- 2005–2007 WHO included nanotechnology in the project “Enhanced Policy Advice in Environment and Health” (PAVEL), co-funded by the European Commission.
- 2010 In the Parma Declaration on Environment and Health, European governments included nanotechnology among key priority issues in environment and health in Europe.
- 2012 WHO held an expert consultation, “Nanotechnology and Human Health: Scientific Evidence and Risk Governance.”



- Nanoparticles can enter the body relatively easily, especially through inhalation. Humans have limited evolutionary experience of nanomaterials, which may be a possible reason for the diminishing ability of cells to interact with particles as their size decreases to nanoscale.
- Several chemical-physical mechanisms resulting in cell damage have been reported, and effects are often dependent on particle size, with a tendency to increase as the particle size decreases.
- The level of population exposure to nanomaterials is not well known, but may be or become quite high, since nanomaterials are already in widespread use and are expected to have an increasing number of commercial applications in the coming years.<sup>1</sup>

## The Way Forward

Since the use of nanotechnology in many domains of human activity is expected to grow substantially, it is important that the health implications are periodically assessed and that evidence is carefully evaluated as soon as it becomes available. Health implications for groups that may be more biologically vulnerable to harm, such as children and elderly people, represent an area of particular concern. Given the complexity of the issue, the importance of carefully balancing risks and benefits, and the many different interests surrounding nanotechnology, open and transparent consultation processes are needed to ensure the development of fair and health-friendly policies and regulations.

## WHO/ECEH's Role

- Gather and critically assess information on potential health effects of nanotechnology.
- Provide governments with advice on appropriate nanotechnology risk/benefit assessment methods.
- Promote the sharing and dissemination of good practices in risk assessment and risk governance.
- Support the development of evidence-based policies and regulations.

## Key Resources

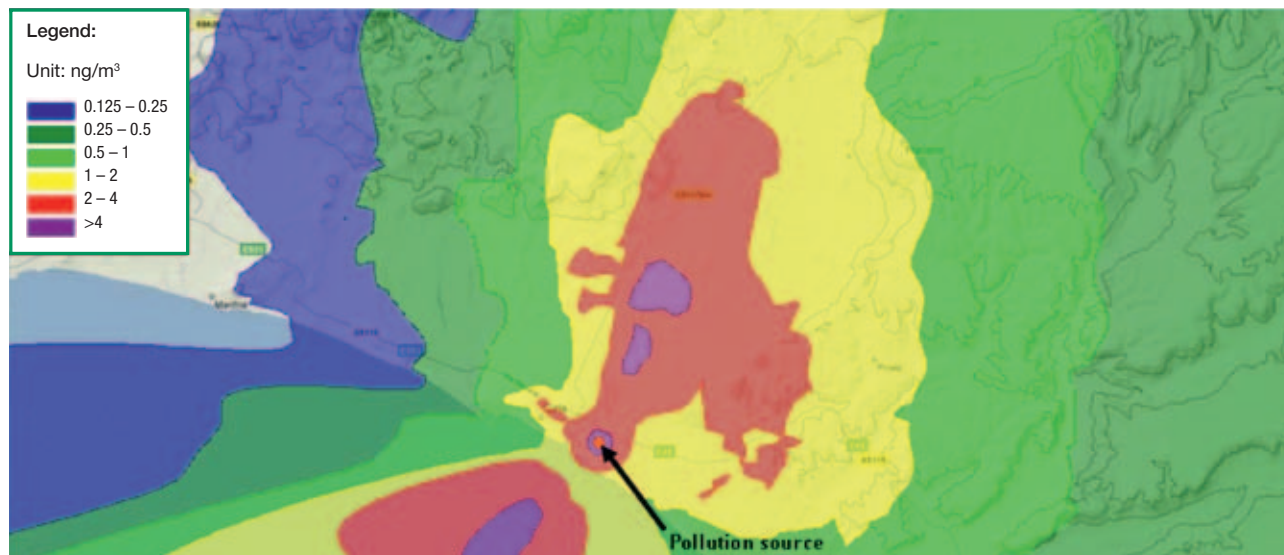
- [Nanotechnology and human health: scientific evidence and risk governance](#) (meeting report, WHO Regional Office for Europe, forthcoming 2013).
- [Joint FAO/WHO Expert Meeting on the Application of Nanotechnologies in the Food and Agriculture Sectors: Potential Food Safety Implications](#). (Food and Agriculture Organization, World Health Organization, 2010)

<sup>1</sup> Nanotechnology and human health: scientific evidence and risk governance. Copenhagen, WHO Regional Office for Europe, forthcoming 2013.

For more information, please contact Marco Martuzzi (Programme Manager, Environment and Health Intelligence and Forecasting, WHO European Centre for Environment and Health) at [mam@euro.who.int](mailto:mam@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health.

# Industrially contaminated sites



The European Region has thousands of industrially contaminated sites – locations where past and current industrial activity have caused environmental changes that may be harmful to human health. Industrially contaminated sites include processing plants and facilities for chemicals, petrochemicals, manufacturing, waste disposal, cement, power generation, mining and metals. Potential pathways to exposure include groundwater, surface water, soil, the air and the food chain.

## Health Issues

Exposure to chemicals and other environmental stressors from industrially contaminated sites can cause health problems such as cancers, cardiovascular diseases, respiratory diseases and congenital malformations.

Identifying causal links between specific episodes of contamination and specific health outcomes, however, is a complex undertaking. While the harmful effects of exposure to many substances are well documented, the challenge for environmental and public health experts is to determine sources of exposure in situations where multiple health risks may exist alongside each other.

For example, it may be difficult to quantify the health impact of the discharge of heavy metals at a mining

site if the facility is located in a region where other major sources of pollution exist. Assessing exposure patterns from industrially contaminated sites is further complicated by the fact that many of these sites are close to urban areas and to economically disadvantaged communities, resulting in interactions with other important health determinants.

## The Way Forward

The burden of disease from industrially contaminated sites in the European Region is suspected to be substantial, but knowledge gaps in relation to this issue

## Key Developments

- 2011 WHO/ECEH proposed a European consultation on industrially contaminated sites and health, and organized the first of two technical meetings to establish a technical network.
- 2012 WHO/ECEH convened a follow-up technical meeting at which topics and goals for collaborative work were identified.
- 2013 WHO/Europe published a collection of European case studies in a combined report of the 2011 and 2012 meetings.

leave policy-makers with insufficient guidance about how to improve the situation. The establishment of the European Network on Industrially Contaminated Sites and Health is an important first step. Specific measures for further characterizing and addressing the health implications of industrially contaminated sites include:

- producing guidelines on strategies for the study of industrially contaminated sites, with an emphasis on identifying suitable study designs and methodologies;
- strengthening exposure assessment, particularly in relation to biomonitoring;
- implementing health assessments that include separate analyses of children, since children are particularly sensitive to environmental stressors;
- developing training modules on the approaches and methodologies to be applied in different contexts; and
- establishing a data collection system that will facilitate comparative analyses of the health impact of industrially contaminated sites within and across different countries, and also across different socio-economic strata.

## WHO/ECEH's Role

- Support governments in analyzing the health impact of industrially contaminated sites.

- Promote and participate in expert groups developing methods and tools for this work.
- Provide guidance to authorities regarding what can be done to reduce health impacts of pollution at industrially contaminated sites.
- Carry out capacity-building activities to share expertise among a larger body of environmental and public health professionals.
- Apply innovative methods in relation to risk perception and communication.

## Key Resources

- [Contaminated sites and health: report of two WHO workshops: Syracuse, Italy, 18 November 2011, Catania, Italy, 21–22 June 2012](#) (WHO Regional Office for Europe, 2013).
- [Human Health in Areas with Local Industrial Contamination](#) (WHO Regional Office for Europe, forthcoming 2013).
- [Industrially Contaminated Sites; Journal of Environmental and Public Health, Special Issue, 2013.](#) <http://www.hindawi.com/journals/jep/h/si/480565/>

For more information, please contact Marco Martuzzi (Programme Manager, Environment and Health Intelligence and Forecasting, WHO European Centre for Environment and Health) at [mam@euro.who.int](mailto:mam@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health.

# Air quality



Various sources of pollution can reduce air quality significantly enough to have major consequences for human health. Some of the most common air pollution sources in the European Region include motor vehicles, power plants, industrial processes, agriculture, household combustion and energy use.

The most recent WHO air quality guidelines, which provide recommendations for the protection of public health, applicable across all WHO regions, focus on four main pollutants: particulate matter, nitrogen dioxide, sulfur dioxide and ozone.<sup>1</sup>

Forty million people in the 115 largest cities in the European Union are exposed to air exceeding WHO air quality guideline values for at least one pollutant.<sup>2</sup> In the WHO European Region, exposure to particulate matter decreases life expectancy by an average of almost nine months.<sup>3</sup>

## Health Issues

Air pollution can cause respiratory diseases, cardiovascular diseases and lung cancer.<sup>1</sup> It is also linked with pregnancy outcomes, and it may damage the central nervous system as well.<sup>4, 5</sup>

4 Effects of air pollution on children's health and development: a review of the evidence. Copenhagen, WHO Regional Office for Europe 2005 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0010/74728/E86575.pdf](http://www.euro.who.int/__data/assets/pdf_file/0010/74728/E86575.pdf)).

5 Review of evidence on health aspects of air pollution – REVIHAAP Project: final technical report. Copenhagen, WHO Regional Office for Europe, 2013 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0004/193108/REVIHAAP-Final-technical-report-final-version.pdf](http://www.euro.who.int/__data/assets/pdf_file/0004/193108/REVIHAAP-Final-technical-report-final-version.pdf)).

## Key Developments

- 1979 Within the framework of the United Nations Economic Commission for Europe, 34 governments and the European Community signed The 1979 Geneva Convention on Long-range Transboundary Air Pollution.
- 1998 The United Nations Economic Commission for Europe and WHO/ECEH established the Joint Task Force on the Health Aspects of Air Pollution.
- 2006 WHO published Air quality guidelines: global update 2005: particulate matter, ozone, nitrogen dioxide and sulfur dioxide.
- 2010 In the Parma Declaration on Environment and Health, European governments pledged to prevent disease through improved outdoor and indoor air quality.

1 Air quality guidelines: global update 2005: particulate matter, ozone, nitrogen dioxide and sulfur dioxide. Geneva, WHO, 2006 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0005/78638/E90038.pdf](http://www.euro.who.int/__data/assets/pdf_file/0005/78638/E90038.pdf)).

2 Criteria for EUROAIRNET: The EEA Air Quality Monitoring and Information Network: Technical Report No. 12. 1999. Copenhagen, European Environment Agency, 1999 ([www.eea.europa.eu/publications/TEC12/at\\_download/file](http://www.eea.europa.eu/publications/TEC12/at_download/file)).

3 Health effects of particulate matter: policy implications for countries in eastern Europe, Caucasus and central Asia. Copenhagen, WHO Regional Office for Europe, 2013 (<http://www.euro.who.int/en/what-we-do/health-topics/environment-and-health/air-quality/publications/health-effects-of-particulate-matter.-policy-implications-for-countries-in-eastern-europe,-caucasus-and-central-asia>).

Clear relationships have been observed between proximity to sources of air pollution and health outcomes. For example, children living near roads with heavy-duty vehicle traffic have twice the risk of respiratory problems as those living near less congested streets.<sup>6</sup>

Some of the groups most vulnerable to air pollution include children, elderly people and those with pre-existing medical conditions. Emerging evidence indicates that poor air quality may disproportionately harm economically disadvantaged groups as a result of risk factors such as poor nutrition, limited access to health care and higher exposure to pollution sources.<sup>1</sup>

## The Way Forward

Interventions that can reduce the health effects of air pollution include regulatory measures (such as stricter air quality standards), structural changes (such as land use planning) and individual behavioral changes (such as switching to cleaner modes of transport and household energy sources).

## WHO/ECEH's Role

- Review the evidence on health effects of air pollution.
- Provide evidence-based guidance to policy-makers.
- Help governments build capacity to assess health risks from air pollution and develop air quality policies.
- Coordinate the work of the [Joint Task Force on the Health Aspects of Air Pollution](#), which aims to improve air quality and reduce the effects of air pollution on health and ecosystems in the WHO European Region.

## Key Resources

- [Health effects of particulate matter: policy implications for countries in eastern Europe, Caucasus and central Asia](#) (WHO Regional Office for Europe, 2013).
- [Review of evidence on health aspects of air pollution – REVIHAAP Project: final technical report](#) (WHO Regional Office for Europe, 2013).
- [WHO guidelines for indoor air quality: selected pollutants](#) (WHO Regional Office for Europe, 2010).
- [WHO guidelines for indoor air quality: dampness and mould](#) (WHO Regional Office for Europe, 2009).
- [Air quality guidelines: global update 2005: particulate matter, ozone, nitrogen dioxide and sulfur dioxide](#) (WHO, 2006).

<sup>6</sup> Kim JJ et al. Residential traffic and children's respiratory health. *Environ Health Perspect.* 2008 Sep;116(9):1274–1279.

For more information, please contact Marie-Eve Héroux (Technical Officer, Air Quality and Noise, WHO European Centre for Environment and Health) at [mhe@euro.who.int](mailto:mhe@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health > Air quality.

# Transport and health



Various forms of transportation are associated with health risks such as air pollution, noise, injuries and reduced physical activity. Furthermore, emissions from motor vehicles contribute significantly to rising greenhouse gas levels; the resulting changes in the climate pose additional threats to human health (see the “Climate change” chapter).

The countries of the European Region recognize that intersectoral cooperation and high-level political commitment are crucial for successfully addressing their transportation-related health and environment challenges. Reducing the harmful health effects of motorized transportation is not the only concern. Countries are increasingly acting on new insights regarding how certain policy options such as “active mobility” (i.e. bicycling and walking), together with public transport, can benefit population health while simultaneously helping to mitigate climate change and improve urban environments.

## Health Issues

Transport-related air pollution is estimated to cause some 100,000 premature adult deaths annually in the European Region.<sup>1</sup> Transport activities are also

the primary source of noise exposure in the European Region, particularly in urban areas. Harmful effects of noise include cardiovascular disease, sleep disturbance and stress. Another health issue associated

## Key Developments

- 1999 The Third Ministerial Conference on Environment and Health adopted the WHO Charter on Transport, Environment and Health as the first international policy platform bringing together the ministries and stakeholders of the three sectors.
- 2002 The Transport, Health and Environment Pan-European Programme (THE PEP) was launched, bringing together the work of WHO and the United Nations Economic Commission for Europe (UNECE) in a shared policy platform and informational resource for the three sectors.
- 2009 Delegates to the Third High-level Meeting on Transport, Health and Environment adopted the Amsterdam Declaration, which established four priority goals: investment in environment- and health-friendly transport; sustainable mobility and more efficient transport systems; reduction of emissions of transport-related greenhouse gases, air pollutants and noise; and promotion of policies and actions conducive to healthy and safe modes of transport.

<sup>1</sup> Health effects of transport-related air pollution. Copenhagen, WHO Regional Office for Europe, 2005 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0006/74715/E86650.pdf](http://www.euro.who.int/__data/assets/pdf_file/0006/74715/E86650.pdf)).

with transportation is road safety. Road injuries are estimated to cause nearly 100,000 deaths and 2.4 million injuries annually in the European Region.<sup>2</sup>

By prioritizing motorized transport, many countries in the European Region have deterred cycling and walking. This is problematic not only because active mobility is more environmentally friendly, but also because physical inactivity is associated with nearly one million deaths per year.<sup>3</sup> Physical inactivity contributes to obesity and increases the risk for major non-communicable diseases. More than half of car journeys in Europe cover distances of less than 5 km, suggesting that there may be many unrealized opportunities to encourage cycling and walking.<sup>4</sup>

## The Way Forward

The series of High-level Meetings on Transport, Environment and Health, which gives policy direction to the work carried out under THE PEP, provides a continued political impetus and stimulates closer collaboration with researchers, local authorities and civil society. The role of sustainable transport policies that prioritize cycling, walking and public transport will continue to be emphasized, with researchers and policy-makers exploring the impact of such policies on not only health outcomes but also the green economy and sustainable development.

## WHO/ECEH's Role

The WHO Regional Office for Europe carries out much of its work on transport and health through THE PEP, in partnership with the UNECE and Member States. This programme develops methods and tools to support countries in assessing the health impacts of transport-related policies and interventions. It also offers a platform for countries to share information and expertise and to benefit from each other's experience.

By integrating transport, health and environment policies, THE PEP contributes to a greener economy, safeguarding health and the environment.

## Key Resources

- [European facts and global status report on road safety 2013](#) (WHO Regional Office for Europe, 2013).
- [Health economic assessment tools \(HEAT\) for walking and for cycling: methodology and user guide](#) (WHO Regional Office for Europe, 2011).
- [Green and healthy jobs in transport: launching a new partnership under THE PEP](#) (WHO Regional Office for Europe, 2011).

2 European facts and "Global status report on road safety 2013". Copenhagen, WHO Regional Office for Europe, 2013 (<http://www.euro.who.int/en/what-we-do/health-topics/disease-prevention/violence-and-injuries/publications/2013/european-facts-and-global-status-report-on-road-safety-2013>).

3 Global Health Risks. Geneva, World Health Organization, 2009 ([http://www.who.int/healthinfo/global\\_burden\\_disease/GlobalHealthRisks\\_report\\_full.pdf](http://www.who.int/healthinfo/global_burden_disease/GlobalHealthRisks_report_full.pdf)).

4 Cycling: the way ahead for towns and cities. Brussels, European Commission, 1999 ([http://ec.europa.eu/environment/archives/cycling/cycling\\_en.pdf](http://ec.europa.eu/environment/archives/cycling/cycling_en.pdf)).

For more information, please contact Christian Schweizer (Technical Officer, Coordination of Environment and Health, WHO European Centre for Environment and Health) at [csc@euro.who.int](mailto:csc@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health > Transport and health.

# Housing and urban health



Two thirds of people in the European Region live in towns and cities. Many features of the urban and built environment have direct effects on health and well-being. The design and maintenance of urban neighborhoods and indoor spaces such as schools and day care centres is thus of considerable public health importance. Housing is a matter of particular concern

since people spend such a large amount of time in their homes.

## Health Issues

Factors in the urban environment that affect health outcomes include transportation- and industry-related noise and air pollution; traffic safety; waste disposal; access to recreational and green areas; access to active transport options such as bicycling; and public security. The urban environment has implications for a wide range of health issues such as cancer; respiratory and cardiovascular diseases; accidental and violent injuries; poisoning; obesity; and alcohol and substance abuse.

In regard to housing, poorly designed and improperly built dwellings invite health hazards such as dampness, mould, poor indoor air quality, pests, and poisoning from lead, radon, carbon monoxide and other substances. Crowding can facilitate the spread of tuberculosis. Indoor solid fuel use has been linked to chronic obstructive pulmonary disease, acute lower respiratory infections and lung cancer. In some European countries, more deaths result from accidents in the home than accidents on the road.

## Key Developments

- 1987 The WHO European Healthy Cities Network was launched with the goal of introducing new ways of working for health in cities.
- 2004 Following up on the Budapest Declaration on Environment and Health, the WHO Regional Office for Europe staged a major symposium to present the findings of the WHO Large Analysis and Review of European Housing and Health Status (LARES) and to identify priorities for action.
- 2010 In the Parma Declaration on Environment and Health, European governments pledged to prevent disease arising from physical environments and to “provide each child by 2020 with access to healthy and safe environments and settings of daily life,” assuring that no home safety threats or contaminants are present.



## The Way Forward

Housing and urban health issues are likely to take on increasing prominence as urban populations throughout the European Region continue to expand. There will likely be greater technical challenges relating to climate change (which affects thermal comfort, energy use and housing construction) as well as to housing and urban design modifications for ageing populations. Assessments of individual housing and urban risks need to be broadened into more holistic assessments of housing and urban conditions, and there needs to be greater consideration of sociodemographic and spatial inequalities in housing and the quality of the urban environment.

In light of the diversity of urban challenges, there is a need for a more unified response across the government sectors that address housing, urban planning, education, transportation, social welfare, the environment and public health, and also across the fields of architecture, construction, engineering and building management.

## WHO/ECEH's Role

- Compile and assess evidence on the health effects of housing and urban environments, identifying priorities for action.
- Evaluate risk management approaches and strategies to inform technical and policy decisions by key stakeholders in Member States.
- Support the development of national capacities to address the health challenges associated with the urban and built environment.

## Key Resources

- [Environmental burden of disease associated with inadequate housing](#) (summary report) (WHO Regional Office for Europe, 2011).
- [Urban planning, environment and health: from evidence to policy action](#) (WHO Regional Office for Europe, 2010).
- [Large analysis and review of European housing and health status \(LARES\)](#) (WHO Regional Office for Europe, 2007).

For more information, please contact Matthias Braubach (Technical Officer Housing, Land Use and Urban Planning, WHO European Centre for Environment and Health) at [mbr@euro.who.int](mailto:mbr@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health > Housing and health.

# Noise



Excessive noise is increasingly recognized as a significant public health issue. Population growth and urbanization add to the challenge of protecting people from its harmful effects, which include cardiovascular disease and sleep disturbance. Noise also reduces children’s cognitive abilities, and may undermine their long-term cognitive development.

Transport noise alone is harmful to the health of almost every third person in the WHO European Region. One in five Europeans is regularly exposed to nighttime sound levels that could significantly damage health.<sup>1</sup>

## Health Issues

Noise is considered as a nonspecific stressor that may have adverse health effects including the dysfunction of the autonomous nervous system and endocrine system and bringing about metabolic changes that affect cardiovascular health. There is evidence that road traffic noise increases the risk of ischaemic heart disease, including heart attack, and that both road traffic noise and aircraft noise increase the risk of high blood pressure.<sup>1</sup>

<sup>1</sup> Burden of disease from environmental noise: quantification of healthy life years lost in Europe. Copenhagen, WHO Regional Office for Europe, 2011 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0008/136466/e94888.pdf](http://www.euro.who.int/__data/assets/pdf_file/0008/136466/e94888.pdf)).

Adequate, uninterrupted sleep is necessary for efficient daily performance and for good health in general. Numerous studies report on sleep disturbance due to traffic noise; furthermore, noise may impair behaviour and well-being, increase the risk of accidents and greatly undermine quality of life. Since the human organism responds to sounds even while asleep, a person need not be awakened by chronic noise to suffer harmful effects.<sup>1</sup> The effects related to annoyance from noise include anger, helplessness, depression, anxiety, distraction, agitation and other negative responses.<sup>1</sup>

## Key Developments

- 2009 WHO Regional Office for Europe published *Night noise guidelines for Europe*. These guidelines expand upon the 2002 European Union Environmental Noise Directive, which requires countries to map noise hotspots and reduce noise exposure.
- 2010 In the Parma Declaration on Environment and Health, European governments reaffirmed their call to reduce children’s exposure to harmful noise.
- 2011 WHO Regional Office for Europe published “Burden of disease from environmental noise. Quantification of healthy life years lost in Europe”. This publication quantifies the harmful effects of community noise in the WHO European Region.

## The Way Forward

Strategies and tools for monitoring and controlling noise exposure are becoming increasingly sophisticated. Policy-makers and technical experts in European countries have the potential to make great strides on environmental noise management in the coming years. Noise exposure mapping and action plans at the national and municipal levels will guide this process.

While interventions such as the insulation of bedroom windows can be an option to lessen the harmful effects of some sounds, reducing noise at its sources should be the ultimate goal. Multisectoral efforts are needed to fully capitalize on the expertise of a wide range of fields including public health, transportation, urban planning, housing and education.

## WHO/ECEH's Role

- Review the evidence on health effects of noise.
- Identify the needs of vulnerable groups.
- Support Member States in preventing and controlling exposure to excessive noise.

## Key Resources

- [Night noise guidelines for Europe](#) (WHO Regional Office for Europe, 2009).
- [Burden of disease from environmental noise: quantification of healthy life years lost in Europe](#) (WHO Regional Office for Europe, 2011).
- [Methodological guidance for estimating the burden of disease from environmental noise](#) (WHO Regional Office for Europe, 2012).



For more information, please contact Marie-Eve Héroux (Technical Officer, Air Quality and Noise, WHO European Centre for Environment and Health) at [mhe@euro.who.int](mailto:mhe@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health > Noise.

# Water and sanitation



Having access to adequate sanitation facilities and sufficient amounts of safe water for drinking and hygiene is essential for human health. The production of safe food supplies requires uncontaminated water. Bodies of water function as a source of recreation, which also has implications for health and well-being. Protecting and ensuring the quality of all forms of water is a cornerstone of environmental health.

Nineteen million people in the European Region remain unserved by improved drinking-water sources and sixty-seven million lack access to adequate sanitation.<sup>1</sup> Although access has generally increased in the last decade, there are notable disparities between rural and urban areas, especially in the Caucasus and Central Asia.

<sup>1</sup> WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation. [online database]. WHO, UNICEF, 2003-2013 ([www.wssinfo.org](http://www.wssinfo.org)).

## Key Developments

- 1999 The Third Ministerial Conference on Environment and Health adopted the *Protocol on Water and Health* – the first international legal instrument linking prevention and reduction of water-related diseases and the sustainable use of water resources in Europe.
- 2004 The Fourth Ministerial Conference on Environment and Health adopted the *Children's Environment and Health Action Plan for Europe*, which identified improving “access to safe and affordable water and adequate sanitation for all children” as a regional priority goal.
- 2010 In the *Parma Declaration on Environment and Health*, European governments declared one of four regional priority goals to be “ensuring public health by improving access to safe water and sanitation.” They pledged to “strive to provide each child with access to safe water and sanitation in homes, child care centres, kindergartens, schools, health care institutions and public recreational water settings by 2020.”

## Health Issues

Poor water, sanitation and hygiene can cause infectious diseases. Micro-organisms transmitted by the faecal-oral route are typically associated with self-limiting diarrhea but also can cause severe diseases such as typhoid and viral hepatitis. The five most commonly reported water-related diseases in the European Region are hepatitis A, legionellosis, campylobacteriosis, cryptosporidiosis and giardiasis. Those at greatest risk of water-related disease are infants and young children. Diarrhea attributable to poor water and sanitation is estimated to account for over 5% of all deaths in European children aged 0-14 with a higher prevalence in the Eastern part of the Region.<sup>2</sup> Localized chemical pollution of water may also have significant health consequences, for example from arsenic, fluoride and nitrate.

## The Way Forward

Continuing to improve access to safe drinking-water and adequate sanitation in the European Region will require addressing prevailing inequalities between rural and urban areas as well as between poor and wealthy populations. Progressively realizing children's access to safe water, adequate sanitation and hygiene in schools and kindergartens is essential. New challenges also need to be taken into account in the coming years. Increasingly frequent extreme weather events and other consequences of climate change are already impacting water resources. Understanding and responding to these dynamics is imperative. Scaling up the adoption of water safety plans and strengthening national surveillance capacities remain key priorities for consistently ensuring drinking-water safety and thereby protecting public health.

## WHO/ECEH's Role

- Provide evidence-based guidance and tools for strengthening the capacity of national health systems and water sectors to ensure water quality and to control, prevent and reduce water-related diseases.
- Promote water safety plans and facilitate capacity-building in accordance with the [WHO Guidelines for Drinking-water Quality](#).
- Serve as a regional hub for technical advice about health interventions, including responses to emergency situations.

## Key Resources

- [No one left behind: good practices to ensure equitable access to water and sanitation in the pan-European region](#) (WHO Regional Office for Europe, UNECE, 2012).
- [Policy guidance on water-related disease surveillance](#) (WHO Regional Office for Europe, 2011).
- [Guidance on water supply and sanitation in extreme weather events](#) (WHO Regional Office for Europe, 2011).
- [Small-scale water supplies in the pan-European region: background, challenges, improvements](#) (WHO Regional Office for Europe, UNECE, 2011).
- [Progress and challenges on water and health: the role of the Protocol on Water and Health](#) (WHO Regional Office for Europe, 2010).

For more information, please contact Oliver Schmall (Programme Manager, Management of Natural Resources – Water and Sanitation, WHO European Centre for Environment and Health) at [sol@euro.who.int](mailto:sol@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health > Water and sanitation.

<sup>2</sup> Valent F et al. Burden of disease attributable to selected environmental factors and injury among children and adolescents in Europe. *Lancet*. 2004 Jun 19;363(9426):2032–2039.

# Workers' health protection



## Key Developments

- 2007 The World Health Assembly endorsed the [Global Plan of Action on Workers' Health 2008–2017](#). Working in partnership with: 1. The South-eastern European Network on Workers' Health; and 2. the Baltic Sea Network on Workers' Health under the Northern Dimension Partnership in Public Health and Social Well-being.
- 2013 WHO published a baseline survey of Member States regarding efforts to implement the [Global Plan of Action](#). The survey found that “enforcement of regulations for workplace health protection remains insufficient.”
- 2013 The network of WHO Collaborating Centers for Occupational Health within WHO/Europe brings together more than 20 highly regarded academic, scientific and government institutions that support WHO activities in the protection of workers' health.

Health risks at the workplace are often linked with high exposures to different health hazards, including pollutants that also influence the health of the general population when they are emitted to the environment. It is also important for efforts addressing the environment and health to take into account the occupational health realm because the workplace represents an important opportunity to address communicable and noncommunicable diseases in a well-defined setting. Workplace health promotion programmes have the potential to make major contributions to reducing the burden of disease from a wide range of health conditions.

The [Global Plan of Action on Workers' Health 2008–2017](#) puts forth a comprehensive vision for safeguarding workers' health and safety, and almost 80% of Member States in the European Region have national policy frameworks on workers' health. Yet these efforts

are failing to prevent relatively high levels of occupational health-related illness and injury. Unhealthy working conditions contribute to at least 1.6% of the burden of disease in the Region<sup>1</sup> and cause economic losses totaling 4% of the regional gross domestic product.<sup>2</sup>

## Health Issues

Work-related diseases and injuries result from work-related exposures to different types of dust, chemicals and noise, bad ergonomic conditions, psychosocial factors and other exposures. In the WHO European Region, the risks that contribute the most to the occupational burden of disease are injuries (32%), noise (21%), carcinogens (16%) and airborne particulate matter (27%).<sup>1</sup> Under the banner “Every occupational disease and injury is preventable,” WHO supports equitable access to basic occupational services for all workers in order to prevent occupational diseases and injuries.

## WHO/ECEH's Role

- Support Member States to develop national profiles and programmes for the elimination of asbestos-related diseases in the WHO Europe Region.
- Prepare a European report on the prevention of non-communicable diseases through healthy lifestyle interventions in health workplace programmes.
- Develop national profiles on occupational health systems in the WHO European Region as best practice examples.
- Develop an action plan for scaling up coverage of and improving the quality of occupational health interventions and services in the European Region.

## Key Resources

- [National programmes for elimination of asbestos-related diseases: review and assessment](#) (WHO Regional Office for Europe, 2012).
- [Situation analysis and recommendations for stewardship on workplace health promotion in Poland](#) (WHO Regional Office for Europe, 2012).
- [Country profile of occupational health system in Germany](#) (WHO Regional Office for Europe, 2012).
- [National profile of occupational health system in Finland](#) (WHO Regional Office for Europe, 2012).

<sup>1</sup> Global health risks: mortality and burden of disease attributable to selected major risks. Geneva, World Health Organization, 2009 ([http://www.who.int/healthinfo/global\\_burden\\_disease/GlobalHealthRisks\\_report\\_full.pdf](http://www.who.int/healthinfo/global_burden_disease/GlobalHealthRisks_report_full.pdf)).

<sup>2</sup> The Prevention of Occupational Diseases, World Day for Safety and Health at Work, 28 April 2013. Geneva, International Labour Organization, 2013 ([http://www.ilo.org/wcmsp5/groups/public/---ed\\_protect/---protrav/---safework/documents/publication/wcms\\_208226.pdf](http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_208226.pdf)).

For more information, please contact Elizabet Paunovic (Programme Manager, Environmental Exposures and Risks, WHO European Centre for Environment and Health) at [paunovice@euro.who.int](mailto:paunovice@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health.

# Climate change



Climate change influences environmental systems and social conditions that, in turn, affect food yields, water supplies, infectious disease patterns, disaster preparedness and response, social disruption,

displacement of communities and conflict situations.<sup>1</sup> Many of the effects of climate change are influenced by other global changes and socio-demographic pressures.

## Key Developments

- 1999 The declaration of the Third Ministerial Conference on Environment and Health called for intensified research and monitoring on the health effects of climate change, mitigation and adaptation measures;
- 2004 The declaration of the Fourth Ministerial Conference on Environment and Health, called for intensified prevention of the health effects of climate change and action to prevent adverse health effects of energy production and distribution;
- 2008 The World Health Assembly adopted [Resolution WHA62.19](#) calling on Member States and the World Health Organization to address the health impacts of climate change.
- 2010 At the Fifth Ministerial Conference on Environment and Health governments pledged to protect health and well-being, natural resources and ecosystems and to promote health equity, health security and healthy environments in a changing climate. The European Regional Framework for Action was welcomed.

## Health Issues

Some specific risks to health from climate change in Europe are:<sup>2,3</sup>

- Food productivity is projected to decrease in parts of the European Region, potentially threatening food security and exacerbating malnutrition;
- Warmer temperatures are expected to foster an increase in food-transmitted infections<sup>2</sup> and water-borne diseases;
- Climate change is affecting air quality by altering wind patterns, increasing fires and accelerating desertification, potentially worsening respiratory diseases;<sup>2</sup>
- The amount of airborne pollen (which can trigger

1 McMichael AJ. Globalization, climate and human health. *N Engl J Med*, 2013;368 (14): 1335–1343.

2 Confalonieri U et al. Human health. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 391–431.

3 Menne B, et al. Protecting health in Europe from climate change. WHO Regional Office for Europe, 2008.



asthma and other allergic diseases<sup>4</sup>) is increasing in Europe, and the pollen season has expanded by an average of 10–11 days over the last 30 years;

- The geographical distribution of vectors, including disease-transmitting ticks and other insects, has significantly expanded, increasing the risk of vector-borne infections;<sup>5</sup> and
- Climate change may indirectly play a role in the distribution of West Nile fever and Crimean-Congo haemorrhagic fever.<sup>4</sup>

## The Way Forward

Responding more effectively to the health challenges arising from climate change requires an intensification of six types of action: 1) strengthening the resilience of health systems and public health preparedness; 2) a greater integration of health considerations into all sectors' adaptation measures; 3) a greater integration of health considerations into all sectors' mitigation efforts (reduction of greenhouse gases); 4) more effective communication on the health risks associated with climate change and the health gains from taking action now; 5) supporting governments in assessing the health-related costs of climate change and the effectiveness and costs of interventions; and 6) sharing lessons learnt.

## WHO/ECEH's Role

- Support Member States in fulfilling their commitments under the European Commitment to Act on Climate Change and Health and under other related regional and global agreements.
- Assess and synthesize evidence on projected climate change-related health risks and trends.
- Develop public health guidance and tools for preventing, preparing for and responding to health effects of climate change.
- Provide policy advisories on safe and healthy measures to reduce greenhouse gas emissions in other sectors.

4 Ziello C et al. Changes to airborne pollen counts across Europe. *PLoS ONE*, 2012;7(4).

5 The climatic suitability for Dengue transmission in continental Europe. Stockholm, European Centre for Disease Prevention and Control, 2012.

- Advocate for health to be appropriately considered in decision-making by other sectors in regard to climate change.

## Key Resources

- [Climate change and health: a tool to estimate health and adaptation costs](#) (WHO Regional Office for Europe, 2013).
- [Climate change and health: lessons learnt in the WHO European Region](#) (WHO Regional Office for Europe, 2012).
- [Protecting health in an environment challenged by climate change: European Regional Framework for Action](#) (WHO Regional Office for Europe, 2010).
- [Protecting health in Europe from climate change](#) (WHO Regional Office for Europe, 2008).

For more information, please contact Bettina Menne (Programme Manager, Climate Change, Sustainable Environment and Green Health Services, WHO European Centre for Environment and Health) at [bme@euro.who.int](mailto:bme@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health > Climate change.

# Extreme weather events



Extreme weather events frequently affect Europe, imposing a heavy human cost. Between 2003 and 2012, for example, such events caused the deaths of more than 130,000 people in Europe, left over 52,000 homeless and cost over US \$90 billion (€70 billion).<sup>1</sup> The social, environmental and economic effects of extreme weather events have also increased in Europe over the last 50 years<sup>1,2</sup> as a result of changes in land use, urbanization, growing and ageing populations, increasing structural and economic assets and climate change.<sup>3,4</sup>

## Health Issues

Several types of extreme weather events are projected to increase in frequency and intensity. The public health consequences include the following:

- Health impacts of floods range from mortality to injuries, infections and mental health effects.<sup>3</sup> Climate change is projected to increase the occurrence and severity of flood events in large areas of Europe.<sup>4</sup>

- Heatwaves are increasing in frequency and intensity in the WHO European Region, with extreme cases like the heat wave that caused 70,000 excess deaths in 12 European countries in 2003.<sup>5</sup>
- Despite the overall increase in temperature, severe cold weather spells are still frequent in the Region. Cold-related exposure can lead to hypothermia, cardiovascular incidents, respiratory diseases and frostbite.
- Droughts are likely to become more intense in central and southern Europe and the Mediterranean area in the twenty-first century, potentially resulting in increased food prices and decreased food security.
- Health system infrastructure and the health workforce are put under additional stress during and after extreme events to cope simultaneously with physical damage and an influx of patients.

1 Hyogo Framework for Action 2005-2015: building the resilience of nations and communities to disasters. Geneva, United Nations International Strategy for Disaster Reduction, 2007 (<http://www.unisdr.org/we/inform/publications/1037>).

2 WHO Regional Office for Europe. Public health responses to weather extremes [website], 2013 (<http://www.euro.who.int/en/what-we-do/health-topics/environment-and-health/Climate-change/activities/public-health-responses-to-weather-extremes2>).

3 Floods in the WHO European Region: health effects and their prevention. Copenhagen, WHO Regional Office for Europe, 2013 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0020/189020/e96853.pdf](http://www.euro.who.int/__data/assets/pdf_file/0020/189020/e96853.pdf)).

4 Lehner B, et al., Estimating the impact of global change on flood and drought risks in Europe: A continental, integrated analysis. *Climatic Change*, 2006; 75(3): 273–299.

5 Robine JM et al. Death toll exceeded 70,000 in Europe during the summer of 2003. *C R Biol*, 2008, 331(2):171–178.

## Key Developments

- 2005 Hyogo Framework for Action 2005-2015.<sup>1</sup>
- 2005 World Health Assembly resolutions 58.16 and 59.227 urged member states to formulate national emergency preparedness plans.
- 2005 International Health Regulations entered into force.
- 2007 Promotion of heat-health action plans in the European region.<sup>2</sup>

## The Way Forward

The WHO European Regional Framework for Action on Climate Change sets objectives and supports action to improve the provision of early warning systems; develop extreme weather event action plans and disaster preparedness and response mechanisms in the European region; and develop climate-resilient health care infrastructure.

## WHO/ECEH's Role

- Build the capacity of Member States to prevent, prepare for and respond to extreme weather events.
- Provide tools and guidelines to support efforts to protect public health in the context of extreme weather events.
- Cooperate with meteorological partners and other partners to provide early warnings.
- Contribute to research to assess the effectiveness of public health action.

## Key Resources

- [Floods in the WHO European Region: health effects and their prevention](#) (WHO Regional Office for Europe, 2013).
- [Public health advice on preventing health effects of heat: new and updated information for different audiences](#) (WHO Regional Office for Europe, 2011).
- [Guidance on water supply and sanitation in extreme weather events](#) (WHO Regional Office for Europe and UNECE, 2011).
- [Climate change, extreme weather events and public health: meeting report](#) (WHO Regional Office for Europe, 2010).
- [Heat-health action plans: guidance](#). (WHO Regional Office for Europe, 2008).

For more information, please contact Bettina Menne (Programme Manager, Climate Change, Sustainable Environment and Green Health Services, WHO European Centre for Environment and Health) at [bme@euro.who.int](mailto:bme@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health > Climate change.

# Environmentally friendly health systems



The health sector is a key economic sector, generating 8% to 10% of the global gross domestic product. However, the provision of health care services is highly energy-intensive, and the health sector is a major consumer of water, food and other resources. The health sector has the potential to play a leadership role in minimizing greenhouse gas emissions, reducing consumption of resources and demonstrating how more environmentally friendly practices can go hand-in-hand with more effective and cost-effective services.

## 'Health 2020' and environmentally friendly health systems

The European Region's [Health 2020 Policy Framework and Strategy](#) states

*Important opportunities to improve the environment are ... emerging from the greening of health services. Hospitals and clinics can achieve substantial health and economic benefits through energy efficiency measures such as developing low-energy medical devices, using renewable energy, conserving water and storing it safely on site, improving the management of procurement, recycling waste and using locally grown food. The health sector also has an essential part to play in mitigating the effects of climate change and in reducing environmental exposure by taking steps to limit its own significant climate footprint and its negative impact on the environment.<sup>1</sup>*

<sup>1</sup> Health 2020 Policy Framework and Strategy. Copenhagen, WHO Regional Office for Europe, 2012 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0020/170093/RC62wd08-Eng.pdf](http://www.euro.who.int/__data/assets/pdf_file/0020/170093/RC62wd08-Eng.pdf)).

## Health Issues

Important health benefits arise from reducing the health sector's climate footprint as well as reducing environmental damage and its associated burden of disease. Mainstreaming environmental sustainability offers a significant opportunity to redesign health systems to better ensure the sustainable and resilient provision of health care. This can also reduce environmental exposures from health care, generating tangible health benefits.

Environmentally sustainable health care systems are furthermore more resilient. For example, generating onsite renewable power is more environmentally friendly and makes services less susceptible to grid outages. Enhancing green space in the health care estate is good for the environment and can reduce the risk of flooding-related service disruptions.

## The Way Forward

Greening health services entails opportunities, but some important steps are required to build capacity and strengthen health systems. There is a need to identify those measures that are healthy and environmentally friendly, but also viable from an economic point of view. Capacity must be developed within the context of a long-term step-wise approach to this set of issues. Priorities include planning the construction and siting of health facilities taking into account opportunities to reduce energy and resource consumption, education of hospital staff, procurement practices,

audit measures and sharing of good practices. In this regard, the WHO/ECEH technical work is expected to focus on the development of technical guidance and the provision of information to support policy processes.

### WHO/ECEH's Role

- Develop technical and practical guidelines.
- Cooperate with other United Nations agencies in the European Region to identify sustainable procurement practices.
- Promote good practice case studies.
- Establish a roadmap for sustainable health systems development.

### Key Resources

- [Healthy hospitals, healthy planet, healthy people](#) (WHO/Health Care Without Harm, 2011).

### Transferability of WHO/ECEH climate change project results

WHO/ECEH-supported pilot projects in Kyrgyzstan and the former Yugoslav Republic of Macedonia offer valuable guidance to health systems in other countries facing similar challenges. In Kyrgyzstan, global warming is causing water shortages that limit hydropower generation and result in electricity shortages, especially in rural areas. The health sector is increasing its energy security through the introduction of solar panels and collectors at five hospitals. The intervention is expected to make more electricity available for patient treatment and for the refrigeration of essential medicines and vaccinations.<sup>2</sup>

In the former Yugoslav Republic of Macedonia, two hospitals conducted assessments to determine the best ways to increase energy efficiency, evaluating measures in terms of reductions in energy use, emissions and running costs, as well as overall benefit for hospital patients and personnel. The initiative additionally explored how training might encourage staff to change their behaviours in order to save energy and protect the environment.<sup>2</sup>

<sup>2</sup> Protecting health from climate change. Copenhagen, WHO Regional Office for Europe, 2009 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0008/95921/protect\\_health\\_climate.pdf](http://www.euro.who.int/__data/assets/pdf_file/0008/95921/protect_health_climate.pdf)).

For more information, please contact Bettina Menne (Programme Manager, Climate Change, Sustainable Environment and Green Health Services, WHO European Centre for Environment and Health) at [bme@euro.who.int](mailto:bme@euro.who.int).

Also see: [www.euro.who.int](http://www.euro.who.int) > What we do > Environment and health > Climate change.

## The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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## World Health Organization Regional Office for Europe

UN City, Marmorvej 51, DK-2100 Copenhagen Ø, Denmark  
Tel.: +45 45 33 70 00 | Fax: +45 45 33 70 01  
Email: [contact@euro.who.int](mailto:contact@euro.who.int)  
Website: [www.euro.who.int](http://www.euro.who.int)