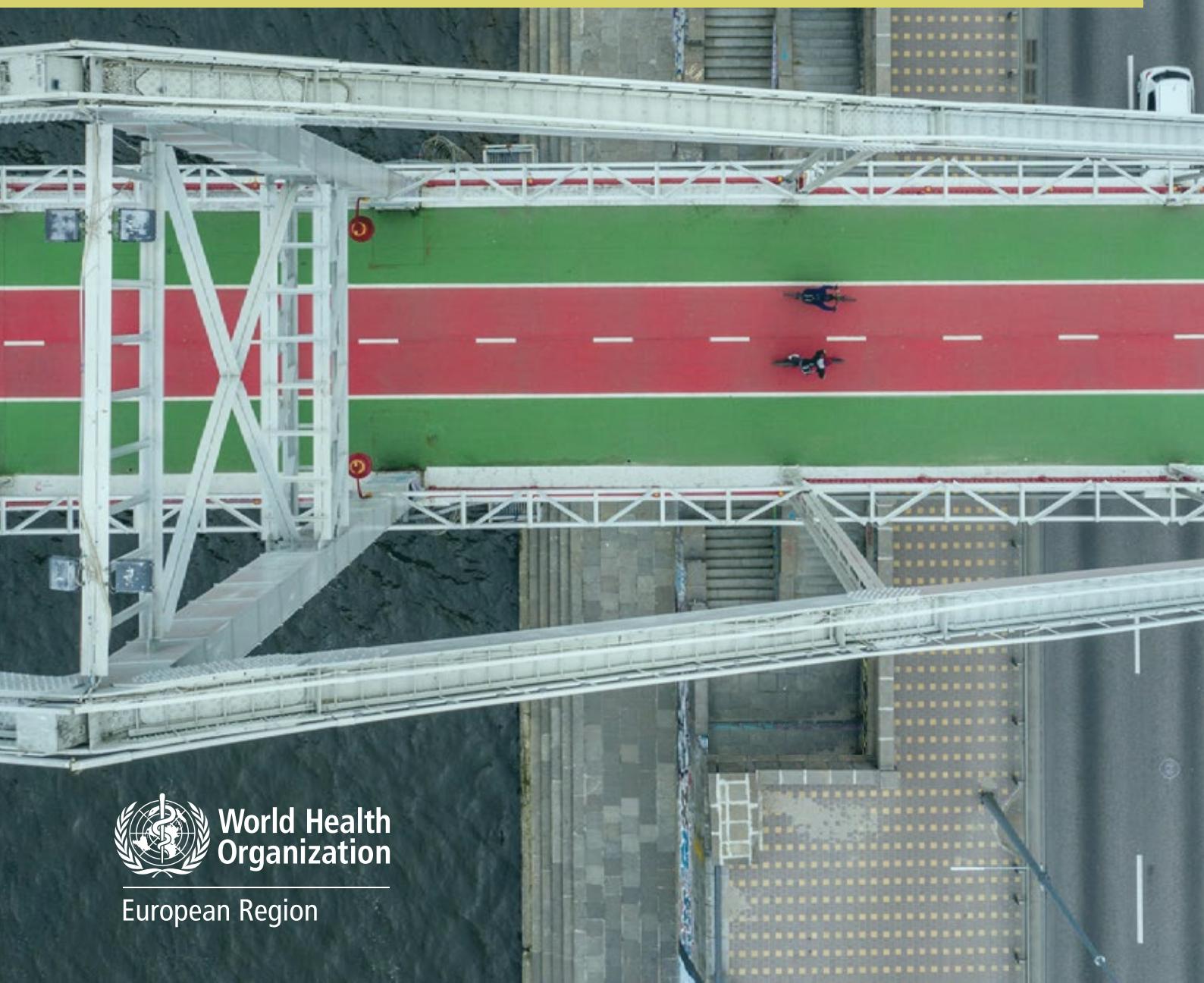
A healthy environment in the WHO European Region:

why it matters and what steps we can take to improve health



World Health Organization
European Region

The WHO European Centre for Environment and Health, located in Bonn, Germany, was established in 1989 by the First European Conference on Environment and Health and is an integral part of the WHO Regional Office for Europe. The centre provides technical and scientific expertise on the impacts of the environment on health. It delivers policy advice and tools to inform and support decision-making in the areas of air quality; access to safe drinking-water, sanitation and hygiene; minimizing the adverse effects of chemicals; adaptation to and mitigation of climate change; environmental sustainability of health systems; urban health planning, including transport and mobility; and violence and injury prevention. It works with partners to develop collaborative initiatives addressing environment-related diseases. The centre also strengthens country capacities to address environment and health challenges through a range of training courses on environment and health, including health impact assessments.

A healthy environment in the WHO European Region:

why it matters and what steps we can take to improve health

World Health Organization
European Region

Abstract

Around 15% of all deaths could be prevented through healthier environments in the WHO European Region. This document gives an overview of the environmental burden of disease and additional relevant environment and health data and facts in the Region. As a preparation for the Seventh Ministerial Conference on Environment and Health taking place from 5–7 July 2023 in Budapest, it provides a starting point for discussing the current status of the field of environment and health and the actions that Member States can take to provide a healthy future for the entire Region. Key risk areas are addressed such as air pollution, water, sanitation and hygiene, chemicals, radiation and climate change. European cities and their health-care systems are fundamental sectors for environmental sustainability and are, therefore, also addressed.

Keywords

BURDEN OF DISEASE, ENVIRONMENT AND PUBLIC HEALTH, RISK FACTORS

Document number

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Foreword

Within the 53 Member States of the WHO European Region, every year there are more than 1.4 million deaths associated with avoidable environmental risks to health – these deaths account for approximately 15% of the burden of disease in the Region (2012 data). Considering recent data, ambient air pollution alone caused about 569 000 deaths in the Region, placing it among the top risks to health in the Region in 2019.

The globe is facing a triple crisis, namely environmental pollution, climate change and land degradation and biodiversity loss. Human impact on the environment continues to grow and rapid urbanization is affecting countries in the entire Region. Many of the resulting environmental risks are generating noncommunicable diseases, communicable diseases and injuries, impacting our quality of life and well-being, widening equity gaps, reducing productivity, affecting earning ability and increasing medical cost and burden on health systems.

The COVID-19 pandemic has demonstrated clearly that a new approach to human–planet interaction is required to develop and maintain resilient, healthy and sustainable communities. Ample evidence shows not only the impact of human activities on the environment and health but also demonstrates proven measures and actions society can take in order to prevent harmful consequences while rebuilding forward better for a thriving future for all.

This document was created on the occasion of the seventh Ministerial Conference on Environment and Health to reflect on recent data on environmental burden of disease and additional relevant environment and health data and facts. It highlights key actions that can be taken to improve environment and health and offers practical resources to be used by the health and environment communities and other relevant sectors and key actors in the WHO European Region. By implementing these key actions, Member States will be in a better position for attaining the targets of the 2030 Agenda for Sustainable Development, which is at the core of the WHO European Programme of Work, 2020–2025. We hope this report will serve you in promoting actions in this important area of environment and health.

Dr Nino Berdzuli
Director, Country Health Programmes
WHO Regional Office for Europe

Acknowledgements

The WHO Regional Office for Europe wishes to express its appreciation to all those whose efforts made the production of this report possible.

Data extraction and estimation was carried out by Myriam Tobollik,[1] with technical guidance from Annette Prüss (WHO headquarters) and Jennyfer Wolf.[2] Structuring and technical editing was done by Myriam Tobollik together with Sinaia Netanyahu (WHO European Centre for Environment and Health). Thanks also go to WHO staff members and consultants who supported the development of the report and contributed in the writing and reviewing of various chapters: Matthias Braubach, Karla Cervantes,[3] Massimo Cozzone, Shinee Enkhtsetseg, Valentina Grossi, Sophie Gumy, Dorota Jarosinska, Richard Paul Johnston, Vladimir Kendrovski, Pierpaolo Mudu, David Novillo Ortiz, Frank Pega, Roman Perez Velasco, Francesca Racioppi, Pilmu Ryu, Oliver Schmoll, Nino Sharashidze, Emilie Tahera van Deventer, and Irina Zastenskaya.

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Abbreviations

AQG	WHO air quality guidelines
COP26	2021 United Nations Climate Change Conference
EHTF	European Environment and Health Task Force
EU	European Union
NAP	National Adaptation Plan
$PM_{2.5}$	particulate matter 2.5 micrometres or less in diameter
SDG	Sustainable Development Goal
UNECE	United Nations Economic Commission for Europe
WASH	water, sanitation and hygiene

1 Myriam Tobollik, Consultant to the WHO European Centre for Environment and Health, Bonn, Germany from August 2021 to March 2023.

2 Jennyfer Wolf, Consultant to WHO headquarters, Geneva, Switzerland from February 2023.

3 Karlva Cervantes, Consultant to WHO headquarters, Geneva, Switzerland from April 2023.

Introduction

Purpose

The aim of this document is to give an overview of the environmental burden of disease and additional relevant environment and health data in the WHO European Region in preparation for the Seventh Ministerial Conference on Environment and Health taking place from 5–7 July 2023, Budapest. It provides a starting point for discussing where we are in the field of environment and health and which actions Member States can take to provide a healthy future for the entire Region.

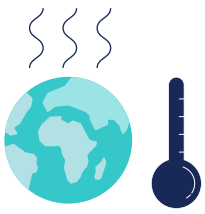
The fact sheets prepared for the Sixth Ministerial Conference on Environment and Health, held in Ostrava, Czechia in June 2017, served as a starting point for this analysis *(1, 2)*. Based on the Ostrava Declaration, priority environmental health challenges for the WHO European Region were selected, and their burden was assessed. In this document, the risk factors identified are analysed and described, alongside presenting additional supporting quantitative evidence and possible actions to reduce their harm.

The included risk factors in this report are:

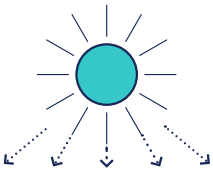
ambient and household air pollution

water, sanitation and hygiene (WASH)

chemicals



climate change



radiation[4]

[4] Radiation was not a priority area in the Ostrava Declaration

In Part 1 of this document, for each risk factor, the primary health impacts are described, as well as suggestions of key actions for health improvement and the key actions which WHO can take towards supporting their implementation and leading intersectoral policy-making.

Additionally, the Ostrava Conference identified cities and environmentally sustainable and climate-smart health systems as two fundamental areas for action that will ensure environmental sustainability. These areas are, therefore, addressed in Part 2 and the main settings most relevant for actions for health improvement are highlighted. Similarly to the five risk factors listed above for European cities and the health-care systems, WHO's actions in leading intersectoral policy development and supporting implementation of these actions are outlined.

Structure

This document presents the status of the leading risks and areas for action in environment and health in the 53 Member States of the WHO European Region and how they affect the health of its population. Additionally, we describe possible actions that Member States can take to improve the environment and, therefore, health.

For each topic, the following is addressed:

key risks to health at a glance
a brief overview of the main health impacts of the environmental risk factor/area for action/key sector;

key actions for improvement
which can be taken by the Member States;

main WHO actions relevant to the WHO European Region
WHO actions and asks in supporting implementation for improving environment and health; and

possibilities for intersectoral interactions.

Method and sources of estimates

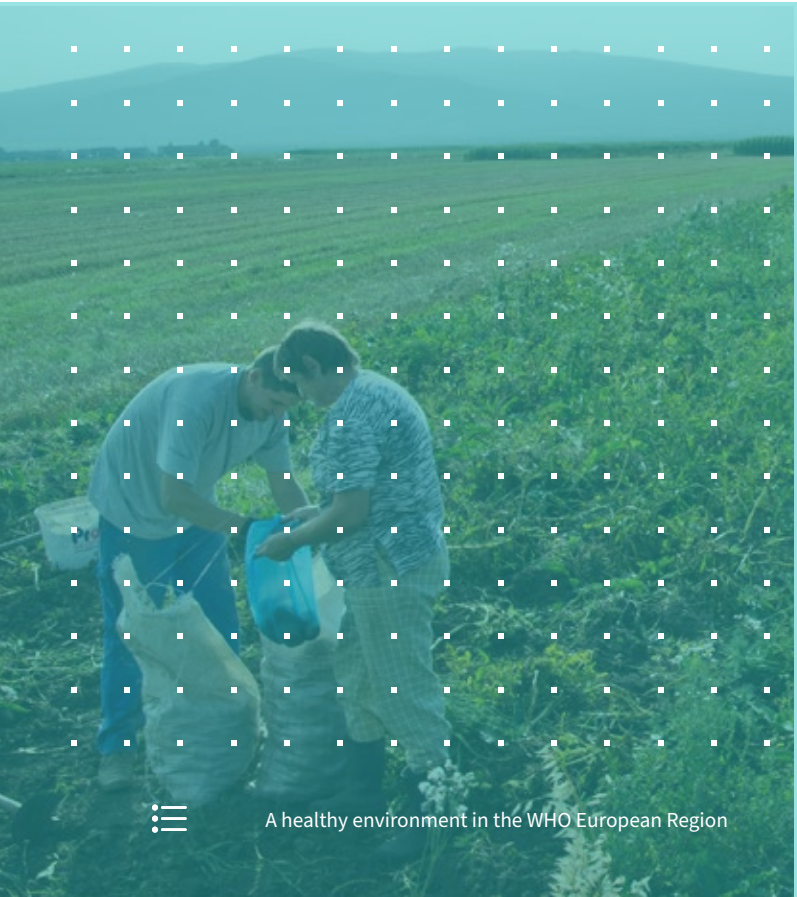
The method and the sources of the burden of disease estimates presented under the heading Key risks to health differ between Parts 1 and 2. The estimates for air pollution, and partly for WASH, come from the WHO Global Health Observatory *(3)*. The website of the WHO/United Nations Children's Fund Joint Monitoring Programme for Water Supply, Sanitation and Hygiene *(4)* is the source of several WASH indicators. The estimates for climate change come from the Copernicus Climate Change Service *(5)*, WHO and the International Disaster Database *(6)*. Radiation estimates are from the United Nations Scientific Committee on the Effects of Atomic Radiation *(7)*, several publications and the WHO Global Health Observatory. The numbers presented for European cities are from the United Nations Population Division, WHO and the European Commission. The description of the environmentally sustainable and climate-smart health systems and the estimates are from the WHO European Health Report 2021 *(8)*.

The respective sources are cited in each chapter and the references are listed at the end of the report. An exception are the estimates for chemicals. They are quantified for this report. The quantification approach follows the method used in the WHO-published Prüss-Üstün et al. (2016) *(9)*. The included risk factors are chemicals, pesticides, occupational carcinogens, lead and occupational particles. The reference year for all data is 2019, except for the population-attributable fractions for chemicals and poisoning (2016), chemicals and congenital anomalies (2016), pesticides and self-harm (2006). The quantifications have been carried out for 50 WHO European Region Member States (not included are Andorra, Monaco and San Marino) and separately for sex and age groups.

The deaths and disability-adjusted life years of a health outcome were extracted from the WHO Global Health Observatory together with their upper and lower bounds. For the risk outcome pairs: chemicals and poisoning; chemicals and congenital anomalies; and pesticides and self-harm, the population-attributable fractions are extracted from the literature and are based on expert opinion. To estimate the attributable burden (attributable deaths and disability-adjusted life years), the deaths and disability-adjusted life years due to the outcome are multiplied with the population-attributable fraction.

For the risk outcome pairs: occupational carcinogens and cancer; lead and cardiovascular diseases; lead and chronic kidney disease; occupational particles and chronic obstructive pulmonary disease; and lead and idiopathic intellectual disability, the attributable deaths and disability-adjusted life years were extracted from the Global Burden of Disease study of the Institute of Health Metrics and Evaluation *(10)* and then divided by the overall deaths and disability-adjusted life years of an outcome, which were extracted from the WHO Global Health Observatory, to gain the population-attributable fraction.

For radon and lung cancer, estimates based on a combination of comparative risk assessments, evidence synthesis, epidemiological calculations and expert evaluation were calculated using disability-adjusted life years and deaths from the WHO Global Health Observatory together with their upper and lower bounds and the population attributable fraction from the Global Burden of Disease study. Both were multiplied to obtain lung cancer disability-adjusted life years and deaths due to radon exposure in 2019. The quantifications were carried out for 50 Member States in the Region (excluding Andorra, Monaco and San Marino) and separately for sex and age groups.

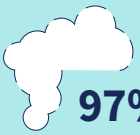


“This document provides a starting point for discussing where we are in the field of environment and health.

Key messages

Air pollution

In the WHO European Region, **569 000 deaths** could be attributed to ambient air pollution, and **154 000 deaths** to household air pollution in 2019 *(11)*.



97% of the population in the Region were exposed to $PM_{2.5}$[5] concentrations above the WHO air quality guidelines (AQG) in 2019 *(11,12)*.

WASH

33 500 deaths are WASH-related annually (92 deaths per day), of which 13% can be attributed to diarrhoeal disease and 87% to acute respiratory infections *(13)*.

About **77 million** people lacked access to safely managed drinking-water in 2020; **seven out of 10 people** used safely managed sanitation services.

Chemicals

269 500 deaths could be attributed to selected chemicals in the WHO European Region in 2019.[6]

Out of 100 000 chemicals in the global market, **70 000 are poorly characterized** in terms of their hazards and safe exposure levels *(14)*.

Climate change

In the last 50 years, **1672 reported disasters** in the WHO European Region led to **159 000 deaths** and an estimated economic loss of **US$ 477 billion** *(14)*.

Floods (38%) and storms (32%) were the most-reported causes for disasters, but **extreme temperatures** led to the highest proportion of disaster-related deaths (93%), with approximately **148 000 lives** lost *(15)*.

Radiation

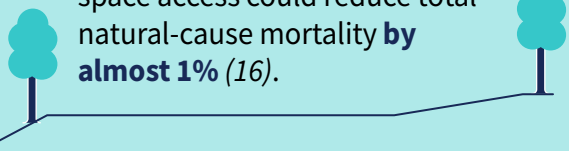
Around **24 600 deaths from lung cancer** were caused by residential radon in 2019.[7]

Health system

4.7% of the CO_2 emissions in the European Union (EU) is produced by the health care sector *(17)*.

Healthy cities

A health impact assessment of green space access and mortality in cities suggested that **almost two thirds of city populations** had insufficient access to green space close to their homes *(16)*.



Providing adequate green space access could reduce total natural-cause mortality **by almost 1%** *(16)*.

[5] Particulate matter ≤ 25 micrometres in diameter.

[6] Estimates based on a combination of comparative risk assessments, evidence synthesis, epidemiological calculations and expert evaluation.

[7] Quantification based on data from the Global Health Observatory *(3)* and Global Health Data Exchange *(10)*. For more details see the Method and sources of estimates section on page 3.

Strategies to create a healthier environment in the WHO European Region

The Sustainable Development Goals

Monitoring the progress countries are making towards achieving the Sustainable Development Goals (SDGs) and developing programmes and policies, institutionalizing areas in environment and health and taking action and diverting investments on local, regional, national and international level to achieve the targets under each SDG by 2030.

Capacity-building

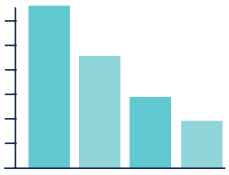
Building capacities, updating professional profiles and empowering and developing leadership within the workforce in the health and environmental sectors to match the triple environmental challenges of the 21st century and to support healthier environments.

Awareness raising and communication

Demonstrating the importance of sustainable actions for a healthy future by sharing practices and experience for the general public, including children and youth, and decision-makers.

Cross and intersectoral actions and partnership

Critically engaging for systemic consideration of health in sectoral policies, e.g., transportation, health care, urban planning and building partnerships to exploit potential co-benefits, manage risks effectively and invest resources smartly.



Monitoring risks and assessing equity

Monitoring key environmental risks to health, assessing impact on vulnerable groups and develop interventions to orient future actions.

WHO actions

Leadership and policy development

Provide leadership on environmental health matters and define policy positions, coordinate international and regional policy processes and catalyse action for environmental health protection.

Capacity-building

Strengthen and build capacity of the health sector with knowledge and tools such as Health in All Policies and health impact assessments to engage with other sectors and provide leadership in health matters. Guide policies with health relevance and provide training, including through the Bonn School on Environment and Health.

Monitoring

Guide, define and monitor exposure, health indicators and interventions to measure results and help track attainment of the SDGs.

Knowledge generation and evidence synthesis

Ensure knowledge generation and evidence synthesis and provide evidence-informed guidelines and normative guidance on health impacts of sustainable strategies, technologies and interventions; for example, WHO guidelines on air quality, environmental noise, drinking-water quality and sanitation and health.

Emergency response

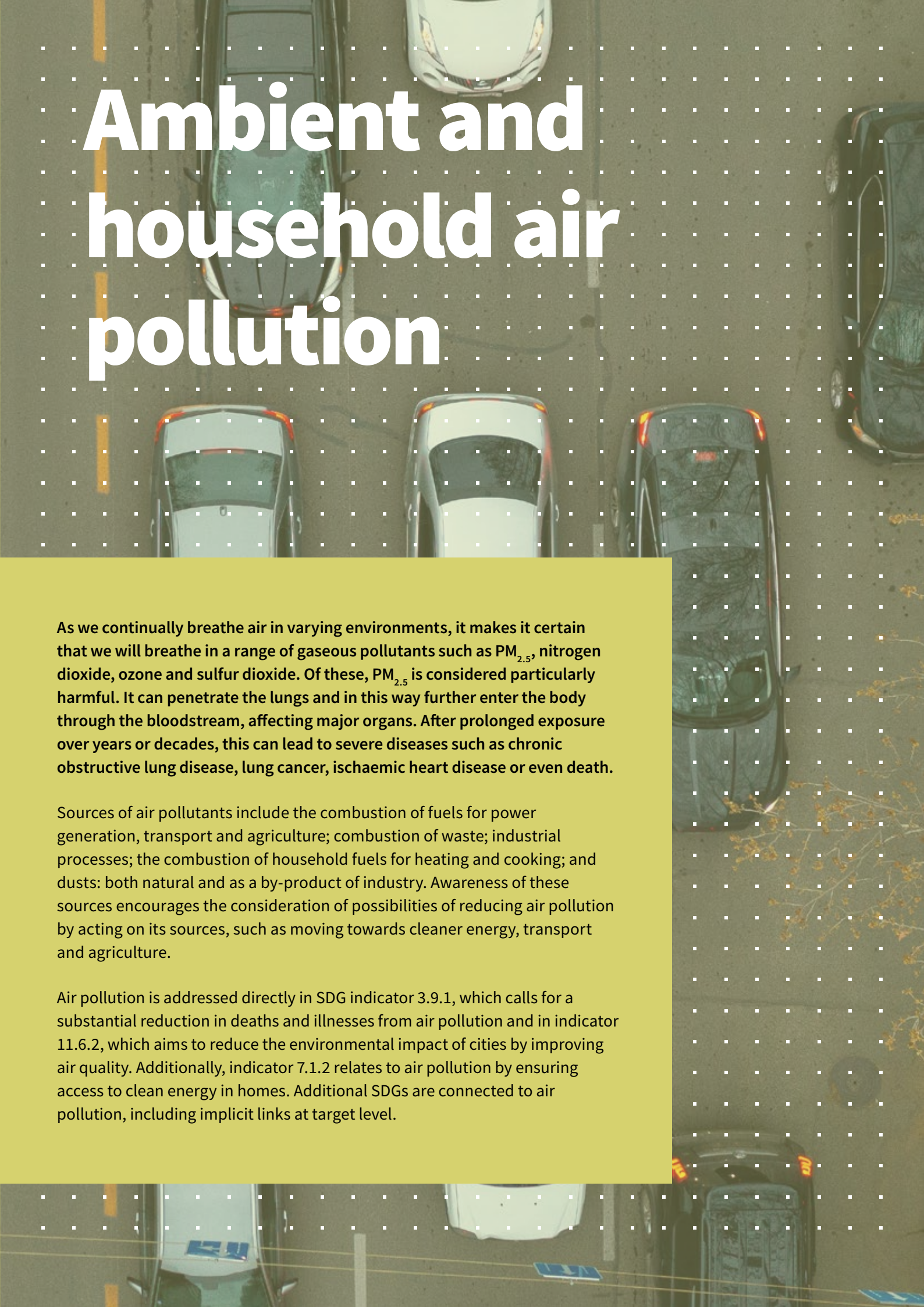
Provide timely and effective response to environmental health emergencies.

WHO actions provide leadership on environmental health matters and define policy positions, coordinate international and regional policy processes and catalyse action for environmental health protection.

Part 1

Key environmental risks to health

Ambient and household air pollution



As we continually breathe air in varying environments, it makes it certain that we will breathe in a range of gaseous pollutants such as $PM_{2.5}$, nitrogen dioxide, ozone and sulfur dioxide. Of these, $PM_{2.5}$ is considered particularly harmful. It can penetrate the lungs and in this way further enter the body through the bloodstream, affecting major organs. After prolonged exposure over years or decades, this can lead to severe diseases such as chronic obstructive lung disease, lung cancer, ischaemic heart disease or even death.

Sources of air pollutants include the combustion of fuels for power generation, transport and agriculture; combustion of waste; industrial processes; the combustion of household fuels for heating and cooking; and dusts: both natural and as a by-product of industry. Awareness of these sources encourages the consideration of possibilities of reducing air pollution by acting on its sources, such as moving towards cleaner energy, transport and agriculture.

Air pollution is addressed directly in SDG indicator 3.9.1, which calls for a substantial reduction in deaths and illnesses from air pollution and in indicator 11.6.2, which aims to reduce the environmental impact of cities by improving air quality. Additionally, indicator 7.1.2 relates to air pollution by ensuring access to clean energy in homes. Additional SDGs are connected to air pollution, including implicit links at target level.

Key risks to health at a glance

In the WHO European Region in 2019

97% of the population in the WHO European Region were exposed to $PM_{2.5}$ concentrations above the WHO air quality guidelines. based on 2019 data *(11)*.

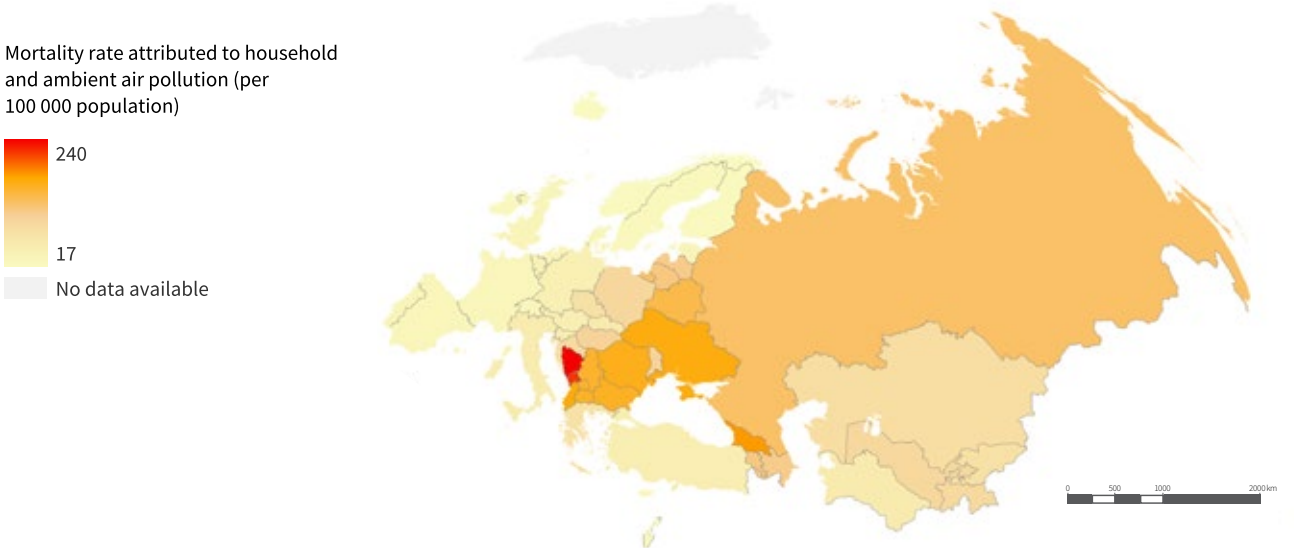
In the WHO European Region 569 000 premature deaths can be attributed to ambient air pollution *(11)*.

154 000 deaths can be attributable to household air pollution in 2019 *(11)*.

Key risks to health, further detail

The mortality rate attributed to household and ambient air pollution (per 100 000 population) per country in the WHO European Region for 2019 is shown in Fig. 1. This data is also available in age-standardized form in the Global Health Observatory data repository *(19)*.

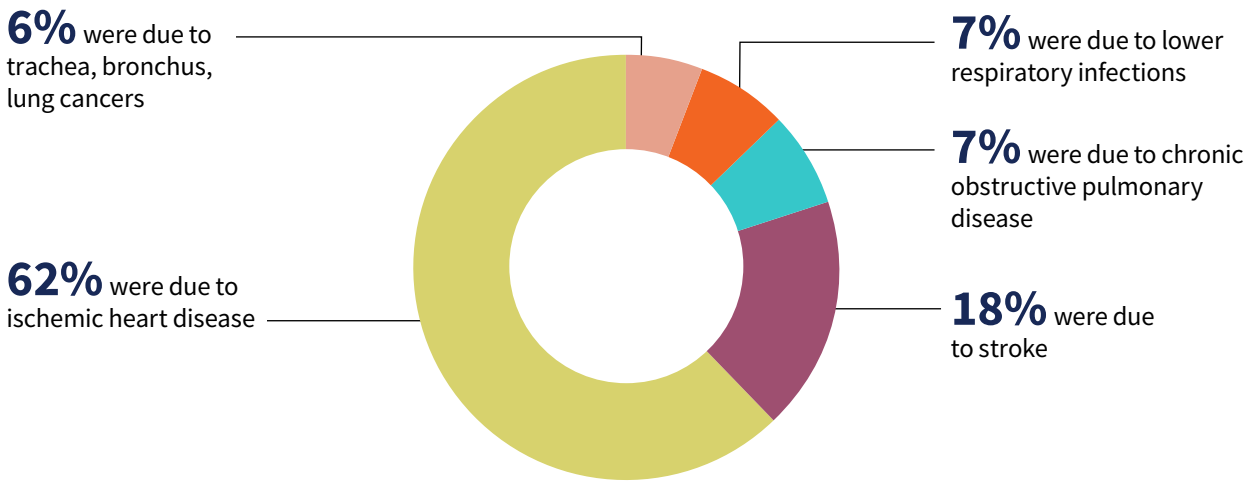
Fig. 1. SDG indicator 3.9.1: mortality rate attributed to household and ambient air pollution (per 100 000 population) 2019



Source: Adapted from Global Health Observatory data repository, 2022 *(18)*. Reproduced under CC BY-NC-SA 3.0 IGO licence (https://creativecommons.org/licenses/by-nc-sa/3.0/igo/).
Map production: Public Health Information and Geographic Information System (GIS) World Health Organization

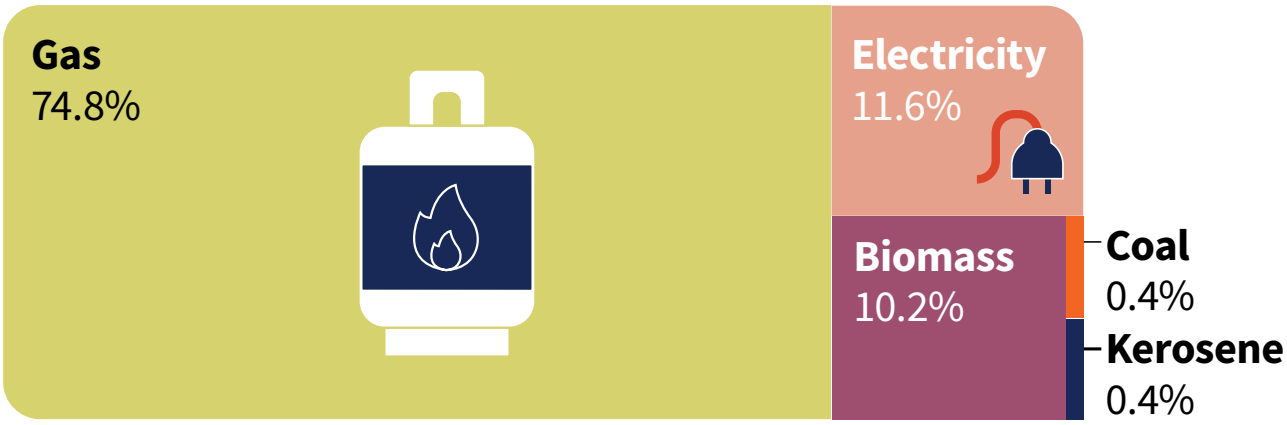
The mortality rate attributed to household and ambient air pollution (per 100 000 population, age-standardized) ranged from 7.44 (4.05–10.66) in the country with the lowest rate to 203.8 (152.6–259) in the country with the highest rate in 2019: around a 27-fold difference *(19)*. SDG target 11.6.2: annual mean levels of particulate matter (population-weighted) in cities ranged from 6.07 μg/m^3 in the country with the least polluted cities on average to 62.65 μg/m^3 in the country with the most in 2019 *(11)*, suggesting more than a 10-fold difference in particulate matter concentration between the least and the most polluted cities in the Region (Fig. 2).

Fig. 2. Of the 10 million disability adjusted life years in 2019 caused by ambient air pollution *(11)*



Household air pollution is caused by the combustion of household fuels, mainly for heating but also for cooking. Most people in the WHO European Region relied on gas for cooking, with the proportions of populations with primary reliance on fuels and technologies in 2019 distributed as shown in Fig. 3, below *(11)*.

Fig 3. Primary cooking fuel use in the WHO European region population



Key actions for improvement

Air quality guidelines

Utilizing the 2021 WHO AQG in standard settings and air quality policies; the 2005 WHO AQG can be consulted regarding any air pollutants and specific issues not updated in 2021.

International agreements

Ratifying and implementing the United Nations Economic Commission for Europe (UNECE) Convention on Long-range Transboundary Air Pollution and its protocols.

Targeted policies

Identifying the main sources of air pollution and developing targeted air pollution reduction policies.

Monitoring

Improving air quality monitoring and linking it to health surveillance and data management for diseases related to air pollution.

Collaboration

Developing and strengthening cross-sectoral and multistakeholder cooperation on air quality improvement at the national and regional levels.

Capacity building

Providing training to health professionals and other technical government staff on current evidence and tools and facilitating research on air quality and health.

Awareness-raising

Engaging with a wide range of partners, stakeholders and actors to ensure that awareness is raised about the health effects of air pollution and personal measures that can be taken to reduce air pollution.

Main WHO actions relevant to the WHO European Region

Norms and guidance

Provide norms, guidance and tools to assist countries and other stakeholders in addressing the risks of air pollution.

Providing technical support and building capacity

Increase the capacity of the health, energy, land-use and environment sectors to understand the risks of air pollution, conduct health risk assessments and design effective policies to reduce the health burden.

Tools

Offer a software tool for health risk assessment of air pollution such as AirQ+ and CLIMAQ-H.

SDG indicators

Report on SDG indicators 3.9.1 (mortality from air pollution), 11.6.2 (levels of fine particulate matter) and 7.1.2 (proportion of population using clean fuels and technologies.

Monitor and consolidate emerging evidence

Provide a platform, mainly through the Task Force on Health of the Long-Range Transboundary Air Pollution Convention, to monitor the progress in research on the health effects of air pollution and help to define priorities to guide future monitoring and abatement strategies.

Sectoral policies interacting with health protection from air pollution:

Industry

Energy

Health

Labour

Environment

Housing

Agriculture

Land use planning

Transport

For further information please see:

WHO global air quality guidelines: particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide *(12)*.
Compendium of WHO and other United Nations guidance on health and environment. 2022 update. Chapter 2: air pollution *(20)*.
Protecting health through ambient air quality management: a resource package for the WHO European Region *(21)*.
Risk communication of ambient air pollution in the WHO European Region: review of air quality indexes and lessons learned *(22)*.
AirQ+ software tool for health risk assessment of air pollution *(23)*.

WASH

WASH are fundamental to human health, well-being, dignity and sustainable development. Universal and equitable access to sufficient amounts of safe drinking-water and adequate sanitation are basic human rights. The 2030 Agenda recognizes the crucial role of WASH provisions under SDG 6, while the importance of WASH is also echoed by several other SDGs, such as SDG 3 on good health and well-being, and SDG 4 on quality education *(24)*.

Despite notable progress since the Parma Conference (2010), access to basic WASH services is not yet a reality for everyone in the WHO European Region, with tens of millions of people still facing unmet needs and lack access to safe WASH services. Rural dwellers and the poorest continue to be the most disadvantaged. Ensuring universal and equitable access to WASH services requires considering provision in places such as schools, health-care facilities, prisons and workplaces; it also means addressing the special needs of vulnerable groups *(24)*.

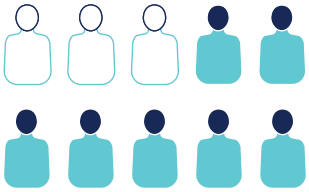
Water-related infectious diseases, such as diarrhoeal diseases and respiratory infections caused by unsafe drinking-water, poorly managed sanitation and inadequate hygiene practices still present a considerable burden in the Region. Other emerging concerns include the environmental dispersal and transmission of antimicrobial resistance through the water environment and the need for safe treatment, disposal or reuse of waste-water.

The COVID-19 pandemic highlighted the critical role of WASH services as the first line of defence in preventing and controlling the spread of infectious diseases. Naturally occurring water constituents such as arsenic and fluoride, and anthropogenic substances such as lead from plumbing, nitrates and other chemicals from agricultural and commercial activity, are a public health concern in various locations throughout the Region. Driving forces such as climate change and population growth, are expected to exacerbate the impacts associated with changes in availability and quality of freshwater resources and challenge access to WASH services *(24)*.

“Universal and equitable access to sufficient amounts of safe drinking-water and adequate sanitation are basic human rights.

Key risks to health at a glance

Access to adequate WASH services is still limited



7 out of 10 people
used safely managed sanitation services in 2020: the remaining population relied mainly on basic sanitation, but 29 million people did not even enjoy access to such basic services *(4)*.[8]

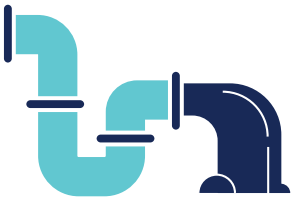
About 77 million people
lacked access to safely managed drinking-water in 2020 *(4)*.

Around 350 000 people
still practiced open defecation in 2020 *(4)*.[9]

2.7 million people
relied on surface water as their main drinking-water source in 2020 *(4)*.

[8] *Safely managed:* use of improved facilities that are not shared with other households and where excreta are safely disposed of the situ or removed and treated offsite. Basic: use of improved facilities which are not shared with other households.

[9] *Open defecation:* disposal of human faeces in field, forests, bushes, open bodies of water, beaches and other open spaces or with solid waste.



Only around two thirds of domestic waste-water was safely treated across the Region in 2020 *(25)*.

Around 96% of pupils in the Region had access to basic drinking-water services in schools in 2021, while access rates for basic sanitation and hygiene services were around 94% *(4)*.

The health burden related to WASH is preventable

About 33 500 deaths can be attributed to inadequate WASH conditions and services in 2019 (92 deaths per day) *(13)*.

Overall, 11% of total acute respiratory deaths are attributable to poor hygiene and 30% of diarrhoea-related deaths to poor WASH services *(13)*.

Key risks to health, further detail

Access to adequate WASH services is still limited.

- Seven out of 10 people used safely managed sanitation services in 2020: the remaining population relied mainly on basic sanitation, but 29 million people did not even enjoy access to such basic services *(4)*.
- Around 350 000 people still practiced open defecation in 2020 *(4)*.
- Across the WHO European Region, only around two thirds of domestic waste-water was safely treated in 2020 *(25)*.
- About 77 million people lacked access to safely managed drinking-water in 2020 *(4)*.
- 2.7 million people relied on surface water as their main drinking-water source in 2020 *(4)*.
- Around 96% of pupils in the WHO European Region had access to basic drinking-water services in schools in 2021, while access rates for basic sanitation and hygiene services were around 94% *(4)*.

The health burden related to WASH is preventable.

- About 33 500 deaths can be attributed to inadequate WASH conditions and services in 2019 (92 deaths per day), of which 13% can be attributed to diarrhoeal disease and 87% to acute respiratory infections *(13)*.
- Overall, 11% of total acute respiratory deaths are attributable to poor hygiene, and 30% of diarrhoea-related deaths are attributable to poor WASH services *(13)*.
- Unsafe drinking-water, unsafe sanitation and poor hygiene practices cause a broad array of gastrointestinal and respiratory diseases, helminth infections and insect vector-borne diseases, in addition to infections of the skin, mucous membranes, wounds and eyes. Shigellosis, E. *coli*, diarrhoea, hepatitis A and cryptosporidiosis had the highest number of outbreaks in countries in the Region between 2010 and 2021 *(26)*. The broader well-being impacts of unsafe sanitation may also include anxiety, sexual assault and adverse birth outcomes, among others.

> **“Broader well-being impacts of unsafe sanitation can include anxiety, sexual assault and adverse birth outcomes.**

Key actions for improvement

Access

Ensure universal, equitable and sustainable access to safe drinking-WASH for all and in all settings, including in health-care facilities, schools and other institutional settings.

Policies

Ratify the Protocol on Water and Health to strengthen national action towards progressively reaching regional and global commitments for WASH and health, including the formulation of national priority targets and implementation plans.

Water and sanitation safety plans

Scale up water and sanitation safety plan implementation to consistently ensure safe drinking-water and sanitation services, including by developing national road maps.

Waste-water

Reduce discharges of untreated or insufficiently treated waste-water into the environment and increase the efficiency and capacity of existing waste-water treatment facilities.

Hand hygiene

Make provisions for hand hygiene practices in institutions and public places to ensure hand hygiene for all.

Water use and resource management

Ensure the efficient use of water and consider the safe reuse of (waste)water (for example, in agriculture and industry).

Climate resilience

Building climate-resilient water and sanitation services that are responsive to the effects of climate change impacting variability, availability and quality of freshwater resources and extreme weather events.

Emergencies

Integrate WASH considerations into national and local emergency preparedness and response planning and actions to effectively address crises, such as pandemics and natural disasters.

Main WHO actions relevant to the WHO European Region

Monitor progress through WASH-related SDG indicators, such as:

- 1.4.1 (proportion of population living in households with access to basic services);
- 3.9.2 (mortality rate attributed to unsafe water and sanitation and lack of hygiene);
- 4.a.1 (proportion of schools with access to: basic drinking-water; single-sex basic sanitation facilities; and basic handwashing facilities);
- 6.1.1 (proportion of population using safely managed drinking-water services);
- 6.2.1 (proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water);
- 6.3.1 (proportion of waste-water safely treated); and
- 6.a.1 (water- and sanitation-related official development assistance) and 6.b.1 (participation of local communities in water and sanitation management).

Guidelines – support national policy development

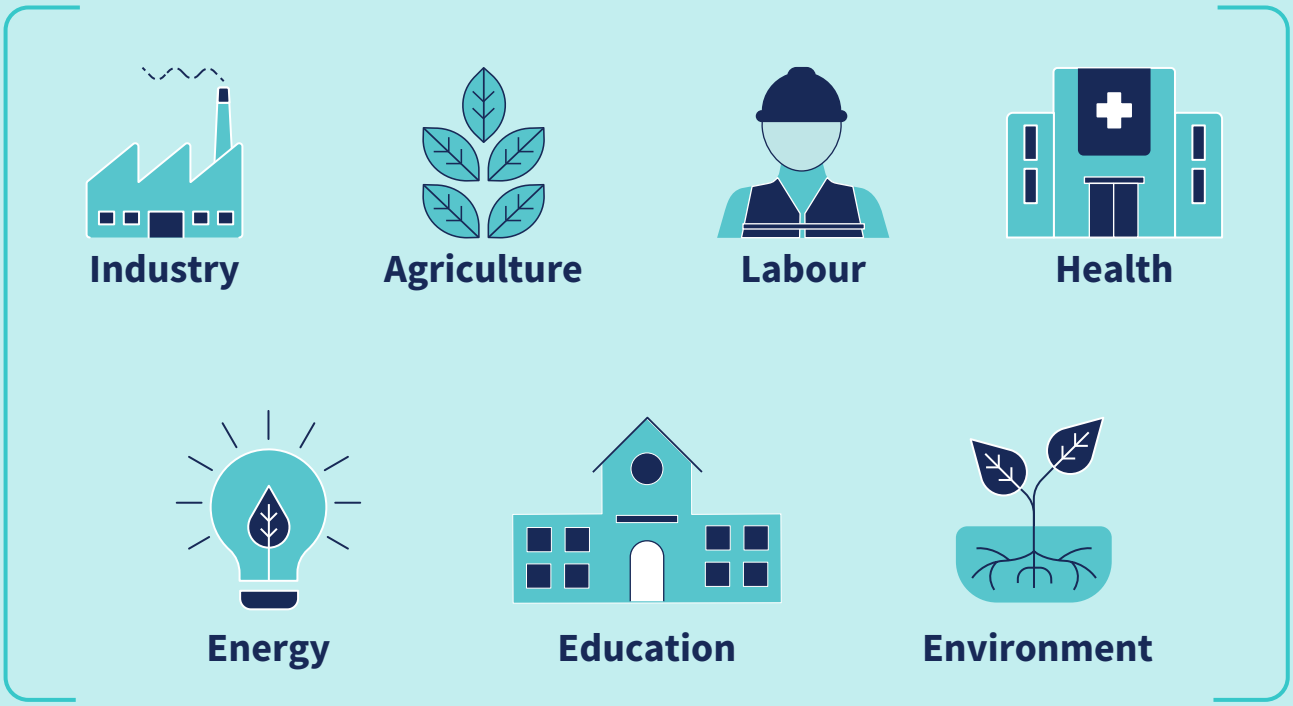
- Provide health-based guidelines to support the development of effective national policies and regulations, as well as tools to support their implementation in practice. This includes guidelines for drinking-water quality, guidelines on sanitation and health, guidelines for hand hygiene and guidelines for WASH in schools.

Capacity-building

Assist countries in building capacities at national level to support long-term uptake of WHO guidelines, recommendations and tools, including but not limited to the following areas:

- effective approaches to water-related disease surveillance and management of WASH-related disease outbreaks;
- waste-water surveillance as a public health tool;
- risk-based management and surveillance of water and sanitation services;
- WASH-related aspects in preventing and controlling neglected tropical diseases;
- climate-resilience of water and sanitation services;
- safe WASH conditions and practices in health-care facilities and schools;
- promoting a culture of hand hygiene in all settings; and
- WASH and waste-water interventions in support to combating antimicrobial resistance.

Sectoral policies interacting with health protection from WASH:



For further information please see:

Water, sanitation, hygiene and health: policy brief *(24)*.
Drinking-water, sanitation and hygiene in the WHO European Region *(27)*.
Delivering safe sanitation for all *(25)*.
UNECE/WHO protocol on water and health *(28)*.
Water safety planning for rural communities *(29)*.
UNECE/WHO WASH information package for schools *(30)*.
UNECE/WHO WASH information package for health care facilities *(31)*.
Wastewater surveillance of SARS-CoV-2 *(32)*.
UNECE/WHO water-related disease surveillance and outbreak management *(33)*.
UNECE/WHO drinking-water quality surveillance *(34)*.

Chemicals

Chemicals are ubiquitous. Many of them are hazardous to human health and the environment. They can be found in the environment (air, water and soil), in consumer products and at the workplace. We are exposed to them through breathing, drinking and eating or via skin. Some are produced for specific purpose, some are unwanted by-products and others are of natural origin.

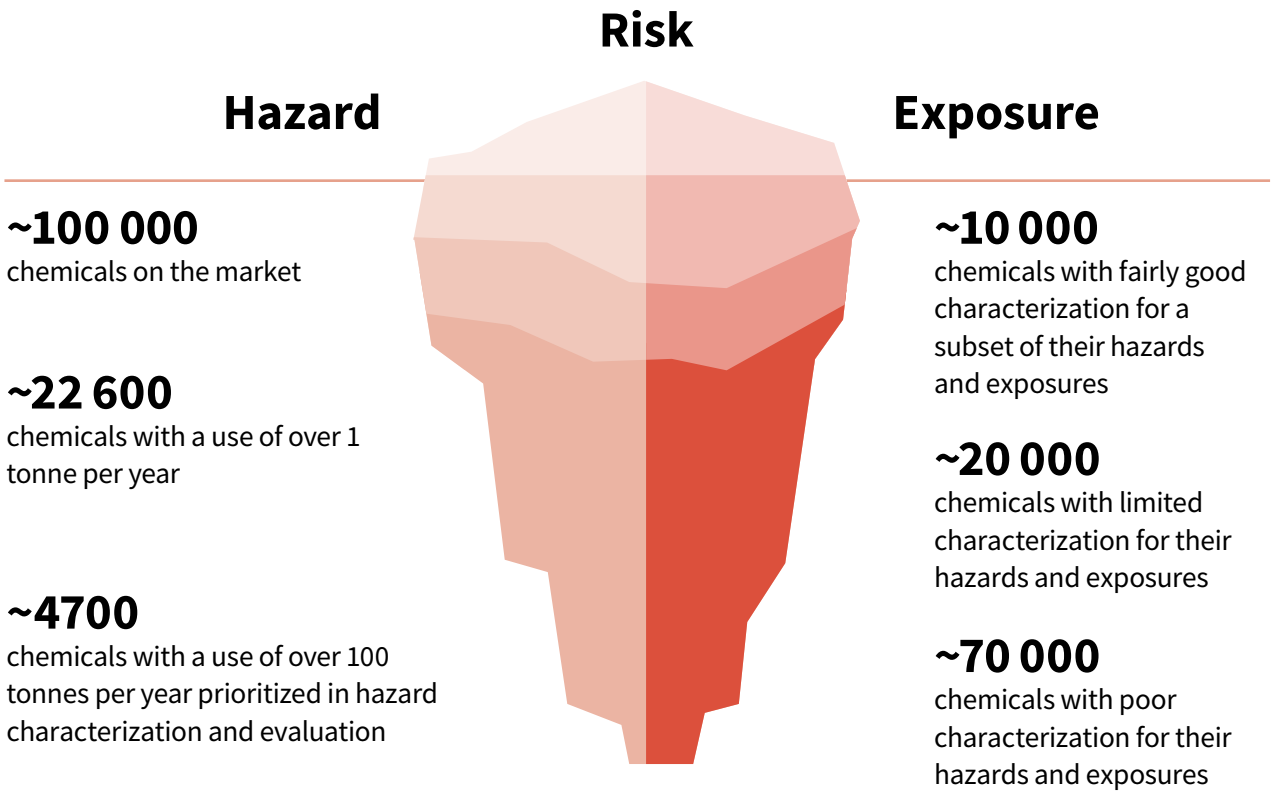
Some chemicals can cause serious negative health effects, such as reproductive disorders; cancers; neurological, respiratory, cardiovascular and immune defects; and diabetes and other metabolic problems *(35)*. Some chemicals affect organisms during early life and can impact health later in life.

Three SDG targets explicitly address problems caused by chemicals – 3.9, 6.3 and 12.4. SDG target 12.4 refers to the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks to prevent or significantly minimize their adverse impacts on human health and the environment *(36)*. However, sound management of chemicals throughout their life cycle is relevant to nearly all SDGs.

Key risks to health at a glance

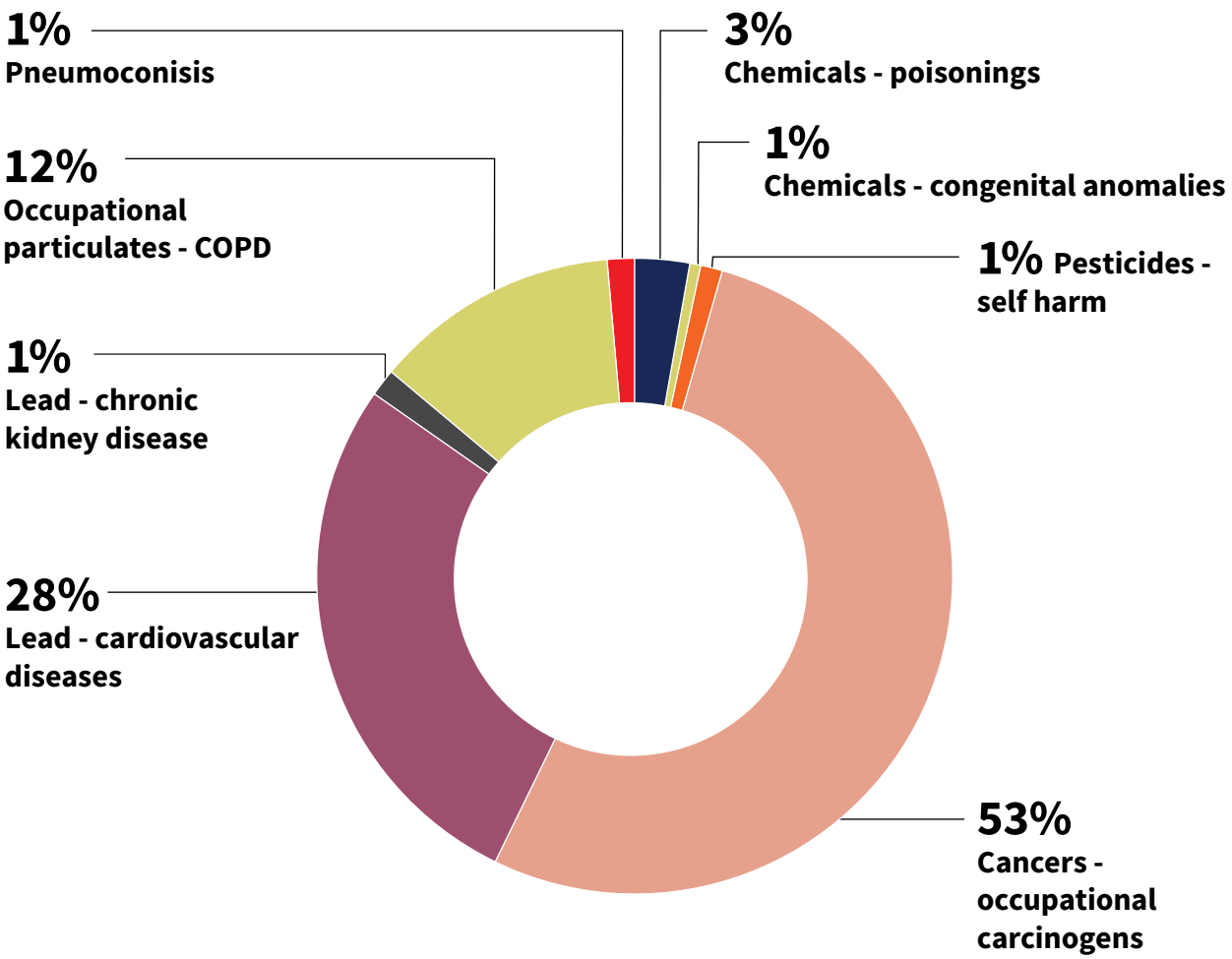
The health impact of exposure to hazardous chemicals is extensive. In 2019 in the WHO European Region, 269 500 deaths were attributable to exposure to chemicals or groups of chemicals such as pesticides, occupational carcinogens, lead and occupational particles. However, as this assessment is based on only a specified and, therefore, limited list of particular chemicals and groups, the true burden is considerably larger (Fig. 4, Fig. 5).

Fig. 4. Health impact of exposure to hazardous chemicals within the WHO European Region



Source: Adapted from European Environment Agency, 2022 *(37)*. Reproduced under CC BY 2.5 DK licence (https://creativecommons.org/licenses/by/2.5/dk/deed.en_GB).

Fig. 5. Proportion of deaths caused by diseases attributed to chemicals



Source: Quantification based on data from the Global Health Observatory *(3)* and Global Health Data Exchange *(10)*. Reproduced under CC BY-NC-SA 3.0 IGO licence (https://creativecommons.org/licenses/by-nc-sa/3.0/igo/). For more details see the Method and sources of estimates section on page 3.

Key actions for improvement

Use of non-hazardous or less hazardous alternatives

Substituting hazardous chemicals with safer alternatives to minimize health and environmental risks.

Implementation of legally binding and voluntary international agreements

Implementing the Strategic Approach to International Chemicals Management, including its health strategy, the WHO Road map to enhance health sector engagement in the Strategic Approach to International Chemicals Management towards the 2020 goal and beyond *(38)*, and relevant multilateral legally binding agreements.

Focus on vulnerable groups

Developing national policies and actions to protect vulnerable populations such as children and pregnant women from the adverse impacts of chemicals in the environment and workplaces.

Capacity-building

Ensuring capacity to enable response to existing and upcoming challenges related to acute and chronic exposure to chemicals.

Strengthening

Institutional capacities, for example the establishment of poison control centres.

Working in partnership

Establishing new and strengthening existing relevant multisectoral and multistakeholder instruments to strengthen coordination and collaboration and raise awareness among all stakeholders – governments, nongovernmental organizations and industry.

Main WHO actions relevant to the WHO European Region

Development of tools for stimulating exposure and risk assessment

- Research protocols and standard operating procedures for assessment of prenatal exposure to mercury.
- Share and develop the IAQRiskCalculator tool, which enables assessment of risks to children's health from indoor air pollution in public buildings.

Strengthening capacity-building

- Information sharing, training and development of training material, including on chemicals risk assessment and methodological support.

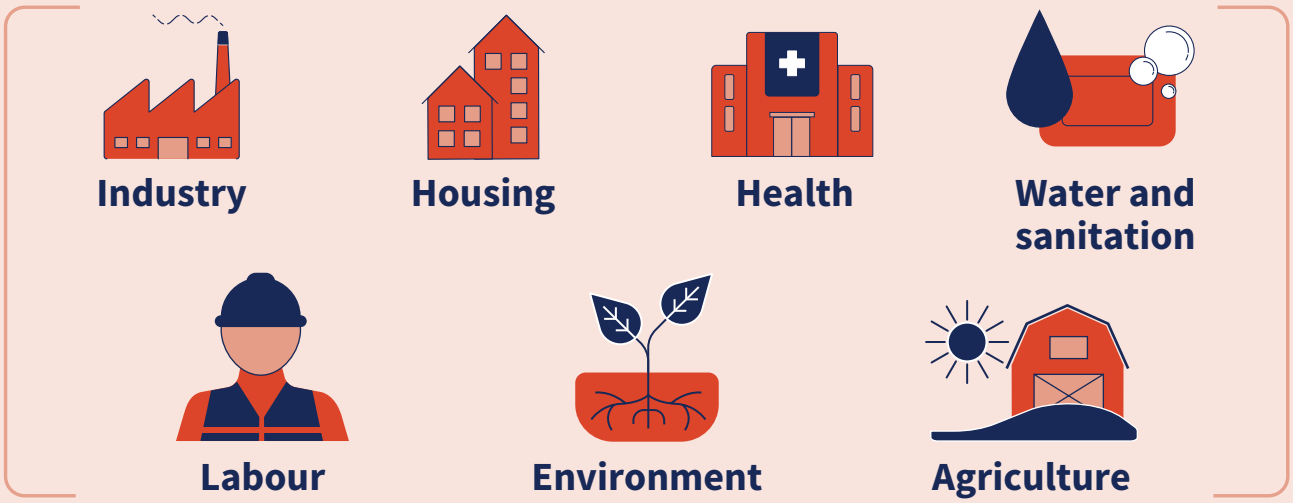
Promoting safer alternatives

- Assessing countries' development of legislation to prohibit use of lead in paints.

Supporting development of national strategies and policies

- Assisting countries in development and implementation of the WHO and national chemical Road map, relevant multilateral agreements and sustainable development strategies in terms of chemicals management.

Sectoral policies interacting with health protection from chemicals:



For further information please see:

Compendium of WHO and other United Nations guidance on health and environment. 2022 update. Chapter 5: chemicals *(20)*.

Climate change

Human activity is changing the climate of the whole planet. The effects of climate change are already being felt through progressive global temperature increases and more frequent extreme weather events, such as heat waves, floods, storms and droughts. Indirect effects include the spread of vectors and pathogens, forest fires, disruption of health-care systems, impacts on water and sanitation services, food quality and security, as well as ecosystem changes impacting agricultural processes. The direct and indirect impacts of climate change pose a significant toll on human health, including mental health, well-being, livelihoods and life on earth. Climate change is amplifying current health problems, causing new risks and pressures for the environment and altering the social and economic determinants of health *(39,40)*.

SDG 13 addresses climate action. However, climate change is integral to all other SDGs *(41)*, including SDG 3. Climate change impacts almost all aspects of sustainable development, giving rise to a pressing need to understand how action to address climate change can reinforce or undermine attainment of all other SDGs and vice versa.

Key risks to health at a glance

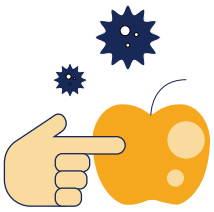
In the last 50 years, the 1672 reported disasters in the WHO European Region led to 159 438 deaths and economic loss of US$ 476.5 billion *(14)*.

Extreme temperatures led to the highest proportion of disaster-related deaths (93%), with **148 109 lives lost** *(42)*.

Floods (38%) and storms (32%) were the most-reported cause of disasters *(42)*.

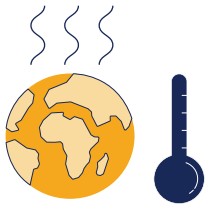
More than 200 people were killed by devastating floods in north-western Europe in 2021. Climate change makes heavy rainfall, nine times more likely to occur *(43)*.

16–44 million more people globally, will be affected by high water stress by the 2070s *(44)*.



An increase of 17% was seen in the reproductive rate of dengue between 1986 and 2020, compared with the period 1951-1985 in the 34 countries of the European Economic Area *(45)*. Climate change affects ecological systems and therefore the risk of infectious disease *(45)*.

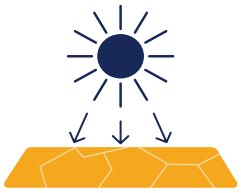
Mental health is affected by exposure to high temperatures, extreme weather events, displacement, malnutrition, conflict, climate-related economic and social losses, and anxiety and distress associated with worry about climate change *(46)*.



High ambient temperatures under different climate change scenarios are likely to cause an overall excess of between

47 000 and 117 000

heat-attributable deaths per year during the period 2071–2099 in 43 Member States if relevant mitigation and adaptation actions are not implemented *(48)*.



More than 15 000 excess heat deaths

were caused in the summer of 2022, the Region's hottest on record *(47)*.

A 1.94 to 1.99°C rise in average temperature has been seen in Europe since preindustrial times - a faster increase over the same period than the global rise in temperature (1.11 to 1.14 °C) *(49)*.

In the last 2 decades, the WHO European Region has faced increasing wildland fire smoke *(50)*.

Many countries have developed climate change and health policies and committed further activities:

15 of 22 participating Member States

(68%) indicated having national health and climate change strategies or plans in place in 2021. Ten countries (45%) reported undertaking a vulnerability and adaptation assessment *(51)*.

8 Member States

have responded positively to the commitments roadmap of the 2021 United Nations Climate Change Conference (COP26) Health Programme. *(52)*.

Among 17 countries

with a national/ federal heat health action plan, five of the plan's eight key elements were almost fully implemented *(50)*.

Key risks to health, further detail

In the last 50 years, the 1 672 reported disasters in the WHO European Region led to 159 438 deaths and economic losses of US$ 476.5 billion *(14)*. Floods (38%) and storms (32%) were the most-reported cause of disasters, but extreme temperatures led to the highest proportion of disaster-related deaths (93%), with 148 109 lives lost *(42).*

In July 2021, north-western Europe was exposed to devastating floods, primarily driven by heavy rainfall that was nine times more likely to happen because of climate change. These floods directly killed more than 200 people in Europe *(43)*. Climate change is projected to increase the intensity and frequency of flood events throughout the WHO European Region and heavy rain events are likely to become more frequent in many parts of the Region *(44).*

The causal pathways between drought, water scarcity and health involve meteorological, environmental, ecological and socioeconomic processes. Droughts put food and water security at risk, threaten sanitation, affect livelihoods and increase the risk of wildfires and infectious disease transmission. It is estimated that the global area under high water stress will increase from 19% in 2007 to 35% by the 2070s, and the number of additional people affected is expected to be 16–44 million *(44).*

Climate change also affects mental health, psychological well-being and their social and environmental determinants. Mental health impacts are expected to arise from exposure to high temperatures, extreme weather events, displacement, malnutrition, conflict, climate-related economic and social losses, and anxiety and distress associated with worry about climate change *(45).*

The WHO European Region has faced an increasing amount of wildland fire smoke in the last two decades and this trend may continue into the foreseeable future. Wildfires pose a range of direct health threats including smoke inhalation and injuries *(46)*. Climate change is projected to increase the number and severity of and the evidence for wildfire smoke-related cardiovascular morbidity and mortality *(39).*

Temperatures in the Region have warmed significantly from 1961 to 2021, at an average rate of about 0.5 °C per decade *(53).* Since preindustrial times, the average temperature in Europe has risen by 1.94 to 1.99 °C and has increased faster over the same period than the global rise in temperature (1.11 to 1.14 °C) *(49).*

Extreme high temperatures contribute directly to deaths from cardiovascular and respiratory diseases. The summer of 2022 was the Region's hottest on record. Northern and western Europe were hit with prolonged, intense heat waves. Many countries saw drought and wildfires as temperatures soared and rainfall was low. Crops suffered, rivers dried up and more than 15 000 excess heat deaths were caused by the extreme heat *(47).*

High ambient temperatures under different climate change scenarios are likely to cause an overall excess of between 47 000 and 117 000 heat-attributable deaths per year during the period 2071–2099 in 43 WHO European Region Member States if policies and plans for heat mitigation and climate adaptation are not implemented *(48).*

Climate change is likely to cause changes in ecological systems that will affect the risk of infectious diseases in the WHO European Region through water, food, air, rodent and arthropod vectors and has also contributed to the increased suitability of marine waters for Vibrio bacteria. For example, in the period 1986–2020, the reproductive rate of dengue in the 34 European Economic Area Member States increased by 17% compared with the period 1951–1985 *(45).* Local transmission was reported for the first time in 2010 and autochthonous cases are now observed on an annual basis in several European countries *(54).* Climate change also facilitates the further spread of ticks and related diseases to northern and western Europe.

Climate change also facilitates the further spread of ticks and related diseases to northern and western Europe.

Many countries have developed climate change and health policies and committed further activities

In the 2021 WHO health and climate change global survey report, 15 or 68% of 22 participating European Member States indicated having national health and climate change strategies or plans in place, while 10 countries or 45% reported undertaking a vulnerability and adaptation assessment *(53).*

Eight Member States from the Region have so far responded positively to the commitments roadmap of the 2021 United Nations Climate Change Conference (COP26) Health Programme. The WHO Alliance for Transformative Action on Climate and Health has been established as a WHO-led mechanism to support delivery on the COP26 health commitments. It provides a platform to bring stronger coordination and ambition towards building climate-resilient and sustainable low-carbon health systems *(54).*

Among 17 countries with a national/federal heat health action plan in the Region, five of the eight key elements of these plans (agreement on a lead body, accurate and timely alert systems, heat-related health information plans, strategies to reduce health exposure and care for vulnerable groups) were almost fully implemented. The least often implemented elements were real-time surveillance, long-term urban planning and preparedness of health and social systems *(46).*

Key actions for improvement

Climate risks to health

Systematically assess health risks related to climate change.

Health in climate policies

Address health considerations in national climate change policies, strategies and plans, either by updating existing or creating new ones.

Intersectoral policies

Consider climate change adaptation and mitigation in the development of specific environment and health policies.

Paris Climate Agreement

Include health considerations within Member States' nationally determined contributions to the United Nations Framework Convention on Climate Change and develop and implement National Adaptation Plans (NAPs) with specific "Health NAPs" that are informed by health vulnerability assessments.

Preparation

Strengthen early warning, surveillance and preparedness systems for extreme weather events and climate-sensitive diseases.

Health systems

Increase the adaptive capacity and resilience of health systems to climate change-related risks.

Communities

Develop information, tools and methodologies to support communities to adapt and increase their resilience against extreme weather and climate health risks.

Public communication

Scaling up awareness-raising campaigns on climate change and health for the public and health professionals.

Main WHO actions relevant to the WHO European Region

WHO consolidates emerging evidence, provides technical support and building capacity and coordinates a platform for Member States through the European Environment and Health Task Force (EHTF) for development of actions and key messages in climate and health.

The Working Group on Health in Climate Change of the EHTF, for the 71st session of the Regional Committee for Europe, developed a range of key messages on scaling up action on climate change mitigation and adaptation for health in the WHO European Region that are outlined in the publication Zero Regrets *(55)*[10] and summarized here.

Carbon emissions

- Strive for net zero economies by 2050 to support a sustainable future.
- Promote and strive for green, low-carbon health services with the health sector leading by example.

Policies

- Support climate change in all policies and prioritize actions that optimize the multiple benefits for the environment, health and societal well-being.
- Advocate for the inclusion of health in main climate planning and response processes.

Health co-benefits

- Prioritize health co-benefits and explore synergies of tackling climate change and air pollution.
- Optimize potential synergies between mitigation and adaptation policies.

Health systems

- Optimize climate resilience and sustainability within health systems by scaling up adaption action at the local and national level.
- Strengthen the voice of health sector professionals and expand the community of practice for health in climate action.

Decision-making

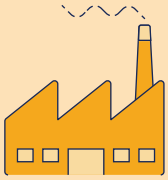
- Facilitate community-led, people-centred decision-making approaches for all interventions.

Capacities and resources

- Mobilize and sustain resources (knowledge, technology and finance) for climate change mitigation and adaptation action in the health and health-determining sectors.

[10] Second edition published May 2023.

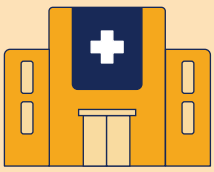
Sectoral policies interacting with health protection from climate change:



Industry

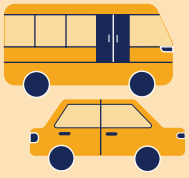
Agriculture

Labour



Health

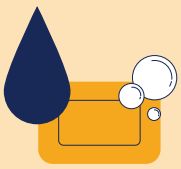
Energy



Transport

Housing

Environment



Water and sanitation

For further information please see:

Zero regrets: scaling up action on climate change mitigation and adaptation for health in the WHO European Region; key messages from the Working Group on Health in Climate Change, 2021 *(55)*.

Compendium of WHO and other United Nations guidance on health and environment. 2022 update. Chapter 7: climate change *(20)*.

WHO manifesto for a healthy recovery from COVID-19 *(56)*.

COP26 special report on climate change and health *(57)*.

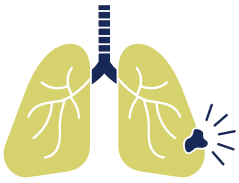
The 2022 Europe report of the Lancet countdown on health and climate change *(40)*.

Radiation

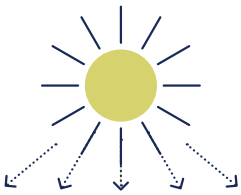
Radiation is energy which travels in the form of waves or particles, and forms part of our everyday life. People are exposed to radiation from cosmic rays, as well as to radioactive material found in the air, food and water. Radiation may occur naturally; for example as ultraviolet radiation, radiation from outer space or radon gas. Human-made sources include X-rays used in medicine for diagnosis and treatment, and industries producing radiation through nuclear energy production. Other forms of radiation include electromagnetic fields emitted by electricity or by devices such as mobile phones, lasers and LED. Excessive exposure to some radioactive elements such as radon may damage living tissues and organs, depending on the amount of radiation received. SDG 3 on good health and well-being covers radiation safety, including target 3.4 on noncommunicable diseases.

Key risks to health at a glance

Exposure to radiation from several sources can increase the risk of cancer and death



Around 24 600 deaths from lung cancer were caused by residential radon in 2019.[11]



78 000 melanoma cases are attributable to UV radiation in 2012 *(58)*.

500 women and 300 men may die each year from a melanoma as a result of being exposed to indoor tanning *(59)*.

20 000 thyroid cancers were caused by the Chernobyl accident (up to 2015) *(60)*.

Many countries have developed regulations for protection from selected radiation risks:

19 WHO European countries out of 23 confirm to have sunbed regulations *(61)*.

31 countries have guidelines or national radon regulations *(62)*.

26 countries have national policies on the use of iodine thyroid blocking in case of nuclear emergencies *(63)*.

[11] Quantification based on data from the Global Health Observatory *(3)* and Global Health Data Exchange *(10)*. For more details see the Method and sources of estimates section on page 3.

Key actions for improvement[12]

Legislation

Establishing relevant legislation, tools and mechanisms to protect the public, workers and patients from radiation.

Protective measures

Informing the public about the effects and risks of overexposure to radiation and protective measures that can be taken.

Radon

Reducing exposure to radon, for example through radon mitigation strategies.

Ultraviolet radiation

Encouraging personal protection against ultraviolet radiation.

Medical use of radiation

Promoting a safety culture in the medical use of radiation and reducing unnecessary medical radiation exposure.

Emergencies

Building and strengthening national capacities to respond to prepare and response to radiation emergencies.

[12] Based on Healthy environments for healthier populations: Why do they matter, and what can we do?, 2019 *(64)*.

Main WHO actions relevant to the WHO European Region

Radiation safety standards

- Develop radiation safety standards and support countries in their implementation and model legislation (e.g. for electromagnetic fields).

Information

- Produce information on the effects of radiation through advocacy and communication.

Emergencies

- Coordinate preparedness and public health response to radiation emergencies.

Research agendas

- Develop research agendas on radiation-related topics (e.g. radiofrequency fields and ultraviolet radiation).

Evidence-based policy

- Assess health risks from radiation exposure and provide evidence-informed policy options, guidelines and tools, for example on radiation safety in medicine, sunbed use, radon control and emergency preparedness and response.

Sectoral policies interacting with health protection from radiation:

Industry

Housing

Health

Labour

Energy

Telecom

Environment

For further information please see:

Compendium of WHO and other United Nations guidance on health and environment. 2022 update. Chapter 6: radiation *(20)*.

Part 2
Areas for action

Healthy cities

Around two thirds of the population of the WHO European Region Member States live in urban environments. Cities are, therefore, a very important context for health protection and promotion. Urban infrastructure can enhance access to health and social services, culture and recreation.

Urban design and planning can determine and affect environmental conditions and limit or support access to healthy foods and active lifestyles, which affects people's physical and mental health. Likewise, varying environmental risks can occur in cities, such as increased air pollution and noise from busy roads. Heat waves have significant effects on human health, particularly among elderly people and in cities due to the urban heat island effect. Lack of nature, green and blue spaces and inadequate public infrastructure and services related to transport, energy or water supply can further increase environmental problems in urban settings. Furthermore, cities can concentrate poverty and ill health, which can contribute to and reinforce discrepancies by imposing disproportionate exposure for less advantaged citizens and creating unhealthy and socially undesirable patterns and inequalities. These aspects make cities a crucial actor in achieving sustainable development. To this end, a dedicated SDG has been established for cities: Make cities and human settlements inclusive, safe, resilient and sustainable – SDG 11.

Environmental noise

Noise pollution is a considerable risk, particularly in towns and cities. Excessive noise is a health risk, contributing to cardiovascular diseases. It impacts our well-being and our sleep, through annoyance and sleep disturbance. Children are particularly affected, because noise can decrease their abilities to learn properly at school. The main sources of environmental noise include transportation (aircraft, rail and road traffic), wind turbines, industry and leisure. To protect human health WHO published updated guidelines in 2018 which define exposure levels to noise that should not be exceeded to minimize adverse health effects *(65).* Nevertheless, in the EU more than 100 million people are exposed to harmful levels of environmental noise pollution *(66)*. When considering the entire WHO European Region this number is likely to be much higher. Road traffic noise is a particular public health problem across many urban areas. Implementing the 2018 WHO Environmental noise guidelines for the WHO European Region is an important step that can be taken.

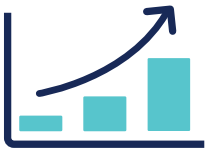
Contaminated sites

Contaminated sites are areas where pollution of soil, surface- or ground-water, air or the food chain have occurred. In the EU-28, potentially polluting activities take place at around 2.8 million sites, with more than 650 000 of these identified and registered in national and/or regional inventories *(67)*. The predominant activity contributing to environmental pollution in contaminated sites is waste disposal, followed by chemical industries, metallurgic plants, mining industry and electric power plants. These activities lead to an increase in heavy metals and mineral oils in the affected soils and water. However, many more chemicals such as persistent organic pollutants or micro plastic are also continually being generated. Most of these chemicals have adverse health effects, particularly for populations living close to contaminated sites *(68)*. National and urban planners can contribute to the protection of human health through urban redevelopment of contaminated sites *(69*).

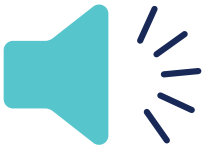
Waste management and the circular economy

A circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible to extend the life cycle of products. It aims to minimize the dumping or burning of waste and thereby the extraction of new resources in favour of reusing existing ones. It offers a transition to a green economy *(70)*. The links to health are diverse, but direct impacts of circular economies on health have not yet been quantified *(71)*. Here, research is needed to show countries how important it is to invest in circular economies and which co-benefits a circular economy can have on health. An interesting application of the circular economy is in the waste management sector, where the health impact and health economic arguments are instrumental for decision-making *(72,73)*. SDG 12 is dedicated to sustainable consumption and production.

Key risks to health at a glance



Around 80% of Europeans are expected to live in urban areas in 2030 *(1)*, and may be exposed to urban health risks.



More than 100 million people in the EU were exposed to harmful levels of environmental noise pollution in 2017, which contributed to **48 000** new cases of heart disease and **12 000** premature deaths every year *(66)*.

30% of car journeys in Europe cover distances of less than 3 km and 50% cover less than 5 km *(74)*.

2.8 million sites in the EU-28 experience potentially polluting activities. More than 650 000 sites are registered in national and/or regional inventories.

14.8% of the EU population live in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames/floors *(75)*.

Between 3% and 63% of the urban population (in Ireland and Montenegro, respectively) were living in crowded conditions in 2019 *(76)*.

3% or more of the urban population in some countries still depend on potentially unsafe drinking-water *(77)*.

Only 3% of the total city area on average within EU countries, comprises publicly accessible green space *(78)*.

An almost 1% reduction in natural-cause mortality could be achieved through adequate access to green space *(16)*.

> **In most countries, households with low-income levels are much more affected by crowding.**

Key risks to health, further detail

Between 28% (Tajikistan) and 100% (Monaco) of people in the WHO European Region lived in urban settings in 2021 *(79)*. Around 80% are expected to live in urban areas in 2030 *(1)* and may be exposed to a range of urban health risks.

30% of car journeys in Europe cover distances of less than 3 km and 50% cover less than 5km *(74).*

14.8% of the EU population are living in dwellings with a leaking roof, damp walls, floors or foundation, or rot in window frames or floors; for the population below the relative poverty threshold this percentage rises to 23.1% *(75).*

More than 100 million people in the EU were exposed to harmful levels of environmental noise pollution in 2017, which contributed to 48 000 new cases of heart disease and 12 000 premature deaths every year in the EU *(66).*

In the EU-28, potentially polluting activities take place on around 2.8 million sites, with more than 650 000 sites identified and registered in national and/or regional inventories.

Significant proportions of the urban population were living in crowded conditions in 2019, ranging from 3% (Ireland) to 63% (Montenegro). In most countries, households with low-income levels are much more affected by crowding *(76).*

Although water supply conditions are better in urban than in rural areas, some countries still have 3% or more of the urban population dependant on potentially unsafe drinking-water – most often affecting poorer households *(77).*

Publicly accessible green areas represent only a very low proportion of our cities, estimated at just 3% of the total city area on average within EU countries *(78).*

A recent assessment of green space and mortality estimated that provision of adequate access to green space could reduce total natural-cause mortality by almost 1% *(16)*.

Key actions for improvement

Planning

Integrating health-promoting approaches into urban and spatial planning and mobility management and effectively using health and environmental impact assessment methods to integrate health aspects in planning projects.

Health in all policies

Integrating health, environmental and equity targets into housing, land use, urban, regional, transport, energy and infrastructure strategies, plans and policies and ensuring intersectoral collaboration.

Localizing global commitments and targets

Adapting global commitments, targets and tools related to sustainable urban development (such as the SDGs, the Paris Agreement on climate change or the New Urban Agenda) to local conditions and aiming to implement them at city scale.

Urban preparedness and resilience

Protecting health and well-being through assessing and improving preparedness and resilience of cities and neighbourhoods to extreme situations and disasters.

Air pollution and noise mitigation

Reducing exposure to excessive air pollution and noise from transport and other sources through air-pollution and noise mitigation measures and by addressing hazards at the source and implementing the Global Air Quality Guidelines *(12)* and the WHO noise guidelines for the European Region *(65)*.

Clean contaminated sites and manage waste wisely

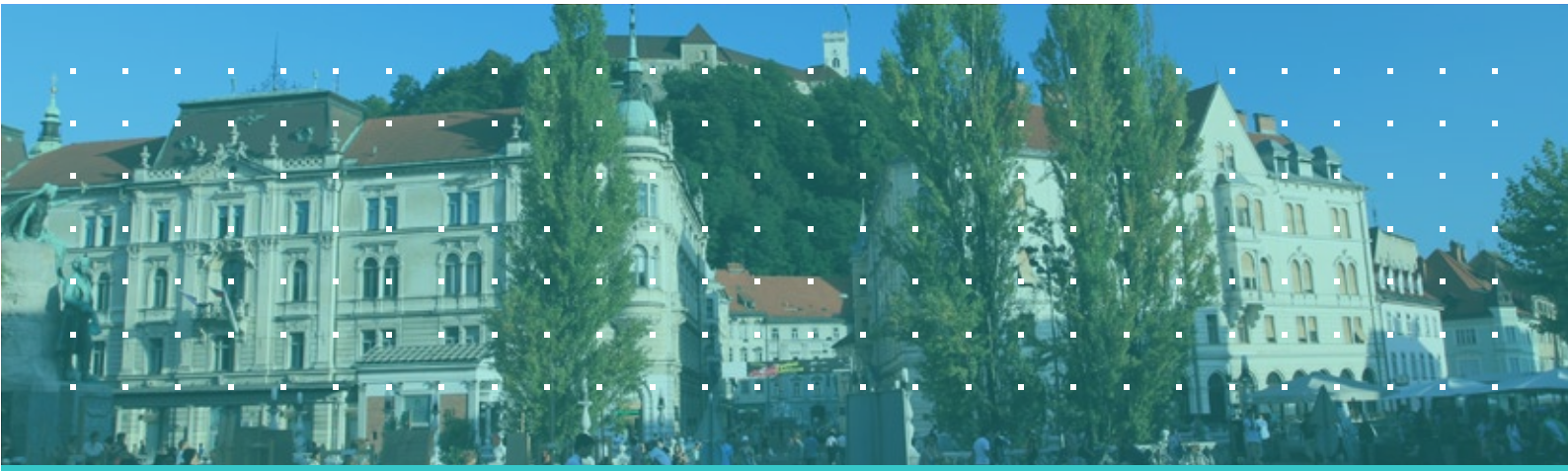
Applying principles of circular economy, as natural resources are limited and their extraction involves an environmental, ecological and health impact.

Active mobility

Implementing coherent national and local policies for healthy, active mobility focused on cycling and walking, including accessible and affordable public transport, land use and infrastructure development.

Participation

Providing mechanisms for the effective participation of citizens.



Main WHO actions relevant to the WHO European Region

Leadership and policy development

- Provide technical support and policy guidance on environmental health matters through tools such as GreenUR and HEAT, and planning briefs that facilitate decision-making and catalyse action for environmental health protection at local level.

Capacity-building

- Build capacity and strengthen the skill set of staff in the environment and health sector at national and subnational scale through training courses and workshops related to urban environmental health themes and the integration of health in local and national assessment methods.

Monitoring

- Develop tools, assessments and indicators to define and monitor magnitude and equity distribution environmental risks and policy interventions in urban settings and to measure results and help track the implementation of the SDGs.

Knowledge generation and evidence-informed reports

- Ensure facilitation of knowledge through synthesis of evidence and practice to assess health impacts of urban settings and provide good practice elements for healthy and sustainable urban planning and design.

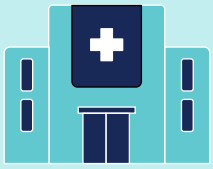
Resilience and preparedness

- Support national and subnational governments with implementable intervention and policy proposals to protect health through urban resilience and preparedness.

Sectoral policies interacting with health protection from healthy cities:

Industry

Energy



Health

Labour

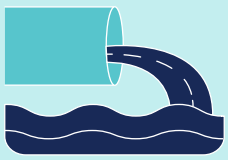
Housing

Land use planning

Transport, air pollution and noise

Environment

Water and sanitation



Contaminated sites and waste

For further information please see:

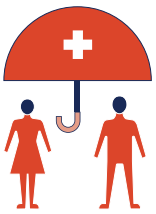
The urban health repository of WHO resources *(80)*.

Environmentally sustainable and climate-smart health systems

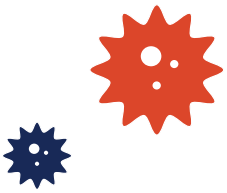
The health system encompasses all people, organizations, institutions and processes whose tasks involve the prevention and treatment of diseases and injuries, and the promotion of health. A health system is fundamental to achieve and maintain societal health and well-being. The World Health Assembly resolution on WASH in health-care facilities, adopted in May 2019, stresses the fundamental importance of adequate WASH services in achieving universal health coverage and re-emphasizes attainment of the WASH-related commitments, such as those expressed by the SDGs. Relevant SDGs are SDG 3, with target 3.8 addressing the need for quality essential health-care services, and SDG 6 which calls for universal and equitable access to safe WASH services in all settings.

From one point of view, health-care systems foster development and economic growth and yet they can consume a considerable quantity of resources and energy. Additionally, health systems produce pollution, waste, waste-water and foster climate change through carbon emissions. Therefore, a climate-smart health system can represent a game changer in terms of green transition. Please see the chapter on Climate change in this publication for further insights.

Key risks to health at a glance

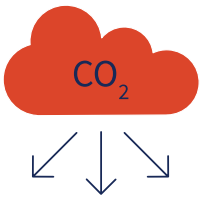


6% of patients on average acquired an infection during their hospital stay in 2016–2017 in the WHO European Region *(81)*.



Around 670 000 infections occur each year due to antimicrobial resistance in the European Economic Area, associated with 33 000 deaths *(82)*.

15% of the waste generated by health-care activities is considered hazardous material *(83)*.



249 metric tons of carbon dioxide equivalent are emitted by the EU health-care industry, making it the third largest globally *(17)*.

2% of countries in Europe and northern America provide data on basic water, 1% on basic sanitation, 2% on basic hygiene and 2% on basic waste management, as of 2022 *(84)*.

Key risks to health, further detail

Many WHO European Region Member States still lack universal health care coverage – SDG indicator 3.8.1 *(8).*

On average 6% of patients acquired an infection during their hospital stay in 2016–17 in the WHO European Region *(81).*

Each year, around 670 000 infections occur due to antimicrobial resistance in the European Economic Area, associated with 33 000 deaths *(82).*

As of 2022, 2% of countries (n = 8) in Europe and northern America provide data on basic water, 1% on basic sanitation (n = 3), 2% on basic hygiene (n = 7) and 2% on basic waste management (n = 8) *(84).*

249 metric tons of carbon dioxide equivalent are emitted by the EU health-care industry, placing it as the third largest globally *(17).*

4.7% of the CO_2 emissions in the EU are produced by the health-care industry *(17).*

15% of the waste generated by health-care activities is considered hazardous material that may be infectious, toxic or radioactive *(83).*

> **Many Member States in the WHO European Region still lack universal health care coverage.**

Key actions for improvement

National plans

Developing national plans to achieve environmentally sustainable and climate-resilient health systems.

Sustainability

Promoting actions that ensure energy and resource efficiency in health systems, including sustainable procurement practices, use of renewable energy and intelligent mobility management.

Solid and medical waste and waste-water

Reducing pollution through safely managed waste and waste-water.

Cooperation

Fostering closer cooperation between the health and environment sectors and other relevant actors and organizations.

Evaluation

Developing a set of measurable targets and goals for the health sector and publish evaluation results regularly.

Main WHO actions relevant to the WHO European Region

Policy development

- Guidelines for environmental health standards in health-care facilities and safe health-care waste management.
- Guidance on climate-resilient and environmentally sustainable health systems.
- The COP26 Climate Change Convention resulted in a new global initiative for health with several European countries joining.

Energy-efficient medical devices

- Identify energy-efficient medical devices for resource-constrained settings.

National monitoring and reporting on progress of SDG implementation

- Strengthen national surveillance to inform policy-making.
- Collect data on monitoring for SDG targets 6.1 and 6.2, which include WASH in health-care facilities as part of universal WASH access for all.

Access to electricity

- Promote clean energy for health-care facilities.

Sectoral policies interacting with health protection from health-care facilities:

For further information please see:

Global analysis of health care waste in the context of COVID-19 *(85)*.

The way forward

This document outlines the most recent evidence of the environmental burden of disease for leading risk factors and some of the priority areas and actions that will lead to healthier environments and sustainable disease prevention. While work needs to continue on collecting and analysing data, advancing research in environment and health and developing effective strategies and policies, sufficient evidence and knowledge are available for taking many steps in key areas. These include implementing clean and safe technologies, promoting safe, environmentally friendly, and healthy practices, developing and implementing policies such as introducing targeted subsidies or setting safety standards, increasing resilience and mitigation to climate change and other environmental threats, halting activities that cause land degradation and biodiversity loss and planning for emergency response. We need to promote mainstreaming health and the environment in comprehensive policy areas, such as healthy transport and energy policies. Many of these actions require intersectoral cooperation. A strengthened health sector – providing leadership and useful tools, ensuring that the health argument is being considered and guiding action for health protection – will be central to the success of the proposed interventions.

Necessary actions must be carried out by many different stakeholders both within and outside the health-care environment including transport, agriculture, housing, energy, labour and land use planning. Furthermore, governments and public authorities at all levels share responsibilities for a healthy environment in the WHO European Region and beyond. Decisions and actions in every sector may affect the environment and human health. Keeping in mind the consequences for social determinants of health and in particular the impact on those least privileged is, therefore, paramount and equity-related side-effects should be actively avoided.

Strategic environmental assessment, environmental impact assessment and health impact assessments are important tools in assessing possible environmental and health impacts caused by development *(86)*. The risk factors outlined in this report should all be considered when taking a decision. Forecasting and estimating potential economic benefits and costs should be included in the decision-making process as well. Uncertainties and growing crises such as pandemics, energy, wars and conflicts all need to be accounted for when planning and building resilience in the environment and health sectors.

By creating healthier environments, we will create benefits for human health and quality of life and will reduce burdens on the health-care system. By adopting a sustainable approach, we are likely to close the gaps in achieving the 2030 SDGs.

When designed adequately, many of the required actions to achieve healthier and sustainable environments will have co-benefits and appeal to several sectors. For example, mitigating climate change is linked to combating air pollution and to prevention of biodiversity loss.

WHO will continue to support countries and communities in their endeavours to create a healthier and safer world through scaling up primary prevention and building health-promoting environments. WHO will also provide leadership on environmental health matters, coordinate global and regional actions, support the development of international agreements for health protection and influence international priority settings.

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