



**Fact sheet
Copenhagen, 4 April 2008**

Taking action to protect health in Europe from climate change

Man-made greenhouse gas (GHG) emissions, particularly from the burning of fossil fuels, are warming the earth. GHGs have increased by 70% over the last four decades, trapping more heat in the lower atmosphere. Globally, the largest increases in emissions have come from the energy-supply sector. In the WHO European Region, transport-related emissions have played an equally large role; such emissions in the European Union (EU) are projected to increase by about 50% between 2000 and 2030.

The global average surface temperature has increased by approximately 0.74 °C over the last 100 years. The projected increase for Europe between the ends of the 20th and 21st centuries varies from 2.3 °C to 6 °C, depending on the scenario. Populations in the Region are exposed to climate change directly through changing weather patterns and indirectly through changes in water, air, food quality and quantity, ecosystems, agriculture, livelihoods and infrastructure. These exposures profoundly influence health and well-being.

Heat-waves

An increase in the frequency and intensity of heat-waves is one of the most certain consequences of climate change. Thermal stress and death rates are directly related. In EU countries, mortality is estimated to increase by 1–4% for each one-degree rise in temperature. Over 70 000 excess deaths were reported from 12 European countries following the heat-wave in summer 2003. In the EU, 86 000 extra deaths are projected every year, with a global mean temperature increase of 3 °C, in 2071–2100. The elderly are most at risk of death from heat-stroke and cardiovascular, renal, respiratory and metabolic disorders.

Heat-related illness and death are largely preventable. Ensuring health systems' preparedness and ability to respond, reducing individual and community exposure to heat and providing early warning systems and advice to citizens can help to reduce mortality. Since 2003, many countries have developed and implemented heat health action plans.

Cold weather and cold waves

Although cold waves are projected to decrease as a consequence of global warming, they will still affect a major part of the European Region, especially in northern latitudes. Most European countries suffer from 5–30% excess winter mortality. Inadequate indoor thermal temperatures are one of the main conditions causing health effects, including cardiovascular and respiratory conditions. Deaths and diseases related to cold waves will disproportionately affect poorer households that cannot afford to pay for fuel, as in the recent cold spell in Tajikistan. Additional health risks may arise from the use of polluting solid fuels to cope with the cold, which is reported from at least 14 countries in the Region. The use of solid fossil fuels is linked to 13 000 deaths in children yearly.

Protecting health from cold requires better shielding of indoor environments from outdoor conditions. Important factors include energy efficiency and thermal performance in built environments, as well as individual behaviour. Tariff and social-support policies are particularly

needed to protect the poorer segments of society. In addition, action by health systems in this area must include considering location and thermal protection when planning their own facilities.

Floods

Flooding is the most frequent adverse weather-related event in the European Region. Projected climate-related increases in precipitation are likely to make floods more frequent and severe. Winter floods are projected to rise in north-western countries and flash floods, throughout the Region. Coastal flooding is likely to threaten up to 1.6 million more people every year in the EU.

Direct health effects are caused by flood waters, and include drowning, heart attacks and injuries. Indirect health effects follow damage to infrastructure, and include infectious diseases, rodent-borne diseases, poisoning and post-traumatic stress disorder (sleeplessness, difficulties in concentration and psychosocial disturbances).

Recent floods in the Region have shown the need to shift the focus of action from disaster response to long-term risk management. The approach should include assessing the health effects of structural measures, developing regulations and insurance policies for building in flood-prone areas, creating early warning systems and planning for flood preparedness, with special attention to hospitals, ambulance stations, retirement homes and schools. Campaigns to raise awareness before floods occur are critical for prevention and control.

Malnutrition and food safety

With climate change, food productivity is projected to decrease in the Mediterranean area, south-eastern Europe and central Asia, where food security is at risk. Crop yields could decrease up to 30% in central Asia by the middle of the 21st century and threaten food security. This may lead to a worsening of malnutrition, especially in the rural poor, whose family income is closely linked to food production.

Climate change also raises the issue of food safety. Higher temperatures favour the growth of bacteria in food. Infections with *Salmonella* spp. rise by 5–10% for each one-degree increase in weekly temperature, at ambient temperatures above 5 °C. Hot weather can also favour refrigeration failure and the emergence of flies and other pests.

Nutrition and food-safety control are big challenges that will grow with climate change. This is why the Second WHO European Action Plan on Food and Nutrition Policy,¹ setting goals and targets to reduce the health burden associated with food and nutrition, should also result in action relevant to climate change. This includes strengthening surveillance and monitoring systems to detect changes and analyse trends in foodborne and nutrition-related diseases, and educating consumers on healthy diets and food-safety practices.

Vector- and rodent-borne diseases

Shifts in the distribution and behaviour of insect and bird species are early signs that biological systems are already responding to climate change. This is leading to significant changes in infectious disease transmission by vectors such as mosquitoes and ticks. The movement of people and goods plays a role, as in the case of the introduction of Chikungunya virus to Italy in 2007, where the presence of a suitable vector allowed sustained local transmission.

Temperatures and precipitation favourable to malaria persist in some areas of Europe and central Asia, where they keep the risk of transmission a challenge. At present, six countries in the Region

¹ *The Second WHO European Action Plan on Food and Nutrition Policy 2007–2012*. Copenhagen, WHO Regional Office for Europe, 2007 (http://www.euro.who.int/Document/Nut/action_plan_leaflet_final_ENG.pdf, accessed 1 April 2008).

(Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, Turkey and Uzbekistan) report malaria cases. Southern Europe is also threatened, but health services' capacity for early detection and treatment minimizes the probability of the spread of malaria. Lyme disease is showing a tendency to shift to higher latitudes and altitudes. Leishmaniasis, a disease transmitted by sand flies, is also travelling northwards.

Health systems' preparedness is key to identifying and promptly responding to potential disease outbreaks. In risk areas, health systems should reinforce preventive measures – such as vaccination, vector surveillance and control, rapid diagnosis and raising awareness of protective behaviour – in collaboration with veterinary services. The International Health Regulations, which recently entered into force, provide a common global platform for early detection of and response to climate-related events.²

Waterborne diseases

Water stress is projected to increase over central and southern Europe and central Asia, affecting 16–44 million additional people by 2080. Reductions in summer water flows of up to 80% will result in the loss of fresh water and increased potential for contamination. The quality of coastal water is endangered, putting bathers and seafood eaters at risk of infection. Access to safe water and sanitation, which is unequal in the Region, may worsen. In central Asia, around 70% of the total population has access to a water supply, but only 25% of the rural population. This disparity contributes to the diarrhoea-related deaths of 13 500 children every year. Even in countries where access is good, the water supplied does not consistently meet WHO's microbial and chemical standards.

Ensuring water safety is essential for adaptation to climate change. The implementation of international instruments, such as the Protocol on Water and Health,³ would help increase access to safe drinking-water and sanitation and reduce the burden of related deaths and diseases. Measures include disease surveillance and outbreak detection, vaccination, and water treatment and supply. Many suppliers in the Region already use WHO-recommended water-safety plans, which ensure safe drinking-water from resource to tap.

Respiratory diseases

Respiratory diseases are affected by climate change through changes in air quality, more frequent heat-waves and earlier onset of the spring pollen season in the northern hemisphere. Climate change may affect the concentrations and dispersion of air pollutants. Changes in wind patterns favour long-range transport of air pollutants. Heat-waves' health effects are stronger when air pollution is high. Ozone and particulate matter (PM) are the air pollutants of greatest health concern. Ozone causes 20 000 premature deaths and 200 million person-days of acute respiratory symptoms per year in the EU while high levels of man-made PM shorten each EU citizen's life expectancy by over 8 months on average. Future climate change may increase regional ozone pollution, owing to higher temperatures and weaker atmospheric circulation.

Reducing climate-sensitive respiratory diseases means reducing people's exposure to hazardous air pollutants, anticipating potential events and preparing health services. Air quality standards, in line with the WHO air quality guidelines,⁴ need to be enforced to reduce exposure to air pollution and

² International Health Regulations (2005) [web site]. Geneva, World Health Organization, 2005 (<http://www.who.int/csr/ihr/en>, accessed 1 April 2008).

³ Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Protocol on Water and Health [web site]. Geneva, United Nations Economic Commission for Europe, 1999 (http://www.unece.org/env/water/text/text_protocol.htm, accessed 1 April 2008).

⁴ *Air quality guidelines. Global update 2005. Particulate matter, ozone, nitrogen dioxide and sulfur dioxide.* Copenhagen, WHO Regional Office for Europe, 2005 (<http://www.euro.who.int/Document/E90038.pdf>, accessed 1 April 2008).

climate-change-related effects. Regulatory instruments, such as national emissions ceilings, can address the emission of pollutants into the atmosphere. Long-term solutions would include energy efficiency and reduced motorized transport. In the short term, people can help protect themselves by avoiding outdoor exercise when ozone levels are high and roads are polluted.

Vulnerable groups and inequalities

Climate change will affect everybody, but everyone in the European Region will not be equally vulnerable. Geography, health-system preparedness, health status, age, social class and support systems will make a difference.

Populations differ in vulnerability. As developing organisms exposed over a long period, children are most at risk from the effects of climate change. Heat primarily affects old people: chronic diseases and drugs can decrease their ability to cope with extremely hot weather. Workers are at risk, too: providers of emergency services and labourers in outdoor environments are particularly affected by extreme weather events. Geographically, the populations most at risk are the rural poor and those living in big cities and mountainous, water-stressed and coastal areas.

Climate change will also have adverse effects on economic growth. Already, more than 60 million people in the eastern part of the Region live in absolute poverty. Climate change can significantly worsen health inequities within and among countries and put additional stress on poorer groups. The global cost of climate change is estimated to be up to 5% of the gross domestic product (GDP) by the end of this century. Thus, climate change threatens to undermine progress made towards the Millennium Development Goals: poverty cannot be eliminated while environmental degradation exacerbates malnutrition, disease and injury.

Knowledge of the groups or geographical areas most vulnerable to the health effects of climate change allows health systems to target their interventions appropriately, in collaboration with other sectors. Public health services need to be strengthened, especially in eastern countries, where, following health-system reform in the 1990s, there is still a need to provide universal access to basic health services such as child vaccination.

Health systems' role in protecting health in Europe from climate change

Traditionally, the response to climate change has focused on environmental, economic and security concerns. Today the evidence of climate-related health effects has stimulated the need for rapid strengthening of health systems' capacities to assess, plan for and respond to current and projected threats. These capacities vary greatly across the Region, reflecting historical processes and resource constraints. Nevertheless, all health systems can take a number of common actions to strengthen their preparedness and capacity to respond, such as:

1. informing health services and professionals of ways to identify problems, the most vulnerable populations and needs for training, communication and supplies (of vaccines, medicine and diagnostic tools);
2. reinforcing their interventions to adapt to climate change, such as ensuring clean water and sanitation, safe and adequate food, immunization, disease surveillance and response, vector control and disaster preparedness;
3. training health professionals on climate-related health issues, such as new transmission patterns for vector-, water- and foodborne diseases and the symptoms and treatments of diseases linked to extreme weather events;
4. delivering accurate and timely information to decision-makers, the general public and other stakeholders for proper protective action;

5. strengthening health services and facilitating collaboration between countries to respond to climate-related health crises, particularly when health security calls for the enforcement of the International Health Regulations;
6. advocating action in sectors where the reduction of emissions can also benefit health (energy, transport, housing, land use and water management), and promoting active travel, healthy local food and contact with green spaces, which can help reduce obesity, respiratory and heart diseases, cancer, road injuries and noise-related illnesses, and save costs; and
7. setting the example in tackling the root causes of climate change, by taking action to reduce health systems' own carbon footprint.

WHO's support to countries in the European Region

The WHO Regional Office for Europe builds on decades of experience in strengthening countries' health systems to protect health from climate change. In particular, its activities include support to programmes to prevent the consequences of heat and floods, combat infectious disease, improve water and sanitation services, respond to natural disasters and provide information to the public on how to avoid risks. The Regional Office also coordinates the review of the scientific evidence on the links between climate and health. Climate change is the new cross-cutting issue on the agenda of the fifth ministerial conference on environment and health, planned to be held in Italy in 2009.

The Regional Office web site offers further information on its work on: climate change and health (<http://www.euro.who.int/globalchange>), the fifth ministerial conference (http://www.euro.who.int/eehc/conferences/20080306_1) and other activities to protect health and the environment (<http://www.euro.who.int/envhealth>).

For more information, contact:

TECHNICAL INFORMATION:

Bettina Menne
Medical Officer, Global Change and Health
WHO Regional Office for Europe
Via Francesco Crispi 10, I-00187 Rome, Italy
Tel.: +39 06 4877546. Fax: +39 06 4877599
E-mail: bme@ecr.euro.who.int

PRESS INFORMATION:

Cristiana Salvi
Technical Officer, Communication and Advocacy
WHO Regional Office for Europe
Via Francesco Crispi 10, I-00187 Rome, Italy
Tel.: +39 06 4877543; mobile: +39 348 0192305
Fax: +39 06 4877599. E-mail: csa@ecr.euro.who.int