

BRIEFING – October 2007

Climate Change and Health: “Protecting the most vulnerable”

*The **Health and Environment Alliance** strives to raise the debate within the health and environment community on the health costs and benefits of adaptation policy and mitigation efforts. We aim to educate and encourage the participation of the healthcare sector in promoting energy saving and energy efficient policies as a means to reducing greenhouse gases and dependency on non-renewable energy sources. We also want to raise awareness on how EU climate change policy is or is not consistent with health objectives.*



Overview

Climate change is already causing major public health disasters for Europe.

The heat wave in August 2003 resulted in 35,000 deaths. Many more suffered from the aggravation of existing health conditions, such as breathing and heart problems. Health services throughout Europe felt the strain. In London, hospital admissions among the over 75s increased by 16% during that year (1).

Floods, drought and other extreme weather events all contribute to the health impact of climate change. However, temperature increases and longer periods of intense heat, including their effects via worsening air pollution, probably present the greatest areas of concern for Europe (2).

The Health & Environment Alliance (HEAL) is part of an international movement calling for the global average temperature increase to be kept below 2 degrees centigrade. Numerous independent analyses indicate that climate change must be limited to less than 2°C above pre-industrial temperatures to avoid dangerous impacts on human health, the environment, and the global economy.

This document investigates the health impacts in greater depth. It draws on the findings of the recent European Commission report (3) and relevant sections of the Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (2). It demonstrates the rapidly growing evidence on how climate change is affecting health in Europe. It also describes some alarming concerns about the potential burden for the health care and social care sectors in, for example, hospitals, old peoples' homes and community health services.

The document recommends that urgent action be taken at the European level, including an immediate review of existing European subsidies and laws to ensure that they do not contribute to climate change. Policies that consider win-win-win scenarios for public health, adaptation and mitigation are a first priority.

HEAL would like to see more representatives of the health sector becoming advocates at the European level for resource efficient, energy saving and energy efficient policies to reduce both greenhouse gases¹ and dependency on non-renewable energy sources².

Policies that consider win-win-win scenarios for public health, adaptation and mitigation are a first priority.

Another key recommendation is for major health investments in primary disease prevention and individual well-being, especially targeted to meet the needs of those most vulnerable. This implies extensive data-gathering to assess the environmental effects on health, and ensuring that this data is framed in a wider health context. Allowing increased network building would lead to the implementation of holistic health action plans that raise awareness, provide educative information and organise structures for behavioural change and responses at EU, national, regional and community levels.

HEAL aims to create a debate within the health and environment community, including the health care sector, on policy options to protect and promote health in a period of rapid climate change. We hope to encourage more health care providers and professionals to become involved in the important work of mitigating and adapting to climate change to protect people's health.

1 Greenhouse gases are components of the atmosphere that contribute to the greenhouse effect. Some greenhouse gases occur naturally in the atmosphere, while others result from human activities such as burning of fossil fuels such as coal. Greenhouse gases include water vapour, carbon dioxide, methane, nitrous oxide, and ozone.

2 Non-renewable energy includes nuclear power here.

Global impact of climate change on health

Climate Change 2007, the Fourth Assessment Report of the United Nations Inter-governmental Panel on Climate Change (IPCC) concluded with a very high level of scientific confidence that: “Climate change currently contributes to the global burden of disease and premature death (2).”

The new report states that since the third assessment, confidence has increased that some weather events and extremes will become more frequent, more widespread and/or more intense during the 21st century. It also says that more is now known about the potential effects of such changes.

The following chart shows the likely future developments in climate change and their effects on health.

FIGURE 1: FUTURE DEVELOPMENTS IN CLIMATE CHANGE AND THE EFFECTS ON GLOBAL HEALTH

Phenomenon and direction of trend	Likelihood of future trends based on projections for 21st century	Impacts on human health
Over most land areas, warmer and fewer cold days and nights, warmer and more frequent hot days and night	Virtually certain	Reduced human mortality from decreased cold exposure
Warm spells/heat waves. Frequency increases over most land areas	Very likely	Increased risk of heat-related mortality especially for the elderly, chronically sick, very young and socially-isolated
Heavy precipitation events Frequency increases over most areas	Very likely	Increased risk of deaths, injuries, infectious, respiratory and skin diseases
Areas affected by drought increase	Likely	Increased risk of food and water shortage; increased risk of malnutrition; increased risk of water- and food-borne diseases
Intense tropical cyclone activity increases	Likely	Increased risk of deaths, injuries, water- and food-borne diseases; post traumatic stress disorders
Increased incidence of extreme high sea level (excludes tsunamis)	Likely	Increased risk of deaths and injuries by drowning in floods; migration-related health effects

Adapted from: “Summary for Policy Makers”, IPCC Fourth Assessment Report (2)

The scientific community has reached a consensus that average global temperature has risen 0.76°C during the past 100 years. Global average sea level has risen by 1.8 mm per year since 1961, and Arctic Sea ice is shrinking by at least 2% per decade. In addition, the sea surface temperature is rising, mountain glaciers are retreating, surface ocean waters are getting more acidic and extreme weather events are occurring more frequently.

Heat-related deaths will increase, especially among vulnerable groups.

Heat waves and heavy precipitation (rainfall) are very likely to increase in frequency over most land areas. Heat-related deaths will increase, especially among vulnerable groups, such as the elderly, children, those with low-income and disabilities. Increased flooding will cause deaths, gastrointestinal, respiratory and skin diseases, and injuries.

The IPCC report also anticipates an increase in cardio-respiratory morbidity and mortality as a result of climate change. Hospital studies cited in the report show how forest fires and dust storms have already increased admissions for burns, heart and respiratory problems.

The worst affected

The impact of climate change will fall heavily on the vulnerable. Most of the additional burden of disease linked to climate change is associated with diarrhoea and malnutrition in countries where rates of these conditions are already high and where the ability to adapt is limited.

In Africa, where malaria already claims 1-3 million lives per year (most of whom are children), higher temperatures will lengthen the malaria season with the number of person-months of exposure rising 16-28%, dependent on the different study methods used.

All countries will be affected but the poorest countries would suffer earliest and most.

The situation in Europe

Heat-related illness and air pollution-related impacts of climate change are perhaps the greatest concern for Europe.

Country assessments (see Figure 2) undertaken with the help of WHO indicate heat-related mortality, air pollution, water and food-related impacts, and effects on infectious diseases (3).

Heavy economic costs

In October 2006, the UK Treasury published a report on the economics of global climate change. It concluded that all countries will be affected but that the poorest countries would suffer earliest and most.

Adding up the costs of a narrow range of the effects, based on the assessment of the science carried out by the IPCC in 2001, the Stern Review calculated that the dangers of unabated climate change would be equivalent to at least 5% of GDP each year.

The Stern Review estimated that the dangers could be equivalent to 20% of GDP or more, taking into account more recent scientific evidence, the economic effects on human life and the environment, and approaches to modelling that ensure the impacts that affect poor people are weighted appropriately (4).

For example, the Netherlands has seen an increase in heat-related mortality, an increase of air pollutants, and an increased risk of Lyme disease, food poisoning and allergic disorders. In Portugal, the risk of leishmaniasis has fallen in some areas but heat waves have caused excess deaths, malaria, food- and waterborne diseases, West Nile fever, Lyme disease and Mediterranean spotted fever.

FIGURE 2: NATIONAL HEALTH IMPACT ASSESSMENTS OF CLIMATE CHANGE PUBLISHED SINCE 2001

Country	Key findings	Adaptation recommendations
Finland (Hassi and Rytkonen, 2005)	Small increase in heat-related mortality; changes in phenological phases and increased risk of allergic disorders; small reduction in winter mortality	Awareness-building and training of medical doctors
Germany (Zebisch et al., 2005)	Observed excess deaths from heat-waves; changing ranges in tick-borne encephalitis; impacts on health care	Increase information to the population; early warning; emergency planning and cooling of buildings; insurance and reserve funds
The Netherlands (Bresser, 2006)	Increase in heat-related mortality, air pollutants; risk of Lyme disease, food poisoning and allergic disorders	Not considered

Figure 2 cont.

Country	Key findings	Adaptation recommendations
Portugal (Casimiro and Calheiros, 2002; Calheiros and Casimiro, 2006)	Increase in heat-related deaths and malaria, food- and water-borne diseases, West Nile fever, Lyme disease and Mediterranean spotted fever; a reduction in leishmaniasis risk in some areas	Address thermal comfort; education and information as well as early warning for hot periods; early detection of infectious diseases
Spain (Moreno, 2005)	Increase in heat-related mortality and air pollutants; potential change of ranges of vector- and rodent-borne diseases	Awareness-raising; early warning systems for heatwaves; surveillance and monitoring; review of health policies
Switzerland (Thommen Dombois and Braun-Fahrlander, 2004)	Increase of heat-related mortality; changes in zoonoses; increase in cases of tick-borne encephalitis	Heat information, early warning; greenhouse gas emissions reduction strategies to reduce secondary air pollutants; setting up a working group on climate and health
United Kingdom (Department of Health and Expert Group on Climate Change and Health in the UK, 2001)	Health impacts of increased flood events; increased risk of heatwave-related mortality; and increased ozone-related exposure	Awareness-raising

Source: ECCP Working Group 11 report (3)

Heat-related illness

Current evidence suggests that the greatest impact on health from climate change in Europe arises from increases in temperature and longer periods of intense heat.

European temperatures repeatedly reached between 35 to 40°C, and peak temperatures well above 40°C in 2003.

The number of “excess deaths” due to the extreme high temperatures in Europe during the month of August 2003 amounted to 35,000, with elderly people being among the worst affected. France alone recorded an additional 15,000 excess deaths.

Warmer winters will mean that cold-related deaths will decrease. For example, the UK may experience greater reductions in cold-related mortality than increases in heat-related deaths (2).

FINDINGS ON HEALTH IMPACTS IN THE EUROPEAN UNION

The EU-funded cCASHh project involving 25 partners in 15 European countries identified the following impacts of climate change on health:

- The **heat wave** in August 2003 caused over 35 000 excess deaths in Europe.
- Cases of **salmonellosis** rise by 5-10% for each 1°C increase in weekly temperature when the ambient temperature is at least 5°C.
- **Floods** in recent years have caused deaths, injuries, and diseases, and their frequency is expected to increase.
- **Lyme borreliosis and tickborne encephalitis** have spread into higher latitudes (as seen in Sweden) and altitudes (such as in the Czech Republic) in recent decades and have become more common.
- The average length of the growing season of plants with allergenic pollen and other elements causing **allergic sensitivity** in Europe has increased by 10-11 days over the past 30 years.

From: The cCASHh project: Climate change and adaptation strategies for climate change in Europe (5).

Nevertheless, deaths related to heat waves are likely to increase dramatically. The EU Peseta project predicts almost 86,000 net extra deaths per year under a scenario with a global mean temperature increase of 3°C in 2071-2100 relative to 1961-1990. With a global mean temperature increase of 2.2°C in 2071-2100 relative to 1961-1990, this number of net additional deaths per year halves to 36,000 (6).

In the UK, using a medium-high climate change scenario, estimates suggest an annual total of 2,800 heat deaths in the 2050s, representing a 250% increase over current levels. A study in Germany predicts a 20% increase in heat-related mortality that is unlikely to be compensated by reductions in cold-related mortality (2).

As well as causing deaths, heat can aggravate existing health problems. WHO says that cardiovascular diseases are more severe in the summer period, and that the risk of allergic disorders increases as a result of climate change.

Hotter and longer summers will bring about new pollen species, such as ragweed, and changes in pollen seasons. In Europe, the pollen season may last more than 10 days longer than was the case 30 years ago, according to the cCASHh project (see box).

Air pollution-related health impacts

Almost 370,000 people in the European Union die prematurely every year because of air pollution, according to the European Commission's Impact Assessment (7).

Air pollution not only kills, it also aggravates chronic respiratory and cardiovascular disease, damages lung tissue, and contributes to cancer (8).

Two components in particular are important with respect to the health effects of air pollution: ground-level ozone and particulate matter (PM). Research shows that both short- and long-term exposure to these substances are associated with a large number of health effects, including premature death and increased illness. Ground level ozone is associated with an increase in cardio-respiratory morbidity and mortality (2).

While stricter air quality policies are expected to lead to a fall in deaths from air pollution over the next 50 years, concerns have been expressed that hotter weather will aggravate the effects of air pollution on health.

The global health chapter of the IPCC report provides a possible explanation. It says that future climate change may cause significant air-quality degradation by changing "the dispersion rate of pollutants, the chemical environment for ozone and aerosol (another name for PM) generation, and the strength of emissions from the biosphere, fires and dust (2)."

The conclusions of the European Climate Change Programme (ECCP) report on climate change and health say that human exposure to the combined effects of stressful weather conditions and air pollution appears to have a greater adverse impact on health than the sum of the two separate effects. It expects climate change to influence the frequency and concentration of both summer and winter smog, which will be a particular problem for highly polluted urban areas (3).

Infectious diseases

The distribution of some infectious disease vectors is changing. Tropical diseases, such as Chikungunya, have now appeared in European continent.

The potential for malaria and other "tropical" diseases to invade southern Europe is a commonly cited concern. An assessment in Portugal projected an increase in the number of days per year suitable for malaria transmission. However, the risk of actual transmission would be low or negligible if infected vectors are not present. In the UK, it was judged highly unlikely that indigenous malaria would be re-established (1).

Water- and food-related impacts

Drought and floods inevitably affect supplies of safe drinking water. In the poorest areas of the wider WHO Europe region, diarrhoeal disease in children under 5 years is likely to increase, contributing additional deaths.

Climatic changes can affect water supplies – their availability, quality, or access. Extreme weather events known to have triggered water-borne disease outbreaks include extended periods of hot weather, droughts, erratic rainfall, storms, and flooding.

Studies on the effects of climate change on food poisoning, for example, salmonellosis and campylobacteriosis, have produced inconclusive results. However, the cCASHh study points out that cases of salmonellosis rise by 5-10% for each 1°C increase in weekly temperature when the ambient temperature is at least 5°C (See box on page 5).

The policy context

Climate change is set to become the biggest public health challenge for this century.

The IPCC fourth assessment report says that the health risks posed by weather extremes are likely to be the most important in terms of requiring preparedness in Europe.

Heat waves will increase in frequency. Simulations by the IPCC suggest that the average near-ground-level temperature will increase between 1.2 and 6.2°C within a century, depending on the models used and the emission scenarios.

Extreme weather events will cause death and injury during heat waves, floods, storms, fires and droughts, all of which will increase, the report says.

The United Nations Framework Convention on Climate Change, which published the Fourth Assessment report, recommends stabilising greenhouse gas concentrations to avoid dangerous anthropogenic interference with the climate system.

Its Kyoto Protocol assigns emission limitations for the reduction of greenhouse gas emissions to the signatory nations.

Although a total of 169 countries have ratified the agreement, they do not include the USA, which

Europe's vulnerable groups

The health of those who are already fragile is most at risk. The IPCC defines those who are more vulnerable in hotter weather, wind storms, flash floods and coastal flooding to be the elderly, disabled, children, women, ethnic minorities and those on low incomes (2).

Human exposure to the combined effects of stressful weather conditions and air pollution appears to have a greater adverse impact on health than the sum of the two separate effects.

contributes approximately 25% of global emissions. In addition, commitments by the 37 richest and most developed nations translate into reductions of around 1-3% of CO₂ released into the atmosphere. Scientists say immediate cuts of 60-80% are needed to stabilise the climate (9).

EU response

The EU emits 13.7% of the world's CO₂ emissions, according to the UN Statistics Division.

The first European Community strategy to limit carbon dioxide (CO₂) emissions and improve energy efficiency was introduced in 1991. Since then, the European Commission has introduced many climate-related policies and measures, including the EU's emissions trading scheme.

On 10 January 2007, the European Commission set out its proposals and options in a Communication entitled: "Limiting Global Climate Change to 2° Celsius: The way ahead for 2020 and beyond (10)."

Two months later, the European Council set a target of reducing by 20-30% greenhouse gas emission by 2020. This represented a step in the right direction, particularly because it changes the cost-benefit ratios in favour of more ambitious limit values for health protection on air pollution.

Recent analyses by the European Environment Agency (EEA) suggest that as a result of enhanced climate policies, significant improvements will take place in urban air quality including in hotspots. The costs of implementing current air pollution legislation are estimated to come down by some 12 billion Euros per year under a 40% greenhouse gas reduction scenario by 2030.

A key problem with European policy however, is that many decisions have not addressed the health and environmental perspectives. For example, a new target has recently been set to increase dependence on nuclear power by 2020. Health protection requires a move away from dangerous, non-renewable energy sources and a greater emphasis on energy saving and energy-efficient policies to reduce greenhouse gases.

Some existing EU subsidies actually contribute to global warming. For example, direct subsidies for road transportation (e.g. road construction) and tax exemptions on air travel encourage additions to greenhouse gas emissions. Alternative investments could create “win-win-win” outcomes for mitigating climate change and protecting health. For example, favouring reduced car use in city centres by widening pavements and planting trees would help to prevent urban “heat islands”, and encourage physical exercise, such as walking and cycling.

The most important development so far towards a health-centred discussion of climate change came in 2006. A stakeholder meeting organised by ECCP Working Group II on Impacts and Adaptation led to the “human health sectoral report” frequently referred to in this document (3).

The ECCP report reviews the evidence on the health impact of climate change, and identifies gaps and opportunities, including for inter-sectoral action, at the European level. For example, it suggests embedding climate change issues into National Environment and Health Action Plans (NEHAPs).

WHO progress

The World Health Organisation has concentrated on public health developments. It says that surveys in 2002 showed that Europe was not well prepared to cope with “unexpected” extreme thermal stress events. These findings were borne out by the high death toll during the 2003 heat wave.

Much progress has been made since then. WHO says many European countries and cities have now developed primary adaptation measures, most of which are built on well-established public health approaches.

For example, some countries have developed action plans. WHO reports that the EuroHEAT project found 16 EU countries had set up heat early warning systems and 10 have heat health action plans. Other initiatives have been established for flood forecasting, windstorm early-warning, injury prevention, and seasonal allergic forecasting.

Findings suggest that action is possible and effective when:

- Measures have already been shown to be effective under current climate conditions;
- Multi-sectoral alliances, partnerships, and networks are in place;
- Adaptation measures have a long lead time; and,
- Decisions have long-term effects and overall benefits for adaptive capacity.

Key components in increasing the ability of European countries to adapt to climate change include reducing inequality, greater investment in primary disease prevention, quality health services, a greater focus on vulnerable groups, and improved access to information.

Countries with the highest adaptive capacities tend to have high incomes, universal health care coverage, and high access to information. The EU-funded WHO cCASHh project raised concerns about the negative impact on “adaptability” in parts of Europe with rising inequalities, falling prevention investment and aging populations (see table 3).

TABLE 3. ADAPTIVE CAPACITY INDEX FOR 22 EUROPEAN AND CENTRAL ASIAN COUNTRIES. HIGHER INDEX VALUES MEAN HIGHER ADAPTIVE CAPACITY* (84)



Government and NGO activity

Some governments and non-governmental organisations are helping the health sector to become more energy-efficient. For example, the UK government has set up the Carbon Trust, which is helping some hospitals within the National Health Service to cut carbon emissions. On average, they find that hospitals can reduce their carbon imprint by 20% during the course of a five-year implementation plan (11).

In the UK, public health professionals have produced a report to help the health community reduce its carbon footprint. Coordinated by the UK Public Health Association (UKPHA), the document was developed on the basis of findings of a think tank comprised of academic, governmental and NGO experts (12).

A hospital can reduce its carbon imprint by 20% during the course of a five-year implementation plan.

Neglected areas

Burden on the health sector: Existing assessments probably do not adequately address the burden on the health and social care sectors. Hospitals, old peoples' homes and community health services will potentially face a huge additional demand. At the same time, extreme weather events may potentially reduce the ability of the health infrastructure to meet the increased demand that it will face. For example, flooding and overheating will affect health care facilities, which invariably have essential services and equipment located at basement level.

Lack of awareness of the health impacts: At present it seems that no-one is sufficiently well-informed about the impact of climate change on health. This includes policy-makers as well as health professionals and the European public. A managed flow of information is required based on regular and thorough monitoring and punctual projections.

Projections can help policy makers and the public better understand the scale of the problem ahead. For example, a recent US report estimated heat-related mortality increases in 21 US cities by mid-century due to climate change (13).

The Stern Review mentioned earlier estimated that annual flood losses in the United Kingdom could increase from 0.1% of gross domestic product today to 0.2–0.4% (4). A survey carried out in Rome found that mortality damages would cost the city 281 million

Recommendations

Urgent action is needed in Europe to prepare for the health impacts of climate change.

IPCC believes that adaptive capacity needs to be improved everywhere, including in rich countries. “The impacts of recent hurricanes and heat waves show that even high-income countries are not well prepared to cope with extreme weather events,” the IPCC report says (2).

Environmental and public health groups can play a vital role in supporting adaptation because of their expertise in action to protect and promote health through organised efforts within different communities. The following recommendations are developed following a review of the recent reports of the WHO (1), the Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (2), European Climate Change Programme (3), and HEAL’s seminar on Climate Change and Health (14), which took place on 2 October 2007.

Euro for the year 2020 (in 2004 Euros) if adaptation programmes were not implemented. Similar projections for the European Union and for the WHO Europe region are needed.

Environmental and public health groups can play a vital role in supporting adaptation because of their expertise in action to protect and promote health through organised efforts within different communities.

EU policy-makers

- Review existing European subsidies to ensure that they do not contribute to climate change but rather work to mitigate its effects and protect health.
- Ensure all measures taken to deal with climate change also benefit health. For example, reduce CO₂ emissions by curbing private vehicle use to improve air quality for those with breathing problems, reduce accidents and noise pollution, and stimulate physical mobility that may help to diminish obesity.
- Create a “renewable energy roadmap”, which makes clear that nuclear energy is not a solution given its threats in terms of accidents and disposal.
- Extend assistance to EU neighbouring countries, especially targeting vulnerable groups.
- Support EU-wide networks of health professionals, women and youth networks, patients’ organisations and community groups in an ongoing process of identifying emerging threats, raising public awareness of the health risks, providing information and education materials, and creating community-based action plans.

- Encourage the sharing and replicating of best practices of raising awareness and local community initiatives, especially in reaching the most vulnerable groups and countries.
- Review the possibility of integrating climate change and health more fully into National Environment and Health Action Plans (NEHAPs) and Children's Environment and Health Action Plans (CEHAPs).
- Investigate further the synergistic effect on health resulting from the combined effects of climate change and air pollution.
- Encourage networks of environmental and health professionals to develop multi-disciplinary approaches to addressing determinants of health and climate.

World Health Organisation

- Boost data collection, trend analysis and projections on the health impact of climate change, especially the effects on vulnerable groups, including morbidity and quality of life.
- Support an ongoing, structured communication programme on climate change and health for health professionals and the general public.
- Estimate the costs to health and sustainable development of climate change in Europe, with standardised comparative country-by-country figures.
- Gather case studies of adaptation and preparedness efforts within the non-governmental sector, which have a strong track record in awareness-raising and producing and disseminating information materials.

Health and environment policy groups

- Raise awareness among policy-makers and the public of the health impacts of climate change from a range of health perspectives.
- Monitor and share information on the benefits and limitations of existing policy and on the opportunities for greater participation in policy-making and action.
- Ensure that new findings are transmitted rapidly to different audiences on an ongoing basis rather than in response to a crisis.

- Provide information to medical professionals on the likely health impacts of climate change on already vulnerable groups, such as the elderly, women, children, minorities, those with low-income, disabilities, Chronic Obstructive Pulmonary Disease, allergies and asthma, heart conditions, and young people.

Health professionals

- Become informed advocates for adaptation in relation to the impact on health and health services of climate change. This will include the promotion of energy-saving and energy-efficient policies as a means to reduce greenhouse gases and dependency on non-renewable energy sources.
- Share examples of improving energy efficiency in hospital and health facilities that do not contribute to the problem. For instance, the German environmental group, BUND provides information and a certificate scheme for energy saving and climate protection in hospitals. Approaches minimise the use of electrical air-conditioning systems and encourage solar power providing benefits for climate change and the environment.

The public

- Write to your MEP, newspaper or journal editor about your concerns.
- Walk or cycle short journeys (use the stairs instead of the lift or escalator).
- Turn off electrical appliances that are on stand-by.
- Use energy-saving bulbs.
- Think about what is good for your health and good for the environment in terms of how you exercise, what you eat, drink and buy in your daily routines and life.
- For many more ideas, visit the Climate Action Network website (www.climnet.org) for 50 things you can do in every aspect of your life to make a difference to climate change.

References

1. Menne B et al, Climate Change and Adaptation Strategies for Human Health, WHO Europe, Springer, 2006
2. IPCC WG11 Fourth Assessment Report (Chapter 8 is devoted to "Human health" and Chapter 12 to "Europe")
3. European Climate Change Programme, Working Group II, Impacts and Adaptation, Human Health Sectoral Report (based on findings of a stakeholder meeting in 2006)
<http://ec.europa.eu/environment/climat/pdf/eccp/impactsadaptation/health.pdf>
4. Stern Review on the Economics of Climate Change
http://www.hm-treasury.gov.uk/newsroom_and_speeches/press/2006/press_stern_06.cfm
5. Climate Change and Adaptation Strategies for Public Health (cCASHh) is an EU-funded project of the World Health Organization, see <http://www.euro.who.int/ccashh>
6. Peseta project (impacts of climate change in Europe) <http://peseta.jrc.es/results.html>
7. Baseline Scenarios for the Clean Air for Europe (CAFE) Programme Final Report DG Environment, Development of the Baseline and Policy Scenarios and Integrated Assessment Modelling Framework for the Clean Air for Europe (CAFE) Programme LOT 1 Contract No B43040/ 2002/340248/MAR/C1
8. The Medical and Public Health Impacts of Global Warming, a Factsheet from Physicians for Social Responsibility.
http://www.saveourenvironment.org/Medical_and_Public_Health_Impacts_of_Global_Warming.pdf
9. MEDACT website http://www.medact.org/env_climate_change.php
10. Communication on Limiting Global Climate Change to 2 degrees Celsius, 10 January 2007
http://ec.europa.eu/environment/climat/future_action.htm Scroll down to see useful "Staff Working Paper"
11. Carbon Trust <http://www.carbontrust.co.uk>
12. "Climates and Change: The urgent need to connect health and sustainable development", UK Public Health Association, www.ukpha.org.uk/media
13. An Analysis of potential heat-related mortality in US cities under a business-as-usual climate change scenario, Illinois Environment, <http://www.environmentillinois.org/reports/energy/energy-program-reports/an-analysis-of-potential-heat-related-mortality-increases-in-u.s.-cities-under-a-business-as-usual-climate-change-scenario>
14. Health and Environment Alliance website www.env-health.org Details on the climate change and health seminar, 2 October 2007, at <http://www.env-health.org/a/2637>

*The **Health and Environment Alliance** aims to raise awareness of how environmental protection improves health. It achieves this by creating opportunities for better representation of the perspectives of citizens and health experts in the environment and health-related European policy-making. Our membership includes a diverse network of more than 50 citizens', patients', women's, health professionals' and environmental organisations across Europe and has a strong track record in increasing public and expert engagement in both EU debates and the decision-making process.*



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