

DRAFT BACKGROUND DOCUMENT

**Climate change and health:
“Protecting the worst affected sector”**

For discussion at HEAL AGM 2-3 October 2007

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 citizens' and health experts' perspectives 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.



Many thanks to Bettina Menne, World Health Organization for her review of this document.

Climate change and health: “Protecting the worst affected sector”

Overview

Climate change has already caused a major public health disaster for Europe.

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

Although floods, drought and other extreme weather events all contribute to the health impact of climate change, temperature increases, including their effects via worsening air pollution, present the greatest areas of concern for Europe. (2)

The Health & Environment Alliance (HEAL) is already part of an international movement calling for the global average temperature increase is 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.

Unless action is taken, the UK Stern review has estimated that climate change could reduce global per capita consumption by 11%. (3)

This document investigates the health impacts in greater depth. It draws on the findings of recent European Commission report (4) 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 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. They should rather work to mitigate the effects of climate change and protect health. HEAL would like to see more representatives of the health sector becoming advocates at the European level for energy saving and energy efficient policies to reduce both greenhouse gases¹ and dependency on non-renewable energy sources.

Another key recommendation is for major investment in prevention, especially to meet the needs of vulnerable groups. This includes gathering data so that the scale of the problem and emerging threats can be shared, and network building to implement health action plans that raise awareness, transmit information and organise structures for community responses.

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

Global impact of climate change on health

Climate Change 2007, the Fourth Assessment Report of the United Nations Intergovernmental 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 likely future developments in climate change and their effects on health.

Figure 1: Future developments in climate change and the effects on global health
Adapted from: "Summary for Policy Makers", IPCC Fourth Assessment Report (2)

| Phenomenon and direction of trend | Likelihood of future trends based on projections for 21 st 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 |

The scientific community has reached a consensus that average global temperature has risen 0.76 degrees Centigrade 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 more frequent extreme weather events are occurring.

Heat waves and heavy precipitation (rainfall) are very likely to increase in frequency over most land areas and heat-related deaths will increase, especially among vulnerable groups. Flooding will cause deaths, injuries, infection, respiratory and skin diseases.

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

The most badly affected

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

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.

Heavy economic costs

In October 2006, the UK Treasury published a report on the economics of global climate change. Although essentially optimistic because of the potential to adapt, without strong action soon the global outlook will be grim.

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%. Similar projections for the European Union and for the WHO Europe region are needed.

The situation in Europe

Heat-related illness and air pollution-related impacts of climate change are the greatest concern for Europe. Evidence also exists that infectious diseases are affected and water- and food-related impacts have both been documented. These findings are clearly supported by country assessments (see Figure 2), undertaken with the help of WHO, and compiled in a report by the European Commission (4)

Taking the examples of two European Union countries, the assessment in the Netherlands shows 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 excess deaths have resulted from heat waves, 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

Source: ECCP Working Group 11 report (4)

| 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 heatwaves; 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. |
| 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; and 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. |

Heat-related illness

Current evidence suggests that the greatest impact on health from climate change in Europe arises from increases in temperature.

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 months of August 2003 amounted to 35,000, with elderly people among the worst affected, according to IPCC fourth report. France alone recorded an additional 15,000 excess deaths.

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

Nevertheless, deaths related to heat waves are likely to increase dramatically.

The EU Preseta project² predicts almost 86,000 net extra deaths per year under with a global mean temperature increase of 3°C in 2071-2100 relative to 1961-1990. Under a scenario with a global mean temperature increase of 2.2°C in 2071-2100 relative to 1961-1990, this number of net deaths per year halves to 36,000. (11)

In the UK, using a medium-high climate change scenario, estimates suggest an annual total 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 mean new pollen species and longer pollen seasons. The ragweed pollen has been introduced into Europe and the seasonal distribution of some allergenic pollen species has altered so that the pollen season in Europe may last more than 10 days longer than 30 years ago, according to the cCASHh project (see box).

Findings on health impact 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.

² <http://peseta.jrc.es/results.html>

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 (5).

Air pollution not only kills, it also aggravates chronic respiratory and cardiovascular disease, damages lung tissue, and contributes to cancer. (6)

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 European Climate Change Programme (ECCP) says 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. (4)

It says: "A small synergistic effect has been seen between excess heat deaths in cities and air pollution in summer and winter."

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 ECCP is clearly concerned about the effects on health of ozone levels. It says: "Although still uncertain, there seems to be no threshold value for the occurrence of ozone-related health effects. The higher the ozone levels, the greater the increase and severity of the effects. Risk groups are people who exercise outdoors, people with cardiovascular diseases and respiratory problems, and people who are extra sensitive to ozone exposure."

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 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 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 those 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)

Europe's vulnerable groups

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

The European Climate Change Programme defines those at risk from higher ozone levels as people who exercise outdoors, people with cardiovascular diseases and respiratory problems, and people who are extra sensitive to ozone exposure. (4)

The policy context

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

The IPCC fourth assessment report considers the health risks posed by weather extremes to be the most important in terms of requiring society's preparedness in Europe.

Heat waves will increase in frequency. Simulations by the IPCC suggest that 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, which will increase, the report says.

The ultimate objective of the United Nations Framework Convention on Climate Change, which published the Fourth Assessment report, is to stabilise greenhouse gas* concentrations to avoid dangerous anthropogenic (resulting from human activity) interference with the climate system.

The Kyoto Protocol to the UN Framework Convention on Climate Change 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 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. (7)

EU response

The European Commission has taken many climate-related initiatives since 1991, when it issued the first Community strategy to limit carbon dioxide (CO₂) emissions and improve energy efficiency.

The work of the European Climate Change Programme (ECCP) has led to the adoption of a range of new policies and measures, including the EU's emissions trading scheme. In March 2007, the European Council set a

target of reducing by 20-30% greenhouse gas emission by 2020 in an effort to mitigate climate change. This is a step in the right direction, especially 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 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 is that many decisions have not addressed 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 construction and tax exemptions on air travel encourage additions to greenhouse gas emissions. Alternative investments could create "win-win" outcomes for mitigating climate change and protecting health. For example, favouring reduced car use by widening pavements for pedestrians and extending cycle lanes and pathways, which would also encourage physical exercise, and providing support for the adaptation of housing in "heat islands" within urban areas.

An important development 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 report. (4)

The EECPP 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 Organization 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 the following year.

WHO considers that much progress has been made since then. Many European countries and cities have developed primary adaptation measures. Most build 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.

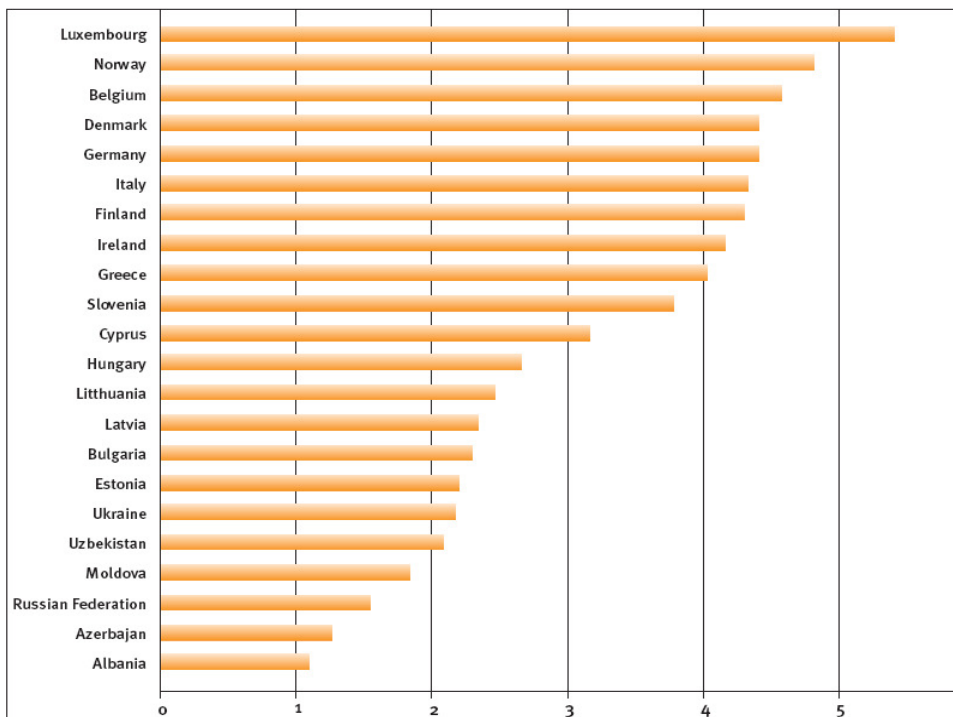
Important factors in ensuring early action is possible and effective are when:

- Action 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 had benefits for adaptive capacity.

Key components in increasing the ability of European countries to adapting to climate change include reducing inequality, greater investment in 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 cCASHh study raised concerns about a 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)



Neglected areas

Burden on health sector: Existing assessments may not adequately address the burden on the health sector. Hospitals, old peoples' home and community health services face a huge additional demand. Although the UK was less hard-hit by the heat wave of 2003, London hospital admissions among the over 75s increased by 16% during the year. (1)

At the same time, extreme weather events may potentially reduce the ability of the health infrastructure to meet the increased demands that it will face. For example, flooding and overheating will affect health care facilities.

Lack of awareness of health impact: No-one is well enough informed about the impact of climate change on health. This includes policy makers as well as health professionals and European citizens. 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 by mid-century due to climate change. This achieved widespread media coverage and brought the issue home to many professionals and ordinary citizens. (8)

Data and projections on overall health impact - as opposed to predicted mortality - and on impacts on vulnerable groups are few. More information is also needed on the anticipated costs of climate change on health. One survey carried out in Rome found, that in the absence of planned adaptation programmes, mortality damages would cost the city 281 million Euro for the year 2020 (in 2004 Euros).

HEAL on climate change

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 increase participation of the healthcare sector to become a strong advocate for energy saving and energy efficient policies as a means to reduce 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. (9)

DRAFT Recommendations

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

IPCC says 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," according to the IPCC report. (2)

The health sector is not well prepared for the effects of climate change. 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), European Climate Change Programme (4) and the Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (2).

EU environmental health 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.
- Extend assistance to EU neighbouring countries, especially targeting vulnerable groups
- Support EU-wide networks of health professional, 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 of best practice in raising awareness and community action, 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.

WHO

- 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 citizens
- 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 impact 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 policymaking and action.

- Ensure 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 likely health impact on already vulnerable groups, such as the elderly, women, children, minorities, those with low-income, disabilities, COPD, 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 example, 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.

Citizens

- Write to your MEP, newspaper or journal editor about your concerns
- Use energy-saving bulbs
- Walk or cycle short journeys
- Turn off electrical appliances that are on stand-by
- Breastfeed
- Drink tap water
- For many more ideas, visit the Climate Change Action website (www.climnet.org), which offers 50 things you can do (in the home, office, transport, buying food, alternative energy, campaign action).

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