



# PROTECTING HEALTH FROM CLIMATE CHANGE

## CLIMATE CHANGE PUTS HEALTH AT RISK

Every century has its own public health challenges; climate change is our century's challenge. Never has it been more evident that health concerns are at the cornerstone of the changing climate. From heat-waves, floods and droughts to worsening air pollution and changes in vectorborne diseases and plant distribution – climate change profoundly affects health, directly and indirectly.

No country will be spared. Over 1000 extreme weather events hit countries in the WHO European Region in the last three decades. Climate change increases the frequency and severity of these events. According to the latest projections, their effects are likely to harm the health of millions of people, if global warming is unconstrained.

While climate change will affect everybody, some people are more vulnerable. A number of factors – such as geography, health-system preparedness, health status, age, social conditions and support systems – determine the degree of danger to people's health. Climate change can worsen health inequities and put additional stress on poorer groups. To protect

the health of the most vulnerable people, tackling climate change cannot be a choice; it is a necessity.

## PROTECTING HEALTH FROM CLIMATE CHANGE. A SEVEN- COUNTRY INITIATIVE.

Recognizing that global climate change is posing ever growing threats to public health security, in 2008 the WHO Regional Office for Europe started a two-year project funded through the International Climate Initiative of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. "Protecting health from climate change. A seven-country initiative" focuses on taking action against the health effects of climate change in seven European countries: Albania, Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan, the former Yugoslav Republic of Macedonia and Uzbekistan.

The project supports actions and pilot-tests some interventions in countries that are already experiencing climate-related problems (such as extreme events, water scarcity, glacier melting, permafrost thawing) that are projected to have severe health effects. All countries ratified the United Nations Framework Convention on Climate Change and are committed to do more to protect health from climate change by increasing awareness and improving intersectoral cooperation. Activities are carried out by national Governments through bilateral agreements with the WHO Regional Office for Europe in the framework of the WHO global workplan on climate change and health.

## DIFFERENT CLIMATIC ZONES: DIFFERENT HEALTH EFFECTS

As these countries belong to different geo-climatic areas, with different expected health effects from climate change, action needs to be specific and tailored.

- **In arid and semi-arid water-stressed areas** (Kazakhstan and Uzbekistan), there are potential risks of changes in the distribution of infectious diseases, respiratory diseases and food security.
- **In high-mountain areas** (Kyrgyzstan and Tajikistan), glacier retreat, glacier lake outburst floods and mudslides can affect population health and health services.
- **Mediterranean countries** (Albania and the former Yugoslav Republic of Macedonia) share risks from extreme weather events and changes in infectious disease outbreaks.
- **The sub-Arctic and Arctic regions** in the northern part of the Russian Federation are threatened by reduction in thickness of glaciers and ice and retreat of permafrost, which damage the health infrastructure, ecosystems and transport routes.

## ACTIVITIES ARE BOTH COMMON AND TAILORED TO SPECIFIC NEEDS

### Common activities

The need to improve knowledge about impact, vulnerability and adaptation are common to all seven countries. The project aims at informing decisions on adaptation to improve health and achieve relevant Millennium Development Goals through:

- building capacity and increasing public awareness of health effects and adaptation;
- carrying out scientific research projects;

- implementing national or local impact, vulnerability and adaptation assessment;
- developing health adaptation plans.

### Country-specific activities

Activities to address the expected health effects of climate change are country specific, reflecting different priorities and needs. Each country has identified health adaptation actions such as disease surveillance, disaster preparedness, primary health care and training of health professionals, control of air pollution, water and food safety, and communication and advocacy. In particular, selected actions focus on:

- health services and collaboration between countries to respond to climate-related health crises;
- climate change, and environment and health information systems;
- strengthening of disease and weather early warning;
- heat-health action plans and safe hospitals in emergencies;
- respiratory disease management;
- cost-effective technology for water treatment for hospitals;
- energy efficiency measures for health services and pilot testing of solar energy in some hospitals;
- technologies to measure air quality;
- contingency planning for basic health services;
- education and training of environment and health professionals.

Communication and advocacy activities aim to raise public awareness of climate change-related health risks and what can be done by policy-makers and individuals. Activities are carried out by national young journalists of the World Health Youth (WHY) Communication Network<sup>1</sup>, an initiative coordinated by the WHO Regional Office for Europe to promote dialogue on environment and health issues.

1 See [http://www.euro.who.int/envhealth/media/20080923\\_1](http://www.euro.who.int/envhealth/media/20080923_1), accessed 17 November 2009.

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# ALBANIA

Albania is a mountainous country in the Mediterranean region with about 70% of the land above 300m. Its over 3 million inhabitants are on average younger than the population of other European countries.

Projected climate changes include higher air temperature; increased frequency of extreme weather events; and a 20% decrease in water runoff with a reduction of up to 60% of power generation. A small increase in the absolute highest air temperature and decrease in the absolute lowest temperature have been observed from 1951–1990.<sup>1</sup> Air pollution episodes are expected to become more frequent in major cities.

## CLIMATE CHANGE AND HEALTH

The consequences of heat-waves, floods, air pollution and changes in infectious diseases are the main health effects expected from climate change.

- A preliminary health impact assessment has shown that additional cardiovascular and respiratory deaths are expected from heat-waves during summer.
- An increase in extreme precipitations is aggravating water-related diseases, damage to health services, accidents and injuries.

- Affecting concentration and dispersion of pollutants, heat-waves frequency and intensity and an earlier onset of pollen seasons, climate change will further worsen air-related health problems in major cities. In the capital of Tirana, particulate matter concentrations are already much higher (348  $\mu\text{g}/\text{m}^3$  as a 24-hour average) than the WHO air quality guideline values, and the prevalence of respiratory diseases is increasing (between 10% and 30% increase from 2001 to 2007). This may be a consequence of traffic increase and the use of small power generators.
- Albania is subject to disease outbreaks of tropical origin such as Chikungunya and dengue. Vectors transmitting these diseases are already present in some areas. Mosquito and rodent mapping is ongoing in the country.

## PROTECTING HEALTH FROM CLIMATE CHANGE IN ALBANIA

To address and prevent potential health threats from climate change, the project *Protecting health from climate change in Albania* undertakes an assessment of the health impact, vulnerability and adaptation to climate change, as a basis for the development of a national health adaptation strategy.

Capacity-building activities, at national and sub-national level, are carried out to help improve the early identification of potential infectious disease risks and outbreaks and contribute to improve disease surveillance systems.

A leaflet developed by young journalists is disseminated among school children to increase awareness of climate change and health.



Specific national action aims at making hospitals safe in emergencies, in particular by strengthening emergency medical services, building further emergency management capacity, and providing guidance for a disaster-proofed health care infrastructure.

Activities also include improving air quality monitoring and reducing air pollution in Tirana, as well as contributing to WHO information platforms by sharing data, tools, results and lessons learnt.

This project fills an important gap in knowledge about the health effects of climate change and adaptation mechanisms. The first workshop on developing a climate change health protection strategy in Albania gave direction to policy action and strengthened the responsibilities of decision-makers and key technical experts.

## CHILDREN AND YOUTH'S INCREASING AWARENESS OF CLIMATE CHANGE AND HEALTH

Albanians are increasingly aware of the damage that climate change is doing to their health. National and local authorities, experts, civil society and the media are partners in the project to involve citizens in tackling climate change for the protection of their health and welfare. Children and youth are the key target audiences of this project, which aims at:

- training university students on climate change and health;
- carrying out school campaigns with dissemination of child-friendly leaflets;
- developing a children's game on climate change and health;
- launching an award for schoolchildren entitled "environmentally-friendly Tirana".

## STRENGTHENING EMERGENCY MEDICAL SERVICES: A TOOL FOR HEALTH ADAPTATION

For the first time, the medical management of health emergencies from extreme weather events is being addressed at the root level: 173 hospital and primary health care doctors and nurses were trained in emergency management. The trainees came from 12 of 36 districts.

They are now able to manage the health crises and consequences of extreme weather events by identifying and treating patients early to avoid deaths and severe health problems from heat-waves, floods, air pollution and infectious diseases; and using tools to make early and accurate decisions on diagnosis and treatment. In this way, they will make an important contribution to the implementation of Albania's national disaster plan.



# KAZAKHSTAN

Kazakhstan is a central Asian country extending over an area of almost 3 million km<sup>2</sup>, with a population of more than 15 million.

During 1936–2005, the average annual air temperature increased by 0.31 °C every decade. Most parts of the country have seen a doubling of the frequency of heat-waves, and a decrease in the duration of cold waves. Aridity in desert areas is growing, jeopardizing water availability and agriculture productivity, which is expected to decrease up to 30%. Kazakhstan already depends on neighbouring countries for almost 50% of water provision.<sup>1</sup> The Government has declared the Aral Sea region, the Semipalatinsk former nuclear region and the heavily polluted industrial eastern area ecological disaster sites; this also refers to the heavy contamination of water sources, which makes climate change-related water scarcity more of concern.

## CLIMATE CHANGE AND HEALTH

Climate change affects health in Kazakhstan directly and indirectly.

- People are already dying as a result of extremely high temperatures, floods, mudflows, and landslides. With a temperature increase of 2–3 °C, mudflow occurrence is estimated to increase tenfold.<sup>1</sup>
- Changes in the distribution of infection-carrying insects (such as mosquitoes and mites) have been observed; the Crimean Congo haemorrhagic fever outbreak being a recent example (see box).

- Reduced water availability and sanitation failures increase the risk of waterborne diseases; while reduced crops can affect nutrition.

The most vulnerable live in rural areas, where families depend on agriculture. Children, the elderly and socially underprivileged people may suffer most, as they have scarce capacity to adapt through such means as drinking enough potable water, promptly getting qualified medical aid and moving to towns. Populations in deprived and polluted areas live in unfavourable weather, environmental, social and economic conditions, resulting in poor public health. A major increase in migration for environmental reasons is expected.

## PROTECTING HEALTH FROM CLIMATE CHANGE IN KAZAKHSTAN

A review identified health adaptation measures that need to be strengthened, such as

- enforcement of the control and treatment of infectious and cardio vascular diseases;
- improvement of the sanitary and hygienic culture of the population, with a special focus on water intake facilities, water collectors, distribution and prompt disinfection;
- support of the establishment of early warning mechanisms;
- provision of guidance and support of pilot tests for adaptation of housing and public structures to extreme conditions;
- emergency management and disaster response.

<sup>1</sup> Kazakhstan's second national communication, to the Conference of the Parties to the United Nations Framework Convention on Climate Change. Astana, Ministry of Environment Protection, 2009.

Building national capacity help improve control and treatment of vector-borne disease related to climate change.



Photo: WHO/B. Muenne

To prevent and address potential health threats from climate change, the project *Protecting health from climate change in Kazakhstan* assesses the health effects of, and vulnerability and adaptation to climate change, as a basis for the development of a national health adaptation strategy.

Capacity-building activities are carried out at the national and subnational levels to help improve the early identification of potential risks and outbreaks of infectious disease and disease surveillance systems.

Specific national action aims to improve emergency preparedness and contribute to WHO information platforms by sharing data, tools, results and lessons learnt.

Given the special character of the various regions in Kazakhstan, adaptation measures for climate change can be efficient only if they are comprehensive.

## TRAINING YOUNG JOURNALISTS TO IMPROVE COVERAGE ON CLIMATE CHANGE AND HEALTH

Climate change and health deserve more attention in Kazakhstan and the quality and quantity of coverage need improvement. This project aims at the creation of a web portal to teach young journalists online about effective ways to write on environment and health, with special focus on climate change in the countries of Caucasus and central Asia.

The web site would use the newest technologies, providing journalists with an innovative tool for learning and networking. It would contain reviewed information on climate change and health and selected articles, radio spots and videos.

## EARLY INFECTIOUS DISEASE IDENTIFICATION: A TOOL FOR HEALTH ADAPTATION

Kazakhstan faced an outbreak of Crimean Congo haemorrhagic fever (CCHF) in 2009. This tickborne disease is highly climate sensitive. Thirty people died and the outbreak illustrated the weaknesses in infectious disease management and control, and highlighted what could happen in the future with increased climate change impacts.

In the framework of the project, a two-day interactive workshop was organized on CCHF in Almaty in September 2009 to identify needs and train health care specialists in disease identification and treatment. The participants recommended activating policy and practice for tick surveillance and control, and exploring options to maximize their impact on public health practice, thus revising the national CCHF control strategy.



## KYRGYZSTAN

Kyrgyzstan is located at the juncture of two mountain systems. About 93% of its territory lies at an elevation higher than 1000 m above sea level. Extreme events, including glacier lake outburst floods and mudslides, are expected to increase as a result of rising temperature.

About 5000 landslides, mudflows and floods threaten almost 95% of settlements located close to water sources; and more than 90% of the lakes are highland, most of which are under danger of bursting every year.<sup>1</sup>

Effects of climate change include a decrease in surface water-flow and glacial water yield and changes in crop cultivation.

### CLIMATE CHANGE AND HEALTH

Projected health effects include deaths and injuries from heat, floods and wildfires, changes in infectious and vectorborne disease patterns, potential nutritional changes from decreasing food yields and loss of livelihoods. Exposure to ultraviolet radiation (UV) already presents a challenge in terms of skin cancer and cataract.

By the end of this century, higher temperatures and more frequent heat-waves are expected to increase the incidence of acute intestinal infectious diseases by 10–15%, and diseases of the circulatory system by 30-50%, compared to 2005.

### PROTECTING HEALTH FROM CLIMATE CHANGE IN KYRGYZSTAN

Health adaptation has been identified as a priority and includes developing:

- scientific research on the health effects of climate change, with science-based forecasts of possible exacerbation of health problems and prevention and adaptation measures;
- a national action plan to prevent the health effects of climate change.

Scientific assessment of health effects from and vulnerability and adaptation to climate change is a basis for the development of a national health adaptation strategy. A national workshop identified the key research gaps for adaptation planning and the need for training of health professionals and raising awareness across the health system.

An important component of the project *Protecting health from climate change in Kyrgyzstan* is technology transfer of efficient renewable energy for health services, particularly those vulnerable to the interruption of the energy supply (see box).

Activities also include providing information to citizens on risks from UV radiation and contributing to WHO information platforms by sharing data, tools, results and lessons learnt.

1 Second national communication of the Kyrgyz Republic to the UN Framework Convention on Climate Change. Bishkek, 2009.

Preparatory interviews are conducted to introduce solar energy in the health sector as adaptation to climate change.



Photo: WHO Country Office, Kyrgyzstan

## ENHANCING A NATIONAL DIALOGUE ON CLIMATE CHANGE AND HEALTH

Knowledge transfer and information sharing on climate change and health can be enhanced through the involvement of the country's stakeholders, including national and local authorities, civil society, citizens and the media.

A wide information campaign through the main national Internet media will disseminate key messages to promote a dialogue on a stronger role for health systems in protecting

people's health from climate change, especially vulnerable groups. Key deliverables include:

- a special edition of the national news agency AKIpress analytical magazine dedicated to climate change and health in Kyrgyzstan;
- online news, articles and experts comments on health and climate change;
- a youth web forum and online polls to conduct a debate on the effects of climate change on health; and
- a public event for media and key national stakeholders.

## THE USE OF SOLAR ENERGY BY THE HEALTH SECTOR: A TOOL FOR HEALTH ADAPTATION

Kyrgyzstan's immense glaciers and snow surfaces represent a strategic resource for all countries in central Asia, a region most vulnerable to climate change. Shrinking of glaciers and snow is resulting in water shortages and could lead to economic, political and environmental problems.

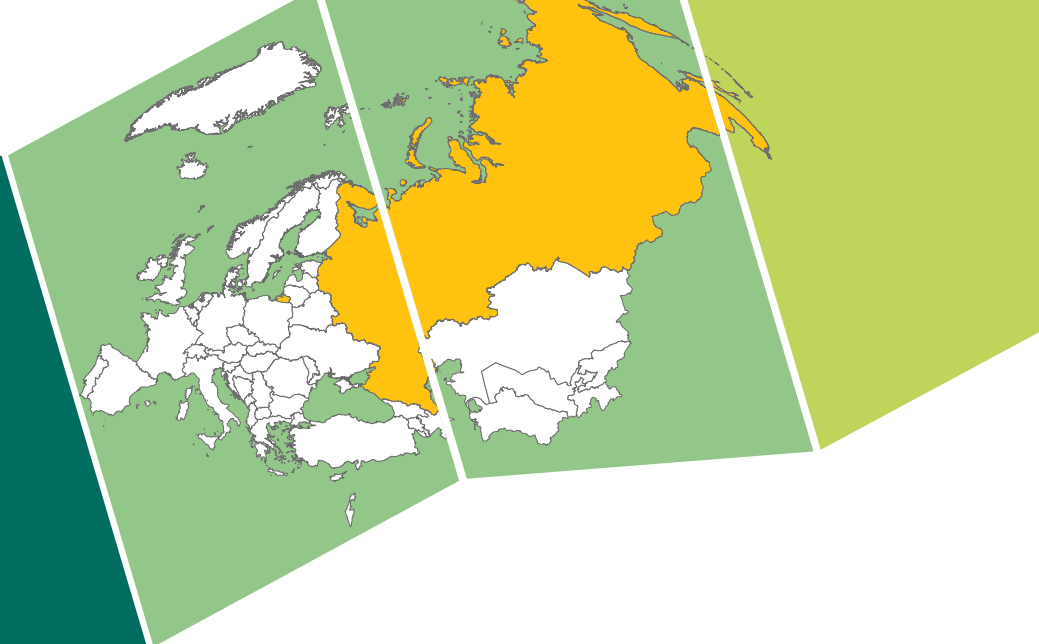
Lack of sufficient hydropower generation capacity entails limitations on the use of electricity particularly in autumn and winter, with serious effects on all aspects of human life. Electricity shortages mainly occur in rural areas, affecting hospitals, first-aid stations and resuscitation units.

Kyrgyzstan has over 300 sunny days a year; there is a great opportunity for the use of renewable energy technologies to generate solar power. The Government acknowledged their importance in adopting the law on renewable energy in January 2009.

The project is introducing renewable energy technologies in five hospitals in different provinces. Solar energy will be used in the health sector for the first time. Solar panels and collectors will ensure increased availability of electricity for patient treatment, and improve the refrigeration of essential medicines and vaccinations.



# RUSSIAN FEDERATION



The Russian Federation is a country with over 144 million inhabitants. Over the last 100 years, the temperature increased on average by 1.29 °C.<sup>1</sup> The effects of climate change are most prominent in the Arctic region, where the coverage of the sea ice has been reducing by 9% every decade and the river runoff has substantially increased. For example, the runoff of the Volga river increased by 15–40%.

## CLIMATE CHANGE AND HEALTH

The effects of climate change on the health of the Arctic population can vary considerably depending on factors such as age, gender, socioeconomic status, lifestyle, culture, location and the capacity of local health infrastructure and systems to adapt.

There are several health concerns from climate change, particularly for Arctic populations. In the pilot area – the Arkhangelsk region including the Nenets Autonomous Okrug – the following effects might occur:

- reduced access to health care due to fewer travelling days on the tundra from permafrost thawing (100 per year compared to over 200 days 30 years ago);
- increased risks of unexpected infectious disease outbreaks from changes in zoonoses, bird migration, and tick and mosquito distribution;
- increased mortality and morbidity from extreme weather events;
- particular stress to indigenous populations.

## PROTECTING HEALTH FROM CLIMATE CHANGE IN THE RUSSIAN FEDERATION

To prevent and address potential health threats from climate change, the project *Protecting health from climate change in the Russian Federation* assesses the health effects of, and vulnerability and adaptation to climate change, as a basis for the development of a national health adaptation strategy. This strategy is also to be implemented in other Arctic regions.

Specific action aims to improve the delivery of primary health care in areas of the district particularly affected and at increasing security from potential infectious diseases associated with climate change, in particular water- and vectorborne diseases.

Activities also involve providing information for decision-makers, including on early detection of infectious diseases, and contributing to WHO information platforms by sharing data, tools, results and lessons learnt.

This project is filling an important gap in knowledge on the health effects of climate change and adaptation mechanisms. WHO, in cooperation with the Northern Medical State University in Arkhangelsk, organized a first workshop on building capacity to assess vulnerability and adaptation to climate change in the region in September 2009 (see box).

1 Assessment report on climate change and its consequences in the Russian Federation. General summary. Moscow, Federal Service for Hydrometeorology and Environmental Monitoring, 2008.



Alternative ways of transport are needed for health emergencies as permafrost thawing decreases travelling days on the tundra.

PhD, Leonid Zubov, Polar Medicine  
Research Institute, Russian Federation

## ENHANCING A REGIONAL–NATIONAL DIALOGUE ON CLIMATE CHANGE AND HEALTH

Knowledge transfer and information sharing on climate change and health between the regional and national levels can be enhanced through the involvement of stakeholders at both levels. A communication strategy relevant to the project is being developed.

## BUILDING CAPACITY IN CLIMATE CHANGE AND HEALTH: A TOOL FOR HEALTH ADAPTATION

The project aims to build capacity in climate change and health by engaging a number of stakeholders to provide ownership and sustainability, and allowing risk management. Based on a stakeholder analysis, a multidisciplinary advisory committee was set up at the national level, complemented by a working group at the regional level.

In this framework, the Northern Medical State University took the lead in assessing health effects and adaptation capacity in the Arkhangelsk region, including the Nenets Autonomous Okrug. The evaluation focused in particular on:

- defining the current burden of climate-sensitive health outcomes and the most vulnerable groups;
- projecting changes in health effects over the coming decades;
- identifying what needs to be strengthened and the estimated costs and benefits;
- ascertaining the potential health risks of adaptation and mitigation measures implemented in other sectors.

Particular attention was devoted to the Nenets Autonomous Okrug, a northern region whose population has particular difficulties in accessing health care, putting their health more at risk. The assessment identified the main areas for action, including:

- high/low temperature impact, cardiovascular/respiratory diseases and mortality;
- vectorborne infectious diseases, including encephalitis;
- food- and waterborne diseases;
- climate change, ozone-layer depletion and melanoma;
- emergencies due to weather anomalies and health.



# TAJIKISTAN

Tajikistan is a landlocked country located in central Asia, covering an area of over 143 000 km<sup>2</sup> with 7 million inhabitants. Mountains occupy 93% and glaciers 6% of the territory. Hydropower provides 98% of the national energy with 70% of the population earning its living from agriculture.

Tajikistan is exposed to all types of natural disasters from earthquakes to frequent landslides and glacier lake outburst floods, and related-damage has increased 2-3 times. Every year 600 families are subjected to forced migration from the effects of natural disasters that make their land and villages inhabitable.

The number of days with extremely hot weather has doubled since 1940 and on average glaciers have retreated of one third while the drought index has increased with severe drought events occurring in 1971, 2000 and 2001<sup>1</sup>. A major cold wave affected Tajikistan in 2007, freezing rivers and interrupting hydropower production.

## CLIMATE CHANGE AND HEALTH

Climate change related health effects are expected from an increase in the frequency and intensity of extreme weather events, such as heat-waves and droughts and changes in hydrological cycles causing drought, mudflows, landslides, glacier lake outbreak floods, avalanches. Longer term consequences are expected to impact on the nutritional

status of the population from a reduction in agriculture and pasture productivity. Changes in biodiversity and ecosystems have a potential for infectious disease outbreaks and for changes in the ranges of water and foodborne diseases.

One of the main problems in Tajikistan is related to the precarious health care infrastructure; in particular in most health facilities, heating, water supply, sewage and sanitation, electricity and communication systems are unsatisfactory. Any extreme event can affect the health system even more. Most rural schools and medical institutions lack proper sanitation and water facilities.

## PROTECTING HEALTH FROM CLIMATE CHANGE IN TAJIKISTAN

To address and prevent potential health threats from climate change, the project *Protecting health from climate change in Tajikistan* undertakes an assessment of the health impact, vulnerability and adaptation to climate change, with a particular focus on the health system as a basis for the development of a national health adaptation strategy.

Capacity building activities, at national and subnational level, are carried out to help improve the early identification of potential infectious disease risks and outbreaks and contribute to improve disease surveillance systems.

1 Makhmalaliev et al. *The second national communication of the Republic of Tajikistan under the United Nations Framework Convention of Climate Change*. Dushanbe, State Agency for Hydrometeorology of the Committee for Environmental Protection, 2008 ([http://unfccc.int/essential\\_background/library/items/3599.php?such=j&symbol=TJK/COM/4%20E#beg](http://unfccc.int/essential_background/library/items/3599.php?such=j&symbol=TJK/COM/4%20E#beg), accessed 17 November 2009).



Health care infrastructures are being strengthened to avoid damage from extreme climate events.

Photo: WHO/S. Keshimova

Specific action aims at transferring cost-effective technologies to improve water and energy security for health care institutions.

Activities also include a contribution to WHO information platforms by sharing data, tools, results and lessons learnt.

This project fills an important gap in knowledge about the health effects of climate change and adaptation mechanisms. The first workshop on developing a climate change health protection strategy in Tajikistan gave direction to policy action and strengthened the responsibilities of decision-makers and key technical experts.

## SHOWING THE HEALTH EFFECTS OF CLIMATE CHANGE THROUGH DOCUMENTARY FILMS

The health effects of climate change capture more and more attention of scientists, the international community and the citizens in Tajikistan. This project aims at showing the effects of the changing climate in the country and raising the awareness especially of children and the young generation that risk to bear the biggest burden in the future.

A long and short version of a documentary film is planned to be produced and broadcasted through the national television Safina. Media article accompany the images with publication of written stories. The video is planned to be presented at the Fifth Ministerial Conference on Environment and Health in March 2010.

## MAKING HOSPITALS AND COMMUNITIES RESILIENT TO CLIMATE CHANGE: A TOOL FOR HEALTH ADAPTATION

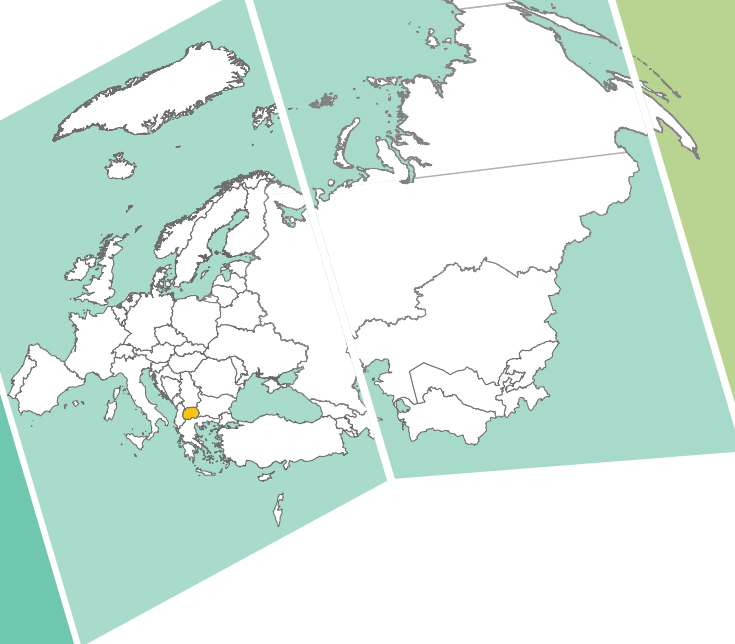
Water safety in health care facilities is key for the safety of medical and support staff, patients and people who flock to hospitals under emergency situations i.e. from floods, droughts, cold waves. In the framework of this project, water safety plans for hospitals are developed, including:

- detailed mapping of the water and sanitation system
- identification of the hazards
- assessment of the risks
- risk management process and identification of control points

- advice on improvement of the operation
- maintenance of infrastructure for production and distribution.

Small scale water supply systems are the most predominant source of water, 55% of which resulting from untreated surface waters. Due to the lack of disinfection systems, a demonstration project on chlorination system is implemented using hypochlorite prepared in situ by electrolysis of common salts. The selection of the small scale system depends on the results of a questionnaire distributed to national authorities.

# THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA



This country has 2 million inhabitants on a mostly hilly and mountainous landlocked territory in south-eastern Europe, spreading over 25 000 km<sup>2</sup>. According to climate change scenarios the average increase in temperature could reach 3.8 °C in 2100, and the average decrease in precipitation could be up to -13% compared with 1970–1990 averages. More frequent and more intense heat-waves, droughts and flood events are expected<sup>1</sup>.

## CLIMATE CHANGE AND HEALTH

Over the next decades, a substantial decrease in excess deaths in the colder months is expected (i.e. a 4% decrease in January and October). On the other hand, there could be an increase in excess deaths between 4% and 11% in some summer months (mostly in April, May and June) with an average increase of 10% compared to 1996–2000. People with chronic diseases, especially cardiovascular and respiratory conditions, are at higher risk of increased mortality during heat-waves, compared to healthier groups. Deprived communities that lack wealth, social institutions, environmental security and good health conditions, are likely to suffer more from the adverse health effects of climate and other environmental changes.

More frequent floods in the last years (five registered in 2003–2009) resulted in infrastructural damage to houses, roads and bridges as well as to agricultural facilities and

water supply systems, with an indirect influence on the occurrence of climate change-related infectious diseases, particularly through contaminated water.

## PROTECTING HEALTH FROM CLIMATE CHANGE IN THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

To address and prevent potential health threats from climate change, the project *Protecting health from climate change in the former Yugoslav Republic of Macedonia* undertakes an assessment of the health impact, vulnerability and adaptation to climate change, as a basis for the development of a national health adaptation strategy.

Specific action aims at implementing heat-health action plans and piloting energy-efficient health services, through investments and technology transfer as a means to develop early information on climate-related infectious disease risks and to protect health from heat.

Activities also include a contribution to WHO information platforms by sharing data, tools, results and lessons learnt.

This project fills an important gap in knowledge about the health effects of climate change and adaptation mechanisms. The first workshop on developing a climate change health protection strategy in the former Yugoslav Republic of Macedonia gave direction to policy action and strengthened the responsibilities of decision-makers and key technical experts.

1 Azievska M et al. *Second national communication on climate change*. Skopje, Ministry of Environment and Physical Planning, 2008 (<http://unfccc.int/resource/docs/natc/macnc2.pdf>, accessed 17 November 2009).

Assessment of energy efficiency is conducted in pilot hospitals to reduce emissions and adapt to climate change.

Photo: WHO Country Office, the former Yugoslav Republic of Macedonia

## **BUILDING MEDIA CAPACITY TO IMPROVE THE QUALITY AND QUANTITY OF STORIES ON CLIMATE CHANGE AND HEALTH**

The quality of information on climate change and health in the countries of the south-eastern European Region has a role in raising public awareness and increasing participation in these issues.

The project aims to contribute to the improvement of media coverage on climate change and health in the country by engaging

journalists in increasing the quality and quantity of their reporting and stimulating networking. In particular it aims to:

- train journalists on climate change and health including through an on-line resource centre;
- organize field trips and press conferences for journalists to facilitate the production of analytical stories and videos;
- establish a journalists' network on environment and health in the south-eastern part of the Region including through an on-line forum.

## **GREENING THE HEALTH SECTOR THROUGH REDUCTION OF GREENHOUSE GAS EMISSIONS IN HEALTH INSTITUTIONS: A TOOL FOR HEALTH ADAPTATION**

The general hospitals in Shtip and Gostivar are piloting the implementation of measures to reduce greenhouse gas emissions by the health sector. This is achieved by improving energy efficiency and introducing renewable sources of energy.

An energy efficiency assessment of the two health institutions identified the best ways to increase energy efficiency and the most suitable equipment to generate energy from renewable sources. This includes the safety of plant operators, hospital personnel and patients; plant operation and maintenance; and energy efficiency and atmospheric emissions. Appropriate measures are evaluated based on savings in energy use, emissions and running costs, and the overall benefit for hospital patients and personnel.

These measures will help reduce greenhouse gas emissions at municipal level and raise awareness of health managers and staff on the effects on climate change. Training of hospital staff is expected to change their behaviour towards energy saving and protection of the environment.

This pilot initiative can in turn promote private and public partnerships in the country. Lessons learnt have a potential large-scale application helping reduce government expenditure; adapting to heat and cold; and providing a model for the government to carry out independent measures and programmes.



## UZBEKISTAN

This landlocked central Asian republic has an area of almost 450 000 km<sup>2</sup> and a population of nearly 27 million. Intensive warming is observed in the whole territory, with an average annual temperature increase of 0.29 °C since 1951, especially during the last decade. By 2050, the water flow may decrease by 2–5% in the Syrdarya River Basin and by 10–15% in the Amudarya River Basin and crop production drop up to 13% and up to 23% respectively in the two areas.

The North-western part of the country, the Republic of Karakalpakstan, is known because of the Aral Sea crisis. The Aral Sea desiccation has resulted in several damages to the territory, including reduction of agriculture production and animal husbandry. From the salt desert formed on the bare sea bottom, winds blow over 100 000 tonnes of salt and dust to surrounding territories annually.

### CLIMATE CHANGE AND HEALTH

Climate change can increase heat stress and waterborne infections, the latter expected to raise by 8–10% by 2050 compared to 1990. There are concerns that vectorborne diseases such as malaria could spread, especially in Surkhandarya, Tashkent, Syrdarya provinces and the Ferghana Valley.

The socioeconomic situation in Karakalpakstan is one of the worst in the country, with gross domestic product per capita less than half the country average. The vast extension of this area hampers access to various services and especially health services.

Dust storms are a common phenomenon here, caused by water shortages and increasing aridity coupled with land degradation problems. Exposure to dust, which contains particulate matter (PM) at very high concentrations, is one of the main health risks. It can be assumed that the PM<sub>10</sub> levels are not less than 100 µg/m<sup>3</sup>, thus largely exceeding the WHO guidelines. This dust is contaminated by pesticides, the levels of which rise with proximity to the Aral Sea.

Lung disease rates are the highest in this region, with mortality from respiratory diseases three times higher than in the rest of the country. Deaths from acute and chronic respiratory infections in children under five also register the highest rates.

### PROTECTING HEALTH FROM CLIMATE CHANGE IN UZBEKISTAN

To address and prevent potential health threats from climate change, the project *Protecting health from climate change in Uzbekistan* undertakes an assessment of the health impact, vulnerability and adaptation to climate change, as a basis for the development of a national health adaptation strategy.

Specific action aims at addressing early warning and early respiratory disease case detection, and at assessing the effects of climate change on nutrition through a pilot survey, as part of the implementation of the WHO European Action Plan for Food and Nutrition Policy.

Activities also include a contribution to WHO information platforms by sharing data, tools, results and lessons learnt.



A protocol on lung health and early dust warning will help reducing respiratory diseases from exposure to dust.

Photo: WHO/T. Wolf

This project fills an important gap in knowledge about the health effects of climate change and adaptation mechanisms. The first workshop on developing a climate change health protection strategy in Uzbekistan gave direction to policy action and strengthened the responsibilities of decision-makers and key technical experts.

### PROMOTING INFORMATION CAMPAIGNS ON CLIMATE CHANGE AND HEALTH IN KARAKALPAKSTAN

This project aims to increase people's awareness of the situation in Karakalpakstan through information campaigns, engaging

experts as trusted sources and the media as wide-reaching channels. Targeted messages are developed for varied audiences to increase understanding of the damage to environment and health, how to reduce exposure and protect health. Early warnings of extreme weather events are an important feature of the campaign, also involving local opinion leaders.

Key activities include regular coverage of climate change and health especially in the Aral Sea area through video and radio news, newspaper, internet and magazine articles, and information bulletins.

### EARLY WARNING AND PROTECTION FROM RESPIRATORY DISEASES: A TOOL FOR HEALTH ADAPTATION

Respiratory diseases represent the highest health burden in north-western Uzbekistan. The introduction of a protocol on lung health is expected to significantly reduce deaths and illness from chronic lung diseases, including from tuberculosis.

Technology transfer and capacity development in the early detection and management of respiratory disease cases are carried out through:

- international expert assessment and collaboration with local authorities;
- establishment of a national/regional working group on practical approaches to lung health protocol (PAL);

- adaptation and development of national PAL guidelines and training materials for implementation and translation into the local language;
- early warning systems for dust storms; and
- air quality assessment.

Specific activities would also improve the prevention of respiratory diseases. These range from mapping existing activities and measures in the pilot area, to installation of necessary equipment, training of personnel on case finding, and monitoring and evaluation of the effectiveness of developed measures over time.