

CLIMATE CHANGE HEALTH ADAPTATION STRATEGY

.....
and ACTION PLAN of
the former Yugoslav Republic of Macedonia



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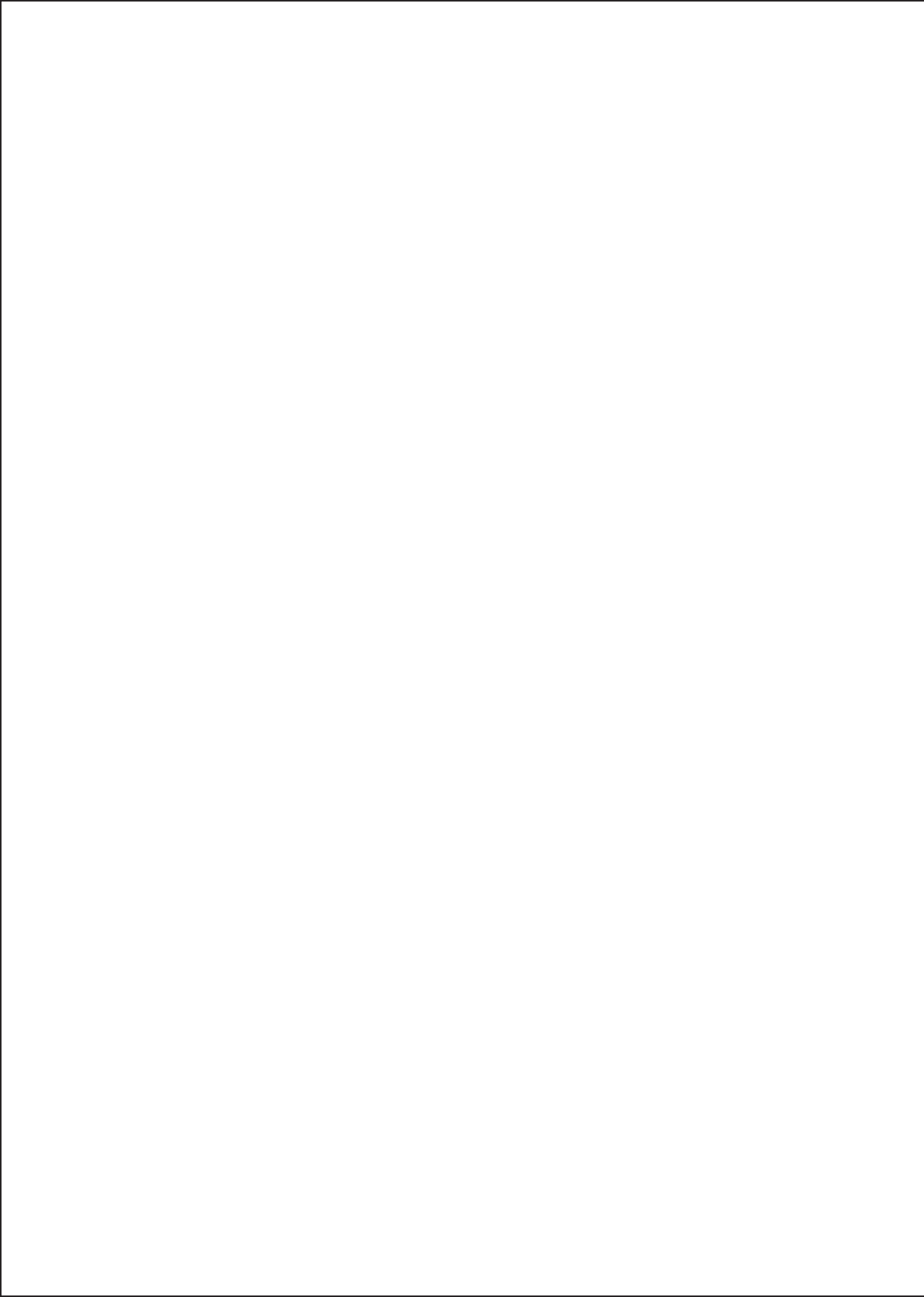
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Abbreviations

BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
CMC	Crisis Management Centre
DPR	Directorate for Protection and Rescue
HMI	Hydrometeorological Institute
MoH	Ministry of Health
NPHI	National Public Health Institute
OHI	Occupational Health Institute
LG	Local Government
MLSA	Ministry of Labour and Social Affairs
MRC	Macedonian Red Cross
MoEPP	Ministry of Environment and Physical Planning
PHC	Public Health Centre
SSHI	State Sanitary and Health Inspectorate
ULS	Local government units
WHO	World Health Organization



“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 vector-borne diseases and plant distribution – directly and indirectly, climate change profoundly affects health.”

Dr Margaret Chan, WHO Director-General

EXECUTIVE SUMMARY

Climate change affects everyone, but not everyone is equally vulnerable because factors such as geographical location, health system, age, social class and support systems determine the effect of climate change on people.

The need for developing a Climate Change Health Adaptation Strategy arose from the relevance of this issue on a global, regional and national level, the necessity to prepare and respond to climate-change-associated health risks and the need for interdisciplinary cooperation and exchange of relevant data with other sectors that could contribute to improving the health status of the population in the former Yugoslav Republic of Macedonia.

The Strategy has been developed by the Climate Change and Health Commission of the Ministry of Health, comprising representatives from various sectors: the Ministry of Environment and Physical Planning, the National Public Health Institute, the Institute of Occupational Health, the Crisis Management Centre, the Directorate for Protection and Rescue, the Hydrometeorological Institute, the State Sanitary and Health Inspectorate, the Public Health Centre of the City of Skopje, Emergency Medical Services and the Macedonian Red Cross.

The National Climate Change Health Adaptation Strategy of the former Yugoslav Republic of Macedonia envisages objectives and activities that will be carried out by the health sector in cooperation with the other relevant sectors in the country. Its goal is to interlink with other strategies in this area developed by other sectors and to form part of the chain of activities aimed at reducing the impact of climate change on people's health in the former Yugoslav Republic of Macedonia.

On the basis of analysis of the conditions caused by climate changes in the former Yugoslav Republic of Macedonia, the following priority domains of action have been defined:

- Raising climate change awareness and the effect on health in the former Yugoslav Republic of Macedonia;
- Identifying, registering and monitoring risks connected with climate change and their influence on people's health; and
- improving the health system in its promotion, prevention and timely response to climate change risks for people's health.

The general goal of the strategy is to plan climate change adaptation measures for the health system in order to prevent and/or overcome both existing and future risks and to respond promptly to the risks and problems for people's health and well-being that are expected as a result of climate change in the the former Yugoslav Republic of Macedonia.

The following specific goals are envisaged as part of the implementation of this Strategy:

1. Provide a coordinated approach and functional cooperation between the sectors and the relevant institutions in terms of effective and efficient use of the available resources;
2. Raise public awareness about climate change and its effect on health;
3. Establish an integrated, efficient and effective approach for prevention, early warning, management and overcoming of the effects of climate change due to heat-waves.
4. Overcome the climate change health consequences connected with air pollution and cold weather during winter, by establishing control and preventive measures.
5. Establish an integrated, efficient and effective approach for prevention, early warning, management and overcoming of the effects of climate change as a result of increased UV radiation.
6. Control and prevention of allergic diseases caused by pollen in the context of climate change.
7. Establish an integrated, efficient and effective approach for prevention, early warning, management and overcoming of the effects of climate change connected to floods and fires.
8. Protection from climate-change-related communicable diseases.

Coordination of cooperation between the institutions involved will be provided by the Ministry of Health, which is in charge of monitoring the level of implementation of the Strategy and the Action Plan. The institutions responsible for implementing the activities of the Action Plan of this Strategy should allocate funds from within their institutional budget for conducting these activities.

The activities connected with raising public awareness and the preparation of promotional materials will be a joint action by the government and non-government sectors, with technical support from the scientific sector, through research in the area of climate change and health on a national, regional and international level.



PREFACE



The climate change process has already started and efforts should be concentrated towards the assessment of the current and future vulnerability of the population in the former Yugoslav Republic of Macedonia, with the aim of identifying the necessary interventions and adaptation options and realizing the objectives and actions of this Strategy.

The influence of global climate change, including its effects on people's health, can be reduced or avoided by undertaking measures for adaptation.

The primary goal of the climate change adaptation measures in the health sector is to reduce the burden of disease, injury, invalidity, suffering and morbidity. The adaptation measures are not solely intended for the health sector, they are also relevant to other fields and sectors such as energy, sanitation and water supply, education, agriculture, economy, tourism, transport, development and housing, etc.

In 2009, the World Health Organization, Regional Office for Europe, with financial support from the German Federal Ministry of Environment, Nature Conservation and Nuclear Safety, began the implementation of activities related to protecting health from climate in seven countries of the WHO European Region, including the former Yugoslav Republic of Macedonia. In the former Yugoslav Republic of Macedonia, these activities are being carried out as a part of the Biennial Collaborative Agreement between the World Health Organization and the Ministry of Health, as part of the priority "Protecting health from climate change", in order to strengthen the capacity of the health system to respond to climate-change-associated health risks.

INTRODUCTION



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There is now widespread agreement that the earth is warming, due to emissions of greenhouse gases caused by human activity. It is also clear that current trends in energy use, development and population growth will lead to continuing – and more severe – climate change. The changing climate will inevitably affect the basic requirements for maintaining health: clean air and water, sufficient food and adequate shelter. The warming of the planet will be gradual, but the effects of extreme weather events – more storms, floods, droughts and heat-waves – will be abrupt and acutely felt (WHO 2008a). The efforts need to be focused on the evaluation of current and future health vulnerability, in order to identify the necessary interventions and measures for adaptation. The adaptation measures will contribute towards reducing the impacts of climate change but it is not expected that they will also prevent all the negative impacts. Early planning and preparation of the health system is essential for reducing or avoiding the effects of climate change on people's health in the near and distant future.

The scientific evidence shows that climate change has influenced the distribution of the vectors through which certain communicable diseases are transmitted, and that it has also affected the seasonal distribution of some specific allergenic types of pollen. Also, the number of deaths due to heat-waves has increased. Another problem is air pollution, the increased intensity of UV radiation and the anticipated increase in morbidity and mortality from diseases and injuries caused by extreme weather events, such as floods, storms, fires, landslides and droughts. While climate change will affect everybody, not everybody is equally vulnerable. A number of factors, like geography, health-system preparedness, health status, age, social class and support systems, determine how much people's health will be endangered (WHO 2008b). Climate change can significantly worsen health inequities and put additional stress on poorer groups. When it comes to affecting the health of the most vulnerable, tackling climate change cannot be a choice, it is a must.

Economic development represents an important adaptation component but the manner in which the economic growth is realized, the allocation of the gains from that growth, as well as the factors which immediately influence people's health, such as education, health protection and public health infrastructure, will be of crucial importance.

There is evidence of a possible reduction of morbidity and mortality through strengthening and implementing early warning systems, strengthening the preparedness and the response of the health services, as well as appropriate urban planning and housing. The adaptation measures should be in place in order to reduce the effects of climate change on people's health by implementing various preventive measures.

One way of improving the level of adaptation and reducing the level of vulnerability from climate change in the health sector is by strengthening public institutions; building health systems that will function well, providing the correct treatment and universal primary health care; providing appropriate education, thus creating a demand for better and more available services and appropriate staff. The infrastructure of the health system has to be able to adapt to deal with extreme events. Appropriate training must be provided to health workers so that they are aware of the threats posed by climate change (WHO 2005).

Adaptation is required to reduce the current vulnerability from climate change, which is already a reality, and further adaptation will be needed in order to respond to the health risks that are foreseen to happen during the next decades. The capacities for climate change adaptation need to be improved in all sectors at all levels.

CURRENT STRATEGIC AND LEGISLATIVE FRAMEWORK IN THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

1. The Constitution of the former Yugoslav Republic of Macedonia contains regulations for the protection of the living environment and the protection of people's health. Article 8 of the Constitution lays down one of the fundamental values of the constitutional order: the structuring and humanizing of the physical space and protection and improvement of the environment and nature. One of the basic human rights laid down in Article 43 Paragraph 1 of the Constitution of the former Yugoslav Republic of Macedonia is the right to a healthy living environment. Everyone is obliged to promote and protect the environment. The Republic provides conditions for the exercise of the right of citizens to a healthy environment. (Article 43, Paragraph 3). The right to health protection is guaranteed to every citizen (Article 39, Paragraph 1).

2. The former Yugoslav Republic of Macedonia ratified the Framework Convention of the United Nation for Climate Change (UNFCCC) in 1997 and the Kyoto Protocol in 2004. The Ministry of Environment and Physical Planning is the national contact point for UNFCCC and for implementing the Kyoto Protocol. The First National Communication on Climate Change was adopted by the Government of the former Yugoslav Republic of Macedonia and submitted to the UNFCCC Secretariat in 2003, and the Second National Communication on Climate Change in 2008.

3. The former Yugoslav Republic of Macedonia, as a candidate country for full EU membership, is building its development on a foundation of respecting the EU priorities. Climate change is one of the four major priorities of the EU, which has taken a leading role in the international negotiations to reach political agreement on action to reduce and adapt to climate change. Within its abilities and status in the Convention, the former Yugoslav Republic of Macedonia contributes towards the realization of pledges by the EU and the international community, including the implementation of the recommendations and key elements contained in the so-called European Union White Paper for adaptation. The Government of the former Yugoslav Republic of Macedonia strives to incorporate the recommendations of the national climate change reports (Second National Climate Change Communication adopted in December 2008 and National Strategy for Clean Development Mechanism for the first period of obligations under the Kyoto Protocol, 2008-2012, adopted in February 2006) into other strategic and planning documents at state level, e.g. the National Strategy for Sustainable Development, the Waste Strategy, etc.

4. In the National Strategy for Sustainable Development, the issue of climate change is identified as one of the key issues which affect several sectors, like energy, agriculture, industry, health, etc.

5. Other strategic documents where the climate change question is being addressed include the Second National Environmental Action Plan, the National Strategy for Adapting to EU, the National Strategy for Investment in the Environment, the draft Strategy for Complex Energy Development, etc.

6. National climate change indicators have been developed and this issue is analysed in the report on the state of the living environment 2010.

7. The Ministry of Environment and Physical Planning is the state agency in charge of environmental policy and also coordinates the climate change activities. The Ministry of Health is in charge of the adaptation of the health sector to the effects of climate change. The prevention or reduction of the possible consequences for people's health is carried out in cooperation with other relevant institutions.

8. The international agreements for global environmental issues, such as climate change, include the principle of sustainable development and the cautionary principle. These are incorporated in the environmental legislation and provide the foundation for political decisions in the sphere of climate change.

9. The Physical Plan of the former Yugoslav Republic of Macedonia (adopted 2004), which has a strategic and developmental emphasis and also defines and ascertains developmental goals and directions, provides a basis for organizing, structuring, using and protecting the physical environment in the former Yugoslav Republic of Macedonia over a time frame of 20 years. Research on the protection of the living environment and nature, built into the Plan, determines goals and planning decisions for protection and development of the environment, as part of all the corresponding activities.

THE SIZE OF THE PROBLEM IN THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

3.1 Climate change

The country has a transitional climate from Mediterranean to continental. The summers are hot and dry and the winters are moderately cold. Average annual precipitation varies from 1700 mm in the western mountainous area to 500 mm in the eastern area. In July the average temperature is 20–23 °C and in January it is -20–0 °C. The warmest regions are Demir Kapija and Gevgelija, where the temperature in July and August frequently exceeds 40 °C.

Between 1971 and 2000, the annual mean temperature increased by -0.1 °C to 0.2 °C in comparison to the period 1961–1991. Recorded values for the period 1996–2005 are 1.3 °C higher for Demir Kapija and Prilep, 1.4 °C higher for Stip and Bitola and 1.5 °C higher for Skopje. Significantly higher mean annual temperatures were also recorded in 1999, 2002, 2003 and 2007, with the most dramatic variations of temperature recorded during the summer period. According to climate change scenarios, the average increase of temperature may reach 3.8 °C in 2100 and the average decrease in precipitation may be 13% compared with 1970–1990 averages.

Precipitation is generally characterized by uneven spatial and temporal distribution over the country, because of the complex orthography which affects the pluvial regime across the months, seasons and years. Such distribution is accompanied by alternating periods of long drought and high-intensity rainfall. These dramatic changes contribute to soil erosion and land degradation. On an annual level, compared to the period 1961–1990, over the last 20 years decreased precipitation has been recorded, especially in 1988–1990, 1992–1994, 2000 and 2001. More frequent and more intense heat-waves, droughts and flood events are expected.

The biggest increase in air temperature by the end of the 21st century is expected in the summer period, accompanied by the most intense decrease in rainfall. Practically no change in rainfall is expected for the winter period but reduction in all other seasons is anticipated. Nevertheless, scientists agree that with an increase of temperature above the threshold of 2 °C, the risks for people's health in this century will also increase. A significant increase in environmental catastrophes is also to be expected.

More frequent and more severe periods of drought and heavy rainfall are expected. The total availability of water in the country (the basin of the River Vardar) is expected to reduce by an average of 18% by 2100.

In 2000, total CO₂-eq emissions in the former Yugoslav Republic of Macedonia were 14 318 kt. Most emissions (70%) come from the energy sector, with each of the remaining sectors (agriculture, waste, transport) contributing less than 10%.

3.2. Health effects

The connections between climate change and health are very complex. The ambient temperature directly influences potentially fatal diseases and conditions. Extreme weather events, the effects of air pollution, changes in the distribution of spores and moulds influence people's health. There are other, more indirect, influences, such as those that affect the distribution of diseases connected with drinking water or food, or diseases that are transmitted through vectors and zoonoses, or health conditions due to lack of food and water.

In the coming decades, a decrease in the percentage of the total average monthly morbidity in the country is expected in some of the colder months (January 4%, October 4% and November 2%) as a result of climate change. On the other hand, the direct health effects of heat-waves could be a significant problem, especially in the context of increased urbanization. More than 60% of the population lives in the cities. According to projected scenarios for mortality trends in the country and Skopje for the period after 2035, an increase in average monthly temperatures of only 1°C compared to the period 1996–2000 will significantly influence the distribution of total mortality expressed as a monthly average. This increase in the monthly mortality rate would be higher in the months of April, May and June (4–11%) and on average 10% higher compared to the period April, May and June 1995–2004. People with chronic diseases, especially cardiovascular and respiratory diseases, have a high risk of increased mortality during heat-waves (Kendrovski 2006).

Floods are especially frequent. Five substantial floods were recorded during the period 2003–2009, that caused damage to homes, roads and bridges, as well as to agricultural fields and water supply systems, which can indirectly lead to higher intensity and frequency of diseases that are transmitted through contaminated water and food. Indirectly these changes can lead to reduction in the sources of food and drinking water, loss of homes, as well as loss of some species of plants and animals.

The indirect effects of climate on food production, water supply and epidemic outbreaks of diseases transmitted through water, food and vectors can also contribute to the consequences of climate change for people's health. Projections for the seasonal index of food poisoning caused by salmonella in the former Yugoslav Republic of Macedonia in 2030, in the context of the increase in average monthly temperatures, suggest a possible additional peak in the colder months as a result of higher temperatures in the future (Kendrovski 2006).

It is predicted that exposure to climate change which is significant for people's health will lead to:

- increase in malnutrition and similar disorders, including disorders connected with child growth and development;
- increase in morbidity for diseases and injuries resulting from heat-waves, floods, storms, fires and drought;
- changes in the distribution of vectors through which certain communicable diseases are transmitted;
- increase in cardio-respiratory morbidity and mortality connected with tropospheric ozone; and
- certain positive effects on the people's health (fewer deaths caused by cold), although it is expected that those positive effects will be much smaller in number than the negative effects of rising temperatures all over the world, especially in developing countries.

Poor communities, without access to good health protection and support from the social sector, are more susceptible to the unpleasant health effects that arise from the climate and other changes in the living environment. People with pre-existing diseases, especially cardiovascular and respiratory diseases, have a high risk of increased morbidity during heat-waves (Confalonieri et al. 2007).

The health system in the former Yugoslav Republic of Macedonia has to respond to all of these challenges and risks. The health risk assessment is still insufficient due to the inadequacy of the existing information for climate change on a regional and national level and for people's exposure, as well as the complexity of the risk interactions during multiple and frequent exposure. The risk assessment for people's health is further complicated by the existence of vulnerable groups such as children, chronically ill, elderly people, pregnant women, people with bad diets or poor socioeconomic living conditions, whose location and size is usually difficult to determine. The clear identification of these groups and meeting their additional health care needs will be a priority activity of both leading sectors – the Ministry of Health and the Ministry of Environment and Physical Planning.

Following analysis of the conditions caused by climate change in the former Yugoslav Republic of Macedonia, the following priority domains of action have been defined:

- Raising awareness of climate change and its effect on health in the former Yugoslav Republic of Macedonia;
- Identifying, registering and monitoring of risks connected with climate change and its influence on people's health; and
- Improving the health system in its promotion, prevention and timely response to climate change risks to people's health.

GOALS OF THE CLIMATE CHANGE HEALTH ADAPTATION STRATEGY

The general goal of the strategy is to plan climate change adaptation measures for the health system in order to prevent and/or overcome both existing and future risks and to respond promptly to the risks and problems for people's health and well-being that are expected as a result of climate change in the the former Yugoslav Republic of Macedonia.

Goal 1:

Provide a coordinated approach and functional cooperation between the sectors and the relevant institutions in terms of effective and efficient use of the available resources.

Actions:

- 1.1 Set up an intersectoral body for functional cooperation and coordination in terms of effective and efficient use of the available resources, comprised of representatives from the Ministries of Health, Environment and Physical Planning, the Crisis Management Centre, DPR, Macedonian Red Cross and the Hydrometeorological Institute.
- 1.2 Improve cooperation between the institutions.
- 1.3 Continuous monitoring of the risks connected with climate change and their influence on health, and upgrading the health system's capacities for prevention.

Goal 2:

Raise public awareness about climate change and its effect on health.

Actions:

- 2.1 Education of and provision of regular information to the public on climate-change-induced health problems.
- 2.2 Introduction of climate-change-related modules into graduate and postgraduate curricula.

Goal 3:

Establish an integrated, efficient and effective approach for prevention, early warning, management and overcoming of the effects of climate change due to heat-waves.

Actions:

- 3.1 Conduct regular health monitoring of the effect of heat-waves on morbidity.
- 3.2 Identify vulnerable groups and define specific prevention measures.
- 3.3 Identify preventive measures for heat-wave protection in health institutions and training of health personnel.
- 3.4 Introduce measures to reduce heat exposures in health, social and educational institutions.
- 3.5 Create cool zones within health facilities.
- 3.6 Conduct regular educational campaigns on the adverse effects of heat-waves and the measures that need to be taken.
- 3.7 Identification and monitoring of vulnerable groups of workers who work outdoors during heat-waves and implementation of preventive measures.
- 3.8 Implementation of measures on energy efficiency within health institutions.
- 3.9 Improving urban planning and reducing urban heat island effects.

Goal 4:

Overcome the climate change health consequences connected with air pollution and cold weather during winter by establishing control and preventive measures.

Actions:

- 4.1 Continuous monitoring and reporting on the type and concentration of the polluting substances in the ambient air for the protection of people's health.
- 4.2 Continuous monitoring of meteorological conditions in order to predict the stable weather conducive to accumulation and non-dispersal of polluting substances.
- 4.3 Develop an early warning system for the air quality and weather conditions.

- 4.4 Strengthen the system for recording incidence of respiratory diseases during increased levels of ambient air pollution.
- 4.5 Implement legislation for managing the quality of the ambient air.
- 4.6 Perform gradient measurements and explore temperature inversions and inversive fogs in the Skopje valley.
- 4.7 Establish a system for prevention, early warning, management and overcoming the effects of cold weather due to climate change.

Goal 5:

Establish an integrated, efficient and effective approach for prevention, early warning, management and overcoming of the effects of climate change as a result of increased UV radiation.

Actions:

- 5.1 Establish a system for monitoring the UV index and associated health risks.
- 5.2 Monitor the incidence and prevalence of those diseases where exposure to ultraviolet radiation has or can have an additional influence on the patient's condition.
- 5.3 Prevention and promotion to raise awareness of the harmful effects of UV radiation among the public, the media, employees and employers.

Goal 6:

Control and prevention of allergic diseases caused by pollen in the context of climate change.

Actions:

- 6.1 Continual aeropalynological monitoring by tracking the specific sensibility and occurrence of allergenic diseases and pollinosis.
- 6.2 Prevention and promotion to raise awareness of the harmful effects of exposure to pollen among the public, the media, employees and employers.
- 6.3 Monitoring the specific sensibility and occurrence of pollinosis.
- 6.4 Raising the awareness of the public and health workers.

Goal 7:

Establish an integrated, efficient and effective approach for prevention, early warning, management and overcoming of the effects of climate change connected to floods and fires.

Actions:

- 7.1 Functional cooperation and coordination in terms of effective and efficient use of the available resources, exchange of data and information, regular communication, undertaking preventive action and early warning activities, management and overcoming of the effects of floods.
- 7.2 Establish and maintain a monitoring system for underground waters from a health aspect (quality and quantity).
- 7.3 Preparation of plans for health institution organization and action in the event of a large number of cases of disease as a result of floods, especially among vulnerable groups.
- 7.4 Functional cooperation and coordination for effective and efficient use of the available resources, exchange of data and information, regular communication, undertaking preventive, early warning, and management activities as well as activities for overcoming the consequences of fires.

Executors: The ministerial departments for health, labour and social policy, living environment and spatial planning, the Crisis Management Centre, the local government units, the Public Health Institute of the former Yugoslav Republic of Macedonia, the public health centres and health institutions.

Goal 8:

Protection from climate-change-related communicable diseases.

Actions:

- 8.1 Controlling food- and waterborne communicable diseases
 - 8.1.1 Reporting, monitoring, analysis and active epidemiological surveillance of acute intestinal communicable diseases in a specific area.
 - 8.1.2 Epidemiological monitoring, sanitary hygiene and inspection surveillance of water supply sources and systems.
 - 8.1.3 Epidemiological monitoring, sanitary hygiene and inspection surveillance of installations where food is produced, stored, distributed and circulated.
 - 8.1.4 Regular monitoring of hygiene conditions in health, educational and social institutions.

- 8.1.5 Safe disposal of communal solid waste and waste waters.
- 8.1.6 Conducting regular disinfection (if necessary) and extermination of rats and insects.
- 8.1.7 Control of surface waters (lakes and rivers).
- 8.2 Controlling other communicable diseases (legionellosis)
 - 8.2.1 Regular checks of cooling systems (central cooling systems) and swimming pools, as well as central heating systems.
 - 8.2.2 Regular maintenance of filters (cleaning, washing and replacing them).
- 8.3 Controlling vector-borne communicable diseases
 - 8.3.1 Epidemiological surveillance, reporting, monitoring and analysis of communicable diseases that are transmitted by vectors.
 - 8.3.2 Education of the general public on the benefits and necessity of disinfection and extermination of rats and insects.
 - 8.3.3 Undertake preventive disinfection and pest control (extermination of rats and insects) in educational, social and health institutions.
- 8.4 Introduction and development of good laboratory and clinical practice to improve the diagnosis and treatment of infectious diseases
 - 8.4.1 Assessment of the need to upgrade the diagnostic and treatment capacities for climate-change-related infectious diseases.
 - 8.4.2 Development and realization of plan to upgrade laboratory capacity.

IMPLEMENTATION OF THE STRATEGY

The National Climate Change Health Adaptation Strategy of the former Yugoslav Republic of Macedonia envisages objectives and activities that will be carried out by the health sector in cooperation with the other relevant sectors in the country. Its goal is to interlink with other strategies in this area developed by other sectors and to form part of the chain of activities aimed at reducing the impact of climate change on people's health in the former Yugoslav Republic of Macedonia.

The former Yugoslav Republic of Macedonia determines its national structures and resources for surveillance alert and response to climate-change-related diseases and also develops and implements national action plans that meet the demands for key capacities. The strengthening of the national preparedness, surveillance and response capacities are essential for a long-term reduction of public health threats in the country, as well as preventing their spreading internationally. Implementation of the activities will not only strengthen national capacity, but also lead to improved capacity of the entire health system.

Coordination of cooperation between the institutions involved will be provided by the Ministry of Health, which is in charge of monitoring the level of implementation of the Strategy and the Action Plan. There will be a responsible person appointed from the Ministry of Health who will monitor, manage and coordinate the process; alternatively, the mandate of the President of the Climate Change and Health Committee will be extended to monitoring the implementation of the Strategy and the Action Plan.

In close cooperation with the Ministry of Health, the responsible person will identify the qualitative and quantitative indicators for monitoring the progress of the Strategy in the National Public Health System. Also, the responsible person will be in charge of identifying the relevant WHO global indicators for climate change and health connected with international public health safety and implementing them in the former Yugoslav Republic of Macedonia. The responsible person will also be in charge of identifying the indicators relevant for the legal procedures and processes as well as data collection and analysis in accordance with the best standards connected with climate change.

The identification and location of the population groups most vulnerable to climate change is the most important preparative measure for strengthening the activities for these groups in the adaptation of the health system. The Public Health Institute of the former Yugoslav Republic of Macedonia will define the populations at risk in the country on the basis of national data and evidence-based medicine.

Climate change risk and health communication, adaptation, education and providing behavioural advice depend on the actions and goals, the locality (different geographical locations in the country) and the specific risk group being targeted.

Several key actions have been defined with the Strategy:

- Intensifying intersectoral cooperation and providing a coordinated approach and functional cooperation in terms of effective and efficient carrying out of the activities;
- Raising people's awareness of climate change and its influence on health;

- Building a proactive, integrated, efficient and effective approach for prevention and early warning of the effects of climate change on people's health, based on evidence;
- Involvement of the community in all the phases of activities and keeping the community informed;
- Determining specifications for the key national capacities that are required by the Regulations; and
- Identifying research fields for improving the Regulations and/or their implementation.

Public communication is necessary for the timely and appropriate dissemination of information to the population. Communication with the media has to be constant and aimed at providing sufficient news coverage (including newspaper articles) about the importance of climate change and its influence on health as well as the importance of prompt and efficient adaptation in the health system and beyond.

MONITORING AND EVALUATION

The implementation of the Health Sector Adaptation Strategy for climate change will be monitored and evaluated regularly in accordance with the indicators specified in the Action Plan for implementation of the Strategy. The Ministry of Health and the other institutions in authority will monitor the flow and dynamics of the implementation of the activities and will suggest any necessary changes for achieving the defined goals.

In carrying out the activities set out in the Strategy, regular evaluation will be conducted on an annual basis, by the responsible person from the Ministry of Health, through reports prepared by the relevant ministries and institutions, according to their jurisdiction.

When necessary, additional surveillance will be undertaken in order to respond to potential risks for the appearance of new diseases due to climate change (e.g. chikungunya, which is transmitted via the tiger mosquito and which up till now has not been recorded in the former Yugoslav Republic of Macedonia).

FINANCIAL IMPLICATIONS

Economic development represents an important component of adaptation but the manner in which the economic growth is realized, the allocation of the gains from that growth, as well as the factors which immediately influence people's health, such as education, health protection and public health infrastructure, will be of crucial importance.

The financial implications for conducting the activities of this Strategy include funds that can be divided into several budgetary categories:

- funds intended for contract services (technical expertise for preparing assessments, analyses and legal articles);
- funds intended for equipment (monitoring and other surveillance equipment); and
- funds intended for maintenance/repairs, and travel and daily expenses for taking samples.

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In accordance with the Action Plan, the institutions responsible for implementing the actions laid down in the Strategy have to allocate funds within the framework of their institutional budgets.

Activities connected with raising public awareness and the preparation of promotional materials, and also relevant research, may be undertaken as a joint action by the government and non-government sectors, with technical support from the scientific sector in performing research on a national, regional and international level.

Applying to international donors and financial institutions for financial support for the implementation of the actions planned in the Strategy, as well as regional cooperation, is encouraged.



ACTION PLAN FOR IMPLEMENTING THE CLIMATE CHANGE HEALTH ADAPTATION STRATEGY



Goal 1:

Provide a coordinated approach and functional cooperation between the sectors and the relevant institutions in terms of effective and efficient use of the available resources

Actions	Measures	Time frame	Responsible institutions* <small>(see list of abbreviations)</small>	Monitoring and evaluation <small>(indicators)</small>
<p>1.1 Set up an intersectoral body for functional cooperation and coordination in terms of effective and efficient use of the available resources, comprised of representatives from the Ministries of Health, Environment and Physical Planning, the Crisis Management Centre, DPR, Macedonian Red Cross and the Hydrometeorological Institute.</p>	<p>Appoint a responsible person from the MoH for monitoring the implementation of the activities in the Action Plan for implementing the National Climate Change Health Adaptation Strategy</p>	2011	MoH	Decision to appoint the Coordinator signed by the Minister of Health
	<p>Set up an intersectoral Commission for Monitoring the Implementation of the National Climate Change Health Adaptation Strategy</p>	2011	MoH, MOEPP, CMC, DPR, MRC, HMI,	Decision to set up the Commission signed by the Minister of Health
	<p>Hold regular meetings of the intersectoral Commission and keep Minutes of the meetings which will be distributed to the members of the Commission</p>	continuously	MoH in cooperation with relevant government bodies	<p>Minutes of meetings held by the Commission</p> <p>Annual evaluation of the Commission's work performed by the Coordinator or by a working group assigned by the Commission</p>
<p>1.2 Improve cooperation between the institutions.</p>	<p>Strengthening institutional capacity in the relevant ministries and institutions by assigning working groups for implementation of activities in the area of climate change</p>	2011	MOEPP, MoH and other government bodies	Signed decisions for responsible people appointed to the working groups
<p>1.3 Continuous monitoring of the risks connected with climate change and their influence on health, and upgrading the health system's capacities for prevention.</p>	<p>Assessment of the climate change threat to people's health and property</p>	2011 - continuously	DPR, CMC, MoH	Annual reports on the assessments carried out
	<p>Monitoring and analysis of concrete parameters by the HMI, MoH, NPHI, CMC, DPR (maximum temperatures, relative moisture, UV index, rainfall, the state of the watercourses and lakes, morbidity and mortality connected with climate change)</p>	2011 - continuously	HMI, CMC MoH, NPHI DPR	<p>Number of detailed analyses performed</p> <p>Annual report and evaluation</p>
	<p>Training for health workers on risks connected with climate change</p>	2011 - continuously	MoH NPHI	<p>Number of trainings organized</p> <p>Number of trained people in institutions</p>

Goal 2:

Raise public awareness about climate change and its influence on health.

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
2.1 Education of and provision of regular information to the public on climate-change-induced health problems.	Preparation, printing and distribution of information leaflets and brochures about the impact of climate change on health and protection measures during high/low temperatures, in conditions of flood/drought, etc.	2011 - 2016 continuously	MoH NPHI, PHC, MRC	Leaflets and brochures produced and distributed to target population
	Preparation, printing and distribution of information leaflets and brochures about the impact of climate change on health and protection measures specifically aimed at vulnerable population groups (the elderly, children, pregnant women and chronically ill, employees in specific conditions, etc.)	2011 - 2016 continuously	MoH NPHI, PHC, MRC	Leaflets and brochures produced and distributed to target population
	Preparation, printing and distribution of information leaflets and brochures on hygiene and other measures to prevent occurrence of communicable diseases connected to climate change	2011 - 2016 continuously according to previously developed plan	MoH NPHI, PHC, MRC	Leaflets and brochures produced and distributed to target population
	Participation in TV shows about the influence of climate change on health	continuously during the year	MoH NPHI, PHC	Number of TV shows
	Educating general practitioners to raise awareness about the effects of climate change on health	December 2011	MoH, NPHI	Number of general practitioners Number of trainings organized
	Web site with information on the effects of climate change on health	Throughout the year	MoH, NPHI	Active web site with regularly updated information
	Regular media briefings	2011 - continuously and regularly	MoH, NPHI	Number of media briefings
2.2 Introduction of climate-change-related modules into graduate and postgraduate curricula.	Preparation of educational programmes in the Hygiene Department, the Epidemiological Department and the Infectology Department within the medical faculties	2011 - Before the start of the academic year	Medical faculties	Educational programme adopted

Goal 3:

Establish an integrated, efficient and effective approach for prevention, early warning, management and overcoming of the effects of climate change due to heat-waves*

* A separate Heat-health Action Plan has been developed containing the actions identified within this goal. The Government of the former Yugoslav Republic of Macedonia adopted the Action Plan to Protect the Health of the Population of the Former Yugoslav Republic of Macedonia Against the Effects of Heat-Waves. For more information please go to www.toplotnibranovi.mk.

Goal 4:

Overcome the climate change health consequences connected with air pollution and cold weather during winter by establishing control and preventive measures

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
4.1 Continuous monitoring and reporting on the type and concentration of the polluting substances in the ambient air for the protection of people's health.	<p>Develop operative national network for monitoring the quality of the ambient air</p> <p>Regular updating of the database on the quality of the ambient air</p> <p>Providing information and announcements about the pollution levels in the ambient air on a national and international level, using standardized tools</p> <p>Preparation and implementation of a national monitoring programme</p>	2011-2015	MOEPP, MoH, NPHI,	<p>Programme for monitoring the quality of the ambient air adopted</p> <p>Number of reports on the quality of the ambient air</p> <p>Number of reports approved and delivered</p> <p>Number of active stations for monitoring the ambient air</p> <p>Increase in the budget for monitoring the ambient air</p>
4.2 Continuous monitoring of meteorological conditions in order to predict the stable weather conducive to accumulation and non-dispersal of polluting substances.	<p>Implementation of an automated meteorological surveillance system</p> <p>Creating an appropriate meteorological and climate database</p> <p>Preparation of monthly and yearly reports for meteorological and climate elements and occurrences</p> <p>Preparing and conducting a national programme for meteorological surveillance system</p>	2011-2015	PHC, HMI. HMI, MOEPP	<p>Number of active stations for monitoring meteorological elements and occurrences</p> <p>Number of reports approved and delivered for meteorological and climate elements and occurrences</p> <p>Programme for monitoring meteorological and climate elements and occurrences adopted</p> <p>Increase in the budget for meteorological surveillance system</p>

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
<p>4.3 Develop an early warning system for the air quality and weather conditions.</p>	<p>Develop early warning alert system regarding the quality of the ambient air and the weather, to protect health</p> <p>Preparation of an action plan for the functioning of the alert system and for the measures that need to be taken for different levels of alarm</p> <p>Introduction of legislation specifying the levels of various pollutants for different levels of alarm and planning appropriate short-term interventions</p>	2011-2015	<p>MOEPP, HMI, MoH, NPFI, the City of Skopje</p> <p>MOEPP, HMI, MoH, NPFI, the City of Skopje</p> <p>MOEPP, HMI, MoH, NPFI, the City of Skopje</p>	<p>Functional alert system for early warning regarding the quality of the ambient air and the weather to protect health</p> <p>Legislation to determine the levels of specific pollutants for different levels of alarm and planning appropriate long-term interventions</p> <p>Adoption of action plan for short-term interventions</p>
<p>4.4 Strengthen the system for recording incidence of respiratory diseases during increased levels of ambient air pollution.</p>	<p>Defining risk groups (children and chronically ill) and regions with increased levels of ambient air pollution and its influences on health</p> <p>Control and prevention of increased levels of ambient air pollution</p>	2011-2012	NPFI, all health institutions, PHC, OHI, MoH, MD, MLSA, the City of Skopje, ULS	Evidence of specific diagnoses connected to respiratory diseases
<p>4.5 Implement legislation for managing the quality of the ambient air.</p>	<p>Preparation of a National Plan for protection of the ambient air</p> <p>Preparation of a programme for reducing pollution and improving air quality</p> <p>Ensuring strict compliance with the threshold values for specified pollutants Individual sanctions for each pollutant</p> <p>Preparation of action plans and mandatory announcements during states of alarm in certain zones and towns</p>	2011	MOEPP, ULS, the City of Skopje	National Plan prepared and adopted for protection of the ambient air as well as programme for reducing pollution and improving air quality, with action plans and mandatory announcements during states of alarm in certain zones and towns
<p>4.6 Researching and confirming microclimate conditions in the City of Skopje and in the Skopje valley as a pilot.</p>	<p>Implementation of microclimate monitoring within the city of Skopje</p> <p>Establishment of gradient measures and research into temperature inversions and inversive fogs in the Skopje valley</p>	2011-2015	HMI, the City of Skopje	<p>Functional operational stations</p> <p>Development of mechanisms for gradient measurements and research</p>

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
4.7 Establish a system for prevention, early warning, management and overcoming the effects of cold weather due to climate change.	Information on and announcement of extremely cold weather Preparation and implementation of a national programme for early warning, management and overcoming of the effects of cold weather due to climate change	2011-2015	HMI, MoH, NPHI	Functional alert system for early warning of threshold values for cold weather and weather conditions, to protect people's health National programme for early warning, management and overcoming of the effects of cold weather due to climate change prepared and adopted

Goal 5:

Establish an integrated, efficient and effective approach for prevention, early warning, management and overcoming of the effects of climate change as a result of increased UV radiation

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
5.1 Establish a system for monitoring the UV index and associated health risks.	Development of studies for monitoring and announcing the UV index and the risks to health Purchase and establishment of UV index measuring stations Informing and educating the rural population, agricultural workers and workers in the open fields about the risks of and protection from UV radiation Carry out clinical-epidemiological studies (methodology development)	2011-2015	MoH, HMI, NPHI, OHI	Action plan for protection of the population from UV radiation prepared and adopted Operational measuring stations for the UV index Number rural population, agricultural workers and open-field workers trained and educated about the risks of and protection from UV radiation
5.2 Monitor the incidence and prevalence of those diseases where exposure to ultraviolet radiation has or can have an additional influence on the patient's condition.	Identification and monitoring of vulnerable groups of workers, as well as workers in the open fields in conditions of increased exposure to ultraviolet radiation from the sun Establish a database of diseases associated with UV radiation Preparation of a strategy, with action plan, for protection of the population from the harmful impact of UV radiation.	2011-2012	MoH; NPHI, OHI, MLSA, State Occupational Inspectorate	Operational database

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
5.3 Prevention and promotion to raise awareness of the harmful effects of UV radiation among the public, the media, employees and employers.	<p>Preparation of a strategy, with action plan, for protection of the population from the harmful impact of UV radiation</p> <p>Preparation of guidance and other educational materials for target groups</p> <p>Training of defined target groups</p>	2011-2012	MoH, NPPI, OHI, trades unions	<p>Strategy adopted, with action plan</p> <p>Number of educational materials produced</p> <p>Number of trainings conducted</p> <p>Number of people trained</p>

Goal 6:

Control and prevention of allergic diseases caused by pollen in the context of climate change

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
6.1 Continual aeropalynological monitoring by tracking the specific sensibility and the occurrence of allergic diseases and pollinosis.	<p>Maintaining an aeropalynological monitoring system</p> <p>Creating an appropriate database</p> <p>Preparing and conducting a national programme for aeropalynological monitoring</p> <p>Maintaining web site for early warning of the population</p> <p>Strengthening human resources and capacities for conducting aeropalynological monitoring</p>	2011-2015	OHI, HMI, MOEPP, MoH, NPPI	Measuring stations operational
6.2 Prevention and promotion to raise awareness of the harmful effects of exposure to pollen among the public, the media, employees and employers.	<p>Development of a strategy, with action plan, for the prevention of allergic diseases and pollinosis as a result of exposure to pollen</p> <p>Preparation of guidelines and other educational materials</p> <p>Training of defined target groups</p> <p>Media briefings</p>	2011-2012	MoH, OHI, NPPI, NGO	<p>Strategy developed</p> <p>Guidelines developed</p> <p>Number of workshops held</p> <p>Number of people trained</p> <p>Number of educational materials produced</p> <p>Number of media briefings organized</p>

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
6.3 Monitoring the specific sensibility and occurrence of pollinosis.	<p>Conducting epidemiological and clinical studies and screening of the specific sensibility and allergic diseases and pollinosis</p> <p>Development and application of the methodology for preparation of studies</p> <p>Setting up and maintaining a data-base (register of patients suffering from pollinosis)</p>	2011-2012	OHI, NPHI	<p>Studies prepared and adopted</p> <p>Methodology adopted</p> <p>Databases established</p> <p>Register of patients suffering from pollinosis developed</p>
6.4 Raising the awareness of the public and health workers.	<p>Education of both target groups</p> <p>Preparation of promotional materials</p> <p>Organizing trainings and seminars</p>	continuously	OHI, MoH, Medical Chamber, NPHI, PHC, Occupational health services, NGOs, media.	<p>Number of people educated</p> <p>Number of promotional materials published</p> <p>Number of trainings and seminars organized</p> <p>Number of people trained</p>

Goal 7:

Establish an integrated, efficient and effective approach for prevention, early warning, management and overcoming of the effects of climate change connected to floods and fires

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
7.1 Functional cooperation and coordination in terms of effective and efficient use of the available resources, exchange of data and information, regular communication, undertaking preventive action and early warning activities, management and overcoming of the effects of floods.	<p>Conducting preventive activities and activities for early warning, managing and overcoming the consequences of fires</p>	continuously	HBI DPR CMC MoH MTC MAFW MLESP LG MRC	<p>Periodical reports from the HMI</p> <p>Annual evaluation and analysis of fires and procedures for managing them from the DPR</p> <p>Scenarios of risk and potential danger from fires prepared by the DPR</p>

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
7.2 Establish and maintain a monitoring system for underground waters from a health aspect (quality and quantity).	Preparation of a programme for monitoring underground waters	2011	MOEPP, MoH, NPHI, ULS	Programme prepared and adopted
7.3 Preparation of plans for health institution organization and action in the event of a large number of cases of disease as a result of floods, especially among vulnerable groups.	<p>Preparation by the PHI and hospitals of plans for response during floods</p> <p>Preparation by the PHC of a study for identifying vulnerable groups during floods (rural surroundings with an inappropriate water supply and sanitation)</p>	<p>2011</p> <p>2012-2013</p>	<p>MoH NPHI PHC DPR LG MRC</p>	<p>Number of plans finalized</p> <p>Number of simulation exercises</p> <p>Number of inspections by the DPR</p> <p>Report on vulnerable groups at regional level prepared by the PHC and Macedonian Red Cross adopted</p> <p>Report on problems associated with available drinking water and sanitation at a regional and local level prepared and adopted</p>
7.4 Functional cooperation and coordination for effective and efficient use of the available resources, exchange of data and information, regular communication, undertaking preventive, early warning, and management activities as well as activities for overcoming the consequences of fires.	<p>Preparation by the PHC of a study for identifying vulnerable groups during floods (rural surroundings with an inappropriate water supply and sanitation)</p> <p>Conducting preventive activities and activities for early warning, managing and overcoming the consequences of fires</p>	continuously	<p>HBI DPR CMC MoH MTC MAFW MLESP LG MRC</p>	<p>Periodical reports from the HMI</p> <p>Annual evaluation and analysis of fires and procedures for managing them from the DPR</p> <p>Scenarios of risk and potential danger from fires prepared by the DPR</p>

Goal 8:

Protection from climate-change-related communicable diseases

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
8.1 Controlling food- and waterborne communicable diseases	Informing/delivering information to all local government units regarding the increased risk of communicable diseases in the period 1 May – 30 September, especially for taking measures to provide safe water and food and disposal of waste	15 April every year	PHC	One announcement a year
	Informing the population through written and electronic media of the health protection measures for the prevention of food- and waterborne communicable diseases	1 May – 30 September	NPHI PHC	Once a month in the stated period
	Providing/delivering information to all health institutions regarding the increased risk of food- and waterborne communicable diseases	April/May	NPHI	Once each year
	Strengthening the regular preventive inspections of health institutions for registering communicable diseases	1 May – 30 September	SSHI	One inspection visit to every health institution in the stated period
	Strengthening regular epidemiological surveillance in health institutions for registering communicable diseases	1 May – 30 September	PHC	One inspection visit to every health institution in the stated period
8.1.1 Reporting, monitoring, analysis and active epidemiological surveillance of acute intestinal communicable diseases in a specific area.	Processing and evaluation of reporting forms for acute intestinal communicable diseases in a specific area and suggesting measures for improvement and feedback from the local government units	throughout the year	All health institutions NPHI, PHC	Reports developed weekly, monthly, six-monthly, annually
	Evaluation of all reports and recommendations of measures for improvement	Weekly, monthly, six-monthly, annually	NPHI	Reports developed weekly, monthly, six-monthly, annually

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
8.1.2 Epidemiological monitoring, sanitary hygiene and inspection surveillance of water supply sources and systems.	Increasing the number of hygiene-epidemiological inspections of water supply sources and systems, especially local and individual water supply sources	1 May - 30 September	PHC	One hygiene-epidemiological inspection in the stated period
8.1.3 Epidemiological monitoring, sanitary hygiene and inspection surveillance of installations where food is produced, stored, distributed and circulated.	<p>Increasing the number of water samples for analysis, especially from local and individual water supply sources in rural areas</p> <p>Increasing the number of inspection visits to installations where food is produced, stored, distributed and circulated, especially in tourist regions</p> <p>Increasing the number of food samples for analysis</p> <p>Providing regular information on good hygiene practices to the legal and physical entities who produce, store, distribute and circulate food</p>	<p>throughout the year</p> <p>1 May - 30 September</p> <p>1 May - 30 September</p> <p>15 April</p>	<p>PHC</p> <p>Food Directorate</p> <p>Food Directorate and PHC</p> <p>Food Directorate</p>	<p>One per year, or one per month in tourist regions</p> <p>One visit a month in the stated period</p> <p>10% more samples than normal</p> <p>One communication</p>
8.1.4 Regular monitoring of hygiene conditions in health, educational and social institutions.	<p>Strengthened inspection in health, educational and social institutions</p> <p>Conducting regular disinfection and extermination of insects and rats in health, educational and social institutions</p>	<p>1 May - 30 September</p> <p>September every year</p>	<p>SSHI</p> <p>PHC</p>	<p>One inspection visit to each institution</p> <p>Disinfection and extermination of insects and rats carried out in all health, educational and social institutions</p>
8.1.5 Safe disposal of communal solid waste and waste waters.	<p>Informing local authorities of the need for more frequent waste disposal, disinfection and cleaning of the containers and transport vehicles, and disinfection of the immediate surrounding of the containers</p> <p>Inspection regarding safe disposal of waste waters</p>	<p>15 March every year</p> <p>Continually during the year, especially in the period 1 May - 30 September</p>	<p>PHC</p> <p>SSHI MOEPP</p>	<p>One communication sent to each of the ten PHCs</p> <p>Number of inspection visits during the summer</p>
8.1.6 Conducting regular disinfection (if necessary) and extermination of rats and insects.	Strengthened inspection of disinfection and extermination of insects and rats in all food and catering outlets, recreational centers and other public outlets	1 May - 30 September	SSHI and Food Directorate	At least one inspection in the stated period

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
8.1.7 Control of surface waters (lakes and rivers).	Increasing the number of samples taken for analysing the quality of surface waters and for recommending measures	1 May - 30 September	SSHI, NPHI, PHC, HMI	Five samples from every surface water/ weekly
8.2 Controlling other communicable diseases (legionellosis)				
8.2.1 Regular checks of cooling systems (central cooling systems) and swimming pools, as well as central heating systems.	Taking smears from the filters of cooling systems (central air-conditioning systems) and water samples from swimming pools, as well as central heating systems	Once a year	SSHI, NPHI, PHC	One smear/sample from a system in a season
8.2.2 Regular maintenance of filters (cleaning, washing and replacing them).	Delivering information to the legal entities that have cooling systems (central air-conditioning systems), swimming pools and central heating systems about the necessity of regular maintenance of the filters, their cleaning, washing or replacing, and about the risks that result from not taking the stated measures	Continually during the year	NPHI, PHC	One communication a year
8.3 Controlling vector-borne communicable diseases	Advice to local authorities to conduct a general clean-up (draining ponds and marshes, removing refuse dumped illegally, cleaning drainage channels) and to control stray dogs and cats	Continually during the year	PHC	One communication a year
8.3.1 Epidemiological surveillance, reporting, monitoring and analysis of communicable diseases that are transmitted by vectors.	Promoting measures for personal protection from vectors	1 April - 30 September	NPHI, PHC	Promotional material developed
	Processing and evaluating the communicable disease reports from a specific region and suggesting measures for improvement	1 May - 30 September	NPHI, PHC	One inspection in the stated period
	Strengthening epidemiological surveillance and reporting of vector-borne communicable diseases	During the year	NPHI	Weekly, monthly and yearly report
	Evaluation of reports and suggesting measures for improvement	During the year	NPHI	Weekly, monthly and yearly report

Actions	Measures	Time frame	Responsible institutions* (see list of abbreviations)	Monitoring and evaluation (indicators)
8.3.2 Undertake preventive disinfection and pest control (extermination of rats and insects) in educational, social and health institutions.	Informing the ULS about conducting disinfection, extermination of insects and rats starting from 1 April with larva disinfection, and from 1 May with aerosol disinfection, and about the need for more frequent waste disposal by the public utility in the period 1 May - 30 September	15 March each year	PHC	One communication a year
8.4 Introduction and development of good laboratory and clinical practice to improve the diagnosis and treatment of infectious diseases			NPHI Infectious Diseases and Febrile States Clinic	Upgrading the diagnostics capacities at the Infectious Diseases and Febrile States Clinic in Skopje and PHI
8.4.1 Assessment of the need to upgrade the diagnostic and treatment capacities for climate-change-related infectious diseases.	Evaluation of the need to upgrade laboratory capacities for selected communicable diseases	2011	MoH Commission on Communicable Diseases	Assessment report produced
8.4.2 Development and realization of plan to upgrade laboratory capacity.	Based on the recommendations of the evaluation plan produced, task force for its realization assigned	2012-2016	MoH Commission on Communicable Diseases	Plan with specific interventions developed Timetable for realization of activities introduced Decision for assigning a task force for implementation of the plan Number of laboratories upgraded

The financial implications for conducting the activities of this Strategy pertain to the funds that will be provided from the institution's budget-holder, as well as from additional financial means (funds from international financial institutions and charity funds), and their combination, where the budget funds would provide the necessary local contribution. Regional cooperation is also encouraged. The activities connected with raising public awareness and the preparation of promotional materials may represent a joint action on behalf of the government and non-government sector, with technical support from the scientific sector, and the financial instruments intended for the non-government sector and research on a national, regional and international level are to be used as well.

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The climate change process has already started and efforts should be concentrated towards the assessment of the current and future vulnerability of the population with aim to identify the necessary interventions and adaptation options. The influence of the global climate change, including the influence on the health of population, can be reduced or avoided by undertaking measures for adaptation.

The primary goal of the climate change adaptation measures in the health sector is to reduce the burden of the diseases, injuries, invalidity, suffering and morbidity. The adaptation solutions are not solely intended for the health sector, they can also be found in other fields and sectors such as energy, sanitation and water supply, education, agriculture, economy, tourism, transport, development and housing etc.

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