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# Climate change and health: Lessons learnt in the WHO European Region

**Meeting Report**

**4–6 June, 2012**

## ABSTRACT

The Fifth Conference on Environment and Health in Parma, Italy (2010) endorsed the “Commitment to act”; this meeting reviewed implementation of this Commitment, exchanged experiences and knowledge, and charted next steps on the six action points. Key achievements observed since 2012 are the growing knowledge of health effects of climate change, multisectoral government initiatives with health at the centre, national health adaptations strategies, preventing health effects of extreme events and infectious diseases, advancements in postgraduate training and awareness raising, and the development and launch of the European Climate Adaptation Platform. Key priorities for future work are greater focus on greening health services, and integration of health into other sectors, as well as strengthen health in national adaptation plans.

## Keywords

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# CONTENTS

*Page*

CONTENTS .....	1
ACKNOWLEDGEMENTS .....	2
INTRODUCTION.....	3
SCOPE OF THE MEETING.....	3
SUMMARY OF THE MEETING .....	4
DETAILED MEETING REPORT .....	3
Welcome and opening .....	11
Session I: "Commitment to act" and Seven-Country Initiative .....	12
The "Commitment to act" and European Regional Framework for Action.....	12
The Seven-Country Initiative to protect health from climate change .....	13
Session II: Integrated policy and governance for climate change and health.....	15
Session II Group work .....	16
Session III: Adaptation to climate change.....	21
Session III Group work .....	22
Session IV: Sustainable health and environment sectors.....	26
Session IV Group work.....	27
Session V: Climate change and health intelligence.....	29
Session V Group work .....	29
Session VI: The Way Forward .....	35
Annex I: Summary of the presentations.....	37
Session I.....	37
Session II.....	45
Session III .....	48
Session IV.....	53
Session V .....	54
Annex II: Bibliography .....	59
Annex III: Programme.....	60
Annex IV: List of participants .....	64

## List of abbreviations

BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany
CAF	Cancun Adaptation Framework
CDM	Clean Development Mechanism
CGS	Climate change, green health services and sustainable development programme
COPD	chronic obstructive pulmonary disease
EC	European Commission
EEHP	European Environment and Health Process
EEHTF	European Environment and Health Task Force
EU	European Union
FP7	Seventh Framework Programme for Research and Technological Development
GDP	gross domestic product
HEAL	Health and Environment Alliance
HIA	health impact assessment
HIC	Working Group on Climate Change and its Impacts on Health of the EEHTF
ICI	International Climate Initiative, Germany
IHR	International Health Regulations
IPCC	Intergovernmental Panel on Climate Change
LEHAP	Local Environmental Health Action Plan
NAPA	National Adaptation Programme of Action
NHS	National Health Service, England. United Kingdom
NHS SDU	National Health Service Sustainable Development Unit
REDD+	Reducing Emissions from Deforestation and Forest Degradation
TDR	Special Programme for Research and Training in Tropical Diseases
United Nations	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UV	ultraviolet
WHA	World Health Assembly
WHO	World Health Organization
WMO	World Meteorological Organization

## ACKNOWLEDGEMENTS

The meeting is co-sponsored by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. BMU/WHO pilot initiative: “Protecting health from climate change in seven countries in the WHO European Region”, funded by the German International Climate Initiative (ICI). The meeting was chaired by Dr Jutta Litvinovitch of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, and Dr Louise Newport of the United Kingdom Department of Health. This meeting report was prepared by Leda E. Nemer.

## INTRODUCTION

It has become clear that the climate system is warming. Climate change has already affected human health directly through changing weather patterns (temperature, precipitation, sea-level rise and more frequent extreme events) and indirectly through changes in water, air and food quality and in the planet's life-support systems. Tackling the root causes of climate change - investing in healthy environments, strengthening health systems and advocating for healthy development - could reduce the burden of disease and promote population health. In 2008, at the Sixty-first World Health Assembly, WHO Member States unanimously adopted resolution WHA61.19, which urges action to:

- ▲ include health measures in adaptation plans;
- ▲ build technical, strategic and leadership capacity in the health sector;
- ▲ strengthen capacity for preparedness and response to natural disasters;
- ▲ promote active cross-sectoral engagement of the health sector; and
- ▲ express commitment to meeting the challenges of climate change and guide planning and investments.

WHO European Member States endorsed a 'commitment to act' at the Fifth European Ministerial Conference on Environment and Health in Parma, Italy, in 2010. The Member States committed themselves to protect health and well-being, natural resources and ecosystems and to promote health equity, health security and healthy environments in a changing climate. They welcomed the European Regional Framework for Action (WHO, 2010), entitled *Protecting health in an environment challenged by climate change*, which gives details of approaches that can be taken to achieve those commitments.

## SCOPE OF THE MEETING

Since 2010, new information has become available about the impacts of climate change on human health, their costs and how to protect human health from those impacts. The purpose of the meeting on 'Climate change and health: lessons learnt in the WHO European Region' was to review implementation at national and regional levels, exchange experiences and knowledge and discuss the next steps to be taken on the six action points of the Parma 'commitment to act', to:

- I. integrate health issues in all climate change mitigation and adaptation measures, policies and strategies;
- II. strengthen health, social welfare and environmental systems and services to improve their response to the impacts of climate change;
- III. develop and strengthen early warning surveillance and preparedness systems for extreme weather events and disease outbreaks;
- IV. develop and implement educational and public awareness programmes on climate change and health;
- V. collaborate to increase the health sector's contribution to reducing greenhouse gas emissions and strengthen its leadership on energy- and resource-efficient management;
- VI. encourage research and development through a European information platform for systematic sharing of best practices, research, data, information and technology.

The meeting was attended by 90 participants: 30 representatives of national ministries of health or the environment; 10 representatives of United Nations agencies (the United Nations Development Programme, the United Nations Framework Convention on Climate Change [UNFCCC], the World Meteorological Organization), the European Commission (Directorates-General for Climate Action, Health and Consumers and for Research and Innovation) and European Commission agencies (the European Environment Agency and the European Centre for Disease Prevention and Control) and nongovernmental organizations (Health and Education for All, Regional Environmental Center); and 40 scientific experts from the Region. WHO staff from headquarters, the Regional Office for Europe and country offices also attended.

## **SUMMARY OF THE MEETING**

1. Significant progress has been made in the WHO European Region in implementing the six points of the ‘commitment to act’ at Regional and national levels. Participants recognized that the action points had been instrumental in targeting measures and action.
2. Climate change and health cannot be seen in isolation but should be considered in the wider context of national and Regional development. This includes the financial crisis, growing health care costs for chronic noncommunicable diseases, universal health coverage, sustainable development and competing regional and national priorities and emergencies. The cost of inaction on climate change in terms of money, lives lost, disability and quality of life might rise if no action is taken now and will represent an additional burden for decision-makers and citizens.
3. It is possible to act now, as illustrated by the many initiatives reported by national representatives and scientific experts. Many opportunities are available when health is placed at the heart of the development. The achievements discussed at the meeting are described below.

### **Health in climate change measures, policies and strategies**

4. In several countries, multisectoral processes to address climate change and health have been introduced as part of implementation of the UNFCCC or of national development or pilot projects. Such processes are promising when linked to a wider array of health and development themes and when clearly focused on a common aim of multisectoral action for the environment and health.
5. Since 2010, an additional eight European countries have assessed the effects of climate change on population health. A strong, systematic evidence base and use of innovative approaches were recognized as essential in adaptation to climate change and in monitoring progress. The methods developed and the lessons learnt can be shared with other countries and stimulate sharing by those countries that have not yet done so. Methods, tools and results should also be shared with the UNFCCC.
6. More countries have prepared health adaptation strategies or action plans or identified measures within multisectoral national adaptation plans that should be strengthened. The participants identified a number of essential measures, most of which build on measures proved to be effective in reducing death, disease and greenhouse gas emissions. ‘No regret’ adaptation measures that should be further promoted include: strengthened public health and primary health care services, access to clean water and sanitation, early-

warning systems, food security, epidemiological disease surveillance and information systems. Urban development was highlighted as a primary target. The criteria to be used in selecting adaptation measures are preferably: health benefit, cost–benefit and effectiveness of existing measures.

7. The mitigation measures (i.e. reducing greenhouse gas emissions) of greatest benefit for public health are those that prevent chronic diseases, reduce health care costs, promote a low-carbon economy and result in multiple gains in transport, agriculture, economy and energy. ‘Low-tech’ solutions that are not attractive from an economic perspective, such as engaging in more physical activity, should be promoted actively. Consistency and continuity of action are needed. Social inequalities pose a challenge, as mitigation measures differ by social stratum. ‘Triple win’ solutions are needed, such as green spaces and nature preservation, to promote health, tourism and the economy. Reaching European citizens without access to technology and information remains a problem.
8. Discussions on health in climate change mitigation and adaptation policies and on climate change within health policies emphasized the importance of maintaining the broader concept of ‘well-being’ and working for sustainable health.

**Strengthen health, social welfare and environmental systems and services to improve their response to the impacts of climate change.**

**Develop and strengthen early-warning, surveillance and preparedness systems for extreme weather events and disease outbreaks.**

9. The results of the seven-country initiative to protect health from climate change, funded by the German International Climate Initiative, were described. The project showed that the potential of our health systems for adaptation is not yet developed. While the systems can deal with existing problems, they must be prepared for what is to come. The challenges identified included intersectoral action and cooperation, with knowledge of each sector’s roles and responsibilities. The tools developed during the project are available for use by other countries.
10. Most health-specific adaptation measures focus on preventing health effects of extreme weather events and of emerging or re-emerging infectious diseases. Although 18 European countries have heat–health action plans, more extreme events occur, on which action is required. An ‘all-hazard’ approach, based on specialist evidence, should be designed, simplified for local users. Working together, using interdisciplinary approaches and clarifying roles and responsibilities are important. Activities that work well (‘best practices’) are communication of medical advice to vulnerable groups and early warning of extreme weather through the media. The group agreed that documentation of extreme weather events was weak, and their impact is usually not fully recorded. A European-wide knowledge base is therefore needed on the impacts of such events. Plans for extreme weather events should be documented and evaluated to encourage use of lessons learnt. Collection and sharing of high-quality data would give meteorologists and health practitioners up-to-date information and allow flexible, long-term surveillance to improve extreme weather responses. Technical expertise and training are important for adapting climate models to the local level and for identifying local problems.
11. Climate change, globalization, trade, travel, ageing, inequalities, antimicrobial resistance, animal health and food safety can all affect the control and spread of infectious disease. The participants in the meeting agreed that the probability of outbreaks of Lyme disease

(borreliosis), cholera, leishmaniasis, dengue and tick-borne encephalitis is high, with potentially severe consequences for society or for certain populations. Recent outbreaks of diseases such as West Nile fever and chikungunya illustrate the limitations of the available response mechanisms.

12. The extent of surveillance for climate-sensitive infectious diseases varies among countries. In countries with some kind of surveillance, that for climate-sensitive infectious disease is built into the existing systems; however, not all such diseases are notifiable or reported. Surveillance of new and emerging vector species is also lacking, as are specific programmes for new diseases. Event-based intelligence for early identification of infectious disease threats, collaboration with the veterinary sector, animal disease outbreak management, cross-sectoral interactions (on e.g. food, animals and water) require strengthening. Transboundary interactions in surveillance, guidelines, harmonization of case definitions and rapid response, such as standardized risk assessments, are necessary throughout the WHO European Region. Technical resources, such as equipment, training, collection of high-quality data and monitoring of rare diseases remain limited. Collecting information and data-sharing are critical but come up against the obstacle of short-term funding. Land use, global travel, trade, densely populated areas and climate are all factors in the spread of these diseases.
13. The International Health Regulations (2005) are useful in adaptation to climate change, as they allow standardized risk assessment in the event of a serious, unexpected public health event with a risk for international spread and potential travel or trade restrictions. Better linkage between those responsible for climate change and for the environment in countries and offices responsible for the International Health Regulations is required.
14. For most European health ministries, climate change is not a priority; therefore, preparation of health systems for adaptation is insufficient. While health systems can address existing problems to some extent, more preparation is needed for future threats. Cross-cutting mechanisms with multiple health benefits and that focus on prevention with 'no regret' are particularly useful. These include improving water and waste management, improving air quality, strengthening primary health care, public health and social services, ensuring climate-resilient environment and health services and promoting the involvement of local communities. Interaction of the health sector with those such as environment, urban planning and design and water management is essential, and many good examples are available.
15. Countries in areas particularly sensitive to climate change, like central Asia, the Caucasus, the Arctic and the Mediterranean, are finding difficulty in obtaining resources for additional climate-change action.

### **Develop and implement educational and public awareness programmes on climate change and health**

16. Advances have been seen in particular in postgraduate training of health professionals, general capacity development and media awareness-raising campaigns. The most effective awareness-raising activities are those based on a good understanding of the target audience, which provide solutions rather than state problems and take account of 'audience fragmentation' with respect to composition, gender, age, culture and language. Cross-sectoral education of young people is important.



17. More information is required about national practices for climate change mitigation in the health sector to allow better communication. This would ensure inclusion of environmental considerations in the health sector, improve understanding of common benefits and trade-offs and clarify the government's role in regulation and education. Better risk communication should involve the media in order to achieve the right balance. The impact of messages, for example during extreme weather events, is not well understood.
18. The main priorities for training and capacity development include more interventions for changing behaviour and for maintaining the changes. The social media and audience segmentation could be used to target such interventions. Capacity-building should be broadened to include other sectors, such as housing, transport and energy. Qualitative research could be used to assess the effectiveness of training and other measures. The target populations identified were policy-makers, environment and health workers, the communications sector (e.g. media and journalists), who can potentially influence communication of messages, and academia.
19. The communication skills of experts and national representatives should be strengthened. The best tools for raising awareness in ministries are evidence-based messages and promoting communication among sectors. For example, the environment sector could use a health impact message in communications or link messages to an event such as a heat-wave.

**Collaborate to increase the health sector's contribution to reducing greenhouse gas emissions and strengthen its leadership on energy- and resource-efficient management**

20. The meeting participants recognized that more work is required in this area. Many local initiatives are available, which are, however, linked by a national strategic approach in only a few countries. There will be conflicts between increasing life expectancy, expansion of health care to universal health coverage and associated greenhouse gas and other environmental problems if health care is not improved in an environmentally friendly way.
21. Technical and behavioural avenues for sustainable health and environment systems include: sustainable procurement; information on common benefits, especially for decision-makers; calculation of costs in terms of welfare; identification of other elements; and promotion of individual and organizational incentives, such as supporting change. Estimates of the emissions of greenhouse gas from the health sector and international guidelines on the measures to be taken would be helpful. The general public and health workers should be trained to make health and environment systems sustainable.
22. Reducing the carbon footprint by a bottom-up approach could be used as an example, including reducing emissions at home and in companies and organizations. Measuring or monitoring carbon use would make change visible for later comparisons. While reduction of the carbon footprint is a good start for sensible strategies, it is not enough. The environment must be considered as a whole, as not all mitigation actions are beneficial for human health (e.g. energy efficiency versus ventilation, biofuels and particle emissions). The side-effects of technologies and cost-benefit analyses should also be considered.

## **Encourage research and development and European information platforms for systematic sharing of best practices, research, data, information and technology**

23. Since 2007, there has been better understanding at national level of the health effects of climate change, the implications of adaptation and mitigation for other sectors and how best to strengthen public health in the face of climate change. Barriers to research include lack of access to data on health and the environment and lack of data exchange.

24. Research is needed to:

- prepare positive messages based on the peer-reviewed literature and integrate them into national, regional and international action on climate change;
- better understand who is vulnerable and why and the effects of climate change and weather extremes on health systems;
- find methods for evaluating health system resilience;
- determine the effectiveness of interventions for more rapid, intense climatic change;
- determine the impact of climate change on local exposure to chemical hazards, including persistent organic pollutants and heavy metals;
- form better links between research on plant, animal and human health;
- determine the effects of climate change and climate policy in workplaces;
- establish the life cycle of an extreme weather event;
- attribute events and effects to climate change;
- deal with emergency situations and outbreaks of diseases or events not currently endemic in a region; and
- elucidate the role of behaviour change in transforming health research.

Specific technical needs identified by the group were methods for assessing and identifying indicators of vulnerability to climate change in order to quantify health damage and the cost of adaptation.

25. More formal mechanisms and tools for knowledge transfer are needed, including evidence synthesis, literature searching, data mining (e.g. old entomological surveys), meta-analyses, systematic reviews and grading tools. Training in use of the new tools should be included to ensure that they are used appropriately. Communication on such tools among sectors would improve understanding. A clearing-house for funders of research programmes would make available the wealth of research findings from projects of the sixth and seventh framework programmes for research and technological development of the European Commission. A modest investment would result in an immense increase in knowledge transfer. Methods for risk assessment, including modelling, mapping and economic appraisal, would also improve knowledge transfer.

26. The diversity of the WHO European Region must be recognized in research on both adaptation and mitigation. While the common health benefits of clean energy are important, rural areas in some countries of the Region still lack access to energy; in that context, dialogue on clean energy is of secondary importance. Some countries also do not undertake systematic monitoring of air pollution, which is required for research on

interventions to improve outdoor air quality (a mutual benefit of mitigation policies). Appropriate research on mutual benefits should also be undertaken in middle-income settings.

27. Research is limited by lack of access to data on health and the environment or lack of data exchange, collaboration and sharing, and the situation should be improved. Mechanisms that facilitate access to data, such as a 'disease mapping platform', would facilitate research. Collaboration with countries that are not members of the European Union, particularly the Central Asian republics, should be improved, with regular information about on-going research projects to facilitate participation and learning. Interdisciplinary research is currently of poor quality at national level and must be improved. Donors can best be engaged by improving communication about on-going research.

### **Discuss construction of an information platform by 2014, based on available tools and information-gathering**

28. The largest initiative for sharing information on adaptation is the European Climate Adaption Platform (CLIMATE-ADAPT), which involves 32 European Member States; it is multisectoral and includes some health information. A WHO information platform should be based on information from a variety of fields. Additional information would include climate change and health issues; taking action and raising awareness; regional and local projections of climate change and health; urban development; mitigation activities; good practices and case studies from the wider WHO European Region. It would also include information on events other than extreme events, links and interpretation of meteorological and health data and training materials.
29. The challenges to setting up and maintaining such a system are numerous and include the comparability of data (as there is no reporting obligation), modelling of data, designing meta-data sheets and maps, quality assurance and control of data and information. Other barriers include the limited number of indicators of climate change and health within the European Environment and Health information system and the requirement for information in at least English and Russian.

### **Assistance from WHO and other agencies for implementing the Parma commitment to act on climate change and health**

30. WHO can help by fulfilling its mandated technical role, with partners, in particular by:
  - preparing training materials and expertise (e.g. train-the-trainer initiatives), including for different users;
  - issuing technical guidelines;
  - assisting in the preparation of indicators;
  - identifying scientific and practical evidence for adaptation strategies and action plans, especially for sustainable health and environment services;
  - ensuring broad networking at several levels;
  - showing what works and what does not;
  - identifying successful models of cross-sectoral work;

assisting in creating incentives for effective, efficient data-sharing and better data; and building on existing surveillance systems (from European Union to subnational level).

31. WHO could also provide assistance in harmonizing terminology, in order to facilitate discussion with partners, and in improving collaboration with other international organizations.
32. Understanding of climate change and health and collaboration among the various United Nations and European Union agencies is essential. Better use of existing WHO networks and initiatives was proposed, including local environment and health action plans, 'healthy cities' initiatives, the new Horizon 2020, universal health coverage and the noncommunicable disease movement. Strong WHO support for public health interventions with low technology (e.g. walking and cycling) would send the message that interventions need not be complex. Better WHO cooperation with local health care authorities and doctors, information campaigns for medical staff and integrating climate change into the educational curricula of future health care professionals are areas in which WHO's help would be welcome.

### **Priorities for future work**

33. The discussion reconfirmed the action points listed in the Regional Framework for Action. The following priorities were suggested:
  - systematic, coherent, comprehensive assessments of health vulnerability and impact;
  - a route map for healthy adaptation and mitigation in all sectors and the health sector;
  - an environmentally sustainable health sector;
  - evaluation of and qualitative research on the cost–benefit of current and future interventions;
  - extension and further development of training of professionals in health and other sectors on health and climate change, with an assessment of its effectiveness;
  - regular communication of knowledge and practices via coherent, consistent information platforms;
  - links to current policy priorities; and
  - equal opportunities for the eastern part of the WHO European Region.

## **DETAILED MEETING REPORT**

### **Welcome and opening**

Dr Michał Krzyżanowski, Head of Office, WHO European Centre for Environment and Health, Bonn, Germany gave a welcome to the group on behalf of the WHO Regional Director and the European Centre on Environment and Health. The participants were updated on the recent expansion of the ECEH Bonn office, following the closure of the Rome office, and the subsequent consolidation of programmes. Dr Krzyżanowski also highlighted the importance of the meeting to monitor implementation of the commitments made in Parma two years previously, especially with respect to climate change adaptation and mitigation.

Mr Hubert Steinkemper of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany, welcomed participants and informed them that a celebration of the reopening of the European Centre on Environment and Health took place in February 2012, accompanied by the expansion of the office to include programmes like Climate change, Green health services and Sustainable development (CGS), Environmental Exposures and Risks (EER), Environment and Health Intelligence (EHI), and Management of Natural Resources – Water and Sanitation (WSN). This expansion amounting to 3.4 million EUR annually shows the importance the German government gives to the topic of environment and health. The German government has been supporting the European Environment and Health Process for over 20 years. In 2010, the Parma conference set a new emphasis on climate change with the “Commitment to act” and the European Regional Framework for Action, once again showing the importance of the issue and the need to ensure rapid implementation. Recent years have shown how climate change is having a considerable impact on health. There are the heat-waves in 2010 resulting in forest fires around Moscow with public life coming to a standstill and a reported 10 000 additional deaths. This is just one of many examples in Europe. For this reason, it is essential that adaptation plans to protect human health are developed and implemented and that health systems be prepared. The German government is also helping countries in the east of the Region. The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) has provided support for the seven country initiative on climate change and health. Globally, the German International Climate Initiative (ICI) has funded 277 projects and initiatives for a total of 643 million EUR globally. The foci of the ICI are development of climate friendly economies, biodiversity, adaptation to climate change, and conservation and sustainable use of natural carbon reservoirs/REDD+. Deep gratitude was expressed to colleagues at the WHO Regional Office for Europe and to the seven countries for their outstanding work on these projects and their dedication.

Dr Srđan Matić, Coordinator Environment & Health, WHO Regional Office for Europe, Copenhagen, Denmark, expressed his gratitude to the German Federal Ministry of Environment for their attendance and support to this meeting. The participants were reminded that climate change was first put on the agenda in 1999, then again in 2004 and 2010, thanks to the WHO Ministerial Conference processes. A very important milestone was the 2008 World Health Assembly resolution on climate change and health which created an agenda for WHO for work in years to come. There has been a call for scaling up work in countries in an effort to tackle climate change. The WHO European Region has been fortunate to be able to

launch the largest pilot project on this topic. There has been a lengthy process of negotiating the European Regional Framework for Action on climate change welcomed in Parma. A sustainable development process is also taking place outside of WHO with a world conference, Rio+20, taking place in the month of June. Within that wide agenda, this meeting is of critical importance and so are the six main points of the “Commitment to act”. We have a governance system set up with the European Environment and Health Process (EEHP) and the European Environment and Health Ministerial Board consisting of four ministers of environment and four ministers of health, four European Union representatives, the United Nations Environment Programme (UNEP), the United Nations Economic Commission for Europe, WHO, the Environment and Health Task Force (EEHTF), the European Commission and other EU institutions and agencies, and civil society. This is a group that meets once a year to discuss and support Parma commitments and the environment and health agenda in Europe and a forum where all 53 WHO European Member States can talk to each other. A recent meeting of the European Environment and Health Task Force in Slovenia suggested we set up a Working Group on Climate Change and its Impacts on Health (HIC) and part of this meeting will discuss the scope, outputs, and activities of that group.

Dr Bettina Menne, Programme Manager, CGS, WHO Regional Office for Europe, Bonn, Germany, welcomed participants and express thanks for the high level of attendance. The participants were informed that the meeting programme would be covering the six action points of the “Commitment to act”, distributed among four sessions, as well as the discussion of the Working Group on Climate Change and its Impacts on Health (HIC), which would be held during the three days as a separate agenda item.

## **Session I: “Commitment to act” and Seven-Country Initiative**

The scope of this session was to recall the climate change and health part of the “Commitment to act” of the 5th Ministerial Conference on Environment and Health and the European Framework for Action, and to show practical results of the pilot projects of the BMU/WHO seven-country initiative on strengthening health systems to protect health from climate change. Full summaries of the presentations can be found in the annexes.

### **The “Commitment to act” and European Regional Framework for Action**

Dr Louise Newport of the Department of Health, United Kingdom of Great Britain and Northern Ireland presented a review of the “Commitment to act” and its six action points. Our climate is changing and many still do not believe this. It is vital that this message be taken to all WHO European Member States. Health is being affected and not in distant future. The more work carried out to reduce emissions the more likely our adaptation processes will take effect. To properly promote population health under a changing climate the six action points of the “Commitment to act” were recalled:

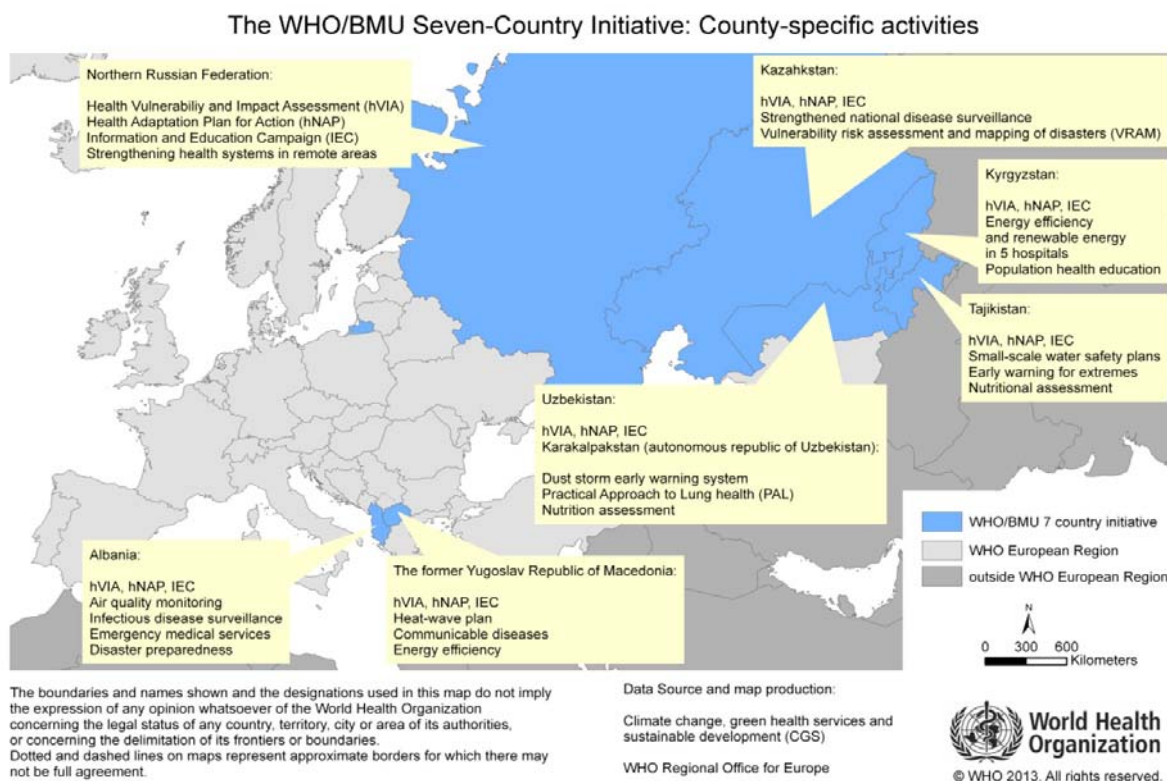
- I. integrate health issues in all climate change mitigation and adaptation measures, policies and strategies at all levels and in all sectors;
- II. strengthen health, social welfare and environmental systems and services to improve their response to the impacts of climate change;
- III. develop and strengthen early warning surveillance and preparedness systems for extreme weather events and disease outbreaks;
- IV. develop and implement educational and public awareness programmes on climate

- change and health;
- V. collaborate to increase the health sector's contribution to reducing greenhouse gas emissions;
- VI. encourage research and development.

The European Regional Framework for Action was also recalled as it provides numerous actions that can be developed to implement the objectives and promote health. The presentation closed recalling that ministries have signed up to this commitment and that this meeting was about reporting progress, at different levels.

## The Seven-Country Initiative to protect health from climate change

Mr James Creswick and Dr Bettina Menne from the CGS programme, WHO Regional Office for Europe, Bonn, Germany, introduced the seven-country initiative. The specific objectives of the pilot projects in the seven countries were the development of national (or subnational) health adaptation strategies or plans, the assessment vulnerability to climate change, and specific pilot action to build institutional capacity. In addition each country carried out specific pilot initiatives to strengthen health systems to cope with extreme weather events, to increase surveillance of climate sensitive infectious diseases, reduce respiratory diseases, develop water safety plans, and ensure technology transfer to foster innovation in energy efficiency and the use of renewable energy for health services. A network to exchange knowledge and experiences on effective adaptation and mitigation measures was further developed.



**Fig. 1.** Map showing some country-specific activities of the seven-country initiative.

The presentation was followed by the presentation of the results in each country. More details for each country are available in Annex 1, focusing on the project goal, key objectives, activities and results:

Dr Edmond Zaimi, Head of Emergency Department, University Hospital Centre “Mother Teresa” in Tirana, **Albania**, presented the results of the national climate change health adaptation plan, the response to health threats such as weather emergencies and infectious diseases, measures to increase energy efficiency for health care and the first results of air quality monitoring.

Dr Shalginbay Zhandossov, Head of Scientific-practical centre of sanitary-epidemiologic examination and monitoring of the Ministry of Health in **Kazakhstan** presented the results of the climate change and health vulnerability assessment, the national adaptation strategy, the training methods and tools developed for environmental health specialists and the provision of information and capacity building in preparing for climate change events.

Mr Omor Kasymov, Director of Scientific and Production Centre for Preventative Medicine of the Ministry of Health in the **Kyrgyz Republic** presented the national adaptation plan, the interesting experience of equipping five medical facilities with solar equipment to pilot energy efficiency and self-sustainability in areas vulnerable to interruption in the continuous energy supply and the large village network that created a cascade of population mother and children education.

Ms Aryuna Dashitsyrenova, Consultant at the Ministry of Health and Social Development in the **Russian Federation**, presented the population vulnerability assessment to climate change and the capacity of the regional health system to adapt to climate change in the Arkhangelsk oblast. She highlighted the results of the work carried out with the Nenetsk community and the overall developments in the Russian Federation. Lessons learnt were discussed for use in other Arctic regions.

Dr Alimakhmad Sufiev, Head Specialist at the State Sanitary Epidemiological Service of **Tajikistan**, presented the national health adaptation plan, the disaster contingency plans, as well as the water safety plans and the improvement initiatives on water security for health care institutions through cost-effective technologies.

Professor Vladimir Kendrovski, Head of Sector at the Institute for Health Protection of **the former Yugoslav Republic of Macedonia** described the results of the health impact assessment, the national strategy, the development of institutional capacity on climate change in relation to extreme weather events and heat waves preparedness and response, the added value of innovation in energy efficiency and renewable energy sources for hospitals and the examples on how early information on climate related infectious disease risks at municipal and national levels is important. He concluded with some general remarks on the lessons learnt in this project.

Dr Nargiza Khodjaeva, National Professional Officer in the WHO Country Office, **Uzbekistan**, presented the results of the adaptation activities in the pilot area of the Republic of Karakalpakstan. In particular the Practical Approach to Lung health (PAL), was introduced together with a wide range of training and capacity development. This was combined with the



development of dust early warning and air quality parameters measurements. The nutritional status in relation to climate change was also assessed through a qualitative survey instrument.

Dr Fiona Adshead, Director, PricewaterhouseCoopers LLP, United Kingdom; Professor Maksut Kulzhanov, Republican Centre for Health Development, Kazakhstan and Ms Sonia Roschnik, NHS Sustainable Development Unit, United Kingdom, from the Scientific Advisory Committee of the project commented on the project process and results. They highlighted that the strength of the project was a strong evidence base and the use of innovative approaches, all providing a strong basis for future action. The projects have shown that the adaptation potential of our health system is not yet well developed. While our systems can deal with already existing problems they need to be prepared for what is to come and up as well as prevention, for example emerging infectious diseases which the health sector has not been prepared to deal as of yet. Challenges identified ranged from the need for intersectoral action and cooperation with each sector knowing their roles and responsibilities. Addressing the critical water supply issue in central Asia came up as an area of concern. A number of learning elements were identified across the seven countries: for example the need to strengthen public health and its services, the importance of capacity building, the need to retrieve complex information from disease mapping to indicators and the ways on how to best integrate health into inter-sectoral action. For many of these developments simple advice and how to do was developed – which now can be shared across countries. The need to improve information systems also arose in the discussion as did the importance of reaching individuals. Many projects are rooted in sustainable development and have used energy-saving technologies, which should be used more widely and proactively. Overall the projects have shown the importance of acting now and the breadth of what has been achieved in a small time scale is clear.

## **Session II: Integrated policy and governance for climate change and health**

The scope of this session was to present and discuss updated information on developments of the “Commitment to act”, namely to “integrate health issues in all climate change mitigation and adaptation measures, policies and strategies at all levels and in all sectors. We will assess, prevent and address any adverse health effects of such policies by, for example, strengthening health promotion in environmental policies”.

The session was introduced by four keynote speakers—full summaries of the presentations can be found in the annex.

Carlos Dora, Department of Public Health and Environment of the World Health Organization, Geneva, outlined the WHO “Health in a green economy” initiative, consisting of an assessment of mitigation measures and policies in the transport, energy, agriculture and health care sector most beneficial to health and equity. After the presentation a question arose as to how much mental diseases are being considered. The reply given that there is not enough evidence in terms of burden of disease but there has been work on well-being which is an important component of environment and health. The IPCC report also integrates the term well-being. References were also made to studies on distance to green spaces and mental well-being.

Bettina Menne, CGS Programme Manager at the WHO European Centre for Environment and Health in Bonn, presented the United Nations System Report on Sustainable development in Europe and central Asia and the challenges linked to sustainable development in the pan-European Region. The report makes concrete policy proposals for managing the green transition to ensure the greatest benefit for the people of the region. Greening of the health sector would generate benefits for health, development and climate change adaptation or mitigation. A comment was made from the floor that many times the health sector does not have control over environmental changes and that many times “green jobs” are not healthy jobs.

Cornelia Jäger of the European Commission Directorate-General for Climate Action summarized EU strategies on climate change relevant to the “Commitment to act”, namely the EU White Paper on Adaptation adopted in April 2009 and the EU Adaptation Strategy planned for adoption in March 2013 (EC, 2009). It was asked how the EU Adaptation Strategy fits with the WHO “Commitment to act”. The response given was that the EC is trying to make a proposal that countries can commit to. The EC is currently preparing an impact assessment so they are awaiting results as to what degree health is included. Regarding mainstreaming climate change in the EC budget, a query was made as to how much will impact assessment currently being carried out includes environment and health. The response given was that there will be a part on health but it was presently not possible to estimate how much and more would be known in November 2012. The participants were reminded that there is a public consultation on the EU strategy development until 20 August, 2012 (see L.1 in meeting documents).

Tiffany Hodgson from the United Nations Framework Convention on Climate Change secretariat presented on aspects of the UNFCCC that could be windows of opportunity for working on climate change and health, with a focus on adaptation. This includes in particular: the work programme on loss and damage; the Adaptation Committee; the Nairobi work programme on impacts, vulnerability and adaptation to climate change (NWP); national adaptation plans (NAPs), the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (CGE), as well as various calls for submissions. One of the topics that arose during the discussion was that a key issue for countries is funding and an update on the status of the Green Climate Fund (GCF) was requested. A response was given that the fund will support activities in developing country Parties, to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change, taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change. It was also noted that the GCF was still in its early stages, with the first meeting of the GCF Board planned for August. Another question was asked if developed and developing countries would somehow work together with a reply given that the NAP process is one of many avenues under the UNFCCC for this kind of cooperation. The NAP process will take into account existing adaptation programmes and projects, including those that are bilateral, in a country-driven manner.

## **Session II Group work**

Three subthemes were discussed in break-out groups, namely:

1. Health in climate change mitigation (greenhouse gas reduction measures) policies
2. Health in climate change adaptation policies of other sectors
3. Climate change in health and social policies.

For the discussion the action points under objective 1 of the European Regional Framework for Action (CC-ERFA) were suggested to be taken into consideration (EURO/HIC/7), namely paragraphs 18 to 23:

- Promote healthy, energy-efficient buildings and renewable energy; access to safe transport that encourages physical activity and social contact; improved outdoor and indoor air quality; the modification of carbon-intensive food choices and production practices.
- Enforce, in the environment and other sectors, existing measures that have proved to be effective in reducing deaths, disease and greenhouse gas emissions.
- Establish multisectoral processes that address climate change and health development at the national level.
- Collect timely information, carry out research and regularly update assessments,
- Develop and implement national adaptation, preparedness and response strategies or action plans with a focus on health.
- Facilitate pilot initiatives, especially on a transboundary level, and guide international resource allocation.

Questions debated included

- What in your opinion are the main measures with the highest benefit for public health? Which criteria do you use? Do you have a best case example?
- What are the main legal, technical and behavioural challenges?
- Which thematic areas would you think has the highest quadruple gain (health, social, economic, environment) if promoted over the next five years?
- What are the specific information and knowledge needs? What are the specific information and knowledge needs?
- What are the specific technical expertise and/or training needs, and for whom?
- What assistance from WHO and other agencies could support implementation?

A summary of the results of the discussions of these three breakout groups are presented here.

### **Health in climate change mitigation (greenhouse gas-reduction) policies**

Chaired by Leendert van Bree, Netherlands Environmental Assessment Agency (PBL).

Participants concurred that mitigation (i.e. reducing greenhouse gas emissions) generates both health benefits with co-benefits when integrated with other policies, such as policies on air quality, traffic and congestion, and the natural environment (e.g. green space).

The main legal, technical and behavioural challenges of climate change mitigation are the fact this is a politically loaded issue with many vested interests and political powers at play. In such an arena, economic arguments become attractive and receive top priority – even if the measures they promote damage health. On the other hand, many simple, low tech solutions are not attractive from an economic perspective such as promoting the use of alternative medicines or engaging in more physical activity. There is also a lot of silo or vertical thinking around mitigation which is difficult to change. Despite these challenges, when taking action, consistency and continuity is needed such as has been seen with successful work on tobacco control. Social inequalities also pose a challenge since implementation of mitigation measures differs according to the given social strata.

In order to gain the highest benefit, it is important to maintain the broader concept of “well-being” and move towards working for sustainable health, with mitigation as a component. It was agreed that if a portfolio of mitigation measures is available these should be selected according to specific needs bearing in mind that some measures might not benefit health. Surely there is not a “one fits all” solution and most measures will depend on the national or local context.

Mitigation measures with the highest benefit for public health were agreed to be those that

- prevent chronic diseases,
- reduce health care costs,
- promote a low carbon economy and
- result in multiple gains, in the transport, agriculture, economy and energy sectors.

The aims of mitigation would be easier achieved if it would also target:

- improvements in child health and health throughout life;
- youth employment;
- planning and policy for population health.

This could be enhanced through the involvement of stakeholders early on; multi and trans-disciplinary research and the need for indicators to visibly illustrate facts and enable evaluation, especially when issues are multi disciplinary.

The group stated that examples of good (and negative) practices would help immensely to illustrate policy options for decision-makers.

### **Health in climate change adaptation policies of other sectors**

Chaired by Cornelia Jäger, European Commission Directorate-General for Climate Action.

The main adaptation measures with highest benefit for public health were recognized to be those with proper, coordinated planning at different scales (regional, national, local) and across sectors. For this a strengthening of existing public health programmes and tools was noted as important. An efficient early-warning and information system, the possibility to carry out vulnerability assessments as well as assessment of current measures was found to be essential to ensure effectiveness of policies. To reduce the risk of uncertainty on the effects of climate change on health, selecting “no regret” measures was also stressed. Preferred criteria used for selection of adaptation measures were cost–benefits and effectiveness of already existing measures.

The group found the main legal, technical and behavioural challenges to be the need for flexibility and ensuring the protection of all in a diverse region where needs varied and heterogeneity in stages of advancement on the issue existed. Selection of an approach also arose as a challenge due to a diversity of choices such as bottom up solutions, as those found in educational interventions, and top down ones such as the creation of legal instruments. The main technical challenges cited were establishing a causal link between climate change and specific health impacts and quantifying the effects of climate change on health. Another challenge that arose was the lack of information on cost–benefit and the cost of adaptation itself. Information, understanding, education and training needed to properly reach individuals.

The highest quadruple gain (health, social, economic, environment) if promoted over the next five years could be obtained from setting up of weather early-warning systems, and prioritizing interventions in the urban environments and on water and food security. A cross-sectoral education of youth to increase individual resilience was also discussed.

With regard to specific information and knowledge needs the group identified an effective and strong evidence base as well as understandable, adaptable information that is easily provided to target groups as key. More interaction of climate change with other drivers such as demography and society would also foster knowledge exchange.

WHO and other agencies could support implementation by creating a mechanism for sharing good and negative experiences and practices and publishing information reported by countries in the WHO questionnaires. Another area that arose was the creation of incentives for effective and efficient data sharing and improvement and building upon existing surveillance systems (from EU- down to subnational level). Assistance in harmonization of terminology to facilitate discussion with partners and assistance improving future collaboration with other international organizations (e.g. OIE) was cited as critical. International scale training that could be further adapted nationally and locally came up as an important area where support was also needed.

Specific technical expertise in the form of guidelines for policy mechanisms illustrating actions and different scenarios would be beneficial as well as tools and training in the use keeping in mind regional diversity. Training adapted to different target groups such as youth, trainers and policy-makers would also be helpful.

### **Climate change in health and social policies**

Two groups were chaired by Maksut Kulzhanov, Republican Center for Health Development in Kazakhstan, and Fiona Adshead, PricewaterhouseCoopers LLP in the United Kingdom, respectively.

Most countries reported having undergone an assessment on the health effect of climate change and associated policies except for Armenia and Belarus which had assessed climate change in general but without the health component.

**Table 1.** Basic priorities identified for climate change and public health action and the inclusion of subjects into assessments

<b>Key public health issues identified</b>	<b>Key public health measures identified</b>	<b>Other measures identified</b>
Air pollution	Acute: Monitoring, harmonization and strengthening of early-warning systems. Identification of vulnerable groups and protective measures. Chronic: Build risk assessment capacity to address long term risks.	Improve intersectorial coordination; ensure air quality monitoring.
Water quality and security.	Small scale water safety plans, where needed. Monitoring and surveillance of water quality and health related effects. Early warning for floods or landslides. Information on what to do? Health education on basic hygiene measures.	Increase cooperation between the water and health sector
Housing	Development of science-based advice on how measures to reduce climate change in housing	Cooperate with the housing sector and train them on health benefits or

<b>Key public health issues identified</b>	<b>Key public health measures identified</b>	<b>Other measures identified</b>
	and construction can avoid risks to health, and produce health improvements.	damages.
Provision of food security and safety.	Raise awareness among the public health professionals of climate change and food security issues. Early identification of problems. European monitoring of food safety related problems. Implementation of HACCP.	Early warning for droughts and floods. Cooperation across UN agencies and various sectors. Strengthen animal, plant and human health monitoring and surveillance.
Infectious diseases	Strengthening early disease detection and surveillance. Strengthening monitoring and laboratory capacity. Enforce communication between different competent areas, e.g. animal health, entomologists, environmental experts, epidemiologists and infectious disease experts. Increase capacity and provide training to health professionals in particular on emerging or potentially new diseases.	Strengthen animal, plant and human health monitoring and surveillance
Cardiovascular diseases	Develop multi-sectorial leadership, governance and action plans for coping with heat and cold. These action plans are suggested to follow the guidance of heat and cold health action plans, as developed by the WHO.	Strengthen weather seasonal forecasting and early warning. Ensure a all – hazard approach and good cooperation with the disaster management agencies.
Respiratory diseases	Strengthen primary health care capacity and integrate climate change information and extreme weather into health professional training. Incidences of respiratory diseases may likely increasing during climate-change related events such as heat waves, bad air pollution days, and other extreme weather.  Monitoring of daily distribution of pollen and early warning. Identification of protective measures. Identification of new emerging allergens. Raise awareness among health professionals and policy-makers.	Promotion of greater regional action and networks.

Overall, the key public health issue to be addressed was air pollution. Other were the need to strengthen institutional capacity or specific calls for training of health professionals; the need for various types of information ranging from strengthened early-warning systems and indicators; health technology and an increase in climate change and health literacy and raised awareness among civil society to policy-makers and decision-makers.

With regard to key public health measures that have the highest quadruple gain (health, social, economic, environment) if promoted over the next five years, the group identified access to clean water, strengthening of epidemiological surveillance and strengthening the primary health care system.

A need for specific information and knowledge was identified for dealing with emergency situations and outbreaks of diseases not currently endemic in the region. The need for knowledge in risk assessment, new methodologies and databases of information also arose. Under specific technical needs, the group identified vulnerability assessment and methodology for identification of climate change vulnerability assessment indicators to

quantify economic burden as important. With regard to technical expertise, the group called for training of a wide spectrum including: health professionals, economists, environmental statisticians, urban and spatial planners, health insurers, parents and the general public.

Assistance from WHO and other agencies could support implementation was welcomed in the areas of indicator development, strengthening information needs, developing cross agency understanding and fostering collaboration with the World Meteorological Organization.

After reporting back, a number of questions arose from the floor. One asked if sharing of practical experiences had arisen as a topic of concern to which a positive reply was given citing the statement made on the need to increase climate change literacy. The issue of climate scepticisms and sceptics also arose and participants were asked how their countries were dealing with this. It was agreed that the health sector would need to become more active and that not enough health professionals had been involved in the IPCC reports so they would need encouragement to take part in that process. It was agreed that policy-makers make decisions on uncertainties but they also want solutions to be provided with the best evidence, harmonious scientific conclusions – and a range of different solutions to the problem to help them decide on action.

### **Session III: Adaptation to climate change**

The scope and purpose of this session was to inform on developments on the paragraphs in the “Commitment to act” to “strengthen health, social welfare and environmental systems and services to improve their response to the impacts of climate change in a timely manner; and develop and strengthen early-warning surveillance and preparedness systems for extreme weather events and disease outbreaks”.

The session was introduced by five keynote speakers – full summaries of the presentations can be found in the annexes.

Dr Peter Berry from Health Canada and Dr Bettina Menne of the WHO Regional Office for Europe presented the current status of *Vulnerability assessments and health adaptation strategies or action plans: Key elements*. They highlighted how mainstreaming adaptation to include risk assessments remains a challenge, as well as how to take a multi-sectoral approach and how to weigh the costs of adapting or not. The presentation also provided information from the recently published *WHO/PAHO Climate Change and Health Vulnerability Assessment Guidelines*.

Mr Amir Delju representative of the World Meteorological Organization (WMO) presented ‘Climate services for human health’. He explained the role of WMO in contribution to the safety of life and property through operation of an Integrated Global Observing System (WIGOS). The data received from this system provides the basis for the forecast of weather extremes, early warnings, climate prediction including the monitoring of climate anomalies.

Dr Paola Michelozzi from the Department of Epidemiology of the Lazio Regional Health Service in Italy presented current knowledge on the health effects of extreme weather events. She provided an example how epidemiological research can provide evidence to develop adaptation strategies by means of the Public Health Adaptation Strategies to Extreme weather events (PHASE) project.

Mr Matthias Niedrig of the Robert Koch Institute in Germany presented the current burden from climate sensitive infectious diseases in Europe. He focused on a number of infectious diseases under a changing climate and global and regional levels of preparedness to deal with these.

Mr Markus Kirchner from the WHO Regional Office for Europe presented how the Climate Change and International Health Regulations could be better linked and mutually enforce each other.

Several comments from the floor highlighted that several countries in the WHO European Region have been affected by climate-sensitive diseases. The Russian Federation and Georgia have found dengue fever and yellow fever close to the Black sea. The attribution of a change in vector borne diseases to climate change has received much critique from infectious disease professionals. To improve understanding across disciplines of the problem there is a need to engage non-health professionals as well entomologists, vector borne disease experts, national study groups, veterinary health professionals, etc more closely into the debate. There is also a problem of data sharing and monitoring of rare diseases. Collecting information and data sharing is indeed a very critical issue with another obstacle being short-term funding, which often hinders a constant data flow. Land use, global travel, trade and densely populated areas and climate are all limiting and modifying factors to the spread of these diseases and climate is intertwined with this. As the influences are different in Europe, there must be proper data to understand what the situation is and get this information into the public context.

### **Session III Group work**

Three subthemes were discussed in break-out groups, namely:

1. Prevention of the health-effects of extreme weather events;
2. Prevention of climate-sensitive infectious diseases;
3. Climate-resilient environment and health services.

For this discussion the action points under objective 2 of the European Regional Framework for Action (CC-ERFA) were suggested to be taken into consideration (EURO/HIC/7), namely paragraphs 24 to 27:

- Engage ministries and key advocates in promoting the integration of health considerations in all policies.
- Engage and provide leadership to public health professionals when developing and implementing national multisectoral adaptation strategies.
- Improve and maintain:
  - the provision of early warning systems and the development of extreme weather events action plans, disaster preparedness and response;
  - climate-resilient health care and other public service infrastructure;
  - early detection and warning of, and rapid response to, climate change-related disease outbreaks;
  - monitoring of vector-borne diseases and zoonoses;
  - integrated disease surveillance and monitoring;
  - implementation of evidence-based prevention, treatment and control of communicable diseases (including immunization programmes, vector control, etc.);
  - primary health care, public health and social services;



- medical, clinical and postgraduate training to deal with unfamiliar conditions;
- environmental services, such as water and waste management.
- Promote local engagement and development, particularly of infrastructure to support the capacity of local communities to become resilient to climate-related health risks and implement adaptation and mitigation action.

Questions debated included

- How good are current response measures?
- What are the needs for additional response under a changing climate?
- What are the mechanisms for event-based intelligence available?
- How well is communication organized before, during and after the event?
- Are there specific knowledge gaps and research requirements?
- Is there a particular requirement for technical expertise and/or training?
- What assistance from WHO and other agencies could support implementation?

A summary of the results of the discussions of these three breakout groups are presented here.

### **Prevention of the health effects of extreme weather events**

Two groups were chaired by Vladimir Kendrovski, Institute of Health Protection of the former Yugoslav Republic of Macedonia, and Virginia Murray, Health Protection Agency of the United Kingdom, respectively.

With reference to the adequacy of current mechanisms for extreme events early warning, preparedness and response, the group believed that currently there are more extreme events taking place than just heat-waves and there is currently little capacity to cope with the health effects of these. The group reported that some countries have developed heat-health action plans as well as actions plans for cold-spells, floods and wild fires. An all-hazard approach using a specialist evidence-based knowledge should be available and simplified to end-users at the local level. Working together, using inter-disciplinary approaches with clarity of roles and responsibilities has been found to be very important where this has been undertaken.

In order to enable a more effective response under a changing climate, a health system assessment would need to identify the most susceptible populations and more research may need to be carried out on how to reach these groups. Added value from epidemiological research to determine the effectiveness of early warning, preparedness and response is considerable, recognizing that there are needs for different mechanisms in different countries to identify and address vulnerable groups.

Collection of high quality data and subsequent sharing would allow meteorologists to develop up-to-date information and flexible long-term surveillance that would aid in extreme weather response. Examples of available mechanisms for event-based intelligence are the United Kingdom pilot of Natural Hazards Partnership which provides event-based intelligence and cross-sectoral working for a national early-warning system. Technical expertise and training was deemed to be important for downscaling climate models to the local level and enabling identification of local problems.

Overall it was agreed that where an extreme weather event was identified, documentation was weak and its impact was usually not recorded. For this reason, a knowledge base system to provide data on impacts of these events would be needed. Extreme weather event plans

should also be documented and evaluated to encourage use of information from lessons identified.

To enable more rapid communication before, during and after an extreme weather event, new or alternative technologies or approaches such as the use of geographic information systems and population based data could be adopted. Another aspect to be strengthened should be risk communication involving the media to achieve the right balance in warning of extreme events. In Hungary, for example, while new media systems such as Facebook and Twitter have been employed to provide information before and during the extreme weather event the only clearly identified communication message after the extreme weather event was the need to clean up after a flood or set up a public health evaluation to assess effects of the heat-wave or cold weather. In Italy concern was raised that the media were no longer interested in providing extreme weather event warnings as these events were becoming routine in the country. Therefore, the need to develop tailored communication messages for the media, the general public, policy-makers and all health and extreme event professionals was essential. However the impact of communication messages given during extreme weather events is not well researched.

Knowledge and research gaps identified included the need to document the life cycle of an extreme weather event (before, during and after) to identify lessons; cross-sectoral cooperation and roles and responsibilities at local and other levels; and the evaluation of effectiveness of measures taken. Extreme event related research gaps identified included impact of relative change of temperature, flood surveillance data, learning from the cold weather in 2011-12, trans-boundary impacts with lack of cross border data and displacement effects from landslides and other events. Impact related gaps identified included evaluation of extreme weather event vulnerabilities for population subgroups, attribution of extreme weather event to climate change, years of lives lost and the need to better describe circumstances where populations and its health services were affected by extreme weather events. To support these knowledge and research gaps it was considered that using the systems recommended by Cochrane Review/Evidence Aid assessments would be of value to support public health knowledge and advice.

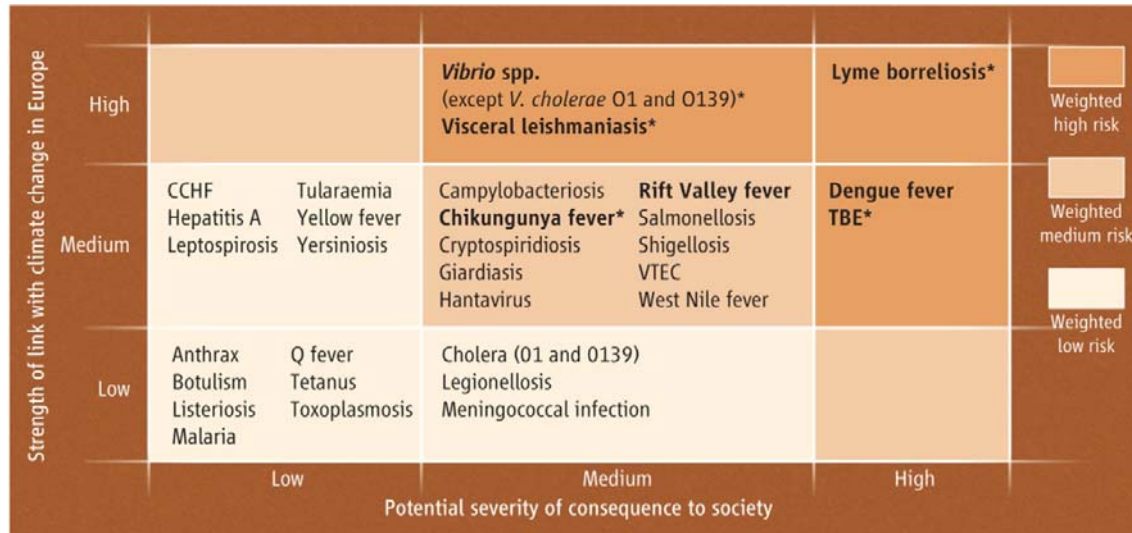
Explaining the difference between climate extreme events and climate change would need to be made clearer to the public and to different professional groups. Training was considered to be key for health professionals and other sectors such as urban planning and education with an emphasis on inter-disciplinary education. Training in communication skills to bring information to the public in an understandable and resilience building manner was also brought up as important.

### **Prevention of climate-sensitive infectious diseases**

Two groups were chaired by Elisabet Lindgren, Karolinska Institute in Sweden, and Jan Semenza, European Centre for Disease Prevention and Control, respectively.

The participants to the meeting agreed that for lyme borreliosis, Vibrio cholera, leishmania, dengue and tick-borne encephalitis the probability of an outbreak is high and/or there are potentially severe consequences for society or for certain risk populations. Also the history of recent outbreaks such as West Nile fever and chikungunya illustrated limitations of current response mechanisms. The degree to which infectious disease surveillance for climate-sensitive infectious diseases is in place varies across countries. In countries where there is some kind of surveillance, climate-sensitive infectious disease surveillance is built into the

existing systems; however not all climate-sensitive diseases are notifiable. Surveillance of new and emerging vector species is also missing, or specific programmes for new unknown diseases. With regard to the probability of an outbreak in Europe and severity of consequence for society or a certain risk group, Lyme borreliosis was shown to have the highest climate change disease relationship (see figure 2).



**Fig. 2.** Weighted risk analysis of climate change impacts on infectious disease risks in the European Union (source: Lindgren et al. (2012) Science 336:418-419)

Event-based intelligence for early identification of infectious disease threats, collaboration with the veterinary sector, animal disease outbreak management, cross-sectoral interactions (on e.g. food, animals and water) require strengthening. Transboundary interactions in surveillance, guidelines, harmonization of case definitions and rapid response, such as standardized risk assessments, are necessary throughout the WHO European Region. Technical resources, such as equipment, training, collection of high-quality data and monitoring of rare diseases remain limited. Collecting information and data-sharing are critical but come up against the obstacle of short-term funding. Land use, global travel, trade, densely populated areas and climate are all factors in the spread of these diseases.

### Climate-resilient environment and health services

Chaired by Hans-Guido Mücke, Federal Environment Agency of Germany.

This group debated slightly different questions, namely:

- What should a climate-resilient environment and health service look like?
- Which are the barriers preventing them from becoming more climate resilient?
- Can you describe an activity which really worked well, and why did it so?
- Are there specific knowledge gaps and research requirements?
- Is there a particular requirement for technical expertise and/or training?
- What assistance from WHO and other agencies could support implementation

Climate-resilient environment and health services are services that with withstand threats and impacts posed by climate change and should be characterized by integrated emergency planning, such as management of flooding and heat wave situations and interaction of sectors

such as environment, urban planning/design, water management and health institutions. Mitigation and adaptation should also be integrated and prevention should be supported with the use of projected environmental data and forecasts. Global long-term preparedness should also be considered.

Multiple barriers to climate resilience were identified ranging from ecological, economic, commercial, normative and institutional, information and communication barriers. Present guidance documents do not explicitly consider barriers to climate resilience and the perception of climate change does not bring health to mind first. For example, when speaking with young people about climate change, they think about the effects on nature and not their own health.

Among the activities that worked well (best practices) identified were the communication of medical advice to vulnerable groups in combination with the weather forecast using different media. Good examples of healthy renewable energy alternatives, such as those used in the BMU seven country project, could also be introduced longer term. The importance of green spaces and promotion of these for their health benefits was also highlighted as was nature preservation and the environment to promote tourism and economy as seen with the case of coastal bathing water quality. Generally speaking, low technology solutions found to be effective were preferred. The challenge of how to reach individuals who do not have high technologies remained.

The group believed that WHO could assist in identification of already existing relevant bottom up approaches that could be utilized such as LEHAPs and Healthy Cities initiatives. Strong WHO support for public health interventions with low technology (e.g. walking and cycling) would send the message that interventions need not be complex. Better WHO cooperation with local health care authorities and doctors, information campaigns for medical staff and integrating climate change into the educational curricula of future health care professionals are areas in which WHO's help would be welcome.

At the core of the issue of dealing with climate resilience are current problems such as the financial crisis which currently makes other issues more urgent. Furthermore, while science includes an element of uncertainty, the cost of inaction in terms of money, lost lives, disabilities and the quality of life should be used as an impetus for action. The private sector which is able to take action quickly should also be engaged with the involvement of business leaders.

## **Session IV: Sustainable health and environment sectors**

The scope and purpose of this session was to inform on developments on the paragraphs in the “Commitment to act” to “collaborate to increase the health sector’s contribution to reducing greenhouse gas emissions and strengthen its leadership on energy and resource-efficient management and stimulate other sectors to do the same”. For this discussion the action points under objective 2 of the European Regional Framework for Action (CC-ERFA) were suggested to be taken into consideration (EURO/HIC/7).

The session was introduced by three keynote speakers – full summaries of the presentations can be found in the annexes.

Sonia Roschnik from the NHS Sustainable Development Unit in England (United Kingdom) presented their experience from the NHS in England in creating sustainable health services by means of reducing the carbon footprint of NHS as an organization.

Mike Holland, Ecometrics Research and Consulting, showed that the health sector contributes to 4.2% of greenhouse gas emissions in Europe. Health care which is often technologically intensive leads to a significant rate of consumption of resources and associated environmental pollution and degradation. Reducing greenhouse gas emissions can reduce the burden on health systems and benefit climate mitigation.

Christoph Hammelmann from the United Nations Development Programme explained that sustainable public procurement needs to be supported as a first critical step to foster the green economy at the national as well as the subnational level. The UNDP environmental procurement guide addresses key environmental challenges and then relates these to management tasks for procurement personnel.

## **Session IV Group work**

For this discussion the action points under objective 4 of the European Regional Framework for Action (CC-ERFA) were suggested to be taken into consideration (EURO/HIC/7), namely paragraphs 34 and 35:

- Promote actions that ensure energy and resource-efficient management of energy, food supply, buildings, transport, waste, water supply and sanitation, within the health and environment sectors, in view of sustainable (renewable) financial and adaptation benefits.
- Encourage individual action by all stakeholders (e.g. employees, managers and patients) to reduce greenhouse gas emissions and minimize adverse health effects of climate change.

The discussion in the group work build on the earlier discussion and focused on questions like:

- What to your opinion are sustainable environment and health services?
- Which governance structures are required?
- Do you know how to reduce your carbon footprint?
- Which technical and behavioural avenues are to be promoted?
- Are there specific knowledge gaps and research requirements?
- Is there a particular requirement for technical expertise and/or training?

Two groups were chaired by Sonia Roschnik, NHS Sustainable Development Unit in England (United Kingdom), and Mike Holland, Ecometrics Research and Consulting (United Kingdom), respectively.

While the term sustainable environment and health system is a challenge to define as it is broad and encompasses many things, it was defined as a system that does not overburden future generations nor overuse resources, works with a broader understanding of “sustainability” including health and is part of an overall sustainable society. Such a term is not understood by many professionals in the health sector. Sustainable environment and health services need to ensure low impacts of health sector actions on climate change (e.g. infrastructures and renewable energy, notably geothermal) through an integrated approach

using both direct (e.g. mitigation actions) and indirect (e.g. training actions) measures. There is the issue of trade-off between expansion of health care, associated greenhouse gases and other environmental burdens to consider as well.

For a sustainable health and environment sector governance structures need to have a long term vision beyond the given political term and should involve youth in decision-making. There should also be connection, collaboration and cooperation among political sectors. Accountability, public reporting, and transparency should be present in such a structure and the ministry of health should take the leading role when it comes to decisions affecting health.

While reduction of the carbon footprint is a good entry point for the development of sensible strategies it is not enough. There is a need to look at the environment as a whole since all mitigation actions are not always good for human health (e.g. building energy efficiency vs. ventilation, biofuels and particle emissions). The side-effects of technologies and cost-benefit analyses also need to be considered. There is also not enough knowledge and data on reduction of the carbon footprint in health sector. The climate-friendly strategies of the health-sector can be presented through the architecture of seven key fields: energy efficiency, green building design, alternative energy generation, transportation, procurement, waste, and water. Moreover, according to studies performed in the UK, procurement (predominantly pharmaceuticals and medical equipment) is the most emitting field in the sector (with 65% of the health-related carbon emissions in England) and should therefore be of particular concern to mitigation health policies in the European region.

Reducing the carbon footprint using a bottom-up approach could provide an example to follow, such as reduction in one's own residence, company or organization. The measuring or monitoring of carbon use could be used as a starting point to make change visible and later compare.

Technical and behavioural avenues to be promoted for sustainable health and environment systems include information on co-benefits especially for decision-makers; calculation of costs in terms of welfare such as seen by the United Kingdom Climate Change Act which made decision-makers focus on the topic; identification of other drivers and promotion of individual and organizational incentives such as supporting change management. The above-mentioned avenues would need to be adapted to the national or local scale. Simple avenues, such as supporting the understanding of a health sector worker, should not be forgotten due to a focus on very ambitious and technical measures. The seven country project provided good examples of this with the example of energy security provided by renewables.

WHO can help by exercising its mandated technical role, identifying barriers to use of already available information, developing training materials and expertise (e.g. train the trainer initiatives), developing action plans such as a road map to sustainable health and environment services, monitoring of not only best but also negative practices, ensuring cross-sector collaboration and building up networks for local implementation. More guidelines were not deemed necessary, while translation of these was welcomed. Instead assistance in implementing existing frameworks was highlighted.

At national level, assessment of mitigation in the health sector would be needed and it was thought that the dissemination of this information should largely take place at the national level. The need for the institution to ensure inclusion of environmental considerations within

the health sector, to understand where co-benefits and trade-offs exist, and an active national role in regulation and education were also identified as important. The private sector could also play an important role due to its market power in health and the public sector was called on to provide them with incentives for collaboration.

With regard to knowledge gaps and research requirements, estimation of emissions from the health sector arose as an area where a simple assessment methodology could be used to start the process then refined where necessary. The group thought that international guidelines of measures that could be adapted at smaller levels would also be helpful. Lastly, knowledge of health workers should be strengthened to make the health and environment system sustainable as well as that of the general public to make them aware of what can be done and why it should be done.

## **Session V: Climate change and health intelligence**

The scope and purpose of this session was to inform on developments on the paragraphs in the “Commitment to act” to “develop and implement educational and public awareness programmes on climate change and health, to encourage healthy, energy-efficient behaviours in all settings and provide information on opportunities for mitigation and adaptation interventions, with a particular focus on vulnerable groups and subregions; encourage research and development, for example with tools for forecasting climate impacts on health, identifying health vulnerability and developing appropriate mitigation and adaptation measures.”

The session was introduced by the four keynote speakers – full summaries of the presentations can be found in the annexes.

André Jol from the European Environment Agency presented the European Climate Adaptation Platform. CLIMATE-ADAPT is a publicly accessible, web-based platform (<http://climate-adapt.eea.europa.eu>) designed to support policy-makers at EU, national, regional and local levels in the development of climate change adaptation measures and policies.

Génon Jensen of the Health and Environment Alliance (HEAL) focused on awareness raising and communication activities being carried out by HEAL as a contribution to the work on climate change and health including some concrete examples.

Sari Kovats from the London School of Hygiene and Tropical Medicine in the United Kingdom presented climate change and health research, its current status, research results and research gaps.

Lara Passante of the European Commission Directorate-General for Research and Innovation presented climate change and health research under the Seventh Framework Programme for Research and Technological Development (FP7) and the European Commission proposal for Horizon 2020, the next Framework Programme for Research and Innovation.

## **Session V Group work**

Three subthemes were discussed in break-out groups, namely:

1. Research;
2. Awareness raising and capacity development;
3. Information needs to be met through the information platform.

For this discussion the action points under objective 3 and 5 of the European Regional Framework for Action (CC-ERFA) are suggested to be taken into consideration (EURO/HIC/7), namely paragraphs 28 to 33 on awareness raising:

- Develop special curricula, programmes and activities to improve health and climate change-related knowledge in education, from kindergarten to postgraduate level.
- Train health and environment professionals on the health effects of climate change and co-benefits and risks of mitigation and adaptation measures.
- Promote and facilitate the development and implementation of communication strategies and advocacy campaigns, engaging the media and using effective dissemination channels to raise public awareness of the health impacts of, and adaptation and mitigation measures and personal action to reduce, greenhouse gas emissions.
- Involve children and young people, adults, scientific, technical and managerial personnel in settings such as schools, hospitals and workplaces in promotional activities.
- Ensure public participation and access to information on climate change, its effects, and adequate responses to facilitate informed choices.
- Promote dialogue among public authorities and provide health expertise in the negotiation of international multilateral environment agreements for informed decisions.

And paragraphs 36 to 38 on research and information of CC-ERFA:

- to discuss contribution of an information platform by 2014, based on available tools and information-gathering.
- Member States to contribute, and support the provision of, regular information to the platform, on:
  - national health impact assessments;
  - adaptation plans and strategy developments;
  - trends in climate change, environment and health indicators;
  - case studies of best practices and health co-benefits;
  - pilot project funding and research opportunities;
  - effectiveness of adaptation and mitigation measures.
- The global research priorities identified by WHO in the area of climate change and health (WHO, 2009) should be addressed.

A summary of the results of the discussions of these three breakout groups are presented here.

## **Research**

Chaired by Sari Kovats, London School of Hygiene and Tropical Medicine in the United Kingdom.

The group debated questions like:

- What are current research gaps?
- What research activities should be promoted?
- Which mechanisms currently exist?



- How to best communicate to donors?
- Identify three major research objectives.

The group discussed both gaps in research as well as partnerships, collaboration, capacity building, funding, institutional issues and research governance. In particular, concerns were raised regarding environment and health research in the Health Challenge theme of Horizon2020, the plan for future European Commission Funding, as the topic currently did not sit very highly on the agenda.

Research gaps were discussed under the three priority headings that follow.

*Research gaps on climate change and health in Europe*

More work on the direct effects of heat and cold, including information on susceptible groups including newborns and children was needed. In the health system setting, the effects of weather extremes in hospital settings, which often lack air conditioning in resource poor areas, in-patient health, in-patient care and labour wards, given newborns sensitivity to temperature due to inadequate thermoregulation, were also found to areas needing more information.

Methods for the evaluation of health system resilience to extreme weather were also identified as an area needing more research as was the direct effect of other types of extreme weather, including wild fires (air pollution, injuries, mental health), floods, and landslides, and drought events. Evaluation of interventions to deal with heat and cold spells, particularly with reference to high risk groups and how these might change over time, would be necessary.

Indirect effects of climate change, including land use change and behaviour change, leading to changes in the human environment and human-vector interactions, were also identified as an area where more information was needed. The impact of climate change on local exposure to chemical hazards, including POPs and heavy metals was also raised. On the geographical front, evidence of the health effects of loss of water bodies such as the Aral Sea, associated with a wide range of health effects, is limited and necessary.

Health effects of mitigation policies, including those of biofuels, some of which have negative effects, health effects of decontamination treatments, and multiple exposures need to be addressed including the impact of multiple extremes on population health (heat waves, wildfires, drought). Research that links human and animal health (one health paradigm) and cross-fertilization between human and veterinary epidemiology could bridge some knowledge gaps.

In the workplace, the impacts of demographic changes such as an aging workforce, economic requirements such as a young workforce, climate change and climate policy on workplaces, and implications for health of workers all need to be addressed.

*Knowledge transfer*

There is a need to ensure the current and future knowledge on environmental and climate impacts on health is communicated to decision-makers, researchers and other stakeholders. More formal mechanisms and tools for knowledge transfer are needed, including evidence synthesis, literature searching, data mining (e.g. old entomological surveys), meta-analyses,

systematic reviews and grading tools. Training in use of the new tools should be included to ensure that they are used appropriately.

Setting up of a clearinghouse for research programme funders making the wealth of research findings from European Commission FP6 and FP7 projects available to researchers for modest investment could immensely help knowledge transfer. Lastly, methods for risk assessment, including modelling, mapping, and economic appraisal would all enhance knowledge transfer.

#### *Transformative change*

Research agenda should address future health goals broadly and proactively in order to address the health effects of systems that are not yet in place. Future housing or transports systems can be developed that optimize health, economic and environmental goals. Hazards only research associated with current infrastructure can be limiting. Behaviour change research could become a key part of the transformative health research agenda.

#### *Research activities to be promoted*

The diversity of the WHO European Region must be recognized in research on both adaptation and mitigation. While the common health benefits of clean energy are important, rural areas in some countries of the Region still lack access to energy; in that context, dialogue on clean energy is of secondary importance. Some countries also do not undertake systematic monitoring of air pollution, which is required for research on interventions to improve outdoor air quality (a mutual benefit of mitigation policies). Appropriate research on mutual benefits should also be undertaken in middle-income settings.

Research is limited by lack of access to data on health and the environment or lack of data exchange, collaboration and sharing, and the situation should be improved. Mechanisms that facilitate access to data, such as a 'disease mapping platform', would facilitate research. Collaboration with countries that are not members of the European Union, particularly the Central Asian republics, should be improved, with regular information about on-going research projects to facilitate participation and learning. Interdisciplinary research is currently of poor quality at national level and must be improved. The EC FP7 has successfully established several interdisciplinary collaborative projects on environment, climate change and health.

A range of possible methods have been developed to prioritize health topics for research based on current or future health burden, feasibility of interventions, and health burden potentially avoided. For example, some mitigation policies have more health benefits in highly polluted areas than in cities with good air quality. Methods and tools of economic appraisal of health impacts looking at cost of damage and the co-benefits or harm of climate policies both adaptation and mitigation are also necessary. Surveillance and monitoring also still need to be improved.

#### *How to best engage donors*

The group found that donors can best be engaged by improving communication about ongoing research at national level. Within EC FP7 projects and others it is very important to engage with decision-makers, including funders, early on in the project. Such interaction will also ensure research results are more policy relevant. Finally the group thought that donors can also be engaged by communicating findings of this research group to them.

## Awareness raising and capacity development

Chaired by Génon Jensen, Health and Environment Alliance (HEAL) based in Brussels, Belgium.

### Questions

- Can you describe winning awareness rising activities?
- Can you describe an activity which really worked well, and why did it so?
- Which activities need to be developed for which target audience?
- What are the main priorities for training and capacity development?
- What assistance from WHO and other agencies could support implementation?

The group identified winning awareness raising activities to be those which have a good understanding of the target audience and which use audience fragmentation to understand population composition, gender, age and culture. It would also be important to ensure that activities bridge the gap between scientific knowledge and policy-makers or the public to ensure translation of technical discourse to actions. The importance of factoring in sustainability in awareness raising efforts would ensure continued effect. The group suggested promoting transport and mobility activities where lowering emissions and fighting chronic diseases at the same time were both related to climate change and health.

**Table 2.** Winning climate change and health activities by NGOs

Activity	Details
Film festival to showcase winning entries of INCHES children's climate and health video competition	Featured participation of NGOs, researchers and students. Produced short videos of clips for public use.
City festivals, involving citizens	Involved them in activity, not only direct information and presentations.
Official thematic "health and climate" days	Free skin diagnosis to prevent cancer.
Projection of real-time satellite images compared with older pictures of a territory	Use of Amazon forest in school settings.
Climate breakfasts in schools	Combination of healthy nutrition with pedagogic explanation of climate change mechanisms and impact of food on it (seasonality, packaging).
Communication on weather events and allergies forecasts in media	Included advice on behaviours during heat-waves and UV protection measures.
Communication on specific sectors and health co-benefits	Sustainable transport and active travel
Availability of climate change monitoring software to general public	Featured environment data from transport, air quality and adapted for adults and children.

When discussing the main priorities for training and capacity development the need for more interventions focusing not only on behaviour change but also on action after behaviour has been changed was highlighted. Mechanisms such as social media and audience segmentation could also help target behaviour change interventions. Strengthening capacity building should involve broadening it, making it cross-sectoral and integration of qualitative research methods to assess effectiveness of training and different measures. Main target populations should be policy-makers, health workers and the communications sector (e.g. media and journalists) due to their potential influence in sending out messages and academia. When faced with the challenge of raising awareness in ministries the best tools identified were evidence based messages and the promotion of communication among sectors, with the

example used of the environment sector using a health impact message in their communications or linking messages to a timely event such as a heat-wave.

To best support implementation of awareness raising and capacity development, the group welcomed assistance from WHO and other agencies in areas such as the compilation and grouping of existing initiatives to share experiences and good practices; assistance in identifying successful models of cross-sectoral work; promotion of the inclusion of youth networks such as the International Federation of Medical Students and the European Youth Forum and in climate change and health awareness raising and ensuring that capacity building and training reach actors on the front line. Sample materials materials such as press releases or fact sheets providing evidence, background messages and country figures that could be adapted or translated to climate and health topics would also be welcome.

### **Information needs to be met through the Information Platform**

Chaired by James Creswick, WHO Regional Office for Europe in Bonn, Germany.

#### **Questions**

- What information would you like to see on a climate change and health information platform?
- What information can you contribute?
- Would you be willing to co-finance some of the developments?
- What are the barriers?
- What other information networks can we build on?

The discussion in this group centred around the current CLIMATE-ADAPT information platform which covers 32 European Member States and is not a health-only platform. It was believed that there should be a mechanism to expand this platform since WHO/Europe has 53 Member States and a health focus is warranted in all these. The group discussed a platform that is complementary with existing systems and identified the types of information they would like to see on such a system. This ranged from background information on different climate change and health issues; information on how take action and raise awareness; regional and local climate change and health projections (also urban issues); information on mitigation; good practices an case studies from the wider WHO European Region; information on relative events, not just extreme events; connection between meteorological and health data and interpretation of this and training materials and packages. A web site with information on current extreme weather events called Medisys was also mentioned.

Challenges and barriers to such a system were numerous. Capacity related challenges arose in the group discussion ranging from comparability of data since there is no reporting obligation, modelling of data, the need for meta data sheets and maps. The issue of quality assurance and control of data was also highlighted as currently there was limited capacity to deal with this. Also related to data was the limited number of indicators available since the only ones that could currently be used are ENHIS indicators. The language issue also came up as there is a lack of material in Russian to serve the countries currently not covered under the information platform. The group discussion closed with other information networks that could be built upon (see Table 3 below).

**Table 3.** Examples of information networks to build upon

Type of portal	Name
Community-driven modelling effort that provides cross-sectoral global impact assessments based on the newly developed climate and socioeconomic scenarios.	ISI-MIP Intersectoral Impact Model Intercomparison Project (PIK Germany) with 6 modeling groups: <a href="http://www.isi-mip.org/">http://www.isi-mip.org/</a>
WHO Europe	ENHIS is an information system aiming to support public health and environmental policies in the WHO European Region.
WHO globally	WHO Global Health Observatory
National portals	KomPass, UKCIP
European Commission & its agencies	EEA CLIMATE-ADAPT, ECDC E3 Network, Eurostat
Surveillance and early-warning systems	
Climate change and health-related work of other United Nations agencies	UNEP ProVIA: <a href="http://www.provia-climatechange.org/">http://www.provia-climatechange.org/</a>

## Session VI: The Way Forward

Two parallel groups were chaired by Rob Swart, Wageningen University and Research Centre in the Netherlands, and Thomas Krafft, Maastricht University in the Netherlands, respectively. The scope and purpose of this group discussion was to elaborate on:

- key issues arising from meeting (research, capacity development, thematic priorities, etc) and possibly priorities for a WHO business plan

This session focused on the way forward and asked participants elaborate key issues arising from the meeting and specify how the technical community could support the diverse needs of the WHO European Region Member States.

A key issue that arose from the meeting was the urgent need to include climate change and health further into national, regional (like Horizon2020) and international research. The focus should move away from expressing concerns to stressing positive recommendations based on peer-reviewed literature. There should also be a focus on a limited number of key content issues reflecting the major climate change and health achievements over the last years.

Content issues identified:

1. Knowledge on direct health effects of policies has significantly improved;
2. There are co-benefits and trade-offs for mitigation measures identified, some of these quantified;
3. There is a need to acknowledge the greater importance and broadened understanding of mitigation opportunities in the health sector;
4. There is a need for methodological developments to assess vulnerability and risk;
5. Climate change and health cannot be seen in isolation and health can be placed a wider context;
6. There are winning health sector measures that can be utilized and

7. There is a Framework for Action on Climate Change and Health and many countries have adaptation strategies now in place.

Major priorities proposed:

- systematic, coherent, comprehensive assessments of health vulnerability and impact;
- a route map for healthy adaptation and mitigation in all sectors and the health sector;
- an environmentally sustainable health sector;
- evaluation of and qualitative research on the cost–benefit of current and future interventions;
- extension and further development of training of professionals in health and other sectors on health and climate change, with an assessment of its effectiveness;
- regular communication of knowledge and practices via coherent, consistent information platforms;
- links to current policy priorities; and
- equal opportunities for the eastern part of the WHO European Region.

When referring to implementation, the take home message focused on taking the information and ideas from the meeting and getting national activities started. Again, the need for collaboration between United Nations agencies was stressed, including joint side events at major meetings. Finally, participants brought up the need to monitor recommendations from this meeting and called for a mechanism to get feedback on progress.

## Annex I: Summary of the presentations

### Session I

#### Mr James Creswick and Dr Bettina Menne

#### *CGS programme, WHO Regional Office for Europe, Bonn, Germany*

The scope of the seven-country initiative was to increase health system resilience to climate change. Seven countries were selected from the WHO European Region based on their geographical and climatic features:

- arid and semi arid water-stressed areas: Kazakhstan and Uzbekistan;
- high-mountainous areas: Kyrgyzstan and Tajikistan;
- Mediterranean climate: Albania and the former Yugoslav Republic of Macedonia;
- subarctic and arctic region: Arkhangelsk Oblast, including the Nenets Autonomous Okrug, in the northern Russian Federation.

The specific objectives of the pilot projects in the seven countries were:

1. Development of national (or subnational) environment and health adaptation plans or integration of health into existing plans;
2. Strengthening health systems and building institutional capacity on climate change in relation to extreme weather events preparedness and response; infectious disease surveillance and response; respiratory disease early detection and response; water, food safety and malnutrition; technology transfer to foster innovation in energy efficiency and the use of renewable energy for health services; and
3. Provide intelligence and facilitate the exchange of knowledge and experiences on effective adaptation and mitigation measures.

The project ran from 2008 to 2012 with the official launch in March 2009 by Dr Margaret Chan, Director-General of the World Health Organization. It was funded by 9.3 million USD from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). Each project had a nationally-appointed steering committee and benefited from cooperation between the Ministry of Health and other sectors. This mechanism allowed for involvement of thousands of professionals depending on the country. WHO Regional Office for Europe played a coordination role and provided countries with technical assistance, as well as assisted in the internal and external communication and information aspects.

The project used three key mechanisms, as outlined in the UNFCCC Nairobi Work Programme<sup>1</sup>, namely:

- advice: assisting countries in developing national health adaptation plans, with specific focus on health system preparedness and response;
- investment: early-warning, detection and response systems for extreme events and infectious disease outbreaks; renewable energy (solar energy) for health services;

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<sup>1</sup> The Nairobi work programme (NWP) ([http://unfccc.int/adaptation/nairobi\\_work\\_programme/items/3633.php](http://unfccc.int/adaptation/nairobi_work_programme/items/3633.php)) has the objective to assist all Parties, in particular developing countries, to:

- improve their understanding and assessment of impacts, vulnerability and adaptation to climate change; and
- make informed decisions on practical adaptation actions and measures to respond to climate change on a sound scientific, technical and socio-economic basis, taking into account current and future climate change and variability.
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primary health care and health system capacity; water safety and cost effective infrastructure; air quality monitoring and improvement;

- capacity building: building capacity in national health and environment professionals and policy-makers in understanding and acting for the protection of the climate system and health from climate change.

These mechanisms apply to all participating countries, though with different focus and emphasis, depending on the risks profiles and the level of development and capacity of the countries.

The project helped the work on climate change and health advance technically allowing for the use of numerous guidelines, inclusion of a wide range of expertise and production of training materials. It helped put health higher on the climate agenda and helped implementers to reflect on public health measures available. The results of the project were widely presented, both to the other countries within the seven-country initiative, but also to other audiences at both national and international level. In Box 1 to the right, we summarize some of the methods used in achieving this output.

**Box A.1:** Inter-country mainstreaming and results communication – quantitative evidence:

- International external communication,
  - a. Dedicated pages on WHO/Europe climate change website;
  - b. Project leaflets and brochures;
  - c. A short documentary about the 7-country project;
  - d. Three side-events at UNFCCC meetings;
  - e. The activation of the World Health Youth Environment and Health Communication Network (WHY);
- Internal 7-country initiative project communication:
  - a. Through regular email alert;
  - b. Dedicated ShareFile site for the project;
  - c. Three project-specific meetings

Following are short descriptions of each of the seven country projects focusing on the project goal, key objectives, activities carried out and results.

## ***Albania***

**Dr Edmond Zaimi**

***Head of Emergency Department, University Hospital Centre “Mother Teresa”, Tirana, Albania***

Albania is a Mediterranean country at risk of extreme weather events and changes in infectious disease outbreaks.

Five main activities were envisaged for the whole duration of the project:

1. Develop a national vulnerability assessment and climate change health adaptation plan for preparedness and response;
2. Strengthen capacity building and policy support in preparing for climate change events;
3. Promote technology transfer, specifically with regard to energy efficiency;
4. Strengthen the climate, environment and health information system and ensure integration of data analysis and coordination with other sectors;

The project first carried out a vulnerability assessment focusing on extreme weather events, air quality, communicable diseases and impaired water quality. A vulnerability report and a national climate change adaptation plan were then produced. The strategy defined the following objectives for Albania.<sup>2</sup>

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<sup>2</sup> Extracted from the Albanian Strategy for Health System Adaptation into the Climate Change, Tirana, 2011



- Raise public awareness, improve education and build capacities among professionals on the possible effects of climate change on health.
- Adapt the information system to make it appropriate for detection of climate change related risks and evaluate in time their effects in health. Encourage research and innovation related to health and climate change.
- Integrate health prospective approaches and issues at all current and future climate change policies so to ensure potentiating of benefits and minimizing harms. Assure coordination between different stakeholders and different sectors to increase efficiency.
- Enhance the capacities of inter-sectoral monitoring systems to control increasing problems related to air pollution with special focus on particles and ozone.
- Increase the capacities, preparedness and coordination of the health system with other systems in dealing with expected health problems inflicted by heat waves and extreme cold weather.
- Improve collaboration and integration of health system into the national emergency structures responsible for floods and fires, landslides and other natural disasters inflicted by climate change.
- Adapt and integrate surveillance and control systems for selected communicable diseases and vectors likely to be affected by climate change.
- Strengthen the health services and coordination of information systems for prevention and management of health problems inflicted by increasing exposure to pollens.
- Bringing together different sectors for setting up a system for monitoring and prevention of health problems resulting from increased ultraviolet radiation.
- Developing an action plan to improve energy efficiency in the health sector based upon the energy assessment report.

Specific activities followed ranging from strengthening climate related emergency management in health care facilities such as setting up a disaster response plan in hospitals and capacity building of health professionals for prevention and control of infectious diseases and training of health professionals by WHO experts.

The purchase of two sets of equipment for measuring air pollution in Tirana led to an increase in the country's capacity to monitor air pollution and the subsequent installation of four more pollution monitoring stations throughout the country.

General population awareness raising on how to protect health from climate change also took place thanks to production of numerous communication pieces. Local capacities for communication or alert-mechanisms for the population were also set up as well as the production of regular reports.

Challenges stemmed from the fact that climate change is a new area for Albania, a country with little experience or studies on the subject. The country's information system is also rather weak making it difficult to carry out proper studies on the subject. Intersectoral communication is also a challenge and civil society's role is not very active.

## ***Kazakhstan***

**Dr Shalginbay Zhandossov**

***Head of Scientific-practical center of sanitary-epidemiologic examination and monitoring, Ministry of Health, Kazakhstan***

Kazakhstan is a mountainous semi-arid country characterized by four climatic zones and a low population density. In Kazakhstan, the overall goal of the project was to strengthen health sector emergency preparedness for climate related events by means of:

- conducting an assessment of health vulnerability;
- training public health and environmental health specialists;
- developing an action plan for preparedness and response and communicating results; and
- provision of information and capacity building in preparing for climate change events.

The project carried out a vulnerability, impact and adaptation assessment as a basis for the development of a national health adaptation strategy. Vulnerability of hospitals to extreme weather events and natural disasters such as earthquakes and flooding was found in southern Kazakhstan. The capacity of the health system for crisis management was also strengthened by the development and adoption of an education standard for medical postgraduate students on emergency. A hospital safety assessment was also conducted in five hospitals. Capacity building events were carried out at national and subnational levels to help improve skills in early identification of potential risks, outbreaks of infectious disease and for strengthening of disease surveillance systems.

As a result of the vulnerability, impact and adaptation assessments the project led to improved emergency management systems. Thanks to the capacity building component of the project, understanding of emerging infectious diseases increased as did the application of International Health Regulations. Concrete recommendations for adaptation arose as a result of the project, centred around:

- the need to create mechanisms for inter-agency coordination to protect public health in a changing climate;
- the strengthening of human and scientific potential of the health system;
- raising awareness among health care workers and the public;
- strengthening of epidemiological monitoring and surveillance for climate related infectious diseases;
- inclusion of climate change into the list of priority research areas in the country; and
- the identification of indicators to regularly monitor the impact of climate change on health.

### ***Kyrgyz Republic***

**Mr Omor Kasymov**

***Director of Scientific and Production Centre for Preventative Medicine, Ministry of Health, Kyrgyz Republic***

The Kyrgyz Republic is a country characterized by high-mountain areas. It is a country where glacier retreat, glacier lake outburst floods (GLOFs) and mudslides, which all put population health and health services at risk.

In the Kyrgyz Republic the overall goals of the project were:

- Carrying out of a national impact, vulnerability and adaptation assessment;
- Developing of adaptation plan;
- Building capacity through national training workshops and stakeholder involvement;
- Increasing awareness on the climate change and health problem, and
- Creating energy efficient health service infrastructure by means of the installation of solar energy in five hospitals.

The national impact, vulnerability and adaptation assessment found a projected increase in cardiovascular diseases by 10.5% by the year 2100. It also found a projected increase in intestinal infections of 18.2% by 2100 among children under age one (Ministry of Health Kyrgyz Republic, 2011). A projected increase would also occur in areas where malaria already exists as well as the spread of tick-borne infections. The national adaptation plan was supported by an order of the minister of health with the main aim of preventing, minimizing and eliminating consequences of climate change by means of the following priorities:

- capacity building of health professionals;
- prevention of accidents from extreme natural events;
- climate related infectious and non-infectious morbidity;
- safe drinking-water and foods;
- improvement of the public health infrastructure; and
- scientific research.

Challenges in development of the national adaptation plan were insufficient funding, lack of public health personnel and weaknesses in the monitoring system. Within this context opportunities for cross-sectoral work for incorporation of the health section in the national adaptation strategy arose as well as the prioritization of climate change and health in the public health system. Energy saving technologies and alternative energy sources were also introduced as a result of the national adaptation plan; five medical facilities are piloting solar energy equipment. Solar energy could cover 90% of hot water demand for 8–9 months of the year, provide about 50% of the energy needed for heating during the heating season and provide electric power for up to 30% of population. Benefits include improved refrigeration of medicines and vaccines, improved security of energy supplies, for example for operating theatres and incubators for new-born infants, provision of hot water for hygiene and overall improvement of well-being.

Numerous public health specialists were trained in climate change and health at province and district level and five new curricula for the topic were developed for undergraduate medical and post-graduate public health students. Methodological guidance on climate change and health issues were also developed for health professionals. The awareness of journalists was also increased by means of training, village health committees received copies of a film on the topic of climate change and health and 40 types of informational materials and media stories were developed. The national climate change and health assessment found that 40% of procured energy in hospitals was lost due to inefficient use. As a result of this, solar collectors and panels were piloted in five hospitals situated in diverse climate zones and altitudes with an acceptable cost and high levels of political support.

### ***Russian Federation***

**Ms Aryuna Dashitsyrenova**

***Consultant, Ministry of Health and Social Development, Russian Federation***

In the Russian Federation, the project took place in the Arkhangelsk region, including the Nenets Autonomous District. This is a subarctic and arctic region in northern part country threatened by reduction in thickness of glaciers and ice and retreat of permafrost, which damage the health infrastructure, ecosystems and transport routes.

Specifically, the project aimed to:

- Assess population vulnerability to climate change and the capacity of the regional health system to adapt to climate change;
- Develop a Regional Action Plan aiming to prevent negative climate change impacts on the health of the population which could be used in other Arctic regions of the Russian Federation;
- Build institutional capacity for dealing with climate change, extreme weather event preparedness and response, and infectious disease surveillance and control;
- Raise awareness among decision-makers about the link between climate changes and health; and
- Coordinate and disseminate information among the participants of the Project.

The vulnerability assessment looked at the impact of climate change on mortality due to heat-waves and cold spells. The assessment found that a rise by each degree above 15.5°C to be connected with an 1.6% increase in the number of calls for injuries, poisonings and external effects and for respiratory diseases, a 1.6% increase in men, a 2.5% increase in children and a 3.0% increase in the 60 and over age group. For each increase in temperature of 1°C, salmonellosis was found to increase 1.9% and incidence of tick borne encephalitis rose nearly 60 times. Floods in the region resulted in damage to roads, bridges, overpasses and communications infrastructure resulting in interrupted communication between 67 settlements with a population of over 16,500 people. Transportation services for passengers, food and medicines have also been discontinued during this period. Due to climate change, the Nenets Autonomous District now has a lengthened period of inaccessibility and limited accessibility of medical aid that amounts to eight weeks.

The WHO/BMU project led to a strategy for adaptation to climate change impacts specific to the region, capacity building activities for undergraduate and postgraduate education of health workers, population awareness raising activities, primary health care sector strengthening using tools such as medical kits for screening and monitoring cardiovascular and respiratory diseases as well as regular monitoring the capacity of climate-dependent communicable diseases.

Reflecting on lessons learned, it was found that the adaptation strategy could serve as a basis for a regional strategy and could be implemented in other parts of the Russian Federation. Creation of a national inter-ministerial committee for climate change and health to carry out vulnerability assessments, development of strategies and research cooperation at the international level would support such efforts. The use of similar methodological approaches was deemed necessary to carry out vulnerability assessments of the population with other climate-dependent communicable and noncommunicable diseases. With respect to capacity building it was found necessary to include training hours on the topic of climate change impacts on health in the educational programs of health care workers at the postgraduate level.

### ***Tajikistan***

**Dr Alimakhmad Sufiev**

***Head Specialist, State Sanitary Epidemiological Service, Tajikistan***

Tajikistan is a country characterized by high mountain areas whose population is also put at risk from glacier retreat, glacier lake outburst floods and mudslides.

In Tajikistan, the overall goal of the project was to strengthen the capacity of the country in understanding the health risks of climate change and take action by:

- developing a national health adaptation plan, with particular emphasis on assessing health impacts;
- assessing the capacity of the local health system to respond to climate change;
- develop contingency plans for health facilities in close cooperation with other sectors;
- building capacity of the local health system including provision and response to early warning; and
- improving water security for health care institutions through cost-effective technologies.

The project vulnerability assessment found the main priorities in Tajikistan to be water and sanitation, food security, reproductive health, communicable diseases and cardiovascular and respiratory diseases. The main activities carried out in the country were an improvement of the legislative means to support the topic of climate change and health; implementation of interventions to reduce vulnerability and socioeconomic damage; strengthening of the population's capacity to adapt; institutional and individual capacity building and increased public awareness. The project also set up an inter sectoral working group and created a national strategy on adaptation to climate change including actions up to the year 2020 and a plan to provide a safe water supply to the population. A water safety plan was also set in place with the water component in a central regional hospital undergoing infrastructural improvement. Prior to these changes, the water supply had been open to animals and to human waste activity.

### ***The former Yugoslav Republic of Macedonia***

**Professor Vladimir Kendrovski**

***Head of Sector, Institute for Health Protection, the former Yugoslav Republic of Macedonia***

The former Yugoslav Republic of Macedonia is a Mediterranean country at risk of extreme weather events and changes in infectious disease outbreaks. The overall objective of the project in the former Yugoslav Republic of Macedonia was to mainstream climate change adaptation issues in the regular development of health sector policies and strategies.

Specific objectives were:

- Assessing the health impacts of climate change and developing a national health adaptation strategy;
- Building institutional capacity on climate change in relation to extreme weather events and heat waves preparedness and response;
- Fostering innovation in energy efficiency and renewable energy sources; and
- Developing early information on climate related infectious disease risks at municipal and national levels.

Heat was found to pose a particular challenge for this country. The project risk assessment found an excess number of deaths during the summer 2007 compared with average deaths during the period 1994-2007 and an increase in projected temperatures for 2025 compared to 2000. Salmonella morbidity was also shown to increase in warmer periods of the year as was prevalence of pollen allergens and sensitization to these. A heat wave alert system was developed ([www.toplotnibranovi.mk](http://www.toplotnibranovi.mk)) heat-related syndromes monitoring in place. The upgrading of the existing early warning system for communicable diseases surveillance also took place as well as awareness raising activities on communicable diseases related to climate

change at regional and local levels. Pilot measures were carried out to make two health facilities energy efficient (this section is interesting but makes the summary too long).

Main project results were the setting up of a national task force; the designation of the Institute of Public Health (IPH) as national IHR focal point and development of an action plan for IHR development. A five day online training course, accredited by the National Center for Continuous Education, was also carried out.

Challenges related to this project were the fact that this was a new area with lack of experience and studies to support the work. Working intersectorally also posed challenges as did the fact that the current information system in the country would need to be strengthened and proper indicators needed to monitor the issue. The fact that the issue is of long term nature poses a challenge when convincing policy-makers to take action. Civil society is also aware of the impact and consequences of climate change on health.

Nevertheless, the project created a basis for sustainability by means of the national strategy and action plan and expansion of the steering committee to engage them in future activities. The fact that the country is moving towards EU membership is also another motivating factor. Six future project proposals have been drafted on the topic of climate change and health with hopes for future funding.

## ***Uzbekistan***

### **Dr Nargiza Khodjaeva**

#### ***National Professional Officer, WHO Country Office, Uzbekistan***

Uzbekistan is a country characterized by arid and semi-arid water-stressed areas. The project took place in the pilot region of Karakalpakstan, an autonomous Republic in the north western part of the country, an area well known due to the Aral Sea crisis. The project general objectives were to develop national capacity for assessing health impacts of climate change and to develop a national plan for protecting health from climate change. Specific objectives for Karakalpakstan were:

- to reduce the burden of respiratory diseases through early warning and early case detection and management;
- to assess the nutritional status related to climate events and provide the government with recommendations for action; and
- to assess the feasibility of the national action plan at the regional level and evaluate the Practical Approach to Lung health (PAL).

Specific measures identified to be taken both within the country's health care system and beyond to implement this project in the country include the following:

- capacity building for risk assessment and development of national and subnational adaptation strategies;
- enhancing national capacities for the prevention of pulmonary, cardiovascular and acute intestinal diseases as well as other indicators related to climate change factors;
- developing strategies and providing recommendations about practical measures to improve public health and prevent both cardiovascular and acute intestinal diseases and other diseases associated with changing climatic conditions in the Republic of Uzbekistan using the example of the Aral Sea region;

With regard to improvements in early warning and early case detection and management, two stations in Tashkent were equipped with samplers for PM<sub>10</sub> and PM<sub>2.5</sub> dust particle monitoring and staff trained in their use. An early-warning system on dust storms was also developed. An assessment of the impact of climate change on nutrition was also carried out and a joint project with UNICEF and the Ministry of Health on improving complementary nutritional practices. The national action plan was supported by the establishment of a national steering committee and a national adaptation strategy was drafted.

## Session II

### **Putting health at the Heart of the Green Economy Agenda- Making the links for Rio+20** *Carlos Dora, Department of Public Health and Environment, World Health Organization*

Worldwide we are faced with an enormous burden from noncommunicable diseases with 80% of that occurring in low and middle income countries. We are also faced with a global economic crisis in the midst of ever increasing climate change. Environment and health has shown that solutions such as greening the economy, adapting and mitigating climate change and changing behaviours, consumption and patterns smart development choices can reduce pollution and injury thereby improving health. WHO headquarters is carrying out a “Health in a green economy” initiative consisting of an assessment of policies to mitigate climate change for health impacts, identification of those policies and investments most beneficial to health and equity and identification of opportunities and barriers to better policies. Many proposed solutions have not addressed co-benefits, benefits to health and integrated strategies. An example of green urban transport was given as a means of reducing chronic disease, injuries and improving health equity. Examples of inappropriate solutions from transport, housing and household energy, health care facilities were also given to show contrast.

Climate finance needs adaption to take health into account. Currently health adaptation projects comprise just 1% of international climate finance. United Nations Clean Development Mechanism finance is not well suited to green housing, energy and transport systems in low income cities. Health co-benefits of mitigation are also not recognized in CDM finance. Synergies between climate change adaptation and mitigation are currently not being optimized. An integrated approach to climate, development and health is needed. Cost-effective interventions exist which can save lives now, reduce vulnerability to climate change and reduce future greenhouse gases. Environment and health actors can ensure that health receives Climate Finance support and use health impact assessment (HIA) to identify best health performance policies; mainstream health into existing environmental and social safeguard frameworks; use economic valuation of health co-benefits of green investments; Monitor-report-verify (MRV) health impacts from investments using valid health metrics as indicators of sustainable development; support innovation and build capacity in cities and countries as well as build a coalition to advocate for health in sector policies. In short, health can be at the heart of Rio+20 by advocating for universal access to health services. Health co-benefits (and risks) need to be considered in green economy policies and investments and health indicators can provide the metrics for sustainable development monitoring and evaluation.

More information is available on the “Health in the Green Economy” page of the WHO web site: [http://www.who.int/hia/green\\_economy/en/](http://www.who.int/hia/green_economy/en/)

## **Climate Change and the Green Economy**

***Bettina Menne, Programme Manager, CGS programme, WHO Regional Office for Europe, Bonn, Germany***

The United Nations System Report: Sustainable development in Europe and central Asia presents the challenges linked to sustainable development in the pan-European Region and makes concrete policy proposals for managing the green transition to ensure the greatest benefit for the people of the region. Three concepts underpin the report:

1. Resource depletion and environmental degradation: While there is some good news in terms of energy efficiency in fossil fuel consumption and use of renewable energy, the region is still one of the most energy intensive regions in the world. Similarly, progress has been made in preserving natural resources, with an overall increase in forest areas and the establishment of protected areas, but ecosystem services and biodiversity continue to be depleted and degraded, and the value of natural capital is not recognized yet in national accounting systems.
2. Poverty. The report emphasizes the synergies between the goals of poverty eradication and sustainable development. In the long run, transformation to inclusive and sustainable development will reduce the vulnerability of the poor to environmental degradation and create the necessary basis for their development. However, during the transition specific prevention and protection measures are necessary to compensate the adjustment costs which will likely affect poor households and other vulnerable groups. Structurally, a social protection floor is a critical investment. In order to finance these social mechanisms, the fiscal space needs to be expanded; on the revenue side through the removal of subsidies and increasing taxes on fossil fuel, cap-and-trade quota allocations and better capital taxation, and on the expenditure side through public savings from administration reforms and better targeting of social protection measures.
3. Inequality. During the past two decades, inequality has increased rapidly in both the Eastern and Western parts of the ECE region. This trend has aggravated living conditions in some areas due to lack of employment, inadequate housing, education, health and social services, and the degradation of natural resources — in particular soil and water. In order to reduce social and geographical inequalities, the report reviews the policies aimed at ensuring a just transition, in particular by generating green and decent jobs and providing equal access to health services.

The report proposes some solutions among them the elimination of environmentally harmful subsidies, excise taxes and other forms of carbon pricing that would correct misleading market signals and reduce the wasteful use of energy and greenhouse gas emissions. Promoting the uptake of new environmentally friendly technologies and practices would also be critical for shifting towards sustainable production patterns in the region. The report calls for a comprehensive approach to overcoming residual institutional, market and behavioural barriers to sustainable production by means of a national energy strategy, action plans by subsectors, long-term goals and quantifiable energy-efficiency targets.

Greening of the health sector would generate benefits for health, development and climate change adaptation or mitigation. Such a change in energy sources in existing health facilities could yield immediate, annual facility savings in the order of 10%–30% in a sector estimated to account for 5%–7% of national greenhouse gas emissions in some developed countries (WHO, 2012).



## **Towards development of the multi-sectoral EU Adaptation Strategy**

**Cornelia Jäger, European Commission Directorate-General for Climate Action**

This presentation gave a summary of EU strategies on climate change relevant to the “Commitment to act”, namely the EU White Paper on Adaptation adopted in April 2009 and the EU Adaptation Strategy foreseen for adoption in March 2013 (EC, 2009).

The EU White Paper presents a framework within which the European Union and its Member States can prepare for the impacts of climate change. The first phase of the strategy will run until 2012 and will lay the groundwork for preparing a comprehensive EU adaptation strategy from 2013 and beyond. The strategy will focus on increasing our understanding of climate change and possible adaptation measures and how adaptation can be embedded in key EU policies. “Climate-ADAPT, the European Climate Change Adaptation Platform is one of the actions implemented following the adoption of the 2009 White Paper on adaptation, where the establishment of a Clearinghouse Mechanism was mentioned. The platform for information sharing was successfully launched in March 2012.

Building on this existing work, the EU Adaptation Strategy aims to enhance the preparedness and capacity to respond to the impacts of climate change in the EU, its Member States and regions, down to the local level. This includes, *inter alia*, preparing for and responding to rising temperatures, changing precipitation patterns, sea level rise and extreme weather events. Based on best available knowledge on climate impacts, risks and vulnerabilities, the EU Adaptation Strategy could outline a comprehensive range of feasible solutions and required actions at all levels (EU, national, regional, local) and dimensions (sectoral and horizontal) to adapt to climate change.

Three key issues could be considered in priority:

- Strengthening the knowledge base
- Working with and facilitating cooperation between Member States/Stakeholders
- Developing a policy and market framework for adaptation in the EU

The Strategy will respect the principle of subsidiarity and support the overarching EU objectives of a smart, sustainable and inclusive growth as stated in the Europe 2020 – Europe’s growth strategy. The Strategy will also take due account of other on-going activities at EU level in which adaptation considerations are already being integrated.

## **Health in the United Nations Framework Convention on Climate Change (UNFCCC)**

**Tiffany Hodgson, United Nations Framework Convention on Climate Change**

This presentation focused on aspects of the UNFCCC that could be windows of opportunity for working on climate change and health, with a focus on adaptation. The IPCC defines adaptation as the “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (IPCC, 2001a). There are also two articles in the Convention that address health namely, Article 1: which defines the “adverse effects of climate change” as, *inter alia*, those which negatively impact on “socioeconomic systems or on human health and welfare.” and Article 4.1 (f) which calls for the need to “employ appropriate methods, for example impact assessments... with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, or projects or measures undertaken by them to mitigate or adapt to climate change” (United Nations, 1992).

The presentation also focussed on the outcomes of COP 16 (in Cancún, Mexico) where the COP invited all Parties to enhance action on adaptation under the Cancun Adaptation Framework (CAF), taking into account their common but differentiated responsibilities and

respective capabilities, and specific national and regional development priorities, objectives and circumstances, by undertaking, inter alia, planning, prioritizing and implementing adaptation actions, including projects and programmes, including in the areas of water resources; health; agriculture and food security. The CAF presents an opportunity for further engagement with the health constituency, and it incorporates the work programme on loss and damage, the Adaptation Committee and the NAP process. The latter process was established to enable LDCs to formulate and implement NAPs by building upon their experience in preparing and implementing National Action Programmes of Adaptation (NAPAs), as a means of identifying medium- and long-term adaptation needs and developing and implementing strategies and programmes to address those needs.

Another window of opportunity is the Nairobi Work Programme on impacts, vulnerability and adaptation to climate change (NWP) implemented by Parties, IGOs, NGOs, the private sector, communities and other stakeholders with the aim of disseminating knowledge and information on adaptation. A call for submissions was made at COP 17 in Durban at the end of 2011, and two workshops were mandated that included health as an element (one on water and another on ecosystems-based approaches). The CGE was also mentioned. As part of its work programme, it assists non-annex I Parties with vulnerability and adaptation assessments, with health being included.

### **Session III**

#### **Vulnerability assessments and health adaptation strategies or action plans: Key elements**

*Dr Peter Berry, Health Canada; Bettina Menne, WHO Regional Office for Europe*

Public health adaptation to climate change faces numerous challenges. Among these are obtaining and disseminating behaviour changing and understanding adaptation needs whether it be introduction of a new activity or improvement or expansion of what is already in place. Mainstreaming adaptation to include risk assessments also remain a challenge as well as how to take a multi-sectoral approach and weighing the costs of adapting or not. A public health approach to adaptation should be an iterative multi-sectoral process that engages stakeholders, builds on evidence and current public health knowledge, provides leadership and includes research, development and innovation.

The presentation also provided information from the recently published *WHO/PAHO Climate Change and Health Vulnerability Assessment Guidelines* designed to provide guidance on conducting national or subnational assessments of current and future vulnerability to the health risks of climate change, and of policies and programmes that could increase resilience, while taking into account determinants of climate-sensitive health outcomes. The guidelines also provide information about health risks and adaptations; a framework and steps for assessment; guidance on how to organize and conduct an assessment with partners; research methods and tools; sources of health and climate data and examples of assessment activities. Twenty-five case studies inform different parts of the assessment and information on how to prioritize impacts once identified are provided. Governance is also looked at in terms of what actions each relevant sector can take as well as the need to consider the robustness of actions with continued climate change.

## **Climate services for human health**

### ***Mr Amir Delju, World Meteorological Organization***

The World Meteorological Organization (WMO) contributes to the safety of life and property through operation of an Integrated Global Observing System (WIGOS). The data received from this system provides the basis for the forecast of weather extremes, early warnings, climate prediction including monitoring of climate anomalies. WMO provides a global picture of the behaviour of atmosphere and climate system. This operation covers a seamless continuum from weather forecast to climate prediction. The meeting noted that widespread heat-waves happened in northern and western Europe, in 2010 and 2011, respectively. According to the IPCC Special Report on 'Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation' (SREX), it is projected that in the current century, Europe will experience more frequent heat waves than before. The climate models also project that record high heat waves will happen almost every five years, or at least, every ten years in northern Europe and central Asia.

WMO's climate-health activities range from early warnings to health sector on heat and cold waves, Climate Outlook Forums (RCOFs), Malaria Outlook Forum (MALCOF), drought monitoring, El Nino and La Nina updates, air quality observation including pollens and allergens, ultraviolet radiation monitoring, particularly in urban areas, sand and dust storm warning and Flash Flood Management. Furthermore, WMO through Commission for Climatology (CCI), which mobilizes a large group of climate scientists from around the world to cooperate on interdisciplinary areas contributes to climate and health. As an example, WMO-WHO are developing 'Climate and Health Atlas' as well as 'Heat Waves and Health: Guidance on Warning System Development'. The climate monitoring, seasonal to interannual prediction and early warnings facilitate estimates of disease seasonality and help identify best timing for interventions and investments. WMO is integrating all these activities into the Global Framework for Climate Services (GFCS) to maximize effective delivery of climate services in close interaction with user communities. The vision of the Framework is; '*To enable society to manage better the risks and opportunities arising from climate variability and change, especially as they concern those who are most vulnerable to climate-related hazards*'. The GFCS has four focus areas; namely, agriculture, health, water and disaster risk reduction.

## **Current knowledge on the health effects of extreme weather events**

### ***Dr Paola Michelozzi, Department of Epidemiology, Lazio Regional Health Service, Italy***

This presentation provided an example how epidemiological research can provide evidence to develop adaptation strategies by means of the Public Health Adaptation Strategies to Extreme weather events (PHASE) project. The main objectives of PHASE are:

- To evaluate the impact of EWEs (heat/cold, wildfires, floods, air pollution and their synergistic effects) on health, the performance of warning systems and the effectiveness of prevention activities;
- To identify population subgroups vulnerable to specific EWEs; and
- To develop a framework of tools to improve preparedness and reduce the impact of EWEs on health,

Susceptible populations at risk are changing over time because of interventions. An example was given of heat monitoring in 16 Italian cities where a reduction in the effect of extreme high temperatures after the introduction of a heat plan took place. The intervention focused on specific subgroups when the effect of heat on mortality among the most susceptible was identified *a priori* (age, hospital admissions, low social conditions). In Rome, for example,

from 2007 to 2011 there was a significant reduction in the health effect of heat waves among the very old age group (age >75, RR from 1.22 to 0.97) but this risk increased in the 65-74 age group (RR from 1.06 to 1.37). A significant effect of high temperatures was also observed in pre-term deliveries (with several possible consequences on health). In Rome Italy a 1.25% increase was seen per 1°C increase in maximum apparent temperature and Barcelona Spain saw a five day reduction in gestational age after a heat wave episode. (Source: presentation of Dr Paola Michelozzi)

Cold and cold spells still have open questions with reference to health effect and are being studied in by means of an evaluation of cause-specific mortality/morbidity and latency in the effect of cold in 8 EU cities. The extreme cold in Italy in February 2012 resulted in a high increase in mortality due to respiratory and cardiovascular disease mortality. For this reason, the effects of cold on cohorts of elderly populations with chronic disease will be the main focus. The effects of wildfire smoke in Europe are a third area being assessed by PHASE. The project has identified fire events close to towns by means of satellite observations and use of local sources such as fire departments and civil protection service. Work will be carried out to define exposure and assess fire-related health effects in identified areas of Greece, Italy, United Kingdom, France and Finland with high risk subgroups defined as the elderly, infants, individuals with pre-existing cardiovascular and respiratory diseases (asthma, COPD, sinusitis and upper respiratory infections). Taking into consideration the frequency and intensity of EWE it would be pertinent to invest in adaptation strategies to cope with weather instability.

More information can be found on the project web site:

<http://www.hpa.org.uk/Topics/EmergencyResponse/ExtremeWeatherEventsAndNaturalDisasters/PHASE/>

### **Adaptation measures to reduce the burden from climate sensitive infectious diseases in Europe**

***Mr Matthias Niedrig, Robert Koch Institute, Germany***

This presentation focused on infectious diseases under a changing climate and the world's preparedness to deal with these showing a map of viral threats worldwide and the global distribution of Flaviviruses. There are an estimated 13,000 cases per year of tick borne encephalitis virus taking place in Europe with mortality ranging from 1-40% (source: presentation of Mr Matthias Neidrig). Background factors contributing to these are international transport, animal migrations and travel. Cases of dengue and malaria have even been identified in Germany. The effect of climate change on the life cycle of these diseases is yet unknown and we do not know when and where outbreaks can occur. Humans are usually accidental hosts. While vectors are involved in disease transmission they are also affected by climate changes such as is the case with tick-borne, mosquito-borne sandfly-borne, bat-borne and rodent-borne diseases. Future prospects can be seen in the table below.

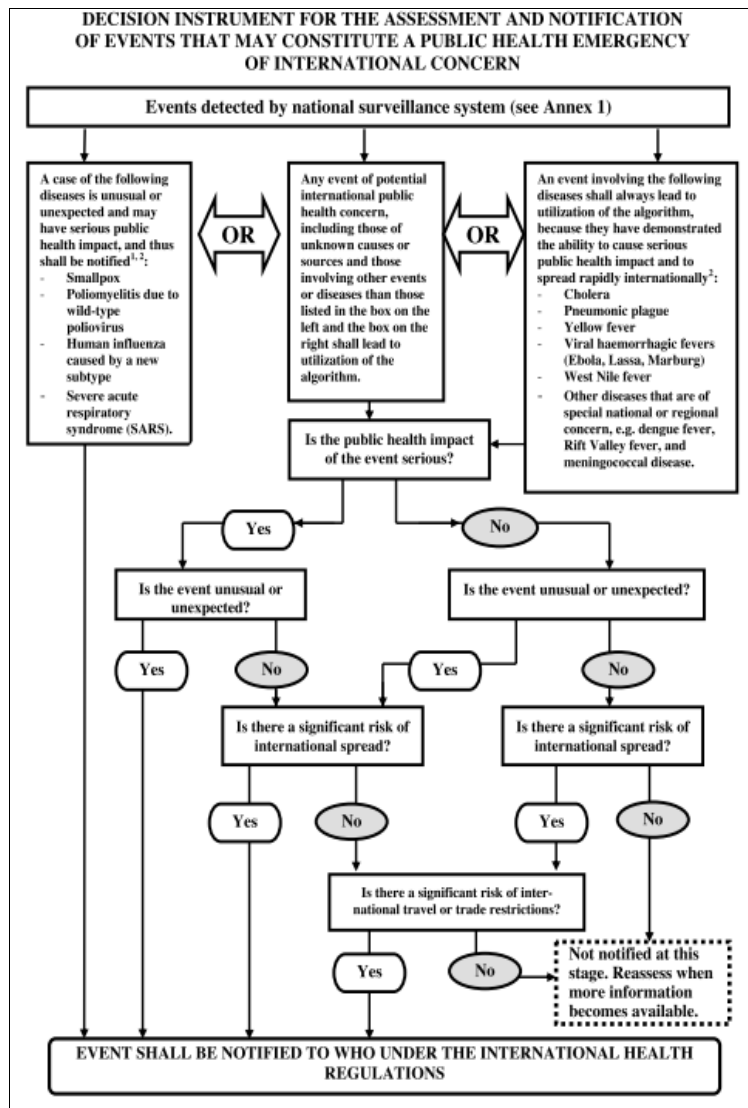
**Table A.1:** Future prospects and what can be done (source: presentation of Mr Matthias Niedrig)

Zoonotic viral diseases	Call for: Closer and better collaboration with veterinarians
Human-only viruses	Call for: Proceeding with eradication measures. Checking for vaccination schedule in travellers.
Sexually transmitted viruses	Call for: Better education on risks and protection measures for travellers
Food- & water-borne viruses	
Respiratory viruses	

### **Climate Change and International Health Regulations**

*Mr Markus Kirchner, WHO Regional Office for Europe*

This presentation focused on how International Health Regulations (IHR) could be used for climate change. In 2005 the World Health Assembly adopted IHR which are one of two legally binding issues that the Organization deals with, the other one being tobacco. Member States got a five year period for preparedness and response and entry into force took place on 15 June 2007. IHR calls for strengthening capacities, multi-sectoral working and communication, including notification. There is a decision instrument appearing in Annex two of the IHR stating, *“Any event of potential international public health concern, including..unknown causes or sources ... shall lead to utilization of the algorithm”* that follows.



**Fig. A.1:** International Health Regulations Annex 2. Decision instrument for the assessment and notification of events that may constitute a public health emergency of international concern (WHO, 2008).

IHR provides the possibility of doing risk assessment as there are four diseases that need to be notified in a country namely polio (wild-type), smallpox, human influenza (new subtype) and SARS. Cholera, pneumonic plague, yellow fever, VHF (Ebola, Lassa, Marburg) and WNF always lead to use of the decision instrument. Four questions must be asked: is the public health impact serious?, is it unusual or unexpected?, is there risk of international spread? and is there risk of travel or trade restrictions because of the disease? An example of how the IHR decision instrument has been used was shown using the Chikungunya Fever Outbreak in the Region Emilia-Romagna, Italy and how the instrument allowed for appropriate reporting.

Challenges and barriers to the IHRs are that they provide a new way of reporting for day-to-day operations; they employ a multisectoral approach calling for multiple technical expertise; clear communication channels and areas of responsibility are needed; there is a reduced risk

for unilateral trade and travel restrictions and new or revised provisions can be fulfilled by building on and strengthening existing systems and capacities.

## **Session IV**

### **The way towards sustainable health services**

***Sonia Roschnik, NHS Sustainable Development Unit, England, United Kingdom***

This presentation focused on sharing of the experience from the United Kingdom in creating sustainable health services by means of reducing the carbon footprint of NHS as an organization. Within less than one year, the NHS did a carbon footprint and developed a carbon reduction strategy. The agency looked at some future scenarios and tried to integrate all their work into regulation and reporting. They found that 65% of their carbon footprint is in procurement both purchases and then surplus that goes to waste. Pharmaceuticals contributed to 20% of that total (NHS SDU, 2012). There are now also maps showing carbon related to energy waste in water which visually help build up competition for reduction of carbon.

NHS four organizational tasks to achieve this goal are: 1) creation of a Board Approved Sustainable Development Management Plan, 2) assess corporate citizenship by means of a Good Corporate Citizenship Assessment Model, 3) Monitor, Review and Report on Carbon and 4) Raise carbon awareness at every level. An example of a United Kingdom map indicating percentage of NHS organizations with board approved sustainable development management plans was shown. These maps have been a major first step since the fact that a map exists in the first place is already a big step.

While many NHS organizations have been cutting emissions significantly and have been making financial savings in the process, the effects have been lessened by other organizations not making such good progress. To achieve the level of carbon reduction required in the future requires a concerted effort by all NHS organizations (NHS SDU, 2012). Efficiency is not enough to get to a decarbonized world. Shifts within the health system towards sustainability would need to be made with the reason behind the shift not being as important as the fact that a positive change is being made.

### **The estimated benefits of reducing GHG emissions in Europe**

***Mike Holland, Ecometrics Research and Consulting, United Kingdom***

On average across the WHO European Region the health sector accounts for about 7.5% of GDP (WHO, 2012). Health care which is often technologically intensive leads to a significant rate of consumption of resources and associated environmental pollution and degradation. As a result, this sector accounts for a significant part of greenhouse gas emissions, either directly through its use of energy, or indirectly through its use of materials and products and their disposal. The benefits of reducing greenhouse gas emissions from health care are not just climate change related. Reducing greenhouse gas in health care is possible. A number of simple measures with short to medium payback times are available. These range from changing behaviour of health services personnel, improving energy efficiency of health facilities, energy efficient equipment, simple energy efficiency techniques such as low energy lighting, boilers and electrical systems, reducing the demand for transport for personnel and users of health care facilities, using more energy-efficient vehicles for the ambulance and goods fleet, promoting cycling and walking of the health staff as well as of users and visitors of health facilities, providing alternatives to private car use, avoiding travel altogether through remote systems, a full life cycle approach to procurement, waste monitoring and

avoidance, local food procurement, water leak management and future proofed IT technology. Reducing greenhouse gas emissions can reduce the burden on health systems and benefit climate mitigation. Associated annual benefits are estimated to include 15 to 36 000 fewer life years lost to air pollution, 16 to 38 000 fewer consultations for asthma and upper respiratory disease, 1.4 to 3.3 million fewer days of restricted activity and 800 to 1900 fewer new cases of chronic bronchitis (WHO, 2012). Money saved by many of these measures can be reinvested to improve health care. Given the benefits that could accrue to the health sector from actions to reduce emissions from other sectors, it is appropriate that health professionals take a lead in pushing forward the climate and sustainable development agenda (WHO, 2012).

### **Sustainable procurement in the health sector**

#### ***Christoph Hammelmann, United Nations Development Programme***

At the Economic Commission for Europe Report Regional Preparatory Meeting, Sustainable public procurement was supported as a first critical step to further the green economy at the national as well as the subnational level. Concrete progress was proposed in the form of sustainable public procurement targets that could be met by an increasing number of countries over the years. The UNDP environmental procurement guide addresses key environmental challenges and then related these to management tasks for procurement personnel specifically consumption of raw materials and energy, chemicals and radiation in products and polluting emissions waste. An example was given for greenhouse gases which account for 7.5% of GDP in the ECIS region and 4-2% of greenhouse gases. These are technology intensive with significant consumption of resources and are associated with environmental pollution and degradation. Up to 25% of these greenhouse gas can be reduced within short-term and more through long-term measures with reductions having a direct positive impact on life-years saved. UNDP is engaged mainly with Global fund projects with total procurement being 150 million USD in 2011, mostly in pharmaceuticals where a large amount of carbon emissions occur (UNDP, 2008).

Current activities are a project with the NHS Sustainable Development and representatives from pharmaceutical and medical devices manufacturers directly participating. UNDP is also contributing to development of United Kingdom Sector Guidance and Product Rules for carbon foot printing and is involved in getting stakeholders from United Nations family agencies involved in substantial health sector procurement and pre-qualifications to ensure sustainability. Planned activities are moving the United Kingdom project on Sector Guidance and Product Rules to a regional/global level; developing a strategy for involvement of Global Health financing institutions at Board and Executive levels; a pilot project on carbon foot printing and cost abatement analysis of Global Fund grants on country level and continued collaboration with the NHS/SDU.

## **Session V**

### **European CLIMATE-ADAPT platform**

#### ***André Jol, European Environment Agency***

This presentation began with a summary of the EU policy processes which require supporting European information on climate change impacts, vulnerability and adaptation. Among those cited were the Climate change adaptation White Paper 2009 and planned EU 2013 strategy;



the Europe 2020 strategy for smart, sustainable and inclusive growth and the EU low-carbon strategy 2050; the Draft 2014-2020 Multiannual Financial Framework, proposal for share of climate-related expenditure (mitigation and adaptation) to 20%; existing environmental policies such as the Water Framework Directive and Floods Directive, the Nature protection directives, policies to halt biodiversity loss, Marine Strategy Framework Directive and Integrated Coastal Zone Management (ICZM); and work on sectoral, cross-cutting themes such as maritime, agriculture, forestry, human health, disaster risk reduction, infrastructure and urban areas.

Several relevant EEA reports published or being prepared during the course of 2012 were also presented. The first one entitled, *Climate change impacts, vulnerability and adaptation* (to be published November 2012) will be indicator based looking at the climate system, impacts of climate change and vulnerabilities and risks. A second related report on *'Adaptation in Europe'* (to be published early 2013) will provide an EU, national and sectoral adaptation assessment. Another relevant report was published in early 2012 entitled, *Towards efficient use of water resources in Europe.*, It is one of EEA's contributions to the European Commission's blueprint (to be published end of 2012) to safeguard Europe's water resources and to promote the use of resource efficient technologies and economic instruments related to water as a public good or common pool resource. The fourth EEA report presented was *Urban adaptation to climate change* (published May 2012) which focuses on heat waves, flooding, water scarcity and droughts, how to plan urban adaptation and the importance of multilevel governance to enable urban adaptation. An ongoing European Commission led project (to be finalized in 2013) on *Adaptation strategies for EU cities* was also presented as the first one dedicated to cities and their experiences dealing with adaptation.

The European Climate Adaptation Platform, a publicly accessible, web-based platform (<http://climateadapt.eea.europa.eu>) designed to support policy-makers at EU, national, regional and local levels in the development of climate change adaptation measures and policies was also presented. This platform was developed by the European Commission with the support of the European scientific and policy-making community. From March 2012 onwards EEA is responsible for managing and maintaining the platform, in close collaboration with the European Commission. The platform aims to help users access, disseminate and integrate information on:

- Expected climate change in Europe;
- The vulnerability of regions, countries and sectors now and in the future;
- National, regional and transnational adaptation activities and strategies;
- Case studies of adaptation and potential future adaptation options;
- Online tools that support adaptation planning;
- Adaptation-related research projects, guideline documents, reports information sources, links, news and events.

#### **Awareness raising and communication activities**

##### ***Génon Jensen, Health and Environment Alliance (HEAL)***

This presentation focused on awareness raising and communication activities being carried out by the HEAL as a contribution to the work on climate change and health including some concrete examples. HEAL is membership based organization with 70 member organizations in 30 countries, all in the non-profit sector. With reference to communicating on climate change and health, results of a 2010 survey carried out in Malta, the US and Canada showed that a majority believed climate posed significant risks (respiratory, heat related, cancer, infectious diseases). There were some country differences on people being affected and little

awareness on details of health risks. Results of the survey showed that if health impact can be shown, people are motivated to take action since climate change becomes an issue affecting human beings and not just plants and animals.

HEAL has also done a lot of work on raising awareness with policy-makers. Climate change and health was not on the map in Brussels in 2007 so HEAL and the European health alliance focused on the existing science about the topic and created a policy brief to provide succinct, factual information. In 2008 HEAL collaborated with WHO on World Health Day on climate change and also carried out a workshop with journalists. In 2010, a series of advocacy meetings with policy-makers were held in Brussels and health and climate country visits to Hungary, Poland, the United Kingdom and Denmark.

HEAL's latest report, *Acting NOW for better health: A 30% reduction target for EU climate policy*\_co-published with Health Care Without Harm, quantifies the health benefits for Europeans of stronger EU action on climate change for both the EU and different Member States. The report takes the current discussions from climate costs to focus on climate benefits, particularly for people's health and health care systems. It demonstrates that reaching a 30% emissions reduction target could save public health billions. For the EU as a whole, the anticipated benefits could be as high as €30.5 billion – equivalent to just under 0.2% of EU GDP (Jensen G, Leetz A, 2010).

HEAL has also carried out awareness raising activities among chronic disease groups (patient groups) since they are the ones most at risk from the health effects of climate change. Climate and health clinics where people could learn about climate change and health and get a prescription on how to deal with it at home.

### **Research: current status, results and research gaps**

*Sari Kovats, London School of Hygiene and Tropical Medicine, United Kingdom*

This presentation focused on climate change and health research, the current status, research results and research gaps. The IPCC is in process of doing its Fifth assessment report. Dr Kovats is one of the coordinating lead authors of chapter 23 (Europe including the Urals). The IPCC evaluates research and does not make statements about policy. There was a need to look at the geographic context of vulnerability as health was missing from some chapters. Subregional assessments have taken place namely the Baltic Assessment (BACC 2008), the Arctic Climate Impact Assessment and the Regional Assessment of Climate Change in the Mediterranean. In the United Kingdom, a national risk assessment, the CCRA, has been carried out.

**Box A.2.** Lessons learnt: Using health to communicate around climate

Capitalise on existing climate and health resources (WHO, Lancet, BMJ, health services, advocacy and patient groups, etc.)

Greater engagement of health actors (ministry, public health and health promotion)

Link policy action to concrete health benefit (i.e. less pollution)

Link to agenda of chronic disease groups (heart, cancer, respiratory, diabetes ... the time is ripe)

Link to a timely event (i.e. heat waves, extreme weather, national, local discussion on air pollution, national adaptation plan)

(Source: presentation of Génon Jensen)

In response to the WHA resolution, WHO convened a global consultation of public health researchers, practitioners, representatives of the United Nations (United Nations) and other agencies, and donors. The meeting, attended by over 70 leading professionals in this field contributed to the development of a series of recommendations for priority areas of research and risk management, and guidance on how to support further progress on this issue.

Recommendations for priority research and risk management areas focus on:

1. health vulnerability to climate change, mainly mapping and risk assessment
2. health protection strategies and measures relating to climate risks, such as effectiveness of these
3. health impacts of environmental management, such as mitigation and adaptation policies.
4. decision-support tools, such as surveillance and monitoring and
5. assessment of financial costs

To focus on Europe, under the topic of heat, houses and cities, there is a need to assess the effectiveness of community based heat warning systems since southern Europe is at most risk from heat waves so. In such a context, housing needs to be healthy providing protection from heat, cold and indoor air. Spatial planning needs to make links to development and have health co-benefits. Emerging infectious diseases will also have an impact on Europe. The TDR or Special Programme for Research and Training in Tropical Diseases, is a global programme of scientific collaboration that helps coordinate, support and influence global efforts to combat a portfolio of major diseases of the poor and disadvantaged. The European Centres for Disease Control have also identified important gaps in surveillance strategies for some infectious diseases in Europe with respect to climate change. Risk assessments are needed to identify risk factors and vulnerable groups and awareness of the public and professionals must be raised about the implications of climate change. In Europe, flooding is impacting mental health and increasing injuries. Due to a loss of access to health services under such conditions, more post-disaster interventions are needed. Vulnerable groups in Europe such as indigenous populations in the Arctic regions need more protection. While there is limited evidence of the health effects despite high rates of warming, this region is being hit by this issue.

The WHO Fifth Ministerial Conference climate change commitments were recalled, specifically those on development and implementation of educational and public awareness programmes and on encouragement of research and development with tools for forecasting climate impacts on health and identifying health vulnerability. Indeed, progress has been made in the areas of educational and public awareness programmes on climate change and health and in the health co-benefits of mitigation interventions for the topic of air quality but it will be important to ensure that adaptation can reduce inequalities in exposure to environmental health risks.

### **Climate change and health research and innovation**

***Lara Passante, European Commission Directorate-General for Research and Innovation***

This presentation focused on Climate change and Health under the Seventh Framework Programme (FP7) and on the European Commission proposal for Horizon 2020, the next EU framework programme for research and innovation for 2014-2020. Environment and health research under FP7 has covered so far 10 topics: chemical risk assessment, nanoparticle risk

assessment, ionising radiation, alternative testing, microbial risk assessment, ambient air pollution, indoor air quality, non-ionising radiation, noise and global change and extreme events. In FP7 under climate change and health, the following collaborative projects have been funded: Impact of global climate change on health in Arctic and Europe (ArcRisk, Arctic Monitoring and Assessment Programme <http://www.arcrisk.eu/>); Climate change, environmental contaminants and reproductive health (CLEAR, Aarhus University Hospital <http://www.inuendo.dk/clear/>); Impact of Climate Change on the Transport, Fate and Risk Management of Viral Pathogens in Water (Viroclime, University of Aberystwyth <http://www.viroclime.org/>); Urban Reduction of GHG emissions in China and Europe (URGENCE, University of Exeter, <http://www.urgence.eu/>); Public health impacts in urban environments of greenhouse gas emissions reductions strategies (PURGE, London School of Hygiene and Tropical Medicine, <http://purge.lshtm.ac.uk/node/3>); Positive health effects of the natural outdoor environment (Phenotype, CREAL <http://www.phenotype.eu>) and Combined pan-European impact of changes in climate, land use and air pollution on allergen pollen-induced diseases (Atopica, The Medical University of Vienna <http://www.atopica.eu/default.aspx>). European Parliament and Council negotiations on the basis of the Commission proposal for Horizon 2020 are on-going and adoption of legislative acts by the Parliament and the Council is expected at the end of 2013, with the first calls to be launched beginning of 2014.

**Table A.2.** Priorities in Horizon2020.

<b>Priority 1 Excellent Science</b>	<b>Priority 2 Industrial leadership</b>	<b>Priority 3 Societal challenges</b>
European Research Council Frontier research by the best individual teams	Leadership in enabling and industrial technologies (ICT, nanotechnologies, materials, biotechnology, manufacturing, space)	Health, demographic change and well-being
Future and Emerging Technologies Collaborative research to open new fields of innovation	Access to risk finance Leveraging private finance and venture capital for research and innovation	Food security, sustainable agriculture, marine and maritime research & the bioeconomy
Marie Curie actions Opportunities for training and career development	Fostering all forms of innovation in all types of SMEs	Secure, clean and efficient energy*
Research infrastructures (including e-infrastructure) Ensuring access to world-class facilities		Smart, green and integrated transport Climate action, resource efficiency and raw materials Inclusive, innovative and secure societies

The Commission proposal for Horizon 2020 is structured around three priorities: excellent science, industrial leadership and societal challenges. Among the societal challenges, “*Health, demographic change and well-being*” has the specific objective of improving “*the lifelong health and well-being of all*”. In the Commission proposal for the Horizon 2020 Specific Programme, “Understanding the determinants of health, improving health promotion and disease prevention” is one of the specific activities proposed under the societal challenge “*Health, demographic change and well-being*”, while under the societal challenge “*Climate action, resource efficiency and raw materials*” it is proposed that the research and innovation

focus, among others, on assessing “*impacts, vulnerabilities and develop innovative cost-effective adaptation and risk prevention measures*”. Further information on the Commission proposal for Horizon 2020 can be found at <http://ec.europa.eu/research/horizon2020>

## **Annex II: Bibliography**

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## Annex III: Programme

### DAY 1, Monday, 4 June, 2012

09:00–10:00	Registration
10:00–10:05	Welcome to the WHO European Centre for Environment and Health (Michał Krzyżanowski, WHO Regional Office for Europe)
10:05–10:15	Opening of the meeting (Hubert Steinkemper, German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety)
10:15–10:30	Opening of the meeting (Srđan Matić, WHO Regional Office for Europe)
	<b>Session I: The “Commitment to act” and the seven-country initiative on protecting health from climate change</b>
10:30–10:45	The “Commitment to act” on climate change and health and the European Regional Framework for Action (Louise Newport, United Kingdom)
10:45–11:00	The seven-country pilot initiative on protecting health from climate change (James Creswick and Bettina Menne, WHO Regional Office for Europe)
11:00–11:15	Coffee break
11:15–12:35	Presentations on the seven-country pilot initiative from: <ul style="list-style-type: none"> <li>• Albania</li> <li>• Kazakhstan</li> <li>• Kyrgyzstan</li> <li>• Russian Federation</li> <li>• Tajikistan</li> <li>• the former Yugoslav Republic of Macedonia</li> <li>• Uzbekistan</li> </ul>
12:35–13:00	Comments from the Scientific Advisory Board: <ul style="list-style-type: none"> <li>• Fiona Adshead (PricewaterhouseCoopers, London, United Kingdom)</li> <li>• Maksut Kulzhanov (Kazakhstan School of Public Health, Kazakhstan)</li> <li>• Sonia Roschnik (NHS Sustainable Development Unit, England, United Kingdom)</li> </ul>
13:00–14:00	Lunch
	<b>Session II: Integrated policy and governance for climate change and health</b>

14:00–15:00	<p>Keynote speeches:</p> <ul style="list-style-type: none"> <li>• Summary of the reviews on co-benefits for human health of climate change mitigation (Carlos Dora, World Health Organization)</li> <li>• Climate change and the green economy (Bettina Menne, WHO Regional Office for Europe)</li> <li>• Towards the development of the multisectoral EU adaptation strategy (Cornelia Jäger, European Commission Directorate-General for Climate Action)</li> <li>• Health in the UNFCCC (Tiffany Hodgson, United Nations Framework Convention on Climate Change)</li> </ul>
15:00–15:20	Coffee break
15:20–16:30	<p><b>Session II (cont.): Integrated policy and governance for climate change and health</b></p> <p>Group discussion in three thematic areas:</p> <ol style="list-style-type: none"> <li>1. Health in climate change mitigation policies</li> <li>2. Health in climate change adaptation policies</li> <li>3. Environment and climate change in health and social policies</li> </ol>
16:30–17:30	Reporting back from the group work to the scientific and technical audience
16:30–17:30	<b>1<sup>st</sup> HIC meeting: Meeting of the nominated representatives to the Working Group on Climate Change and its Impacts on Health (HIC) of the European Environment and Health Task Force (EEHTF)</b>

**DAY 2, Tuesday, 5 June, 2012**

09:00–09:30	Summary of Day 1
09:30–10:45	<p><b>Session III: Adaptation to climate change</b></p> <p>Keynote speeches:</p> <ul style="list-style-type: none"> <li>• Vulnerability assessments and health adaptation strategies or action plans: key elements (Peter Berry, Health Canada; Bettina Menne, WHO Regional Office for Europe)</li> <li>• Climate services for human health (Amir Delju, World Meteorological Organization)</li> <li>• Current knowledge on the health effects of extreme weather events (Paola Michelozzi, Lazio Regional Health Service, Italy)</li> <li>• Adaptation measures to reduce the burden from climate-sensitive infectious diseases in Europe (Matthias Niedrig, Robert Koch Institute, Germany)</li> <li>• Climate change and International Health Regulations (Markus Kirchner, WHO Regional Office for Europe)</li> </ul>
10:45–11:00	Coffee break

11:00–12:00	<p><b>Session III (cont.): Adaptation to climate change</b></p> <p>Group Discussion III in three thematic areas:</p> <ol style="list-style-type: none"> <li>1. Extreme weather events preparedness and response (including: early-warning systems, action plans, etc);</li> <li>2. Climate-sensitive infectious diseases (including discussion on early detection and warning, rapid identification, disease outbreaks, monitoring and surveillance, treatment and control, IHR, etc);</li> <li>3. Climate-resilient environment and health services (including water and waste management; public service infrastructure; local developments, etc)</li> </ol>
12:15–13:00	Presentation in the plenary session of the group work
13:00–14:00	Lunch
14:00–14:30	<p><b>Session IV: Sustainable health and environment sectors</b></p> <p>Keynote speeches:</p> <ul style="list-style-type: none"> <li>• The way towards sustainable health services (Sonia Roschnik, NHS Sustainable Development Unit, England, United Kingdom)</li> <li>• The estimated benefits of reducing greenhouse gas emissions in Europe (Mike Holland, United Kingdom)</li> <li>• Sustainable procurement in the health sector (Christoph Hamelmann, United Nations Development Programme)</li> </ul>
14:30–15:00	Coffee break
15:00–16:30	<b>Session IV (cont.): Sustainable health and environment sector</b>
15:00–16:30	2 <sup>nd</sup> HIC meeting in parallel: Meeting of the nominated representatives to the Working Group on Climate Change and its Impacts on Health (HIC) of the European Environment and Health Task Force (EEHTF)
16:30–17:00	Reporting in plenary session the technical group work

19:00	Reception hosted by the City of Bonn in the old town hall (Altes Rathaus)
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**DAY 3, Wednesday, 6 June, 2012**

09:00–09:30	Summary of Day 2
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09:30–10:30	<p><b>Session V: Climate change and health intelligence</b></p> <p>Keynote speeches:</p> <ul style="list-style-type: none"> <li>• European CLIMATE-ADAPT platform (André Jol, European Environment Agency)</li> <li>• Awareness raising and communication activities (Génon Jensen, Health and Environment Alliance)</li> <li>• Research: current status, results and research gaps (Sari Kovats, London School of Hygiene and Tropical Medicine, United Kingdom)</li> <li>• Climate change and health research and innovation (Lara Passante, European Commission Directorate-General for Research and Innovation)</li> </ul>
10:30–10:50	Coffee break
10:50–12:30	<p><b>Session V (cont.): Climate change and health intelligence</b></p> <p>Group Discussion V in three thematic areas:</p> <ol style="list-style-type: none"> <li>1. Research</li> <li>2. Awareness raising and capacity development</li> <li>3. Information needs of the European Member States to be met through the Information Platform</li> </ol>
12:30–13:00	Reporting in the plenary session the results of the group discussion
13:00–14:00	Lunch
14:00–16:00	<p><b>Session VI: The way forward</b></p> <p>Two parallel groups:</p> <ol style="list-style-type: none"> <li>1. Meeting of technical scientific participants to the meeting: Elaboration of key issues arising from the meeting and how the technical community can support the needs in the variety of Member States</li> <li>2. 3<sup>rd</sup> HIC meeting: Meeting of the nominated representatives to the Working Group on Climate Change and its Impacts on Health (HIC) of the European Environment and Health Task Force (EEHTF)</li> </ol>
16:00–16:30	<p>Reporting to plenary session the discussion of the technical scientific group</p> <p>Presentation of the business plan to the audience</p> <p>Discussion on next steps</p>
16:30–17:00	Closure of the meeting

## **Annex IV: List of participants**

### **Nominated members of the Working Group on Climate Change and its Impacts on Health (HIC) of the European Environment and Health Task Force (EEHTF)**

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## **German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety**

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Mr Alexander Nies  
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Mr Hubert Steinkemper  
Ministerial Director  
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**The WHO Regional Office for Europe**

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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The Fifth Conference on Environment and Health in Parma, Italy (2010) endorsed the "Commitment to act"; this meeting reviewed implementation of this Commitment, exchanged experiences and knowledge, and charted next steps on the six action points. Key achievements observed since 2012 are the growing knowledge of health effects of climate change, multisectoral government initiatives with health at the centre, national health adaptations strategies, preventing health effects of extreme events and infectious diseases, advancements in postgraduate training and awareness raising, and the development and launch of the European Climate Adaptation Platform. Key priorities for future work are greater focus on greening health services, and integration of health into other sectors, as well as strengthen health in national adaptation plans

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