MEETING REPORT

Second meeting of the ECDC expert group on climate change

Stockholm, 15–16 November 2011

Executive summary

On 15 and 16 November 2011, ECDC hosted the second meeting of the ECDC Expert Group on Climate Change in Stockholm. The recent focus of ECDC on climate change and adaptation is a follow-up of the European Commission's White Paper on adapting to climate change[1], which calls for a focus on climate change and health adaptation in the EU region. The aim of the meeting was to provide Member State representatives with access to a series of resources and decision-support tools that ECDC has developed for climate change adaptation; to discuss risks and surveillance needs related to climate change across the EU; and to explore how ECDC can best assist Member States. Participants underlined the need for ECDC to continue to gather and analyse the most up-to-date information and develop decision-support tools, and to be a network hub for Member States' interactions on issues related to climate change and infectious diseases.

Background

There is now widespread scientific recognition that the recent observed rapid changes in the global climate are due to anthropogenic emissions of atmospheric greenhouse gases, and that with further emissions, the climate will inevitably continue to change. Extreme climate events (heat waves and flooding) are projected to increase in Europe. In northern parts winters will become considerably milder with increased precipitation, whereas the southern parts will experience markedly warmer and drier summers (see Figure 1).

Climate change is expected to directly and indirectly affect the transmission of infectious diseases[2]. Changes in the distribution limits of vectors at higher latitudes and altitudes have already been observed in Europe. The combination of the impacts of climate change and other risk drivers[3] such as land-use changes, migration, and

[1] Commission of the European Communities. White paper. Adapting to climate change: towards a European framework for action. COM(2009) 147 final. Available from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52009DC0147:EN:NOT

[2] Semenza JC, Menne B. Climate change and infectious diseases in Europe. Lancet 2009;9:365-375.

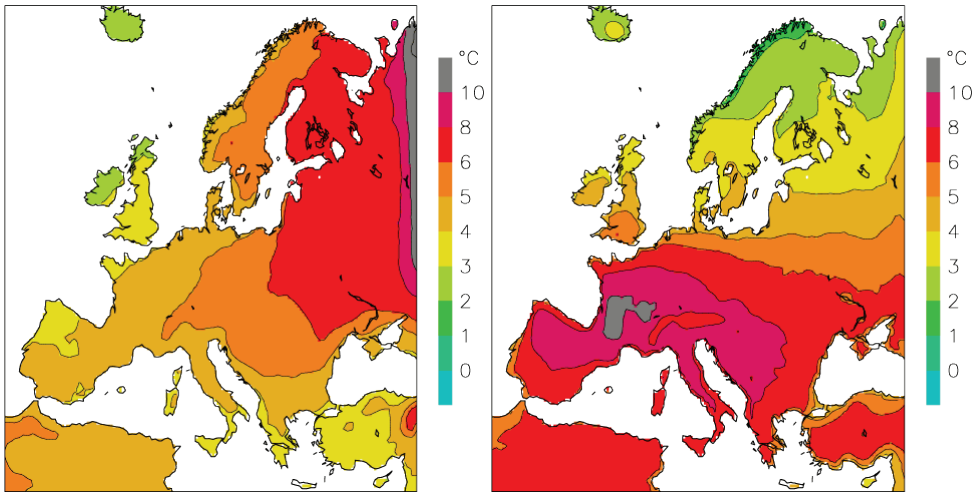
[3] Suk JE, Semenza JC. Future infectious disease threats to Europe. Am J Publ Health 2011;101:2068-2079.

Rapporteur: Elisabet Lindgren MD, PhD, Stockholm, Sweden. The meeting was coordinated by Jan Semenza, Bertrand Sudre, and Jonathan Suk, Health Impacts Section, Office of the Chief Scientist, ECDC.

Stockholm, February 2012

rapid travel and trade will increase the risk of (re-)emergence of some vector-borne diseases in the European region. Additionally, heavy rain events and flooding have been are linked to outbreaks of several water-borne diseases as well as leptospirosis, whilst salmonellosis outbreaks have been shown to have linear relationships with mean temperatures[4].

Figure 1. Anticipated increases in mean winter temperatures (left) and mean summer temperatures (right) from the time period 1961–1990 to the time period 2071–2100



The scenarios are based on the IPCC-SRES A2 emissions scenario, and the model system RCAO based on the global model ECHAM4/OP4C3.
Source: The Rossby Centre, SMHI, Sweden.

The magnitude of the impact of climate change on specific diseases will differ between Member States and will depend on the areas' vulnerability, resilience, and capacity to adapt to changes in disease risk posed by a changing climate.

ECDC has undertaken an extensive programme to identify the potential risks to Europe from climate change, and to assist Member States to prepare for them. This meeting was the follow-up to the first Meeting of the ECDC Competent Body Contact Points for Climate Change that was held at ECDC, Stockholm, in September 2009.

Purpose of the meeting

The purposes of the Second Meeting of the ECDC Expert Group on Climate Change were:

- to discuss the latest scientific knowledge on climate change and communicable diseases;
- to provide Member State representatives with access to a series of resources and decision-support tools that ECDC has developed for climate change adaptation;
- to discuss risks and surveillance needs related to climate change across the EU; and
- to discuss how ECDC can best assist Member States with issues related to climate change and infectious diseases.

The meeting comprised plenary lectures, hands-on computer sessions, and group discussions on climate change, risks, and surveillance needs both at the EU and national levels (see Annex 1).

[4] European Centre for Disease Prevention and Control. Assessing the potential impacts of climate change on food- and waterborne diseases in Europe: Development of the Climate Change Knowledge Base. Stockholm: ECDC; 2012. In press.

Climate change and infectious diseases: Key on-going and planned adaptation projects

European Commission

The recent focus of ECDC on climate change and adaptation/changes in disease surveillance is a follow-up of the European Commission's White Paper on Adapting to climate change: Towards a European framework for action (COM(2009)147), and the accompanying Commission Staff Working Document on Human, Animal and Plant Health Impacts of Climate Change, that builds on the 2007 Green paper on Adapting to Climate Change in Europe (COM(2007)354). The White Paper states the need to take measures to adapt and gives a framework to reduce the EU's vulnerability to the impact of climate change.

ECDC

ECDC has recently developed the following four adaptation tools that were presented during the meeting.

1 Climate change knowledge base for food- and waterborne diseases

This tool consists of an on-line database, the 'PathoClim database', that is based on the analysed results of an extensive review (741 publications) on the links between meteorological and climate variables and certain food- and waterborne pathogens[5].

2 Quantitative microbiological risk assessment (QMRA)

The QMRA tool is a decision-support tool to estimate the risk of food- and waterborne diseases through quantitative risk assessment for different climate change scenarios. The tool is designed for the diverse climatic regions of Europe.

3 ECDC handbook for national vulnerability, impact and adaptation assessments

The Handbook explains the different direct and indirect links between climate change and infectious diseases, and gives hands-on instructions on how to perform national (or county-level) climate change risk assessments on impact, vulnerability and adaptation of infectious diseases. The importance of analysing projected changes in climate in the context of local conditions and vulnerabilities is emphasised in the Handbook, as well as instructions on how to choose the correct variables for different kinds of diseases.

4 Guidance on surveillance strategies for infectious disease and climate change in Europe

The unpublished results of a new ECDC project on the need for changes in pan-European surveillance due to the impact of climate change on infectious disease risks was presented. The weighted impact of climate change on disease risk (based on the strength of the climate change–disease link and the importance of an increased risk for society) has been analysed for all major infectious diseases in Europe. It was concluded that EU-level surveillance should be considered for five additional diseases: tick-borne encephalitis, Lyme borreliosis, visceral leishmaniasis, chikungunya fever (the disease is already being reported to ECDC voluntarily by Member States, and vibrio species (non-cholera). Adjustments to current surveillance (that is either indicator- or event-based) may be needed to pick up early signals of changes in disease risk, or of emergence of new diseases due to climate change.

WHO Regional Office for Europe

The WHO Regional Office for Europe has developed several projects, tools, and documents on health and climate change[6]. A list of publications can be found on their website. The recently published report 'Climate change and communicable diseases' is a manual for health workers in the former Yugoslav Republic of Macedonia that was developed by their Ministry of Health and the WHO Country Office.

[5] Semenza, et al. Knowledge mapping for climate change and food- and water-borne diseases. Critical Reviews in Environmental science and technology 2012;42:1-32.

[6] Climate change and adaptation strategies for human health. Menne B. Ebi KL (eds). Steinkopff Verlag Darmstadt 2006.

Centers for Disease Control and Prevention (CDC), USA

CDC's Climate Change Program was formally constituted as a Program in March 2009 with a congressional appropriation. The program has three core functions: 1) To translate climate change science to inform states, local health departments and communities; 2) To create decision-support tools to build capacity to prepare for climate change; and 3) To serve as a credible leader in planning for the public health impacts of climate change.

Meeting outcomes

The ECDC climate change adaptation tools that were presented at the meeting were in general considered to be very helpful. The need for continuous updates of the 'Climate change knowledge base' and the QMRA tool was pointed out. It was suggested that the computer tools could be further expanded to include additional water- and food-borne pathogens as well as vector-borne diseases. The importance of increased collaboration between the health sector and other sectors (such as veterinary medicine, water management, food industry) for surveillance purposes as well as national assessments was highlighted, as was the need for early stakeholder involvement.

The attributional impact of climate change on changes in disease risk is often difficult to quantify, as other drivers may interact. Nevertheless, trends of possible changes in risks can be projected. Some of the Member States have developed strategies that will strengthen adaptation and surveillance of climate sensitive diseases. Several of the northern and central European countries focus on tick-borne diseases, like Ireland where Lyme borreliosis will soon become notifiable, and Denmark that will perform sentinel surveillance of tick vector populations. The Czech Republic has developed an early warning system for tick-borne diseases that can provide forecasts of increases in disease risk several days in advance. (Re-)emerging mosquito-borne diseases have been the focus in southern Europe. Some countries have focused on providing information to at-risk populations and education of health workers, like Turkey and the former Yugoslav Republic of Macedonia.

Sentinel surveillance and best approaches to catch signals of climate change impact on disease risk were discussed. It was concluded that a better understanding of seasonal patterns in the occurrence of disease, especially enteric pathogens, is needed.

In answer to the question of how ECDC could better serve the Member States, some issues were brought forward:

- Increased collaboration between Member States' climate change representatives and ECDC, with more frequent formal as well as informal dialogues. The use of web-based conferences in addition to on-site workshops was suggested, as was the formation of regional work groups to address area-specific infectious diseases.
- A restricted website provided by ECDC that gives Member States access to useful data, tools, and soft-wares. Such a website could include access to 'real time' geographical distribution of climate-sensitive diseases, in particular vector-borne diseases.
- Vector-borne disease surveillance should include both vector populations (VBORNET), human cases (TESSy), and animal cases (for zoonoses). Exotic vector surveillance could be implemented at important gates for species introduction (e.g. airports, harbours).
- Better spatial and temporal data resolutions to interpret pan-European surveillance results.
- Regarding endemic infectious diseases, identify target diseases and have clear case definitions for notification.
- Regarding (re-)emerging infectious diseases, identify syndromes to be monitored.

It was also suggested that ECDC could develop a tool to calculate estimates of costs of action versus inaction, with cost–effect or cost–benefit approaches.

Conclusions and next steps

Participants highlighted the added value that ECDC currently provides on climate change and infectious diseases, and that continued work in the area by ECDC is crucial. The meeting participants underlined the need for ECDC to continue to push forward, and gather state-of-the-art information, assess data, and develop tools as a help for the Member States. Examples of new adaptive tools to develop were, for example, on-line updated risk maps of the main climate-sensitive diseases, and cost–benefit analysis tools.

It was considered important that ECDC will continue to be a network hub for Member States to discuss and learn more about climate change impact, vulnerability, and adaptation. Wishes were expressed for more frequent interactions between ECDC and the Member States on climate change issues.

Annex 1. Agenda

Tuesday, 15 November 2011

8:30 – 10:00	**Registration and introduction (Reception and Auditorium)**
09:00 – 09:30	*Registration and coffee*
09:30 – 09:40	Opening *Johan Giesecke, Chief Scientist, ECDC, Stockholm*
09:40 – 10:00	Introduction to the workshop *Jan Semenza, ECDC, Stockholm*
10:00 – 12:00	**Session 1: Climate change and infectious diseases: reviewing the linkages**
10:00 – 10:30	Climate change in Europe *Sten Bergström, SMHI*
10:30 – 11:00	Climate change adaptation tools *James Creswick, WHO European Centre for Environment and Health, Bonn, Germany*
11:00 – 11:30	CDC activities on climate change and human health *George Luber, CDC, Atlanta*
11:30 – 12:00	Synthesis of ECDC activities on climate change *Jan Semenza, ECDC, Stockholm*
12:00 – 13:00	*Lunch*
13:00 – 15:00	**Session 2: A Knowledge-base for food-and water-borne (FWB) diseases**
13:00 – 13:30	FWB diseases and climate change: Bonn/ECDC Project *Christoph Hoser, Thomas Kistemann, University of Bonn*
13:30 – 14:15	Parallel Session 2a Group 1. Hands-on session: Working with the knowledge-base Group 2 Group discussion: Member State Perspectives on Climate Change
14:15– 15:00	Parallel Session 2b Group 1. Group discussion: Member State Perspectives on Climate Change Group 2. Hands-on session: Working with the knowledge-base
15:00 – 15:30	*Coffee break*
15:30 – 17:30	**Session 3: Surveillance of (re-) emerging infectious diseases**
15:30 – 16:00	Monitoring (re-) emergence of infectious disease from climate change *Elisabet Lindgren, KI, Stockholm*
16:00 – 17:00	Parallel session 3
	Groups 1 & 2. Group discussion: Surveillance of infectious diseases in light of climate change
17:00 – 17:30	Plenary session: Findings from Parallel session 3
17:30 – 17:40	Concluding remarks

Wednesday, 16 November 2011

09:00 – 13:00	**Session 4: Assessing the risks from climate change**
9:00 – 10:00	Future infectious disease threats to the EU: Perspectives on Chikungunya, Dengue and Malaria *Jonathan Suk, Bertrand Sudre, ECDC, Stockholm*
10:00 – 10.30	*Coffee*
10:30 – 12:00	**Session 5: Quantitative Microbial Risk Assessment for FWD**
10:30 – 11.00	Introducing the Microbial Risk Assessment Tool *Bertrand Sudre, ECDC, Stockholm*
11:00 – 11:30	Parallel Session 5a Group 1. Hands-on session: Working with the quantitative risk assessment tool Group 2. Group discussion: Member State requirements for climate change
11:30 – 12:00	Parallel Session 5b Group 1. Group discussion: Member State requirements for climate change Group 2. Hands-on session: Working with the quantitative risk assessment tool
12:00 – 13:00	*Lunch*
13:00 – 15:30	**Session 6: Vulnerability, impact and adaptation assessments**
13:00 – 13:30	Handbook for national vulnerability, impact and adaptation assessments *Elisabet Lindgren, KI, Stockholm*
13:30 – 15:00	Parallel Session 6 Groups 1 & 2. Regional approaches to vulnerability, impact and adaptation assessments
15:00 – 16:00	Plenary wrap-up, conclusions and next steps *Jonathan Suk, Jan Semenza, ECDC, Stockholm*

Annex 2. List of participants

ECDC Expert Group on Climate Change

Austria	Ursula Kunze
Belgium	Mathias Leroy
Bosnia and Herzegovina	Aida Vilić-Švraka
Bulgaria	Tamara Lazarova
Croatia	Borislav Aleraj
Czech Republic	Križ Bohumir
Denmark	Palle Valentiner-Branth
Estonia	Irina Dontsenko
Finland	Markku Kuusi
The former Yugoslav Republic of Macedonia	Vladimir Kendrovski
Germany	Mirko Faber
Greece	Assimoula Ekonomopoulou
Hungary	Viktor Zöldi
Ireland	Paul Mckeown
Italy	Susanna Conti
Latvia	Antra Bormane
Lithuania	Milda Žygutienė
Luxembourg	Pierre Weicherding
Montenegro	Milos Mazibrada
Netherlands	Ana Maria de Roda Human
Norway	Preben Ottesen
Poland	Daniel Rabczenko
Portugal	Ana Leça
Romania	Ceianu Cornelia
Slovakia	Lukáš Murajda
Slovenia	Ana Hojs
Spain	Isabel Ortega Crespo
Sweden	Caroline Schonning
Turkey	Rifat Pamuk
United Kingdom	Gordon Nichols

Invited experts

Avia-GIS	Guy Hendrickx
CDC Atlanta	George Luber
EFSA	Frank Boelaert
Karolinska Institute	Elisabet Lindgren
Karolinska Institute	Yvonne Andersson
RIVM	Jack Schifvens
SMHI	Sten Bergstrom
University of Bonn	Christoph Hoser
University of Bonn	Thomas Kisteman
WHO Europe	James Creswick

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Wim Van Bortel

ECDC expert group on climate change

Outside ECDC, Stockholm, November 2011