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QUALITATIVE ANALYSIS ON EU CLIMATE CHANGE ADAPTATION STRATEGY IN HEALTH SECTOR

Vera Dimitrievska[1], Vladimir Kendrovski[2]

[1]PhD candidate, School of Business Economics and Management, University American College Skopje, R.N. Macedonia

[2] WHO European Centre for Environment and Health, Bohn, Germany

ABSTRACT: The study assesses the level of integration of public health measures into national climate change adaptation strategies or action plans in the EU 28 countries in 2017-8, as part of the Pagoda WHO project. Areas covered in the analysis are: governance and policies on climate change and health impact, vulnerability assessment of climate change, integrated climate information into infectious disease surveillance, early warning systems for extreme weather, recent projects on climate change and human health, health effects of climate change, best practices, main risks and priorities protecting from climate change. A qualitative approach was applied in this research study based on responses of 20 questionnaires of WHO European Member States. 15 of the responding countries had developed a climate change health adaptation strategy and an associated implementation plan (75%), and these were approved by the government in 13 countries (65%). The results revealed certain specific areas for technical improvement mainly in strengthening of capacities to ascertain the climate-sensitive disease burden in populations.

KEYWORDS: *climate change, health, climate change strategy*

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INTRODUCTION

Climate change is one of the global phenomenon which will probably influence the health of the population with two kinds of effects: direct and indirect. Climate change and other environmental changes started to raise interest and concerns among numerous scholars. This challenges has started to evoke a growing interest within epidemiologists in studying and understanding the population-level influences on patterns of health and disease. Furthermore, Watts et all, (2015) in their study stressed that various extreme weather events that have recently occurred in Europe have become much more likely as a result of global climate change.

According to WHO report (2018), climate change related to health affects different communities to different degrees and in different ways. The report states that positive health consequences such as morbidity and mortalityinfluenced by climate change may emerge in places where they have not been known previously, or the severity and/or frequency of climate-sensitive health risks may be intensified. Climate change will affect everybody, but vulnerability to weather and climate change depends on people's level of exposure, their personal characteristics (such as age, education, income and health status) and their access to health services. Elderly people, children, people with chronical diseases and homeless people are particularly considered as vulnerable groups. Furthermore, the populations considered at greatest risk are those living in large cities or near a coast, and those considered water-stressed as they have limited access to water and/or live in arid areas (WHO, 2018).

Therefore, as a result of climate change, WHO urges national health systems to prepare for and adapt to gradual changes in health outcomes caused by extreme events (such as heat-waves, storms, floods and associated infectious disease outbreaks). There are challenges, however, to implementing the plans and beneficial policy in order to adopt on heat warning alerts systems to respond to climate changes. Several international policy frameworks and platforms have been places, whereas the main global frameworks are: The United Nations Framework Convention on Climate Change (UNFCCC) sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change and the Paris Agreement on Climate Change is the first universal.

The EU Strategy on adaptation to climate change, adopted by the European Commission in April 2013, has set out a framework and mechanisms for raising the EU's preparedness for current and future climate impacts. The objective of the Strategy is to support countries in adapting to climate change by prioritizing coherent, flexible and participatory approaches in vulnerable sectors, including health.

The WHO (2018) carried out targeted surveys in 2012 and 2017 among its Member States (i. e. with 22 countries participating in 2012 and 20 countries in 2017) to track the status and progress of how health is positioned in existing climate change policies and programming in the European Region (Wolf et al, 2014). The surveys primarily focused on governance of climate change and health, the status of health vulnerability and impact assessments, the existence of national adaptation health policies, the strengthening of health systems and the raising of awareness.

This study presents a summary findings, from WHO EU countries with a view to providing relevant information to the EU and national stakeholders on strengthening the links between health and climate change in relevant policy processes.

MATERIAL AND METHODS

A qualitative approach in assessing the level integration of public health measures into national climate change adaptation strategies or action plan in the EU countries was carried out. Our results are based on responses of 19 questionnaires of WHO European Member States which are EU members.

In order to address the goal of the study, a semi-structured questionnaire was sent to 28 EU countries to their relevant departments that dealing with climate change issues. Purposive sampling was used for this study report with an email communication with the professionals involved on climate change, as the best way to obtain the information on integration of public health measures into national climate change adaptation strategies. (Hennink et all. 2000) The questionnaire contained 7 blocks of open and closed questions. Data collection took place between March and July 2017. The data is summarized from the following counties: Austria, Belgium, Bulgaria, Croatia, Chezch Republic, Estonia, Germany, Latvia, Lithuania, Slovenia, Slovakia, Netherlands, France, Finland, Poland, Sweden, Malta, Luxembourg and Spain.

The first part of the questionnaire addresses the EU Strategy on adaptation to climate change, adopted by the European Commission in April 2013, later discussed in details early warning systems for extreme weathers and impact to health on humans. The second part of the questionnaire is focused on technical information on climate change and health effects, building capacity, lessons learnt and the best practices. The questionaries' results were deductively analysed by creating codes, categories and themes with the aid of qualitative software Atlas.ti. However, this study shed a light on governance and policies on climate change and health impact, vulnerability assessment of climate change, integrated climate information into infectious disease surveillance results and observed health effects of climate change.

There were 19 respondents (countries) participating in this study report. We grouped them into the EU transnational regions and for other regions and countries:

Table 1.
Transnational regions

Alpine Space	Slovenia, France, Germany, Austria
Adriatic	Slovenia, Croatia
Artic	Sweden, Finland
Atlantic	Spain, France
Balkan Mediterranean	Bulgaria
Baltic	Poland, Latvia, Lithuania, Finland, Estonia, Germany
Danube Area	Bulgaria, Germany, Czech, Austria
Central Europe	Poland, Slovenia, Slovakia, Germany, Croatia, Austria
Mediterranean	Spain, Malta, Croatia
North Sea	Sweden, The Netherlands, Germany, Belgium
North-West Europe	The Netherlands, Luxembourg, France, Germany, Belgium
South West	Spain, France

RESULTS

Governance and policies on health impact of climate change

Country participants were asked about the governance structure in climate change in their respective countries. Data demonstrate that majority of the countries have established a multi-sectoral body to deal with climate change, where-

as certain countries reported that have designated a focal point as part of their respective Government structure, either at the Ministry of Health or Ministry of Environment or Centre for Health Education and Diseases. Looking through the selected transnational regions, it demonstrates that in all 12 regions there have established multi-sectoral bodies to deal with climate change. However, the countries that have not established multi-sectoral bodies are Sweden and Belgium, wherein these two countries are coordinating the climate adaptation within specific working groups, like in Belgium Belgian NEHAP Cell or in Sweden the task is delegated within the 21 county administrative boards.

Health impact, vulnerability assessment of climate change

Discussion about the health impact assessment of climate change has shown that almost each country has conducted national assessments on health impact and climate change. Belgium has not done a national assessment but it was piloted at regional and federal level (Wallonia, Brussels, Federal, Flanders). These preliminary studies covered several sectors (including health) which are the first steps before starting the development of regional and federal adaptation plans. In the similar manner goes for Slovakia, the assessment is not a separate document, but the general assessment of the health consequences of the climate change which is part of the "National adaptation strategy to climate change" under governance of the Ministry of Environment. It is a base document adopted by the government at national level. It is available only in Slovak language.

A climate change health adaptation strategy and associated implementation plan

The countries from all regions described that have developed own Strategic Frameworks on Climate Adaptation and Action Plans. In most of their strategies the focus is on the climate change impacts and adaptation instruments in the field of human health and rescue management. In Latvia, there is an ongoing process about health aspects regarding climate change impacts, risks, policies, measures, indicators for monitoring, etc. to be discussed and to be included in the National Adaptation Climate Change Strategy up to 2030. Additionally, climate change risks are mentioned in the National Public Health Programme 2014-2020. In similar position is the Netherlands as apart from the National Climate Adaptation Strategy adopted in 2016, no specific strategy for the Health sector has been developed. However, a Heat Action Plan in force, as a surveillance structure on emerging pathogens. Both programmes are considered to cover climate related health impact to a certain extent for the time being. While, Luxembourg did not specify if there is a National Strategy on Climate Adaptation and Action plans. Only seven countries (Austria, Croatia, Estonia, Finland, France, Malta and Spain) have confirmed that their Strategies have been approved by the Government and described its main objectives.

Integrated climate information into Infectious Disease Surveillance and Response

Regarding the responses on whether the respective countries have integrated climate information into infections disease surveillance and response, there are quite disparate and fragmented. Belgium, Netherlands, Poland, Slovenia and Germany have explained that there is not

integrated integrated climate information into infections disease surveillance and response. As main reasons are listed: specialists responsible for climate and environment surveillance are working in close collaboration with people in charge of infectious disease surveillance and response (Belgium). Medical statistics are conducted in a routine manner, but without the thematic details of climate-related diseases (Poland). The system is strong enough to detect effect of climate change (Slovenia). In the Netherlands, information on surveillance of infectious diseases is shared with partners weekly in (1) signal meetings on infectious diseases and (2) signal meetings on zoonoses. This is where interpretation takes place. If there is reason to increase surveillance on a specific pathogen – regardless the driver – surveillance is increased. While in Germany, for Vector-borne as well as rodent-borne diseases, there is no sufficient information about the correlation and causality of climate to infections. However, there is funded several research projects on climate change and ticks/tick-borne diseases, climate change and exotic mosquitoes as well as climate change and rodent borne diseases (correlation/causality of bank vole abundance and Hanta-infections).

Observed health effects of climate change

The vast majority of responses of the respective countries demonstrate that climate change has a direct effect and shaped human health ad behavior. Although the findings are discussed regarding the current observed health effect of climate change, the respective countries provided a data on retrospectively 10 years back, which is appreciated. A total of 7 main codes/topics emerged about this question (health effects of climate change), increased days with high air temperature, increased of mortality and cardiovascular diseases due to extreme weather – heat waves and cold waves, increased food-borne disease, increased vector-borne diseases, increased infections due to drinking water quality and increased number of allergies.

Increased days of high air temperature

The findings from the studies in Bulgaria, Netherlands, Latvia, Belgium, Croatia and Estonia describe an average increase of the air temperature of around 1.5C, increased a rainfall in winter by 20% and decrease in summer about 10% in Central and Eastern Europe like in Bulgaria.

In Baltic countries like in Latvia, Estonia and Lithuania show an increasing tendency in the number of days with high temperature extremes and a decrease in the number of days with extremely low air temperatures. The overall warming tendency is evident in both the mean values and extremes of air temperature as well as the increased occurrence of heat waves that is even more significant in the major cities.

While Belgium had to deal with summers with extended heat waves. In the summer of 1994, a six-week heat wave claimed 1226 lives. In addition to the high temperatures, increased ozone concentrations also resulted in victims; In 2003, Belgium had a significant heat wave that lasted for 14 days, and another hot period that lasted for 13 days; There were two heat waves in 2006, of 5 and 21 days respectively, and another hot period of 9 days.

Increased of mortality and cardiovascular diseases due to extreme weather – heat waves and cold waves

Potential health effects of expected temperature changes in Bulgaria include an increase in mortality from cardiovascular diseases and strokes in large cities during summer periods from 40% to 60%; in extreme weather events in Bulgaria include increased mortality due

to extreme weather events and fires by 10%, over-represented among vulnerable groups - up to 30%.

In the Netherlands, projections of longer and more intense heat-waves with the resultant ill-effect on vulnerable people such as older persons, the socially isolated, children, and outdoor workers. In Latvia, have a significant negative effect on human mortality and morbidity, taking into account a large share of old and poor people in Latvia`s population vulnerability assessment. The number of cases of cardiovascular disease depends on weather conditions and can be predicted on the basis of a relationship with meteorological parameters, in Lithuania. In Croatia, the heat-waves contributing to more frequent admissions to emergency departments due to cardiovascular diseases. The increased number of days with temperatures exceeding 30°C demonstrably impacts the incidence of cardiovascular diseases in the Czech Republic.

In Belgium, in 2003, the death toll rises even further to 2052. The ozone concentrations were also exceptionally high; There were two heat waves in 2006, of 5 and 21 days respectively, and another hot period of 9 days. These three periods collectively resulted in 1263 deaths. Almost half of the victims were 85 or older; there were two heat waves in quick succession at the end of June and in the first half of July 2010. The first heat wave lasted for 12 days and resulted in 593 deaths. The second heat wave lasted for eight days and caused 374 victims. Mortalities in both periods were significantly higher than the reference level: +20 % and +19 % respectively. More than 40% of the victims were 85 or older.

Increased food-borne disease, vector-borne diseases, increased infections due to drinking water quality and increased number of allergies

In Bulgaria, there is an increase in the incidence of vector-borne diseases in the 10% to 30%; increase in the incidence of Salmonella infection from 50% to 100%; increase in campylobacteriosis from 10% to 100%, and increasing the risk of disease in combination of elevated temperatures and humidity. Also, there is and increase and exacerbation of respiratory diseases from 10% to 30%; and increasing the number of allergic diseases from 10% to 30%.; increase in cases of campylobacteriosis from 10% to 100% in Northwestern Bulgaria; and increased incidence of diarrheal diseases caused by non- Cholera Vibrions in Northwestern Bulgaria and the Black Sea.

In the Netherlands is noted an increase in average annual air temperatures with the potential for an increase in food borne illnesses such as salmonellosis. The introduction of a new mosquito species to the Maltese islands (Aedes albopictus) possibly as a result also of sea-trade, with the risk of local transmission of new vector- borne diseases such as Chikungunya fever, Zika virus and Dengue fever. In France, there is a proliferation of vectors. Germany--Heat impacts on e.g. IHD and COPD, solar UV radiation impacts on skin and eyes. Injuries of extreme weather events, such as storms, flash floods and landslides. Allergies and asthma from heat in combination with air pollution.

Air pollution in Estonia (long-range transported particles) resulted in increased of pollen levels and allergies, storms and floods (flash floods in urban areas after heavy rain), water-related problems (temporary deterioration of water quality, interrupted supply, public beaches and cyanobacteria, fecal microbes), vector-borne diseases (tick-

borne diseases), extreme temperature (heat and cold) waves, food security.

In Croatia, diseases of the respiratory system and mental diseases; the occurrence of infectious diseases not known in our country before such as dengue fever, chikungugnya fever, West Nile fever and zika virus

In the Czech Republic, in the last 25 years, it has been documented that incidence of tick-borne infections – Lyme disease and encephalitis – has increased due to climatic changes. It has been shown that ticks, as well as vehicles of these infections, have gradually moved to higher altitudes. The frequency of floods has also increased, accompanied by an outbreak of mosquitos and other arthropods that extremely bothered the citizens of affected areas; incidence of leptospirosis and even fatalities caused by this disease have been recorded in these areas. High average day temperatures affect the incidence of gastrointestinal illnesses in spring and summer. Higher average temperatures also lead to a longer pollen season, which means a longer period of health issues for people with allergies. Longer droughts have a negative impact on water management. Lower water levels in rivers and water reservoirs lead to a higher concentration of pollutants due to lower dilution and more favourable conditions for the growth of microorganisms and algae. This poses increased health risks.

Table 2.
Specification on each ~ –borne diseases per country

Countries					
Diseases	**Spain**	**Czech**	**Latvia**	**France**	**Croatia**
vector-borne diseases	Diseases transmitted by mosquitoes (Aedes), (dengue, chikungunya and Zika) and ticks (CCHF).	Tick-borne encephalitis, Lyme borreliosis, Anaplasmosis.	tick-borne diseases, focal territories, in the monitoring sites for abundance and pathogen prevalence	Dengue, chikungunya-yellow fever, Zika virus.	Dengua fever, Chikungunya fever, West Nile fever and Zika virus.
water-borne diseases		Shigelosis, leptospirosis, Viral hepatitis A.			
food borne-diseases		Salmonelosis, Campylobacteriosis Viral, hepatitis C			
rodent-borne diseases		Tularemia, hantavirus infections			

CONCLUSIONS

Data demonstrate that majority of the countries have established a multi-sectoral body to deal with climate change whereas, certain countries reported that have designated a focal point as part of their respective Government structure, either at the Ministry of Health or Ministry of Environment or Centre for Health Education and Diseases. Looking through the selected transnational regions it shows that in all 12 regions there have been established a multi-sectoral body to deal with climate change issues. Each country has carried out national assessments on health impact and climate change.

The countries from all regions described that have developed own Strategic Frameworks on Climate Adaptation and Action Plans. In most of their strategies, it is addressed the climate change impacts and adaptation instruments in the field of human health and rescue management.

Implemented projects or programmes on health adaptation to climate change in following public health areas: Strengthened primary health care, Built climate resilient infrastructure, Strengthened infectious disease surveillance, Developed integrated climate, environment and health surveillance, Ensured climate change was included in wider health and public health policy, Strengthened environmental health services, including water and sanitation, vaccination programs and laboratory services, Strengthened Health security, Implementation of the International Health Regulations, Strengthened early warning and disaster response, Addressing vulnerable populations (e.g. elderly people, children, outside workers, low-income families). However, a project Actions on climate-related health impacts in the area of nutrition is noted only by Belgium.

The data from the respective countries whether have integrated climate information into infections disease surveillance and response, are quite disparate and fragmented. For instance, Belgium, Netherlands, Poland, Slovenia and Germany have explained that there is not integrated integrated climate information into infections disease surveillance and response. Results on Strengthened health sector engagement in emergency planning for extreme weather events and cross-sector plans is elaborated by Germany, Sweden and Czech Republic with certain contingency plans for emergency planning. The responses by the respective countries pertained to communication messages for extreme weather events with an early warning are overwhelming by bigger number countries with given positive responses.

The issue on health effect of climate change and its relevance in the political process in the EU member states have been shown in the responses by Spain, Malta, Lithuania, Austria, Germany, Latvia and Czech Republic. In all these representative countries there is a particular focus on policy documents development wherein the climate change has health effects. While in Sweden, the Netherlands, Belgium and Luxembourg still the health effects and climate change issues are not high in the political agenda.

The vast majority of responses demonstrate that climate change has a direct effect that shapes human health ad behaviour. Although the findings are discussed regarding the current observed health effect of climate change, the respective countries provided a data on retrospectively 10 years back, which is appreciated. As main effects of climate change on human health are listed: increased days with high air temperature, increased of mortality and cardiovascular diseases due to extreme weather – heat waves and cold waves, increased food-borne disease, increased vector-borne diseases, increased infections due to drinking water quality and increased number of allergies.

REFERENCES

IPCC summary for policymakers. In Climate Change (2014): Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change;

Field, C.B., Barros, V.R., Dokken, D.J., Mach, K.J., Mastrandrea, M.D., Bilir, T.E., Chatterjee, M., Ebi, K.L., Estrada, Y.O., Genova, R.C., et al., Eds. *Cambridge University Press*: Cambridge, UK; New York, NY, USA: pp.1–32.

M. Hennink, et all. (2010). Qualitative Research Methods, Sage Publications.

Watts N., Adger WN., Agnolucci P., Blackstock J., Byass P., Cai W et al (2015) Health and climate change: Policy responses to protect public health. *Lancet* 386(10006): pp.1861–1914.

WHO (2018). Public health and climate change adaptation policies in the EU, Final report. Bonn: World Health Organizations.

Wolf T., Martinez G.S., Cheong G.H., Williams E., Menne B. (2014) Protecting health from climate change in the WHO European region. *Int J Environ Res Public Health* 11(6): pp. 6265–6280.