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CLIMATE CHANGE, EXTREME WEATHER EVENTS AND EFFECTS ON WORKERS' HEALTH IN MACEDONIA

Introduction

Climate change and health risks

The impact of climate change on human health is evident and the health risks caused by climate change are complex and comprehensive. The risks are product of complicated inter-reactions between the physical hazards associated with climate change and climate variability on one hand and the vulnerability of society or social-ecology system and their exposure to these hazards on the other hand.

They include the **direct effects** that are manifested through increased frequency and intensity of extreme weather events, they are the result of the impacts of weather features, and the indirect effects that mainly cause the changes in environmental, social and economic determinants of health.

Phenomena that follow climate change with strong effect on the human health are extreme temperatures (heat and cold waves), floods, fires, droughts, storms, deterioration of air pollution, water pollution and unsafe food, changes

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in the distribution of vectors with increasing number of cases of certain infectious diseases, etc.

Anticipated/expected risks could be managed "with adaptable politics and actions, and the success in their implementation will depend on the characteristics of climate change and also of the level of global cooperation for implementation support and protect vulnerable regions and vulnerable populations in the world."

Climate change and impact on workers' health

Unlike many studies about negative effects of climate change on the general population and public health, the working population is not yet added in appropriate research focus in this area, despite the evident effects of climate change not only on workers health, but also on the labor market.

- In 2009, a ***conceptual framework for the identification of the most important risk factors*** has been published, related to climate change that can affect on the health and safety at work: *increased ambient temperature, air pollution, exposure to UV radiation, extreme weather events, infectious vector-borne diseases, changes in the industry (green jobs) and urban areas* (Schulte and Chun).

The direct effect of climate change on the workers' health is related to an increased mortality and morbidity caused by floods, droughts, hurricanes and fires as a result of extreme weather events, while excessive ambient temperature (high or low) can lead to heat stroke or exhaustion, or frostbite or immersion phenomenon and increased exposure to UV radiation leads to an increased risk of cancer of the skin and eyes changes in occupationally exposed workers.

- **vulnerable groups of workers who are exposed to occupational risk factors associated with climate change and extreme weather events** *outdoor workers, such as construction workers, farmers, forestry workers, gardeners, military, police, firefighters, workers in waste disposal, green markets vendors, field workers and traffic workers (bus, taxi, rail, outdoor workers on airports, road maintenance etc.).*

As a result of climate change, **the increased air pollution** with chronic effects on the lungs leads to frequent occurrence of respiratory diseases, **and changes in the pollen micro flora** (distribution, length of season, etc.) are resulting to frequent respiratory allergies, particularly among outdoor workers.

In relation of **vector-borne diseases**, occupational risk exists for workers who work in areas where vectors are present such as forest areas, fields with tall grass, fallen leaves, marsh and wetland areas.

In extreme weather events such as floods, fires, droughts, storms and others, the workers are engaged in specific work activities that accompany the extraordinary and emergency situations, rescue actions or clearing and are often exposed to high levels of professional risk.

In terms of occupational exposure, **the indirect effect of climate change** is linked to new and unfamiliar technologies such as renewable energy processes and “green” technologies that can bring new occupational hazards and risks and changes in the urban environment, with the appearance of the syndrome “sick building” that may involve inappropriate indoor air quality and emission of radon.

Occupational risks may occur in terms of introducing new technologies (eco-friendly), new equipment and machinery, particularly in terms of not implementing trainings, as well as inadequate awareness of employees.

The side effects of climate change could lead to damaging the health and endangering the safety on the workplace of exposed workers with the occurrence of injuries, illnesses, increased absence, early disability and even fatal consequences.

Climate change and extreme weather events in R. Macedonia and workers health

In R. Macedonia, in the next few decades, in some of the colder months of the year is expected a drop of few rates on the total average monthly mortality in the country (January 4%, in October 4%, November 2%) due to climate change, and in the warmer period of the year is expected an increase rate of 4-11% (most in April, May, June on average 10% more than 1996-2000). According to the projected scenarios of death, in Skopje in the period of 2026-2045, because of the heat waves a 130 people will die per year, and for the period of 2081-2100 the number will increase to an average of 180 per year. People with chronic disease (cardiovascular, respiratory) have a high risk of increased mortality during heat waves.

In the period of 2003-2011 year and of 2015 more serious floods are registered, which caused damage to homes, roads and bridges, as well on agricultural areas and systems for water supply, which can indirectly lead to increased intensity and frequency of diseases that are transmitted through contaminated water and food.

Community response

Policy, regulations, actions

The issue of climate change and the right to a healthy environment in the R. Macedonia is subject of several legal and strategic, planned and programmed documents at national level, but also international agreements and policies (the UN Framework Convention on Climate Change – UNFCCC 1997, the Kyoto Protocol 2004, National report on Climate Change 2003, 2008, 2014, the Constitution of the Republic and others). These include the strategic documents promoted by the Ministry of Health and adopted by the Government, such as Strategy for adaptation of the health sector to climate change with actions plan, 2011, and also Action plan to prevent the effects of the heat waves on the population in

Macedonia, 2011, and Action plan to prevent the effects of the cold waves on the population in Macedonia, 2012. These documents provides measures to secure timely response to the health system of the risks and problems expected to arise as a result of the impact of climate change on the health and welfare on the population in R. Macedonia.

In these strategic documents the importance of climate change and workers' health in the country is recognized and the Ministry of Health entrusted the Institute of Occupational Health of RM and WHO Collaborating Centre as part of the national institutional and expert network to conduct various activities to protect and prevent the workers' health from the impact of climate change.

Research and analysis

Since 2010 till now the Institute of occupational medicine of R.M with the support of WHO Office in Macedonia, conduct many studies, research and analysis, focused on specific topics related to climate change, published in international professional and science journals.

During the 2011/2012 year it was made a **research on the impact of weather and climate changes on the** production, the season and the distribution of pollen grains in an urban environment by air quality monitoring, and also a research on the **problem of respiratory allergies** among adults in the city in the period 1996-2009 / 2010. Specific changes in the pollen micro flora (increased number, extended season) in this period are associated with a statistically significant increase in the prevalence of allergic rhinitis (11.5% vs. 17.4%) and allergic asthma (2.1% vs. 5.1%).

During 2013, a study was realized **to assess the attitudes, knowledge**

and practices about the harmful effects and protection from the effects of heat waves in about 350 workers who work outdoors in our environment. The research showed that more than 30% of respondents are not informed about the procedures for dealing with the impact of heat waves on human health and as the most significant aggravating factors in their application stand out - the lack of support by the management (36.2%), as well the fear of losing the job (34%) and others. The research resulted with specific recommendations for employers, workers and specialists doctors in occupational health which should ensure proper implementation of the proposed measures for prevention.

In 2014 an expert assessment is conducted and prepared a Report on prevention, early warning and dealing with the **side effects of increased UV radiation, with special accent on the health of workers in the Republic Macedonia** in which a situational analysis of the problem is given and measures and activities are proposed for his dismissal.

Disseminations of information, trainings and education

Within the established continuous monitoring and alert system for heat and cold waves in the country, with the well-organized inter-sector activity, the Institute of Occupational Health of the Republic of Macedonia and the State Labour Inspectorate are responsible for the dissemination of information to workers and employers. In the last five years **several reports and recommendations** are prepared on various issues in terms of the impact of weather, climate change and variability on human health (heat wave, cold wave, recommendations and prevention measures among workers who participate in the remediation of damages from floods etc.). We realized a large number of **educational meetings** for different target groups, **campaigns**, developed and distributed **brochures** with recommendations relating to the impact of heat and cold waves, and on the active website (www.toplotnibranovi.mk) the workers are primary involved in order to better inform all related subjects.

Conclusions and recommendations

In the next period, the planned activities related to climate change included as one of the strategic priorities in the Action Plan for Health and Environment in 2020 in Macedonia, should secure a development on appropriate specific preventive interventions that will serve to reduce the health risks of climate change to the whole population, as well as the

working population, with increasing the resilience of the community, according to the principles of the WHO strategic documents in the field (WHO Health 2020 - European policy framework for the 21st century and the Global Action Plan for health workers 2008-2017).

These *public health actions through whole-of-government approach with actions at local to the central level, as well through whole-of-society approach* should be directed to:

- **Strengthening the health system,**
- **Revising and modernizing legislation in the field of safety and health at work in occupationally exposed workers** (risk assessment, standards and norms at work, preventive medical examinations)
- **Raising awareness the occupational risks associated with climate change in the community** and
- **Capacity building.**

In these guidelines one of the priorities is the development of **educational programs and training modules** for specific occupational health risks related to climate change and extreme weather events intended for different target groups (workers, employers, safety inspectors, health professionals and doctors and specialists in occupational medicine).

Intensifying the dissemination of information through workshops, round tables, preparation of brochures, leaflets, campaigns, involving electronic and print media, social networks, etc, should be basic tools to increase community awareness of the problem of climate change and workers' health.

The use of preventive interventions and policies that can reduce the health risks and the potential effects of climate change and extreme weather events on workers' health requires further capacity building in the health sector especially in the field of environmental health which will provide, recognize, assess and control the changes in the working environment and occupational hazards with increased focus on modeling and adaptive management that should help increase the resilience of the community, building an integrated, efficient and effective public health approach.

Executive summary

The policy brief of the issue of climate change, extreme weather events and effects on workers health of the in R. Macedonia is prepared in order to develop tools for preventive interventions to reduce the health risks of climate change in the working population by increasing the resilience of the community. The document is a contribution in the development of the Health strategy of 2020 in R. Macedonia.

The purpose of this policy brief is to draw attention to the professional and social public of the urgency and criticality of the problem of climate change, extreme weather events and the effects on the workers health, to present the results and recommendations from research and practice, to emphasize the need to adopt the planned guidelines for action and to offer efficient and effective policies for public health interventions to solve this problem.

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