Assessment of climate change health impact in the population of the Kyrgyz Republic

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BMU Project & Objectives

This work is conducted within the WHO - BMU Project “Protecting Health from Climate Change” in 7 countries of the European region. It is coordinated by the WHO Regional Office for Europe, and funded by the Federal Ministry of Environment, Nature Conservation and Nuclear Safety (Germany).

The overall goal of the project is, to strengthen the capacity of the country in understanding the health risks of climate change and developing actions.

The objectives are:

- **Assessing the health risks**;
- Developing a national adaptation plan of health system to climate change;
- Carrying out the communication activities according the Health promotion Action Plan;
- Training of public health and environmental health specialists;
- Equipping five medical facilities with solar equipment to pilot energy efficiency and self-sustainability in areas vulnerable to interruption in the continuous energy supply;
Kyrgyz Republic (KR)

- Area: KR 199,000 square km
- Capital - Bishkek
- The administrative areas include 7 regions: Batken, Jalal-Abad, Issyk-Kul, Naryn, Osh, Talas, Chui.
- KR is a mountainous country with 93% of the territory at higher than 1000 m above sea level, 85% - over 1500 m, about 42% - over 3000 m above the see level (SNC KR, 2009)
Main climate change risks for Kyrgyz Republic

The Second National Communication of the Kyrgyz Republic to the UN Framework Convention on Climate Change was approved by the Government Decree No.274, 6 May 2009. The SNC was developed in the framework of GEF/UNDP Project (PIMS 3209 CC EA SNC Kyrgyzstan)

The main climate change risks concern four sections:
- water resources,
- agriculture,
- population health
- climate-related emergencies.

Expected morbidity of circulatory system diseases

Observed climatic changes
Assessment of climate change health risks in Kyrgyz Republic

**Aim:** to assess the climate change related impact on the health of the Bishkek city’s population using medico-demographical and meteorological data.

**Objectives:**

- to carry out the analysis and assessment of population mortality data in relation to meteorological data;
- to carry out the analysis and assessment of population morbidity data in relation to cold/heat waves;
- to carry out collection and analysis of meteorological data.
The Ministry of Health of the KR created:

- the working group on development of the Adaptation strategy to Climate Change in the health sector (Order No. 271 as of 25.05.2009).
- the working group for conducting the programme on the assessment climate change and health (Order 643 of 10 September 2009).

Ministry of Health has several working groups on:

- climate change adaptation strategy in the health sector;
- climate change health impact assessment;
- climate change awareness of the population;
- the use of alternative energy sources in hospitals.
Specific working groups for CC&H

Research groups:
- Scientific and Production Centre for Preventive Medicine (SPCPM) of the MoH of the Kyrgyz Republic (KR);
- Academician M. Mirrhakhimov National Centre of Cardiology and Therapy (NICT).

Partners:
- City Bishkek Emergency Care Station;
- Republican Medical Information Centre;
- National Statistical Committee;
- Kyrgyzhydromet under the Ministry of Emergency Situations of KR;
- Republican and city archives of the Civilian Registry Office;
- Institute of Physiology & High Altitude Pathology of the National Academy of Sciences of the Kyrgyz Republic.

Co-ordinators of the BMU project:
- Dr. Bettina Menne (WHO Regional Office for Europe);
- Dr. Oskon Moldokulov and Dr. Arthur Buyuklyanov (WHO Country Office in Kyrgyzstan).
Methods and Approaches

We used: epidemiological, mathematical and statistical (regression, SPSS) methods.

WHO guidelines used in the study:


We used two climatic scenarios for climate change health impact assessment in Kyrgyz Republic:


**NOTE:** Kyrgyz Republic has not piloted the draft “Guidance”.

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Mortality data

Population mortality data (ICD-10)

- **All natural causes**: A00-R99
- **Cardiovascular diseases**: I00-I52
- **Circulatory system diseases**: I70-I79
- **Diseases of the respiratory system**: J00-J99

Mortality data were analyzed for the following categories:

- Gender
- Age groups: 0-1, 1-14, 15-44, 45-64, 65-74, 75+
Morbidity data

Population morbidity data are assessed in relation to temperature waves using data of registrations:

- of the Emergency Care Station
- of the National Centre of Cardiology and Therapy

Morbidity indicators:

- Infectious (A00-B99)
- non-infectious diseases (I00-I99) in Bishkek city

Demographical data (National Statistical Committee)
Meteorological data & air pollutants

Climate change health impact will be studied using:

- **Meteorological parameters:**
  - Air temperatures (average daily, average monthly °C),
  - Relative air humidity (%),
  - Monthly and annual precipitation (mm);
  - Wind velocity

- Analysis of cold / heatwave temperatures

- Data on atmospheric air pollutants: sulfur dioxide, nitrogen dioxide, nitrogen oxide, formaldehyde.
Climate change scenarios

- To calculate expected levels of health of the population two scenarios of emissions A2-ASF and B2-MES, prognostic estimations of temperatures and average annual amounts of precipitation were used.

- The analysis showed that the probable increase in annual temperatures will be 4,5...8,4°C (scenario A2) и 3,5...6,1°C (scenario B2) and the probable change in annual precipitation totals will be -43,4%...59,9% (scenario A2) and -30,9%...40,9% (scenario B2).
Findings regarding CC&H risks in KR

Within the GEF/UNDP project the most significant association between morbidity of circulatory diseases and meteorological parameters were found for 3 out of 6 regions of the Kyrgyz Republic: Chui; Issykkul and Jalalabat Regions.

- Acute intestinal infection morbidity is expected to increase by 15.9% under scenario A2-ASF and by 10.6% under B2-MESSAGE in 2100 in relation to base parameters of disease for year 2005.

- Morbidity from diseases of the circulatory system is expected to increase in 2100 in relation to the basal period (1996-2005) for 3 regions of the KR under climatic scenarios A2-ASF and B2-MESSAGE as follows:
  - Chui oblast – 69.6% and 45.6% under scenarios A2-ASF and B2-MESSAGE respectively;
  - Issyk-Kul oblast – 13.5% and 8.3% under scenarios A2-ASF and B2-MESSAGE respectively;
  - Jalal-Abad oblast – 73.2% and 37.6% under scenarios A2-ASF and B2-MESSAGE respectively.

BMU project is currently at a stage of data analysis on climate change health risks.
The work on development of the Climate Change Adaptation Plan for the Health Sector was begun in May 2009 by the Ministry of Health of Kyrgyz Republic and interested ministries.

The Inter-agency Group on development of the National Strategy and Climate Change Adaptation Plan in Kyrgyz Republic was created by the State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic in August 2009.

The key elements of the Climate Change Adaptation Plan for the Health Sector in KR include:

- Prevention of infectious diseases
- Prevention of non-infectious diseases
- Providing safe drinking water for the population
- Implementation Food Safety measures
- Implementation of energy saving technologies in Health sector
- Capacity building of HS personnel on CC&H
- Increasing public awareness on the issues of climate change and health
- Carrying out of Scientific researches on CC&H
- Improving of monitoring and information systems with CC&H relation
Data limitations

- Lack of quality data on electron media.
- Data are often aggregated as year totals. The analysis of medical data regarding climate change health impact requires more detailed (incl. personified) data with greater time and spatial resolution (hourly, daily, weekly), so that they can be analyzed in relation to meteorological data or pollutants.
- Restrictions and delays for access to archival data.
- The registered data on death causes (death certificates) were without ICD-10 codes which required additional time for their coding and analysis.
- Limited time for good analysis of data (deficiencies in management and work planning).
Barriers for CC&H Assessment

- Insufficient funding of the Public Health services
- Insufficient legislative / regulative base
- Lack of specialists on specific topics (Climate Change)
- Insufficient funding for research works
- Imperfect reporting forms, lack of special information systems and software for daily monitoring for health with meteorological and environmental data.
Thank you for attention!