Estimation of vulnerability and health adaptation of the population to climate changes in the Arkhangelsk region, Northwest Russia: the WHO project

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Background

It is known that a change in climate significantly affects population health in different territories of the world (WHO, 2005). Global climate models predict stronger effects of warming on all Arctic zones in comparison with other territories of the Northern Hemisphere.

In international studies, follow-up health outcomes are considered: morbidity and mortality due to heat and wave events, air pollution, floods, windstorms and food insecurity; vectorborne diseases; waterborne and foodborne diarrhoeal diseases; and adverse health outcomes associated with stratospheric ozone depletion.

Project

“Estimation of vulnerability and health adaptation of the population to climate changes in the Arkhangelsk region”

Period of the project: from January, 01st 2009 - to December, 31st 2010.

This project, according to WHO recommendations, includes the following tasks: i) estimation of the climate changes; ii) estimation of the population health in connection with climate changes; iii) estimation of undertaken measures and development of contemporary actions on prevention and decrease the influence of climatic changes on the population health; iv) estimation of health care system availability to the given changes and its optimization.

- Endocrine diseases (ICD: E10-E14)
- 2) Climate and sensitive to climate non-communicable diseases (Arkhangelsk, Novodvinsk).
- Diseases of the circulatory system (ICD: 100-199)
- Respiratory mortality (ICD: J00-J09)
- Diseases of the genitourinary system (ICD: N00-N99)
- Endocrine diseases (ICD: E10-E14)
- Air-pollution concentrations: suspended matters, carbon monoxide, nitrogen dioxide, hydrogen sulfide, carbon bisulphide.

3) Climate change effect on tick-borne encephalitis.

Territory

The Arkhangelsk region is located in the north of the European part of Russia, is a part of the Northwest federal district. The area coast is washed by three seas: White, Barents and Karsky. The territory is 587 thousand square km (figure 1).

The population of the Arkhangelsk region is 1.3 million people, population density - 2.2 persons on 1 km², 75% live in urban areas. The region includes 229 municipal territories: 7 city districts, 19 municipal areas, 24 urban and 179 rural areas. The Arkhangelsk region is known for its forestry, fishing industry and modern shipbuilding.

There are frequent changes of the air mass leading to instability of the weather. Absence of mountain ridges makes this territory readily available for cyclones from Atlantic and streams of cold Arctic air from the northeast. The cyclones from Atlantic bring precipitations, cloudy weather, in the winter - the warming, the streams of cold Arctic air cause strong decreases in temperatures and frosts.

Aim of the project

To protect population health from negative consequences of climate change in the Northwest Russia.

Methods


Time-series analysis.

Meteorological daily data:
- maximum and minimum, average temperature
- humidity
- atmospheric pressure
- wind speed
- precipitation
- cloudiness in summer months
- ozone layer.

Working groups

1) Climate change effect on mortality in the Arkhangelsk.
- All causes (excluding external reasons)
- Diseases of the circulatory system (ICD: 100-199)
- Respiratory mortality (ICD: J00-J09)
- Diseases of the genitourinary system (ICD: N00-N99)

2) Climate and sensitive to climate non-communicable diseases (Arkhangelsk, Novodvinsk).
- Shigellosis (ICD: A03)
- Salmonellosis (ICD: A03)
- Rotaviral intestinal infections (ICD: A08)

3) Climate change effect on tick-borne encephalitis.

4) Climate change effect on communicable intestinal (water and food) diseases and helminthiasises.

5) Climate change and ozone depletion effect on cancer.
- Malignant melanoma of skin (ICD: C43)
- Basal cell carcinoma of skin (ICD: C44)
- Squamous cell carcinoma of skin (ICD: C44)

6) Climate change and its effect on the population in the Nenets Autonomous region.