Research methods, impacts and adaptation policies: A course on research methods in climate change and health

Responsible institution:
Bjerknes Centre for Climate Research and Centre for International Health, University of Bergen (UiB)

Disciplines:
Public health, climate, ecosystems, water resources, agriculture, and social sciences.

Course leader(s):
Bernt Lindtjørn (coordinator), Professor, Centre for International Health, UiB.
Asgeir Sorteberg, Senior scientist, Bjerknes Centre for Climate Research, UiB.
Helge Drange, Professor, Bjerknes Centre for Climate Research, UiB

Invited course leader:
Rainer Sauerborn, Professor, Department of Tropical Hygiene and Public Health, University of Heidelberg, Germany

Course description and Objectives:
Most researchers agree that greenhouse gas emissions may change the earth's climate, and may adversely affect human health. Global climate change may lead to extreme weather events such heat waves, and severe hurricanes, and affect human health by bringing about changes in the ecology of infectious diseases. However, we need also a broader research approach to address the social, demographic, and economic disruptions that may occur because of climate change.

We need to improve our understanding of the adverse health effects of climate change, and researchers, health practitioners and health institutions need to develop policies and carry interventions to adapt to unwanted results of climate change.

The course will explore the links between human health and the earth's environment, and consider the implications of those links for human health in a changing environment.

The central objective of the course is to help develop and strengthen local and regional scientific knowledge and capacity to deal with the impacts of climate variability and climate change on human health.

At the end of the course the participant will be able to:

- Discuss and describe the basis of climate change and its possible adverse consequences on human health.

- Understand the main research tools and methods used in climate and health research
- Understand which policies and actions that might need to take place to adapt to unwanted results of climate change

The specific objectives include:

On health:

- Understand research methods to assess health impact such as
  - epidemiological methods to evaluate health condition
  - identify methods to assess the possible climate impacts on climate-sensitive diseases
  - identify mechanisms linking environmental conditions and health
- Plan, carry out, and evaluate mitigation and adaptation policies
  - distinguish the ideas of mitigation (equivalent to primary prevention) and adaptation (equivalent to secondary prevention)
  - use mitigation and adaptation policies to derive possible alternatives
  - analyse mitigation and adaptation policies and evaluate their effectiveness

On climate

- Understand the physical mechanisms of climate variability and change on different timescales.
  - The dynamics and thermodynamics of Earth's physical system
  - The sensitivity of earth's climate.
  - Climate change and scenarios
- Understand research methods used in climate change modelling
  - Assessment of predictability, and approaches to prediction
  - Physical and statistical methods used in climate modelling
  - The use of remote-sensing methods in climate research

Apply the ideas, methods and tools within a country or region in the form of a case study (synthesis).

Content:

- Prof. Rainer Sauerborn: Evaluation and adaptation policies
- Prof. Bernt Lindtjørn: Assessing health impacts and introduction to research methods.
- Dr. Nisancioglu K. Energy balance of the Earth
- Prof. Jansen E. Climate variability and change on different timescales.
- Prof. Jansen E. The physical basis of the greenhouse science
- Prof. Drange H, Main conclusions from the 4th assessment report of Intergovernmental Panel on Climate Change
- Dr. Sorteberg A. Climate predictability
- Dr. Sorteberg A. Physical and statistical climate modelling
- Dr. Babiker. M. The use of satellite remote sensing in climate change studies
- Dr. Bader J. The drying of the Sahel

Methods:
The course is composed of lectures, group work, student presentations, and self-directed learning.

The group work will include case studies at the regional or national level that focus on specific regions of interest selected by the participants. This helps the participants' achievement of the learning objectives and shows the applicability of the ideas and methods to specific regional settings.

Because the topic of the course lies at the crossroad of several scientific disciplines, lecturers will be from various fields including geography, climatology, biodiversity, modelling, epidemiology, public health and medicine. A proper mix of knowledge-transfer methods such as lectures, films, case study, critical incidents, will be used to insure that material that is new to most participants is communicated effectively.

Each session has specific objectives and short key readings that are included in the course reader. Further readings, which are not compulsory, are suggested and made available.

Prerequisites:
Proficiency in the English language is required.

Target candidates:
The candidate should be a registered PhD student, or have completed a master in a relevant discipline.

We welcome students from any natural science, social or health science arena whose dissertations involve mixed methods, or who simply have curiosity about mixed methods approaches.

Assessment Procedures:
The course participants are expected to attend teaching sessions and take part in discussions and group work.

On the last day of the course, group results will be presented. Each group shall present a paper summarizing the work.

ECTS:
3 ECTS granted for approved course performance

Total hours: 90

- Lectures 20 hours
- Group Work 20 hours
- Independent Study 50 hours

Course Readings: