The direct and indirect effects of climate change on health and wellbeing

Climate Change and Health

- Climate change affects the social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter.
- Between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year, from malnutrition, malaria, diarrhoea and heat stress.
- The direct damage costs to health (i.e. excluding costs in health-determining sectors such as agriculture and water and sanitation), is estimated to be between US$ 2-4 billion/year by 2030.
- Areas with weak health infrastructure – mostly in developing countries – will be the least able to cope without assistance to prepare and respond.
- Reducing emissions of greenhouse gases through better transport, food and energy-use choices can result in improved health, particularly through reduced air pollution.

Source: WHO
Climate change impacts on human health and adaptation mechanism

Chief Scientist: Qiyong LIU

National Basic Research Program of China (973 Program) 2012CB955500
Top design

Climate
Population
Diseases
Environment
Geography

Basic research

Retrospective studies
Prospective studies
Projecting studies

Functions and demands of MOH

Large-scale analysis
Small-scale analysis

Data Technology Modeling

Mechanism Identifying characteristics

Adaptation strategies
Database Sharing platform

Applied research
Project 1: Climate (mean) change impacts on human health

Project 2: Extreme weather events impacts on population health

Project 3: Identification of vulnerable population & risk regions

Project 4: Response and adaptation to climate-sensitive diseases in different regions

The four projects
Research issues and locations

- **Heat wave**: Jiangsu (Nanjing), Guangdong (Shenzhen), Heilongjiang (Harbin), Shandong, Tibet, Heilongjiang (Harbin), Shandong, Zhejiang (Hangzhou), Anhui, Hubei, Hunan, and Chongqing

- **Cold snap**: Jiangsu (Nanjing), Guangdong (Shenzhen), Heilongjiang (Harbin), Shandong, Hunan, Anhui

- **Flood**: Anhui, Guangxi, Hunan, Liaoning, Sichuan, Zhejiang, Gansu

- **Cyclone**: Guangzhou, Ningde, Wenzhou, Hainan, Shandong, Liaoning, Jiangsu

- **Drought**: Hunan, Hebei, Jilin, Yunnan, Qinghai

- **Sand storm**: Gansu, Inner Mongolia, Ningxia

- **Dengue**: Guangdong, Zhejiang, Shandong

- **Hand-foot-mouth disease**: Anhui, norovirus, hepatitis A, influenza, malaria

- **Blue**: since 2012

- **Red**: since 2014
Five Highlights

- Screening for and detecting climate sensitive diseases
- Climate change impact on dengue and adaptive mechanism
- Climate change impact on bird migration and outbreak risk of H5N1 flu
- The impact of heat wave/high temperature on health and adaptive mechanism
- A new model–Single Point Area Estimation Model (SPA)
Shandong University
Climate Change and Health Center (SUCH)
• Based on Shandong University School of Public Health;
• Established in September 2010;
• The inaugural Director: Professor Qiyong Liu at the China CDC, the IPCC AR5 lead author on human health, the chief scientist for climate change and human health.
• Missions
  – Collaboration for capacity building to conduct research on the association between climate change and health;
  – Strengthening scientific communication with international experts and promoting technology & information sharing;
  – Integrating research and education for the training of interdisciplinary professionals.
Research in the Shandong University

• Project 1: Impact of climate change on infectious and chronic non-communicable diseases
• Project 2: Impact of extreme weather events on human health (flood, typhoon, drought)
• Project 3: Identification of vulnerable population and risk regions
• Project 4: Response and adaptation to climate-sensitive diseases in different regions
Publications


- Bai L, Morton LC, Liu Q. Climate change and mosquito-borne diseases in China: a review. *Global Health* 2013, 9:10

Publications


Publications


Publications


Collaborators

• Extramural
  – China CDC
  – Shandong Provincial CDC
  – China Meteorological Administration
  – Shandong Provincial Meteorological Bureau
  – Griffith University, Australia
  – University of Auckland, New Zealand
  – The University of Adelaide, Australia
  – The University of Sydney, Australia
  – Ohio State University, USA
  – Karolinska Institutet, Sweden
Collaboration with Australia

• Building Community Resilience to Climate Change: Australia-China Science and Research Fund Group Mission (2012)
• Memorandum of Understanding w/ Griffith University Centre for Environment and Population Health (2012)
• Visiting University of Sydney, University of Adelaide (2013)
• Regional Workshop & International Symposium on Climate Change and Health
• Shandong University Forum on Climate Change and Health (2011, 2014)
Research Gaps in China

- Mechanism of climate change and health
- Knowledge and awareness
- Resilience and adaptation
- Involvement of health sectors
  - Policy study
  - Climate resilient health systems
Research Priorities in Climate Change and health

• Enhance resilience and protect health from climate change.
• Identify the health benefits associated with reducing greenhouse gas emissions and other climate pollutants.
• Develop health-promoting climate change policies.
Potential areas of cooperation between China and Australia

- Collaborative research;
- Mutual assistance in the preparation and conduct of seminars, conferences and workshops;
- Mutual development and strengthening of international partnerships. For example, cooperation in training projects, professional short courses, exchange of staff, and other educational activities and study tours.

» Memorandum of Understanding between SUCH and CEPH at Griffith University
Potential areas of cooperation between China and Australia

- Exchange of publication materials or other information as appropriate;
- Possible partnership for longer term and a variety of capacity building programs, including degree courses such as joint Master and PhD programs and post-doctoral fellowship program.

» Memorandum of Understanding between SUCH and CEPH at Griffith University
United Nations Climate Change Conference
Paris, France
30 November – 11 December 2015

Registration!
December 4, Hôpital Européen Georges-Pompidou, Paris

Let's put health at the heart of the Paris climate agreement

Sign the call to action
“Tackling climate change could be the greatest global health opportunity of the 21st century.”

Acknowledgement

- **Prof. Qiyong Liu, Director, SUCH**
  **Chief scientist, National Basic Research Program of China**
  **Chinese Center for Disease Control and Prevention**
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THANK YOU!