



Collaborating Centre for Oxford University and CUHK  
for Disaster and Medical Humanitarian Response  
CCOUC 災害與人道救援研究所

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# Heat Action and Innovation in Hong Kong

1<sup>st</sup> Global Forum for Heat and Health, Hong Kong SAR

**Ms. Gloria Chan**

Deputy Director

Collaborating Centre for Oxford University and CUHK  
for Disaster and Medical Humanitarian Response (CCOUC),  
The Chinese University of Hong Kong





# HONG KONG

Hong Kong's unique urban planning and as a subtropical city (such as urban heat island with 40+ storeys high buildings) means findings from other major cities may not be applicable to Hong Kong

Issues	Situation
Globalization	Annually, HK has <b>10</b> times as much transient migrants than local population
Income inequality	The <b>highest income inequality</b> in developed regions
Environmental stress	One of the <b>highest population density</b>
Urbanization	<b>98%</b> of the city is urbanized
Emergency risk	Experiences with <b>global public health crisis</b> such as SARS(2003), H7N9 (2012)
Impact of climate change	The <b>highest increase</b> in average urban temperature in the past century



## Hong Kong: Very Hot Weather Warning (VHWW)

- Since 2000, The Hong Kong Observatory (HKO) established very hot weather warning system (VHWW)
  - A weather-based warning and factors accounted includes: temperature, humidity, solar radiation, and wind speed
- Research collaboration with HKO created a new impact based warning system **additionally accounts for excess hospitalization ratio**. Adopted since 2014



In 2016 alone, 38 of such warnings were issued, the most of any year even accounting for retrospective temperature recordings



# Suggested Health Actions during VHWW



## By HKO

- Government departments e.g. Home Affairs may open **temporary shelters**
- Ensure **ventilation** in indoor areas
- Check and pay attention to **vulnerable populations**
- If warning persists, observatory will repeat special announcement to public
- Warnings are **broadcasted over radio and television**

## By Centre for Health Protection

- Public should carry and **drink plenty of water**
- Engaged in strenuous outdoor activities should **avoid caffeinated and alcoholic beverages**
- Wear **loose and light-coloured clothing**
- Perform outdoor activities in the morning or late afternoon
- Open all windows; **use a fan or air-con for indoor activities**



## Co-benefits of Climate and Health

- ‘Hong Kong People’s Carbon-reduction Behaviours and Health’
  - Large-scale telephone survey
  - Representational sample from 18 districts in Hong Kong
- To understand the awareness and practice of:
  - Reduce electricity consumption?
  - Use less packaging and plastic bags?
  - Use less air-conditioners or heaters?
  - Walk or cycle? Do more exercise?
  - Eating less meat?



# Temperature Health Impact in Hong Kong

## Hot Season

## Cold Season

Mortality ↑ by 1.8% for every  
increase of 1°C above 28.2 °C

Cumulative mortality\* ↑ by 3.8%  
for every decrease of 1°C

Hospital admissions ↑ by 4.5%  
for every increase of 1°C above 29 °C

Hospital admissions ↑ by 1.4% for every  
decrease of 1°C within the 8.2-26.9°C  
range

Health-related calls ↑ when max. temp.  
reaches 30-32 °C. About 49% of calls  
were for explicit health-related reasons

Help-seeking  
e.g. Clinic attendance

12.7% Required medical help  
82% Professional medical help  
18% Self-care only

2% Required medical care  
95% Professional Medical Health  
(Western 70.0%/Chinese 25.0%)  
5% Self-Care only

Mild symptoms and  
Discomfort

66.9% Have symptoms

1.9 % Heatstroke

88.4% reported changes

Behavioral changes<sup>#</sup>

67.1% reported changes

\* Cumulative mortality is used because the lagged effect of coldness towards mortality is estimated to be 3 weeks.

# Behavioral changes include *amount of physical activity, appetite, frequency of social activity, mood and sleeping quality*





# Between Extremes: Threatening Heat and Cold Health Series





# Hong Kong's Weather Acquisition Study



- Television was the most widely used channel but most people would prefer smartphone apps
- Radio user consistent
- Smartphone ownership was **inversely** related to age
  - May become the dominant source of information in the near future due to the high usage rate, especially among young people
  - Issue with technology literacy
  - HKO has a weather information app





# Hong Kong's Climate Action Plan 2030+



- Focus on existing buildings and public infrastructure energy and carbon efficiency
- Mandatory Energy Efficiency labelling Scheme to choose more energy efficient electrical products
- District cooling system - energy-efficient air conditioning at the Kai Tak Development buildings
- Carbon Audits for government buildings and public facilities
- Promote electric vehicles

# Heat Focused Action of Health and Climate Change Adaptation in China

**National Institute of Environmental Health,  
Chinese Center for Disease Control and Prevention**

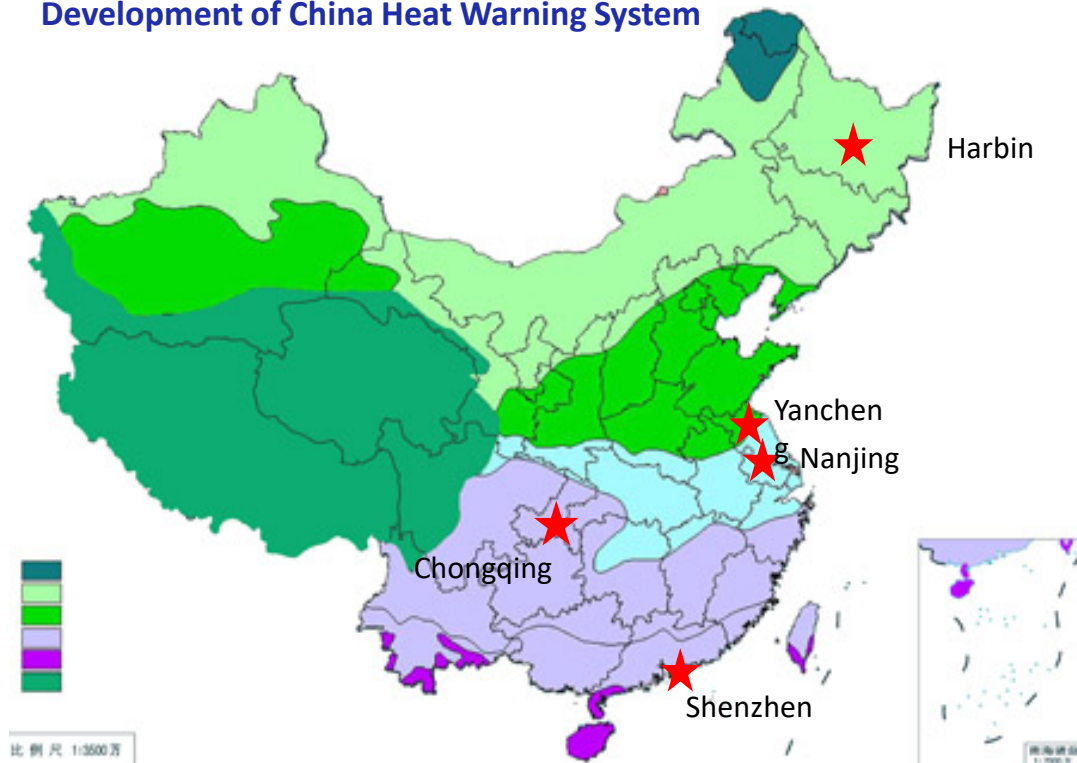


中国疾病预防控制中心环境与健康相关产品安全所  
NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH, CHINA CDC



# GEF/UNDP/WHO global pilot project on Adaptation to Climate Change to Protect Human Health:(2010-2014)

## Development of China Heat Warning System





## 高温热浪与健康风险早期预警系统 Heat-wave and Health Risks Early Warning System



预警监控



系统管理



安全退出

### 预警与监控

- 试点城市导航
- 城市基础数据录入
- 健康风险预测**
- 多级响应措施
- 数据查询
- 统计分析
- 网站操作手册
- 信息交流
- 健康教育
- 公告栏
- 相关网站链接
- 用户密码修改

### 健康风险预测

Today

Tomorrow

The day after tomorrow

城市: 南京采集点1

今天 (2013-8-1)

明天 (2013-8-2)

后天 (2013-8-3)

Health risks prediction

总健康风险 : 4 级

心脑血管疾病发病风险 : 4 级

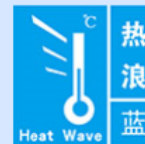
呼吸系统疾病发病风险 : 4 级

儿童呼吸道疾病发病风险 : 4 级

中暑风险 : 4 级

响应等级 : 4 级

Warning sign



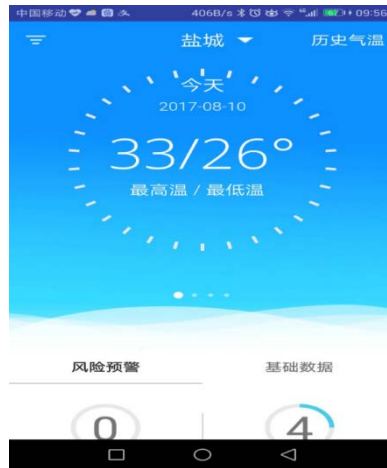
Response level

# Communication of health risk information

- Advisories and information on health risks, jointly issued by health sector and meteorological bureau
- Delivered to the community health service centres and community residents through fixed electronic display screens in the community, mobile APP, website, etc.



Electronic display screen



Mobile APP



Website





# Health education and promotion



EWS training in health sector



Drawing contest of pupils



Lecture in community



Drill of heatstroke first aid at bus station



# New research: Scientific investigation on regional climate-sensitive diseases in China

- Funded by the Ministry of Science and Technology of China (grant number 2017FY101200) RMB 26.08 Million
- Execution time: 2017 –2021
- 11 geo-meteorological regions in whole China
- 1 community and 1 county per region



## Objectives

- Establish scientific investigation bases and collect related basic data;
- Develop prediction and early warning models and develop intervention strategies ;
- Carry out health risk early warning and intervention services;
- Set up an integrated data and information platform.



# Sensitive diseases include:

- **CVD** : Ischemic heart disease, myocardial infarction, stroke
- **Respiratory** : COPD, asthma(children)
- **Urinary system** : acute renal failure
- **Heatstroke**

**Chronic diseases**  
( 7 )

**Commun. disease**  
( 6 )

25

**Injury & mental**  
( 6 )

**Parasite disease**  
( 6 )

- **Injury**: traffic injury, drowning, dog bite
- **Mental diseases**: suicide, depression, posttraumatic stress disorder ( female )

- **Vector-borne disease** : dengue, epidemic hemorrhagic fever
- **Food-borne disease** : hand-foot-and mouth disease,

bacterial dysentery

**Air-borne disease:**

influenza, pulmonary tuberculosis (TB)

- **Mosquito-borne-d**: malaria;
- **Snails-borne-d**: schistosomiasis, angiostrongyliasis
- **Tick/sandfly-borne d**: theileriasis, kala-azar (black fever)







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# Thank you!

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