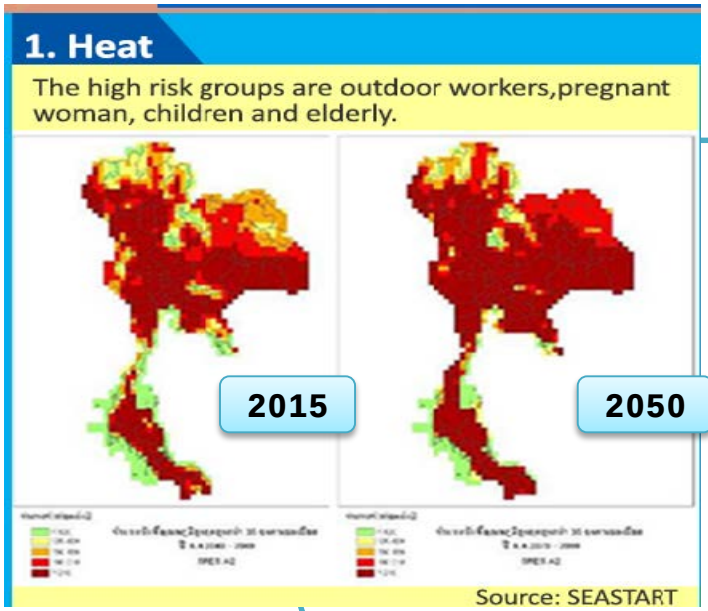

Association between temperature and health outcomes of population in Thailand

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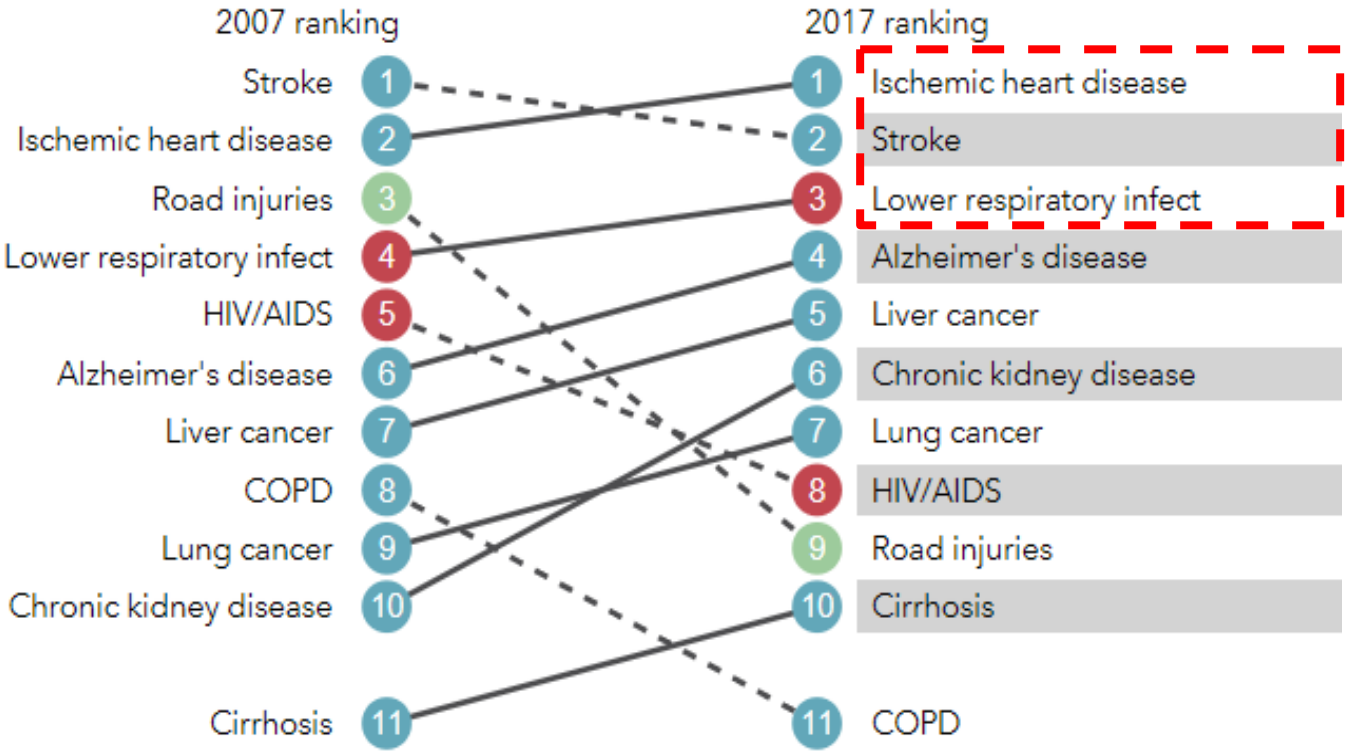
What causes the most death in Thailand?

Top 10 causes of death in 2017



Diseases of the circulatory system (I00-I99)

Diseases of the respiratory system (J00-J99)

http://www.healthdata.org/thailand

BACKGROUND AND OBJECTIVES

Objective:

To identify the temp effect on mortality in Thailand

Specific objectives:

1) To identify specific causes of deaths associated with temp

2) To indicate populations at risk in terms of age, region and seasonality

Cardio-circulatory diseases (I00-I99)

(Guo et al., 2012; Pudpong & Hajat, 2011)

Respiratory diseases (J00-J99)

(Bunker et al., 2016; Yu et al., 2012)

METHODS

Daily Mortality &

Weather (Mean temp, RH) &

Air quality (O_3,PM_{10})

- Data available in 20 provinces
- 1 Jan 2009 – 31 Dec 2015 (7 yrs)
- Total 242,963 deaths classified

Cardio-circulatory diseases (I00-I99): 142,534 deaths

Respiratory diseases (J00-J99): 100,159 deaths

Association analysis (STATA version 13)

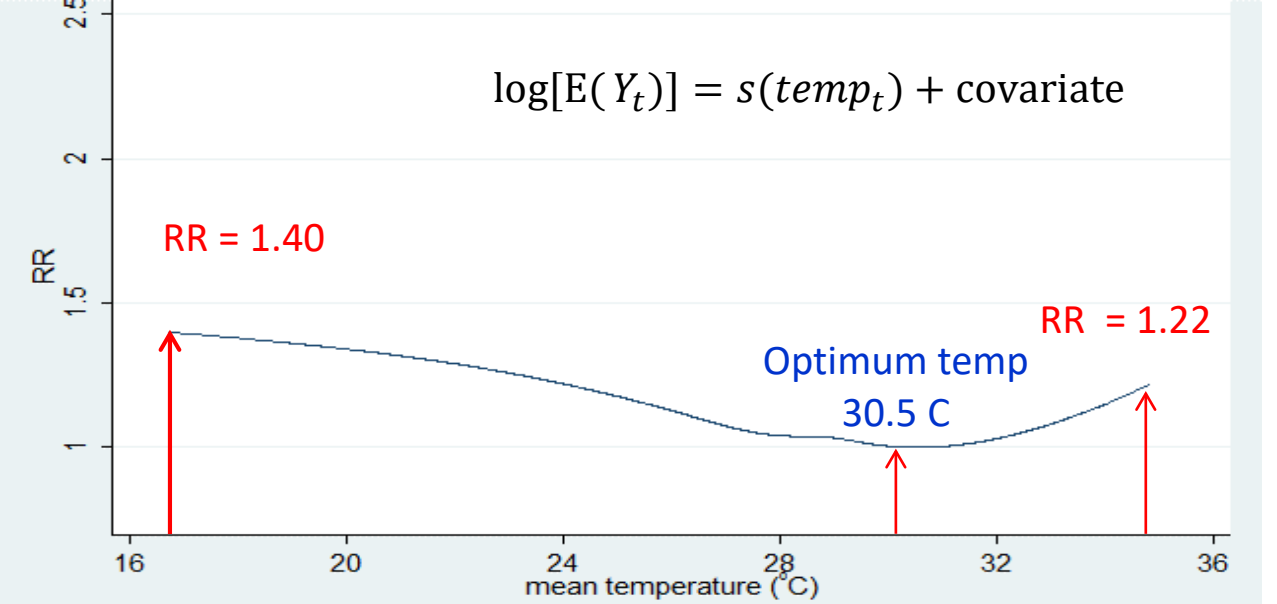
- Linked with Mean temperature at lag 0-13
- Time series using Poisson regression models
- The results are presented by relative risks (RR) of mortality associated with changes in temp for both diseases and stratified by…

By age groups	By region	By season
• Cardio-circulatory disease for 0-59 and ≥ 60 yrs, • Respiratory disease for 0-14, 15-59 and ≥ 60 yrs	• Middle • Northeast • North • South	• Winter (Sep-Feb) • Summer (Mar-Jun) • Rainy (Jul-Aug)

RESULTS

Main findings

Identifying the temp effect on mortality in Thailand



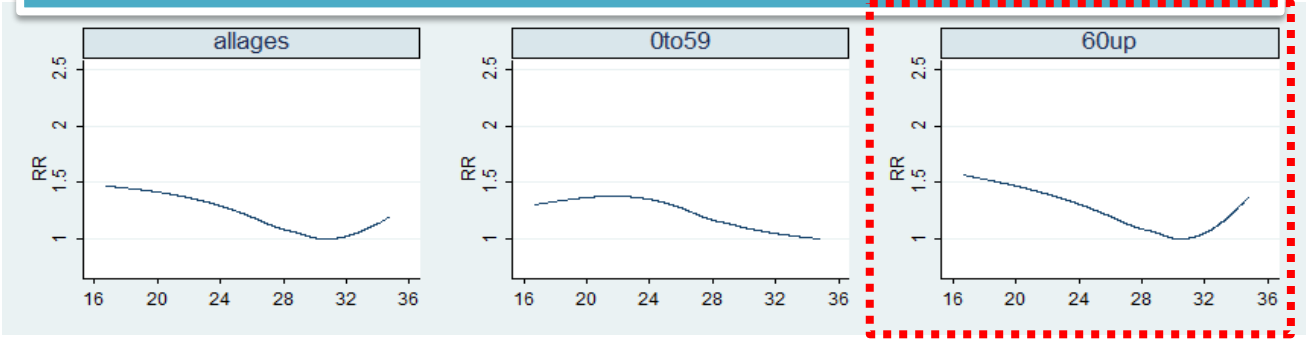
- There was a significant relationship between mortality for two diseases and temp in Thailand.
- The pattern of the relationship was inverse J-shape (non-linear relationship)
  - RR of 1.40 at the lowest daily mean temp (16.7 C)
  - RR 0f 1.22 at the highest daily mean temp (34.8 C)
- Minimal impact on mortality at 30.5 C = "Optimum temperature"

RESULTS (cont.)

Specific findings

Indicating pop at risk in terms of age

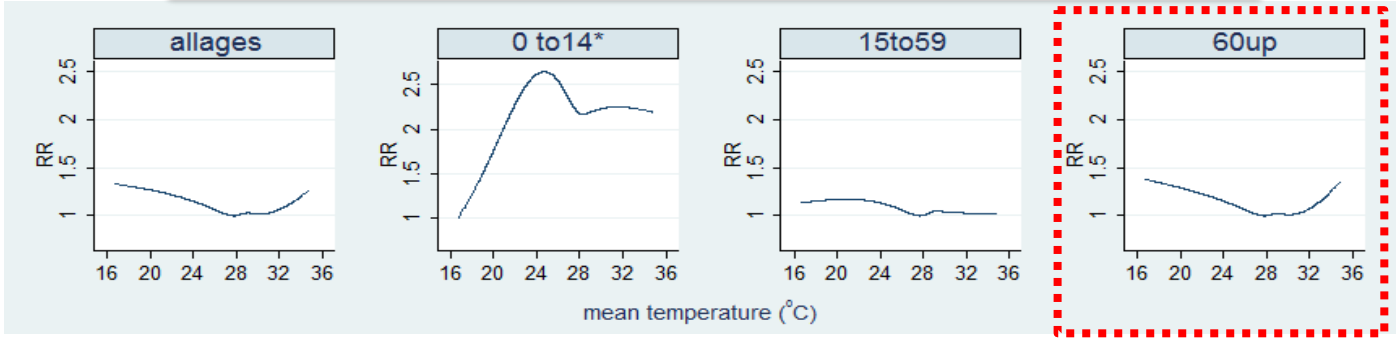
RR of cardio-circulatory deaths by age groups



Stratified by age groups

Age gr ≥ 60 yrs was at the highest risk for both diseases

RR of respiratory deaths by age groups



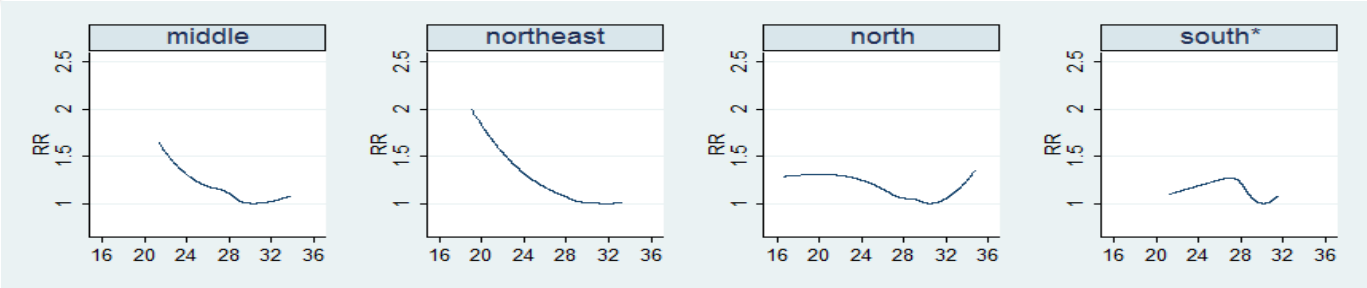
RESULTS (cont.)

Specific findings

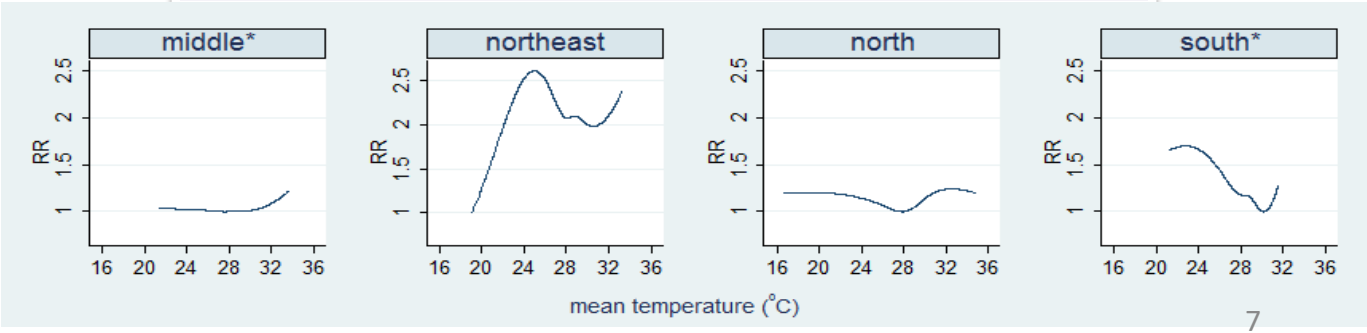
Indicating pop at risk in terms of region

- Associations were different by region.
- The N and NE were at the highest risk with regard to temp changes.

RR of cardio-circulatory deaths by regions



RR of respiratory deaths by regions



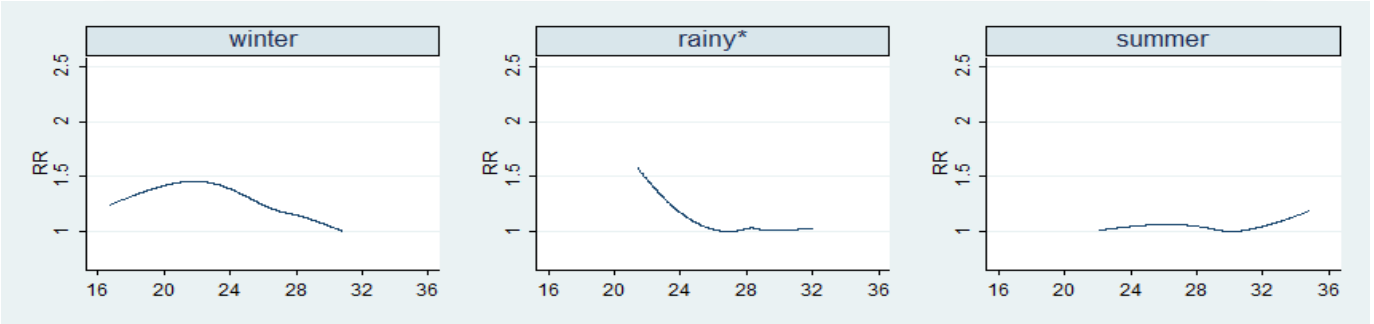
RESULTS (cont.)

Specific findings

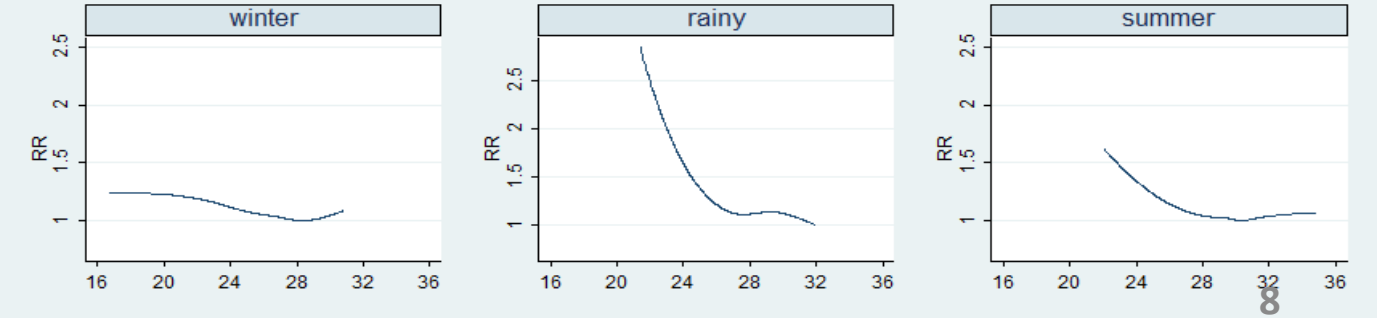
Indicating pop at risk in terms of seasons

- In winter, RR at low temp were greater than other seasons.
- In summer, temp reached 30 C, RR increased with higher temp.

RR of cardio-circulatory deaths by seasons



RR of respiratory deaths by seasons



Assessment

Conclusions

- There was an association between temp and mortality for cardio-circulatory and respiratory systems in Thailand
- The association was found at high risk especially in pop at age ≥ 60 yrs, in North and Northeast regions, and during winter and summer

Recommendations

Advocacy

- Health impacts from temperature are preventable and need to increase policy & public awareness for better prevention.

Recommendations

Intervention

To prevent more health impacts in future climate, Heat-health warning system are needed

Management

Collaboration with health & non-health sectors and active community for action

Discussion

Implication of this study

- Used as baseline for monitoring long-term impacts of temp on health and for future projections of changes in CC-related mortality.
- Monitoring an achievement of goals set in "Thailand's Adaptation Plan on Climate Change and Health 2018-2030"

Limitations & Future studies

Due to limitations of daily data and aggregated analysis at country level,

- Assess health impacts related to temp by using morbidity data.
- Conduct a similar assessment at provincial and city levels.
- Explore association between temp and other potential health outcomes such as renal diseases, NCD, pregnant outcomes

Goal 3. Ensure healthy lives and promote well-being for all at all ages

Goal 13. Take urgent action to combat climate change and its impacts

Thank you

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