Climate Change

& Respiratory allergy diseases

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Selective mutism
Outline

- Current situation of world, Thailand climate
- Effect to respiratory allergy diseases
- Prevention strategies
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World climate situation

Temperature rising
0.98 ±0.12°C after 1900

4th year hottest than ever

The earth got a FEVER
World climate situation

Artic glacier ice loss 27%

Sea-level rising 7.8 cm in 25 year period

WMO statement 2018
Thailand climate situation 2017

Highest 42.2 °C

Temperature rising 0.4 °C

New high of Bangkok temperature 38.2 °C

Rainfall increasing 27%
Feel Disaster
Feel Disaster

Mangkhut typhoon, Asia
241 km/h, 62 died

Europe heat wave, Spain
47°C, 2 died

Polar vortex, USA, -53°C, 21 died
Greenhouse effect

- N
- O₂
- CO₂
- Ar
- CH₄
- O₃
- N₂O
- CO₂
- PFC
- HFC
- SF₆
Source of GHG

- Fluorinated Gases: 3%
- Nitrous Oxide ($N_2O$): 6%
- Methane ($CH_4$): 10%
- Carbon Dioxide ($CO_2$): 82%

Total U.S. Greenhouse Gas Emissions by Economic Sector in 2016:
- Transportation: 28%
- Electricity generation: 28%
- Industry: 22%
- Agriculture: 9%
- Commercial: 6%
- Residential: 5%
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Prevalence: **ISAAC 2006**
Respiratory allergens: Pollen

- Duration of pollen season
- Amount of pollen
- Allergenicity of pollen
- Change distribution

WAO, world allergy week 2016
Respiratory allergens: *Pollen*

**Urban vs Rural**

Earlier 4 days

Biomass > 189%

**CO2 > 30%**

**Temp. > 2°C**

Respiratory allergens

Temperature difference $+3.7^\circ C$

Unknown pollen $+4x$

Synergy between air pollution and temperature

Air pollution (Ozone, PM)

Temperature
Global warming

Green house effect
Respiratory allergens: **Pollen**

Cytoplasmic granules: 3 micrometers

- **Phleum pratense** pollen: 35 micrometers
- 50 ppm of $\text{N}_2\text{O}$
- 0.7 ppm of $\text{O}_3$

*M Birch pollen form high ozone*


Respiratory allergens: *Fungus*

- FEV1 240 ml (mold odor)
- Allergic rhinitis OR 1.5-2, Asthma OR 1.7-1.9
- Exacerbation 40% (seen)
- Length, amount of spore

Thunderstorm asthma: Eighth person dies after Melbourne freak weather event

An eighth person has died following last week’s freak thunderstorm asthma event in Melbourne, health authorities have said.

One person remains in a critical condition in intensive care, the Victorian Department of Health and Human Services said.

Last week hospitals were overwhelmed when after a cool change and storm caused respiratory problems for thousands of people, with more than 8,500 attending emergency departments.

"This was a tragic and unforeseen event and hospitals are continuing to treat seven people for a variety of respiratory and other related conditions," the department said in a statement.

Suddenly temperature drop 12 degree Celsius,

3365 (672%) excess respiratory-related presentations to ER

476 (992%) excess asthma-related admissions to hospital

10 died (6 were Asian)

Only 28% had current doctor-diagnosed asthma

Indian, Sri Lankan, south-east Asian birth (p < 0.001)
Thunderstorms asthma
Respiratory allergy diseases

- Prevalence
- Respiratory allergens
- Thunderstorms asthma
Outline

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Prevention strategies

- Non fossil energy
- Energy smart use
- Public transport
- Recycle
- Less meat
Prevention strategies

- No destroy the wood
- Paperless
- Encourage planted

Increase absorption of GHG
Tipping point

2°C
We were reach **1.5 °C** within **2030 - 2052** (high confident)
For limit 1.5 °C → decline CO₂ emission by 45% in 2030 and ZERO in 2050.