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OUR HEALTH & ENVIRONMENT

Is loss of visibility damaging health in Hong Kong?

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Five important questions on environmental health

1. What has been happening to visibility in Hong Kong in recent years?
2. What is the most likely cause of loss of visibility?
3. Why should we care about loss of visibility?
- 4. Is loss of visibility an indicator of serious community health problems?*
- 5. What are the solutions to our loss of visibility and our need for environmental health protection?*

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What you see is what you breathe

From Tsim Sha Tsui to Victoria Harbour

Better visibility



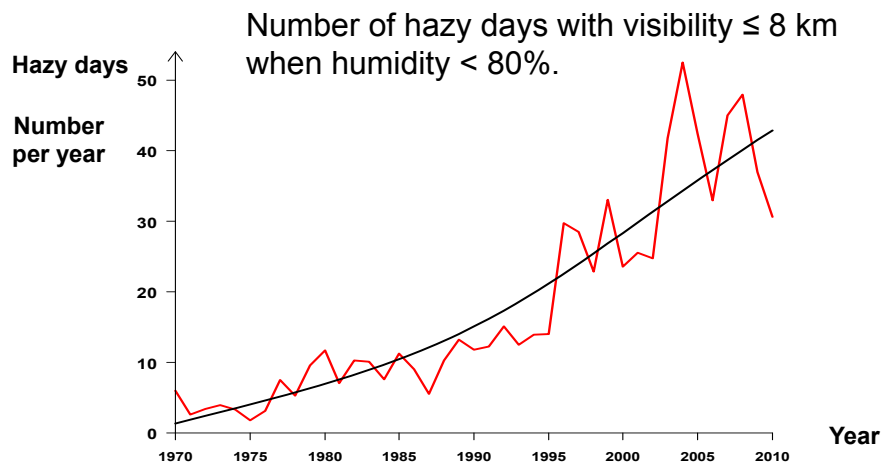
Poor visibility



Source: Ed Stokes. Hong Kong Conservation Photography Foundation

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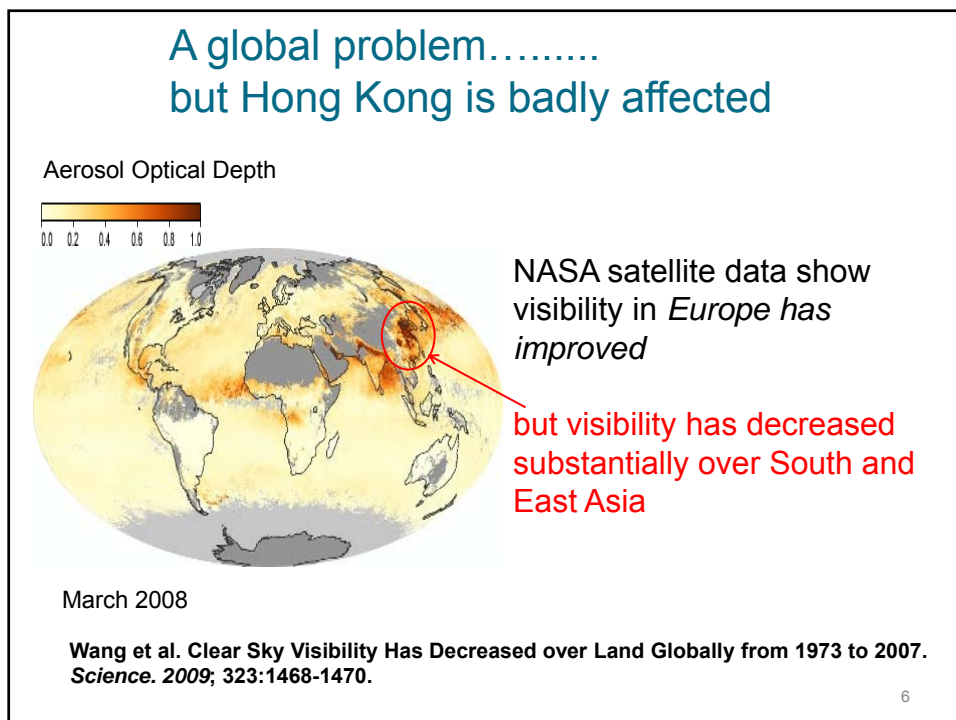
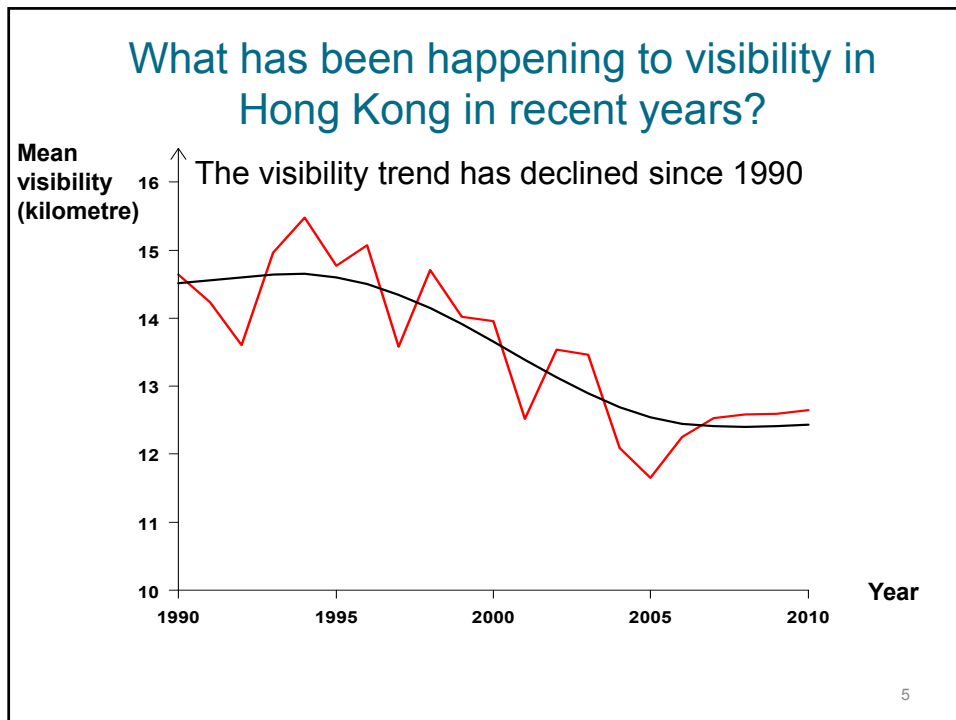
What has been happening to visibility in Hong Kong in recent years?



Are we looking at the emergence of a long term epidemic?

Source: Hong Kong Observatory

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Why should we care about loss of visibility?

Health outcomes

Mortality?
Hospital Admissions?
Healthcare costs?
Psychological impacts?



Quality of life?

Loss of productivity

Work and school absenteeism
caused by illness?



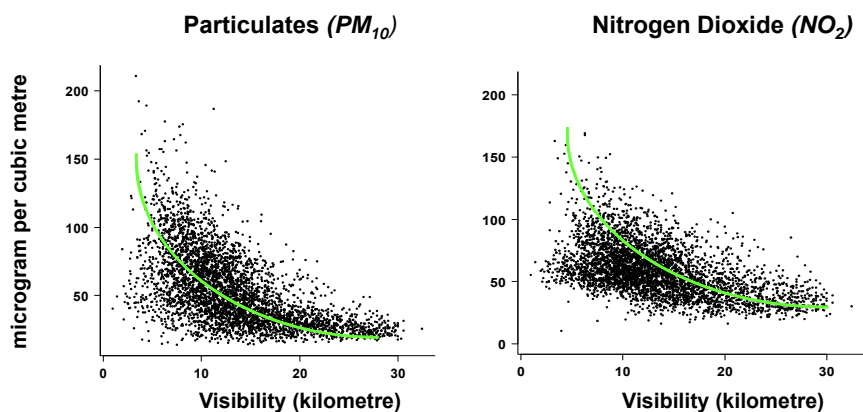
Business and investment

Tourism – unattractive destination
Brand value of Hong Kong



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What is the most likely cause of loss of visibility?



- Visibility is strongly negatively correlated with air pollution especially *Particulates (PM_{10})* and *Nitrogen Dioxide (NO_2)*
- The higher the pollutant concentrations the lower the visibility.
- *PM_{10} and NO_2 are strong signatures of traffic pollution*

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Is loss of visibility an indicator of serious community health problems? A new analysis



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Daily visibility and mortality: Assessment of health benefits from improved visibility in Hong Kong

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How do we assess the association between daily visibility and daily mortality?

First we count the daily number of deaths (1996-2006): All ages and 65+ years old (N=360,000)

- All natural causes

Cardiovascular disease

Respiratory disease

- Accidental causes

死因 CAUSE OF DEATH 申報人應閱第 II 及 III 部。 (The informant should read Parts II and III.)		發作與死亡之間的大約相庭時間 Approximate interval between onset and death
I 直接引致死亡的疾病或情況 <i>Disease or condition directly leading to death.</i>	(a) <u>Immediate cause of death</u> 由於(或起因為) due to (or as a consequence of)
先前原因 導致上述原因的病理學情況(如有的話), 說明最後的潛在情況。 <i>Antecedent causes</i> Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last.	(b) <u>Intervening cause of death</u> 由於(或起因為) due to (or as a consequence of)
	(c) <u>Underlying cause of death</u>
II 造成死亡的其他主要情況, 但與引致死亡的疾病或情況無關者。 <i>Other significant conditions contributing to the death, but not related to the disease or condition causing it.</i>	<u>Contributing conditions</u>

What are all the factors which could affect daily mortality?

Temperature (°C) _____



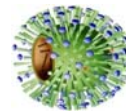
Humidity (%) _____



Days of the week _____



Influenza epidemics _____



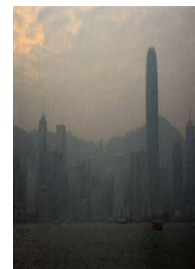
SARS epidemic _____



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What are the factors which could affect daily mortality?

Visibility



Visibility is measured at the Hong Kong Observatory and recorded every hour as the visual range in kilometers by trained observers.

(We have a total of 4,018 days)

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How far can we see on a clear day?

Average visibility = 12.6km



Loss of visibility = 30km - 12.6km = 17.4km

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Statistical Modeling – Poisson Regression

Input

- Daily visibility (km)
- +
- Temperature (Celsius)
- +
- Humidity (%)
- +
- Days of the week
- +
- Influenza epidemics
- +
- SARS epidemic

Analysis

Daily death counts



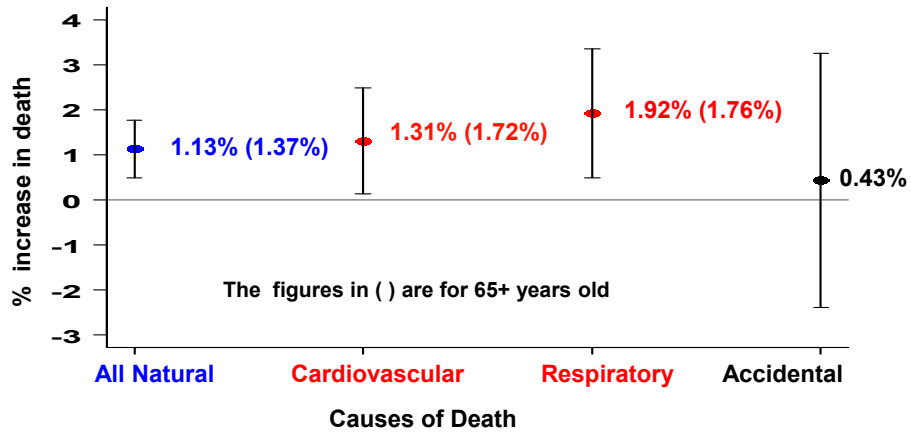
Output

% increase in death per 1km decrease in visibility

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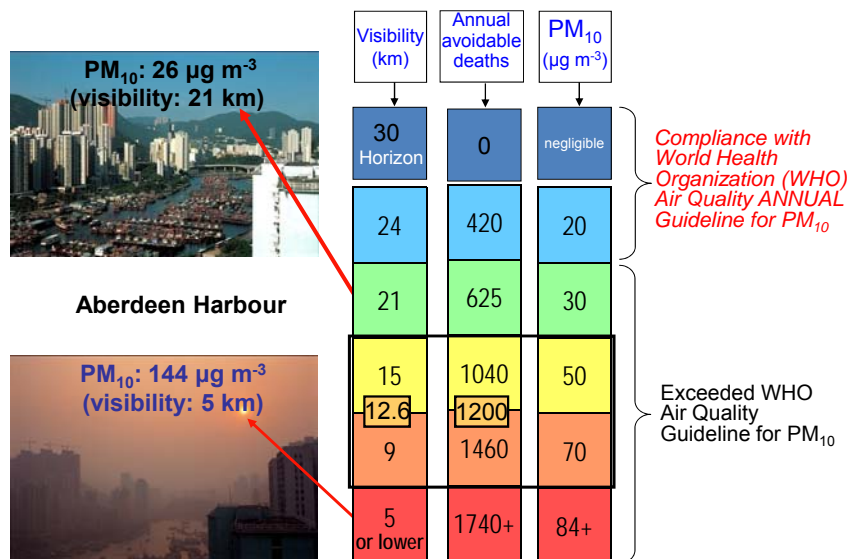
What are the findings?

- The average day-to-day variation in visibility is 6.5km
- For each 6.5km loss of visibility there is a 1.13% increase in all natural causes of death



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What is the annual mortality impact of visibility loss?

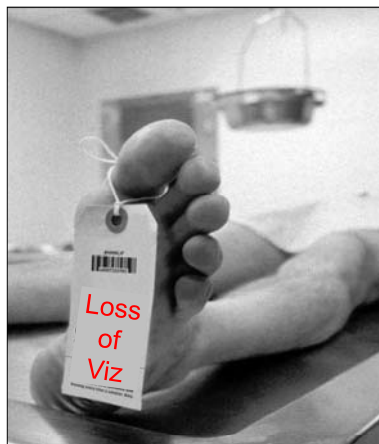


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In a silent epidemic ...

Risk estimates for air pollution and health are based on:

- illness in whole communities (epidemiology)
- sick individuals needing care (health services and costs)
- causes of death (pathological sciences)
- *environmental analysis* (exposure and bad health outcomes)



Body tags in the mortuary do not carry the label "Killed By Air Pollutants"

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Conclusions on visibility and mortality

Every kilometre reduction in visibility increases our mortality risks

How far we can see means how likely we are to die

1. Visibility measures provide an important tool for environmental health impact assessment in Hong Kong
2. Our findings can:
 - support the development of public understanding about environmental health risks
 - inform policy makers, the general public and the media about the harm caused by loss of visibility to health, productivity and quality of life
3. Our analysis has clear implications for public health policy and provides a basis for immediate action to protect the health of all Hong Kong citizens

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What are the solutions to our loss of visibility?

1. The newly proposed Hong Kong Air Quality Objectives by the government are weak and will not provide the necessary health protection for the Hong Kong population.
2. The WHO Air Quality Guidelines should be adopted as the basis for air quality management and must be recognized as minimum safety levels.

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The Standard

Putrid air 'killing us slowly'

January 31, 2004



Polluted air pushes people into doctors' clinics, hospitals and funeral parlours

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