



Travel Guard® Health Advisory

Haze: Protecting Yourself

Impact, Implications and Measures

Air pollution is a growing global concern as it can cause adverse effects on both humans and the environment. Globally, 3.7 million deaths were attributable to ambient air pollution in 2012 according to the World Health Organisation (WHO)¹. Air pollution is the degradation of air quality, which occurs when harmful pollutants are present in the air in large quantity.

Haze is a severe condition of air degradation, in which air is filled with high amounts of dust, smoke and other harmful pollutants. Also known as smog, it is primarily caused by forest burning (organic materials), coupled with relatively dry weather that does not allow pollutants to disperse, which can negatively impact one's health.

The Southeast Asian haze mainly affecting Brunei, Indonesia, Malaysia, Singapore and southern Thailand is one such pollution. A yearly phenomenon, the air pollution crisis began in the middle of August 2015 and worsened in September and October 2015.

Expected to remain until November 2015, the Southeast Asian haze is caused by forest fires resulting from illegal slash-and-burn practices, principally in the Indonesian islands of Sumatra and Kalimantan. It has been particularly severe this year due to the El Niño phenomenon, which has caused drier conditions, allowing the fires to spread more easily.



Measuring Air Quality and Haze

There are various indices being used by different countries and regions to measure and indicate air quality.

Air Pollutant Index (API)

In Malaysia and Indonesia for example, the index used to determine the quality of the air is the Air Pollutant Index (API). API is calculated from several sets of air pollution data.²

API measures the concentration of five types of pollutants in the air, i.e.

- Sulphur dioxide (SO₂)
- Particulate matter (PM₁₀)
- Nitrogen dioxide (NO₂)
- Carbon monoxide (CO)
- Ozone (O₃)

As shown in Figure 1, API reading correlates with the severity of air degradation.

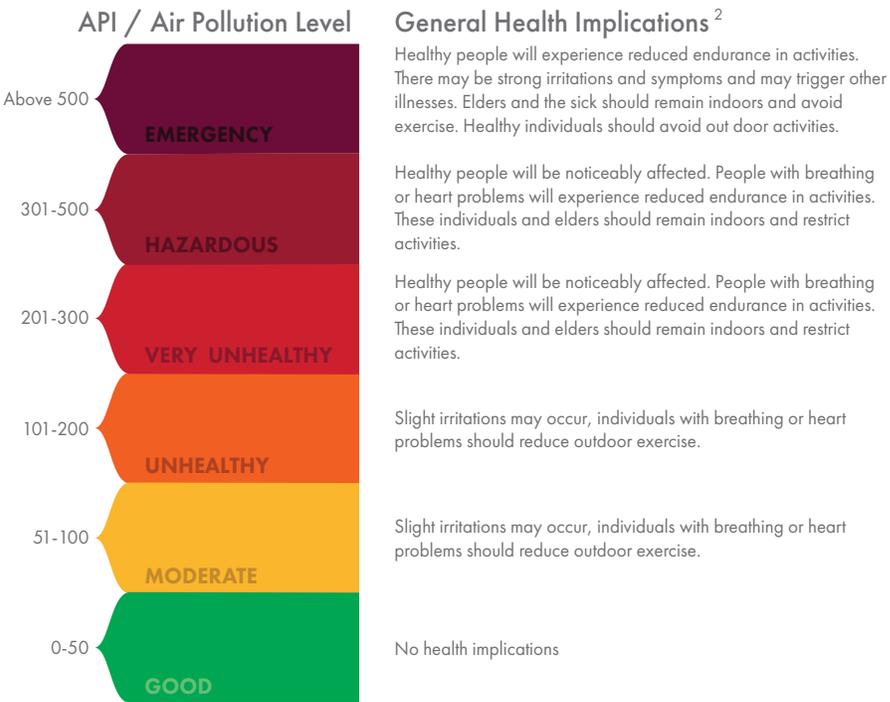


Figure 1

Pollutant Standards Index (PSI)

Singapore and Brunei on the other hand use the Pollutant Standards Index (PSI). Unlike the API, the PSI measures six air pollutants; namely sulphur dioxide (SO₂), particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), nitrogen dioxide (NO₂), carbon monoxide (CO) and ozone (O₃).³

The PSI reading, which also correlates with the severity of air degradation like API, is determined by the pollutant with the most significant concentration. During haze episodes, fine particulate matter (PM_{2.5}) is the most significant pollutant.

Note: Figure 2 reflects the guidelines used in Singapore and may differ from other countries that use PSI to measure air quality.



Figure 2

Air Quality Index (AQI)

For example, Thailand uses the Air Quality Index (AQI), which is divided into six categories of increasing levels of health concerns.⁴

Like the API, the AQI is also based on five same categories of pollutants as shown in Figure 3.

Particulate Matter (PM)

Of all the pollutants, particulate matter (PM) affects people and their health the most. Particles are identified according to size (diameter) and penetration. Particulate matter (PM₁₀) refers to coarse particles that can irritate eyes and upper respiratory tract. Fine particulate matter (PM_{2.5}) refers to particles that are more dangerous, small enough to reach deep into lungs, and interfere with gas exchange and enter the blood stream.

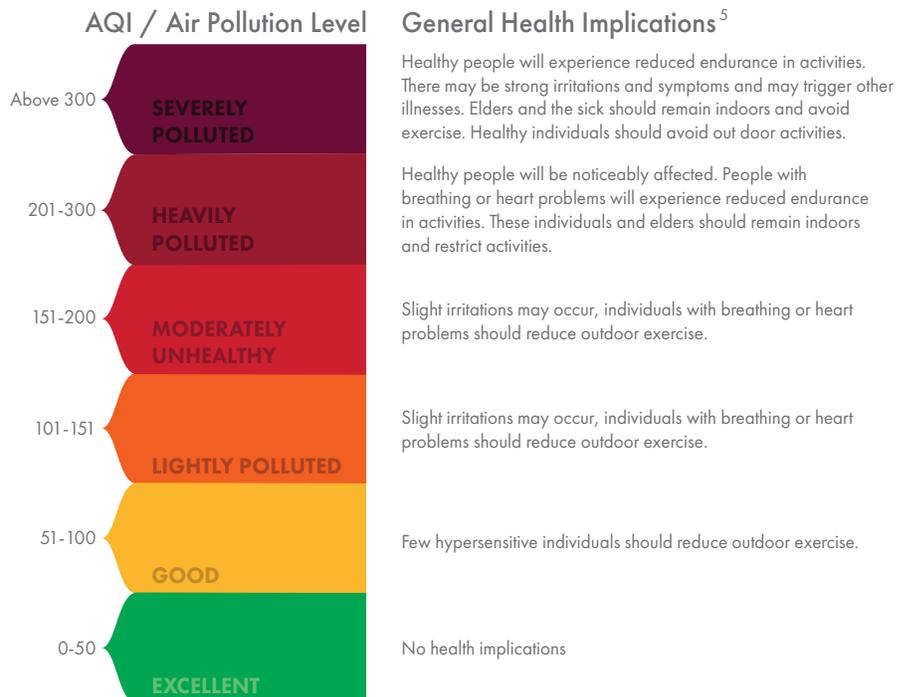


Figure 3

Health Risks

Haze can cause the following reactions and symptoms:

- Irritation of eyes and nose
- Headache, nausea and vomiting
- Wheezing, coughing, shortness of breath (pain may occur upon deep inhalation)
- Temporary inflammation of breathing passages

The effects of haze are dependent on:

- Health status of an individual
- API reading
- Duration of exposure

For healthy individuals, while there may be short term reactions and symptoms as a result of haze. Generally, there are no long term exposure consequences. However, reactions and consequences, depending on the individual, may vary and could be severe for the elderly, children, expectant mothers and individuals with the following underlying chronic health problems:

- Heart disease
- Emphysema
- Bronchitis
- Asthma

Upon exposure to haze, symptoms and reactions could surface in one to three days.

General Guidelines for Outdoor Activities⁶

Air Quality Reading	Healthy Persons	Elderly , Pregnant Women, Children	Persons with Chronic Lung Disease, Heart Disease
Less than 100 Good/ Moderate	Normal activities	Normal activities	Normal activities
101-200 Unhealthy	Reduce prolonged or strenuous outdoor physical exertion	Minimise prolonged or strenuous outdoor physical exertion	Avoid prolonged or strenuous outdoor physical exertion
201-300 Very Unhealthy	Avoid prolonged or strenuous outdoor physical exertion	Minimise outdoor activity	Avoid outdoor activity
Above 300 Hazardous/ Emergency	Minimise outdoor activity	Avoid outdoor activity	Avoid outdoor activity

How Can Individuals Protect Themselves Against Haze?

Individuals can take precautions and steps to protect themselves and their family members from haze by:

1. Obtaining reliable information from the Department of Environment (DOE), Ministry of Health (MOH), your family doctor, and staying informed.
2. Limit exposure by staying indoors and keeping windows and doors closed. If it is necessary to be outdoors, it is advisable to reduce physical exertion, such as jogging or running..
3. Institute and put in place specific health measures such as:
 - Use saline eye drops if eyes are irritated and stop wearing contacts / use disposable lenses.
 - Use air-conditioner in re-circulate mode.
 - Use portable air cleaner while indoors and use a respirator (N95 masks) while outdoors.

How Do Companies Protect Their Employees?

1. Education

- Disseminate information to employees through talk/engagement sessions.
- Organise Q&A sessions to address concerns among employees.
- Educate and update employees via company communication systems (e.g. emails, employees e-bulletin).

2. Preparation

- Identify at-risk individuals and determine criteria for alternative work arrangements.
- Clean and service air-conditioners quarterly if the condition of haze persists. If possible, use air-conditioners with HEPA filters.
- Stockpile masks and organise fit-testing to ensure all employees have masks. Avoid using expired masks. Advise employees to NOT USE N95 masks on children.

3. Action

- Implement mechanisms for working from home.
- Develop a process for distributing masks at work and at home.
- Develop a process to track on the ground employee appointments, as well as travel plans for visitors.

How Does Haze Impact Travel and Transportation?

- Disruption to flights, overland travel and commercial activities due to poor visibility.
- Driving conditions can worsen while the pollution persists.
- Itineraries may need to be adjusted.
- Personnel / employees should reconfirm scheduled appointments as businesses may be closed or staff may have been advised to work from home.

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SOURCES

¹ http://www.who.int/phe/health_topics/outdoorair/databases/FINAL_HAP_AAP_BoD_24March2014.pdf?ua=1

² <http://apims.doe.gov.my/v2/information.html>

³ <http://www.nea.gov.sg/anti-pollution-radiation-protection/air-pollution-control/psi/psi>

⁴ <http://aqicn.org/faq/2015-05-02/south-asian-air-quality-scales-malaysia-and-thailand/>

⁵ http://www3.epa.gov/airnow/aqi_brochure_02_14.pdf

⁶ <http://www.e101.gov.sg/haze/whattodo.htm>



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