

# Air pollution linked to risk of premature death

Date: August 21, 2019

Source: Monash University

Summary: a new international study has found that air pollution is linked to increased cardiovascular and respiratory death rates. The study is the largest of its kind to investigate the short-term impacts of air pollution on death, conducted over a 30-year period. The study analysed data on air pollution and mortality in 24 countries and regions.

The study, led by Dr Haidong Kan from Fudan University in China, analysed data on air pollution and mortality in 652 cities across 24 countries and regions, and found increases in total deaths are linked to exposure to inhalable particles (PM10) and fine particles (PM2.5) emitted from fires or formed through atmospheric chemical transformation.

Published in the *New England Journal of Medicine*, it's the largest international study to investigate the short-term impacts of air pollution on death, conducted over a 30-year period.

Associate Professor Yuming Guo from Monash University's School of Public Health and Preventive Medicine in Australia, said as there's no threshold for the association between particulate matter (PM) and mortality, even low levels of air pollution can increase the risk of death.

"The adverse health effects of short-term exposure to air pollution have been well documented and known to raise public health concerns of its toxicity and widespread exposure," Professor Guo said.

"The smaller the airborne particles, the more easily they can penetrate deep into the lungs and absorb more toxic components causing death.

"Though concentrations of air pollution in Australia are lower than in other countries, the study found that Australians are more sensitive to particulate matter air pollution and cannot effectively resist its adverse impacts. This may be attributed to Australians' physiological functions having adapted to living in areas with low levels of particulate matter air pollution.

"Given the extensive evidence on their health impacts, PM10 and PM2.5 are regulated through the World Health Organisation (WHO) Air Quality Guidelines and standards in major countries, however Australians should pay more attention to the sudden increase in air pollution," Professor Guo said.

The results are comparable to previous findings in other multi-city and multi-country studies and suggest that the levels of particulate matter below the current air quality guidelines and standards are still hazardous to public health.

Source URL: <https://www.sciencedaily.com/releases/2019/08/190821173711.htm>

**For Students:**

After reading the above article, answer the following questions

1. What are PM 10 and PM2.5 ?

---

---

---

2. How are particulate matters formed?

---

---

---

3. What is the association between Particulate matters and mortality?

---

---

---

4. How does the size of PM relate to mortality?

---

---

---

5. Does physiological function of a person affect the rate of sensitivity toward PM? Give an evidence.

---

---

---

6. What are WHO air quality guidelines and standards?

---

---

---

7. List some examples to regulate air quality.

---

---

---

## For Students:

After reading the above article, answer the following questions

1. What are PM 10 and PM2.5 ?  
PM10 is particulate matter 10 micrometres or less in diameter, PM 2.5 is particulate matter 2.5 micrometres or less in diameter
2. How are particulate matters formed?  
They are emitted from fires or formed through atmospheric chemical transformation.
3. What is the association between Particulate matters and mortality?  
There's no threshold for the association between particulate matter (PM) and mortality, even low levels of air pollution can increase the risk of death.
4. How does the size of PM relate to mortality?  
The smaller the airborne particles, the more easily they can penetrate deep into the lungs and absorb more toxic components causing death
5. Does physiological function of a person affect the rate of sensitivity toward PM? Give an evidence.  
the study found that Australians are more sensitive to particulate matter air pollution and cannot effectively resist its adverse impacts. This may be attributed to Australians' physiological functions having adapted to living in areas with low levels of particulate matter air pollution.
6. What are WHO air quality guidelines and standards?  
WHO guidelines cover annual and daily concentrations of fine particulates, nitrogen dioxide, sulfur dioxide, carbon monoxide and ozone (WHO, 2005). Guidelines also cover indoor mould and dampness (WHO, 2009) and emissions of gases and chemicals from furnishings and building materials that collect indoors (2010). Most recently, WHO Guidelines for indoor air quality - household fuel combustion, set limits on emissions from cooking and heating stoves, as well as recommendations regarding clean fuel use.
7. List some examples to improve air quality.
  - avoid unnecessary driving
  - frequently use public transportations
  - use air purifier
  - be aware of daily air quality