Health Impacts of Air Quality – linking to the Know and Respond Service

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History

Meuse Valley, Belgium 1930
Several thousand cases, 60 deaths

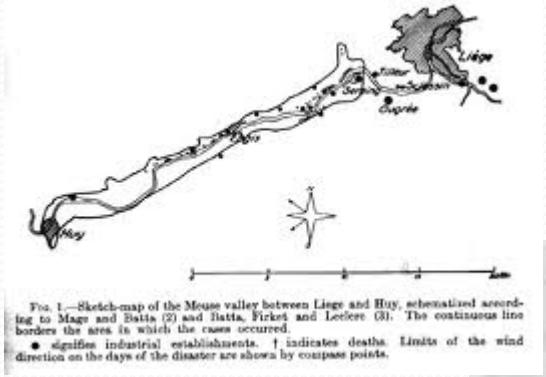


FIG. 1.—Sketch-map of the Meuse valley between Liege and Huy, schematized according to Mage and Batta (2) and Batta, Firket and Leclerc (3). The continuous line borders the area in which the cases occurred.
● signifies industrial establishments. † indicates deaths. Limits of the wind direction on the days of the disaster are shown by compass points.

Donora, Pennsylvania 1948
6000 ill, 20 deaths

London 1952
Over 4000 deaths

New York 1966

Impact on Health

- Time

- Place

- Person

Time

Acute effects

Mild and short-term:

- Irritation of the eyes, nose and throat

More severe:

- Exacerbation of respiratory or cardiovascular diseases
- Hospital admission
- Death

Time

Chronic Effects

- Increase in COPD* hospitalisations of between 1 and 3% for a 10 microg/m^3 rise in PM10
- Increase in cardiovascular deaths of 0.5% for a 10 microg/m^3 in PM10
- Increase of 5% in myocardial infarction within 1-2 hours with a 2.5 microg/m^3 increase inPM2.5
- Increase in risk of death of between 8-18% for a long term elevation in fine PM of 10 microg/m^3

*COPD (Chronic Obstructive Pulmonary Disease)

Place

- Type of source
- Strength of source

Person

- No threshold
- Guideline levels – the majority of the population is unlikely to experience adverse effects as a result of exposure.
- Margin of safety

COMEAP

Committee on the Medical Effects of Air Pollution

- … exposure to outdoor air pollutants may play a part in triggering asthma attacks in people who already have the condition…it is unlikely that exposure to outdoor air pollutants causes asthma in the general population. However, it is possible that in a small group of those who suffer from asthma, who also live near busy roads, exposure to traffic generated air pollutants, largely from trucks, may have played a small part in causing their disease.

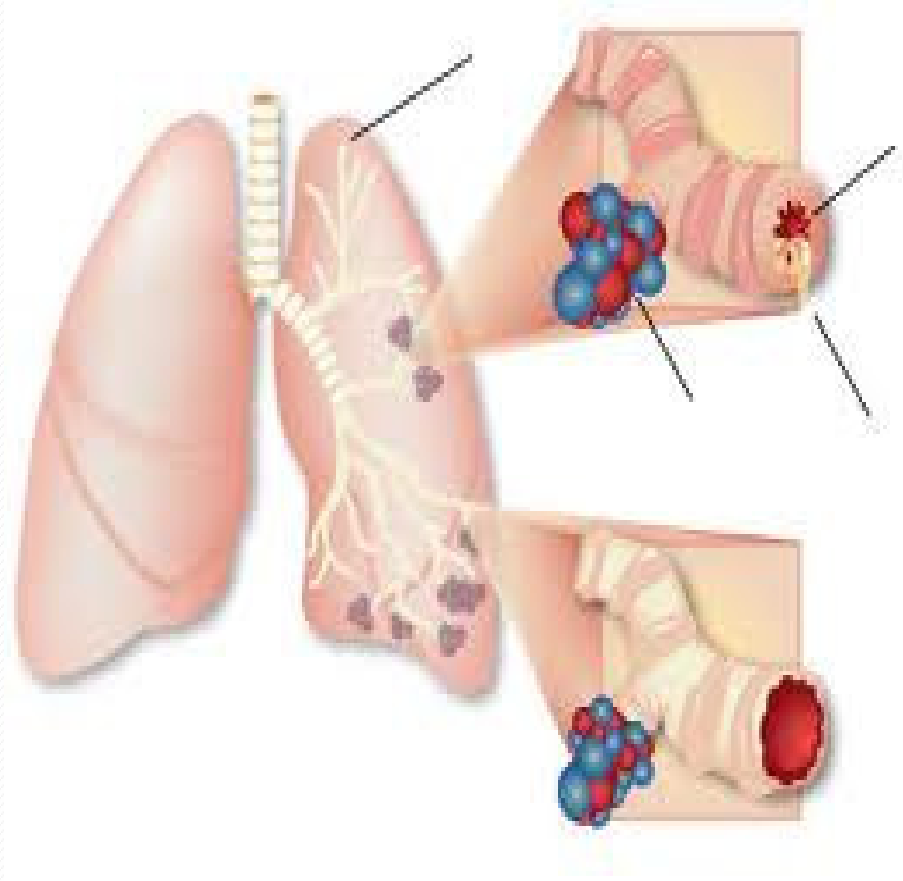
  Does Outdoor Air Pollution Cause Asthma? November 2010

Asthma and COPD

- **NO_2**
- **Ozone**
- **Sulphur dioxide**

Increase

- symptoms
- inhaler use
- hospital admissions



WHO
(World Health Organisation)

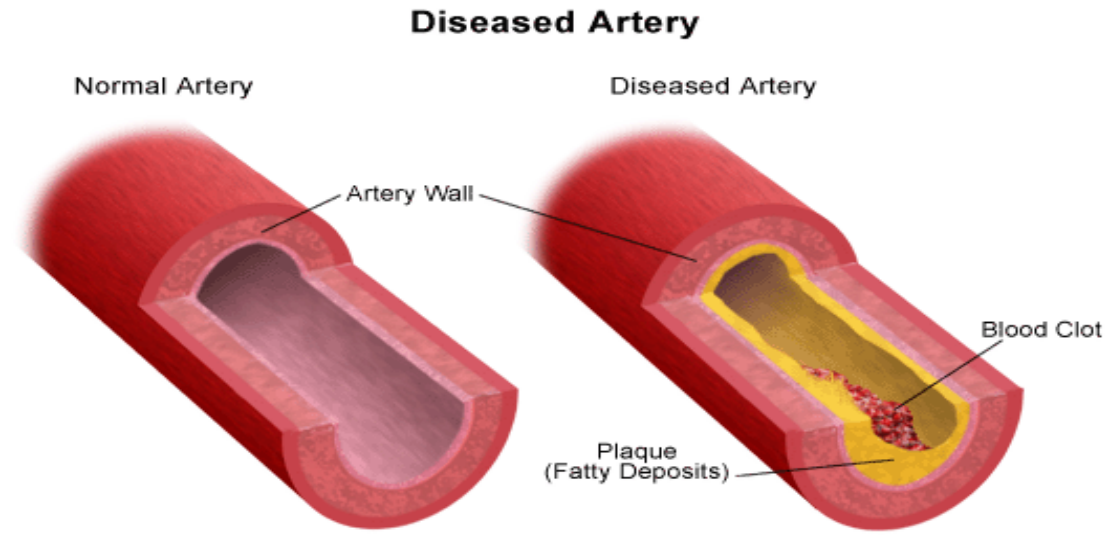
- Air pollution is a major environmental risk to health and is estimated to cause approximately 2 million premature deaths worldwide per year.

- By reducing particulate matter (PM_{10}) pollution from 70 to 20 micrograms per cubic metre, we can cut air quality related deaths by around 15%.

- By reducing air pollution levels, we can help countries reduce the global burden of disease from respiratory infections, heart disease, and lung cancer.

Heart Effects

- Inflammation in lungs and arteries
- Increase risk of thrombosis – clotting
- Increase in arterial thickness and hence longer term function of the cardiovascular system – atheroschlerotic plaques, ischaemic heart disease, hypertension.



Does it make a difference where I live?

What we do know:

- For an individual pollutant, levels vary across the country. Levels also vary between different places in the same area for example beside roads.
- Levels of some pollutants vary more than others and levels of different pollutants are higher in different areas. For example, ozone is higher in rural areas but particles are higher in urban areas.
- Air pollution can worsen the symptoms of heart or lung disease in some people but not in others.
- Some studies find that asthma symptoms are greater in those living beside roads but other studies do not.

Does it make a difference where I live?

What we do not know:

- It may be unclear whether a person is truly sensitive to air pollution. For example, there are many triggers for asthma and reducing exposure to air pollution will not help if in fact it is another trigger that is more important.
- Despite the fact a person appears to be sensitive to air pollution, they may not know which pollutant is having an effect.
- It may not be obvious how much of a reduction in exposure is required to make a significant difference.

http://www.defra.gov.uk/environment/quality/air/airquality/publications/airpoll/documents/airpollution_leaflet.pdf

Know and Respond Service

Moderate

The air pollution forecast for ******** is 'Moderate'.**

If you have a pre-existing heart or lung condition you may notice some mild effects, however, these are unlikely to require any action.

High

The air pollution forecast for ******** is 'High'**

If you have a pre-existing heart or lung condition you may notice significant effects.

If this happens and you suffer from a lung disorder, you may need to change your treatment in the usual way to increase its effectiveness or reduce the time you spend outdoors. If these steps don't help, consult your doctor or ring NHS 24 on 08454 242424.

If you suffer from a heart condition and you notice a change in your symptoms, do not try to change your treatment yourself, but seek medical advice as you normally would or ring NHS 24 on 08454 242424.

Very High

The air pollution forecast for ******** is 'Very High'**

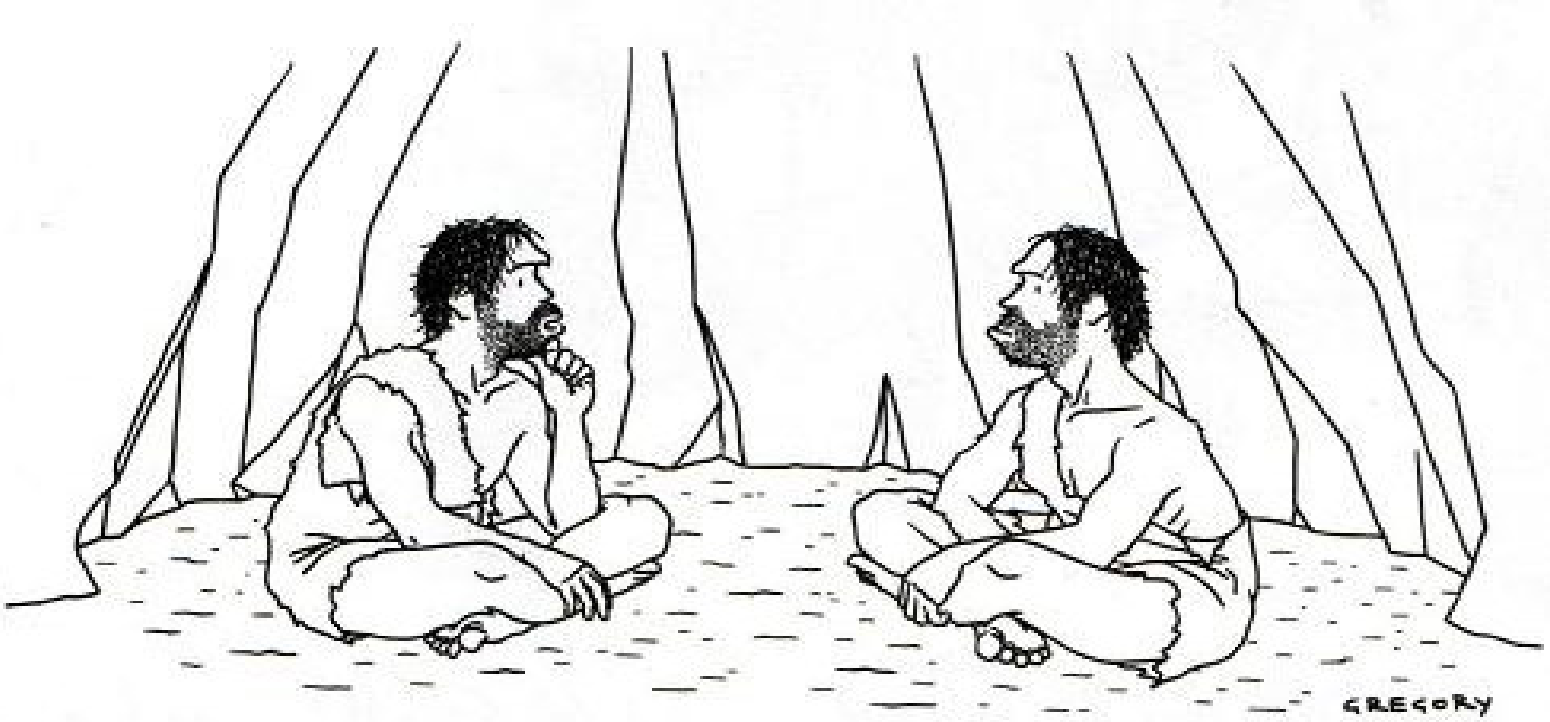
If you have a pre-existing heart or lung condition your symptoms may worsen as a result of exposure to the air pollution. If this happens and you suffer from a lung disorder, you may need to change your treatment in the usual way to increase its effectiveness or reduce the time you spend outdoors. If these steps don't help, consult your doctor or ring NHS 24 on 08454 242424.

If you suffer from a heart condition and you notice a change in your symptoms, do not try to change your treatment yourself, but seek medical advice as you normally would or ring NHS 24 on 08454 242424.

Summary

- Air quality is determined by history and regulations
- Air pollution results in acute and chronic health impacts
- The extent of the health impact is determined by time, place and person
- Provision of alerts via the Know and Respond Service should enable vulnerable people manage their behaviour to minimise the impact.

Thank-you



"Something's just not right—our air is clean, our water is pure, we all get plenty of exercise, everything we eat is organic and free-range, and yet nobody lives past thirty."