

Air pollution through the lifecourse

Every breath we take: the lifelong impact of air pollution

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Setting higher standards

The Great Smog of 1952 took hold on London 64 years ago, claiming an estimated 4200 lives.



WORSE THAN 1866 CHOLERA

Deaths After Fog

The rise in deaths in the week after London's great fog early in December was greater than that in the worst week of the cholera epidemic in 1866. This is disclosed in a report of the health

Clean air policy cuts smog death rate

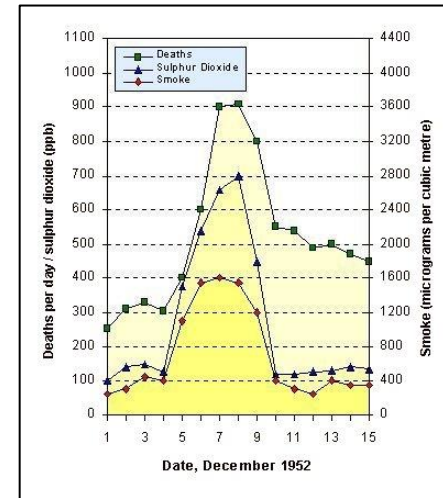
By our Parliamentary Staff

The lower level of smoke pollution brought about by the clean air policy helped to reduce the number of deaths in the London smog in 1952, compared with the smog in 1952.

This is the conclusion of the Ministry of Housing and Local Government in its report for 1962, published yesterday (Stationery Office, Cmd 1976, 4s 6d). The report emphasises that it is dangerous, nevertheless, to base con-

were only a few hundred deaths attributable to the weather; but applications for admission to hospital and the sickness rate showed sharp increases. On both occasions, the new claims for sickness benefit rose by 50 per cent in a week.

The report says that during 1962, 392 smoke-control orders covering 92,109 acres were operative, affecting well over half a million premises. In 1961, 352 orders covered about the same area but 100,000 fewer premises.



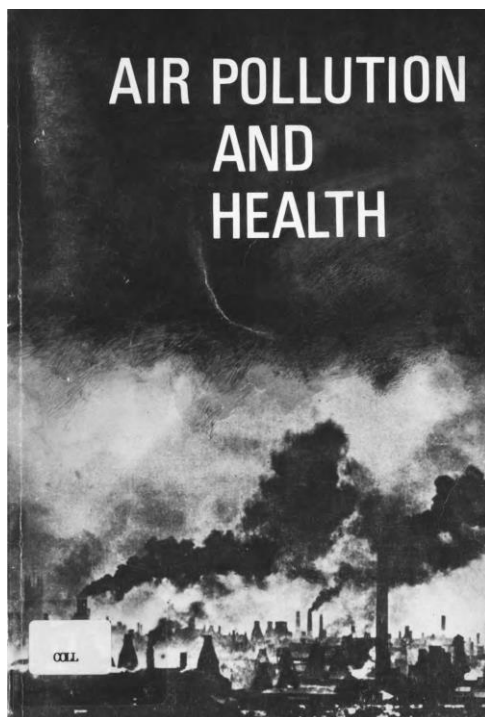
Health impact: 1952 Great Smog

- 5-8 December 1952: Great Smog. Estimated 4,075 premature deaths (and perhaps up to 12,000 in total)
- Government's initial response was to deny it had any responsibility in the matter
- Churchill Government appointed Sir Hugh Beaver as Chairman of the Committee on Air Pollution to make recommendations
- Sir Hugh Beaver called for "a national effort" of "costs and sacrifices" to combat "a social and economic evil which should no longer be tolerated"
- In 1955 it fell to Eden's new administration to enact the Committee's findings.
 - Civil servants were bothered by their practicality
 - The Federation of British Industry was concerned about costs
 - Libertarians argued that it was no business of Whitehall what burnt in an Englishman's hearth and home. Some argued the poor would freeze without coal
 - Treasury said it didn't have the money and was rumoured to be blocking change
 - Ministers worried there was insufficient smokeless fuel to replace coal
- But the public clamoured to go smoke-free
- Sir Gerald Nabarro tabled a private Members Bill which was withdrawn when the Government agreed to legislation. The Clean Air Act came into force in 1956

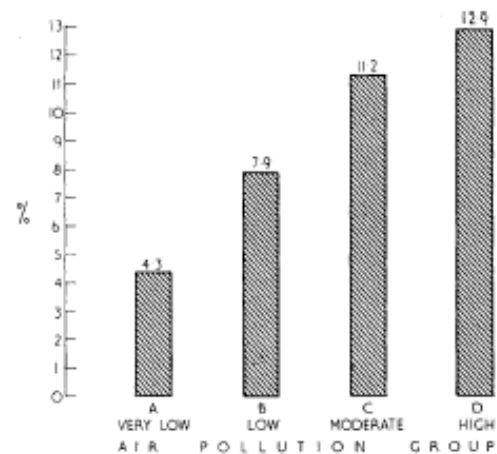




Air pollution and health, RCP 1970



Bronchitis in children



10.13 This report, it is suggested, brings forward enough evidence to justify the vigorous enforcement of existing legislation on the control of various forms of pollution, and especially the Clean Air Acts of 1956 and 1968, the benefits of which are now being experienced.

How the report came about

- Great strides made on tobacco control, alcohol and obesity
- Air pollution remains a major public health challenge
- RCP and RCPCH convened working party to discuss evidence and draw up recommendations

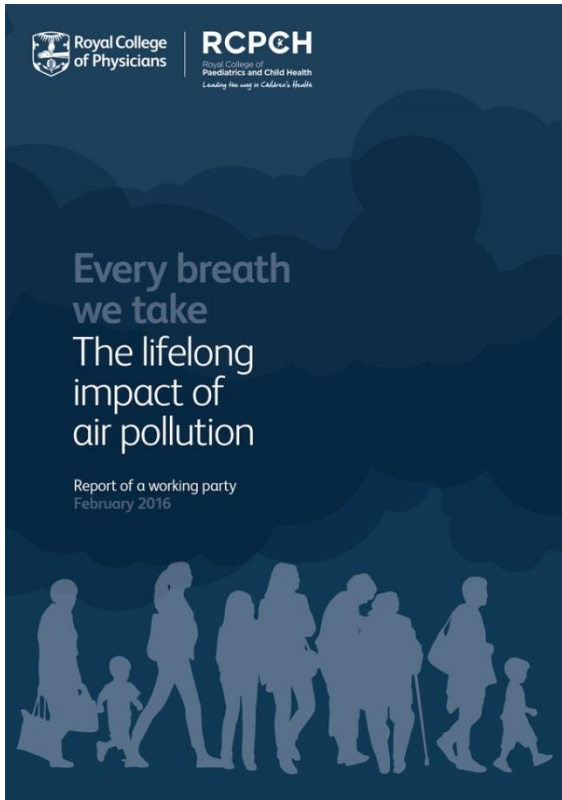


The Battle for Breath - the impact of lung disease in the UK

- Lung disease is one of the top three killer diseases in the UK
- 115,000 people a year die from lung disease - 1 person every 5 minutes
- Mortality figures are roughly the same as 10 years ago, yet heart disease has fallen 15%
- 1 in 5 people in the UK have been diagnosed with a lung disease
- Every day, 1,500 new people are diagnosed with a lung disease

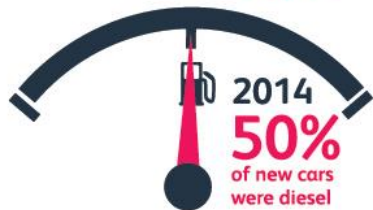


Why the RCP is tackling this issue



- Air pollution estimated to cause around 40,000 deaths per year in the UK
- Estimated cost of air pollution is £20bn annually in the UK
- Linked to major health challenges of our day such as heart disease, asthma, COPD, lung cancer, diabetes and dementia

Air pollution in our changing world

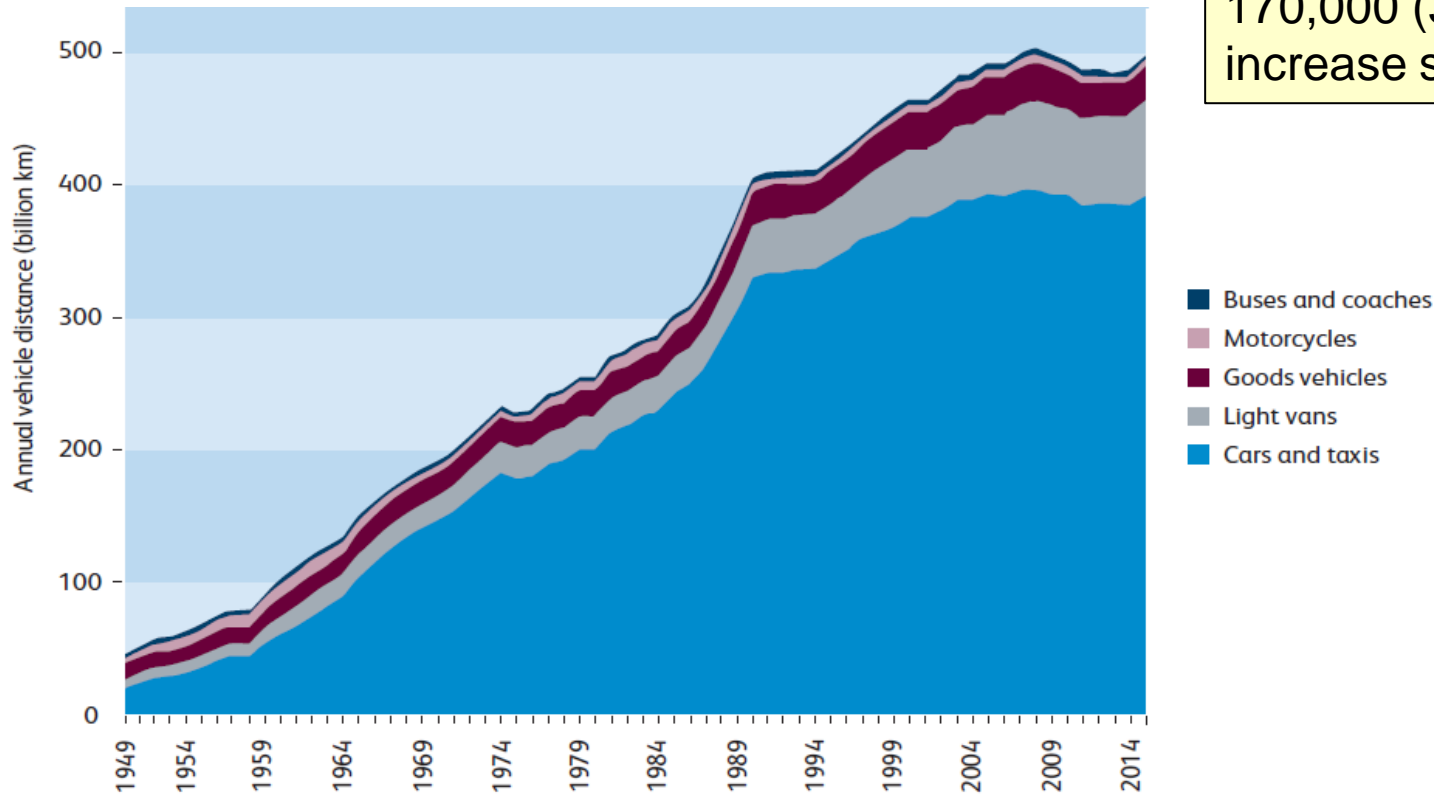


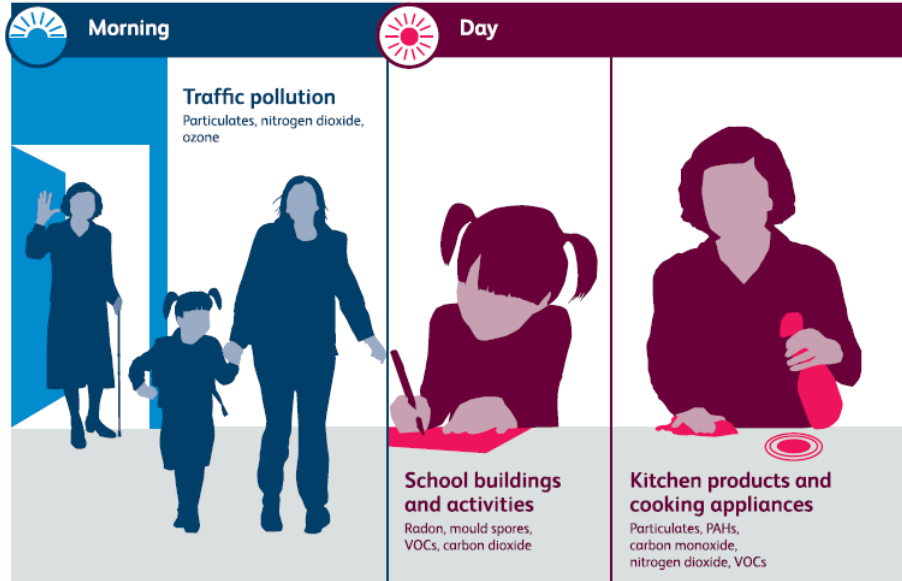
- Changes in the way we live have changed air we breathe
- Total distance walked each year decreased by 30% between 1995 and 2013
- In 2012, road traffic in the UK was 10x higher than in 1949
- Not just outdoor environment but indoor as well



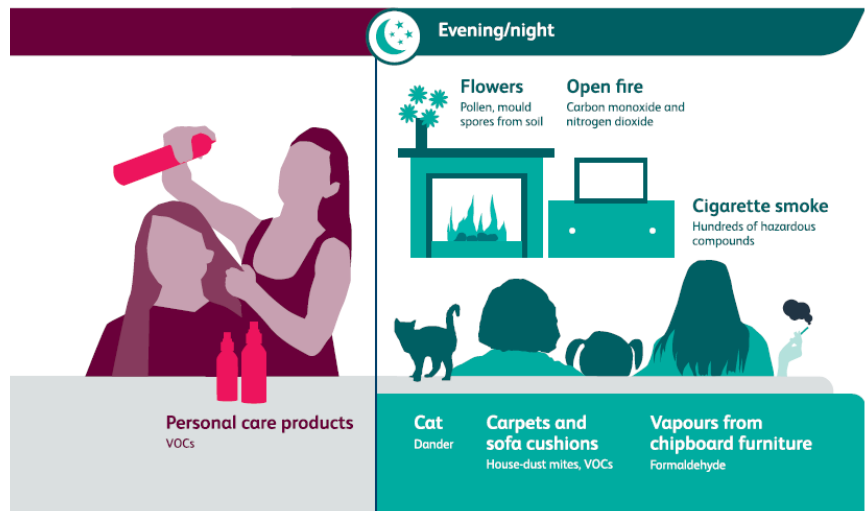
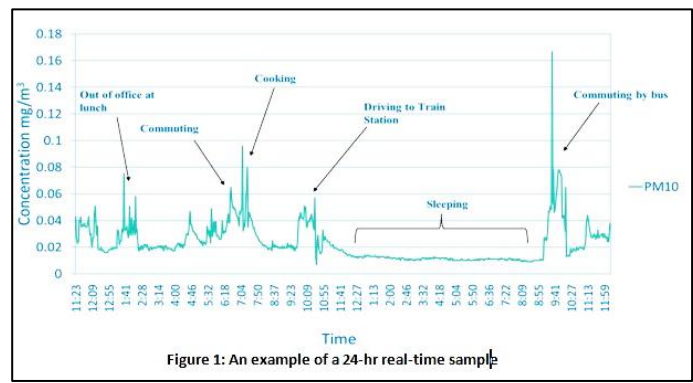
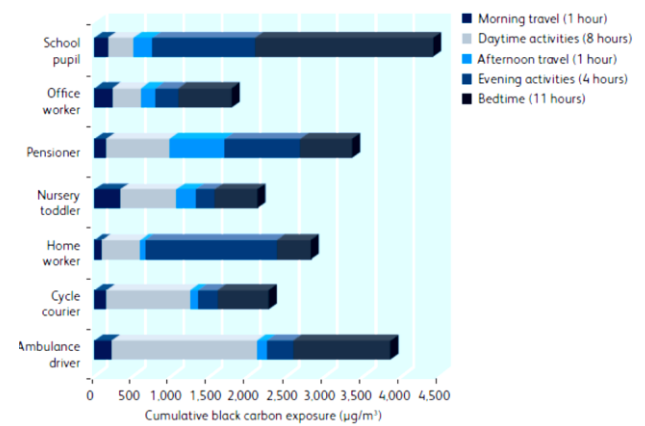
Annual distance travelled by road in the UK

Now, 774,513 diesel cars in London
170,000 (30%)
increase since 2012

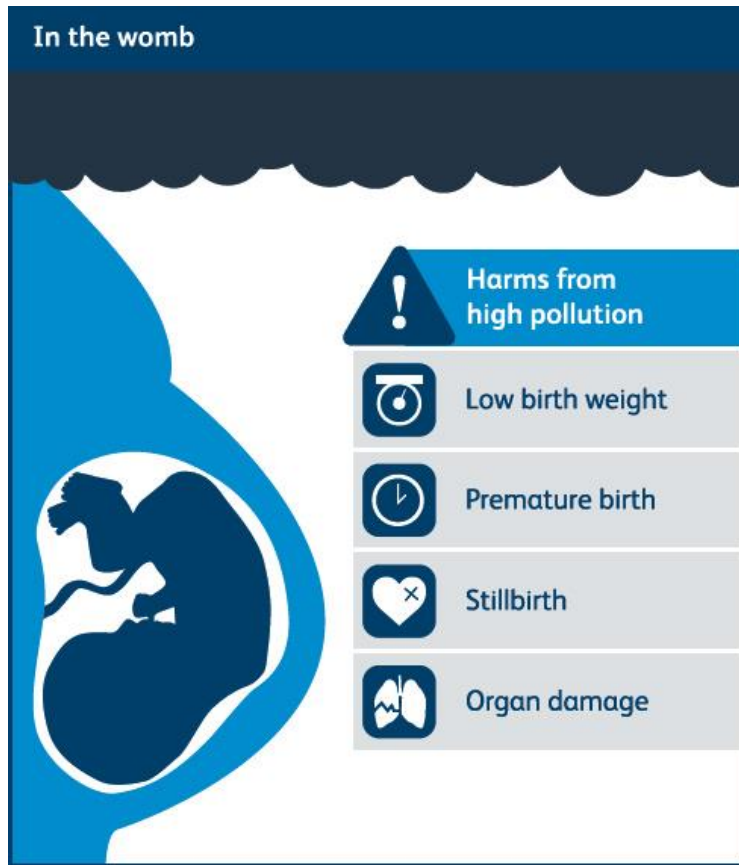




Health effects of pollutants across 24 hours/day of exposures



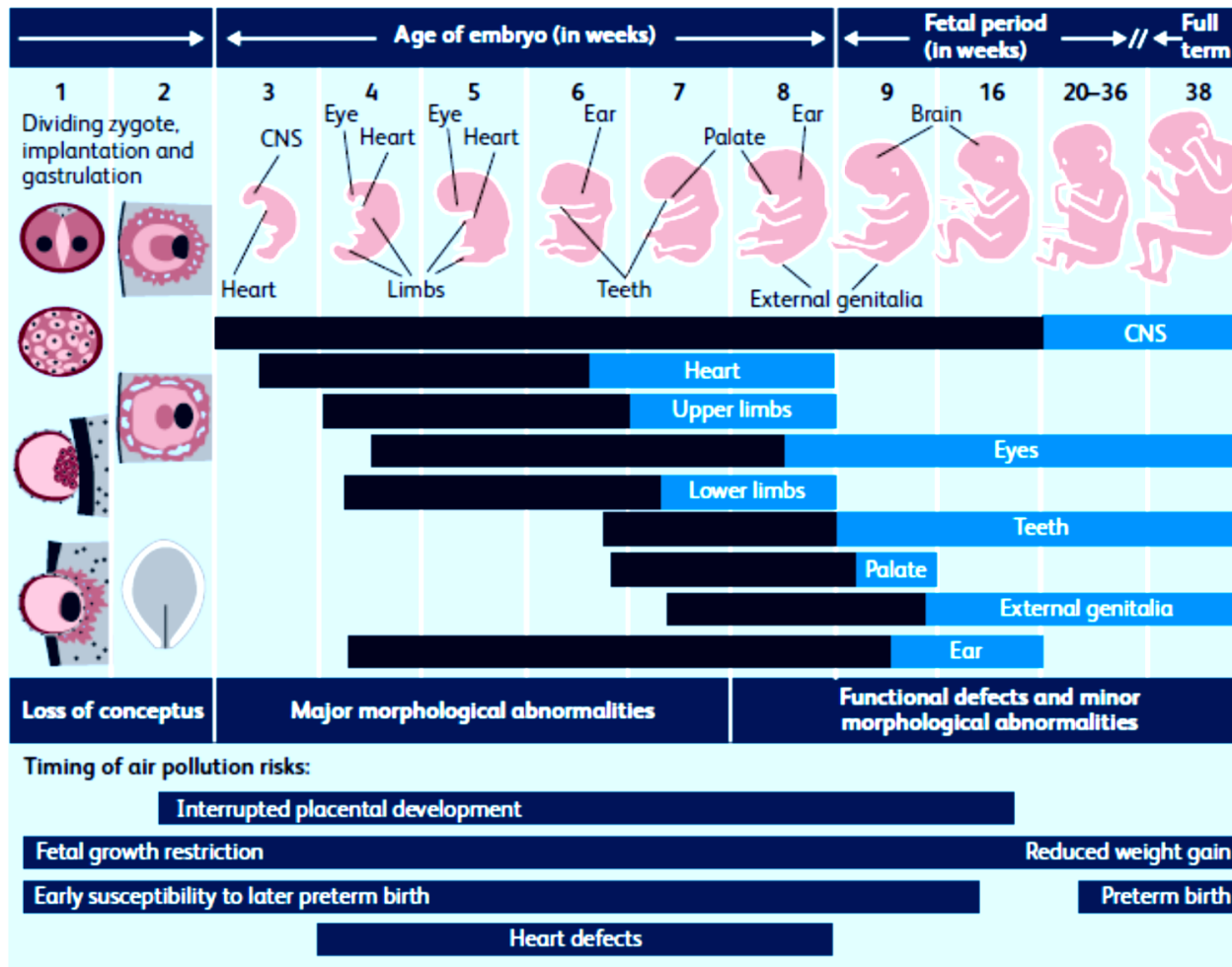
Protecting future generations



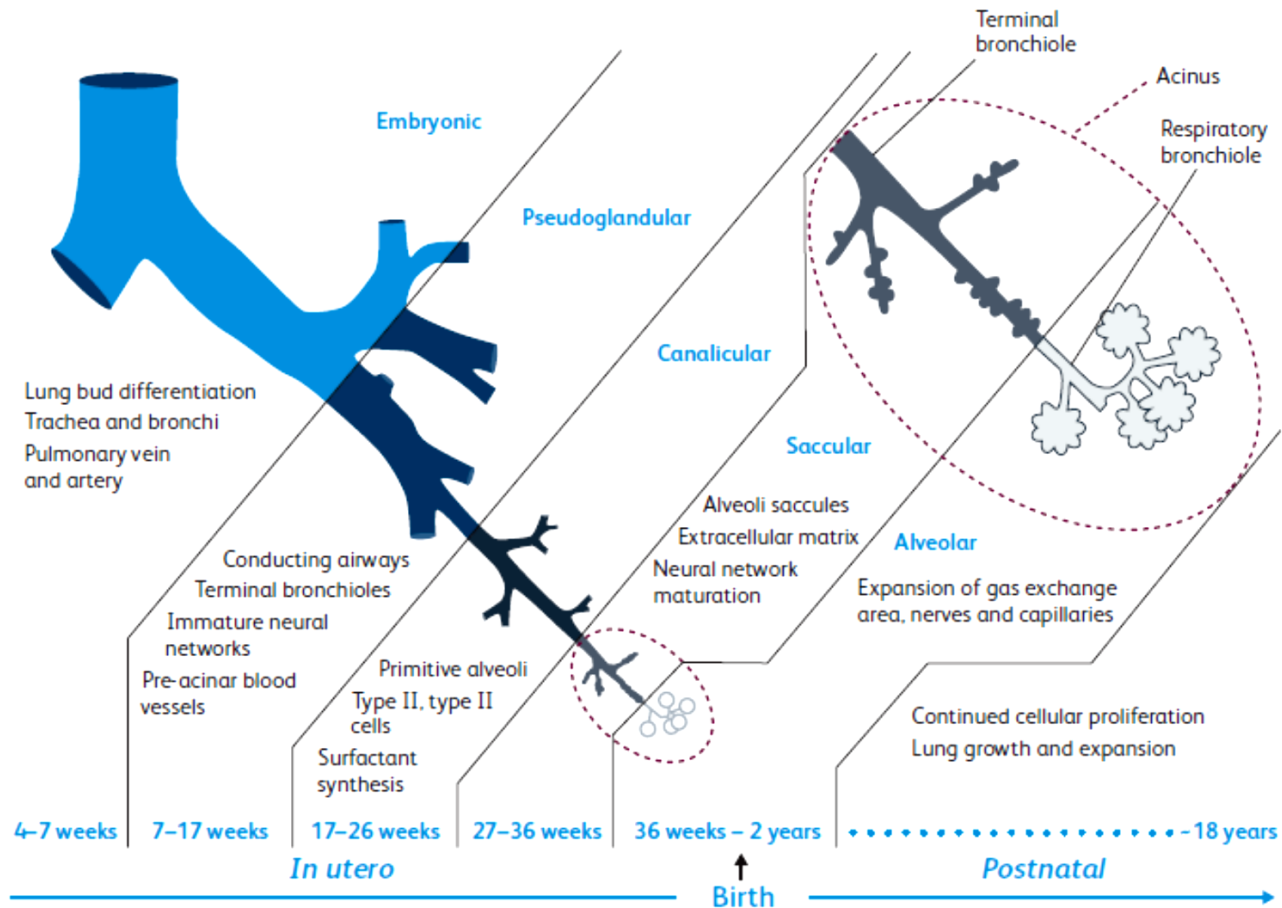
- First report to examine health implications of exposure to air pollution over lifetime
- Developing heart, lung, brain, hormone systems and immunity can all be harmed by pollution
- Effects growth, intelligence, asthma and development of the brain and coordination



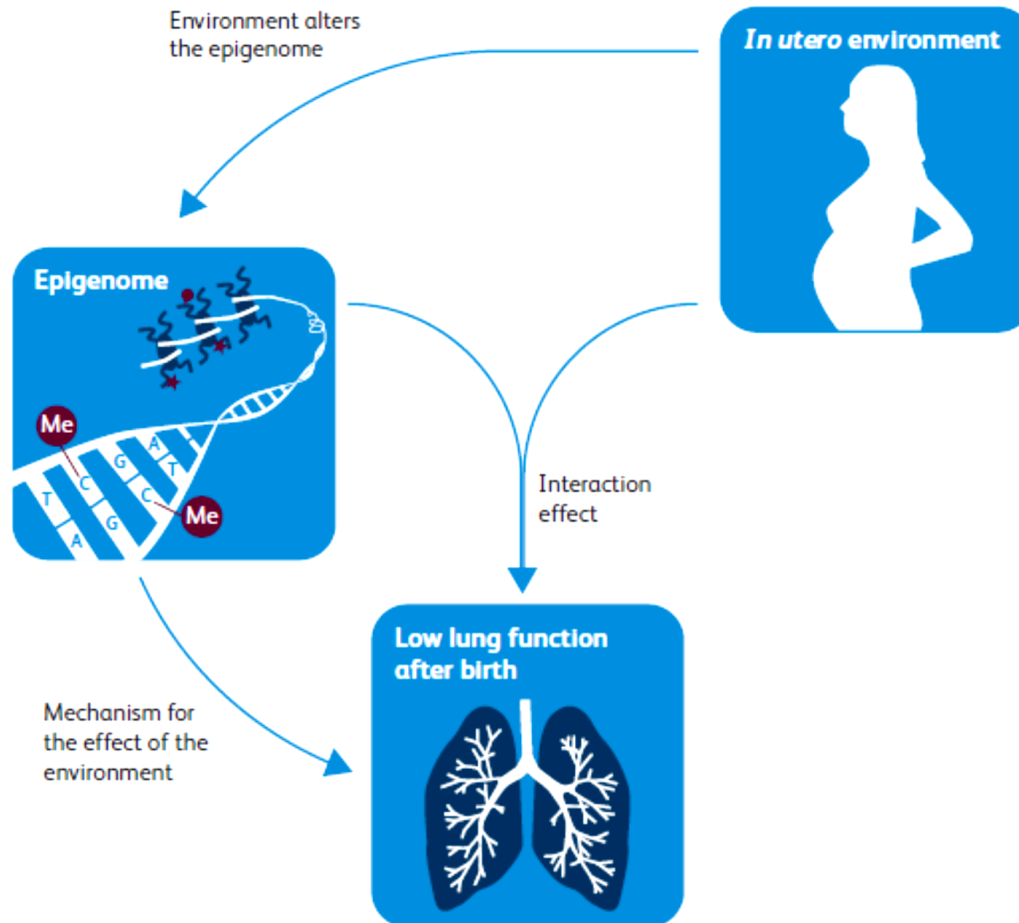
Critical periods of risk from pollution during fetal development



Principle stages of lung development in humans




Effect of air pollution in modifying gene expression - epigenetics



Health effects of air pollution over our lifetime


Toddler



Harms from high pollution

- More coughs and wheezing
- More A&E visits
- Decreased lung function

Older person



Harms from high pollution

- Accelerated decline in lung function
- Asthma
- Type 2 diabetes
- Poor cognition
- Heart attacks, heart failure and strokes
- Lung cancer

Vulnerable groups

Some people suffer more from exposure to air pollution because they are:

- More likely to live in polluted areas
- Exposed to higher levels of air pollution
- More vulnerable to health problems caused by air pollution



Recommendations for action



- 1. Act now, think long term.** We must **act now, and with urgency**, to protect the health, wellbeing and economic sustainability of today's communities and future generations. Government must empower local authorities and incentivise industry to plan for the long term.
- 2. Educate professionals and the public.** The **NHS and patient charities must educate health professionals, policymakers and the public about the serious harm that air pollution can cause.** Health professionals, in particular, have a duty to inform their patients.



3) Promote alternatives to cars fuelled by petrol and diesel. Government, employers and schools should **encourage and facilitate the use of public transport and active travel options like walking and cycling.** Active travel also increases physical activity, which will have major health benefits for everyone. Local Transport Plans, especially in deprived areas, should:

- expand cycle networks
- require cycle training at school,
- promote safe alternatives to the “school run”, based on walking, public transport and cycling instead of cars
- encourage employers to support alternatives to commuting by car
- promote leisure cycling
- develop ‘islands’ of space away from traffic, for safer walking and cycling.

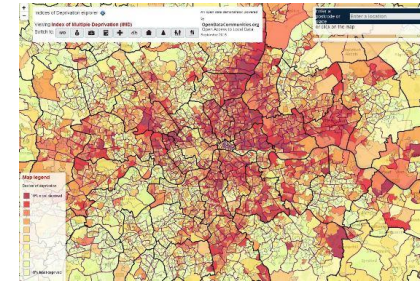
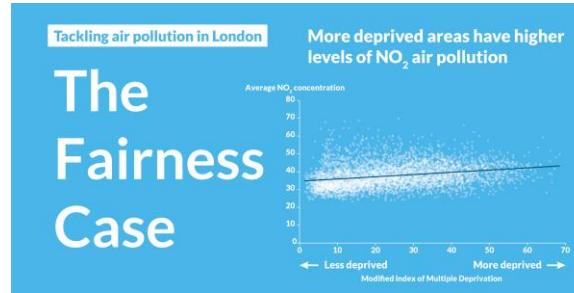
European, national and local policies should also **encourage the use of electrical and hydrogen-powered vehicles.**





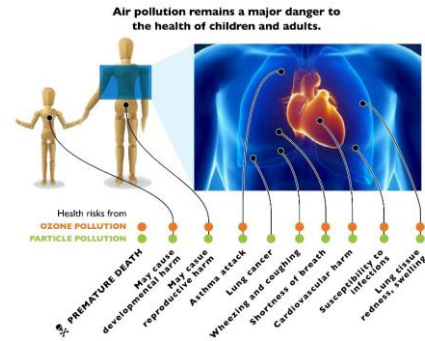
- 4. Put the onus on the polluters.** Polluters must be required to take responsibility for harming our health. Political leaders at a local, national and EU level must introduce tougher regulations, including reliable emissions testing for cars. They must also enforce regulations vigorously, especially in deprived areas where pollution levels are higher and people are more vulnerable.
- 5. Monitor air pollution effectively.** Air pollution monitoring by central and local government must track exposure to harmful pollutants in major urban areas and near schools. These results should be proactively communicated to the public, in a clear way that everyone can understand. When levels exceed EU limits or World Health Organization guidelines, local authorities must immediately publish serious incident alerts.





- 6. Act to protect the public health when air pollution levels are high.** When these limits are exceeded, **local authorities must have the power to close or divert roads to reduce the volume of traffic, especially near schools.**
- 7. Tackle inequality.** **Our most deprived communities are exposed to some of the worst outdoor and indoor air quality, contributing to the gap in life expectancy of nearly 10 years between the most and the least affluent communities.** Regulators, local government and NHS organisations must prioritise improvements in air quality in our most deprived areas, setting high standards of emission control across all sectors of industry.





8. **Protect those most at risk.** Children, older people, and people with chronic health problems are among the most vulnerable to air pollution. Public services must take account of this disproportionate harm through local tools such as planning policies for housing and schools, equalities impact assessments, and joint strategic needs assessments. At an individual level, healthcare professionals should help vulnerable patients protect themselves from the worst effects of air pollution.

Information packs developed as part of the Barts Health Cleaner Air Programme developed by the **Global Action Plan**



9. **Lead by example in the NHS.** The NHS is one of the largest employers in Europe, contributing 8% of the UK's gross domestic product (GDP). **The health service must no longer be a major polluter; it must lead by example and set the benchmark for clean air and safe workplaces.** In turn, this action will reduce the burden of air pollution-related illness on the NHS. The Department of Health, NHS England and the devolved administrations **must give commissioners and providers incentives to reduce their emissions,** and protect their employees and patients from dangerous pollutants.

YOU are the key
to cleaner air



What can I do?



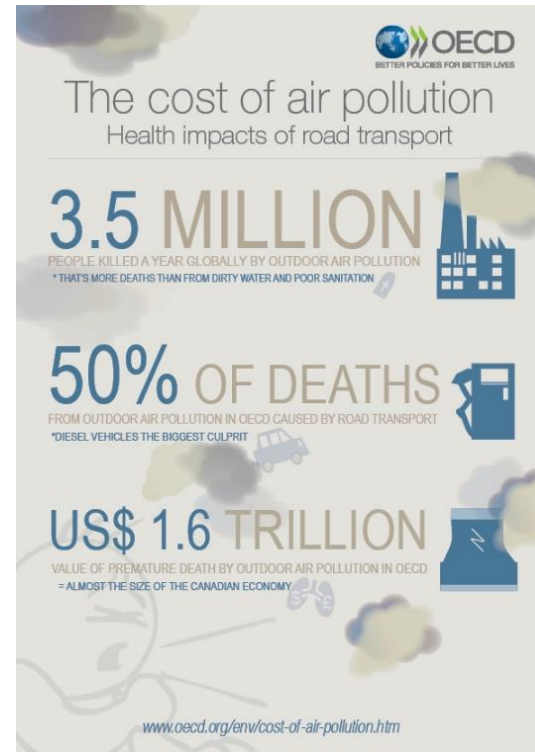
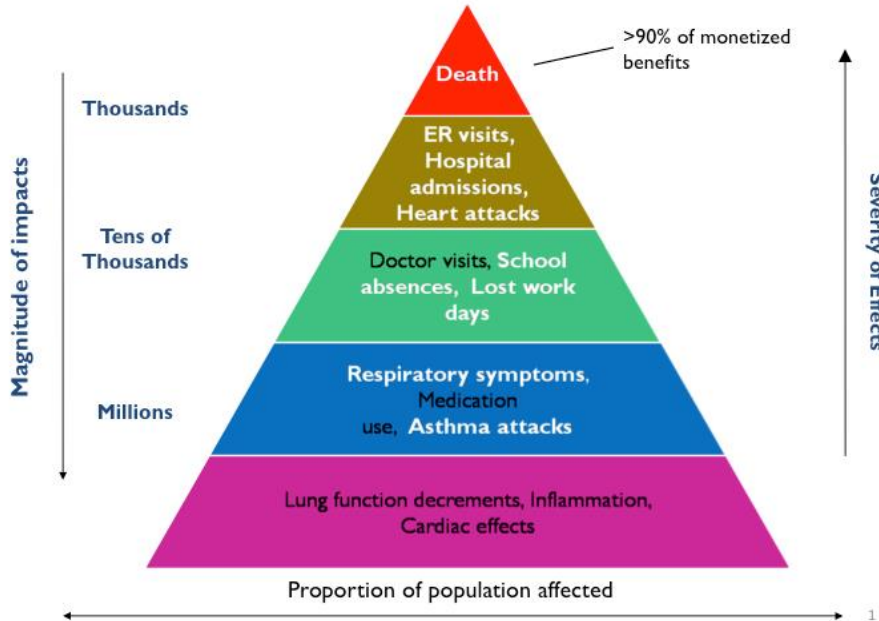
As citizens and members of the public, everyone can help by:

- trying alternatives to car travel: bus, train, walking and cycling
- aiming for energy efficiency in our homes
- keeping gas appliances and solid fuel burners in good repair
- asking our local council and MPs to take action
- learning more about air quality and staying informed.

It might seem as if individual actions will not make a difference, but it all adds up, and each one of us must act.

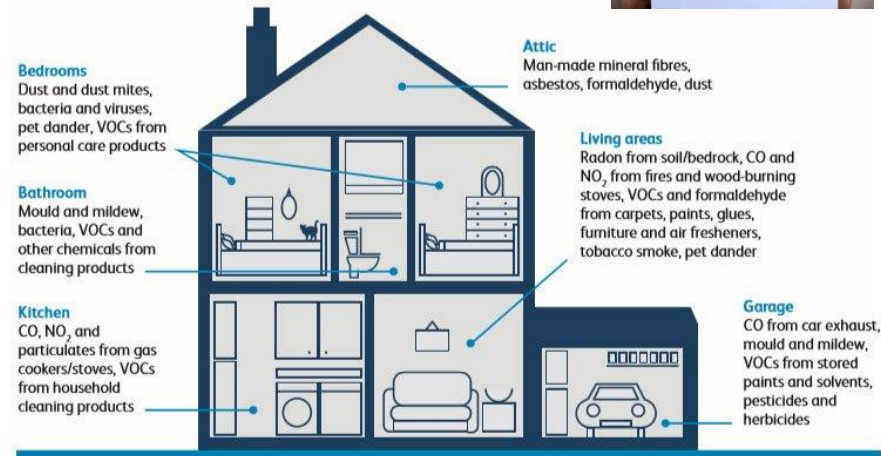


A “Pyramid of Effects” from Air Pollution



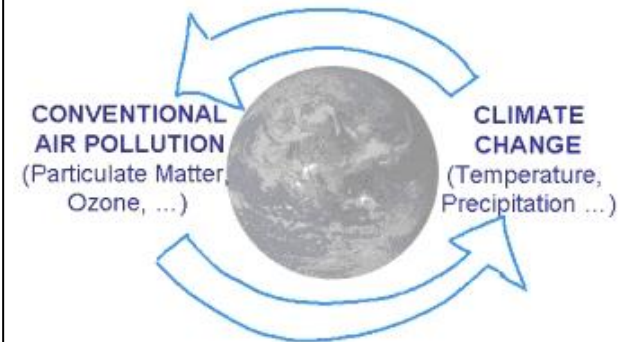
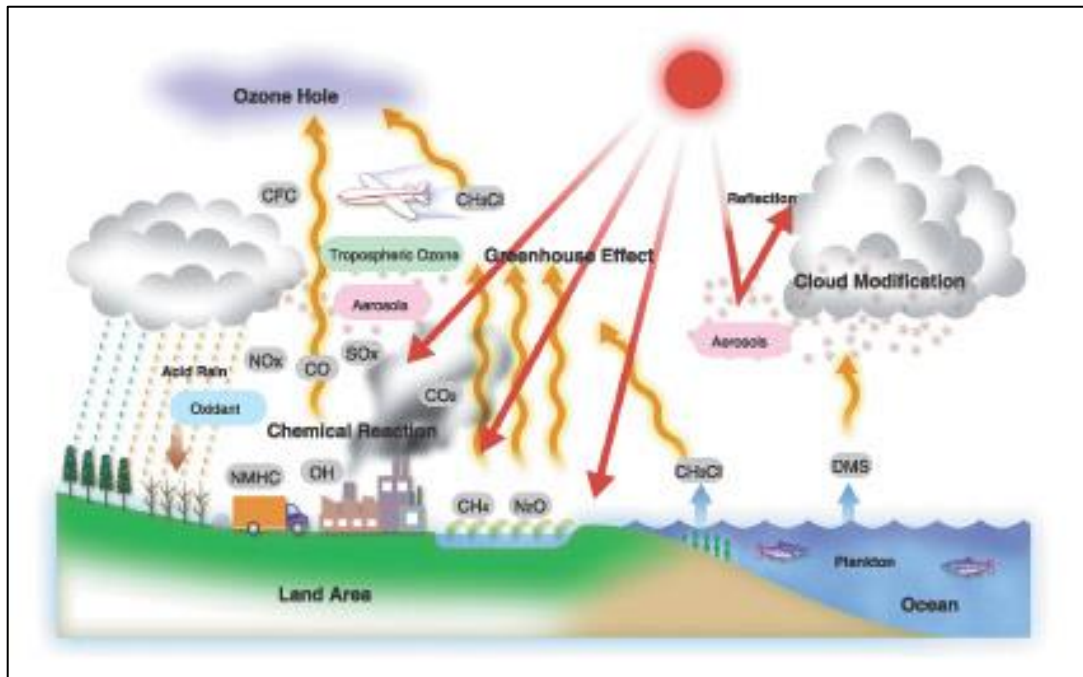
10. Define the economic impact of air pollution. Air pollution damages not only our physical health, but also our economic wellbeing. We need further research into the economic impact of air pollution, and the potential economic benefits of well-designed policies to tackle it.



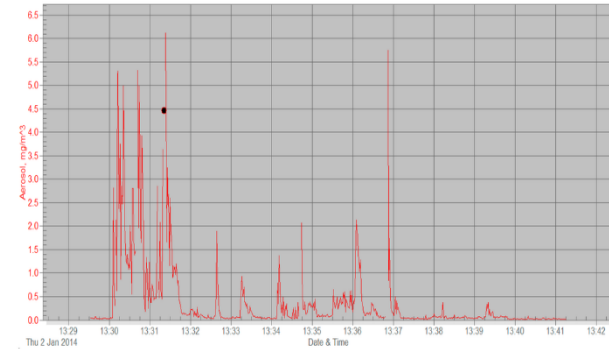


11. Quantify the relationship between indoor air pollution and health.

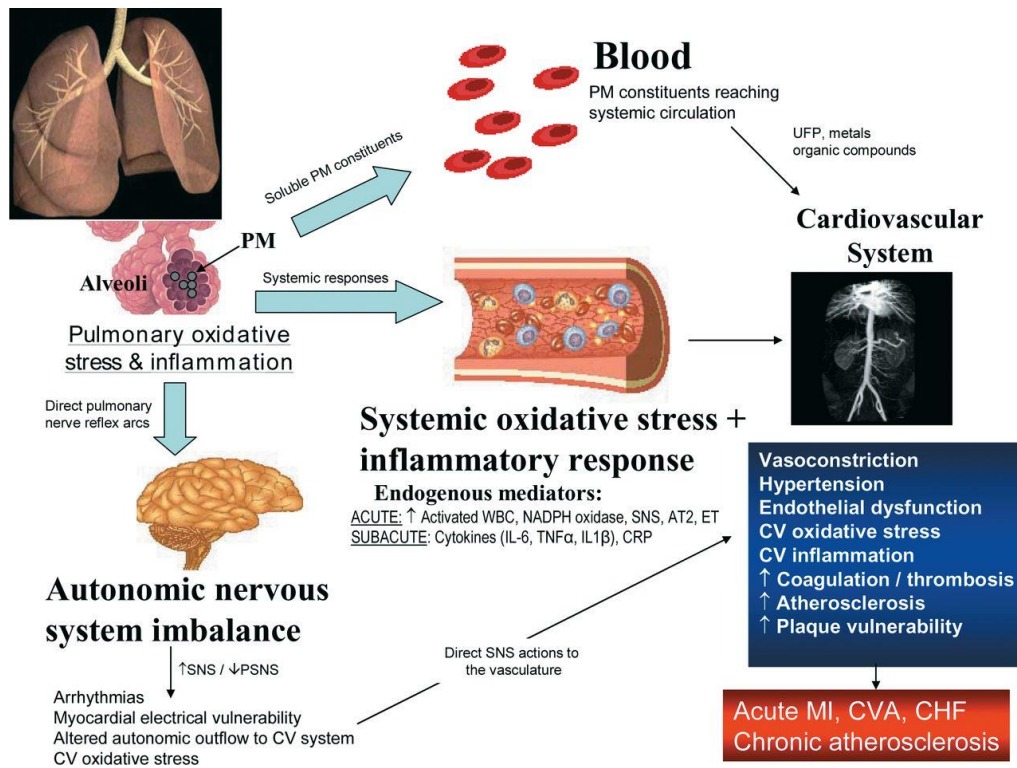
We must **strengthen our understanding of the relationship between indoor air pollution and health**, including the key risk factors and effects of poor air quality in our homes, schools and workplaces. A coordinated effort among policymaking bodies will be required to develop and apply any necessary policy changes



- 12. Determine how global trends are affecting air quality.** From increased energy production and consumption to global economic development and urbanisation, we need to **improve our understanding of how major social and economic trends are affecting air quality and its twin threat, climate change.**



13. Develop new technologies to improve air pollution monitoring. We need better, more accurate and wider-ranging monitoring programmes so that we can track population-level exposure to air pollution. We also need to develop adaptable monitoring techniques to measure emerging new pollutants, and known pollutants that occur below current concentration limits. We must develop practical technology – such as wearable ‘smart’ monitors – that empower individuals to check their exposure and take action to protect their health.



14. Study the effects of air pollution on health. To appreciate fully the risk to health, we need further research on air pollution's effects on the body. In addition to lung and cardiovascular disease, research into the adverse health effects of pollution should accommodate systemic effects such as **obesity, diabetes, changes linked to dementia, and cancer**, as well as effects on the developing fetus and in early childhood.

The Mayor has announced bold plans to clean up London's air and will launch a formal policy consultation in a matter of weeks.



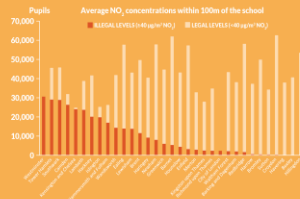
- **Extending the Ultra-Low Emission Zone (ULEZ)** to the North Circular Road and the South Circular Road and the possibility of bringing forward the introduction earlier than 2020. Under current plans the ULEZ will only operate within the Congestion Charging Zone and it is due to come in from 2020.
- **Implementing an extra charge on the most polluting vehicles entering central London** using the Congestion Charge payment and enforcement system from 2017 (this would not mean an increase in the Congestion Charge but just the method for collecting the extra charge from people driving the most polluting vehicles).
- **Introducing ULEZ standards for heavy vehicles London-wide from 2020.**
- **Giving the go-ahead for Transport for London (TfL) to start work on the costs and challenges of implementing a diesel scrappage scheme** as part of a wider national scheme delivered by the Government.

Proposals to work with the Government to tackle air pollution on a national and international level.

Tackling air pollution in London

The Moral Case

328,000 London children (25%) attend a school where NO₂ concentrations exceed legal and healthy limits



Tackling air pollution in London

The Legal Case

12.5% of London's area has air pollution levels above the EU legal limit



Next steps: inform and empower the public on the serious effects of air pollution and lobby MPs for change as was so successful in Clean Air Acts of 1956 and 1968 and more recently, the delivery of tobacco legislation

The Mayor has now set out his view that London can meet the legal standards for NO₂ well before 2025, which is the date the Government's Air Quality Action Plan projects London will be compliant.



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