



# Community Planning Alliance

## Tackling the National Health Emergency caused by Air Pollution Air Quality Workshop 1

November 2021





# You wouldn't drink dirty water. So why are you still breathing dirty air?

150 years ago Greater Manchester got clean water.  
Isn't it time we got clean air?



**Supporting Greater Manchester's Clean Air Campaign**

Click





# Workshop 1: Agenda

- **Introductions and Welcome** – Marj Powner (Vice Chair, Community Planning Alliance)
- **Targets for Air Pollution (the debate to date)** – Andrew Jackson (Head of the Defra/DfT Joint Air Quality Task Force)
- **What’s all the fuss about?** – Professor Roy Harrison (OBE, FRS) University of Birmingham
- **Everyone Knows Someone (With Asthma)** - Heather Henry (Queen’s Nurse) and Founder Breathchamps)
- **Q&A**
- **Next Steps**
  - Launch of the CPA Air Quality Survey
  - Information about the next two sessions





Department  
for Transport



Department  
for Environment  
Food & Rural Affairs

# Clean Air Zones Update

Joint Air Quality Unit – 02 December 2021



# Air Pollution

- Air pollution has reduced significantly since 2010 – emissions of nitrogen oxides have fallen by 32% and are at their lowest level since records began.
- But there is more to do which is why the Government continues to take action to improve air quality and deliver cleaner transport.
- The **Clean Air Strategy** was published in Jan 2019 and sets out how we will meet international commitments to
- The **Transport Decarbonisation Plan** was published in July 2021, setting the government plan to **transition to zero emission road transport** and reduce emissions.
- Alongside these sits a targeted delivery programme on the UK's most immediate air quality challenge: **tackling roadside NO<sub>2</sub> concentrations** - the only statutory air quality limit that the UK currently fails to meet.





# Environment Act



- The landmark Environment Act, which was ratified into legislation in October 2021, addresses the environment and climate emergency we are facing. It is ambitious, with new air quality targets which primarily focus on reducing public health impacts of air pollution. The Act enshrines environmental principles in law for the first time.
- The Act requires us to set at least two legally-binding air quality targets, including a new target on PM2.5 – the most damaging pollutant to human health. As part of this we will be considering the World Health Organisation’s guidelines for PM2.5.
- The Act will build on our investments into cleaning up transport and tackling NO<sub>2</sub> pollution. It will also makes it easier for local authorities to address sources of air pollution in their areas and brings forward powers for the Government to mandate recalls of vehicles when they do not meet legal emission standards.



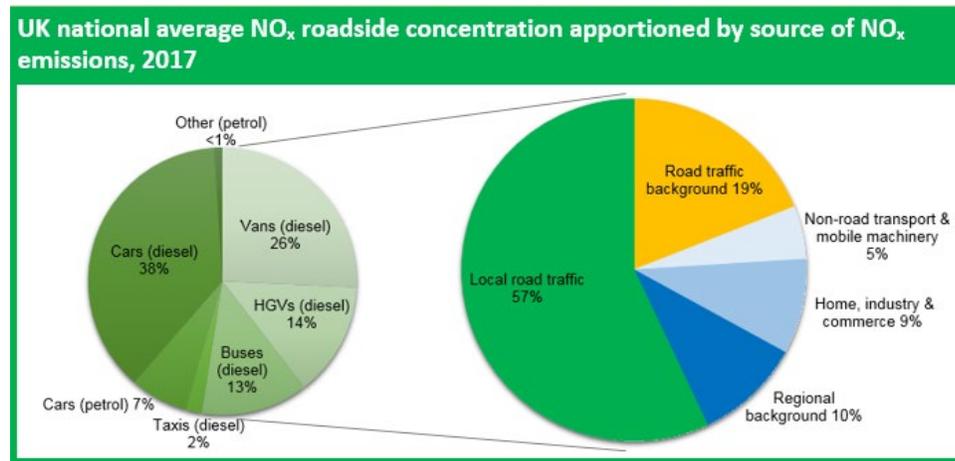
# Air Quality Targets



- We are taking the work set out in the Environment Act forward by undertaking essential work to develop target details, in addition to the level of ambition and achievement date, including how and where to monitor pollutants and how to measure progress.
- We will launch a public consultation by early 2022 on proposed targets for reduction of PM2.5.
- The consultation will launch alongside evidence informed by the independent Air Quality Expert Group and the Committee on the Medical Effects of Air Pollutants.
- Following the consultation, we will publish a government response and then lay the air quality targets in secondary legislation by 31<sup>st</sup> October 2022.

# Background to the NO<sub>2</sub> Programme

- Pollution is the biggest environmental threat to health
- The most immediate air quality challenge is nitrogen dioxide (NO<sub>2</sub>) concentrations around roads, the only statutory air quality limit that the UK is currently failing to meet.
- Evidence suggests a strong association between exposure to NO<sub>2</sub> concentrations and a wide range of adverse health effects including asthma in children and chronic mortality.
- Health benefits of reduced NO<sub>2</sub> are also realised through reductions in Particulate Matter (PM) as a secondary pollutant to emissions of NO<sub>2</sub>.



# The NO<sub>2</sub> Programme



## A Clean Air Zone is coming

We're introducing a Clean Air Zone to make our town a healthier place to be. Charges apply. Use our quick and easy vehicle checker to find out more.

[gov.uk/cleanairzone](https://gov.uk/cleanairzone)

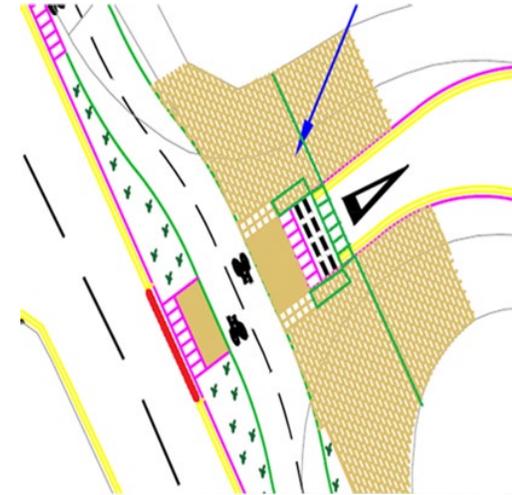
#CleanAirZone



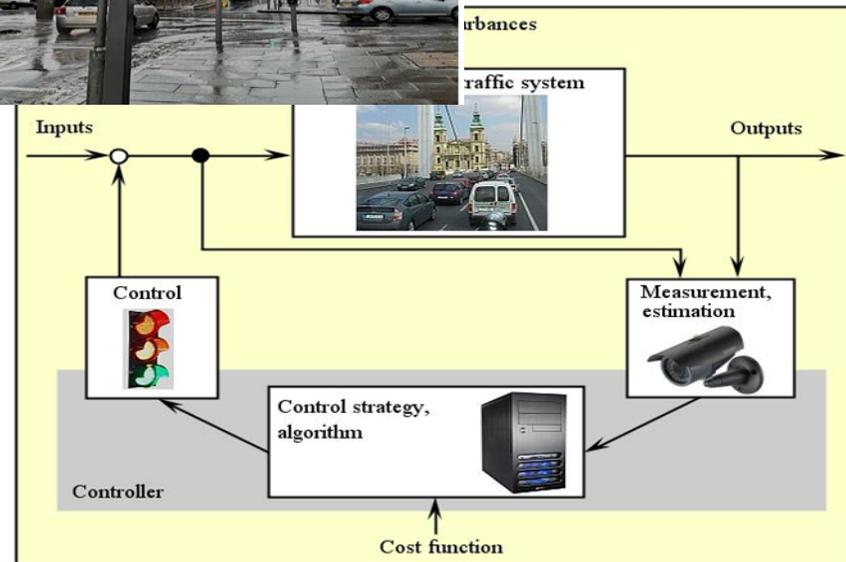
- Through the NO<sub>2</sub> plan, we are investing £880 million to clean up transport and cut pollution in the shortest possible time, working with local authorities to urgently tackle these emissions.
- Government is supporting local authorities with funding and expertise to help them develop their plans and accompanying measures to support those affected.
- Clean Air Zones (CAZ) are required to deliver the health and air quality benefits in some places. Non-charging measures are preferred. Where CAZs are required Government assures that the size, charge levels and vehicle types affected by the zone is required to deliver the air quality and health benefits.

# Examples of Non-CAZ Measures

Traffic management and rerouting



Junction improvements and cycle schemes



# Buses and Retrofit

## SCRT - Selective Catalytic Reduction Technology

- Reducing tailpipe emissions of vehicles with years left on their lives.
- CAZ compliance



Reduces tailpipe  
emissions of NO<sub>2</sub>  
and PM  
~£16k per bus

Zero Emissions  
~£100k per bus



- **Funding streams include**– Clean Bus Technology Funds, Air Quality Grant, Clean Air Fund.
- Since 2013 the Government has invested over £80m retrofitting vehicles, mainly buses.
- Over 3,700 buses have been retrofitted under the 2017-19 CBTF to date.



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#CleanAirZone



# What is a Clean Air Zone (CAZ)?

- A **Clean Air Zone (CAZ)** is an area where targeted action is taken to improve air quality. The CAZ Framework sets out the principles Local Authorities should follow when setting up CAZ in England. The Framework is designed to provide a consistent approach to the introduction of CAZs by Local Authorities to help businesses and individuals.
- **The CAZ Framework establishes the minimum standards for compliant vehicles and four charging classes** covering different types of vehicle, A-D.
- There are **exemptions** for disabled, military, historic and specialist vehicles. Specialist vehicle exemption will need to be apply for with local authorities.
- Limited local exemptions to suit specific local situation, for example school and community buses, low income commuters.
- When driving into or within a charging CAZ, a vehicle will be subject to a monetary charge if it does not meet certain European Union emissions standards.





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# Implementation Fund and Clean Air Fund

- **£880m has been made available to support local authorities** with an Implementation Fund to develop and implement measures and a Clean Air Fund.
- The **Implementation Fund** is provided to support local authorities implementing measures which will achieve compliance with NO<sub>2</sub> limits in the shortest possible time. Examples of these measures include the setting up of Clean Air Zones and traffic management improvements.
- The **Clean Air Fund** was launched by the Government in 2018 to support individuals and business affected by the measures. A range of options local authorities can consider to utilise this money such as new park and ride services, freight consolidation centres, concessionary travel schemes and improvements to bus fleets have been set out.

# Recent Milestones

- Portsmouth CAZ launched
- Greater Manchester and Bradford added to the Drive in a Clean Air Zone vehicle checker

## Look Ahead

- Starting work to deliver Bristol CAZ
- Preparation work with Tyneside and Sheffield





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## Future Engagement & Feedback

Evaluation of our communication and engagement strategy is ongoing. We are keen for open discussions and any feedback from our stakeholders is always helpful.

If you have any thoughts or suggestions, please get in touch!



UNIVERSITY OF  
BIRMINGHAM

# Air Quality: Current Threats and Opportunities

Roy M. Harrison

University of Birmingham

and National Centre for Atmospheric Science



# WHICH ARE THE MOST IMPORTANT LOCALLY ACTING POLLUTANTS?

POLLUTANT	EFFECTS			
	Human Health	Biosphere	Visibility	Materials
Particulate Matter	√		√	√
Sulphur Dioxide	√	√		
Nitrogen Dioxide	√	√	√	
Ozone	√	√		√
Carbon Monoxide	√			
Benzene	√			
Polycyclic Aromatic Hydrocarbons	√			

# WHAT ARE THE RECENT TRENDS IN CONCENTRATION IN WESTERN EUROPE?

POLLUTANT	TREND
Particulate Matter	Flat
Sulphur Dioxide	Fast downward
Nitrogen Dioxide	Flat
Ozone	Peaks down; baseline upward
Carbon Monoxide	Fast downward
Benzene	Fast downward
Polycyclic Aromatic Hydrocarbons	Fast downward

# AIR QUALITY POLLUTANTS

There have been some success stories, notably

- ❖ Smoke and sulphur dioxide in many developed countries
- ❖ Carbon monoxide and benzene in most developed countries
- ❖ Lead from motor vehicles

# AIR QUALITY POLLUTANTS

There have been some notable failures, e.g.

- ❖ *Nitrogen dioxide*, for two reasons
  - (a) failure to reduce  $\text{NO}_x$  from diesels
  - (b) Increased contribution of primary  $\text{NO}_2$  from diesel
  
- ❖ *Ozone*, for which abatement policies in Europe have achieved a reduction in episodic peak concentrations, but the hemispheric background has increased
  
- ❖ *Particulate matter* ( $\text{PM}_{2.5}$  and  $\text{PM}_{10}$ ), mainly because of a large secondary contribution and poorly characterised primary sources



# Diesel Vehicle Emissions And Urban Air Quality

December 1993

Second Report of the  
Quality of Urban Air Review Group

Prepared at the request of the  
Department of the Environment

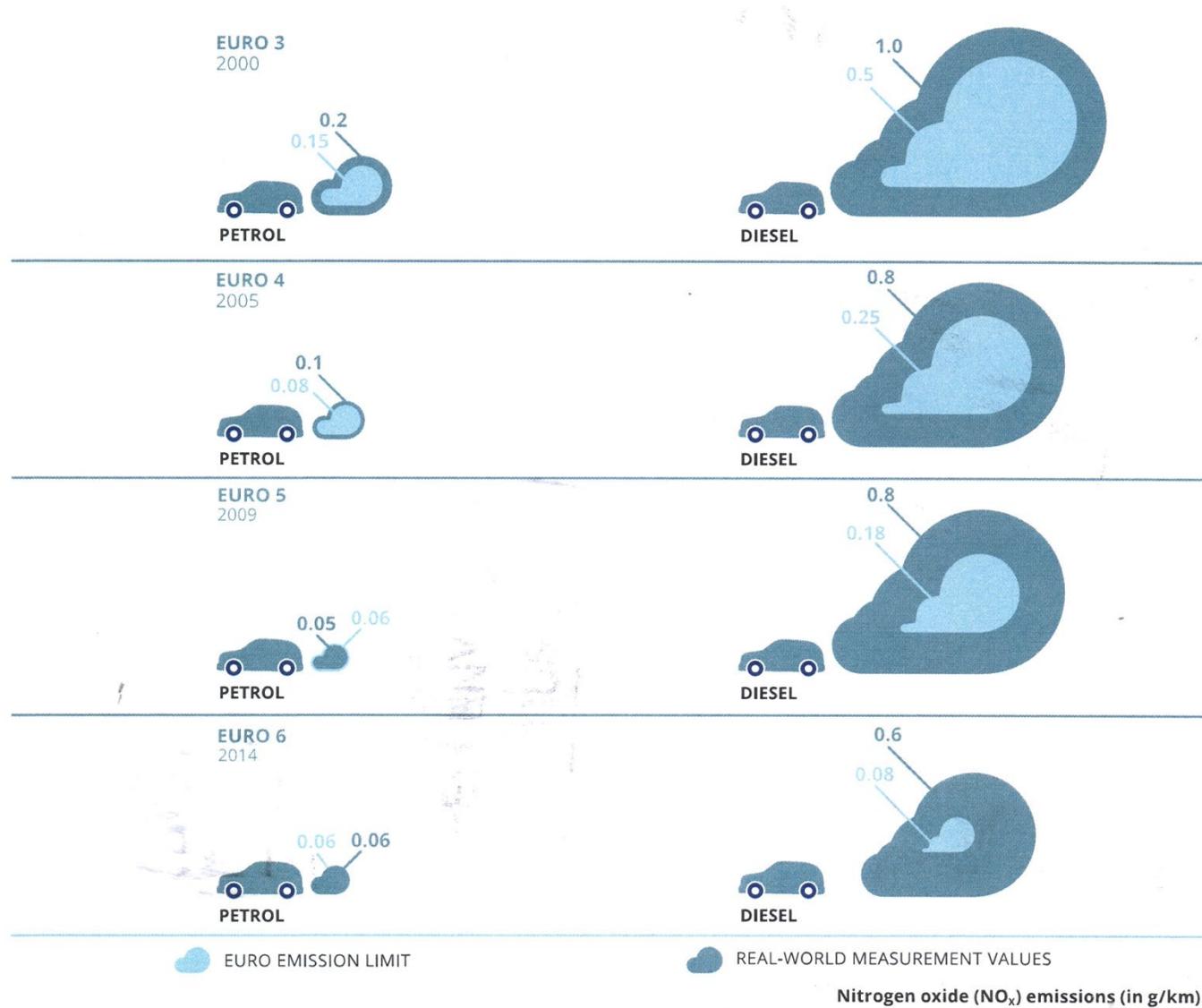
# DIESEL VEHICLES AND URBAN AIR QUALITY

“In the view of the Review Group, the impact of diesel vehicles on urban air quality is a serious one. Any increase in the proportion of diesel vehicles on our urban streets is to be viewed with considerable concern unless problems of particulate matter and nitrogen oxides emissions are effectively addressed.”

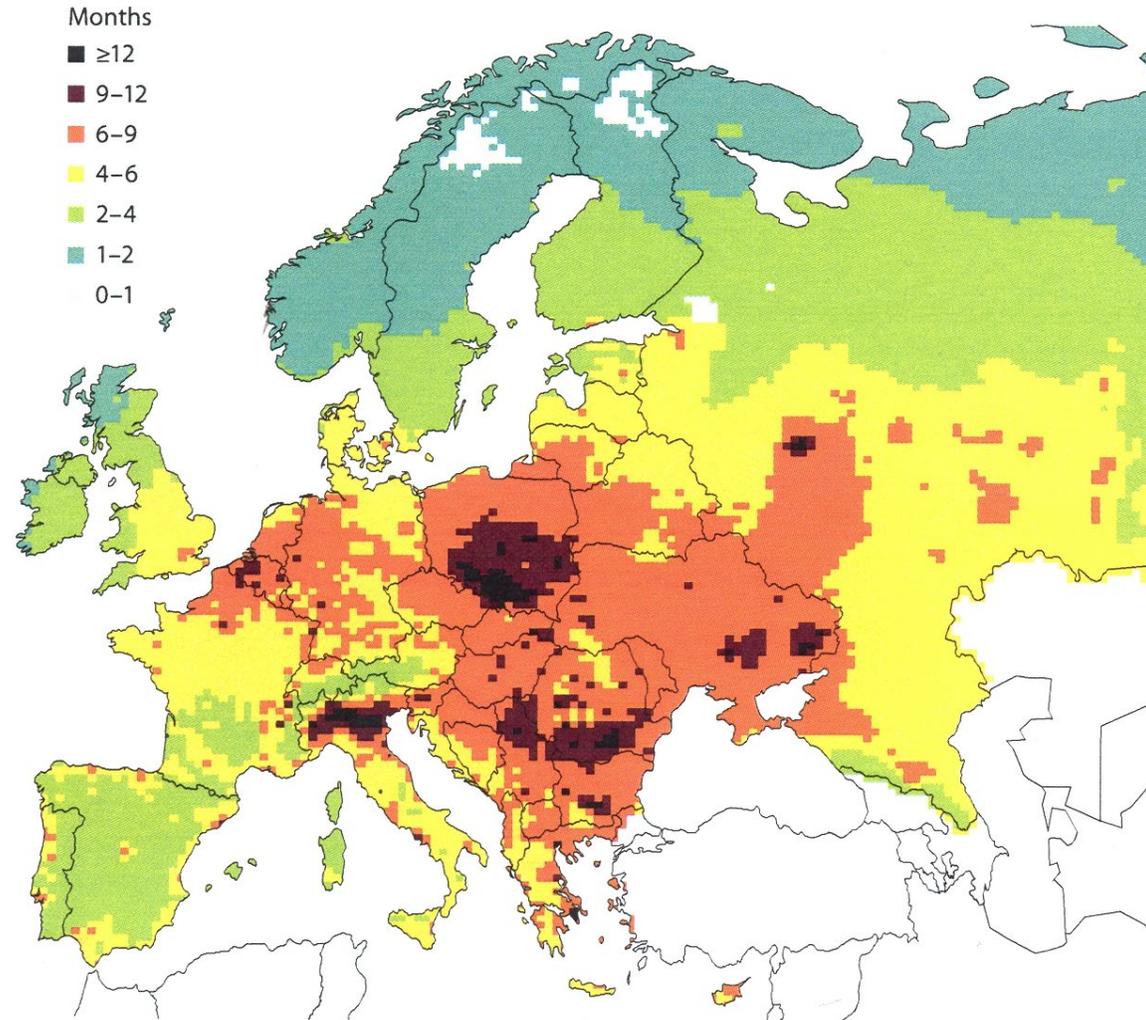
*Quality of Urban Air Review Group*

*Diesel Vehicles and Urban Air Quality, December 1993*

# Comparison of NO<sub>x</sub> standards and emissions for different Euro classes

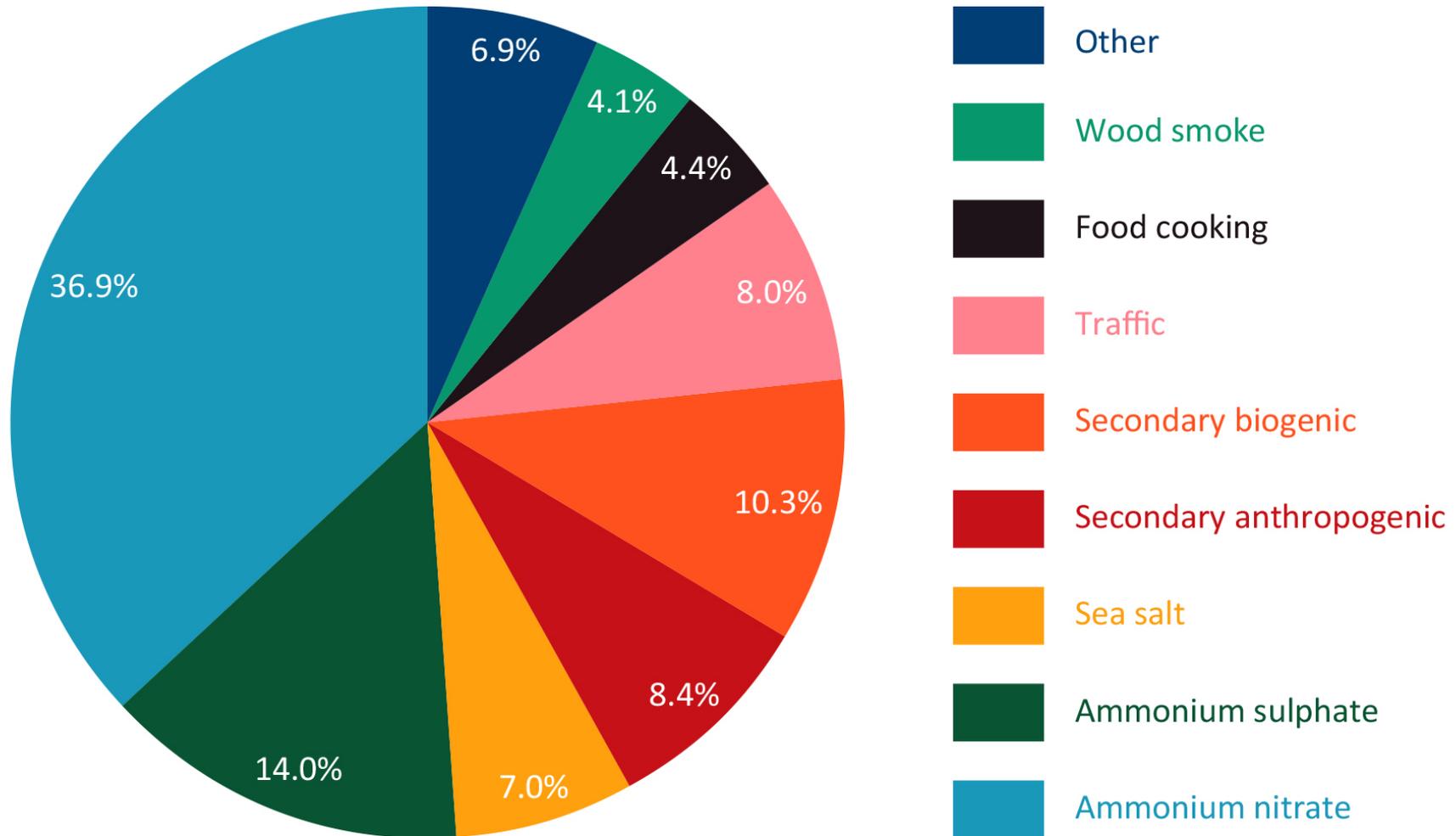


# Loss of Life Expectancy due to PM<sub>2.5</sub> Exposure



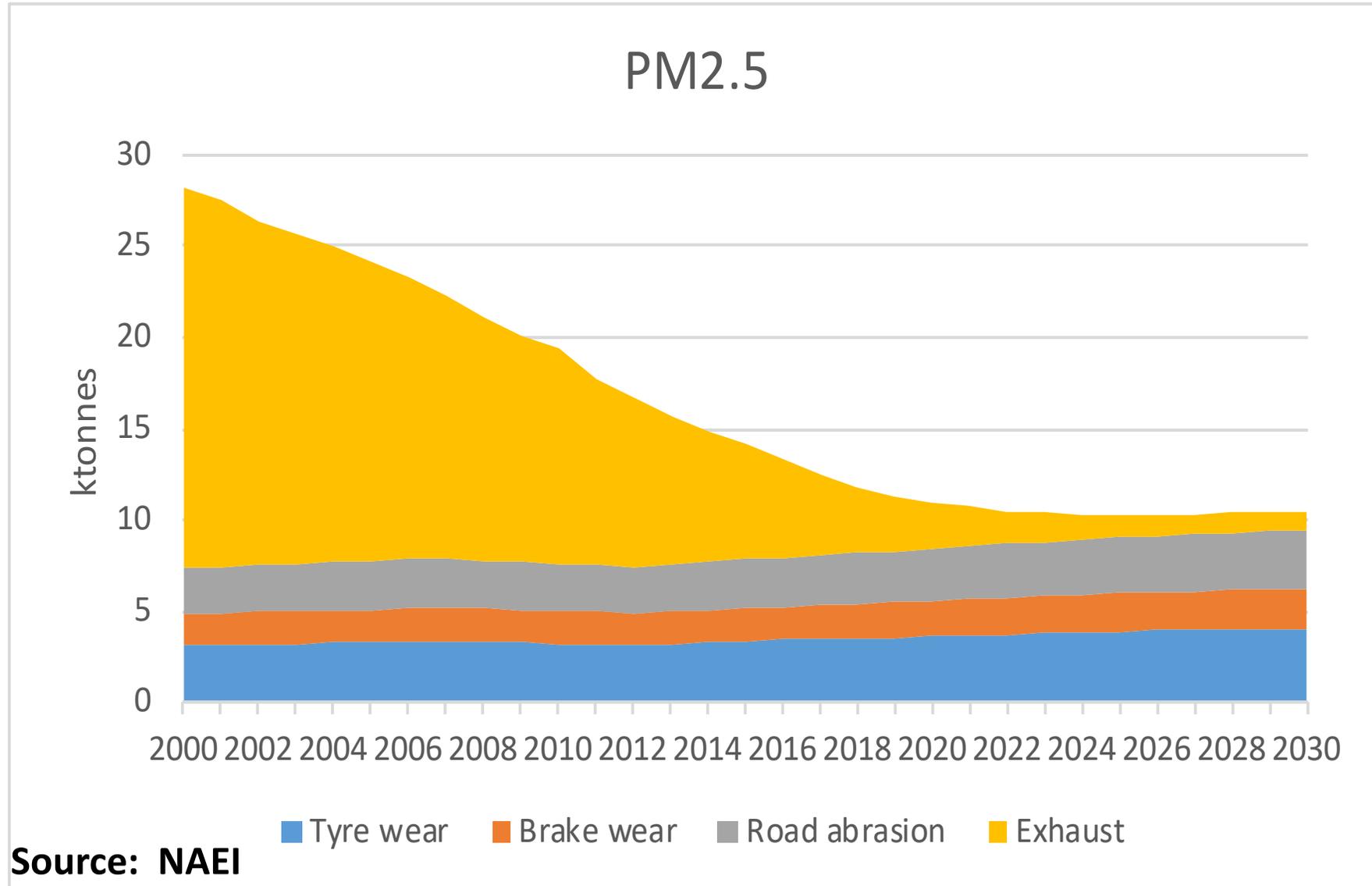
From: UNECE, 2016

# Source contributions to PM<sub>2.5</sub> at North Kensington (%)

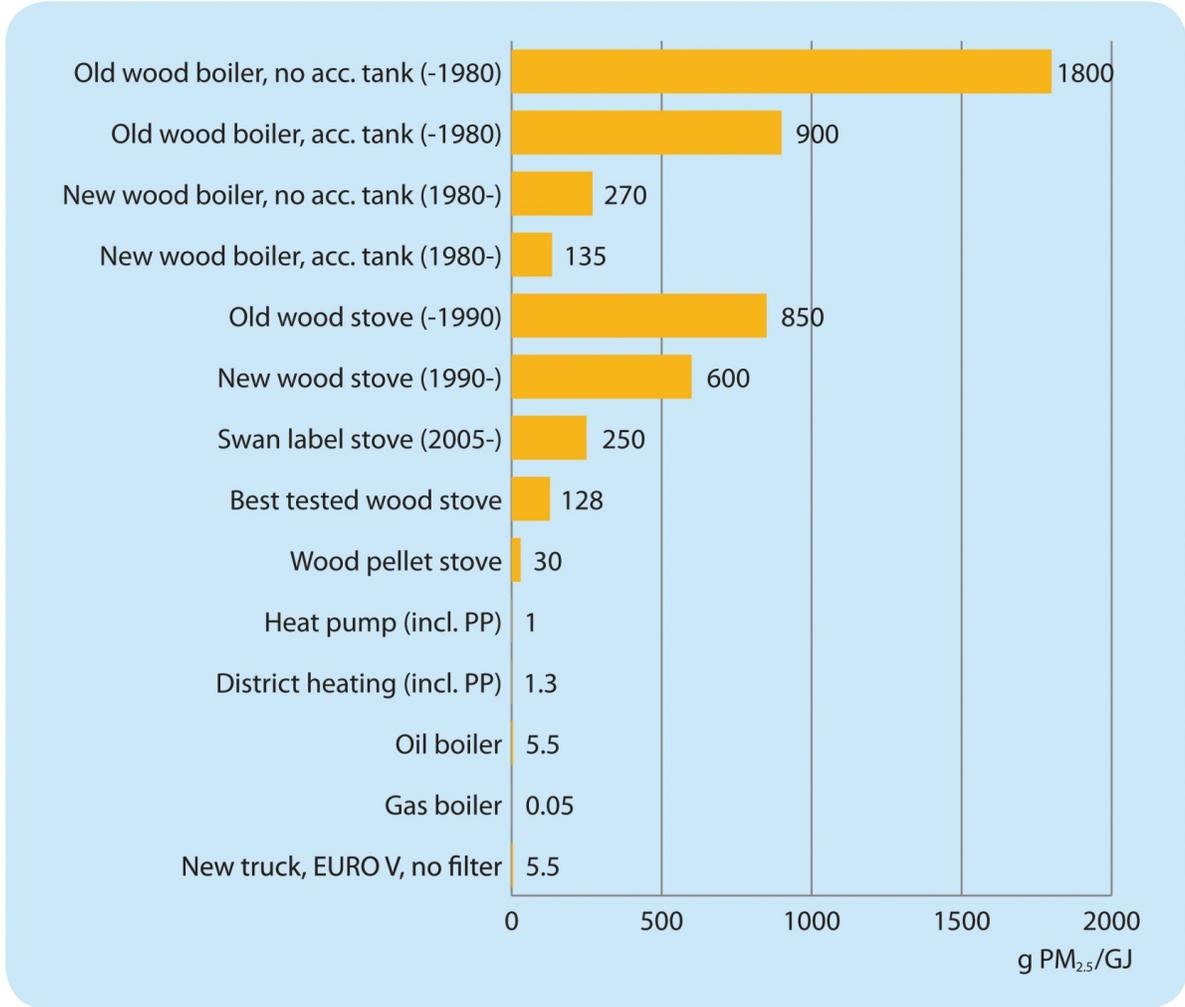


*Other = dust/soil (2.2%); coal (1.1%); vegetation (1.3%); natural gas (0.3%); unidentified (2.0%)*

# UK emissions of PM<sub>2.5</sub> from road traffic – non-exhaust emissions now exceed exhaust emissions



# Emissions of Particles – even the best wood stove emits more particles than a diesel truck



PM<sub>2.5</sub> emission levels including condensates (Norwegian standard NS 3058-2) from boilers and stoves compared to other heat sources. In comparison, the emission level of a truck without filter (EURO V) is included.

# CONCLUSIONS

- ❑ The main current problems in the developed world lie with  $\text{NO}_2$ , ozone and PM.
- ❑ Further abatement of  $\text{NO}_x$  emissions is essential to reducing  $\text{NO}_2$  concentrations, as well as nitrate aerosol and nitrogen deposition.
- ❑ Particulate matter emissions from engine exhaust are declining, but other sources such as non-exhaust particles and wood smoke may be increasing.
- ❑ Secondary particles derived from oxidation of  $\text{SO}_2$ ,  $\text{NO}_x$  and VOC are the largest contributors to  $\text{PM}_{2.5}$ , so control of precursor emissions remains a priority.

**THANK YOU**



# *Better air*

# *Better Health*



[WWW.BREATHCHAMPS.COM](http://WWW.BREATHCHAMPS.COM)

7TH DECEMBER 2021

PRESENTED BY HEATHER HENRY, QUEEN'S NURSE



The world is facing new environmental challenges. BreathChamps CIC helps by bringing communities together to share learning & find ways to breathe better

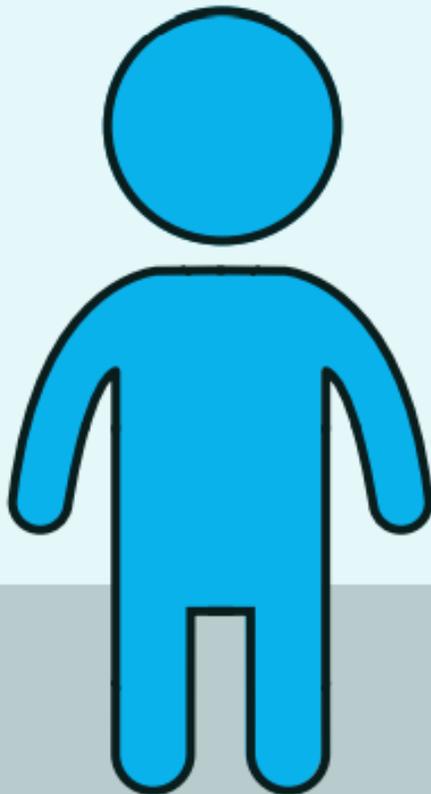
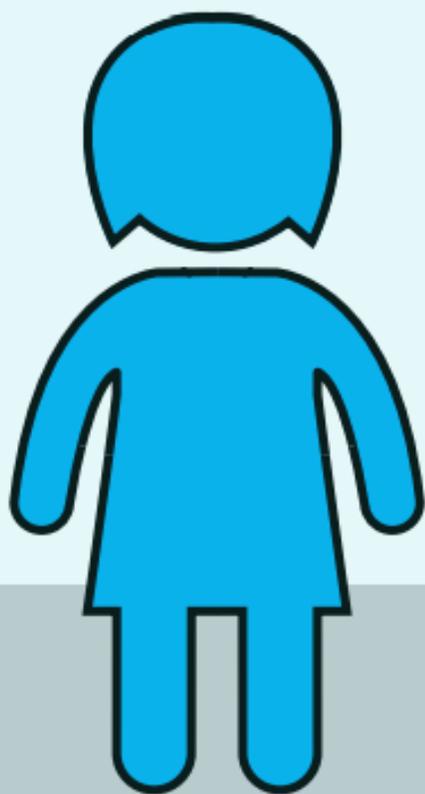


# 'Environmental injustice'

SOURCE: ROYAL COLLEGE OF PHYSICIANS &  
ROYAL COLLEGE OF PAEDIATRICS AND CHILD HEALTH 2016  
EVERY BREATH WE TAKE

**1 IN 3 CHILDREN**

**IN THE UK ARE GROWING UP BREATHING  
UNSAFE LEVELS OF AIR POLLUTION**



In the womb

Baby/toddler

Child

Outdoor pollution: vehicle exhaust, industrial emissions

 Harms from high pollution



Smaller head



Lower birth weight at term



 Harms from high pollution



Developmental problems



More wheezing



More coughs



 Harms from high pollution



Slower development of lung function



Asthma



Start of atherosclerosis



\*Includes exhaust gases from cooking, heating and burning solid fuels, use of household cleaners and other chemicals, VOCs, etc

Adult

Older person

Indoor pollution: tobacco smoke, household fumes\*



**Harms from high pollution**

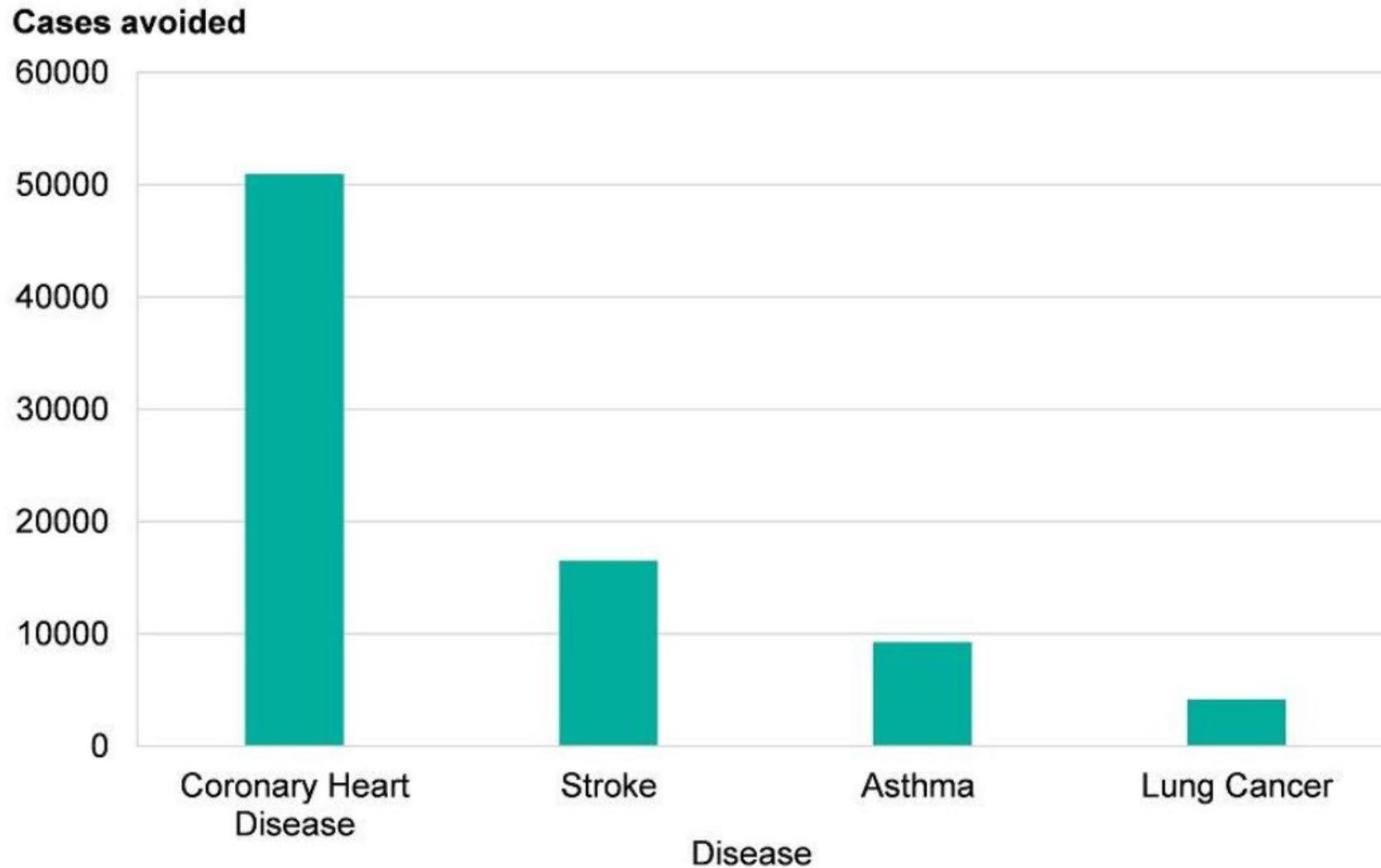
- Accelerated decline in lung function
- Asthma
- Type 2 diabetes
- Heart attacks
- Start of lung cancer



**Harms from high pollution**

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

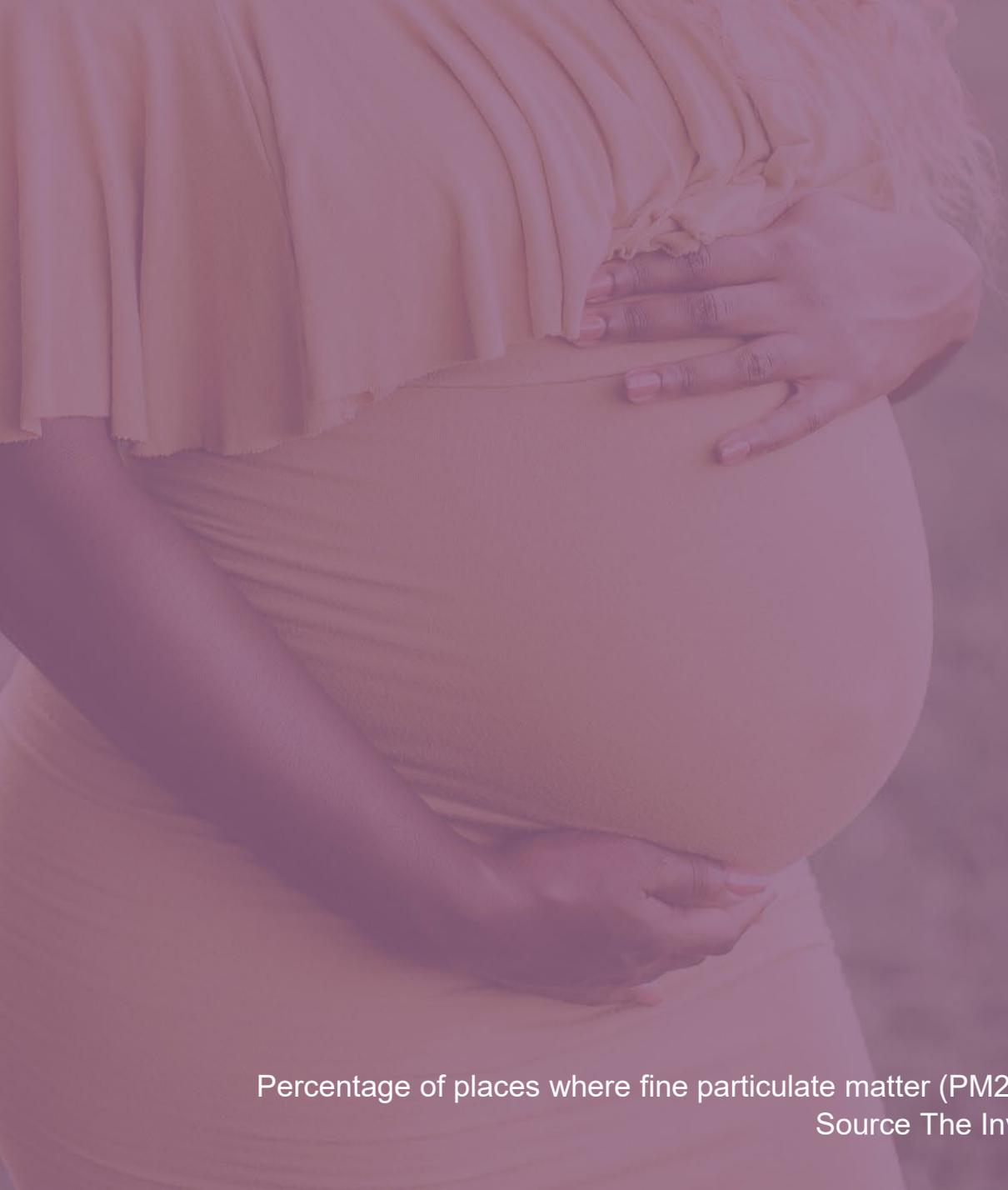
**Figure 1: cumulative new cases of disease avoided by 2035 for 1 µg/m<sup>3</sup> reduction in PM 2.5, England**



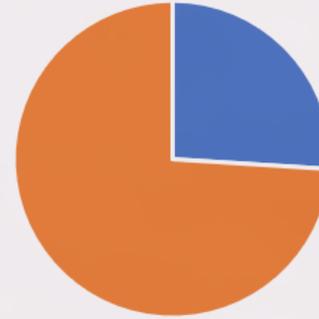
# The invisible threat:

how we can protect people from air pollution  
and create a fairer, healthier society

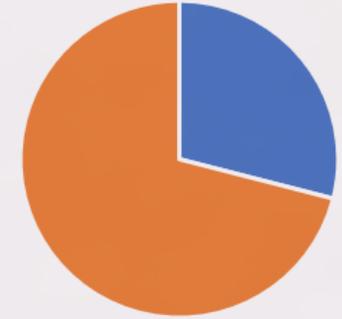




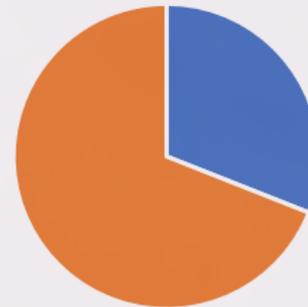
English care homes: 26%



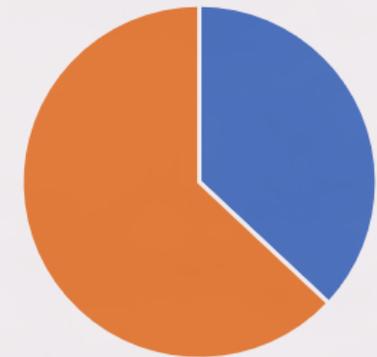
English Hospitals - 29%



English schools and colleges: 31%



English GP surgeries: 37%



Percentage of places where fine particulate matter (PM2.5) exceed levels recommended by the World Health Organisation

Source The Invisible Threat, BLF 2020

## CORONER'S CONCERNS

During the course of the inquest the evidence revealed matters giving rise to concern. In my opinion there is a risk that future deaths could occur unless action is taken. In the circumstances it is my statutory duty to report to you.

The **MATTERS OF CONCERN** are as follows. –

- (1) The national limits for Particulate Matter are set at a level far higher than the WHO guidelines. The evidence at the inquest was that there is no safe level for Particulate Matter and that the WHO guidelines should be seen as minimum requirements. Legally binding targets based on WHO guidelines would reduce the number of deaths from air pollution in the UK.
- (2) There is a low public awareness of the sources of information (such as UK-Air website) about national and local pollution levels. Greater awareness would help individuals reduce their personal exposure to air pollution. It was clear from the evidence at the inquest that publicising this information is an issue that needs to be addressed by national as well as local government. The information must be sufficiently detailed and this is likely to require enlargement of the capacity to monitor air quality, for example by increasing the number of air quality sensors.
- (3) The adverse effects of air pollution on health are not being sufficiently communicated to patients and their carers by medical and nursing professionals. The evidence at the inquest was that this needs to be addressed at three levels:
  - a. Undergraduate. I am informed that undergraduate teaching is the responsibility of the GMC, Health Education England and the NMC.
  - b. Postgraduate. I am informed that postgraduate education is the responsibility of the Royal Colleges, in this case the Royal College of Physicians, the Royal College of Paediatrics and Child Health, the Royal College of General Practitioners, and the NMC.
  - c. Professional guidance. In this case relevant organisations are NICE and the British Thoracic Society.

## Actions today

- Inhaler recycling & reducing stockpiling
- 'Green' inhalers
- Fewer patient journeys (better diagnosis and control)
- One stop shops
- Digital consultations
- Efficient buildings

## Future vision

- Awareness of clean air
- Continued help with smoking cessation
- Procurement for air quality
- Early/accurate diagnosis
- Innovations in pharma and reports on carbon impact
- Drug formularies contain information on 'global warming potential' (GWP)
- Consistent communication and education between clinicians



# Summary points

- Breathing clean air is a human right
- Poor air quality widens inequalities
- Education for clinicians & decision makers will...
  - Enable better local strategies and clinical pathways to improve air quality
  - Clinical role modelling
  - Clinicians who speak out more often



# Thanks

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7TH DECEMBER 2021

PRESENTED BY HEATHER HENRY, QUEEN'S NURSE



# Aim / Purpose of Event

## Key Aim:

- Engage communities in discussions about how the Government aims to tackle air pollution and its consequences

## Purpose of this specific Event:

- To consider the Government's plan to introduce more rigorous targets for air pollution





**Thank you for listening**