



UK HEALTH
ALLIANCE ON
CLIMATE CHANGE

MOVING BEYOND THE AIR QUALITY CRISIS

Realising the health benefits of
acting on air pollution



A report from the UK Health Alliance on Climate Change



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The UK Health Alliance on Climate Change was founded in April 2016, bringing together leading health bodies to advocate for responses to climate change that protect and promote health. Our vision is a world in which health is improved as climate change is solved. Our membership comprises many Medical Royal Colleges, the Royal College of Nursing, Faculties, the British Medical Association, the British Medical Journal, and The Lancet.

While climate change poses the greatest health threat of the 21st century, the actions needed to halt climate change can unlock large health co-benefits. The Alliance was formed in reaction to these profound threats and opportunities and seeks to drive an accelerated policy response.



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For any questions or queries about this UK Health Alliance on Climate Change report, or to discuss it further, please contact info@ukhealthalliance.org

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Executive Summary

Air pollution continues to have a large negative health impact on the UK population. The negative health effects of exposure to air pollution build up over time, and can include asthma, chronic obstructive pulmonary disease (COPD), cancer, dementia, stroke and heart disease, obesity and diabetes. Estimates of the mortality burden of air pollution are as high as 40,000 deaths a year. By 2035, the health and social care costs of air pollution have been estimated to reach up to £18.6 billion.

While the World Health Organisation advises that no levels of air pollution are safe, those with pre-existing respiratory and heart conditions and children are most vulnerable to its effects. Furthermore, people from socially and economically disadvantaged backgrounds are more likely to be exposed to higher levels of air pollution and are more at risk of negative health effects with children particularly vulnerable.

The policy recommendations in this report aim to improve air quality in general, with a particular focus on road transport. This is for three reasons: firstly, road transport is a major contributor to the air pollution problem. In 2016, for example, emissions from road transport accounted for 12% of particulate air pollution in the UK, the third largest source. Road transport accounted for 34% of UK nitrogen dioxide emissions in the same year, with the rate of reduction from this sector slowing down due to the increased contribution from diesel vehicles. Secondly, in delivering healthcare, the NHS is a significant contributor to air pollution with 3.5% of all road traffic in England undertaken on NHS business. Finally, the Alliance recognises that action on road transport can unlock large health co-benefits, through increases in cycling, walking and other active transport.

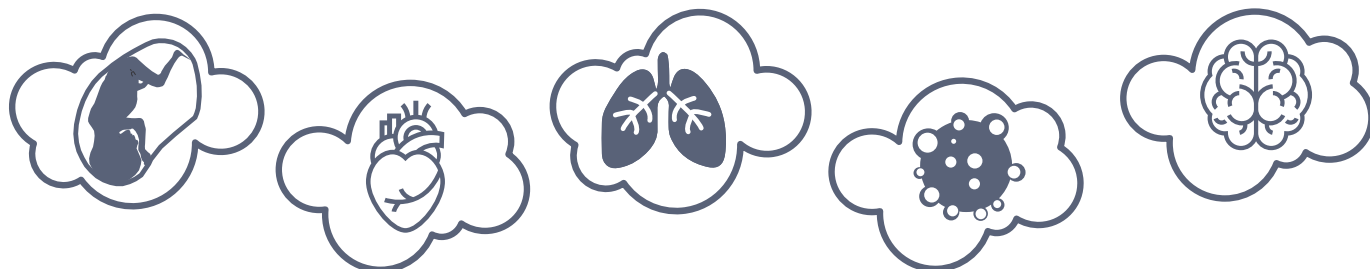
Overall, two shifts in transport use are needed to minimise road transport air pollution:

1. A move from diesel and petrol vehicles to electric and other zero emission fuels.

2. A reduction in overall vehicle use, with increases in shared and active transport, such as cycling and walking.

In response, the Alliance's key recommendations are:

- The government's duty to reduce air pollution and protect population health should be **enshrined in law through a new Clean Air Act**, with legally-enforced air quality standards that at least meet WHO recommended limits, a new independent statutory body to enforce these limits, a new independent advisory body modelled along the lines of the Committee on Climate Change, and powers and resources for local authorities and national agencies to protect health when air pollution levels are high.
- A UK-wide framework for **the expansion of Clean Air Zones in towns and cities is needed**, providing local authorities with the powers to charge vehicles and the funding to ensure effective implementation.
- The ban on the sale of new conventional diesel and petrol cars and vans should be **brought forward to 2030**.
- An **'Active Travel Scheme' should be created to support businesses and households in adopting shared and active transport options**. The Scheme should provide, for example, discounts on car club schemes, access to bikes and support to engage in physical activity, as opposed to grants to buy new vehicles, as has typified diesel scrappage policies of the past.
- By 2020, the government should **increase investment in active transport to at least £10 per capita**.
- An **'NHS Clean Air Fund' should be created to support the adoption of low and zero tailpipe emission vehicles for the NHS** and to support in the rollout of electric vehicles charging infrastructure, funded through fines and/or contributions when industries are found to be breaching emissions regulations, on the 'polluter pays' principle.



Introduction

Air quality is a key issue for the UK Health Alliance on Climate Change and its members. This is because of the large negative health impacts of air pollution, which range from asthma to diabetes, and have an estimated mortality impact of up to 40,000 early deaths a year.^{1,2} Estimates of the resultant costs to society and the economy exceed £22 billion.³ In turn, actions to limit air pollution not only reduce the health burden of poor air, but can improve general well-being through increases in physical activity and by helping mitigate climate change.

The health case for acting to reduce air pollution is clear and the Alliance has led the health profession's response, starting with an all-member policy position in early 2016, which made the case for a more integrated strategy to address air pollution and climate change.⁴ It outlined six key steps that should be taken to simultaneously improve air quality and tackle climate:

- Increase cross-departmental collaboration to promote a joined-up approach to tackling air pollution and climate change
- Phase-out coal power stations by 2025
- Expand existing clean air zones and extend their use to other cities
- Better monitor air pollution in areas where the most vulnerable populations live
- Retain or improve air quality standards that the previous EU regulations afforded us
- Better inform and support health professionals to take local action and provide advice to patients

While some of these measures have been adopted – most notably the phase out of coal – air pollution still imposes large health, economic, social and environmental costs on society. Action has not been fast or ambitious enough, nor have policies adequately recognised the virtuous circle of health benefits that arise from the integration of environmental and public health policy.

In this new policy position paper, the Alliance and its members present measures that are commensurate to the scale and urgency of the air pollution problem, building on previous recommendations, which the Alliance still supports. In chapter 2, this paper reviews the latest health impacts of air pollution, its relation to climate change, and the co-benefits from acting, including through increases in physical activity. Chapters 3 and 4 provide a comprehensive policy programme for reducing air pollution and maximising health co-benefits in the process.

This report is based on a submission made by the Alliance and its members to the government's 2018 draft Clean Air Strategy consultation.



1 Associations of long-term average concentrations of nitrogen dioxide with mortality: A report by the Committee on the Medical Effects of Air Pollutants [2018] Public Health England <https://bit.ly/2NIHUEg>

2 Every breath we take: the lifelong impact of air pollution [2016], Royal College of Physicians <https://bit.ly/1PUBD09>

3 Reducing air pollution in the the UK: Progress report 2018, Royal College of Physicians, London. <https://bit.ly/21MZg0g>

4 A Breath of Fresh Air: Addressing Climate Change and Air Pollution Together for Health, UK Health Alliance on Climate Change [2016] <https://bit.ly/2f9DTEx>



Sources of air pollution

The UK government has a statutory duty to monitor the concentrations of a number of harmful air pollutants, including sulphur dioxide, benzene, ozone and carbon monoxide. Among these, particulate matter and nitrogen oxides pose some of the greatest threats to health across the population and are the primary focus of this report.

Particulate matter (PM)⁶ are tiny particles suspended in the air. They come from natural sources, like pollen, or human sources, such as dust from car breaking. PM₁₀ refers to particles 10 micrometres (µm) or less in diameter, while PM_{2.5}, a subsection of PM₁₀, refers to those less than 2.5 µm in diameter. These particles are so small they can enter the lungs and even the blood, and can be transported around the body, entering other organs. Those with existing lung and heart conditions are more likely to have their health negatively impacted, as are older people, the very young, and pregnant women and their unborn children. Outdoors, PM comes from a variety of sources, including traffic, coal-fired power stations and domestic wood combustion heaters.⁷

Nitrogen oxides (NO_x)⁸ are gases that are mostly formed when fossil fuels, like petrol, are burned, including nitrogen dioxide (NO₂). In the moment, NO₂ exposure can cause sore eyes and inflammation of airways. Over time, it can make existing lung and heart conditions worse and increase the chance of respiratory problems. NO_x is a major problem in cities, with 80% of NO_x emissions near roads coming from road transport.

Air pollution is a public health crisis

Air pollution has a large negative health impact on the UK population. The effects of air pollution exposure build over a lifetime, and are linked to asthma, chronic obstructive pulmonary disease (COPD), cancer, dementia, stroke and heart disease, obesity and diabetes.⁹ The latest Committee on the Medical Effects of Air Pollution (COMEAP) report estimates

that PM_{2.5} and NO₂ air pollution had a mortality effect equivalent to between 28,000 to 36,000 deaths in the UK in 2013, associated with a loss of 328,000 – 416,000 life years.¹⁰ Other estimates, including from the Royal College of Physicians, put the combined impact at around 40,000 deaths a year.¹¹

In addition, each year, air pollution is estimated to cause:¹²

- over 6 million sick days
- over 20,000 people to be admitted to hospital with respiratory and cardiovascular problems
- an estimated social cost of £22.6 billion a year

By 2035, air pollution is projected to enact large negative health and economic impacts, including:¹³

- The health and social care costs of PM_{2.5} and NO₂ air pollution in England could reach £5.3 billion. This is for diseases that have a strong association with air pollution, including stroke, child asthma, coronary heart disease and lung cancer.
- If diseases with less evidence of association are included, such as diabetes, the costs on health and to the economy could reach over £18 billion.
- When all diseases are included, air pollution is expected to cause 2.4 million new cases of disease in England between now and 2035.
- PM_{2.5} alone could be responsible for around 350,000 cases of coronary heart disease and 44,000 cases of lung cancer in England between now and 2035.

Small changes can make a big difference – just a 1µg/m³ reduction in PM_{2.5} concentrations this year could prevent 50,000 new cases of coronary heart disease and 9,000 new cases of asthma.

⁵ Defra [2018] Clean Air Strategy 2018, Crown Copyright. <https://bit.ly/2LncgHQ>

⁶ ibid

⁷ Hime, Marks & Cowie [2018], A Comparison of the Health Effects of Ambient Particulate Matter Air Pollution from Five Emission Sources, International Journal of Environmental Research into Public Health, <https://bit.ly/2CA95v6>

⁸ Defra [2018] Clean Air Strategy 2018, Crown Copyright. <https://bit.ly/2LncgHQ>

⁹ Royal College of Physicians [2018] Reducing air pollution in the UK: Progress report 2018, London. <https://bit.ly/2IMZg0g>

¹⁰ Associations of long-term average concentrations of nitrogen dioxide with mortality: A report by the Committee on the Medical Effects of Air Pollutants [2018] Public Health England <https://bit.ly/2NIHUEg>

¹¹ Every breath we take: the lifelong impact of air pollution [2016], Royal College of Physicians <https://bit.ly/1PUBD09>

¹² Reducing air pollution in the the UK: Progress report 2018, Royal College of Physicians, London. <https://bit.ly/2IMZg0g>

¹³ Guidance – Air pollution: a tool to estimate healthcare costs [2018] Public Health England <https://bit.ly/2ICyUdl>

Anyone who spends significant time next to busy roads is more likely to suffer from the effects of air pollution, and schools and hospitals are often exposed to air pollution levels above legal limits. Furthermore, people from socially and economically disadvantaged backgrounds are more likely to be exposed to higher levels of air pollution and are more at risk of negative health effects.¹⁴ For example, in 2001, of the 2.5 million people resident in areas where the annual mean NO₂ limit value was exceeded, over half were in the poorest 20% of the population. By 2011, the exceedance population had fallen to 0.6 million due to overall improvements in air quality, but 85% of this population was in the poorest fifth.¹⁵ Overall, most deprived communities are exposed to some of the worst outdoor and indoor air quality.

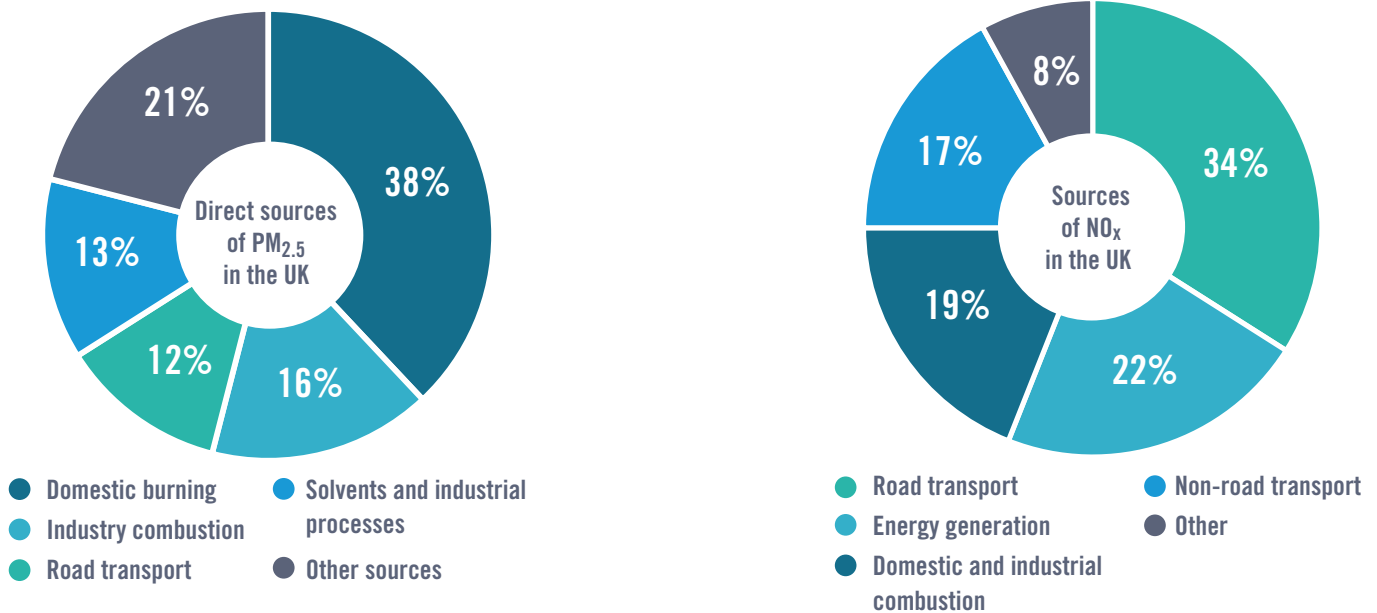
Children are another group that are particularly vulnerable to the effects of air pollution. Research has shown that exposure to PM affects children's lung development, including reversible deficits in lung function as well as chronically reduced lung growth rate and a deficit in long-term lung function.¹⁶ It has also been suggested that prenatal exposure to high levels of ambient PM₁₀ increased the risk of abnormal fetal growth.¹⁷

Road transport is a major cause of air pollution

In 2016, 44 out of 51 major UK cities exceeded the recommended limit for PM_{2.5} in the World Health Organization's (WHO) ambient air pollution database, with significant variation within cities.¹⁸ Furthermore, 37 of the 43 major urban areas in the UK were above legal limits for NO₂ in 2016.¹⁹

In 2016, emissions from road transport accounted for 12% of PM₁₀ and PM_{2.5} in the UK and were the third largest source after industrial processes and combustion in residential, public, commercial and agricultural sectors.²¹ Road transport accounted for 34% of UK NO_x emissions in 2016, with the rate of reduction from this sector slowing down due to the increased contribution from diesel vehicles. Crucially road transport is responsible for 80% of NO₂ near roadsides.²² Therefore, road transport is a major contributor to the air pollution public health problem; in London, for example, air pollution is the second most significant factor in determining health, after smoking.²³ As such, road transport is a major focus of this report.²⁴

Sources of air pollution in the UK²⁰



¹⁴ Davies S C et al. [2018] Annual Report of the Chief Medical Officer 2017, Health Impacts of All Pollution – what do we know? HM Government. <https://bit.ly/2IN0oRF>

¹⁵ Mitchell G, Norman P, Mullin K. Who benefits from environmental policy? An environmental justice analysis of air quality change in Britain, 2001–2011. *Environmental Research Letters*. 2015;10(10):105009.

¹⁶ Exposure to air pollution (particulate matter) in outdoor air. Copenhagen, WHO Regional Office for Europe [2011] (ENHIS Factsheet 3.3) <https://bit.ly/20PWWrK>

¹⁷ Zhao, N et al. [2018] Effects of prenatal exposure to ambient air pollutant PM₁₀ on ultrasound-measured fetal growth, *International Journal of Epidemiology*, Volume 47, Issue 4, 1 August 2018, Pages 1072–1081, <https://bit.ly/2A4aSpl>

¹⁸ Lancet Countdown and the Royal College of Physicians [2017] Lancet Countdown 2017 Report: Briefing for UK Policymakers. <https://bit.ly/2hd4sub>

¹⁹ DEFRA and DfT [2017] UK Plan for tackling roadside nitrogen dioxide concentrations, Crown Copyright. <https://bit.ly/2vLIZQ>

²⁰ Defra [2018] Clean Air Strategy 2018, Crown Copyright. <https://bit.ly/2LncgHQ>

²¹ *ibid*

²² *ibid*

²³ Laybourn-Langton L, Quilter-Pinner H and Ho H [2016] Lethal and Illegal: Solving London's air pollution crisis, IPPR.

²⁴ For the Alliance's wider view on air pollution policy, please see the UKHACC response to the government's draft Clean Air Strategy consultation <https://bit.ly/2pViKEg>

Air quality policy and climate change are related

Acting to reduce air pollution can also help to limit climate change, including through reducing the number of dirty vehicles and encouraging more people to cycle and walk. This is because sources of air pollution are also sources of greenhouse gas emissions. For example, transport is now the largest-emitting sector of the UK economy, accounting for 28% of UK greenhouse gas (GHG) emissions in 2017.²⁵ Furthermore, new car CO₂ emitted per mile has increased for the first time since records began (in 2000), increasing by 0.8% in 2017.²⁶ Demand for travel continues to grow across cars and vans, whereas efficiency improvements have slowed.²⁷ This sector is now significantly off-track from the cost-effective path in the Committee on Climate Change's (CCC) fifth carbon budget assessment.

Large reductions in coal power generation, which were recommended by the UK Health Alliance on Climate Change in 2016, have been the foundation of the UK's impressive decarbonisation to date.²⁸ In the UK in 2013, burning coal was linked to 1,600 premature deaths, 68,000 additional days of medication, 363,266 working days lost and more than a million incidents of lower respiratory symptoms, costing as much as £3.1 billion.²⁹ Hence, the phase out of coal contributes to air pollution reductions. As air pollution policy and climate change policy are intimately related, they should be viewed as such. In turn, the health dimension to these policies should be of priority consideration to government.

Climate change is a health threat – and opportunity

Climate change and its consequences are some of the greatest threats to health.³⁰ The consequences of climate change can impact health directly, through, for example, mental and physical ill health resulting from increases in extreme weather. Impacts can also occur indirectly, by undermining the conditions upon which good health can occur, including through higher incidence of vector borne disease and poor nutrition and social stress resulting from crop failure or famine. Climate changes interact with worsening air pollution, ocean acidification, deforestation, biodiversity loss, and

other forms of environmental degradation to undermine the foundations of good health. The health impacts of climate change are being experienced today, and will prove catastrophic if left unabated.

But acting on climate change is also one of the greatest opportunities to improve health across the UK and the world.³¹ Many of the drivers of climate change – fossil fuels, over-consumption, and poorly designed cities – also cause ill health directly, through air pollution, unhealthy diets, and physical inactivity. Hence, by responding to climate change, we can simultaneously address these health challenges, often making climate change mitigation policies cost-effective and sensible public health interventions.

Similarly, health system strengthening and improved community health is one of the most effective adaptation strategies to minimise the harm caused by climate change. In considering the sum of these co-benefits, the 2015 Lancet Commission on Health and Climate Change concluded that “responding to climate change could be the greatest global health opportunity of the 21st century”.³² Recent research estimates that meeting greenhouse reduction commitments could reduce NO₂ levels by up to 60% across the UK, with greater reductions in many cities, leading to significant health improvements.³³



²⁵ Reducing UK emissions 2018: Progress Report to Parliament, Committee on Climate Change, June 2018 <https://bit.ly/2Ku6CWw>

²⁶ *ibid*

²⁷ *ibid*

²⁸ A Breath of Fresh Air: Addressing Climate Change and Air Pollution Together for Health, UK Health Alliance on Climate Change [2016] <https://bit.ly/2f9DTEx>

²⁹ Huscher J, Jensen G. What does coal cost health in the United Kingdom? Health and Environment Alliance [2013]

³⁰ Chan M [2007] 'Climate change and health: preparing for unprecedented challenges', Statement by WHO Director-General Dr Margaret Chan on, 10 December 2007. <https://bit.ly/1qEMp2r>

³¹ Watts N et al. The Lancet Countdown on health and climate change: from 25 years of inaction to a global transformation for public health, Volume 391, Issue 10120, P581-630, February 10, 2018. <https://bit.ly/2Oi6egT>

³² Wang H and Horton R [2015] 'Tackling climate change: the greatest opportunity for global health', The Lancet, 386(10006), pp.1798-1799.

³³ Williams M. L. et al. [2018] 'The Lancet Countdown on health benefits from the UK Climate Change Act: a modelling study for Great Britain', *Lancet Planetary Health*, 2(5), pp.e202-e213. <https://bit.ly/2r5ocFK>

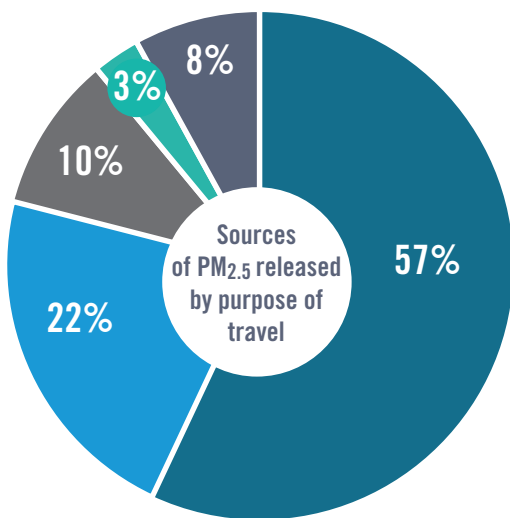
THE NHS AND TRANSPORT

The NHS has an important role to play in reducing emissions from transport. The health and social care system accounts for 5% of all road traffic in England and, as a result, is a major contributor to air pollution.³⁴ Of this, NHS travel accounts for around 3.5% of road traffic in England, which contributes around 7,285 tonnes of NO_x and 330 tonnes of PM_{2.5}, imposing an estimated economic cost of £345 million from mortality and other social costs.³⁵ Therefore, by creating air pollution as it delivers healthcare, the NHS also contributes to ill health.

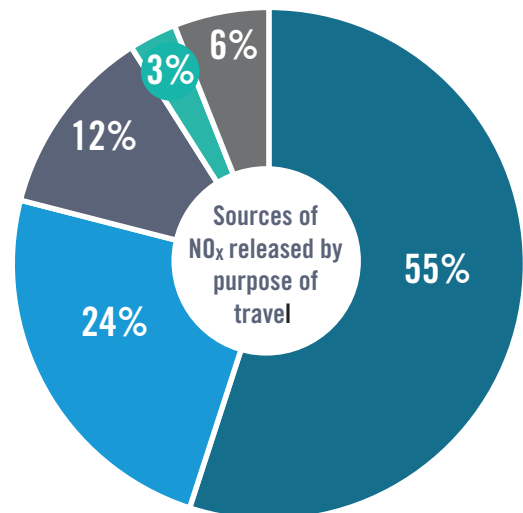
By reducing sources of air pollution across its activities, the NHS can play a major role in reducing the health impact of poor air. Moving to more sustainable modes of transport not only reduces air pollution but can improve convenience and safety, as well as saving time and money.³⁷

These actions can also reduce carbon emissions. Indeed, the NHS is making significant progress in decarbonising – the health and social care carbon footprint has reduced by 18.5% between 2007 and 2017, which equates in scale to the annual emissions of Mauritius or Cyprus.^{38, 39} Simultaneously, some indicators of NHS clinical activity are up by 27.5% over the same period.⁴⁰ This signals an effective ‘decoupling’ of clinical growth from carbon emissions, much in the same way that the UK economy has grown while its emissions have fallen.⁴¹ In further decarbonising, the NHS should ensure that policies to reduce greenhouse gas emissions complement those to reduce air pollution.

NHS air pollution impact by pollutant and areas of influence, 2017³⁶



- Business Mileage
- Supply Chain
- Patient and Visitor
- Ambulance fleet
- Staff Commute



- Business Mileage
- Supply Chain
- Patient and Visitor
- Ambulance fleet
- Staff Commute

³⁴ Reducing the use of natural resources in health and social care: 2018 report, Public Health England, NHS England. <https://bit.ly/2Ra7ujl>

³⁵ *ibid*

³⁶ *ibid*

³⁷ NHS Confederation and NEF (2007) Taking the Temperature-Towards an NHS response to Global Warming, London

³⁸ Reducing the use of natural resources in health and social care: 2018 report, Public Health England, NHS England, Sustainable Development Unit. <https://bit.ly/2Ra7ujl>

³⁹ CAIT – Historical Emissions Data (Countries, U.S. States, UNFCCC), World Resources Institute. <https://bit.ly/2QmRKZw>

⁴⁰ NHS Digital Hospital Episode Statistics (HES) <https://bit.ly/20qWUq7>

⁴¹ Reducing UK emissions 2018: Progress Report to Parliament, Committee on Climate Change, June 2018 <https://bit.ly/2Ku6CWw>

Responding to the air pollution problem

Cleaner fuels and less vehicle use reduces air pollution

No level of air pollution exposure is safe.⁴² As such, the ultimate aim of the government's air pollution policy should be to minimise the health impact of air pollution by seeking to reduce concentration levels to as close to zero as possible in the shortest amount of time.⁴³

Overall, two shifts in transport use are needed to minimise road transport air pollution:

- 1. A move from diesel and petrol vehicles to electric and other zero emission fuels**
- 2. A reduction in overall vehicle use, with increases in shared and active transport, such as cycling and walking**

In the case of the first shift, electric vehicles have no direct exhaust pollution and minimal noise pollution but do emit pollution from non-exhaust sources.⁴⁴ Furthermore, electric vehicles, if powered from renewable energy sources, emit no direct greenhouse gas emissions. As such, electric vehicles should be promoted, as a matter of priority, over diesel and petrol vehicles.

However, while there are significant health and environment benefits from electric vehicles, they are still contributors to particulate matter and nitrous oxides, including through tyre wear-and-tear, breaking and resuspension.⁴⁵ Therefore, alongside moving to electric vehicles, a reduction in road transport of all kinds is needed to further minimise air pollution and associated negative health impacts. In particular, shifting to higher rates of shared vehicle use is needed to reduce overall road transport. Primarily, this means a modal shift from private vehicle use to public and other shared transport. This can be supported through increased use of digital technology as an enabler of shared, more efficient vehicle use, including through use of car clubs, journey planners, and remote access bike share.⁴⁶

Alongside shared transport, vehicle use should be minimised altogether and active transport, such as cycling and walking, promoted as a first-best option. This is because active transport

emits little to no air pollution and, crucially, provides the co-benefit of improving health through increases in physical activity. Previous analyses by Sustrans have shown that the average benefit-to-cost ratio of a traffic-free walking and cycling route is 26:1, with the majority of benefit coming from improved health.⁴⁷ This is well in excess of the Department of Transport's (DfT) own benchmark for valuing 'very highly' any scheme which returns more than £4 for every £1 invested'.⁴⁸ It is also clear that the public strongly values active travel and supports investment to increase it. In a survey of seven UK cities 75% of respondents supported increased investment in cycling and thought the government should be investing an average of £26 per head per year.⁴⁹ It is because of the large direct and indirect health benefits of active transport that the Alliance and its members have consistently called for increases in investment in cycling and walking.⁵⁰

The pace of change has been too slow

Air pollution is a national problem and is deeply entrenched into how our society and economies work, with people, businesses and the NHS relying on road transport and other sources of air pollution every day. However, there is much that can be done to quickly reduce high levels of air pollution – and realise the health benefits of doing so – including reducing the reliance on dirty vehicles, investing in cleaner alternatives, and making it easier for people to cycle and walk.

The government response to date has been inadequate.⁵¹ The government has lost a series of legal cases taken by UK citizens and campaign organisations, which have ruled that a lack of action from the government poses 'a significant threat to public health' and the UK has now been taken to the European Court of Justice for not reducing emissions quick enough. Furthermore, the UN has warned that 'air pollution continues to inflict grave harms on the rights of children, women, older persons and people with disabilities, with limited accountability for perpetrators'.⁵² While targets are being introduced more immediate steps are needed to reduce exposure now and begin to realise the health benefits of acting on air pollution. In particular, investment in cycling, walking and other active transport is too low: in 2017, the government spent less than 5% of its transport budget on active transport.⁵³

42 Ambient (outdoor) air quality and health, World Health Organisation [2018]. <https://bit.ly/2tblhek>

43 The Alliance understands that reducing air pollution is determined by a number of factors, including the cost and plausibility of action and transboundary effects, with up to 50% of measured PM_{2.5} in the UK coming from non-domestic sources.

44 McKoy, D et al, Still failing to tackle air pollution, BMJ 2017, 358, 9 August 2017. <https://bit.ly/20wGGwh>

45 Defra, Department for Transport, Brakes, tyres and road wear call for evidence, 26 July 2018. <https://bit.ly/2PwOIID>

46 Laybourn-Langton, L. [2017] Crossroads: Choosing a future for London's transport in the digital age, IPPR. <https://bit.ly/2RG7FU6>

47 Sustrans. The National Cycle Network Route User Monitoring Report – To end 2008. <http://bit.ly/25c28Jc>

48 Department for Transport. Claiming the Health Dividend: A summary and discussion of value for money estimates from studies of investment in walking and cycling. 2014. <http://bit.ly/1GuHF3p>

49 Sustrans. What does bike life mean to you? [ICM Bike Life Household research 2015 on behalf of Sustrans]. 2015. <http://bit.ly/1jSN9xy>

50 See, for example: <https://bit.ly/2IKCxCi>

51 Royal College of Physicians [2018] Reducing air pollution in the UK: Progress report 2018, London. <https://bit.ly/2IMZgOg>

52 Office of the United Nations High Commissioner for Human Rights. Brexit puts UK at risk of worsening pollution and lower environmental standards, UN rights expert warns. [2017] <https://bit.ly/2QL21ix>

53 Royal College of Physicians [2018] Reducing air pollution in the UK: Progress report 2018, London. <https://bit.ly/2IMZgOg>

Policy Recommendations

The UK currently has a unique opportunity to establish itself as a global leader in air pollution policy. In particular, the UK's departure from the European Union need not result in any weakening of our air quality commitments – and lead to negative impacts on health. Instead, the UK should go further in the scope and ambition of its policies, linking them more strongly to associated issues, such as climate change. To realise this potential, policy ambition is required – the central tenants of which the Alliance maps out below.

1 Protecting our health – a new Clean Air Act

No level of air pollution exposure is safe. As such, the ultimate aim of the government's air pollution policy should be to minimise the health impact of air pollution by seeking to reduce concentration levels to as close to zero as possible in the shortest amount of time.⁵⁴ Accordingly, we recommend that **the government's duty to reduce air pollution and protect public health should be enshrined in law through a new Clean Air Act**. The Act should include:

- **Legally-enforced air quality standards** that at least meet WHO recommended limits, with a plan to steadily decrease the legal exposure limit over time.⁵⁵
- **A new independent statutory body** should be established as soon as possible to enforce these limits; either a new body, potentially called 'Air Quality UK', holding the UK government, local authorities and devolved administrations to account, or a new overall environmental watchdog endowed with full powers of oversight and enforcement, as presented by the government in its 'Environmental Principles and Governance after EU Exit' consultation.⁵⁶ This statutory body should also ensure the complementarities between air pollution policy and decarbonisation policy are maximised.
- **The creation of an independent non-departmental public body**, formed in statute, that advises the government on the air pollution problem, its causes, and assesses potential and planned policies to improve air quality. This body, potentially called the Committee on Air Quality (AQC), should be modelled on the Committee on Climate Change (CCC), providing regular reports to Parliaments and Assemblies on the progress made in

reducing air pollution, and should explore the plausibility of applying a 'budgetary' approach to air pollution reductions, in much the same way as the CCC does for carbon emissions. Crucially, the AQC should be separate from the enforcement body described above and work closely with the CCC to ensure close interrelation between air quality and climate change policies. It should be staffed with medical and academic experts, while ensuring it provides a system-wide view of latest expert evidence – or lack thereof.

- **Powers to and resources for local and regional authorities** to tackle all sources of air pollution, including Clean Air Zones.
- **Empowering local authorities to protect public health** when air pollution levels are high. When these limits are exceeded, local authorities should have the power to close or divert roads to reduce the volume of traffic, especially near schools.
- **A requirement that national agencies and local authorities** protect those most at risk and reduce exposure to air pollution among vulnerable groups such as children, older people and those with pre-existing health conditions.⁵⁷

In particular, adequate resources need to be provided to national agencies and local authorities as a matter of priority so that measures to reduce exposure and protect population health do not come at the cost of providing other local services. The Alliance notes that local authorities have experienced a nearly 50% reduction in government funding since 2010.⁵⁸ More funding is likely needed to adequately protect populations against the risk of air pollution at the local level.⁵⁹

In particular, protection from air pollution should focus on those who are most vulnerable to its effects. While the draft Clean Air Strategy is right to identify children, the elderly and individuals with preexisting cardiovascular and respiratory conditions as particularly vulnerable to air pollution, it does not focus enough on the socio-economic differences that contribute to vulnerability. Our most deprived communities are exposed to some of the worst levels of indoor and outdoor air pollution, contributing to an approximately 10 year gap in life expectancy between the highest and lowest socioeconomic group.⁶⁰

⁵⁴ The Alliance understands that reducing air pollution is determined by a number of factors, including the cost and plausibility of action and transboundary effects, with up to 50% of measured PM_{2.5} in the UK coming from non-domestic sources.

⁵⁵ World Health Organisation [2018] Ambient (outdoor) air quality and health <https://bit.ly/2tb1hek>

⁵⁶ The Alliance view on the government's currently proposed watchdog shall be submitted for the consultation on the proposed Environmental Principles and Governance Bill.

⁵⁷ Royal College of Physicians [2018] Reducing air pollution in the UK: Progress report 2018, London. <https://bit.ly/2IMZgOg>

⁵⁸ Financial sustainability of local authorities [2018] National audit Office. <https://bit.ly/2oQ6wwl>

⁵⁹ Sadiq to unite cities with call to ban new petrol and diesel vehicles, 18 June 2018, London Assembly <https://bit.ly/2InaIBC>

⁶⁰ Every breath we take: the lifelong impact of air pollution [2016], Royal College of Physicians <https://bit.ly/1PUBD09>

As the Chief Medical Officer has concluded, socio-economically deprived groups face a ‘Triple Jeopardy’ from air pollution: “first, increased risks from social and behavioural determinants of health; second, higher risks from high ambient pollution exposure; and, third, an effect modification that makes exposure to ambient pollutants exert disproportionately large health effects on them compared with advantaged groups.”⁶¹ Health inequalities cost the NHS an estimated £20 billion per year and so health inequalities are rightly a priority for health policy in the UK.⁶² This priority should be extended to air pollution.

Therefore, we recommend that central and local government should be required to present to an air quality enforcement body (e.g. Air Quality UK, as suggested above) **plans for progressively reducing the impact of air pollution on socio-economically deprived groups**, alongside its plans to reduce air pollution impacts on the population in general and vulnerable groups in particular.⁶³

Extra funding into research to develop new technologies to improve air pollution monitoring is needed. As stated in the Chief Medical Officer’s most recent annual report, “there is a proliferation of data, across pollution exposures and health outcomes, ‘joined-up data’ increase size and richness of datasets, and can add a longitudinal component – all of which increases the ‘power’ of these data to answer question about the health impacts of pollution.”⁶⁴ In this context, we recommend that a **single accessible portal for air quality information should be developed**, available publicly. More collaboration needs to occur between the health sector, industry and academic community, as well as national and local government, to ensure the quality, consistency and interoperability of data and that appropriate governance are in place. Furthermore, data on the portal, and accessibility to health professionals and academics, should be enabled fast enough to maximise the effectiveness of responses to emerging health threats. A summary of the most recent air pollution data should be released monthly, as a statutory requirement of the portal akin to the notifications of infectious diseases (NOIDs) updates curated by Public Health England. Wherever possible, live data should be available or at the highest frequency accessible.

The evidence of the links between health inequalities and air pollution is limited for a number of reasons. This includes the prevailing use of area-level data rather than at the individual level. While area-level data can be helpful, combining data, including pollution exposures, health outcomes and socio-demographic data, will help develop a better understanding of

the relationship between health inequalities and air pollution. Therefore, as part of its plans to reduce air pollution impacts on socio-economically deprived groups, **the government should ensure investment in air pollution monitoring and research supports in understanding the relationship between health, socio-economic position and air pollution**. As one example, those who live in housing close to factories are particularly vulnerable to high levels of air pollution exposure.⁶⁵ Children particularly suffer from health inequalities, with, for example, research showing asthma in children directly linked to deprivation.⁶⁶

As understanding as to the magnitude of the health impacts of many air pollutants is an ongoing process, including NO_x and PM and the health effects resulting from their interrelation, it is imperative that air quality and health scientists and health practitioners are at the forefront of and have access to the latest data collection and analysis, ideally working with the new statutory advisory body described above. Key areas of future research necessary to understand the full health impact of air pollution include:⁶⁷

- The systemic effects of longer-term exposure to air pollution, including obesity, diabetes, changes linked to dementia, and cancer, as well as effects in early childhood and on the developing foetus.
- The relationship between indoor air pollution and health, including the key risk factors and effects of poor air quality in our homes, workplaces and schools.
- The health outcomes and pollution over an individual’s lifetime, as well as the health impacts of WHO limits, and below.
- The relative impacts of different sources of emissions on human health (e.g. road transport, farming, non-road mobile machinery, shipping etc.) to understand how different sectors are affecting public health.

We do not know how the health effects of particulate matter vary from different sources. There is some evidence that emissions of particulate matter from coal-fired power stations and traffic may have more adverse health effects than particulate matter from other sources. However, overall we do not fully understand how different emissions sources affect health differently.⁶⁸ Funding is needed to consolidate existing research on this topic, and to establish a harmfulness hierarchy from different emissions sources. Better understanding of this will encourage air pollution policy that maximises the intersection between environmental and health considerations.

61 Jerrett et al. [2001] *Environment and Planning A*, 33 (955-973)

62 Challenging Health Inequalities: Support for CCGs [2017] NHS England. <https://bit.ly/2AyhgV3>

63 Davies S C et al. [2018] Annual Report of the Chief Medical Officer 2017, Health Impacts of All Pollution – what do we know? HM Government. <https://bit.ly/2IN0oRF> (18)

64 *ibid*

65 Philips, J, [2017] The UK environment – fighting pollution, improving our health and saving us money, Office for National Statistics <https://bit.ly/2xD2UV9>

66 State of Child Health 6 – Health conditions of childhood, [2018], Royal College of Pediatrics and Child Health <https://bit.ly/2ubgvzh>

67 Royal College of Physicians [2018] Reducing air pollution in the UK: Progress report 2018, London <https://bit.ly/2IMZgOg>

68 Hime, Marks & Cowie [2018], A Comparison of the Health Effects of Ambient Particulate Matter Air Pollution from Five Emission Sources, *International Journal of Environmental Research into Public Health* <https://bit.ly/2CA95v6>

2 Reducing emissions from transport

As noted above, two shifts in transport use are needed to minimise road transport air pollution: a move from diesel and petrol vehicles to electric and other zero emission fuels; and a reduction in overall vehicle use, with increases in shared transport and active transport, such as cycling and walking.

In seeking to realise these goals, the Alliance believes that 2040 is not an acceptable time to end the sale of new petrol and diesel cars and vans – with many countries across the world seeking to phase out these vehicles quicker. Norway has pledged to implement a ban of the sale of new petrol and diesel cars by 2025 and India has pledged to sell only electric vehicles 2030. Air pollution from road transport is a major threat to health and should be reduced as quickly as possible. As such, we recommend that **the ban on the sale of new diesel and petrol cars and vans should be brought forward to 2030**. It has been estimated that bringing forward the ban could reduce the current gap in meeting the UK's carbon budget by between 60 and 85% over the fourth and fifth carbon budgets.⁶⁹

Furthermore, a UK-wide framework for **the expansion of Clean Air Zones in towns and cities is needed**, providing local authorities with the powers to charge vehicles and the funding to ensure effective implementation, as per the Alliance's recommendation from 2016.⁷⁰ Clean Air Zones should also cover key interchanges for other modes of transport, including schools, ports and airports.

In addition to these recommendations, the Alliance notes that:

- Fiscal policy needs to address the fact that currently, even with Vehicle Excise Duty and tax paid on fuel, the costs to society greatly outweigh the costs paid by drivers.⁷¹ In addition, while the costs of car use are low, the costs of public transport journeys are high. Addressing this imbalance requires encouraging more people not to drive.
- Large fleets belonging to business have a key role to play in any action to reduce emission from transport. Royal Mail, for example, operated a fleet of 47,000 vehicles in 2017.⁷² In London, 85% of goods are transported

by road and freight makes up 17% of London's road traffic.⁷³ Ratios are similar in other major urban centres. Therefore, incentives need to be put in place for consumers to have items delivered to local consolidation centres, and a levy on home delivery for singular items should be explored.

- The UK should work with international partners to research and develop new standards for tyres and brakes, as major contributors to particulate matter. Legislation should be considered to make tampering with emissions controls a legal offence and measures to ensure any manufacturer found tampering with their emissions should receive a large fine, as a 'polluter pays' mechanism. Polluters should be required to take responsibility for harming health and that fines should be of a level that deters future behaviour, such as a non-trivial percentage of revenues.⁷⁴ The resultant revenues should be invested in schemes to reduce unsustainable vehicle use, such as the 'NHS Clean Air Fund' recommended below.

3 Realising the health opportunity – investment in active travel

The need to encourage individuals to participate in physical activity has never been greater. Over half the population do not reach a healthy level of activity, with wide variations between groups, sufficient to cause ill-health.⁷⁵ Previous government analyses have concluded that the total cost of inactivity in the UK is over £20 billion a year.⁷⁶ There are greater intangible costs too – in the UK, lack of physical activity is acknowledged as one of the top four factors responsible for premature deaths and long-term diseases (alongside smoking, alcohol and poor nutrition), and also as a key mechanism for large inequalities in health.^{77,78,79,80}



69 How the UK can lead the electric vehicle revolution. [2018] Green Alliance. <https://bit.ly/2EIQUoX>

70 Royal College of Physicians [2018] Reducing air pollution in the UK: Progress report 2018, London <https://bit.ly/2IMZgOg>

71 Technische Universität Dresden. The True Costs of Automobility: External Costs of Cars Overview on existing estimates in EU-27, Dresden [2012]

72 Horses to horsepower – 120 years of motorised mail deliveries [2017] Royal Mail Group <https://bit.ly/2L7HzZV>

73 TfL launches freight programme to deliver improved air quality [2016] Transport for London <https://bit.ly/2uhei5j>

74 Royal College of Physicians [2018] Reducing air pollution in the UK: Progress report 2018, London. <https://bit.ly/2IMZgOg>

75 'Exercise: The miracle cure and the role of the doctor in promoting it' [2015] Academy of Medical Royal Colleges <https://bit.ly/2jdXeln>

76 HM government and Mayor of London [2014] Moving More, Living More; The Physical Activity Olympic and Paralympic Legacy for the Nation. Publ: Cabinet office. <https://bit.ly/2EaMYO9>

77 Driessens S, Van Oyen H, Demarest S, Van der Heyden J, Gisle L, Tafforeau J [2010]. 'Multiple risk behaviour: increasing socio-economic gap over time?' European Journal of Public Health, vol 20, no 6, pp 634–9 [ePub 2009] <https://bit.ly/2A421OQ>

78 Chief Medical Officer [2009] Annual report 2009, Department of Health <https://bit.ly/2CyMOxU>

79 Dept of Health [2009]. Be Active, Be Healthy: a plan to get the nation moving. <https://bit.ly/2E6Tvc5>

80 Buck, D, Frosini F. [2012] Clustering of unhealthy behaviours over time Implications for policy and practice. Kings' Fund, London <https://bit.ly/2QycHk8>

There are sound economic justifications for encouraging active travel – both for individuals and the public purse. These costs include costs of over £8 billion related to physical diseases and £7 billion relating to mental health problems.^{81,82} Further to this, there is a plethora of hidden costs due to reduced productivity – for example, 7% of the working age population is on incapacity benefit of which 40% is related to mental health conditions and 30% to musculoskeletal conditions.⁸³

Measures to support moderate exercise for 30 minutes, five times a week could generate savings of over 15% of the NHS budget across the UK, and could also save over 15% of the UK's social care budget.^{84,85} This recommendation echoes others made by NICE, the BMA, the Royal College of Physicians, the King's Fund and the government.^{86,87,88,89,90}

Changes in infrastructure are needed to encourage harder to reach groups to increase active travel.^{91,92,93} The benefits that come from improving the outdoor environment to increase activity will significantly outweigh the costs – indeed, benefits to costs ratios of up to 19:1 are reported from investment in walking and cycling infrastructure, mainly from health gains to the local population.^{94,95,96,99}

Overall, the government needs to encourage more sustainable modes of transport like cycling, walking and public transport. In particular, more support is needed for households and businesses to make the shift away from unsustainable transport. In order to achieve this, we recommend the creation of a national **'Active Travel Scheme' to provide funding to households and businesses to incentivise them to move away from polluting vehicles** to more sustainable alternatives and a reduction in vehicle use in general. This should provide, for example, discounts on car club schemes, access to bikes

and support to engage in physical activity, among others – as opposed to grants to buy new vehicles, as has typified diesel scrappage policies of the past. The Scheme should seek to realise three goals, as it encourages decreases in polluting vehicle use:

- Rapid increases in physical activity, in particular walking and cycling
- Large scale adoption of car sharing schemes
- Targeted support for socioeconomically deprived groups, small businesses and those who find it hardest to move beyond (polluting) vehicle use

In addition, we also recommend that:

- **By 2020, the government should increase investment in active transport to at least £10 per capita.**⁹⁸ This mirrors the recommendation of the All Party Parliamentary Group on Cycling's Get Britain Cycling report of £10 per person annually solely on cycling (compared to the less than £2 currently spent), rising to £20, in order to boost cycle use to 10% of trips by 2025, and to 25% by 2050.⁹⁹ Spending on active travel is an investment not a subsidy and should be seen as such. Investment in cycling, walking and other active transport¹⁰⁰ is too low currently; in 2017, the government spent less than 5% of its transport budget on active transport. There is solid evidence, accepted by DfT, to support this. DfT's robust mechanism for calculating return on investment has consistently demonstrated that walking and cycling schemes show much better value for money than most motor transport schemes.¹⁰¹

81 Lordon G et al for Nuffield Health [2013] 12 minutes more...The importance of physical activity, sports and exercise, in order to improve health, personal finances and the pressures on the NHS <https://bit.ly/20QjIzD>

82 Naylor C, Parsonage M, McDaid D, Knapp M, Fossey M, Galea A for King's Fund [2012] Long-term conditions and mental health: The cost of co-morbidities King's Fund <https://bit.ly/20j9skg>

83 Black C [2008] Working for a healthier tomorrow <https://bit.ly/2C3K22C>

84 World Health Organization [2011] Health economic assessment tools (HEAT) for walking and for cycling, available at <https://bit.ly/1WPx1vn>

85 CTC [2013] Cycling and the economy <https://bit.ly/2CxTIZt>

86 NICE [2012] Walking and cycling: local measures to promote walking and cycling as forms of travel or recreation. <https://bit.ly/2PpBren>

87 British Medical Association [2012] Healthy transport=healthy lives, BMA, London. <https://bit.ly/2QD0ol8>

88 Royal College of Physicians [2012] Exercise for life: physical activity in health and disease. London: RCP <https://bit.ly/20dFCO3>

89 King's Fund [2012] Sustainable health and social care Connecting environmental and financial performance <https://bit.ly/2c9k5DV>

90 Dept of Health [2009]. Be Active, Be Healthy: a plan to get the nation moving. <https://bit.ly/2E6Tvc5>

91 Morrison D, Petticrew M, Thomson H. [2003] What are the most effective ways of improving population health through transport interventions? Evidence from systematic reviews. *Journal of Epidemiology & Community Health* 2003; 57:327-333. <https://bit.ly/2yxHGpd>

92 Morrison et al [2004] Evaluation of the health effects of a neighbourhood traffic calming scheme, *Journal of Epidemiology and Community Health*, 58:837-840. <https://bit.ly/2A4y6fn>

93 NICE [2008] (National Institute for Health and Clinical Excellence) Guidance on the promotion and creation of physical environments that support increased levels of physical activity <https://bit.ly/2A4k6SS>

94 All Party Parliamentary cycling group (2013) Get Britain cycling. <https://bit.ly/20hRtKN>

95 NICE [2012] Walking and cycling: local measures to promote walking and cycling as forms of travel or recreation. <https://bit.ly/2pLE4vW>

96 Government office for the South West and Department of Health [2012] Value for Money: An Economic Assessment of Investment in Walking and Cycling <https://bit.ly/2CBiyIO>

97 Sustrans [2017] Economic appraisal of walking and cycling routes <https://bit.ly/2QDq6aL>

98 Every breath we take: the lifelong impact of air pollution [2016], Royal College of Physicians <https://bit.ly/1PUBD09>

99 All Party Parliamentary Group on Cycling [2013] Get Britain Cycling – Summary and Recommendations. <https://bit.ly/1TqK0na>

100 Royal College of Physicians [2018] Reducing air pollution in the UK: Progress report 2018, London. <https://bit.ly/21MZgOg>

101 Department for Transport. Claiming the Health Dividend: A summary and discussion of value for money estimates from studies of investment in walking and cycling. [2014] <http://bit.ly/1GuHF3p>

- **The government should take steps to tackle the major disincentives to walking and cycling.** Many people perceive cycling as dangerous.¹⁰² Accordingly, no new road scheme or housing development should be permitted without additional infrastructure for active travel. At present, schemes to retro-fit cycle lanes or introduce traffic calming into towns are often defeated by councils or residents who do not wish to lose parking places or have traffic calming in their area.^{103, 104} Attention should be paid to: potholes, re-training of drivers, having codes of conduct for drivers on work business, imposition of sanctions for those who drive dangerously around bicycles, among others.
- **Training of motorists is urgently needed to reinforce the Highway Code stipulations about vulnerable road users.** Sanctions should be reinforced. For example, many motorists do not know that they should not overtake and then turn left, nor that a good margin should be given when overtaking a cyclist. Initiatives such as ‘The Dutch Reach’ (opening a car door with the opposite hand to encourage looking for cyclists) should be supported. It will take multiple actions on many fronts to encourage more people to cycle, yet many other European countries have managed this.

4 The role of the NHS

The NHS has an important role to play in reducing emissions from transport. The NHS accounts for 3.5% of all road traffic in England.¹⁰⁵ The NHS should play its part in reducing air pollution, leading by example. Moving to more sustainable modes of transport can also reduce carbon emissions and improve convenience and safety, as well as saving time and money.¹⁰⁶ In turn, these actions can reduce the burden of air-pollution-related illness on the NHS.

As such, we recommend that the Department of Health and Social Care, NHS England and the devolved administrations give commissioners and providers incentives to reduce their emissions, and protect their employees and patients from dangerous pollutants. This should include guidance on how to use procurement rules to require the adoption of low and zero tailpipe emission vehicles by those companies and providers using transport on NHS business.¹⁰⁷ However, NHS leadership can only occur if adequate resources are provided. As such, we recommend the **creation of an explicit ‘NHS Clean Air**

Fund’ to support the adoption of low and zero tailpipe emission vehicles for the NHS and to support in the rollout of electric vehicles charging infrastructure. The Fund should be funded through fines and/or contributions from when industries are found to be breaching emissions regulations, on the ‘polluter pays’ principle.¹⁰⁸ Furthermore, we recommend that the fund be used in part to explore the extent to which the locations of NHS facilities impacts on air pollution from NHS-affiliated travel; for example, whether re-locating blood test services away from local GP practices into county hospitals results in greater use of motorised travel to and from that area. Analysis of this kind of information has the potential to help create smarter NHS facility development plans.

5 Public engagement

Public engagement with the health effects of air pollution is vital to catalysing change.¹⁰⁹ Despite the evidence of the harm that air pollution causes, public awareness of the importance of this issue remains low.¹¹⁰ Accessible, updated and evidence-based information is critical to mobilising and empowering local communities to lower air pollution and improve health.

It is essential that any communication with the public on the dangers of air pollution should be co-created with healthcare professionals and that any advice given to the public should always be developed and approved by the latest scientific understanding. Furthermore, any advice for healthcare professionals should be easy to deliver to patients, as workload stresses limit the ability of professionals to disseminate this important advice. We recommend that advice for the public should include:

- Car-use reduction: in most urban environments benefits of physical activity outweigh the risks of air pollution. If cycling were to replace driving, the trade-off would be even more beneficial.¹¹¹
- Encouragement of walking and cycling, as a way to improve health and with the co-benefit of reducing personal air pollution contribution.
- Switching engines off when stationary.
- Use of quieter streets and route planning, using apps and web tools where possible.
- Ventilation of homes to avoid air pollution from cleaning products, cooking and other indoor sources.

102 Department for Transport, British Social Attitudes Survey 2013: Public attitudes towards transport, July 2014 <https://bit.ly/2IYuNJx>

103 Jagger, D, ‘Residents’ plea for traffic calming measures set to be rejected’, 5th November 2017, The Telegraph and Argus <https://bit.ly/2CiG46q>

104 Dyson, T, ‘Residents concerned after council rejects traffic calming petition’, 18th April 2018, My Local News <https://bit.ly/2vokRpG>

105 Reducing the use of natural resources in health and social care: 2018 report, Public Health England, NHS England, Sustainable Development Unit. <https://bit.ly/2Ra7ujl>

106 NHS Confederation and NEF [2007] Taking the Temperature-Towards an NHS response to Global Warming, London

107 Tomson C. [2015] Reducing the carbon footprint of hospital-based care, *Future Hosp J* (2) (57–62)

108 Royal College of Physicians [2018] Reducing air pollution in the UK: Progress report 2018, London. <https://bit.ly/2IMZgOg>

109 Chatterton, T. [2017] Air pollution: Putting people at the heart of the issues. *Environmental Scientist*, 26 (2). <https://bit.ly/2Ed1KTZ>

110 Royal College of Physicians [2018] Reducing air pollution in the UK: Progress report 2018, London. <https://bit.ly/2IMZgOg>

111 Marko Tainio, Audrey J. de Nazelle, Thomas Götschi, Sonja Kahlmeier, David Rojas-Rueda, Mark J. Nieuwenhuijsen, Thiago Hérick de Sá, Paul Kelly, James Woodcock, [2016] Can air pollution negate the health benefits of cycling and walking?, *Preventive Medicine*, 87, (233-236)

AIR POLLUTION MONITORS

Evidence shows that monitoring initiatives can improve the accessibility of evidence on air quality.¹¹² In general, more accurate and wider-ranging monitoring programmes to adequately track population-level exposure to air pollution are needed. However, studies into the performance of personal air pollution monitors are limited.¹¹³ More development is required to ensure they meet high standards of specificity.

Furthermore, adaptable monitoring techniques need to be developed and deployed that look at the interrelation between emerging pollutants and known

pollutants that occur below current concentration limits. In addition, practical technology – such as wearable ‘smart’ monitors – can be useful in empowering individuals to check their exposure and take action to protect their health and mitigate the problem, for example by foregoing vehicle use or re-planning travel routes to lower exposure. The provision of air pollution monitoring technology to health professionals could result in clinicians gaining greater insights into the air pollution exposure of some patients. This should be deployed much like a blood pressure monitor used for patients with high blood pressure.

We suggest there are two routes to successfully improving public engagement with the air pollution problem: through existing communication channels, such as broadcast media; and by better equipping healthcare professionals with information resources and guidance.

Embedding information through existing channels

We recommend that **support should be given to local authorities and private providers (e.g. CityMapper) to develop journey planner applications (apps) that include live air pollution data within journey planner functionality**, including signposting users to low air pollution transport options for one’s journey. All sources of information can play a role in communicating key information on air pollution, including through broadcast and social media, on bus stops, and in schools and workplaces. Local communities in areas of air quality standard exceedances should be encouraged to apply for ring-fenced funding for hyper-local air quality monitoring (including around school entrances).

We support the government’s plans to work with media outlets to improve public access to the air quality forecasts as long as information is disseminated through all forms of media – both online and off – to reach as many communities as possible. This information should be catered to the needs of audiences, including and in particular socioeconomically deprived groups and other groups who are at more risk of and have higher exposure to air pollution, and who can find it difficult to access such information and platforms through which it is disseminated.

Real-world emission values of vehicles should be available to consumers in a readily understandable way similar to the energy efficiency rating system used in housing. This would allow a consumer to make a decision based not just on fuel efficiency but also on the basis of social responsibility. Given recent scandals in vehicle emissions measurement, the Alliance urges the government to consider how to make this recording robust and untamperable.



112 Oltra, C., Sala, R., Boso, A. et al. Environ Monit Assess [2017] 189: 296. <https://bit.ly/2pPiJSI>

113 Borghi et al, Miniaturized Monitors for Assessment of Exposure to Air Pollutants: A Review, Int J Environ Res Public Health. 2017 Aug; 14(8): 909. <https://bit.ly/2NK8Mz0>

Giving healthcare professionals the resources they need

Every day, UK healthcare professionals see hundreds of thousands of patients, many of whom have conditions that predispose them to the negative health consequences of air pollution and, particularly in urban environments, are exposed to high levels of air pollution. Therefore, it is crucial that healthcare professionals are given adequate support in educating patients on the risks of air pollution exposure and the measures that can be taken to ameliorate those risks. These efforts should run in conjunction with measures to include air pollution and its implications into medical and nursing curricula, and those responsible for this should work proactively with health professions to shape these changes, rather than just imposing changes from above.

Health practitioners should have access to easily interpretable data and evidence on air pollution exposure and its health impacts. In addition, central and local government should work with the healthcare community to use this evidence to develop guidelines for practitioners in providing advice to their patients. At the local level, this should include measures to develop easy-to-use advice for patients in the form of accessible fact-sheets that can be given to the patient that provide advice on how to reduce personal air pollution exposure. This information should be tailored to the patient's needs regarding air pollution, including, for example, information on the dangers of air pollution given a particular health condition, or local air pollution levels. Furthermore, fact-sheets and other catered materials should be designed for children and their parents, explaining the unique dangers air pollution poses to young people. Crucially, any advice for healthcare professionals should be easy to deliver to patients, as workload stresses limit the ability of professionals to disseminate this important advice.

There is a paradox that needs to be considered and addressed in policy creation. While some information on pollution can make the public want to stay indoors to avoid it, the long-term goal should of course be for the public and for organisations to understand how they can act to aid its reduction (e.g. by changing to walking and cycling and reducing use of motorised vehicles). Therefore, any information on air pollution needs to emphasize the acknowledged net gain from physical activity in both rural and urban environments.¹¹⁴

¹¹⁴ Marko Tainio, Audrey J. de Nazelle, Thomas Götschi, Sonja Kahlmeier, David Rojas-Rueda, Mark J. Nieuwenhuijsen, Thiago Hérick de Sá, Paul Kelly, James Woodcock, [2016] Can air pollution negate the health benefits of cycling and walking?, *Preventive Medicine*, 87, (233-236)

Conclusion and Summary of Recommendations

The latest Intergovernmental Panel on Climate Change (IPCC) report, released on the 8th October 2018, made clearer than ever before the scale of the climate challenge we face. The report warned we have just 12 years to reduce our greenhouse gas emissions by 45% if we are to stay within the critical limit of 1.5 degrees of global warming. We know that going above this threshold is likely to be highly damaging for public health.

The IPCC report leaves no doubt about the extent to which we have to reimagine the structure of our economies, energy consumption patterns and lifestyles. However, when viewed through the lense of health, we can think of the challenge of responding to climate change as an opportunity – as the Lancet Commission on Health and Climate Change concluded, “responding to climate change could be the greatest global health opportunity of the 21st century”.¹¹⁴ This report demonstrates how a similar principle can be applied to air quality policy, ensuring it works to maximise the health co-benefits of action, particularly through increases in physical activity over vehicle use.

As the Alliance has always argued, action to improve air quality should always complement action to combat climate change and to improve health in the process. This policy position paper sets out to alleviate any tension between these policy areas, showing their complementarities and interrelation.

Summary of recommendations

The report recommends that the government should:

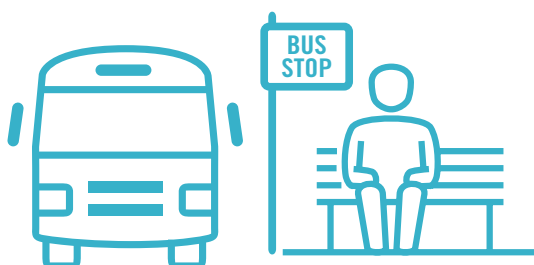
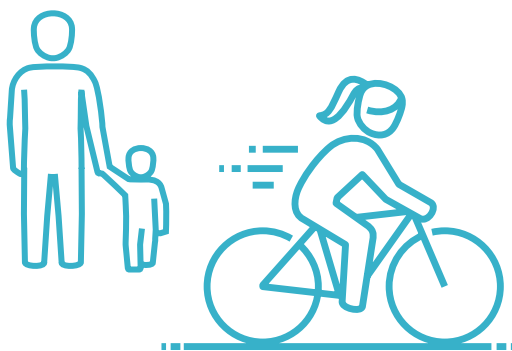
- Reduce air pollution and protect population health by **enshrining in law a new Clean Air Act**, with legally-enforced air quality standards that at least meet WHO recommended limits, and give powers and resources for local authorities and national agencies to protect health when air pollution levels are high. In addition, a new independent statutory body should be created to enforce these limits along with a new independent advisory body modelled along the lines of the Committee on Climate Change.
- **Develop plans for progressively reducing the impact of air pollution on socio-economically deprived groups**, alongside its plans to reduce air pollution impacts on the population in general and vulnerable groups in particular.
- Establish a UK-wide framework for **the expansion of Clean Air Zones in towns and cities**, providing local

authorities with the powers to charge vehicles and the funding to ensure effective implementation.

- Develop a publicly available **single accessible portal for air quality information**. Data on the portal, and accessibility to health professionals and academics, should be enabled fast enough to maximise the effectiveness of responses to emerging health threats.
- **Ensure investment in air pollution monitoring and research supports in understanding the relationship between health, socio-economic position and air pollution**
- **Put incentives in place for consumers to have items delivered to local consolidation centres**, and a levy on home delivery for singular items should be explored.
- **Work with international partners to research and develop new standards for tyres and brakes**, as major contributors to particulate matter. Legislation should be considered to make tampering with emissions controls a legal offence and measures to ensure any manufacturer found tampering with their emissions should receive a large fine.
- **Bring forward the ban on the sale of new conventional diesel and petrol cars and vans to 2030.**
- Create an **‘Active Travel Scheme’ to support businesses and households in adopting shared and active transport options**. The Scheme should provide, for example, discounts on car club schemes, access to bikes and support to engage in physical activity, as opposed to grants to buy new vehicles, as has typified diesel scrappage policies of the past.
- **Increase investment in active transport to at least £10 per capita by 2020.**
- **Take steps to tackle the major disincentives to walking and cycling.**
- **Train motorists on the Highway Code stipulations about vulnerable road users**, and sanctions for not adhering to these stipulations should be reinforced.
- Set up an **‘NHS Clean Air Fund’ to support the adoption of low and zero tailpipe emission vehicles for the NHS** and to support the rollout of electric vehicles charging infrastructure, funded through fines and/or contributions when industries are found to be breaching emissions regulations, on the ‘polluter pays’ principle.

¹¹⁴ Wang H and Horton R [2015] ‘Tackling climate change: the greatest opportunity for global health’, The Lancet, 386(10006), pp.1798-1799.

- **Give NHS commissioners and providers incentives to reduce their emissions, and protect their employees and patients from dangerous pollutants.** This should include guidance on how to use procurement rules to require the adoption of low and zero tailpipe emission vehicles by those companies and providers using transport on NHS business.
- **Co-create air pollution information for the public with healthcare professionals.** The information should include advice on car-use reduction, encouragement of walking and cycling, advice to switch engines off when stationary, encouragement to use quieter streets and route planning information and advice on ventilation of homes to avoid air pollution from cleaning products, cooking and other indoor sources.
- **Support local authorities and private providers (e.g. CityMapper) to develop journey planner applications (apps) that include live air pollution data within journey planner functionality,** including signposting users to low air pollution transport options for one's journey.
- **Make real-world emission values of vehicles available to consumers in a readily understandable way** similar to the energy efficiency rating system used in housing.





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