

Air Quality and Public Health

Health Improvement Board

18 February 2016

National Context

1. The health effects of air pollution have been widely publicised and it is now recognised by the government as the country's second-biggest health threat, after smoking.
2. There is now categorical evidence that long-term exposure to everyday air pollutants contributes to cardiovascular disease (CVD, including heart diseases and stroke), lung cancer, and respiratory disease (which includes asthma and chronic bronchitis).
3. The UK is currently failing to comply with its obligations under the Ambient Air Quality Directive 2008. As a result, the European Commission has launched legal proceedings against the UK for its failure to cut excessive levels of nitrogen dioxide (NO₂). This leaves the UK Government open to potential fines of up to £300m.
4. The Government has reminded Local Authorities of the discretionary power in Part 2 of the Localism Act under which the Government could require responsible authorities to pay all or part of an infraction fine.
5. The Department for Environment, Food and Rural Affairs (Defra) published 'Improving air quality in the UK. Tackling nitrogen dioxide in our towns and cities' in December 2015. The Plan sets out how the UK will comply with the Air Quality Directive in the 'shortest possible' time and has to be submitted to the European Commission for approval in response.
6. Client Earth, the organisation which took Defra to the Supreme Court and forced the revision of the National Air Quality Plan, has indicated that it does not believe that the Plan is adequate and intends to take the UK Government back to court.

The role of District Councils

7. The Environment Act 1995 requires district councils to carry out periodic review and assessment of air quality within their area. The air quality objectives applicable to Local Air Quality Management (LAQM) in England are set out in the Air Quality (England) Regulations. Short and long term objectives are set for a number of pollutants including nitrogen dioxide and particulate matter.
8. District councils are required to designate an Air Quality Management Area (AQMA) when, as a result of the review and assessment that it has carried out, it appears that any of the air quality objectives are not being achieved.
9. Once an AQMA has been designated the district council should prepare an Action Plan that sets out how it will achieve the air quality standards or objectives for the area that it covers. The district council should provide information on the timescales for the achievement of measures that it can take under the powers that it has. Relevant powers and mechanisms include environmental health functions including those concerning the Clean Air Act (e.g. the ability to declare smoke control areas), environmental permitting and land use planning. The Action Plan should be in place within 12 months of the district council identifying the need for one.
10. District councils report annually to the Department for Environment, Food and Rural Affairs (Defra) on the results of monitoring in their area and progress with the

implementation of their Action Plan (if relevant). These reports are independently assessed prior to approval by Defra.

11. The Oxfordshire Air Quality Group has developed a website (<https://oxfordshire.air-quality.info/>) which allows Oxfordshire residents are able to see real-time and historic information about the air quality across the county. The development of the website was funded through a £20,000 grant from Defra's Air Quality Grant Scheme after a successful bid by South Oxfordshire District Council.

The role of County Councils

12. County councils have a number of obligations under LAQM and in practice should proactively engage with the district council as soon as an air quality issue is identified.
13. Where a district council is preparing an Action Plan, the county council is obliged to submit measures related to their functions (i.e. local transport, highways and public health) to help meet air quality objectives in their local area. These measures will be for inclusion in the Action Plan being developed (or Plans that undergo revisions) and should include the timetable for implementation of measures to be adopted.
14. There is now very strong evidence on the significant contribution of transport emissions to air pollution in urban areas and the Government expects county councils to bring forward measures in relation to addressing the transport impacts in its area for inclusion in any Action Plan.
15. The county council is a consultee to Action Plans. The county council may make recommendations to the district council in relation to any review and assessment of air quality or development or amendment of Action Plans in the local authority area.
16. Oxfordshire County Council recently developed the Local Transport Plan 4 (LTP4). LTP4 contains a commitment to improve public health and wellbeing by increasing levels of walking and cycling, reducing transport emissions, reducing casualties, and enabling inclusive access to jobs, education, training and services.

Oxfordshire

17. Air quality across Oxfordshire is considered to be generally good as the county is largely rural in nature. In the more densely populated areas of the county, and those which experience high traffic flows, increased levels of air pollution are of concern. In these areas, road traffic is the most significant source of pollutant emissions.
18. Air quality is regularly monitored at many locations across Oxfordshire. At some locations air quality is at levels where legal intervention is required by Local Authorities. There are currently 13 AQMAs in Oxfordshire, where the annual mean objective for nitrogen dioxide is being exceeded (four in Cherwell, one covering the whole of Oxford, three in South Oxfordshire, three in Vale of White Horse and two in West Oxfordshire).
19. All of the AQMAs in Oxfordshire have been declared as a result of emissions from road vehicles.
20. Public Health England estimated the mortality burden attributed to long term fine particulate air pollution exposure in Oxfordshire to be 5.6% of the population, equivalent to 276 deaths (Age 25+) and equivalent to 2944 life years lost¹. It should be

¹ Public Health England Estimates of Mortality in Local Authority Areas Associated with Air (April 2014) Pollution https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/332854/PHE_CRCE_010.pdf

noted that there is considerable uncertainty attached to this estimate. By contrast, there were 26 fatalities on Oxfordshire's roads in 2014².

21. The quantification of mortality burden associated with long term nitrogen dioxide concentration exposure throughout England is likely to be available during the first half of 2016.³
22. This analysis has been undertaken for London only by King's College London⁴. The total mortality burden of anthropogenic PM2.5 for the year 2010 is estimated to be 52,630 life-years lost, equivalent to 3,537 deaths at typical ages. Whilst much less certain than for PM2.5, the total mortality burden of long-term exposure to NO2 is estimated to be up to 88,113 life-years lost, equivalent to 5,879 deaths at typical ages (assuming the WHO value of up to a 30% overlap between the effects of PM2.5 and NO2). Some of this effect may be due to other traffic pollutants.
23. As well as the mortality burden, air pollution is associated with respiratory and cardiovascular illness, particularly in vulnerable people such as the elderly, the very young and those with pre-existing health conditions including asthma and cardiovascular disease. Acute health effects are usually associated with peak air pollution episodes where people are exposed to high levels of pollution for short periods of time.
24. Damage costs are a simple way to value changes in air pollution. They estimate the cost to society of a change in emissions of different pollutants. Damage costs are provided by pollutant, source and location.
25. The damage costs presented below⁵ include values for the impacts of exposure to air pollution on health – both chronic mortality effects (which consider the loss of life years due to air pollution) and morbidity effects (which consider changes in the number of hospital admissions for respiratory or cardiovascular illness) – in addition to damage to buildings (through building soiling) and impacts on materials.

² Oxfordshire County Council Road Traffic Accident Casualty Data Summary 2014
<https://www.oxfordshire.gov.uk/cms/sites/default/files/folders/documents/roadsandtransport/safety/CasualtyReport2014.pdf>

³ Committee on the Medical Effects of Air Pollutants (COMEAP) Interim Statement on Quantifying the Association of Long-Term Average Concentrations of Nitrogen Dioxide and Mortality (December 2015)
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/485373/COMEAP_NO2_Mortality_Interim_Statement.pdf

⁴ King's College London Understanding the Health Impacts of Air Pollution in London (July 2015)
<http://www.kcl.ac.uk/lsm/research/divisions/aes/research/ERG/research-projects/HIAinLondonKingsReport14072015final.pdf>

⁵ Interdepartmental Group on Costs and Benefits Air Quality Economic Analysis Damage Costs by Location and Source (September 2015) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/460398/air-quality-econanalysis-damagecost.pdf

Table 1: Air quality damage costs per tonne, 2015 prices

		Central (1)	Central sensitivities (2)	
			Low	High
Oxides of nitrogen (NOX)	Transport average	£25,252	£10,101	£40,404
	Industry	£13,131	£5,253	£21,010
	Domestic	£14,646	£5,859	£23,434
Particulate Matter (PM)	Transport average	£58,125	£45,510	£66,052
	Industry	£30,225	£23,665	£34,347
	Domestic	£33,713	£26,396	£38,311

(1) This estimate is intended for use only where a single point estimate is necessary and should always be accompanied by the central range.

(2) The central sensitivity for PM reflects uncertainties around the lag between exposure and the health impact. The sensitivity for NO_x also reflects the uncertainty around the link between NO₂ exposure and mortality.

What is being done?

26. The District Councils either have developed, or are in the process of developing Air Quality Action Plans for the AQMAs in their areas.

27. Annual reports on monitoring and implementation of Action Plans are submitted to Defra and reviewed by an independent body.

28. As the cause of all the AQMAs is road traffic, the actions focus on reducing emissions from these vehicles and can be grouped into the following themes:

- a. Influencing the development of the Local Transport Plan and area specific strategies to ensure that impacts on air quality are considered at an early stage;
- b. Reducing emissions from transport, for example through the introduction of Low Emission Zones;
- c. Promoting more sustainable forms of transport, particularly electric vehicles;
- d. Encouraging modal shift to more active forms of transport such as walking and cycling;
- e. Education and awareness raising around air quality to promote behavioural change; and
- f. Ensuring that air quality is given due consideration as part of the planning process.

29. Opportunities to draw down funding from a variety of sources to implement measures to improve air quality in Oxfordshire have been taken where possible. This has resulted in funding from:
- a. Defra's Air Quality Grant Scheme for a number of projects, including the development of the Oxfordshire Air Quality Group website, Low Emission Zone feasibility studies and the development of Low Emission Strategies;
 - b. The Office for Low Emission Vehicles for projects including the installation of charging infrastructure, a feasibility study into the development of a charging network for taxis and most recently £800,000 to support plans to trial new on-street charging technologies.
 - c. The Department for Transport's Clean Bus Technology Fund to assist with reducing emissions from buses.

What could the Health Improvement Board do?

30. Work collaboratively on initiatives that deliver beneficial impacts on air quality and health.
31. Policies that encourage a shift from motorised transport to walking and cycling would be expected to reduce total vehicle emissions, including particulate pollution. If this could be achieved in towns and cities, then we could expect local improvements in air quality. There would also be additional health benefits from increased physical activity through walking and cycling.
32. Provide warnings to at risk groups about the dangers of air pollution and give them advice about protecting themselves (i.e. adaptation) and reducing pollution for themselves and others (i.e. mitigation). For example, people can reduce their exposure to air pollution by up to 50% by walking or cycling down side streets rather than busy roads. People can also reduce air pollution by walking or cycling or using public transport rather than driving a diesel vehicle.
- Identify particular groups at risk in Oxfordshire (COPD, asthma, young, elderly or pregnant).
 - Provide information for GPs on air quality and its impact upon asthma and existing COPD conditions.
 - Public health should work collaboratively with environmental health, planning and transport to ensure that major developments consider the impact upon air quality and by extension the public's health.