

JSNA Chapter - Air Quality and Health 2019

| Topic information | |
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| Topic title | <i>Air Quality and Health</i> |
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| Topic endorsed by | <i>Health Protection Strategy Group</i> |
| Current version | <i>June 2019</i> |
| Replaces version | <i>May 2015</i> |
| Linked JSNA topics | Cardiovascular Disease (2016), Chronic Obstructive Pulmonary Disease (2016), Dementia (2018), Excess Winter Deaths (2015), Life Expectancy and Healthy Life Expectancy (2018), Physical Activity (2016), Smoking and Tobacco Control (2015). |

Executive summary

Introduction

Air pollution is the top environmental risk to human health. In the UK it is ranked as the fourth greatest threat to public health after cancer, heart disease and obesity, and is a contributory factor to heart disease and some types of cancer.

Human-made air pollution comes from a range of different sources including agriculture, industrial, commercial and domestic activities, and transport. Emissions from road traffic are one of the largest contributors to ambient air pollution in urban areas.

Long-term exposure to air pollution, at the levels experienced in many urban centres in the UK, including Nottingham, causes respiratory and cardiovascular disease and lung cancer. It has also been linked to other cancers. In children, air pollution reduces lung development and function and can lead to the development of asthma.

Short-term exposure to elevated levels of air pollution leads to a worsening of symptoms for those with existing asthma, respiratory or cardiovascular diseases, and can trigger acute events such as asthma and heart attacks in vulnerable individuals.

In Nottingham in 2016, it is estimated that **181** adult deaths were brought forward due to the health impacts of **air pollution** (comprising PM₁₀, PM_{2.5}, NO₂ and other pollutant species).

The impact of air pollution on health is modifiable, and there are cost-effective, achievable local collective and personal actions that reduce personal exposure to, and emissions of, air pollution, and improve health and air quality. These include active travel (walking and cycling), travelling using public transport and ultra-low emission vehicles, and increased energy efficiency (coupled with appropriate ventilation) in buildings and homes. These actions also produce benefits across local priorities, including increasing physical activity, achieving and maintaining healthy weight, reduction in hospital admissions due to excess cold, respiratory, cardiovascular and obesity problems, reduced CO₂ emissions (a key driver of climate change), and reduce the generation of secondary pollutants that also effect health, and have other adverse impacts on the natural environment.

Unmet needs and gaps

The national Public Health Outcomes Framework (PHOF) datasets show that in Nottingham in 2016 approximately **146** deaths (6.3%) of all adult mortality was attributable to long-term exposure to human-made particulate air pollution. It is estimated that in Nottingham in 2016 ambient concentrations of nitrogen dioxide (NO₂) contributed to **35** additional deaths, i.e. **181** adult deaths were attributable to the combination of PM_{2.5}, NO₂ and other air pollutants.

It was predicted that by the end of 2019 concentrations of NO₂ in Nottingham's air will be below the annual mean National Air Quality Objectives (NAQOs), and EU limit value. However, despite meeting the NAQO for PM₁₀, concentrations of particulate matter (PM₁₀ and PM_{2.5}) currently exceed, and are likely to continue to exceed, the World Health Organization's guidelines. Furthermore, the WHO have advised there is no 'safe' concentration for particulate matter in ambient air.

There is increasing evidence that indoor air pollution significantly affects health, and contributes to the development of respiratory conditions that are then further exacerbated by ambient/outdoor air pollution and indoor air pollution e.g. asthma.

The government's Clean Air Strategy 2019 considers both outdoor and indoor air pollution and how reducing emissions, pollutant concentrations and exposure, both outside and inside buildings and homes, can protect and improve health.

The National Institute for Clinical Excellence is preparing guidance (for publication late 2019) for local authorities and health organisations on how to improve citizen health by reducing outdoor and indoor air pollution, and exposure to it.

Gaps include:

- Organisational and public awareness and understanding of the range of air pollutants, wide range of sources, and their effects on health.
- Comprehensive demographic/geographic air pollution-health impact information for Nottingham's citizens.

- Air quality monitoring data of sufficiently high temporal and spatial resolution to inform studies into local health impacts and distribution and thus the need for additional air quality monitoring to inform the studies.
- Cost-benefit analysis tools that holistically (and therefore more fully) identify and consider the fullest range of economic, environmental and health impacts of air pollution (including CO₂, knock-on effects of climate change and the predicted likely consequent environmental change impacts on health and infrastructure).
- Organisational application of approaches and mechanisms that most effectively achieve behavioural change. (Inform, promote, model, enable and reinforce choices and decisions that reduce emissions and exposure).
- Resources/funding to sustain a co-ordinated holistic behavioural change programmes and multi-media messages.

Recommendations for consideration by commissioners

- Continue to include in the Health and Wellbeing Strategy an action plan to raise awareness of the impacts of air pollution and the need to improve air quality, and a summary of the actions citizens and businesses can take to reduce emissions and personal exposure,
- Support the development and roll-out of a communication strategy and awareness raising events to provide key messages on air pollution (outdoor and indoor), emission and exposure reduction to the public and businesses (e.g. information in GP surgeries),
- Support the development and use of comprehensive cost-benefit analysis tools to better quantify the impact of air pollution and mitigation measures on health and healthcare costs in Nottingham and Nottinghamshire,
- Support the collection of air pollution/health impact geo-spatial data for Nottingham to inform local and national air pollution-health studies, and enable targeted action if appropriate.