Personalising the Health Impacts of Air Pollution: Interim Statistics Summary for a Selection of Statements

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The following is a brief summary and citation guide for health impact statements to be finalised as part of an upcoming report from King's College London, titled *Personalising The Health Impacts of Air Pollution.*

Contents

1. Background

The public are understandably interested in the size of the effect of air pollution on health and, in particular, the risks to them as individuals, or at least to individuals like them. Typical statements about the impact of air pollution on health have been communicated in terms of numbers of premature deaths or life years lost. This is mainly because (i) it is assumed that people are most concerned about the most severe endpoints and these usually have a dominant influence on cost-benefit analysis (ii) most places collect mortality statistics routinely, there are a lot more studies for this endpoint (iii) there are also more studies on all-cause mortality because it is a clearly defined endpoint without confusion as to whether a disease has been diagnosed correctly (iv) overall impact on the population as a whole is the output of interest for public health practitioners.

As a measure of population impact, an input into cost-benefit analysis and a general headline for the media, the above types of statements remain influential. However, the acknowledgement of the risks of air pollution and the motivation to change behaviour may be increased by summary statements with which individuals can more easily identify. Life years can seem a rather abstract concept and deaths may seem too distant in time for many in the population. So, there is a role for summary statements on more common adverse health effects of air pollution and in particular groups (due to susceptibility or travel behaviour).

The aim of the project is to develop statements on the effects of air pollution on health outcomes that may be more familiar to the public or specific groups of the public than life years, life expectancy or numbers of deaths. A supporting aim was to ensure a clear route from simple statements, understandable to a wide range of the public, to the detailed technical justification for the numbers quoted. This document is one link in the chain of evidence from simple statement to full technical details. The latter will be available in a full research report, currently in preparation.

There are many scientific studies on the effects of air pollution on a wide variety of disease outcomes but their conclusions are written for scientists rather than the public, and it could be difficult for a member of the public to judge its quality or put a particular study into context. There are, however, documents that pull together consensus positions on the evidence including Committee reports (e.g. COMEAP, 1998; WHO, 2013; US EPA various dates) and also systematic reviews/meta-analyses (e.g. Brook et al 2010; Mills et al, 2015; Hoek et al 2012). Meta-analyses pool quantitative information across studies so are useful to give a sound basis for estimating the size of the air pollution effect. Finally, there are health impact assessments which have quantified effects in particular places or for particular policy scenarios. Some of these only cover mortality (e.g. EEA, 2018) and some are becoming outdated (COMEAP, 1998) but other more recent publications do cover disease outcomes (Holland 2014; APHEKOM 2011; Walton et al 2015). Their methods vary substantially, and they are not necessarily written in language accessible by less specialist readers. The work in this project is based on expert Committee positions, pooled results across several studies or large studies that themselves cover results from many different places. The project did not do its own pooling of the most up to date data, its own review of the latest evidence on causality (if we understand how a pollutant has a particular effect, it strengthens the evidence), or detailed mapping of air pollution exposures at a small spatial scale. (This would have required a very long project given the range of outcomes addressed!). Nonetheless, it is substantially more robust than statements based on single studies or by non-experts, relying on past detailed work by others.

2. Structure and development of the statistics

The statements are constructed from three basic components. The first of these is some measure of exposure, where we have used air quality monitoring data from regulatory based monitoring networks in the UK, France and Poland. It is recognised that fixed-point monitoring data are at best a surrogate for the actual exposures of people as they go about their daily lives. However, the overwhelming majority of short-term epidemiological studies are based on this measure of exposure, hence its use here. The next step is to obtain a numerical relationship between the air pollutant concentration ('exposure') and the change in the health outcome in question. This numerical relationship is termed the 'concentration response function' or CRF. It usually takes the form of a single numerical coefficient in a form equivalent to a percentage increase over the baseline. This is given directly in some statements. The percentage change in the health outcome due to pollutant exposure then has to be combined with the baseline rate of the outcome or disease. Here the 'baseline rate' is the numbers of the outcome expected in the absence of air pollution exposure. The result then allows us to construct quantitative statements giving the effect of a given exposure to an air pollutant on a particular health outcome or disease.

3. Air pollution exposure

We used air quality data from regulatory monitoring networks. In the UK this was the so-called Automatic Urban and Rural Network (AURN) data published by Defra (https://uk-air.defra.gov.uk/networks/network-info?view=aurn). For France and Poland, we used the data submitted under the requirements of the European Air Quality Directive of 2008 (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02008L0050-20150918) and available on the AIRBASE database run by the European Environment Agency (https://data.europa.eu/euodp/en/data/dataset/data_airbase-the-european-air-quality-database-7). For each city we used both urban background and roadside data, where available. Although arguably the urban background stations are a better surrogate for the exposure of the whole population, there are nonetheless situations where schools, hospitals and other sensitive locations may be situated at the roadside. Roadside data was available in several UK cities but not in Poland.

4. Concentration response functions

After extensive exchange and discussion, we have chosen the health outcomes for which we thought the evidence was persuasive and adequately quantified. We have included these health outcomes and CRFs that associate them with the concentrations of specific pollutants in Table 1 below (for the current list of statements, there will be more in the final report).

The concentration-response functions (CRFs) we used, depending on the study design and the question under investigation, reflect either the effects of short-term exposures, i.e. effects taking place on the same day or a few days after the occurrence of higher pollutant concentrations, or the effects of long-term exposures, i.e. those occurring after many years or life-long exposures. The reference time period is specified in the corresponding Tables and text and leads to different types of statements.

We preferred to use CRFs that were based on European studies. However, when there was not enough evidence coming from European studies and there was no reason to think that the effects in Europe would be largely different, we used CRFs based on global estimates. We placed emphasis in using CRFs either included in established reports, such as those from WHO or COMEAP, which are based on the collective opinion of many prominent experts, or in good quality meta-analyses for more recent findings.

Table 1 shows the outcomes for which we have included CRFs for at least one pollutant in this set of statements. The pollutant concentrations are 24-hour unless otherwise noted. Because different pollutants often come from the same sources the apparent effect of one pollutant on health can be at least partly due to another closely correlated one. So, it is not appropriate to add the results from more than one pollutant together, as it may give an overestimate. Instead, we chose one pollutant to represent the others each time. We based this choice on (i) whether the association in the original epidemiological study was statistically significant i.e. whether it could be ruled out that the apparent link between exposure and effect was due to chance and (ii) the largest result obtained for the combination of the size of the pollutant association and the range of pollutant concentrations in the relevant city. Note that this could mean that a different pollutant might be chosen for calculations in London (where NO_2 is higher than in Poland) or in Warsaw (where PM is higher than in London). The pollutant chosen could also differ for calculations based on long-term averages and short-term averages.

Table 1 Source of concentration-response functions and baseline rates

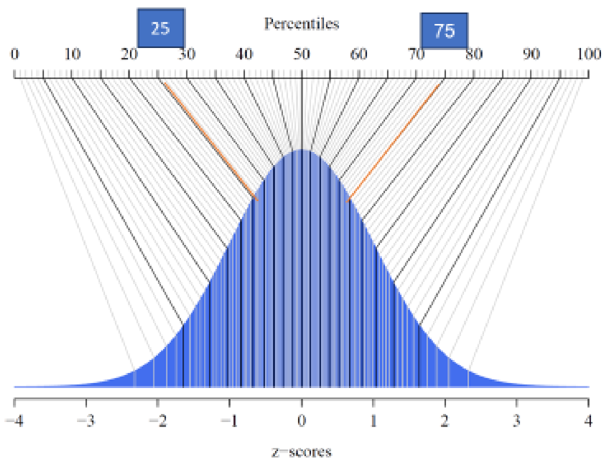
Health outcome	Short-term or long-term	Pollutant	Population	Reference for CRF	Baseline rate source
Out of hospital cardiac arrest (from ambulance calls for heart stopping)	Short-term	$PM_{2.5}$	All ages	Zhao *et al.* 2017	Consensus Paper on out-of-hospital cardiac arrest in England (link) (London)
Hospital admissions for stroke	Short-term	NO_2	All ages	Shah *et al.* 2015	Hospital Admitted Patient Care Activity (link)
Asthma admissions	Short-term	NO_2 London O_3 Warsaw	Children 0-14	Walton *et al.* 2019	Hospital Episode Statistics
		NO_2 London PM_{10} Warsaw	Adults 15-64	Walton *et al.* 2019; Atkinson *et al.* 2001	
Reduced lung growth (change in forced vital capacity (FVC), a measure of the volume of	Long-term	NO_2	Children 11-15, living near to busy roads	Gauderman *et al.* 2015	Compared with standard estimates of normal rates of lung growth (Quanger *et al.* 2012)

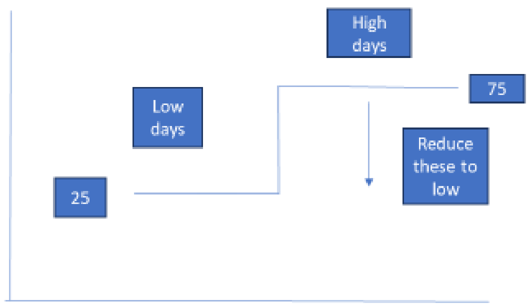
the lungs, from age 11 to 15)					
Low lung function (forced expiratory volume in 1 second (FEV1) less than 85% of that predicted in healthy children) FEV1 is a measure of how fast you can breathe out. It is typically low in asthmatics.	Long-term	NO_2 London PM_{10} Warsaw	Children 6-8, living near to busy roads	Gehring *et al.* 2013	Population: Estimates of the population for the UK (link), Prevalence from Gehring *et al.* 2013 (MAAS cohort)
Asthma symptoms in asthmatic children (including cough, wheeze, breathlessness)	Short-term	PM_{10}	Asthmatic children aged 5-14	Weinmayr *et al.* 2010	Proportion of asthmatic children from Lai *et al.* (2009), proportion of asthmatic children with asthmatic symptoms from WHO (2013)
Lung cancer	Long-term	$PM_{2.5}$	All ages	Raaschou-Nielsen *et al.* 2013	Lung cancer cases in England (link)
Term low birthweight	Long-term	NO_2	Newborn babies	Pedersen *et al.* 2013	Live births with known birthweight and more than 37 weeks of gestation (link)

4.1 Scenarios

Quantitative statements need to be related to a specific concentration difference in pollutant levels. To give statements of interest, this concentration difference needs to come from a scenario that can be visualised. The following scenarios were used:

Higher pollution days vs lower pollution days:
We defined this by assuming that typical higher air pollution days were at the middle of the top half of the annual range of pollutant levels and typical lower air pollution days were at the middle of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average particulate matter concentrations. We simplified the distribution to assume that the top half of the days were all at the 75th percentile level and the bottom half at the 25th percentile. We then did calculations for a hypothetical scenario where the days at the 75th percentile were reduced to the 25th percentile.





Living near busy roads:
This scenario used the difference between concentrations at monitoring sites close to busy roads compared with concentrations away from busy roads from (London) background monitoring sites. For the numbers of health outcomes, we assumed that the relevant population was those living within 50m of a road. This was estimated by an approximate method as 33% of the London population. Where the calculations of health outcomes was for children, we assumed the proportion of children of the specified age was the same as the proportion for the London population as a whole.

We have also used an arbitrary 20% reduction in concentrations. The final report may include some percentage reductions taken from specific analyses of modelled concentration changes as a result of particular policies. This is not easy to do because in reality the percentage changes are different in different places. For Poland, 20% happened to be roughly equivalent to the reduction that would be needed to reach the WHO Interim Target 3 (IT3) for $PM_{2.5}$, although in practice, to reach that Target everywhere would result in concentrations well below IT3 in some places.

5. Statements

We give below the details of the background information relevant to each statement.

5.1 Out-of-hospital cardiac arrests

Out-of-hospital cardiac arrests refer to people whose hearts have stopped when they are not in hospital but are either at home or out in the street. Some but not all survive and are admitted to hospital. Estimates of baseline numbers come from ambulance call data.

Birmingham

- *The risk of out of hospital cardiac arrest in Birmingham is 2.3% higher on high air pollution days than lower air pollution days (short-term).*

Assumes typical high air pollution days are at the average of the top half of the annual range of $PM_{2.5}$ levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average particulate matter concentrations.

- *Each year on average, higher air pollution days in Birmingham are responsible for 12 more cardiac arrests outside hospital than lower air pollution days. (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate matter levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average $PM_{2.5}$ concentrations. Calculation applies to all ages.

Bristol

- *The risk of out of hospital cardiac arrest in Bristol is 2.2% higher on high air pollution days than lower air pollution days (short-term).*

Assumes typical high air pollution days are at the average of the top half of the annual range of $PM_{2.5}$ levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average particulate matter concentrations.

- *Each year on average, higher air pollution days in Bristol are responsible for 4 more cardiac arrests outside hospital than lower air pollution days. (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate matter levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average $PM_{2.5}$ concentrations. Calculation applies to all ages.

Derby

- *The risk of out of hospital cardiac arrest in Derby is 1.8% higher on high air pollution days than lower air pollution days (short-term).*

Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Each year on average, higher air pollution days in Derby are responsible for 0 more cardiac arrests outside hospital than lower air pollution days. (short-term).*

Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average NO_2 concentrations. Calculation applies to all ages.

Liverpool

- *The risk of out of hospital cardiac arrest in Liverpool is 2% higher on high air pollution days than lower air pollution days (short-term).*

Assumes typical high air pollution days are at the average of the top half of the annual range of $PM_{2.5}$ levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average particulate matter concentrations.

- *Each year on average, higher air pollution days in Liverpool are responsible for 4 more cardiac arrests outside hospital than lower air pollution days. (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate matter levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average $PM_{2.5}$ concentrations. Calculation applies to all ages.

London

- *The risk of out of hospital cardiac arrest in London is 2.2% higher on high air pollution days than lower air pollution days (short-term).*

Assumes typical high air pollution days are at the average of the top half of the annual range of $PM_{2.5}$ levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average particulate matter concentrations.

- *Each year on average, higher air pollution days in London are responsible for 87 more cardiac arrests outside hospital than lower air pollution days. (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate matter levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average $PM_{2.5}$ concentrations. Calculation applies to all ages.

Manchester

- *The risk of out of hospital cardiac arrest in Manchester is 2.4% higher on high air pollution days than lower air pollution days (short-term).*

Assumes typical high air pollution days are at the average of the top half of the annual range of $PM_{2.5}$ levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average particulate matter concentrations.

- *Each year on average, higher air pollution days in Manchester are responsible for 6 more cardiac arrests outside hospital than lower air pollution days. (short-term).*

  Assumes half the year was at the average of the top half of the annual range of particulate matter levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average $PM_{2.5}$ concentrations. Calculation applies to all ages.

Nottingham

- *The risk of out of hospital cardiac arrest in Nottingham is 2.3% higher on high air pollution days than lower air pollution days (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of $PM_{2.5}$ levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average particulate matter concentrations.

- *Each year on average, higher air pollution days in Nottingham are responsible for 3 more cardiac arrests outside hospital than lower air pollution days. (short-term).*

  Assumes half the year was at the average of the top half of the annual range of particulate matter levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average $PM_{2.5}$ concentrations. Calculation applies to all ages.

Oxford

- *The risk of out of hospital cardiac arrest in Oxford is 1.9% higher on high air pollution days than lower air pollution days (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of $PM_{2.5}$ levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average particulate matter concentrations.

- *Each year on average, higher air pollution days in Oxford are responsible for 6 more cardiac arrests outside hospital than lower air pollution days. (short-term).*

  Assumes half the year was at the average of the top half of the annual range of particulate matter levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average $PM_{2.5}$ concentrations. Calculation applies to all ages.

Southampton

- *The risk of out of hospital cardiac arrest in Southampton is 1.9% higher on high air pollution days than lower air pollution days (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of $PM_{2.5}$ levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average particulate matter concentrations.

- *Each year on average, higher air pollution days in Southampton are responsible for 2 more cardiac arrests outside hospital than lower air pollution days. (short-term).*

  Assumes half the year was at the average of the top half of the annual range of particulate matter levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average $PM_{2.5}$ concentrations. Calculation applies to all ages.

5.2 Stroke

Birmingham

- *The risk of emergency hospitalisations for stroke in Birmingham is 2.6% higher on high air pollution days than on lower air pollution days (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Living near a busy road in Birmingham increases your risk of hospitalisation for stroke by 4.0% (short-term).*

  Based on the difference between the middle of the range of daily average nitrogen dioxide levels at roadsides and the middle of the range of daily average nitrogen dioxide levels away from roads. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *On high air pollution days in Birmingham, there are on average 27 more hospital admissions for stroke each year than on lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Lowering air pollution by 32.1% on high air pollution days in Birmingham could save 27 hospital admissions for stroke each year (short-term/alternative).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. (The 75th to the 25th percentile). This is a change in air pollution level on high days of 22%. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Each year on average, higher air pollution days in Birmingham can send up to 42 more people to hospital for stroke than lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Figure given uses the upper 95% confidence interval of the concentration-response function. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

Bristol

- *The risk of emergency hospitalisations for stroke in Bristol is 2.8% higher on high air pollution days than on lower air pollution days (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Living near a busy road in Bristol increases your risk of hospitalisation for stroke by 2.8% (short-term).*

  Based on the difference between the middle of the range of daily average nitrogen dioxide levels at roadsides and the middle of the range of daily average nitrogen dioxide levels away from roads. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *On high air pollution days in Bristol, there are on average 9 more hospital admissions for stroke each year than on lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Lowering air pollution by 35.9% on high air pollution days in Bristol could save 9 hospital admissions for stroke each year (short-term/alternative).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. (The 75th to the 25th percentile). This is a change in air pollution level on high days of 22%. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Each year on average, higher air pollution days in Bristol can send up to 14 more people to hospital for stroke than lower air pollution days (short-term)*.

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Figure given uses the upper 95% confidence interval of the concentration-response function. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

Derby

- *The risk of emergency hospitalisations for stroke in Derby is 3.9% higher on high air pollution days than on lower air pollution days (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *On high air pollution days in Derby, there are on average 8 more hospital admissions for stroke each year than on lower air pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Lowering air pollution by 38.2% on high air pollution days in Derby could save 8 hospital admissions for stroke each year (short-term/alternative).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. (The 75th to the 25th percentile). This is a change in air pollution level on high days of 22%. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Each year on average, higher air pollution days in Derby can send up to 13 more people to hospital for stroke than lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Figure given uses the upper 95% confidence interval of the concentration-response function. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

Liverpool

- *The risk of emergency hospitalisations for stroke in Liverpool is 2.6% higher on high air pollution days than on lower air pollution days (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Living near a busy road in Liverpool increases your risk of hospitalisation for stroke by 2.4% (short-term).*

  Based on the difference between the middle of the range of daily average nitrogen dioxide levels at roadsides and the middle of the range of daily average nitrogen dioxide levels away from roads. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *On high air pollution days in Liverpool, there are on average 12 more hospital admissions for stroke each year than on lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Lowering air pollution by 36.0% on high air pollution days in Liverpool could save 12 hospital admissions for stroke each year (short-term/alternative).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. (The 75th to the 25th percentile). This is a change in air pollution level on high days of 22%. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Each year on average, higher air pollution days in Liverpool can send up to 19 more people to hospital for stroke than lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Figure given uses the upper 95% confidence interval of the concentration-response function. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

London

- *The risk of emergency hospitalisations for stroke in London is 2.7% higher on high air pollution days than on lower air pollution days (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Living near a busy road in London increases your risk of hospitalisation for stroke by 6.6% (short-term).*

  Based on the difference between the middle of the range of daily average nitrogen dioxide levels at roadsides and the middle of the range of daily average nitrogen dioxide levels away from roads. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *On high air pollution days in London, there are on average 144 more hospital admissions for stroke each year than on lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Lowering air pollution by 22% on high air pollution days in London could save 144 hospital admissions for stroke each year (short-term/alternative).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. (The 75th to the 25th percentile). This is a change in air pollution level on high days of 22%. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Each year on average, higher air pollution days in London can send up to 219 more people to hospital for stroke than lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Figure given uses the upper 95% confidence interval of the concentration-response function. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

Manchester

- *The risk of emergency hospitalisations for stroke in Manchester is 2.8% higher on high air pollution days than on lower air pollution days (short-term).*

Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *On high air pollution days in Manchester, there are on average 14 more hospital admissions for stroke each year than on lower air pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Lowering air pollution by 33.5% on high air pollution days in Manchester could save 14 hospital admissions for stroke each year (short-term/alternative).*

Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. (The 75th to the 25th percentile). This is a change in air pollution level on high days of 22%. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Each year on average, higher air pollution days in Manchester can send up to 22 more people to hospital for stroke than lower air pollution days (short-term)*.

Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Figure given uses the upper 95% confidence interval of the concentration-response function. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

Nottingham

- *The risk of emergency hospitalisations for stroke in Nottingham is 3.3% higher on high air pollution days than on lower air pollution days (short-term).*

Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Living near a busy road in Nottingham increases your risk of hospitalisation for stroke by 1.5% (short-term).*

Based on the difference between the middle of the range of daily average nitrogen dioxide levels at roadsides and the middle of the range of daily average nitrogen dioxide levels away from roads. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *On high air pollution days in Nottingham, there are on average 8 more hospital admissions for stroke each year than on lower air pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Lowering air pollution by 35.7% on high air pollution days in Nottingham could save 8 hospital admissions for stroke each year (short-term/alternative).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. (The 75th to the 25th percentile). This is a change in air pollution level on high days of 22%. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Each year on average, higher air pollution days in Nottingham can send up to 13 more people to hospital for stroke than lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Figure given uses the upper 95% confidence interval of the concentration-response function. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

Oxford

- *The risk of emergency hospitalisations for stroke in Oxford is 2.2% higher on high air pollution days than on lower air pollution days (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Living near a busy road in Oxford increases your risk of hospitalisation for stroke by 7.4% (short-term).*

  Based on the difference between the middle of the range of daily average nitrogen dioxide levels at roadsides and the middle of the range of daily average nitrogen dioxide levels away from roads. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *On high air pollution days in Oxford, there are on average 2 more hospital admissions for stroke each year than on lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Lowering air pollution by 26.2% on high air pollution days in Oxford could save 2 hospital admissions for stroke each year (short-term/alternative).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. (The 75th to the 25th percentile). This is a change in air pollution level on high days of 22%. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Each year on average, higher air pollution days in Oxford can send up to 4 more people to hospital for stroke than lower air pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Figure given uses the upper 95% confidence interval of the concentration-response function. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

Southampton

- *The risk of emergency hospitalisations for stroke in Southampton is 3.0% higher on high air pollution days than on lower air pollution days (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Living near a busy road in Southampton increases your risk of hospitalisation for stroke by 2.0% (short-term).*

  Based on the difference between the middle of the range of daily average nitrogen dioxide levels at roadsides and the middle of the range of daily average nitrogen dioxide levels away from roads. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *On high air pollution days in Southampton, there are on average 7 more hospital admissions for stroke each year than on lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Lowering air pollution by 30.2% on high air pollution days in Southampton could save 7 hospital admissions for stroke each year (short-term/alternative).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. (The 75th to the 25th percentile). This is a change in air pollution level on high days of 22%. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

- *Each year on average, higher air pollution days in Southampton can send up to 10 more people to hospital for stroke than lower air pollution days (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. Figure given uses the upper 95% confidence interval of the concentration-response function. Nitrogen dioxide may be acting as a marker for other traffic pollutants.

5.3 Asthma admissions in children

Birmingham

- *In Birmingham, your child is 4.1% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of nitrogen dioxide (NO_2) levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Birmingham, an extra 15 children are hospitalised with asthma on days where air pollution is high compared to days where air pollution is low on average each year (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Calculation applies to children aged 0-14.

Bristol

- *In Bristol, your child is 4.4% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of nitrogen dioxide (NO_2) levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Bristol, an extra 5 children are hospitalised with asthma on days where air pollution is high compared to days where air pollution is low on average each year (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Calculation applies to children aged 0-14.

Derby

- *In Derby, your child is 6.2% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of nitrogen dioxide (NO_2) levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Derby, an extra 5 children are hospitalised with asthma on days where air pollution is high compared to days where air pollution is low on average each year (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Calculation applies to children aged 0-14.

Liverpool

- *In Liverpool, your child is 4.0% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of nitrogen dioxide (NO_2) levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75^{th} and 25^{th} percentile of daily average nitrogen dioxide concentrations.

- *In Liverpool, an extra 7 children are hospitalised with asthma on days where air pollution is high compared to days where air pollution is low on average each year (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75^{th} and 25^{th} percentile of daily average nitrogen dioxide concentrations. Calculation applies to children aged 0-14.

London

- *In London, your child is 4.2% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of nitrogen dioxide (NO_2) levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75^{th} and 25^{th} percentile of daily average nitrogen dioxide concentrations.

- *In London, an extra 74 children are hospitalised with asthma on days where air pollution is high compared to days where air pollution is low on average each year (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75^{th} and 25^{th} percentile of daily average nitrogen dioxide concentrations. Calculation applies to children aged 0-14.

Manchester

- *In Manchester, your child is 4.4% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of nitrogen dioxide (NO_2) levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75^{th} and 25^{th} percentile of daily average nitrogen dioxide concentrations.

- *In Manchester, an extra 8 children are hospitalised with asthma on days where air pollution is high compared to days where air pollution is low on average each year (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75^{th} and 25^{th} percentile of daily average nitrogen dioxide concentrations. Calculation applies to children aged 0-14.

Nottingham

- *In Nottingham, your child is 5.1% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of nitrogen dioxide (NO_2) levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Nottingham, an extra 5 children are hospitalised with asthma on days where air pollution is high compared to days where air pollution is low on average each year (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Calculation applies to children aged 0-14.

Oxford

- *In Oxford, your child is 3.5% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of nitrogen dioxide (NO_2) levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Oxford, an extra 1 child is hospitalised with asthma on days where air pollution is high compared to days where air pollution is low on average each year (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Calculation applies to children aged 0-14.

Southampton

- *In Southampton, your child is 4.7% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of nitrogen dioxide (NO_2) levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Southampton, an extra 4 children are hospitalised with asthma on days where air pollution is high compared to days where air pollution is low on average each year (short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations. Calculation applies to children aged 0-14.

5.4 Asthma admissions in adults

Bristol

- *In Bristol, adults are 1.5% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Bristol, an extra 4 adults are taken to hospital with asthma on days of high air pollution compared to days with lower air pollution(short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of nitrogen dioxide concentrations. Calculation applies to adults age 15-64.

Birmingham

- *In Birmingham, adults are 1.4% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Birmingham, an extra 11 adults are taken to hospital with asthma on days of high air pollution compared to days with lower air pollution(short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of nitrogen dioxide concentrations. Calculation applies to adults age 15-64.

Derby

- *In Derby, adults are 2.1% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Derby, an extra 3 adults are taken to hospital with asthma on days of high air pollution compared to days with lower air pollution(short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of nitrogen dioxide concentrations. Calculation applies to adults age 15-64.

Liverpool

- *In Liverpool, adults are 1.3% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Liverpool, an extra 5 adults are taken to hospital with asthma on days of high air pollution compared to days with lower air pollution(short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of nitrogen dioxide concentrations. Calculation applies to adults age 15-64.

London

- *In London, adults are 1.4% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In London, an extra 33 adults are taken to hospital with asthma on days of high air pollution compared to days with lower air pollution(short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of nitrogen dioxide concentrations. Calculation applies to adults age 15-64.

Manchester

- *In Manchester, adults are 1.5% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Manchester, an extra 6 adults are taken to hospital with asthma on days of high air pollution compared to days with lower air pollution(short-term).*

Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of nitrogen dioxide concentrations. Calculation applies to adults age 15-64.

Nottingham

- *In Nottingham, adults are 1.7% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Nottingham, an extra 3 adults are taken to hospital with asthma on days of high air pollution compared to days with lower air pollution(short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of nitrogen dioxide concentrations. Calculation applies to adults age 15-64.

Oxford

- *In Oxford, adults are 1.2% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Oxford, an extra 1 adult are taken to hospital with asthma on days of high air pollution compared to days with lower air pollution(short-term).*

  Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of nitrogen dioxide concentrations. Calculation applies to adults age 15-64.

Southampton

- *In Southampton, adults are 1.6% more likely to be hospitalised for asthma on days with high NO_2 pollution compared to days with lower air pollution (short-term).*

  Assumes typical high air pollution days are at the average of the top half of the annual range of NO_2 levels and typical low air pollution days were at the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of daily average nitrogen dioxide concentrations.

- *In Southampton, an extra 3 adults are taken to hospital with asthma on days of high air pollution compared to days with lower air pollution(short-term).*

Assumes half the year was at the average of the top half of the annual range of nitrogen dioxide levels and these days were reduced to the average of the bottom half of the range of levels. In more technical terms, this is the difference between the 75th and 25th percentile of nitrogen dioxide concentrations. Calculation applies to adults age 15-64.

5.5 Reduced lung growth and low lung function

Birmingham

- *Roadside air pollution in Birmingham stunts lung growth in children by 7.7% (long-term).*

Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Birmingham background). Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Cutting air pollution in Birmingham by one fifth would increase children's lung capacity by around 2.6% (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Living near busy roads in Birmingham may contribute to an 4.7% greater chance of reduced lung function in children (long-term).*

Based on the difference between long term average air nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Birmingham background). Refers to children aged 6-8.

- *Cutting air pollution in Birmingham by one fifth would result in 659 less children with low lung function each year (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Low lung function refers to children with FEV_1 (Forced expiratory volume in 1 second – a measure of how fast a child can breathe out) less than 85% of that predicted for healthy children of the same age and gender. It is typically low in asthmatics. Refers to children aged 6-8.

Bristol

- *Roadside air pollution in Bristol stunts lung growth in children by 5.3% (long-term).*

Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Bristol background). Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Cutting air pollution in Bristol by one fifth would increase children's lung capacity by around 2.3% (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Living near busy roads in Bristol may contribute to an 3.0% greater chance of reduced lung function in children (long-term).*

  Based on the difference between long term average air nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Bristol background). Refers to children aged 6-8.

- *Cutting air pollution in Bristol by one fifth would result in 199 less children with low lung function each year (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Low lung function refers to children with FEV_1 (Forced expiratory volume in 1 second – a measure of how fast a child can breathe out) less than 85% of that predicted for healthy children of the same age and gender. It is typically low in asthmatics. Refers to children aged 6-8.

Derby

- *Cutting air pollution in Derby by one fifth would increase children's lung capacity by around 3.1% (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Cutting air pollution in Derby by one fifth would result in 179 less children with low lung function each year (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Low lung function refers to children with FEV_1 (Forced expiratory volume in 1 second – a measure of how fast a child can breathe out) less than 85% of that predicted for healthy children of the same age and gender. It is typically low in asthmatics. Refers to children aged 6-8.

Liverpool

- *Roadside air pollution in Liverpool stunts lung growth in children by 4.6% (long-term).*

  Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Liverpool background). Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Cutting air pollution in Liverpool by one fifth would increase children's lung capacity by around 2.1% (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Living near busy roads in Liverpool may contribute to an 2.5% greater chance of reduced lung function in children (long-term).*

Based on the difference between long term average air nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Liverpool background). Refers to children aged 6-8.

- *Cutting air pollution in Liverpool by one fifth would result in 174 less children with low lung function each year (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Low lung function refers to children with FEV_1 (Forced expiratory volume in 1 second – a measure of how fast a child can breathe out) less than 85% of that predicted for healthy children of the same age and gender. It is typically low in asthmatics. Refers to children aged 6-8.

London

- *Roadside air pollution in London stunts lung growth in children by 12.5% (long-term).*

Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the London background). Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Cutting air pollution in London by one fifth would increase children's lung capacity by around 4% (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Living near busy roads in London may contribute to an 8.7% greater chance of reduced lung function in children (long-term).*

Based on the difference between long term average air nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the London background). Refers to children aged 6-8.

Manchester

- *Cutting air pollution in Manchester by one fifth would increase children's lung capacity by around 2.6% (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Cutting air pollution in Manchester by one fifth would result in 284 less children with low lung function each year (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Low lung function refers to children with FEV_1 (Forced expiratory volume in 1 second – a measure of how fast a child can breathe out) less than 85% of that predicted for healthy children of the same age and gender. It is typically low in asthmatics. Refers to children aged 6-8.

Nottingham

- *Roadside air pollution in Nottingham stunts lung growth in children by 2.8% (long-term).*

  Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Nottingham background). Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Cutting air pollution in Nottingham by one fifth would increase children's lung capacity by around 2.8% (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Living near busy roads in Nottingham may contribute to an 1.5% greater chance of reduced lung function in children (long-term).*

  Based on the difference between long term average air nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Nottingham background). Refers to children aged 6-8.

- *Cutting air pollution in Nottingham by one fifth would result in 175 less children with low lung function each year (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Low lung function refers to children with FEV_1 (Forced expiratory volume in 1 second – a measure of how fast a child can breathe out) less than 85% of that predicted for healthy children of the same age and gender. It is typically low in asthmatics. Refers to children aged 6-8.

Oxford

- *Roadside air pollution in Oxford stunts lung growth in children by 14.1% (long-term).*

  Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Oxford background). Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Cutting air pollution in Oxford by one fifth would increase children's lung capacity by around 2.8% (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Living near busy roads in Oxford may contribute to an 10.3% greater chance of reduced lung function in children (long-term).*

Based on the difference between long term average air nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Oxford background). Refers to children aged 6-8.

- *Cutting air pollution in Oxford by one fifth would result in 77 less children with low lung function each year (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Low lung function refers to children with FEV_1 (Forced expiratory volume in 1 second – a measure of how fast a child can breathe out) less than 85% of that predicted for healthy children of the same age and gender. It is typically low in asthmatics. Refers to children aged 6-8.

Southampton

- *Roadside air pollution in Southampton stunts lung growth in children by 3.8% (long-term).*

Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Southampton background). Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Cutting air pollution in Southampton by one fifth would increase children's lung capacity by around 3.2% (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Compares the resulting predicted change in Forced Vital Capacity (a measure of the volume of the lungs) in children from age 11-15 with the theoretical normal values in children across the same age span.

- *Living near busy roads in Southampton may contribute to an 2.0% greater chance of reduced lung function in children (long-term).*

Based on the difference between long term average air nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Southampton background). Refers to children aged 6-8.

- *Cutting air pollution in Southampton by one fifth would result in 150 less children with low lung function each year (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Low lung function refers to children with FEV_1 (Forced expiratory volume in 1 second – a measure of how fast a child can breathe out) less than 85% of that predicted for healthy children of the same age and gender. It is typically low in asthmatics. Refers to children aged 6-8.

5.6 Lung cancer

Birmingham

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- *Cutting air pollution in Birmingham by one fifth would decrease lung cancer cases by around 6.4% (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

- *Cutting air pollution in Birmingham by one fifth would result in 50 less lung cancer cases each year (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

Bristol

- *Cutting air pollution in Bristol by one fifth would decrease lung cancer cases by around 5.9% (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

- *Cutting air pollution in Bristol by one fifth would result in 18 less lung cancer cases each year (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

Liverpool

- *Cutting air pollution in Liverpool by one fifth would decrease lung cancer cases by around 5.3% (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

- *Cutting air pollution in Liverpool by one fifth would result in 17 less lung cancer cases each year (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

Manchester

- *Cutting air pollution in Manchester by one fifth would decrease lung cancer cases by around 5.6% (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

- *Cutting air pollution in Manchester by one fifth would result in 20 less lung cancer cases each year (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

Nottingham

- *Cutting air pollution in Nottingham by one fifth would decrease lung cancer cases by around 6.7% (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

- *Cutting air pollution in Nottingham by one fifth would result in 15 less lung cancer cases each year (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

Oxford

- *Cutting air pollution in Oxford by one fifth would decrease lung cancer cases by around 6.0% (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

- *Cutting air pollution in Oxford by one fifth would result in 28 less lung cancer cases each year (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

Southampton

- *Cutting air pollution in Southampton by one fifth would decrease lung cancer cases by around 5.9% (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

- *Cutting air pollution in Southampton by one fifth would result in 10 less lung cancer cases each year (long-term).*

  20% is an arbitrary number for a reduction in long-term $PM_{2.5}$ concentrations. Lung cancer develops through many steps and smoking is the major cause but air pollution may contribute too.

5.7 Asthma symptoms

Birmingham

- *In Birmingham, children with asthma are 0.3% more likely to experience asthma symptoms on high air pollution days than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness.

- *On high air pollution days, 42 more children with asthma in Birmingham experience asthma symptoms than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness. Applies to children age 5-14.

Bristol

- *In Bristol, children with asthma are 0.2% more likely to experience asthma symptoms on high air pollution days than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness.

- *On high air pollution days, 12 more children with asthma in Bristol experience asthma symptoms than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness. Applies to children age 5-14.

Liverpool

- *In Liverpool, children with asthma are 0.2% more likely to experience asthma symptoms on high air pollution days than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness.

- *On high air pollution days, 12 more children with asthma in Liverpool experience asthma symptoms than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness. Applies to children age 5-14.

London

- *In London, children with asthma are 0.3% more likely to experience asthma symptoms on high air pollution days than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness.

- *On high air pollution days, 143 more children with asthma in London experience asthma symptoms than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness. Applies to children age 5-14.

Nottingham

- *In Nottingham, children with asthma are 0.3% more likely to experience asthma symptoms on high air pollution days than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness.

- *On high air pollution days, 11 more children with asthma in Nottingham experience asthma symptoms than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness. Applies to children age 5-14.

Oxford

- *In Oxford, children with asthma are 0.2% more likely to experience asthma symptoms on high air pollution days than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness.

- *On high air pollution days, 4 more children with asthma in Oxford experience asthma symptoms than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness. Applies to children age 5-14.

Southampton

- *In Southampton, children with asthma are 0.3% more likely to experience asthma symptoms on high air pollution days than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness.

- *On high air pollution days, 9 more children with asthma in Southampton experience asthma symptoms than on lower pollution days (short-term).*

Assumes half the year was at the average of the top half of the annual range of particulate air pollution (PM_{10}) levels and these days were reduced to the average of the bottom half of the range of levels. Asthmatic symptoms include cough, wheeze and breathlessness. Applies to children age 5-14.

5.8 Term low birthweight

Birmingham

- *Living near busy roads in Birmingham may contribute to a 0.2% greater risk of babies being born underweight (long-term).*

Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Birmingham background). Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Birmingham by one fifth would decrease the risk of babies being born underweight by around 0.1% (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Birmingham by one fifth would result in 11 fewer babies born underweight each year (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

Bristol

- *Living near busy roads in Bristol may contribute to a 0.2% greater risk of babies being born underweight (long-term).*

Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Bristol background). Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Bristol by one fifth would decrease the risk of babies being born underweight by around 0.1% (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Bristol by one fifth would result in 4 fewer babies born underweight each year (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

Derby

- *Cutting air pollution in Derby by one fifth would decrease the risk of babies being born underweight by around 0.1% (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Derby by one fifth would result in 3 fewer babies born underweight each year (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

Liverpool

- *Living near busy roads in Liverpool may contribute to a 0.1% greater risk of babies being born underweight (long-term).*

  Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Liverpool background). Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Liverpool by one fifth would decrease the risk of babies being born underweight by around 0.1% (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Liverpool by one fifth would result in 3 fewer babies born underweight each year (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

Manchester

- *Cutting air pollution in Manchester by one fifth would decrease the risk of babies being born underweight by around 0.1% (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Manchester by one fifth would result in 5 fewer babies born underweight each year (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

Nottingham

- *Living near busy roads in Nottingham may contribute to a 0.1% greater risk of babies being born underweight (long-term).*

  Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Nottingham background). Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Nottingham by one fifth would decrease the risk of babies being born underweight by around 0.1% (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Nottingham by one fifth would result in 3 fewer babies born underweight each year (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

Oxford

- *Living near busy roads in Oxford may contribute to a 0.4% greater risk of babies being born underweight (long-term).*

  Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Oxford background). Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Oxford by one fifth would decrease the risk of babies being born underweight by around 0.1% (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Oxford by one fifth would result in 1 fewer baby born underweight each year (long-term).*

  20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

Southampton

- *Living near busy roads in Southampton may contribute to a 0.1% greater risk of babies being born underweight (long-term).*

  Based on the difference between long term average nitrogen dioxide levels at roadsides compared to the long-term average at less polluted, quieter streets (the Southampton background). Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Southampton by one fifth would decrease the risk of babies being born underweight by around 0.1% (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

- *Cutting air pollution in Southampton by one fifth would result in 3 fewer babies born underweight each year (long-term).*

20% is an arbitrary number for a reduction in long-term NO_2 concentrations. Babies born underweight refers to babies born at term with a birthweight less than 2,500g.

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FINAL REPORT

The final report and accompanying health statistics will be released in November 2019. If you are interested in receiving the link to the final version of this report, please email heather.walton@kcl.ac.uk.

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