

CAMPAIGN FOR CLEAN AIR IN LONDON

"The cross-party campaign to achieve urgently and sustainably at least World Health Organisation recommended standards of air quality throughout London"

Campaign website: www.cleanairinlondon.org

Boris Johnson
Mayor of London
Greater London Authority
City Hall
The Queen's Walk
More London
London SE1 2AA

By email: mayor@london.gov.uk

20 September 2009

Dear Mayor Johnson

Government releases previously unpublished spreadsheets for calculating premature deaths due to air pollution in London after formal information request from 'Clean Air in London' (CCAL)

Using government spreadsheets and its current risk figures indicates there were around 5,000 premature deaths in London in 2005 due to dangerous airborne particles (PM₁₀) alone

CCAL urges Mayor Johnson to apply the Precautionary Principle when developing his Air Quality Strategy and accept government recommendations for sensitivity analyses which suggest there may have been some 6,300 to 7,900 premature deaths in London in 2005 due to PM₁₀ alone

CCAL calls for a radical overhaul of guidance from the Health and Safety Executive after a long-serving London policeman describes air pollution on a 'fixed post' that made him 'rasp'

I am writing on behalf of the Campaign for Clean Air in London (CCAL) to urge you to take full and appropriate account of the most up-to-date scientific evidence on the health impact of poor air quality and to apply the Precautionary Principle in developing your forthcoming Air Quality Strategy.

Many people have aided CCAL in understanding the issues set out in the letter. CCAL thanks them all.

Summary

Ministers tend to say: air quality is good across 99% of the UK's landmass; has improved a lot since 1990; that people lose on average a maximum of seven to eight months of their lives due to the problem; and the alert bands show air pollution as being mostly 'low' or 'moderate'.

The real picture is quite different. No-one lives in our fields and mountains; they live alongside the 1,117 kilometres of roads in London (2,496 kilometres nationally)^{Note 2} forecast by the government to breach legal standards for nitrogen dioxide (NO₂) in 2010. Air quality has improved since 1990 but the level of dangerous airborne particles (PM₁₀) in London has increased at a mean rate of around 0.4% per year since the late 1990's despite public health laws requiring sharp reductions^{Note 3}. London has the highest annual mean concentrations of NO₂ of any capital city in western (or eastern) Europe. Rather than talk abstractly

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about an average reduction in life expectancy across 60,975,000 people, Ministers should warn people that the amount of time lost per statistical victim due to dangerous airborne particles may be 9.8 years^{Note}.
4. Air quality can be in the 'low' band all year round but still breach European Union (EU) limit values.

Embarrassment at the London 2012 Olympics over unlimited fines and legal action to enforce air quality laws will be outweighed by the government's failure to protect lives.

CCAL therefore wrote to the Secretary of State for Health in a letter dated 19 April 2009 to ask the Department of Health (DoH): for its urgent assistance to clarify the full extent of the health impact of poor air quality in Greater London; and to commit to a major public information programme to communicate updated similar information at least annually in future.

In a reply from the DoH (attached as Appendix One) and in subsequent meetings with DoH executives and others, CCAL has obtained a more detailed understanding of the health impacts of poor air quality in London. CCAL has also obtained a response from the Department from Environment Food and Rural Affairs (Defra) under the Environmental Impact Regulations 2004 (EIR) that discloses two previously unpublished spreadsheets used by the government to calculate premature deaths in London due to poor air quality (the letter and spreadsheets are attached). In addition, the Committee on Medical Effects of Air Pollution (COMEAP) published, in June 2009, its final report titled 'Long Term Exposure to Air Pollution: Effect on Mortality'.

As a result of this further work, CCAL has become more concerned even than previously about the health impact of air pollution on Londoners. Assuming that London suffers no worse than average UK population-weighted levels of fine particles (PM_{2.5}) CCAL estimates, from information in the government's Air Quality Strategy 2007, that some 3,100 people died prematurely (i.e. Attributable Deaths) in London in 2005. This number compares with that calculated by CCAL earlier this year of around 2,900 from the European Environment Agency's report on PM₁₀. Using COMEAP's currently recommended coefficient in the government spreadsheet indicates some 5,000 premature deaths in London in 2005 due to long-term exposure to PM₁₀ alone compared to the 1,031 premature deaths from short-term only air pollution which has been referred to in London for several years. CCAL is arranging to meet government officials to check this result.

Please note that the need for scientists to have exceptionally high standards of proof means that it has taken some 15 years to determine that long-term exposure to airborne particles has some 10 times greater impact on mortality (i.e. deaths) than short-term exposure.

Assuming again that London suffers no worse than average UK population-weighted levels of PM_{2.5}, and applying the Precautionary Principle and COMEAP's recommendation to use a wider interval of relative risk in any report on quantification of risks from long term exposure to particulate air pollution represented by PM_{2.5}, suggests that between 6,300 and 7,900 people may have died prematurely in London in 2005 due to PM_{2.5} (and therefore PM₁₀).

Action 1: CCAL urges you, as Mayor of London, to take full account of this latest information in your forthcoming Air Quality Strategy and to address the other actions listed in this letter. Radical

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and urgent action is needed now to reduce sharply levels of dangerous airborne particles (PM_{2.5} and PM₁₀) and other pollutants (e.g. NO₂) in London.

Notes for Summary:

1. PM₁₀ is particulate matter (or dangerous airborne particles) with an aerodynamic diameter of up to 10 microns (one-millionth of a metre), i.e. fine (PM_{2.5}) and coarse (PM₁₀ minus PM_{2.5}) PM fractions together.
2. Page 6 of Defra’s ‘UK Approach to its Application for Time Extension Notification to Nitrogen Dioxide Limit Value deadline’. See

<http://www.defra.gov.uk/environment/airquality/panels/forum/documents/aq-forum-draft-no2-approach-paper0902.pdf>

3. Page 5 of King’s College London, London Air Quality Network report ‘Air quality in London, Report 14, 2006-7’

<http://www.londonair.org.uk/london/reports/AirqualityinLondon2006-2007.pdf>

4. Paragraph 3 of discussion section of ‘Assessment of Deaths Attributable to Air Pollution’ by Künzli et al 2001. See:

<http://aje.oxfordjournals.org/cgi/content/full/153/11/1050>

Premature (or Attributable or Accelerated) Deaths due to dangerous airborne particles in London in 2005

Earlier estimates of Premature Deaths

For many years, Londoners have been told that there were an estimated 1,031 premature (or attributable or accelerated) deaths in London in 2005 due to the harmful effects of dangerous airborne particles (PM₁₀). This number was published in August 2005 in the ‘Mayor’s Air quality Strategy, Progress Report to March 2005’. See page 1 of the Progress Report:

http://mayor.london.gov.uk/mayor/environment/air_quality/docs/MAQS_progress_report_2005.pdf

This number has been repeated as recently as 4 February 2008 in a press release about the introduction of the Low Emission Zone which stated:

“Poor air quality worsens asthma and causes the premature death of an estimated 1,000 people each year in London. Seven out of ten Londoners say they are worried about pollution from traffic exhaust fumes.”

See: http://www.london.gov.uk/view_press_release.jsp?releaseid=15533

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In the Mayor’s Air Quality Strategy published in September 2002, the Executive Summary stated that:

“It is estimated that 1,600 accelerated deaths and 1,500 respiratory hospital admissions per year occur in London as a result of air pollution.” See:

http://www.london.gov.uk/mayor/strategies/air_quality/docs/exec_sum.pdf

CCAL understands that the difference between the 1,031 and 1,600 numbers was largely due to deaths attributed to sulphur dioxide (SO₂). CCAL has not yet probed further that number and is focusing in this letter on the health impact of dangerous airborne particles alone.

Information requests to Defra and GLA

CCAL submitted simultaneous requests on 20 August 2009 to the Greater London Authority (GLA) and Defra under the EIR seeking to discover the basis for the above estimates for PM₁₀. CCAL wanted particularly to uncover the Relative Risk (RR) used to compare age-specific deaths rates in two groups that differ in terms of exposure or other characteristics. As you may know, the RR is used to determine the number of Attributable (or premature) deaths that would be reduced by a given reduction in population-weighted exposure to dangerous airborne particles.

The GLA’s response to CCAL dated 4 September said that:

“The GLA holds no information relating to the underlying data that was used to reach the figure of 1,031 premature deaths resulting each year from air pollution that was used in the ‘Mayor’s Air Quality Strategy Progress Report’ that was published in 2006.”

Defra responded in a letter dated 18 September and attached two previously unpublished spreadsheets (attached). Defra said:

“The value of 1,031 comes from an unpublished spreadsheet prepared in support of the 2007 [National Air Quality Strategy]. It is derived from 2005 baseline projections of Particulate Matter (PM₁₀) concentrations calculated from a base year in 2003.”

The Defra letter referred also to its Air Quality Strategy, see:

<http://www.defra.gov.uk/environment/quality/air/airquality/strategy/index.htm>

and in particular Volume 3 (mainly see pages 58 and 59) for an explanation of the calculations made:

<http://www.defra.gov.uk/environment/quality/air/airquality/publications/stratreview-analysis/chap-2-icgb.pdf>

These pages note that the Defra model used ‘annual average concentrations of pollutants [with] the resident population estimated for each’.

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The spreadsheets were particularly enlightening because they confirmed that the government had used a coefficient of 0.75% per 10 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$) of PM_{10} to calculate the number of premature deaths (i.e. those due only to short term exposure). This equates to a RR of 1.0075 and means that 0.75% of all those dying (aged 30 and above) in that year would not have died at that time if population-weighted concentrations of PM_{10} were reduced by $10 \mu\text{g}/\text{m}^3$.

COMEAP advice in 1998 and 2009

The coefficient of 0.75% per $10 \mu\text{g}/\text{m}^3$ of PM_{10} as a 24 hour mean (i.e. an RR of 1.0075) was recommended by COMEAP in a report titled ‘Quantification of the Effects of Air Pollution on Health in the United Kingdom’ which was published in 1998. The same report estimated that PM_{10} contributes to around 8,100 deaths in the urban population of Great Britain annually. CCAL has a copy of that report but has been unable to find a weblink to it.

The latest COMEAP advice published in June 2009 (the COMEAP 2009 Report) recommends a much higher RR of 1.06 equating to a coefficient of 6.0% for every reduction in exposure to fine particulate matter (so called $\text{PM}_{2.5}$) of $10 \mu\text{g}/\text{m}^3$.

Note that: (i) COMEAP is referring nowadays to $\text{PM}_{2.5}$ not PM_{10} ; and (ii) the coefficient and RR is log-linear meaning that linear scaling is a reasonable approximation for many applications. However, for larger coefficients and/or larger concentration increments, it is better to use a more precise equation based on multiplicative scaling of the original study (see footnote on page 46 of the COMEAP 2009 Report). It is easy to calculate the coefficient for PM_{10} knowing that for $\text{PM}_{2.5}$ and the relevant fraction (see below).

See page 3 of the COMEAP 2009 Report:

<http://www.advisorybodies.doh.gov.uk/comeap/pdfs/finallongtermeffectsmort2009report.pdf>

COMEAP went on to state on page 3:

“We suggest that the plausible ‘low’ and ‘high’ values of 1.01 and 1.12, respectively, based approximately on the 12.5th and 87.5% percentiles of the overall range of plausibility, could be used in sensitivity analysis.

“We also recommend that the wider interval of 0 to 15% (RR 1.00 and 1.15) be included in any report on quantification of risks from long term exposure to particulate air pollution represented by $\text{PM}_{2.5}$.”

Further information about the scientific evidence on the health impact of air pollution is set out in Appendix Two. It includes references to two crucial pieces of research published by Jerrett et al (2006) and Laden et al (2006) that were not considered fully by COMEAP because it applied a cut-off of early 2006 to the consideration of research for its 2009 Report. These refer to a mean RR of 1.17 and 1.16 respectively for a $10 \mu\text{g}/\text{m}^3$ change in $\text{PM}_{2.5}$.

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Estimates of PM_{2.5} as a fraction of PM₁₀

The World Health Organisation (WHO) in a report titled ‘Outdoor air pollution, Assessing the environmental burden of disease at national and local levels’ published in Geneva in 2004 stated:

“The best estimation of the PM_{2.5}/PM₁₀ ratio would be from a local study, as it would capture all the local conditions and sources of pollution that condition that ratio. In the absence of a local measurement of the ratio, a value of 0.65 could be assumed for developed countries, and 0.5 for developing countries. For Europe, a mean of 0.73 has been reported and may be more adequate (Second Position Paper on Particulate Matter. Final Draft. April 2004).”

See:

http://www.who.int/quantifying_ehimpacts/publications/ebd5.pdf

A later report by the European Topic Centre on Air Quality and Climate Change titled ‘Health Impacts and Air Pollution – An exploration of factors influencing estimates of air pollution impact upon the health of European citizens’ published in December 2008 found in Figure 3.1 on page 27 a PM₁₀/ PM_{2.5} ratio of 0.7 for the period 2004-2006.

See:

http://air-climate.eionet.europa.eu/docs/ETCACC_TP_2008_13_HealthImpact_AirPoll.pdf

CCAL has therefore used a PM_{2.5}/PM₁₀ ratio of 0.7 in its calculations (unless stated otherwise).

The Precautionary Principle

There is no universally accepted definition of the Precautionary Principle. However, the Sustainable Development White Paper, set out the government’s commitment to use the Precautionary Principle by reference to the 1992 Rio Declaration on Environment and Development:

‘Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation.’

Since ‘Rio’, however, the UK has signed a number of international agreements which include different formulations of the Precautionary Principle, reflecting the context and negotiating circumstances.

Please see the Communication from the European Commission on the Precautionary Principle (2 February 2000):

http://ec.europa.eu/dgs/health_consumer/library/pub/pub07_en.pdf

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and the Inter-departmental Liaison Group on Risk Assessment ‘The Precautionary principle: policy and application’ (2002):

<http://www.hse.gov.uk/aboutus/meetings/committees/ilgra/pppa.pdf>

Updating Defra estimates of Attributable Deaths in London for 2005

Assuming a $PM_{2.5}/PM_{10}$ ratio of 0.7, the COMEAP 2009 Report advice of a RR of 1.06 (i.e. a coefficient of 6%) for every $10 \mu\text{g}/\text{m}^3$ change (usually reduction) in $PM_{2.5}$ can be adjusted to become an RR and a coefficient for PM_{10} in the following way:

$$PM_{10} = 0.7 \times PM_{2.5} \text{ and } PM_{2.5} = PM_{10}/0.7$$

$$\text{Hence } PM_{10} = 6.0 \times 0.7 = 4.2\% \text{ per } 10 \mu\text{g}/\text{m}^3$$

CCAL notes that this is very close to the coefficient of 4.3% per $10 \mu\text{g}/\text{m}^3$ of PM_{10} for total mortality (excluding violent deaths, adults of 30 years of age and older) (Kunzli et al, 2000). This figure was used by the European Environment Agency in its report titled ‘Spatial assessment of PM_{10} and ozone concentrations in Europe (2005)’ that was published on 24 March 2009. See:

<http://www.eea.europa.eu/publications/spatial-assessment-of-pm10-and-ozone-concentrations-in-europe-2005-1>

Using the 4.2% coefficient in the same Defra model that calculated the 1,031 Attributable Deaths produces a new estimate of 5,772 Attributable Deaths in London in 2005 due to PM_{10} . Using the same coefficient in Defra’s subsequent spreadsheet (which estimated 961 Attributable Deaths in 2005) produces a new estimate of 5,382 Attributable Deaths in London in 2005 due to PM_{10} . As a ‘low’ sensitivity, assuming a $PM_{2.5}/PM_{10}$ ratio of 0.65 implies a coefficient of 3.9% and some 5,361 and 5,000 Attributable Deaths respectively in the two spreadsheets. CCAL has chosen to use, on this occasion, the lowest of all four estimates.

CCAL is disappointed that the government does not appear to have provided COMEAP with the resources it seems to have needed to review highly significant scientific research. It seems extraordinary that the Committee had to adopt a cut-off date in early 2006 for published work which was considered in detail. This was nearly three and one-half years before COMEAP published its 2009 Report. CCAL urges you, as Mayor of London, not to make the same mistake.

CCAL is similarly surprised that the government was still calculating premature deaths rates in 2005 for its Air Quality Strategy 2007 based on out-of-date 1998 recommendations from COMEAP.

Action 2: Please determine the real health impact of poor air quality in London and advise the public accordingly.

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‘Clean Air in London’ calculation of Attributable Deaths in London in 2005

Using national average annual PM_{2.5} concentrations from Defra’s Air Quality Strategy 2007

CCAL has calculated the Attributable Deaths in London in 2005 due to exposure to PM_{2.5} using the following assumptions:

- i. London has the same anthropogenic PM_{2.5} (i.e. man-made fine particles) annual average population-weighted mean as the whole UK of 10.144 µg/m³ (gravimetric) (see Table 2.11 on page 87 of Volume 3 of Defra’s Air Quality Strategy 2007) in 2005. See

<http://www.defra.gov.uk/environment/quality/air/airquality/publications/stratreview-analysis/chap-2-icgb.pdf>

Note that Defra assumed (on page 87) the level of non-anthropogenic PM_{2.5} to be constant and estimated it to be about 3.37 µg/m³ annual average population-weighted mean.

- ii. 52,995 total deaths in London in 2005 from Table 4.1b on page 57 of National Statistics: Key Population and Vital Statistics, Local and Health Authority Areas. See:

http://www.statistics.gov.uk/downloads/theme_population/KPVS32_2005/KPVS2005.pdf

- iii. the death rate of those dying before 30 years of age as 1.9% of total deaths from Table 6.1 on page 47 of National Statistics, Population Trends, No. 124, Summer 2006. See:

http://www.statistics.gov.uk/downloads/theme_population/PT124.pdf

- iv. calculated that there were 52,995 x (1 – 0.019) = 51,988 total deaths in London in 2005 of people aged 30 and above; and

- v. applied the recommendations from COMEAP’s 2009 Report to use a coefficient of 6% per 10 µg/m³ of PM_{2.5} as the best estimate of Attributable Deaths, with a sensitivity of 12% and a wider interval of 15% (which COMEAP said should be used in any report on quantification of risks from long-term exposure to air pollution represented by PM_{2.5}).

The calculations for London in 2005 using the different coefficients are:

6%: Attributable Deaths = 51,988 x 0.06 x 10.144/10.000 = 3,164

12%: Attributable Deaths = 51,988 x 0.12 x 10.144/10.000 = 6,328

15%: Attributable Deaths = 51,988 x 0.15 x 10.144/10.000 = 7,910

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CCAL has not considered it necessary to use the log-linear function to scale the results since the amount of anthropogenic PM_{2.5} is so close to the defined parameter of 10 µg/m³. For details see the footnote on page 46 of the COMEAP 2009 Report.

CCAL has assumed that the coefficients are to be applied to deaths of people of 30 years of age and older.

Using London Atmospheric Emissions Inventory population-weighted concentrations of PM₁₀ in 2006

The population-weighted average annual mean concentration of PM₁₀ for London in 2006 (assuming 2006 meteorology) was 21.4 µg/m³.

Assuming PM_{2.5} to PM₁₀ ratios of 0.65 and 0.70, CCAL estimates anthropogenic levels of PM_{2.5} for London in 2006 of 10.5 and 11.6 µg/m³ respectively. Applying these would increase the Attributable Deaths calculated above by roughly 3.8% (i.e. 10.5/10.144) and 14% (i.e. 11.6/10.144) respectively.

As far as CCAL can discover the only full analysis of PM_{2.5} exposure that has ever been modeled for London is for the year 2015.

Please note that Jerrett et al (2006) and Laden et al (2006) have estimated a mean coefficient of 17% and 16% respectively for every 10 µg/m³ of annual mean concentration of PM_{2.5} i.e. compared with the top sensitivity of 15% recommended by COMEAP in its 2009 Report. Given COMEAP admits these studies missed its early 2006 chosen ‘cut-off’, CCAL considers it important that the Mayor of London gives, at a bare minimum, full weight to the 12% and 15% sensitivities in developing his Air Quality Strategy.

Action 3: Please ensure that accurate population-weighted estimates are made for annual average concentrations of PM_{2.5} for every Census Output Area, Ward and Borough in London and estimate Attributable Deaths for each such area annually.

Racial Equality Impact Assessment

CCAL wishes to draw to your attention the recent Racial Equality Impact Assessment (England) conducted by Defra in relation to the UK notification to the European Commission to extend the compliance deadline for meeting PM₁₀ limit values in ambient air to 2011. That report is attached.

Action 4: Please ensure you conduct a similar assessment for London and take appropriate measures to reduce inequalities by protecting all those at risk.

Department of Health needs to act on poor air quality to reduce health costs of up to £38 billion

The Financial Times reported on Saturday 19 September 2009, on page two that the National Health Service is seeking to save some £20 billion.

Table 2.14 on page 90 of Volume 3 of Defra’s Air Quality Strategy 2007 estimated the value of the overall health impact from 2005 levels of anthropogenic PM_{2.5} at between £8.582 billion and £20.165

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billion (assuming a 6% coefficient) or £16.238 billion to £38.115 billion (assuming a 12% coefficient). See:

<http://www.defra.gov.uk/environment/quality/air/airquality/publications/stratreview-analysis/chap-2-icgb.pdf>

At a recent meeting attended by CCAL, senior Department of Health executives in London emphasised their focus on ‘cash release’. CCAL made the point at that meeting that a major public understanding campaign (like that for alcoholism, obesity, road traffic accidents or smoking) would prevent premature deaths from poor air quality and quickly save money for the DoH. Clearly, there would need to be rigorous management of the DoH to ensure that the reductions in hospitalisations and other treatments resulted in cash release thereafter.

Action 5: Please ensure that the Department of Health in London plays its full part in promoting and funding measures to protect public health from the impact of poor air quality.

Communicating effectively the health impacts of air pollution

Several panelists at a recent annual conference of the International Society for Environmental Epidemiology (ISEE) in Dublin alluded to a communication ‘battle’ over air quality.

CCAL urges the Mayor of London therefore to think separately about the communication needs to win the air quality communication ‘battle’ and the quite different communication needs once the ‘battle’ is won (in say 15 years time). Also to consider that there are very different audiences to address e.g. sophisticated policy makers, lay members of the general public (and those who communicate with them) and others.

CCAL's main points on communication are:

1. Those wishing to improve air quality are in a communication ‘battle’ with those seeking delay and/or inaction. In the UK, for example, government ministers say: ‘air quality is good over 99% of the UK (landmass)’; it has improved a lot since 1990; poor air quality has a maximum impact averaging seven to eight months across the [whole] UK population; and the alert bands show air pollution as being mostly ‘low’ or ‘moderate’.

As mentioned earlier, the reality, of course, is quite different. The UK has the worst NO₂ problem of any of the EU 27 (London has the highest annual average NO₂ of any EU 27 capital city; and six of the worst 15 of 666 background sites for NO₂ in the EU 27 are in the UK with all of those in London). Annual mean levels of PM₁₀ in London have increased at a mean rate of around 0.4% since the late 1990s in London (Kings College report for 2006/2007). A ‘statistical victim’ of PM₁₀ exposure may die up to 9.8 years early (see Professor Künzli's excellent paper published in 2001 in the Am J of E, Vol. 153, pp 1050/1055). Air quality can be in the 'low' band all year round but still breach EU limit values.

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In essence, while 72% of Londoners are worried about air pollution they get the message from government Ministers that ‘all is well’. No wonder people are confused.

2. Environmental health metrics are well established for other public health problems e.g. alcoholism, obesity and smoking. For all these we are told a number of ‘premature deaths’ and, for example, that: severe obesity reduces the statistical victim's life expectancy by seven years and heavy smoking by eight to 10 years. Air quality communication messages need to be consistent with those for these other risks (for each audience). Air quality epidemiologists may have ‘powerful’ metrics but there is no point trying to operate in their own ‘communication universe’.
3. Air quality laws are in place in Europe and now need to be enforced i.e. the legislators have done their bit for now. London, for example, looks set - without urgent and radical action - to breach air quality laws up to and including the year of the London 2012 Olympics. The main priority, not to the exclusion of all other priorities, is therefore to build public understanding and support for the action needed to improve air quality (noting too that it the reductions in air pollution will also aid the reaching of bold climate change targets).

In CCAL's view, such public support needs strong, simple measures to counter current ‘disinformation’ programmes (from many ‘siren voices’ including the government). In CCAL's view, two messages always ‘get through’ to people: a number of ‘premature’ or ‘attributable deaths’ estimated for a specific year (say 2005); and the ‘average life years lost per statistical victim’ being up to 9.8 years (see above). CCAL therefore urges the Mayor of London most strongly to include such metrics in his plans for the communication of air pollution risks. CCAL appreciates that care needs to be used when referring to such metrics (e.g. by including appropriate caveats and not, for example, referring to ‘annual’ death rates).

4. Dr Brian Miller has done excellent work, with Dr Fintan Hurley and Dr Bert Brunkreef, on developing the years of life lost (YLL) metric. CCAL supports wholeheartedly the use of that measure with sophisticated air quality experts and policy makers (including economists). It will, for example, play a crucial role in justifying the health and financial case to tighten air quality standards in the European Commission's review of standards in 2013. However, CCAL supports firmly the view expressed by Dr Joel Schwartz that the YLL metric does not strike a chord with members of the public.
5. CCAL was struck by the point made by several panelists at the ISEE conference, including Professor Künzli and Andrej Kobe, of the need to communicate the morbidity risks of poor air quality. CCAL therefore urges the Mayor of London to develop an additional metric to be called (say) ‘Attributable illness victims (excluding death)’ to describe the morbidity impact of poor air quality. Please though link it always to an ‘average years of life effected per statistical victim’ as with ‘attributable deaths’ so it counters the misleading message of ‘everyone losing, or being ill for, just a few months at the end of their life’.
6. CCAL is not concerned that epidemiologists cannot predict who will die or become ill from poor air quality. The public understands health risk messages and that is enough.

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In summary, CCAL urges the Mayor of London to focus on developing the tools to win the air quality communication ‘battle’ rather than worrying about how the messages may change in (say) 10 to 15 years time when (if?) there is no air pollution. It would be very valuable to have from the Mayor of London a careful description of several different metrics, with their pros and cons and the caveats to be used with each. It would help too to say which metric might be most suitable for which audience. In the unlikely event that the Mayor of London does not wish to make such recommendations, please just describe the full range of metrics and leave it to others to choose which to use.

Finally, a clear, strong message from the Mayor of London that: air pollution is still far too high; it has serious health impacts; and action is needed now is much overdue.

Action 6: Please include an effective communications plan in your forthcoming Air Quality Strategy.

The need for protective devices to protect the Police and others

Mayor answers to London

Michael Tuffrey, Leader of the Liberal Democrat Group of the London Assembly submitted a written question to you for the 9 September 2009 Mayor’s Question Time. It was:

“What advice and/or protective devices do each of the GLA functional bodies give direct and sub-contracted employees who are required to work for long periods in public spaces where ambient air pollution exceeds European Union limit values?” See:

<http://www.london.gov.uk/mqt/public/question.do?id=27513>

In respect of the Metropolitan Police Authority (MPA), the answer was:

“MPA does not have employees who are required to work for long periods in public spaces where ambient air pollution exceeds European Union limit values.”

This and other parts of the answer given to Michael Tuffrey seem inadequate to CCAL.

A policeman describes ‘rasping’ on duty at a ‘fixed post’ due to high air pollution levels

CCAL met recently a highly regarded policeman with 29 year’s service in the Metropolitan Police in the ordinary course of our respective responsibilities who, when pressed, gave two examples of issues that can arise.

In the first example, some two years ago at the Chelsea Flower Show, the policeman was on duty on a ‘fixed post’ directing bus and coach traffic near Chelsea Bridge to ‘park them up’. He said that after some time, he could not talk because of the affect of the fumes and began ‘rasping’. In a second example, the policeman described the same difficulties that would arise when traffic lights failed at a major junction such as at Vauxhall Bridge. In the policeman’s view, a proper risk assessment should be

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undertaken and an effective protective mask should be on offer to officers who feel the need to wear it when required to work in such a hostile environment. Police officers suffering from asthma, cardiovascular problems or other medical issues deserve particular attention.

It is possible the policeman was not allowed to wear a protective mask in case it impacted ‘the image of the police’. CCAL would find such a stance, if true, unacceptable. Surely, to see a policeman wearing a protective mask in a highly polluted working environment would be entirely appropriate.

CCAL then spoke to the Metropolitan Police Federation. The person CCAL spoke to: was concerned; referred to similar personal experiences (e.g. serving on Marylebone Road); but commented that there is no strong advice on the subject from the Health and Safety Executive (HSE).

CCAL then spoke to the HSE occupational health team who said:

- i. Employers have a duty to protect employees working everywhere including in perambulatory roles in ambient air (i.e. on the streets);
- ii. Ambient air quality cannot be measured for personal exposure;
- iii. Even if it could be measured, no protection is possible; and anyway
- iv. It is the role of local authorities and the Environment Agency to improve ambient air quality, not the HSE.

CCAL disagrees strongly with ii, iii and iv above.

Action 7: Please will you and/or appropriate others meet the policeman (and perhaps a number of his colleagues) (if appropriate channels are ‘cleared’) (and CCAL and Mike Tuffrey, if available) to discuss the examples given above and the action that should be taken in future.

Action 8: Please will you ensure a thorough overhaul and assessment of HSE guidance for exposure to poor ambient air quality and apply the new advice to all GLA functional bodies.

Seeking legal advice on the content of meetings between the government and the Mayor of London

CCAL wishes to make you aware that is seeking *pro bono* legal advice from leading environmental lawyer, Gerry Facenna, about Defra’s refusal after eight months to disclose information relating to meeting(s) between Defra’s Air Quality Minister and you, as Mayor of London.

CCAL is concerned that the government may either be hiding the fact that: the Mayor of London has refused to give a commitment in respect of certain actions to improve air quality in London; or it believes it may or will need to issue the Mayor of London with a legal direction to improve air quality. In CCAL’s carefully considered view, such (or similar) information would be highly material to the European Commission’s decision to grant (or not grant) a time extension to the UK to comply with EU limit values for PM₁₀ since it would indicate a ‘row’ between the Mayor of London and the government and a possible delay in the introduction of measures needed urgently to protect public health.

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Action 9: CCAL urges the Mayor of London to disclose immediately any such information held by him or the GLA.

Other

CCAL notes and/or emphasises that:

1. This letter has focused only on one form of air pollution i.e. dangerous airborne particles;
2. In relation to the DoH's reply dated 13 July 2009 (see Appendix One) CCAL comments that: (i) the EEA report's use of a coefficient of 4.3% per 10 $\mu\text{g}/\text{m}^3$ of PM_{10} is the same as COMEAP's 6.0% per 10 $\mu\text{g}/\text{m}^3$ of $\text{PM}_{2.5}$ assuming a $\text{PM}_{2.5}/\text{PM}_{10}$ ratio of 0.7 i.e. the EEA was correct in its estimate of mortality; (ii) the DoH has confirmed that it did not comment on the draft EEA report:

http://www.whatdotheyknow.com/request/how_many_people_died_prematurely#incoming-39307

(iii) CCAL's impression, speaking to DoH officials, is that they disagree only with presentational aspects of the EEA conclusions (at most); and (iv) the high smog alert throughout the City of Westminster on 3 April 2009 during the G20 was for particulate matter not ozone (and note that particulate matter currently causes the early death of many more people in London than ozone). See the airTEXT website and search the section 'Calendar: archived forecasts' for 3 April 2009:

<http://www.airtext.info/index.php>

3. Health risks from exposure to dangerous airborne particles have been linked more closely to $\text{PM}_{2.5}$ than PM_{10} in recent years;
4. The government and COMEAP appear to be assuming no health risk from the coarse fraction of PM_{10} i.e. $\text{PM}_{2.5-10}$. This stance does not seem to acknowledge the toxicity across the spectrum of PM_{10} ;
5. When referring to premature or attributable deaths due to air pollution it is necessary to do so in respect of one particular year (or time period) at a time. This is because, for example, if anthropogenic air pollution was eliminated tomorrow, premature deaths would continue (from earlier long term exposure to poor air quality) at a gradually falling rate until its effects had gone and people began dying 'only' from 'old age';
6. While levels of air pollution are static or rising, as in London since the late 1990s, premature deaths rates can be considered to be annual and/or similarly rising;
7. The Environment Agency estimates that the London smog in 1952 caused some 4,000 deaths

<http://www.environment-agency.gov.uk/research/library/publications/40987.aspx>

8. It is likely that if obesity rates continue to increase that coefficients and RR will also increase.

CCAL has copied this letter to relevant parties including the Prime Minister and Commissioner Dimas.

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Please acknowledge receipt of this letter to the email address provided separately and respond to CCAL on the action points raised in this letter.

With best wishes.

Yours sincerely

Simon Birkett
Founder and Principal Contact
Campaign for Clean Air in London

Cc: By hand:

Winston Fletcher, Chair, The Knightsbridge Association
Carol Seymour-Newton, Honorary Secretary, The Knightsbridge Association

Cc: The Rt. Hon. Gordon Brown MP, The Prime Minister
Commissioner Dimas, Environment DG
The Rt. Hon. Hilary Benn MP, Secretary of State for Environment Food and Rural Affairs
The Rt. Hon. Lord Andrew Adonis MP, Secretary of State for Transport
The Rt. Hon. Ed Miliband, Secretary of State for Energy and Climate Change
The Rt. Hon Andy Burnham, Secretary of State for Health
Jim Fitzpatrick MP, Minister for Air Quality
ORGANISATIONS
Helen Ainsworth, EU and International Air Quality, Defra
Jenny Bates, London Regional Campaigns Co-ordinator, Friends of the Earth
Patricia Brown, Chief Executive, Central London Partnership
The Lord Coe
Peter Daw, Interim Strategy Manager (Air Quality, Energy and Climate Change), GLA
Isabel Dedring, Environment Adviser to the Mayor of London
Dame Judith Mayhew, Chair, New West End Company
Daniel Moylan, Deputy Chair, Transport for London
Philip Mulligan, Chief Executive, Environmental Protection UK
Derek Picot, Chairman, The Knightsbridge Business Group
Dragomira Raeva, EU Policy Unit, European Environmental Bureau
The Lady Valentine, Chief Executive, London First
Dr Martin Williams, Senior Reporting Officer, Atmospheric Quality and Industrial Pollution, Defra
Tim Williamson, Deputy Senior Reporting Officer, Defra
LEADING POLITICIANS
Jean Lambert MEP, Green
Baroness Ludford MEP, Liberal Democrat
Claude Moraes MEP, Labour

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Charles Tannock MEP, Conservative
Gareth Bacon AM, Conservative, London Assembly Member
James Cleverly AM, Conservative, Environment Committee, London Assembly
Roger Evans AM, Conservative, Environment Committee, London Assembly
Nicky Gavron AM, Labour, Environment Committee, London Assembly
Darren Johnson AM, Green, Chair of the Environment Committee, London Assembly
Caroline Pidgeon AM, Liberal Democrat, Deputy Chair of the Transport Committee
Murad Qureshi AM, Deputy Chair, Environment Committee, London Assembly
Valerie Shawcross AM, Chair of the Transport Committee, London Assembly
Mike Tuffrey AM, Liberal Democrat, Environment Committee, London Assembly

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APPENDIX ONE

Email response received from the Department of Health to CCAL letter to Secretary of State, Alan Johnson MP, dated 19 April 2009

Our ref: DE00000425967

13 July 2009

Dear Mr Birkett,

Thank you for your further email of 29 June regarding the health impact of poor air quality in Greater London. I apologise for the delay in providing a full response.

The Department is very grateful for the thorough research and analysis of the possible implications of applying the recently published European Environment Agency (EEA) report's premature death rates for particulate exposure, from which you have calculated the number of premature deaths attributable to poor air quality in Greater London. The impact of poor air quality on Londoner's lives is clearly a very important issue for the Department to consider and is an issue that it takes very seriously.

With regard to the estimates you have made you should be aware that there are problems with the calculations in the EEA report, which have implications for the calculations of premature deaths that you have made. There are a number of concerns with the EEA calculations that are complex and which officials in the Health Protection Agency (HPA) would be happy to meet with you to clarify.

A significant concern is that whilst the risk factor concerns fine particles, it appears to have been applied in the EEA calculations to exposure to PM₁₀ (which includes coarse particles, which are not thought to cause mortality after long-term exposure). This significantly impacts on any assessment of the health impact of exposure. The Department also believes that the health impact of long-term exposure to particles should be expressed in terms of loss of life-expectancy rather than numbers of premature deaths.

You quote the previous estimate for London of 1,031 premature deaths from PM₁₀. This is based on studies of short-term exposure, so you are correct that it is an underestimate. Unfortunately, as there are problems with the EEA report calculation, your revised estimate (scaled from the EEA report) does not therefore accurately represent the size of this underestimate.

The Department of Health supports the publication of estimates of the health impact of air pollution on the public. Through the Committee on the Medical Effects of Air Pollutants (COMEAP), a methodology has been developed for calculating the health impacts of air pollution in the UK. The recent publication of COMEAP entitled *Long – Term Exposure to Air Pollution: Effects on Mortality* published on 18 June provides the basis for such calculations.

www.advisorybodies.doh.gov.uk/comeap/index.htm

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It is planned that calculations of the potential impact on mortality and life expectancy of specified reductions in concentrations of pollutants will be undertaken and be published as a supplementary paper to this report. This will present calculations for the UK, Scotland, Wales, Northern Ireland, London and the rest of England and is due to be published for comment next year.

You raise concerns about the communication of the risks from air pollution. The Department of Health and HPA do feed into public information about air quality. For example, health advice is provided in conjunction with the *National Heatwave Plan*, given the close correlation of heat and ozone levels, and wording was provided by the Department for the health sections of the leaflet *Air pollution – what it means for your health* published by Department for Environment, Food and Rural Affairs (Defra). The Department agrees that more needs to be done to raise public awareness of the health impacts of air pollution, and so we are also developing pages for the new COMEAP website, giving an introduction to air pollution specifically for the general public and similar material will appear on the HPA website. Clearly, the Department will need to take stock of the implications of any revised estimates of the impact on public health that may come from the planned assessment mentioned above in considering future communications strategies.

You were concerned that the Air Quality Strategy omitted information on the numbers of premature deaths and/or the amount of time lost per statistical victim. This is because the effects of long-term exposure to particles are expressed in terms of loss of life expectancy, i.e. the health impact is not omitted but just expressed in a different way.

The Department understands from Defra that there was no ‘first summer smog’ alert in early April because these are issued only when ozone is predicted to reach the high band. This did not occur at the time. You would need to check any further details with Defra. The issue of re-banding has also been discussed at COMEAP and with Defra and has been factored into COMEAP’s busy forward work programme.

You raise a number of questions in your letter, which are of a very technical nature. Whilst the information you seek is all in the public domain, officials in the HPA would be very happy to meet with you to answer these questions in detail, in particular on the concerns they have raised about the EEA calculations.

The Department very much values the work that you do in this field and your constructive comments on this very important issue and I hope that my reply has been helpful to you.

Yours sincerely,

Edward Corbett
Customer Service Centre

ENDS

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APPENDIX TWO

Scientific advice on the health impact of air pollution

COMEAP 1998

As mentioned earlier, COMEAP recommended a coefficient of 0.75% per 10 $\mu\text{g}/\text{m}^3$ of PM_{10} as a 24 hour mean in its report titled ‘Quantification of the Effects of Air Pollution on Health in the United Kingdom’ which was published in 1998. COMEAP stated in paragraph 9.16 on page 57 of that report:

“While we believe that it is likely that long term exposure to air pollution at current levels does exert an effect on health, we have taken the view that there is insufficient data to quantify these effects. This should be reassessed at a future date as soon as helpful data are available.”

COMEAP 2001

COMEAP updated its advice on the health impact of air pollution in 2001 in a report titled ‘Statement and Report on Long-Term Effects of Particles on Mortality’. In that report, COMEAP stated that the majority of the Committee preferred the estimate [of reduction in mortality rate] of 0.1% reduction in mortality rate per $\mu\text{g}/\text{m}^3$ drop in annual mean $\text{PM}_{2.5}$. These equate to a coefficient of 1.0% and an RR of 1.01 per 10 $\mu\text{g}/\text{m}^3$ drop in annual mean $\text{PM}_{2.5}$. COMEAP in its conclusions on page 22 and 23 of that report:

- i. *“We consider it more likely than not that a causal association exists between long term exposure to particles and mortality. We consider that this association is transferrable to the UK, although the quantitative impact may not be exactly the same.*
- ii. *“We consider that, given there is information regarding the size of the effect, it is preferable to assess this and comment on it rather than ignore it. Nonetheless there are great uncertainties in this process and it is vital that these are made clear. We consider that the long-term effects are more uncertain than the short term effects but it would be unwise to dismiss them completely.*
- iii. *“It is possible, although unlikely, that there are no long term effects, if the results are explained by unknown confounders, confounding by sulphur dioxide or lack of control of spatial variation. If so, the only effect on mortality would be that detected in the time-series studies.”*

COMEAP 2009

Again, as mentioned earlier, COMEAP published its latest advice in June 2009 which recommended a much higher RR of 1.06 equating to a coefficient of 6.0% for every increase (or reduction) in exposure to fine particulate matter (so called $\text{PM}_{2.5}$) of 10 $\mu\text{g}/\text{m}^3$.

Spatial analysis of air pollution and mortality in Los Angeles (2006)

CCAL would like to draw your attention to the scientific paper titled ‘Spatial analysis of air pollution and mortality in Los Angeles’ (Jerrett et al, 2006). See:

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<http://www.ncbi.nlm.nih.gov/pubmed/16222161>

After controlling for 44 individual covariates, all-cause mortality had a relative risk (RR) of 1.17 (95% confidence interval = 1.05-1.30) for an increase of 10 $\mu\text{g}/\text{m}^3$ $\text{PM}_{2.5}$ and a RR of 1.11 (0.99-1.25) with maximal control for both individual and contextual confounders.

Reduction in Fine Particulate Air Pollution and Mortality (Laden et al, 2006)

CCAL would like to draw your attention to the scientific paper titled ‘Reduction in Fine Particulate Air Pollution and Mortality, Extended Follow-up of the Harvard Six Cities Study’ (Laden et al, 2006). See:

<http://ajrcm.atsjournals.org/cgi/reprint/173/6/667>

This authoritative study, published in January 2006 stated:

“We found an increase in overall mortality associated with each 10 $\mu\text{g}/\text{m}^3$ increase in $\text{PM}_{2.5}$ of modelled either as an overall mean (rate ratio [RR], 1.16; 95% confidence interval [CI]. 1.07-1.26) or as an exposure in the year of death (RR, 1.14; 95% CI 1.06-1.22).”

“Conclusion: Total, cardiovascular, and lung cancer mortality were each positively associated with ambient $\text{PM}_{2.5}$ concentrations. Reduced $\text{PM}_{2.5}$ concentrations were associated with reduced mortality risk.”

Health Effects of Fine Particulate Air Pollution: Lines that Connect (Pope and Dockery, June 2006)

CCAL would like to draw your attention particularly to the scientific paper titled ‘Health Effects of Fine Particulate Air Pollution: Lines that Connect’ that was published by Pope and Dockery in June 2006. See:

<http://www.noaca.org/pmhealtheffects.pdf>

“This 2006 Critical Review [focuses] on six substantial lines of research that have been pursued since 1997 that have helped elucidate our understanding about the effects of PM on human health.”

COMEAP Peer Review

Appendix 1 of COMEAP’s 2009 Report included Peer Reviews on the Draft Report.

In Appendix 2 on page 179 of COMEAP’s 2009 Report, the Committee states:

1. Additional publications

“We note the comments made by reviewers regarding papers not considered in this report. That recent material could not be included was inevitable because much time needed to be devoted to considering

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evidence and distilling our conclusions after the evidence-collection phase was completed. A cut-off date in early 2006 was adopted for published work which was considered in detail. We note that this, unfortunately, excludes an important review by Pope and Dockery (2006) and recommend reading of that review to readers of this report.

2. Elicitation exercise

“Another area of interest to those providing comments was our use of an elicitation exercise to provide a ‘plausibility interval’ around the central estimate for the coefficient relating to long-term exposure to fine particles and mortality. Some welcomed this innovative approach; others were concerned that the elicitation process was insufficiently defined or that it was too subjective.

“We note the debate that this relatively new approach has generated and we encourage further discussion of the methodological issues amongst researchers and regulators in this field.”

CCAL is disappointed that the government does not appear to have provided COMEAP with the resources it seems to have needed to review highly significant scientific research. It seems extraordinary that the Committee had to adopt a cut-off date in early 2006 for published work which was considered in detail. This was nearly three and one-half years before COMEAP published its 2009 Report. CCAL urges you, as Mayor of London, not to make the same mistake.

CCAL is similarly surprised that the government was still calculating premature deaths rates in 2005 for its Air Quality Strategy 2007 based on, out-of-date, 1998 recommendations from COMEAP.