



UNIVERSITY OF
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A FEW TOPICAL ISSUES IN AIR QUALITY

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OVERVIEW

- WHO updates**
- Environment Bill**
- COVID-19**



World Health Organization Guidelines

- ❑ The last in depth review of the Air Quality Guidelines was in 2005 and covered PM, nitrogen dioxide, sulphur dioxide and ozone
- ❑ REVIHAAP reported in 2013 on new information and HRAPIE recommended exposure-response functions, but did not recommend guidelines
- ❑ Current process has taken about three years, and has been far more systematic and will publish recommendations in the peer reviewed literature, expected to be late this year



Environment Bill

- ❑ Passage of the bill through parliament was interrupted by the General Election, but the bill is expected to return within the next few months
- ❑ Key provision is for air quality targets



The Environment Bill

The Environment Bill aims to maximise health benefits by improving air quality, which is the greatest environmental risk to human health.

It contains the following measures on air quality targets:

A duty to set a long-term air quality target through the targets framework – Clause 1

Must be a long-term target (min. 15 years)

Amendable and revocable – via process

“A duty to set a target on PM_{2.5} as an annual average concentration in ambient air” – Clause 2

Need not be a long-term target (min. 15 years)

Amendable **not** revocable – via process

Objectively measurable and time bound; government must consider it achievable

SoS must seek independent expert advice

Must be set in SI by 31st October 2022



Target Development Timeline

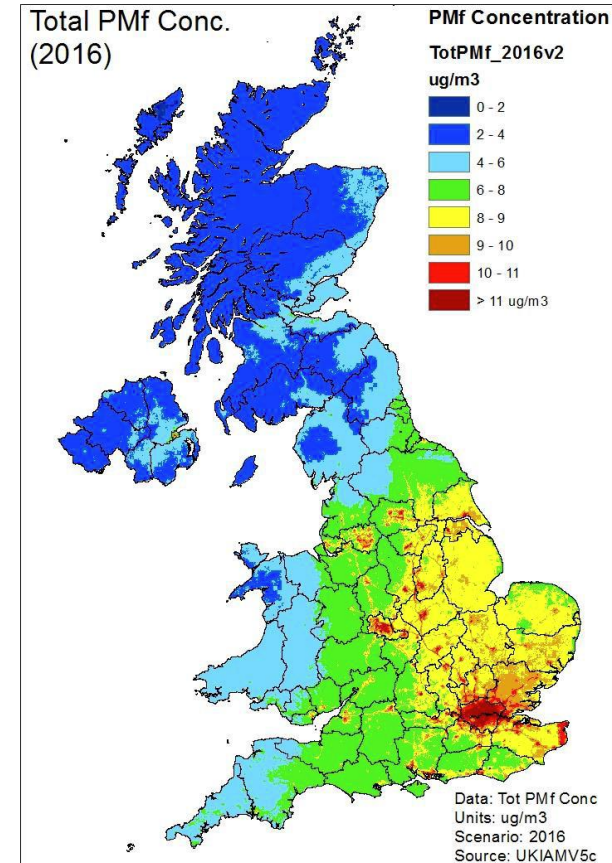
Legal deadline to set the targets – **October 2022**

- Now  August 2021
 - Evidence gathering and analysis
 - Target development
 - Stakeholder engagement

- September 2021  October 2022
 - Evidence gathering and analysis
 - Target development
 - Stakeholder engagement

Rationale for a PERT

- ❑ The majority of the population already live in areas under the WHO annual concentration guideline ($10 \mu\text{g}/\text{m}^3$).
- ❑ However, there is no safe threshold for $\text{PM}_{2.5}$, a reduction in concentration below the WHO guideline level still has significant health benefits.
- ❑ Without the second $\text{PM}_{2.5}$ target, action would focus on hotspots, with no incentive to reduce exposure elsewhere.
- ❑ The greatest health benefit for the most people requires reducing $\text{PM}_{2.5}$ levels in all densely populated areas not just the centres of the largest cities.
- ❑ A threshold target provides equity, and a population exposure reduction target efficiency. Therefore both targets are needed to drive action throughout.





COVID-19 and Air Quality

COVID-19 has stimulated air quality-related work in two areas:

- ❑ Impacts of past air pollution exposure on COVID-related mortality
- ❑ Impacts of the lock-down on air quality



Impacts of past air pollution exposure on COVID-related mortality

- ❑ Cross-sectional studies of COVID-related deaths (dependent variable) in relation to air pollution exposure over the past few years
- ❑ Initial estimates showed a huge effect of air pollution, but as better control for confounders such as ethnicity and population density have been included, estimates have steadily reduced.
- ❑ A mature assessment will require a greater knowledge of the epidemiology of the COVID infection



Impacts of the lock-down on air quality

- ❑ Reductions in traffic of up to 66%
- ❑ Reduced energy consumption and industrial emissions
- ❑ Valuable “intervention study” of the response of air quality to emissions changes

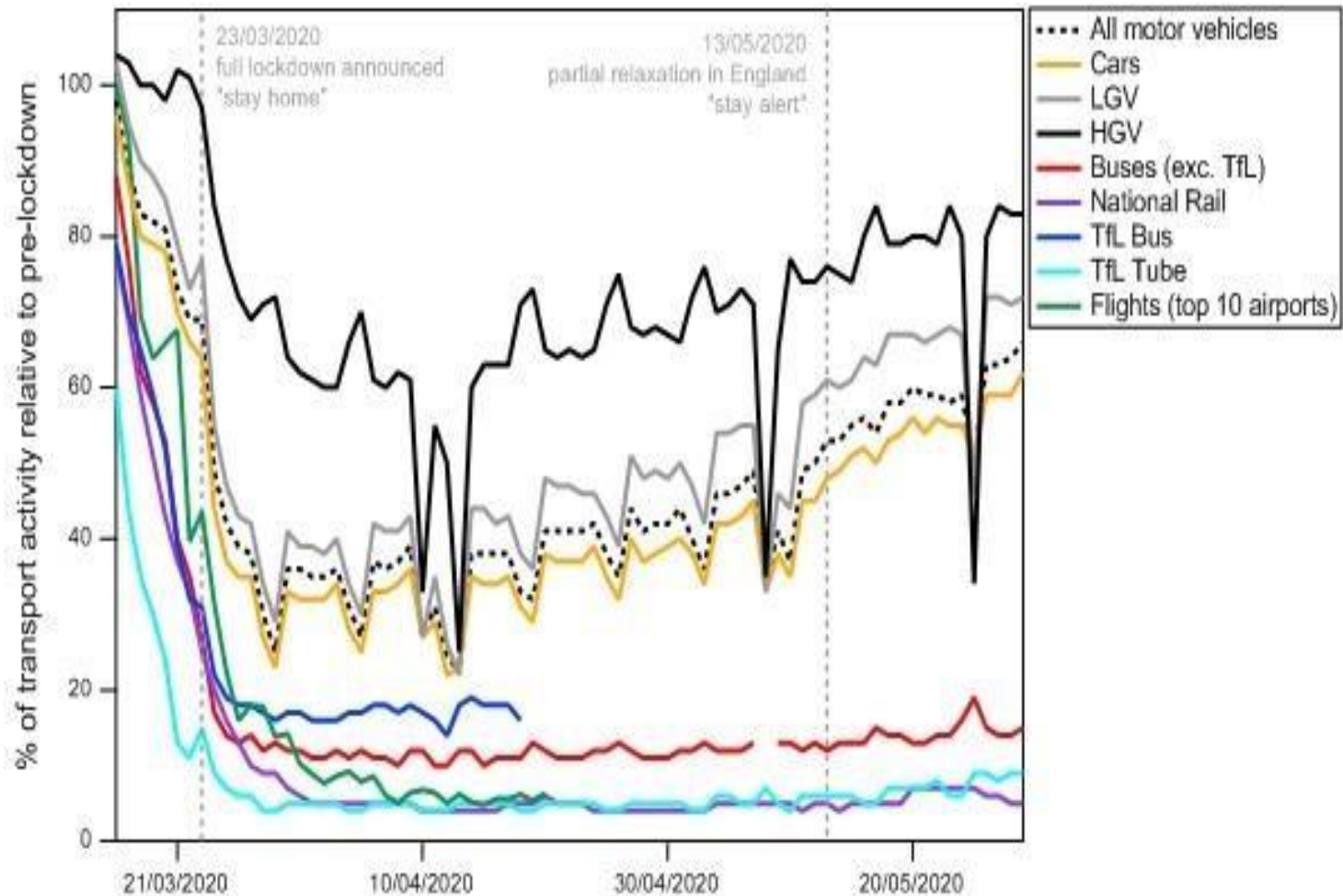
AIR QUALITY EXPERT GROUP

**Estimation of changes in air pollution emissions,
concentrations and exposure during the COVID-19
outbreak in the UK**

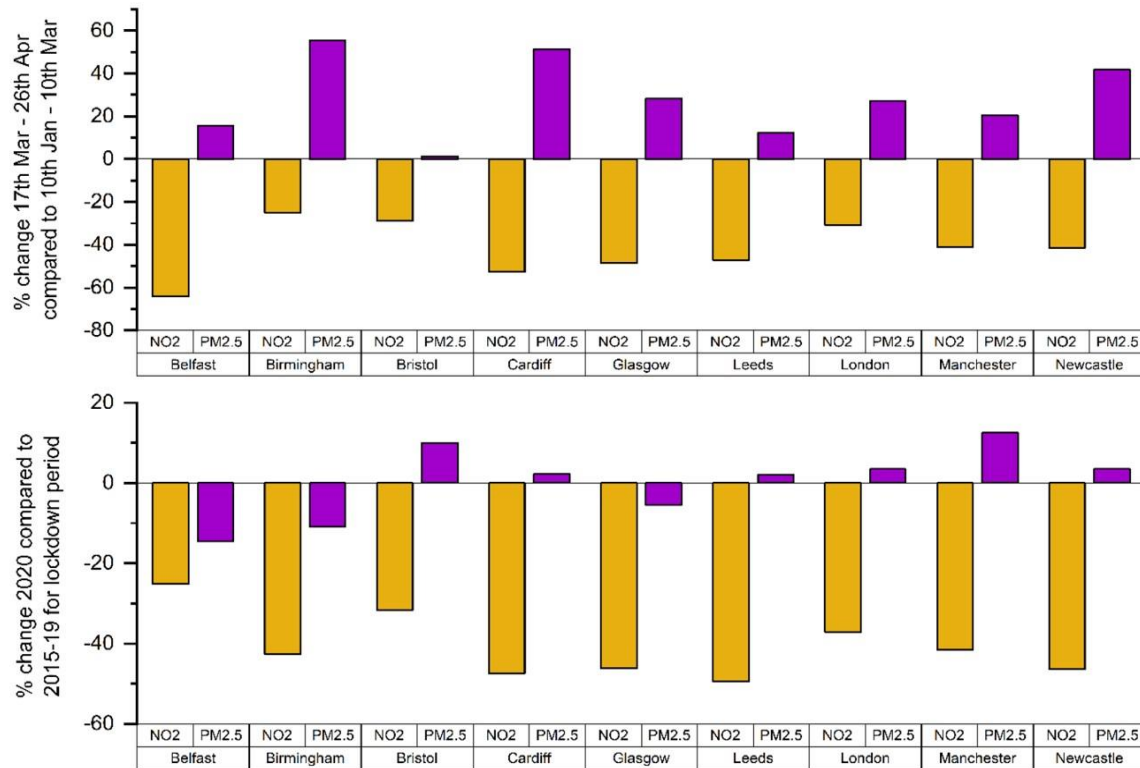
Rapid evidence review – June 2020

**Prepared for: Department for Environment, Food and Rural Affairs; Scottish
Government; Welsh Government; and Department of Agriculture, Environment and
Rural Affairs in Northern Ireland**

Relative reductions in traffic according to the data shown at the government's COVID-19 briefing on 31st May 2020 (Prime Minister's Office, 2020). The flight data were taken from the absolute values from flightradar24 data as reported by the BBC (2020) and rescaled assuming 100% activity was occurring on day 1

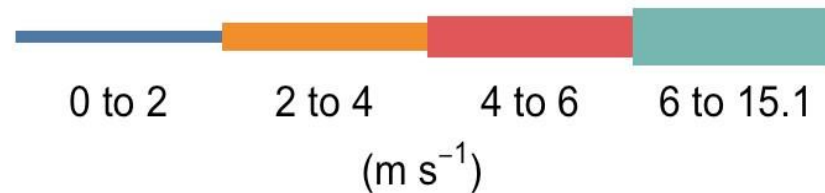
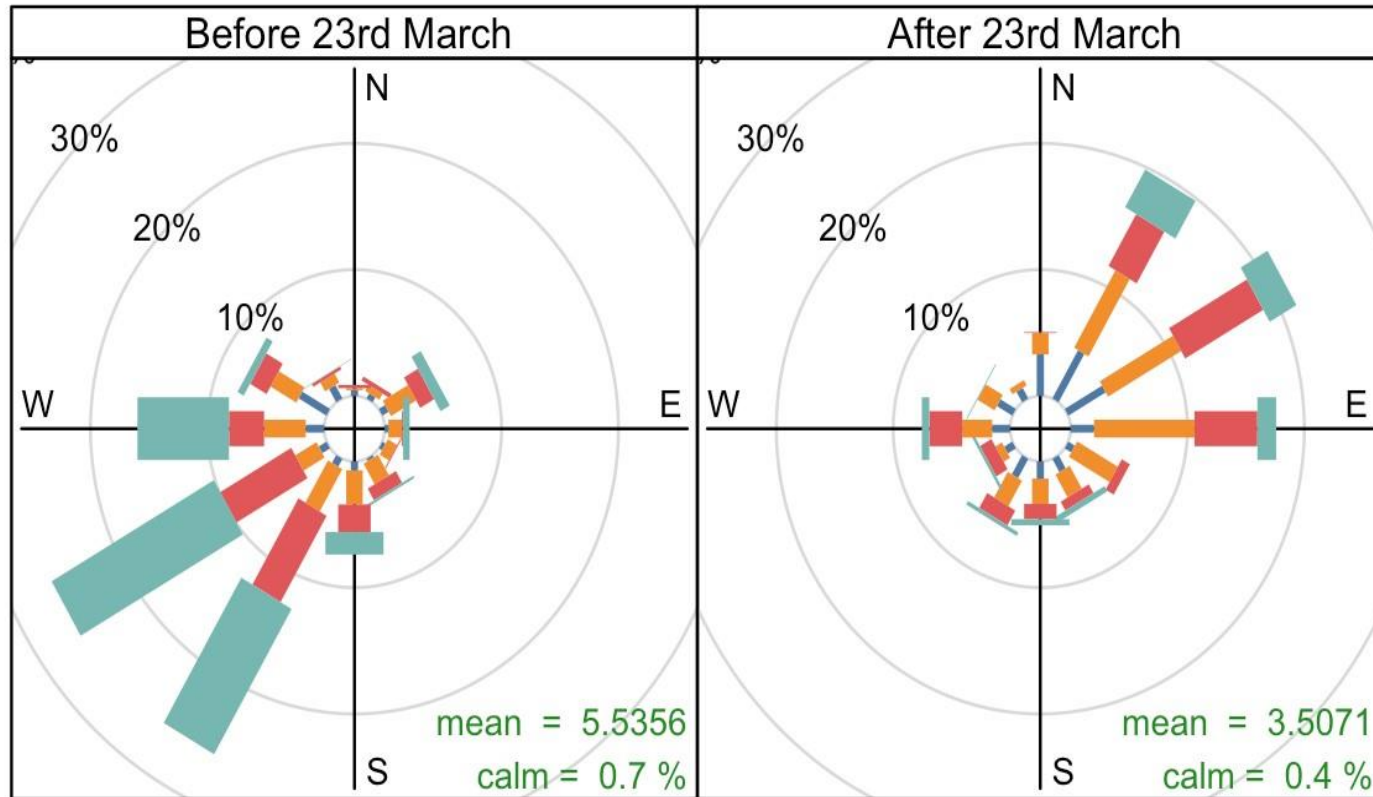


Percentage change in NO₂ (orange) and PM_{2.5} (purple) for nine UK cities for pre- and post-lockdown period (1st Jan -16th March and 17th Mar – 29th Apr 2020). Bottom: the lockdown period in 2020 and compared to the same calendar period averaged over 2015-2019



Reproduced from: Lee, J.D., Drysdale, W., Wilde, S., *National Centre for Atmospheric Science / University of York*, 2020. "Air Quality in the UK during the COVID-19 pandemic – evidence from national monitoring stations."

Wind roses from London Heathrow from 1 January 2020 to 18 May 2020 split by before and after the lockdown date



Frequency of counts by wind direction (%)

THANK YOU

