

Letter to Net Zero Committee from Jill JF Belch

4th April 2023

Dear Net Zero Committee,

Despite local council endeavours, some towns and villages have a busy street that remains with air pollution often above regulatory levels, providing hazards for our school children in buses and cars, as well as for adults. We now know from the W.H.O(1) work, and others(2, 3), that getting below the annual average or current level of 24h exceedances, does not stop the harm associated with intermittently high air pollution levels. W.H.O. significantly reduced the annual means to take this into account. We have recently shown increased hospital admissions at a significant level on days when air quality regulations are breached(4), again indicating that short term bursts of pollution cause health harm. There is in fact huge variations in pollutants giving an annual average that might lull us into believing this annual average is a safe measure. If one looks at air quality monitors it is clear that winter months levels are often above limits, but the summer results bring the averages down (fig 1 shows our own data(4) over 18y in Tayside). Figure 2 shows again how the annual average can be reduced by weekend lower levels, and finally fig 3 shows the peaks associated with rush hour.

I expect the committee has and will be considering the following ideas. My plea is that they be considered for isolated streets in addition to the standard AQMA within cities.

1. Wood burning stoves.

Domestic wood burning is the single biggest source of PM2.5 air pollution in the EU with just 8% of households being wood burners(5). It has been estimated that they emit at least 17% of all of the very dangerous PM2.5 in the UK(6) (Fig 4). Wood stoves release PM0.1 which are not removed under the eco-stove legislation. Domestic wood burning contributes significantly to pollution with this ultrafine particulate matter. Since 2003 purchases have gone up by 3 times, and we know, with cost-of-living issues, that more people are burning wood. I should like to suggest that planning permission should be required for any new stove in towns and cities, and that licences be issued with the remit to regular servicing. Wood burning stoves should not be allowed in AQMAs, or on streets with air quality issues. There is a huge underestimation of the danger of these stoves, even the new eco-models. We actually need to set much stricter emission limit values in the EcoDesign directive for wood stoves/boilers.

2. Rush Hour Traffic

Local Councils are in a unique position in being able to discuss with businesses staggered start and finish times. There should be an obligation via your committee's recommendation to explore this with businesses in an effort to reduce the rush hour peaks of traffic, as well as the standard encouragement to use public transport. This has been shown to reduce air pollution in various studies.

3. Low traffic zones

Again, without the expense of number plate recognition required for LEZs, much can be done with 'low traffic areas' where local councils can work with bus companies to have eBuses on such streets only, and ban HGVs(7). Again studies have shown these to be useful, and alternative routes for HGVs on less busy and polluted routes are usually available

4. Enforce Idling

I am pleased to say that a new campaign to enforce idling laws has started in Perth & Kinross. However, it is of interest to note the very, very few prosecutions for idling across Scotland over the many years since it became illegal to idle(8). A recommendation could be made

that local councils enforce these laws strictly, with traffic wardens able to give tickets to offenders. The worst offenders are often parents waiting to pick up children in the cold weather.

5. Air filters for those on the street

Having visited elderly and disadvantaged people on polluted streets (who don't even own cars) I believe there is a significant inequality issue, as air pollution preferentially harms the elderly and already sick. Whilst councils try to lower levels, people are having to live in these streets. One example is Atholl St in Perth, where elderly owners have to clean the black carbon daily from surfaces, one has rooms full of air lilies having been told this helps purify the air. But why not issue these residents with proper air purifiers(9)? I should like to recommend that local councils should provide high quality air purifiers to residents in the isolated streets, where LEZs are not planned, where pollution occurs. Effective filters are about £600 and should not be above council's budgets.

6. Air Quality Working Group

We know local council employees work hard but are very busy. It seems that once annual levels are below eg 40 for NO₂ then all is believed to be well, when a lot of the concerning areas have annual levels round about 38, with the huge peaks described above. I should like to recommend that councils who have these problems set up a group with interested, and possibly qualified individuals, who along with appropriate council officers can focus in on a regular basis on solutions. These solutions might include 'tredges'(10), or tree planting, or some of the recommendations above. These groups can fund raise, helping council budgets, and will be focused on air quality unlike council officers with their many duties. I would be happy to participate in a trial of this is useful, in Perth.

In conclusion, whilst attention is correctly focussed on AQMAs, there are streets where danger to health is present. I hope it might be possible to take forward some of these recommendations, and other initiatives, in these areas, where LEZ are not appropriate.

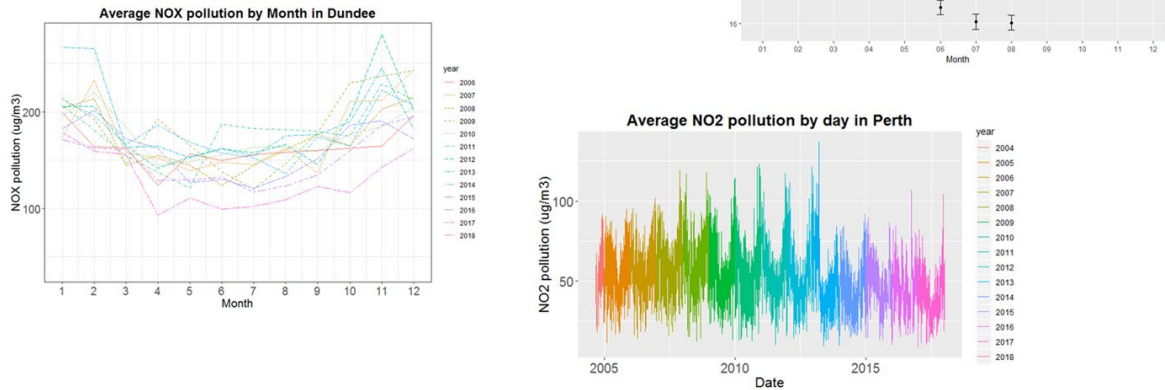
Jill Belch

Professor Jill JF Belch FRCP, MD (Hons), FRS(E), OBE
Immediate Past President of European Society of Vascular Medicine
Professor of Vascular Medicine
Ninewells Hospital and Medical School
Dundee DD1 9SY

Appendix Figures:

Figure 1: Air pollution over 18 years showing winter peaks above regulation levels

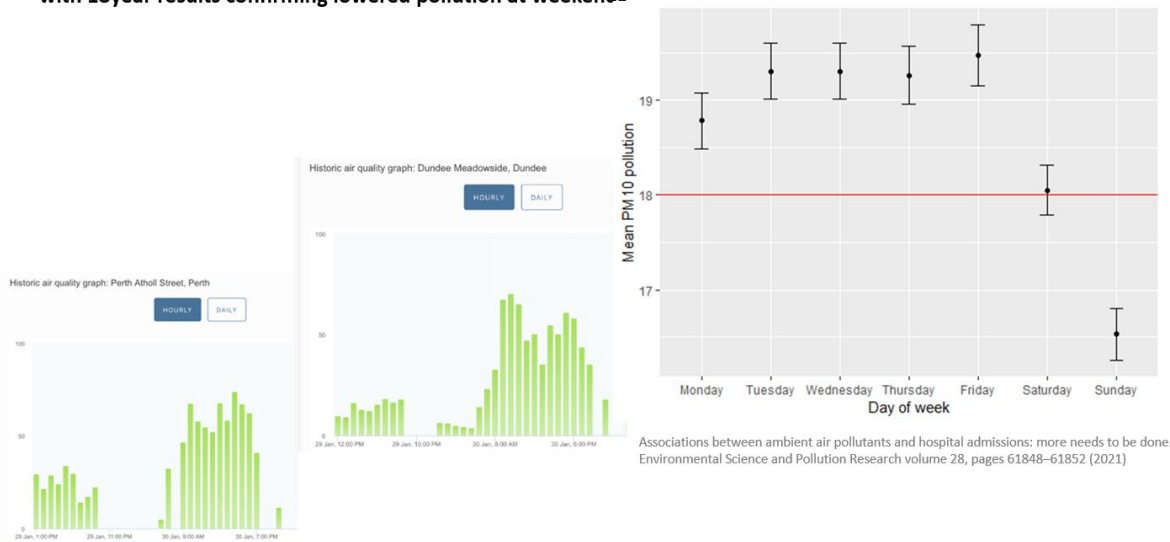
**Annual variation in pollution over 18 years:
for PM10 in Dundee & Perth, NO2 in Perth, NoX in Dundee**



Associations between ambient air pollutants and hospital admissions: more needs to be done. Environmental Science and Pollution Research volume 28, pages 61848–61852 (2021)

Figure 2: Examples of weekly variation in pollution

**Examples of Week day NO₂ variation in Perth & Dundee Jan 2023,
with 18year results confirming lowered pollution at weekends**

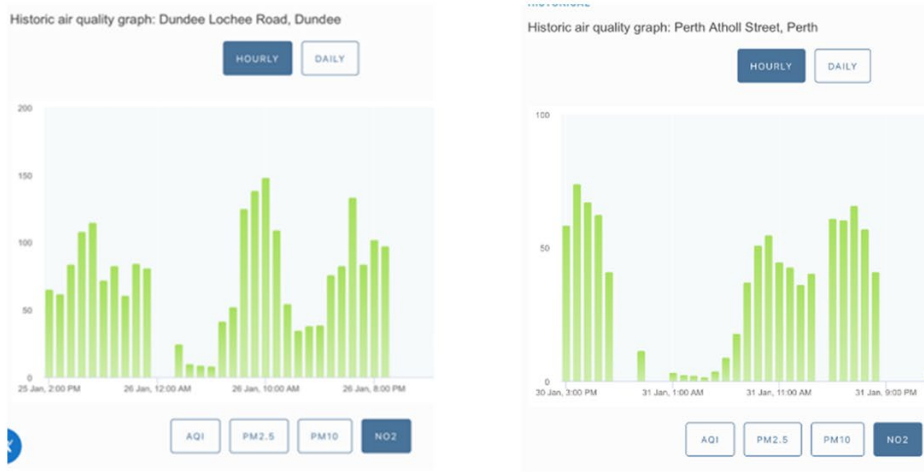


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Source: Scotland Air Quality Monitors & graphed by IQAir.com

Figure 3: Effect of Rush Hour on Air Quality

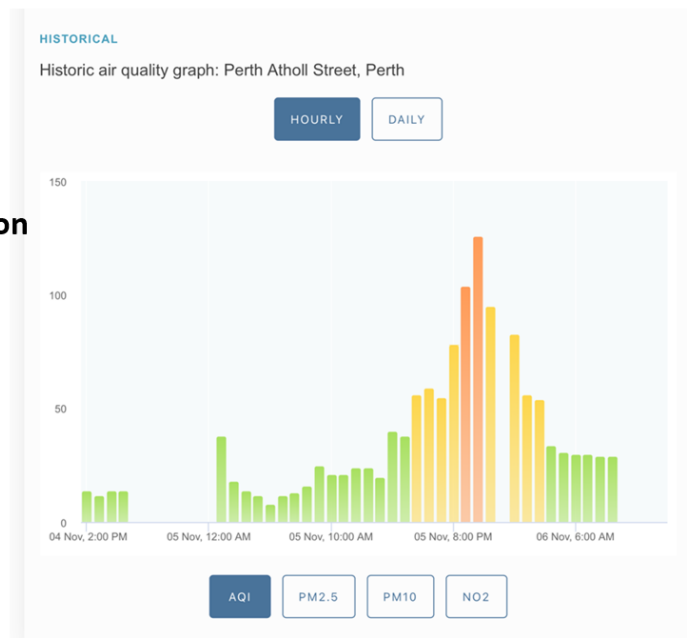
Showing peaks and troughs of air pollution NO₂: effect of rush hour



<https://www.iqair.com/> Derived from Scottish Government sites

Fig 4: PM2.5 on bonfire night (wood burning) in Perth

**PM2.5 peak in Atholl St Perth
1 mile from the annual bonfire celebration
on 5th Nov 2023**



<https://www.iqair.com/> Derived from Scottish Government Air Quality website

References.

1. WHO global air quality guidelines: particulate matter (PM_{2.5} and PM₁₀), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide [Internet]. 2021 [cited March 2023].
2. Ashworth M, Analitis A, Whitney D, Samoli E, Zafeiratou S, Atkinson R, et al. Spatio-temporal associations of air pollutant concentrations, GP respiratory consultations and respiratory inhaler prescriptions: A 5-year study of primary care in the borough of Lambeth, South London. *Environmental Health*. 2021;20(1):1-13.
3. Klingen J, van Ommeren J. Risk-Taking and Air Pollution: Evidence from Chess. *Environmental and Resource Economics*. 2022;81(1):73-93.
4. Belch JJF, Fitton C, Cox B, Chalmers JD. Associations between ambient air pollutants and hospital admissions: more needs to be done. *Environmental Science and Pollution Research*. 2021;28(43):61848-52.
5. Bureau EE. Where there's fire, there's smoke – Emissions from domestic heating with wood. 2021.
6. UK G. Emissions of Air Pollutants in the UK–Particulate Matter (PM₁₀ and PM_{2.5}). 2022.
7. Harrison RM, Vu TV, Jafar H, Shi Z. More mileage in reducing urban air pollution from road traffic. *Environment International*. 2021;149:106329.
8. Mendoza DL, Benney TM, Bares R, Fasoli B, Anderson C, Gonzales SA, et al. Air Quality and Behavioral Impacts of Anti-Idling Campaigns in School Drop-Off Zones. *Atmosphere*. 2022;13(5):706.
9. Souzandeh H, Wang Y, Netravali AN, Zhong W-H. Towards Sustainable and Multifunctional Air-Filters: A Review on Biopolymer-Based Filtration Materials. *Polymer Reviews*. 2019;59(4):651-86.
10. Deshmukh P, Isakov V, Venkatram A, Yang B, Zhang KM, Logan R, et al. The effects of roadside vegetation characteristics on local, near-road air quality. *Air Quality, Atmosphere & Health*. 2019;12(3):259-70.