



# RETHINKING

## HOW WE TACKLE AIR QUALITY AND HEALTH

Imagine a doctor treating a patient based on a partial diagnosis: you wouldn't expect the best outcome. So it is with air pollution. Guidance and legislation around air quality are based on outdated, static approaches that are limiting our individual and collective ability to tackle air pollution effectively. AECOM's **Duncan Urquhart** says it's time to update our systems.

**L**ocal air quality is getting at lot of air time as awareness about the impacts of pollutants on our health, lives and planet increases, particularly in relation to coronavirus.

However, the tools and guidance we use to manage local air quality and tackle air quality issues derive from decades-old studies and incremental updates to legislation.

The result is rigid appraisal methods focused on legal compliance with sometimes semi-arbitrary thresholds and limits based on simplistic ideas of where people spend time.

As air quality professionals we should be challenging this irrational and discriminatory situation. We need to consider what level of pollution people are exposed to, irrespective of what activity they are involved in or whether they are at home, at work or at leisure in a public place. We also need to consider how to take better account of those who are more sensitive to the health effects of pollution, especially given the emerging links between air pollution and higher coronavirus mortality rates<sup>1</sup>. ➔

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**EUROPE LACKS A HOLISTIC VIEW OF THE EFFECT OF AIR POLLUTANTS ON THE POPULATION DUE TO A DISCONNECT BETWEEN AMBIENT AIR QUALITY LEGISLATION, PUBLIC HEALTH RESPONSES, AND WORKPLACE EXPOSURE TO AIR POLLUTANTS EXPERIENCED AT WORK, AT HOME OR IN PUBLIC PLACES ARE TREATED DIFFERENTLY.**

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### **Health and legislation**

Europe lacks a holistic view of the effect of air pollutants on the population due to a disconnect between ambient air quality legislation, public health responses, and workplace exposure to air pollutants. Exposure to air pollutants experienced at work, at home or in public places are treated differently. We also do little to consider air quality in conjunction with factors such as health, poverty, social mobility and education; and we do little to understand the implication of time spent in different locations.

For example, due to a disparity between environmental and occupational regulation the customer buying a coffee in a railway station concourse is subject to a far lower pollution threshold than the barista serving the coffee. So, we allow the barista to inhale a far higher dose of pollution during the course of a day than the customer.

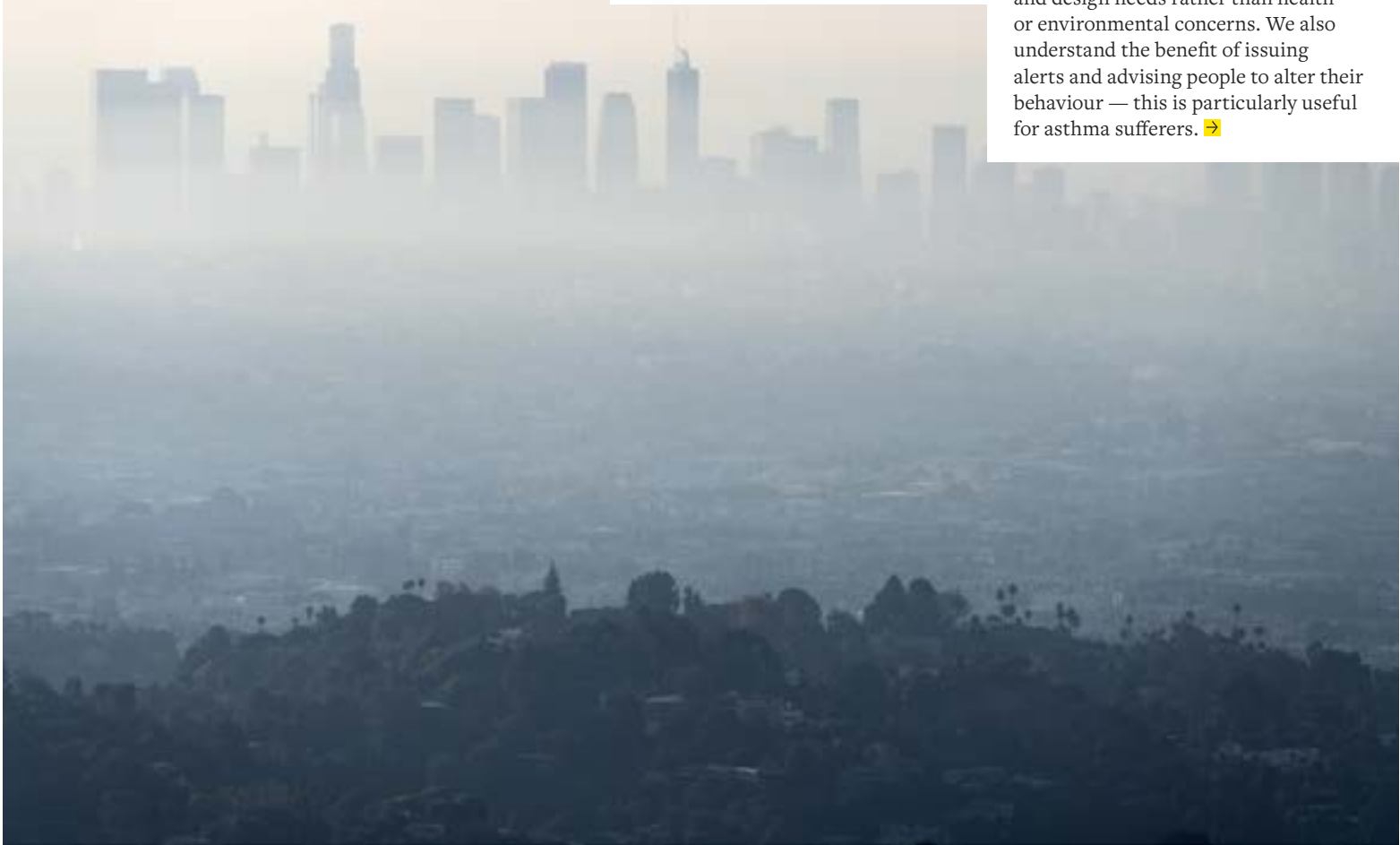
Take another example: we are very careful when it comes to allowing new houses to be built alongside a polluted road, yet offices and shops can be built along the same road with no concern for the effect of the pollution on the office worker or shop assistant.

With regard to the current pandemic, there is evidence indicating that pre-existing or ongoing exposure to high pollutant concentrations exacerbates symptoms of coronavirus, with circumstantial evidence indicating that atmospheric pollution, and specifically fine particulate matter, may act as a vector to increase the effective range of the virus.

Furthermore, health effects from the virus appear to be linked to socio-demographic indicators, which are likely to correlate to poor air quality, social and economic deprivation, poor health, limited access to private transport and, importantly, limited ability to respond to lockdown measures. This is a key message for air quality management that links to multiple other disciplines and implementation of strategic policies.

### **Health and behaviour**

Understanding of air pollution and our exposure to it is improving. For instance, we know that indoor air pollution can be exacerbated by energy-efficient building regulations that limit air changes, or by reliance on mechanical ventilation from polluted external locations that have been determined by construction and design needs rather than health or environmental concerns. We also understand the benefit of issuing alerts and advising people to alter their behaviour — this is particularly useful for asthma sufferers. →





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Our daily lives are so varied, but our understanding is limited about the difference in exposure between those who walk, cycle, drive or take the bus or train to work, for example. We don't know how opening a window or altering car or bus ventilation affects our exposure to pollution. We do attempt to address air pollution in specific situations such as railway stations, but even this doesn't look at the different ways people within the space could be affected.

The result is that we focus our efforts on rigidly defined locations based on static data sets such as address point data. We don't look at the individuals who use that space and how they actually spend their time.

We need to understand how, where and when critical population groups move and behave in order to truly attribute health-response effects that recognise not only the level of exposure but also the sensitivity of individuals to air pollution.

The current coronavirus outbreak is unlikely to be the last pandemic we experience, and so there is value in preparing for the future and ensuring a baseline resilience that focuses on people as individuals.

### Big data solutions

Big Data technology gives us the ability to analyse information from data sets that are too large or complex to work with using traditional techniques. For the purposes of this article, one key advantage of this technology is that it allows us to anonymously track individuals as part of larger populations. It is routinely used to inform transport policy, using journey origin, destination and travel mode, and can make links to qualities such as health, wealth, education.

In reality, these are not rigid and discrete indices but truly holistic values. Increased wealth tends towards higher car ownership, greater range of travel, and higher levels of education and social engagement, resulting in better overall health and lower sensitivity to pollution<sup>2</sup>.

It must be recognised that those most sensitive to changes in air quality are also least able to respond to the measures required to improve it. For example, a societal shift to low-emission vehicles would benefit poorest individuals most — but they would be least likely to afford it<sup>3</sup>. Sensitivity is therefore needed when designing interventions, with care taken to understand how they will affect behaviour and lifestyle, and not just focus on air quality in isolation.

Ultimately, a holistic approach that includes social and behavioural feedback would inevitably change how we appraise potential interventions. A holistic approach would use air quality improvement as a mechanism to promote change and blur the lines between specialist disciplines to deliver an informed consideration of the knock-on effects. →

