ALERTING THE NATION

Improving the way information is used to protect the most vulnerable from air pollution

ASTHMA+ LUNG UK

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Executive summary

Fighting for your right to breath clean air

At Asthma + Lung UK we are fighting for everyone's right to breathe. We're the nation's lung charity and we're here for everyone who's living with a lung condition, regardless of what that condition is. For too long, the nation's lung health has been side-lined, under-treated and under-resourced. This is inexcusable when lung conditions are the third leading cause of death in the UK and millions are affected by breathlessness, which can be terrifying and limit people's ability to get on with their lives.

We hear from our beneficiaries every day of the challenges that they face when trying to do something that so many of us take for granted: breathe. They tell us how air pollution exacerbates their conditions, making it dangerous to leave the house and taking a devastating toll on their mental health and wellbeing. Furthermore, we know that reducing air pollution is central to preventing more people developing lung conditions in the future.

We've been campaigning to tackle toxic air pollution for a number of years; making life easier for our beneficiaries is central to our aims in this. That is why this report seeks to set out the issues with how current information is presented to people with a lung condition and highlight what changes could be made so that people are able to better manage their conditions and live full lives.

This report focuses primarily on those people living with a lung condition. However, the recommendations set out below would have a positive impact on all of those groups who are vulnerable to the health impacts of short-term exposure to high levels of air pollution, such as those with cardiovascular conditions or lung cancer.

At Asthma + Lung UK our vision is for a world where everyone has health lungs. We're trying to achieve this by:

Shining a light on the need for better lung health, and tackling negative attitudes that hold back progress.

Tripling investment in **life-saving research**, through public funding + our pioneering work.

Fighting for clean air for all, wherever you live or are born in the UK.

Ensuring everyone who **needs a diagnosis** gets one, as quickly as possible.

Providing vital **treatment + support** whenever people need it most.

Bringing together everyone affected by a lung condition to **make our voices heard**.

The dangers of air pollution

Air pollution is a public health emergency, and the greatest environmental risk to human health.[1] In the UK, it has been linked with up to 36,000 premature deaths each year.[2] It reduces life expectancy by increasing our chances of lung cancer, cardiovascular disease and stunted lung growth in children. Maternal, paternal and infant exposure to pollution also increases the chance of children developing asthma and people developing COPD later in life.[3]

High air pollution episodes, which usually last a few days, can trigger an exacerbation in lung conditions such as asthma or chronic obstructive pulmonary disease (COPD) and leave them hospitalised.[4] This was sadly shown in the untimely death of nine-year old Ella Adoo-Kissi-Debrah, who became the first person in the UK to have air pollution on her death certificate due to the "significant contributory" role it played in triggering her last asthma attack.[5]

This report also shows that, over the long-term, air pollution can cause significant emotional distress to people with lung conditions.

It also has a large impact on the NHS. In 2017, the two most dangerous pollutants NO_2 and $PM_{2.5}$, cost the NHS in the region of £157m. This is expected to increase to over £1.5bn by 2025.[6] The total economic cost of air pollution has been estimated at up to £20bn per year.[7]

Communicating through air pollution alerts

In an acknowledgement of the impact that air pollution has on public health, the government has developed a national air quality information system. Amongst other things, this sets out a daily forecast for air pollution using the Daily Air Quality Index (DAQI). If air pollution levels rise above a certain threshold, this DAQI sends out alerts to warn people that there is a significant danger to public health from outdoor air pollution.[8] There are also some local authorities who have also developed their own information and alerts systems.

As one of the groups most at risk of severe health outcomes from air pollution, alerts are an integral part of helping people to self-manage their lung conditions on days when ambient air pollution is high enough to endanger their lives.[9]

However, the current alerts system does not do enough to protect people in its current form. The health messaging is not designed in such a way as to protect those that are most vulnerable while still allowing them to live full lives, often asking them to simply stay inside when pollution is high. The thresholds which determine whether pollution levels are low, medium or high are increasingly out of date as new academic research on the severity of the health impacts of air pollution comes to light.[10]

Meanwhile, the system is failing to put any pressure on polluters to reduce their contribution over the long-term. This means that alerts represent an ineffective sticking plaster, rather than a part of a system designed to drive down levels of pollution and protect the health of people across the nation.

As this report has found, one of the major failings of the current system is that the large majority of people with a lung condition do not know that alerts exist, or where to access the most relevant and up-to-date air pollution information. There is also very limited access to accurate data at the local level, or to robust, disease specific guidance from the government on how people can protect themselves during periods when air pollution is high. All of these factors, if addressed, would make it much easier for those with a lung condition to self-monitor their exposure to peaks in air pollution and protect their health over the long-term.

Long-term solutions are also needed

Protecting the health of vulnerable people during high air pollution episodes is the first priority for any national alerts system. Beyond this, however, there needs to be a focus on how to improve awareness about air pollution and drive down overall emission levels over the long term. Reducing emissions is the simplest way to reduce exposure and protect people's lungs both in the long and short term.

This is because long-term exposure to high concentrations of air pollution damages all our lungs, increasing the number of people living with a lung condition and making it especially difficult for those with an existing lung condition to live full, active lives.

Long-term solutions should include significantly more work on communicating information to the public, so that everyone, regardless of if they live with a lung condition, understands the health implications of air pollution, how they can protect themselves and how they can reduce their own contribution to air pollution in their area. And, ultimately, prevention through education on air pollution is a much more effective method to empower people to look after their health than simply relying on urgent short-term messaging when air pollution is high.

The government also needs to be taking the appropriate steps now to reduce pollution in the future. Current proposals would wait until 2040 for us to reduce concentration levels of fine particulate matter pollution ($PM_{2.5}$) in line with the World Health Organization's Interim Level of 10μg/m^3. This target fails to protect the most vulnerable and will lead to another generation being forced to battle with the negative health impact of breathing dangerous levels of toxic air every day. The government is currently seeking the public's view on these proposals, which will remain open for consultation until 27 June 2022.[11]

The proposed target date needs to be brought forward to 2030 in order to ensure that ambient air pollution is less of a risk to those who are most vulnerable. It is only through this activity that people living with a lung condition will have the same access to living, working and socialising as everyone no matter where they live in the UK. Achieving this target by 2030 will also make it much easier for vulnerable groups to manage their conditions on a day-to-day basis and to take appropriate precautions during short-term peaks.

Learning from those with a lung condition

This report demonstrates the urgent need for the government to ramp up action to protect some of the most vulnerable members of our society from the devastating health effects of air pollution.

It uses data from a recent survey undertaken by Asthma + Lung UK (A+LUK), which asked people living with lung conditions how they are impacted on a day-to-day basis, and how they could be better supported in the future to help manage the symptoms of their condition.

While the research focuses primarily on those with a lung condition, the recommendations set out below would have a positive impact on all of those groups who are vulnerable to the health impacts of short-term exposure to high levels of air pollution, such as those with cardiovascular conditions or lung cancer.

This report has been designed to build upon work which the Department for Environment, Food and Rural Affairs (DEFRA) is currently undertaking to improve how information about air quality is communicated to the public.

Our recommendations

1. **Work with trusted partners to raise awareness among at-risk groups about the availability of air pollution alerts**. Government should work with institutions including the NHS, local councils, charities and NGOs, and schools to increase the number of people using alerts and reach more at-risk groups. This should include working with employers to make sure workers are protected.

2. **Review the health advice provided through the alerts system to protect people living with lung conditions** to better reflect the true impact of air pollution on people's health. Messaging should first and foremost prioritise protecting those living with lung conditions in the short term, so they understand how spikes in air pollution could impact their daily life. Advice should, where possible, be condition specific.

3. **Lower the threshold for sending out alerts to those most at-risk and cover a broader range of air pollutants including spikes in $PM_{2.5}$**. Alerts must, at a bare minimum, be aligned with the UK's short-term legal pollution limits, with more alerts provided to the most vulnerable with severe health conditions in line with recommendations provided by the World Health Organization (WHO). Alerts must also be based on a broader range of pollutants, including particulate matter – both $PM_{2.5}$ and PM_{10}.

4. **Ensure the measuring of air pollution levels, and the messaging provided in air pollution alerts are aligned**. There shouldn't be any divergences in the levels of air pollution that warrant an alert. Messaging to vulnerable groups on days of high air pollution should similarly be uniform. Any divergence is likely to cause confusion among these groups and reduce trust in the methods for analysing air pollution levels overall.

5. **Provide ringfenced funding for local authorities to install, insure and maintain air pollution monitors across all locations, starting with air pollution hotspots such as cities**. Working with local authorities to install and maintain monitors in the most suitable locations will provide more accurate, real-time and localised information for people. More diffusion tubes should also be provided for schools, hospitals, GP surgeries and care homes, to ensure pollution is closely monitored around locations where more at-risk groups live, visit and learn.

6. **Roll out a public health campaign centred around the health impacts of air pollution**. This must be targeted to people with lung conditions so they can manage their exposure to air pollution both in the short and long term, as well as educate the wider public about the impacts of air pollution exposure.

7. **Amend clinical teaching guidelines and work closely with the health services to ensure healthcare professionals provide sufficient advice to people living with health conditions**, as recommended by the Coroner in the Prevention of Future Deaths report for Ella Adoo-Kissi-Debrah.[12]

8. **Investigate the viability of practical solutions that can help to drive long-term behaviour change**. This should include measures to ensure that pressure is put on polluters to reduce their contribution over the long-term as well as options that help people to make the right changes in the short term. One example of this could be to make public transport free on days of high air pollution to encourage people to leave their cars at home.

Introduction

Air pollution is a public health emergency, and the greatest environmental risk to human health.[13] In the UK, it has been linked with up to 36,000 premature deaths each year.[14] It reduces life expectancy by increasing our chances of lung cancer, cardiovascular disease and stunted lung growth in children.[15]

Shorter-term high air pollution episodes can exacerbate the symptoms for people with lung conditions such as asthma or chronic obstructive pulmonary disease (COPD). This was sadly shown in the untimely death of nine-year old Ella Adoo-Kissi-Debrah, who became the first person in the UK to have air pollution on her death certificate due to the role it played in triggering her last asthma attack.[16]

Health effects of air pollution[49]

Short-term:

- Inflammation and irritation of the lining of the airways, which can cause symptoms such as coughing and difficulty breathing.
- Asthma attacks, heart attacks or COPD flare-ups for people with existing conditions, resulting in increased hospitalisations.

Long-term:

- Reduced life expectancy, due to lung cancer, respiratory and cardiovascular disease.
- Damage to developing lungs and brains during pregnancy.
- Increased chance of low birth weight and premature birth.
- Likely to cause new cases of asthma.
- Stunted and smaller lungs in children, increased lung infections and likelihood of future lung problems.
- Potentially increased risk of type 2 diabetes and dementia.

The government's work to improve information on air pollution

The government has acknowledged that the current mechanisms for delivering air pollution information to the general public are not providing people with the tools to protect their health and are committed to reviewing this over the coming months.

Part of this review includes analysing the impact of the air quality alerts, which are sent out by DEFRA whenever forecasts show air pollution to be above a certain threshold level. These alerts get sent to schools, hospitals and local authorities, and can be sent directly to individuals if they sign up via the UKAir website.[17] However, these alerts, and the UKAir website more broadly, are currently not optimised to protect the most vulnerable as best they can.

Asthma + Lung UK role in improving air quality information

A+LUK is working to support the government to improve the current mechanisms that deliver air pollution information to vulnerable groups, especially those living with a lung condition. This report will therefore seek to highlight the way information about air pollution is currently communicated to the public, and how it could be improved to better protect people, both over the long term and during short-term episodes when air pollution is particularly high.

We have undertaken survey work with our supporters and the wider public to understand how air pollution impacts them day-to-day, how they use current alert systems, and how these could be improved. Our recent survey, 'vulnerable groups and air pollution', has been used to shape this report.[18] We have also included some data from A+LUK's Annual Asthma Survey[19] and Annual COPD Survey,[20] both of which collected information relating to air pollution.

While this report focuses on lung conditions, there is clear evidence that air pollution also has an impact on other organs such as the heart, and there is a growing body of evidence that shows it is increasingly connected to dementia, increased risk of strokes and worse mental health outcomes.[21]

Air pollution is having a significant impact on people's day-to-day lives

We all breathe the same air, but some groups are significantly more vulnerable to the health risks associated with poor air quality. These include pregnant women, babies and children, older people and those living with an existing lung conditions.[22]

Our survey found that, some of the most vulnerable in our society are being impacted by the blight of toxic air on a daily basis.

95% (1039) of respondents to the survey noted that they had a lung condition themselves, whilst an additional 1.1% (12) answered on behalf of their children who had a lung condition. Only 3.1% (34) answered on behalf of someone else living with a lung condition. For these respondents, the impact which air pollution has on their lives is often debilitating.

Almost half of all respondents (46.9%) have to avoid exercising outdoors when they believe air pollution to be worse. Similarly, almost a third of respondents (31.3%) indicated that they avoid holidays in areas where pollution is worse, and a third (33.2%) don't leave the house at all. The majority (55.6%) of respondents felt that their area was quite or extremely polluted, compared to just over a third (37.5%) who felt their area was not very, or not at all polluted.

"I have COPD and I can't breathe when air pollution is high, it's like there is no air for me to get. I'm opening my mouth to get the air but there is nothing there. It's a really frightening feeling. It's scary."

Niki, East London

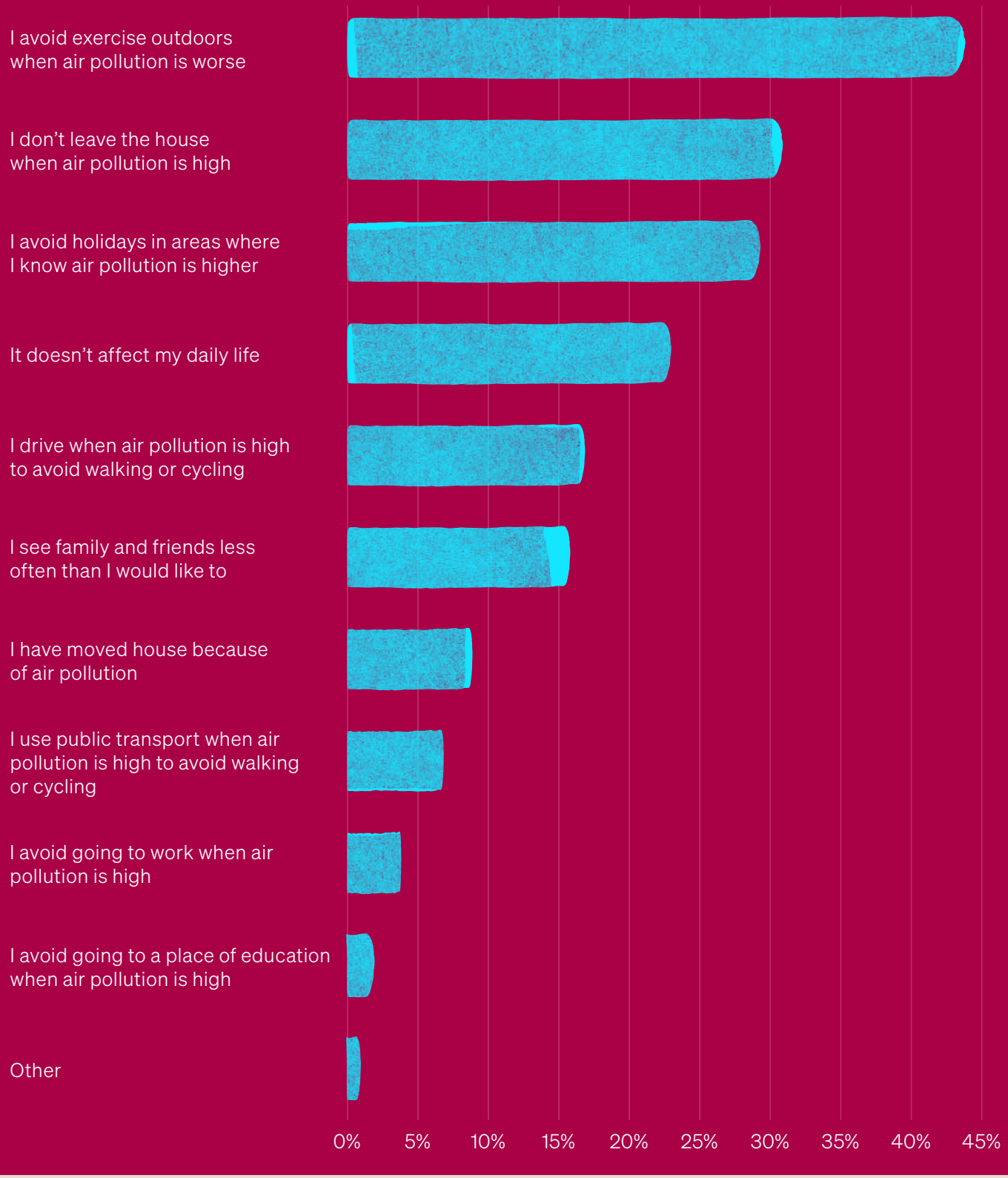
"My breathing deteriorates (my chest tightens) when the air quality is bad in Milton Keynes. I retreat indoors which annoys me that I have to."

Roger, Milton Keynes

It is not right that people should be sitting at home, avoiding exercise, holidays and general outdoor activity due to air pollution levels. Particularly given we know that physical activity and exercise, can be critical ways for people to self-manage their lung condition.[23]

It is therefore essential that those who are most vulnerable receive the right guidance and support to help them to manage their conditions and avoid air pollution in a way which doesn't significantly impact their daily activities.

Chart 1: how does air pollution affect your daily life?



Air pollution exacerbates and triggers symptoms

For almost 60% of respondents, air pollution makes them feel breathless, 51.1% said it makes them feel wheezy, and 43.2% said it made their symptoms flare up. Most worryingly, 7.8% said that they have been hospitalised due to high air pollution levels. Only 9.7% of respondents said that air pollution does not make their lung condition worse. Any information and alerts system must focus on reducing this impact and protecting these individuals first and foremost.

Almost a quarter (23.8%) of people responding to the survey said air pollution made them feel low and depressed.

In our 2022 annual asthma survey, over three quarters (77.4%) of the 8,300 respondents, all of whom had asthma, said that air pollution has an impact on their health and wellbeing and over half (53.3%), said air pollution was a trigger for their symptoms. Similarly, in our 2022 Annual COPD Survey, almost half (47.3%) of the 8232 respondents, all of whom living with COPD, also said that air pollution was a trigger for their symptoms. Overall, we estimate that air pollution triggers or worsens symptoms for 3.4 million people with asthma and COPD. This suggests that air pollution is an ongoing and constant issue for people living with a lung condition across the UK.

"Air pollution makes living with my bronchiectasis very difficult. I find that my breathing feels very laboured and like a tourniquet is being applied around my chest."

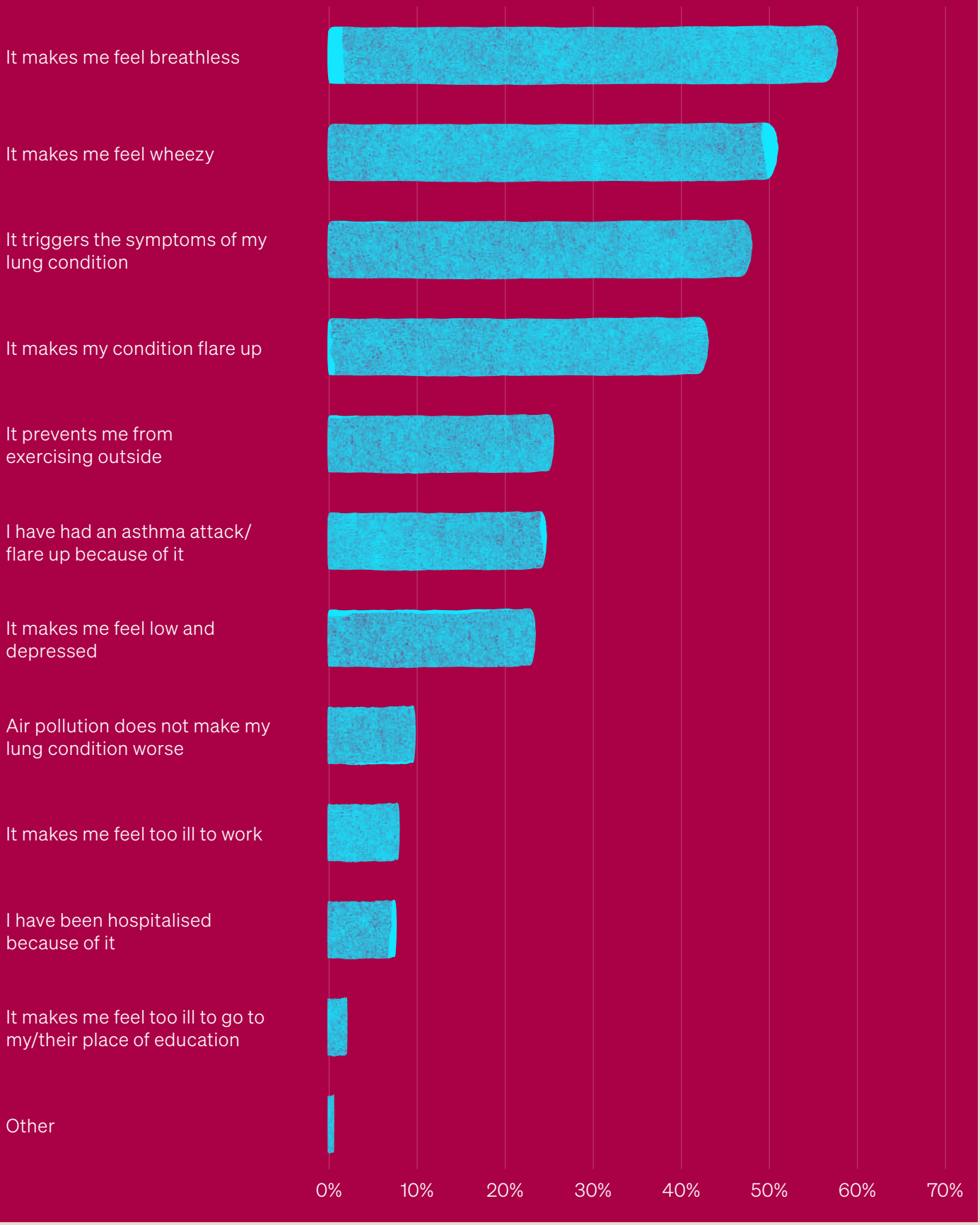
Dave, Rochdale

60%
of respondents said that air pollution makes them feel breathless

51%
said it makes them feel wheezy

43.2%
said it made their symptoms flare up

Chart 2: Does air pollution ever impact your health or make your lung condition worse?



“I had to move because I physically could not live in Greater London. I find it so frustrating”

“It gets me down that air pollution affects my health as much as it does. I went from having mild asthma to severe uncontrolled asthma, shortly after moving to the Greater London area. My symptoms became so frequent and frightening that I realised I had no choice; I had to move to a less polluted suburb to regain some control over my asthma. But I can’t avoid the pollution altogether as I commute to central London for work. Everyday I’m having to make a choice between protecting my health and doing my job. I don’t necessarily want to show how much it affects me, because it’s not something that is taken that seriously and most of my peers don’t have to think about it. When it comes to exercise, things have improved since moving. I can manage hills, but I can’t run outdoors anymore because my lungs just hurt. Indoors is usually fine, and I attend dance classes. But some evenings, after a day breathing the city air, I can’t always manage that. I find it so frustrating as I am an active person and I do want to exercise.”

Jess, Buckinghamshire

Information is failing to reach those most vulnerable

Regardless of the fact that the majority of those living with lung conditions stated that their conditions were exacerbated as a result of poor air quality, over 80% said they do not use air pollution alerts to notify them of days when air pollution is high. Of those who do not use the alerts, almost 4 in 5 (77.6%) said that they were unaware that air pollution alerts existed.

This demonstrates the urgent need for Government to work with trusted partners to raise awareness that these alerts do exist, particularly by communicating this to people living with health conditions which may be worsened by poor air quality.

“I have no idea of the pollution levels in my area, I would not know where to look.”

Philip, Southampton

80%

said they do not use air pollution alerts to notify them of days when air pollution is high

More trusted sources of air pollution alerts will increase reach to at-risk groups

Current sources of air pollution alerts include local authorities, central government through UKAir, and some separate air pollution forecasts and alert systems run externally, such as AirText,[26] via weather apps, online news sites or social media and even local groups. Often this messaging can be confusing and contradictory, with some sources giving out information that differs to others. Information needs to be aligned and, when specifically linked to health advice it should be uniform across all stakeholders. However, the stakeholders delivering the messages should be diverse in order to ensure people trust the advice that is given.

Our survey found that 80.2% of respondents would trust Asthma + Lung UK to provide advice on air pollution. Given the target audience of the survey, this is unsurprising. However, almost two-thirds (65.4%) of respondents indicated that they would trust healthcare professionals the most. In comparison, just 7.8% said they trusted central Government most, 15.4% trusted local authorities and just 4.8% trusted teachers, suggesting that messaging passed through teachers to children should be corroborated by messages from other trusted sources.

In order to reach more communities, Government should seek to work with existing trusted sources who can reach at-risk groups easily. For example, the role of trusted charities and patient networks like those run by Asthma + Lung UK should be further evaluated and developed as a key distributor of air pollution information. Similarly, in London alerts are sent directly to all schools in all London boroughs when air pollution is high, while alerts are also displayed across the public transport and road networks. This should be replicated in cities across the UK, with clear actions developed alongside teachers to ensure children are protected at school.

Similarly, Government could consider how it can better work with the National Health Service (NHS) to connect the different vulnerable groups with air pollution alerts. For example, consideration could be made around how to utilise the NHS App to send notifications directly to those at-risk, alerting if health conditions may be triggered or worsened by episodes of high air pollution. The COVID-19 pandemic has seen the major proliferation of the NHS App and other digital health tools and has meant that audiences are used to alerts coming from digital sources.[27] Of course, any such activity undertaken would need to be accompanied by work seeking to reach those with low or no digital capabilities.

The government needs to ensure greater uniformity of messaging and modelling, so that all information about air pollution levels, and in particular the alerts, is the same. Otherwise, the system risks becoming disjointed and confusing, with different sources distributing different and potentially contradictory messaging.

7.8%
said they trusted central Government

15.4%
said they trusted local authorities to deliver advice on air pollution

65.4%
said they would trust healthcare professionals the most to deliver advice on air pollution

Current messaging must be reviewed to protect the most vulnerable

The health advice provided through air pollution alerts must be reviewed in light of the fact that there is no safe level of air pollution to breathe in.[28] This review should be done in collaboration with healthcare professionals, people with lived experience, health charities, academics and behaviour change experts to ensure sufficient guidance is offered to the most vulnerable groups to better protect them.

Exposure to air pollution, even over short periods of time, is incredibly dangerous to those living with severe lung conditions. Research in Scotland found that increased rates of nitric oxides and PM_{10} were associated with increased risk of hospital admissions including cardiovascular admissions.[29] Similarly, in London, air pollution led to over 1,700 hospital admissions for asthma and serious lung conditions between 2017 and 2019.[30]

Given the primary objective of alerts is to protect public health and reduce hospital admissions, those who are most at risk should qualify for an automatic alert when air pollution is high. This alert should tell them of the substantial risk to their health as soon as pollution levels go above a certain threshold.

Any automatic alerts should contain advice to mitigate the impact of the high air pollution episode, avoiding restricting their ability to go outside as far as is practicably possible. This information should be accompanied by links to support which individuals can use in order to alleviate any concerns or fears they may have about the air pollution episode.

Table 1: Current health advice offered through the UKAir website and other sources[31]

Air pollution banding	Value	Health messages for at-risk individuals	Health messages for the general population
Low	1–3	Enjoy your usual outdoor activities	Enjoy your usual outdoor activities.
Moderate	4–6	Adults and children with lung problems, and adults with heart problems, who experience symptoms, should consider reducing strenuous physical activity, particularly outdoors.	Enjoy your usual outdoor activities.
High	7–9	Adults and children with lung problems, and adults with heart problems, should reduce strenuous physical exertion, particularly outdoors, and particularly if they experience symptoms. People with asthma may find they need to use their reliever inhaler more often. Older people should also reduce physical exertion.	Anyone experiencing discomfort such as sore eyes, cough or sore throat should consider reducing activity, particularly outdoors.
Very high	10	Adults and children with lung problems, adults with heart problems, and older people, should avoid strenuous physical activity. People with asthma may find they need to use their reliever inhaler more often.	Reduce physical exertion, particularly outdoors, especially if you experience symptoms such as cough or sore throat.

The threshold for sending out an alert must be reviewed and cover more air pollutants

Reviewing the air pollution bandings will be crucial in raising awareness that there is no safe level of air pollution to breathe in. One initial step should be to move away from the use of the terms "low" and "moderate" for air pollution forecasts, as well as the green to red scale currently used to represent them. This is particularly crucial in areas where the overall average daily concentration is high enough to damage people's health but the forecast for that day may not breach thresholds to merit a "moderate" or "high" rating.

Furthermore, the alert thresholds themselves are out of date when compared to the short-term legal limits for various pollutants, limits put in place to, among other things, protect public health. For example, on the UKAir website, in order to trigger an alert, NO_2 levels must reach 400µg/m^3 for three consecutive hours.[32] This is twice the UK legal limit for the one hour mean which is set at 200µg/m^3. Similarly, the level of Ozone required simply to issue information is 180µg/m^3 for 1 hour, whilst levels would have to reach 240µg/m^3 to trigger an alert. Both of these figures are over the legal limit for short-term Ozone exposure.[33]

Given our general legal limits are set to protect public health, these alerts are clearly being sent out too late to have the impact they need. This is even more evident given the revision of the WHO Air Quality Guidelines in September 2021, which rendered most of our legal limits outdated from the perspective of protecting public health.[34]

The level at which these bands are set must urgently be reviewed in line with the UK's legal limits at the very least. For those living with severe lung conditions, where lower levels of pollution may still exacerbate symptoms, alerts and information should be sent out on a more regular basis in line with recommendations from the World Health Organization.[35]

Crucially, air pollution alerts must encapsulate a broader range of pollutants, such as particulate matter (both $PM_{2.5}$ and PM_{10}), which is a significant health risk for people with lung conditions and can cause devastating health impacts in the longer term. At present, UKAir's alerts and notifications only apply to ozone, sulphur dioxide and nitrogen dioxide.[36]

Our recommendations:

1. **Work with trusted partners to raise awareness among at-risk groups about the availability of air pollution alerts**. Government should work with institutions including the NHS, local councils, charities and NGOs, and schools to increase the number of people using alerts and reach more at-risk groups. This should include working with employers to make sure workers are protected.

2. **Review the health advice provided through the alerts system to protect people living with lung conditions** to better reflect the true impact of air pollution on people's health. Messaging should first and foremost prioritise protecting those living with lung conditions in the short term, so they understand how spikes in air pollution could impact their daily life. Advice should, where possible, be condition specific.

3. **Lower the threshold for sending out alerts to those most at-risk and cover a broader range of air pollutants including spikes in $PM_{2.5}$**. Alerts must, at a bare minimum, be aligned with the UK's short-term legal pollution limits, with more alerts provided to the most vulnerable with severe health conditions in line with recommendations provided by the World Health Organization (WHO). Alerts must also be based on a broader range of pollutants, including particulate matter – both $PM_{2.5}$ and PM_{10}.

4. **Ensure the measuring of air pollution levels, and the messaging provided in air pollution alerts are aligned**. There shouldn't be any divergences in the levels of air pollution that warrant an alert. Messaging to vulnerable groups on days of high air pollution should similarly be uniform. Any divergence is likely to cause confusion among these groups and reduce trust in the methods for analysing air pollution levels overall.

Canary in a coalmine

"I have COPD and I can feel poor air quality in my chest as soon as I go outside – it's like being a canary in a coalmine. I used to subscribe to the air pollution alert on my phone but found it didn't always work well and my lungs feel the pollution at much lower levels than the warnings.

Living by the coast, there's the misconception that the sea air is cleaner, but in Eastbourne, air pollution is a real problem. Some days I can't go out to exercise, which is vital to managing my lung condition. I get what I call heavy legs – I struggle to move them which makes walking difficult. If I'm out and the pollution levels are high, I must go home and shut the doors, windows, everything; otherwise, I end up coughing or feeling extremely breathless

People with lung conditions are often advised not to go out when it's hot, when it's cold or when there's air pollution, but that's just not fair or realistic. I do always try to take precautions, like when I'm walking along the seafront when there's a lot of traffic I'll change where I'm walking to avoid it, but I don't feel I should have to do this."

Felicity, Eastbourne

Trapped indoors by air pollution

"My lungs have been sensitive to diesel and petrol fumes for as long as I can remember, but since being diagnosed with COPD in 2017, I'm trapped in my own home. On Monday to Friday when the cars turn up taking the children to the primary school on my road, I daren't open the window, I daren't go outside, because if I do and the wind is blowing the wrong way, I can't breathe. I'm left coughing and choking; it's frightening.

I have to carefully plan my day, but often the traffic pollution is unavoidable. I can't walk very fast, so by the time I return from collecting my medication at chemist in the afternoon, people have already started parking their cars outside the school. They arrive early to get a parking space and sit there with their engines running. They don't realise the impact it has on people like me with lung condition and they certainly don't realise the impact it is having on their own health or their children's.

There should be more information out there about the danger of car fumes and other sources of air pollution. People should know exactly what bad air can do to your body – it can kill you. It slowly creeps up on you to the point when it is too late. If your lungs become diseased, it cripples you and it will just get worse.

I didn't know air pollution alerts existed, but I would check them daily and use them to plan my walk into town."

Leon, West Lancashire

People need more support to protect themselves from air pollution

Road transport is the most concerning source of pollution for people

Our survey found that road transport is overwhelmingly the most concerning sources of air pollution for those living with lung conditions. 82.4% of respondents were concerned about road traffic and vehicles, and over 60% concerned about lorries specifically as sources of air pollution. To mitigate against this, 70% of respondents avoid traveling during peak time traffic such as rush hour, and a similar percentage avoid main roads more generally.

As the main focus of air pollution messaging and campaigning to date, it does not come as a surprise that road transport is the most concerning source of air pollution for the majority of people. This shows the importance of consistent messaging around air pollution. It also adds weight behind the importance of a national public health campaign which would raise awareness around the impacts of air pollution from a wide variety of source.

That people are being forced to change their behaviour to avoid times when pollution levels are at their peak, emphasises the need for more progressive ways to help people to protect their lungs, so nobody living with a lung condition is at a disadvantage.

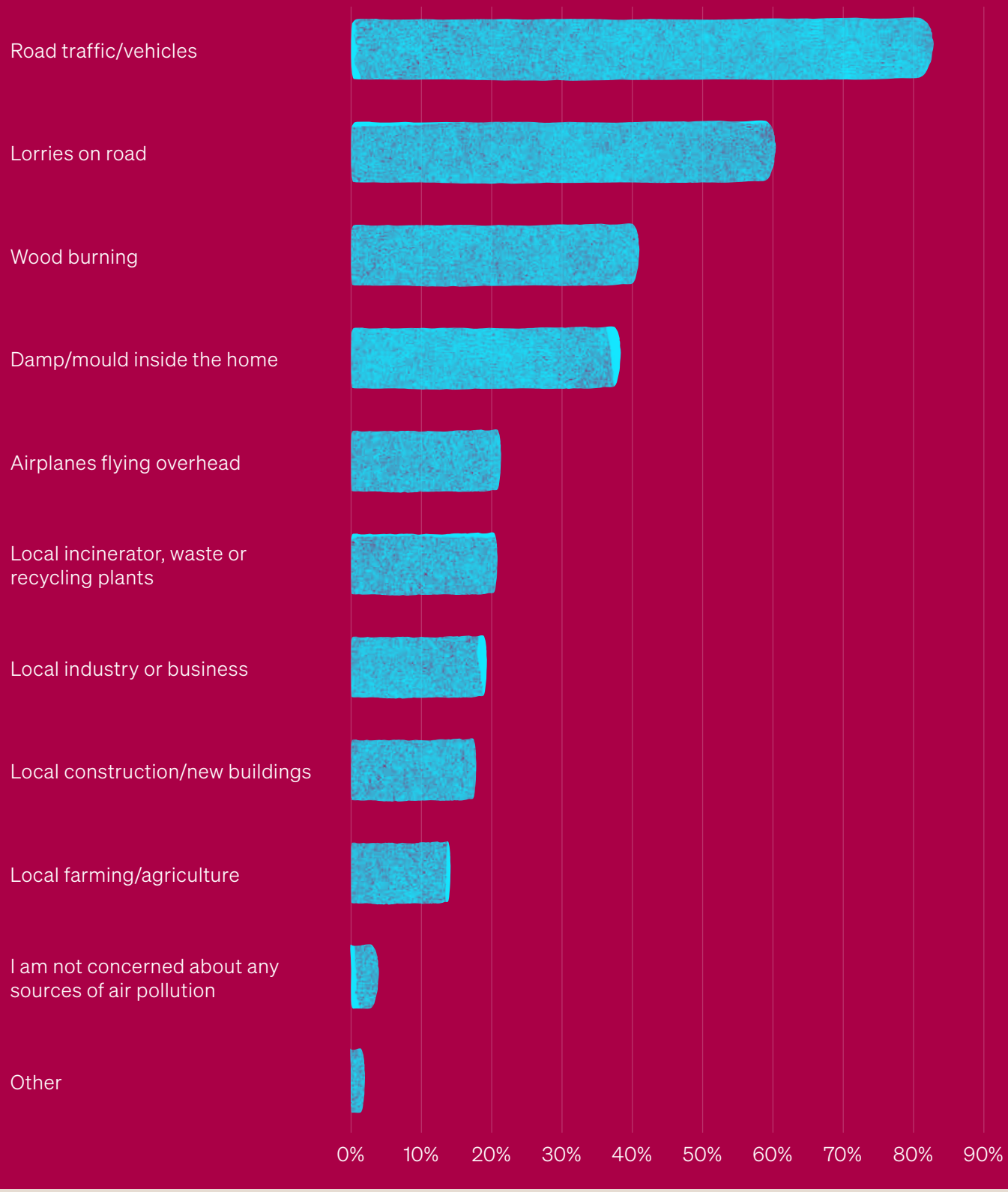
"I do notice when in built up city areas with heavy traffic that my breathing becomes slightly uncomfortable and I have a heavy sensation on my chest."

James, Asthma + Lung UK Readers Panel

This question also highlighted the extent to which pollution from wood burning is impacting people's day-to-day lives. It was the third most concerning source of air pollution, with 40.7% saying it concerned them. Between 2003 and 2020, $PM_{2.5}$ emissions from wood burning have more than doubled, with burning fuel such as coal, wood and other material at home, now accounting for as much as 25% of $PM_{2.5}$ emissions in 2020.[37] The high concentration of $PM_{2.5}$ particles released from burning wood and other material can rapidly exacerbate people's lung condition. Our helpline sees a growing number of calls in the autumn and winter months due to the impact that smoke from bonfires, open fires and wood burning stoves has on their lung condition.

In light of the current energy and cost of living crisis we have seen a boom in sales for wood burners as they offer a cheaper sources of fuel to heat homes.[38] However, given the stark health impact that this has, there is a clear need for all levels of Government, the healthcare sector and NGOs to be raising awareness around how burning wood and other material in the home impacts public health.

Chart 3: Which source of air pollution is most concerning for you?



A national public health campaign will help to raise awareness about air pollution

A national public health campaign would be pivotal in raising awareness amongst the general public. This campaign should set out clear advice for at-risk groups, including those living with lung conditions, as well as raising awareness amongst the general public. 55.7% of respondents to our survey said that more guidance from central government through a national campaign raising awareness would help them to reduce the impact air pollution has on their condition.

Improving awareness around the health implications of air pollution could also have a positive impact on how the general public currently perceive, and endorse, action to improve air quality. As we've seen from smoking, public health campaigns can be effective in increasing awareness and driving change.[39] Therefore, not only could a national campaign help to protect those most vulnerable, it could drive behaviour change to reduce emissions simultaneously.

A national campaign, while driven from the top, must also be coordinated alongside the right stakeholders to ensure that people are receiving information from voices which they trust, rather than central government alone. Local authorities for example are more trusted than the Government to make decisions about how services are provided in their local area.[40]

Those in positions of power need to be doing more

In our survey, 77.2% of respondents felt central Government is not doing enough to protect people from the impacts of air pollution, 68.9% didn't feel healthcare professionals were doing enough, and 72.5% didn't feel local authorities were doing enough. This is despite healthcare professionals being one of the most trusted sources of air pollution information.

Our survey found that 64.5% want more guidance from their local health services and GPs to manage the impact air pollution has on their condition. This demonstrates the need for Government to work closely with healthcare professionals to communicate messaging about the health impacts of air pollution.

This is particularly important for lower income groups where trust in the Government and politicians is lower than higher income groups,[41] and where they are disproportionately impacted by poor air quality. Our previous research has found that 85% of people living in areas with illegal levels of NO_2 making up the poorest 20% of the UK population.[42]

77.2%

of respondents felt central Government is not doing enough to protect people from the impacts of air pollution

More accurate, local data can better support people living with lung conditions

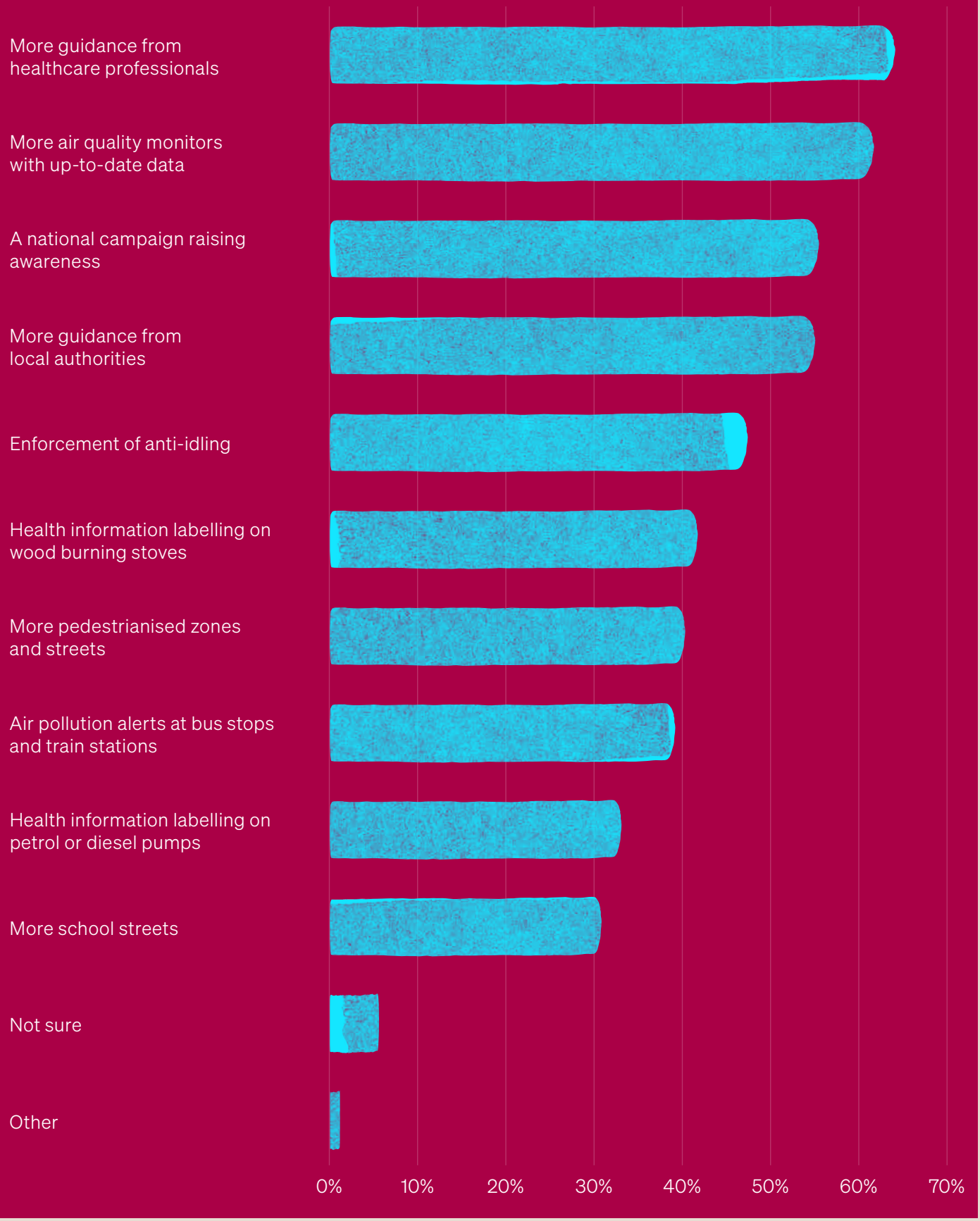
In our survey, almost two thirds (61.9%) of respondents said they wanted more up-to-date, localised data from air quality monitors to better help them to manage the impact air pollution has on their conditions. Having accurate, live data is crucial for people living with lung conditions to make day-to-day lifestyle changes, such as changing the route they walk or the time of day they leave the house in order to avoid places where air pollution is higher. Yet almost 9 in 10 respondents (86.7%) to our survey said they were not aware of any air pollution monitors located near to where they live.

Air pollution in many instances is hyperlocal; even on a road-by-road basis, air pollution can differ significantly depending on levels of traffic or whether a neighbour has lit a bonfire or their woodburning stove.[43] This means that having more localised data will be extremely beneficial in supporting those living with lung conditions to manage their short-term exposure.

Some cities are already leading the way in rolling out air pollution monitors. For example, Birmingham City Council will be rolling out air pollution diffusion tubes to every school in the area, to drive the messaging that congestion and idling cars diminish air quality and damage children's health.[44] Similarly in London, the Mayor has put significant funding behind rolling out more air pollution monitors which provide street-by-street sensor air quality monitors, through London's "Breathe London" network. In 2021, the network was expanded with a £1.5 million investment rolling out sensors to hospitals, schools and other priority locations, as well as 60 sensors for community groups.[45]

Central government must work with every local authority across the country to ensure all communities have access to a wide network of monitors, prioritising cities, pollution hotspots and places frequented by vulnerable groups – such as schools, hospitals and care homes. All data from these monitors should be readily available for all residents.

Chart 4: Which of the following would be useful to support you to reduce the impact the air pollution has on your lung condition?



Our recommendations:

5. **Provide ringfenced funding for local authorities to install, insure and maintain air pollution monitors across all locations, starting with air pollution hotspots such as cities**. Working with local authorities to install and maintain monitors in the most suitable locations in order to provide more accurate, real-time and localised information for people. More diffusion tubes should also be provided for schools, hospitals, GP surgeries and care homes, to ensure pollution is closely monitored around locations where more at-risk groups live, visit and learn.

6. **Roll out a public health campaign centred around the health impacts of air pollution**. This must be targeted to people with lung conditions so they can manage their exposure to air pollution both in the short and long term, as well as educate the wider public about the impacts of air pollution exposure.

7. **Amend clinical teaching guidelines and work closely with the health services to ensure healthcare professionals provide sufficient advice to people living with health conditions**, as recommended by the Coroner in the Prevention of Future Deaths report for Ella Adoo-Kissi-Debrah.[46]

8. **Investigate the viability of practical solutions that can help to drive long-term behaviour change**. This should include measures to ensure that pressure is put on polluters to reduce their contribution over the long-term as well as options that help people to make the right changes in the short term. One example of this could be to make public transport free on days of high air pollution to encourage people to leave their cars at home.

Conclusion

The way that we inform the public about the levels and dangers associated with air pollution is not fit for purpose. People are living without the knowledge to properly protect themselves or reduce their own contribution to air pollution. This is leading to more people living their life in poor health and making it harder for policymakers to gain public support for the measures needed to reduce levels of toxic air, such as reducing traffic on the roads or wood burning in the home.

For those who are already vulnerable, the lack of awareness about air pollution alerts could prove fatal.[47] Short-term exposure to high concentrations of air pollution, particularly NO_2 and $PM_{2.5}$, can trigger asthma attacks and cause COPD symptoms to flare up.

We have seen through our survey work that air pollution is a very real problem for our beneficiaries and supporters. It causes them to feel breathless, wheezy and can lead to hospitalisation. This lived experience is supported by the wider evidence base, which is becoming increasingly clear that air pollution damages our lungs and can impact every part of the body.[48]

It is increasingly causing a problem to their mental health and wellbeing as well. In order to mitigate its worst impacts, people living with a lung condition are often staying indoors, too concerned to venture out during times when air pollution is spiking.

This needs to change. We need to develop a robust system that makes the best use of new technologies and existing processes in order to ensure that no one has their life limited or, worse, cut short completely, by air pollution.

While change cannot come from government alone, it is clear that there needs to be a better coordination of how information is distributed among the population and how air pollution alerts are used to protect public health. The role of government should be one of a coordinator, galvanising those stakeholders who are most trusted to translate messages about air pollution to the public, and driving activity from the centre through a clear strategy that delivers better monitoring, better understanding and better public health outcomes.

If the first imperative of any government is to protect the lives of those it governs, then those who are living with a lung condition must be central to all work done to reduce air pollution.

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