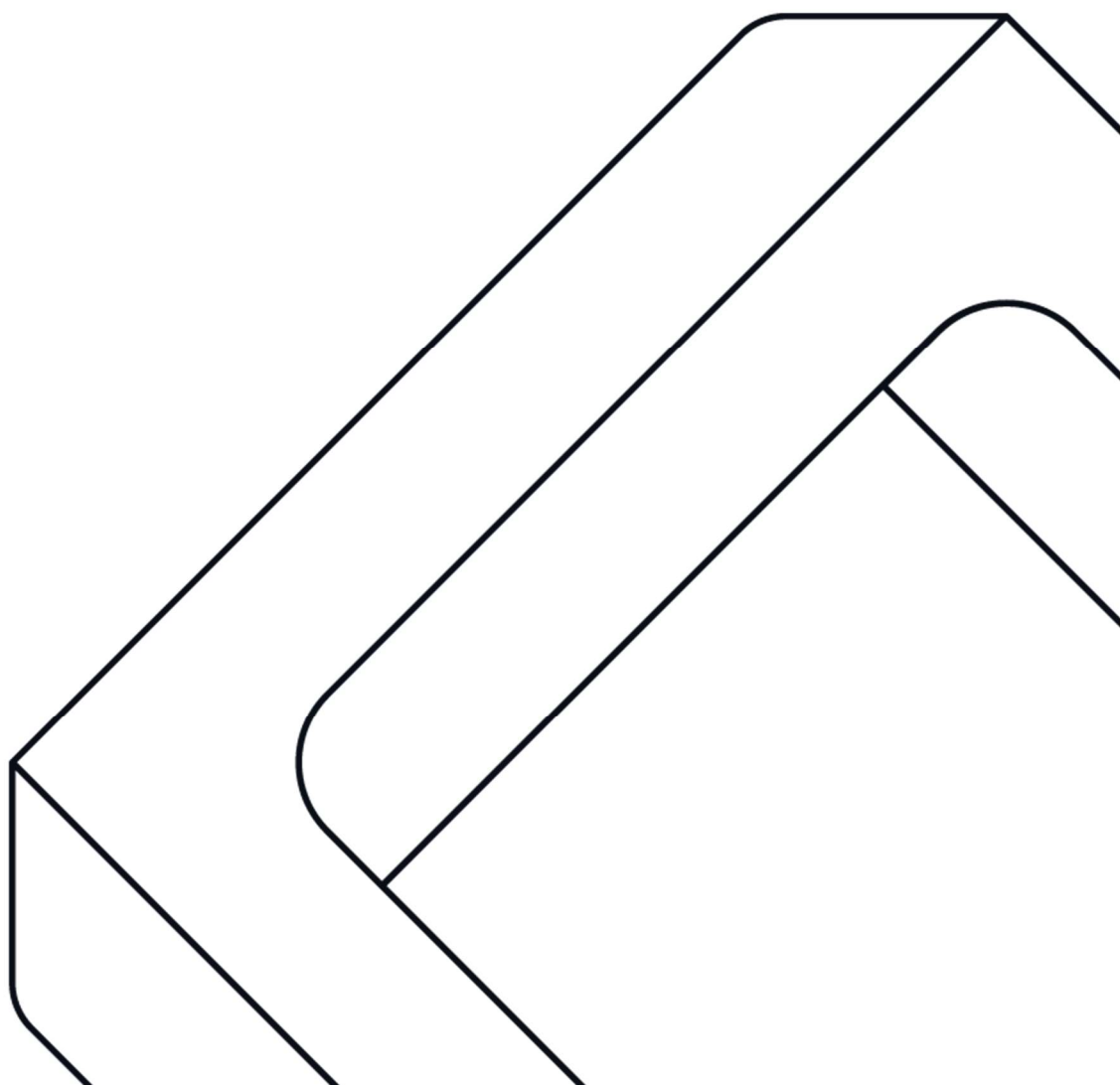


Air Quality Information System Review: Leveraging social networks



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1. Executive Summary

1.1. Background to the research

Defra commissioned this work as part of the Air Quality Information System (AQIS) review to understand the opportunities for disseminating information about air quality via people's social and interpersonal networks. Qualitative research was conducted amongst 36 participants across three iterative stages:

- One-to-one depth interviews, including an exercise to map individual social network and explore when and where within these the discussion of environmental issues and air quality is relevant
- An interim activity, in which participants were tasked with discussing air quality with their peers and recording their experiences on an online platform
- Ten strategy development sessions, reconvening all participants for group discussions to explore responses to a range of potential engagement materials and co-create strategies for leveraging social networks for dissemination

The research sample was purposively selected to include coverage of groups that are at a greater risk from the health impacts of air pollution, as well as a spread of other social situations and demographics.

1.2. Key Findings

Social networks

For all individuals, social networks were made up of a core of close personal ties with friends and family, surrounded by a periphery of other social 'spheres', each of which was associated with a specific social setting or activity. These included Professional, School, Local, Leisure, Voluntary, Religious and Healthcare. Each of these spheres revolved around a different set of people, places, activities and concerns, with typically little overlap between the relationships in each sphere. Communication within each sphere was situational, reflecting the particular relationships and concerns to which it related.

The structure and extent of any individual's social network was influenced by a range of demographic factors, including lifestage, ethnicity, location (e.g. urban vs rural) and socio-economic group. For example, social networks tended to change quite considerably when an individual had children, creating new connections to the School and Healthcare spheres. There was also some variation in social networks based on individual factors. Whilst, for most individuals, concerns about wellbeing and social issues were restricted to their Personal core, for a minority of more socially-minded individuals, there was a greater focus on social wellbeing in other spheres, including for example Voluntary, School and Leisure.

Across the research, we encountered a spread of different network types, differentiated by the extent and nature of connections individuals had to spheres beyond the Personal core. These could be broadly categorised into three different types:

- **Tight:** For a minority of individuals, mostly retired people or young people who did not have children, social networks were restricted primarily to the Personal sphere with only relatively weak connections with a limited number of spheres beyond that.
- **Distributed:** For most individuals, the Personal sphere co-existed alongside a greater level of connection to a wider range of other spheres. However, relationships within each sphere were typically still quite distinct, with little overlap in relationships or concerns.

- **Connected:** For a small minority of more socially-minded individuals, there was a greater level of connection to other spheres via more active participation in different communities. Whilst the Personal sphere was still central for these individuals, peripheral spheres tended to play a more important role, with a greater overlap in concerns between spheres.

The discussion of environmental issues

Across participants in this research, the discussion of environmental issues was relatively infrequent and, when it did occur, was driven by a combination of individual, social and material factors. At the individual level, an issue needed to be felt to have some kind of personal relevance for it to be of interest. At the social level, an issue needed to be seen to have relevance to other people for it to be deemed a suitable topic of conversation. If an issue was deemed to have both individual and social relevance, discussion was still typically triggered by some kind of material prompt, such as a visible impact or media coverage.

Climate change, plastic waste and water pollution were three environmental issues that participants consistently cited as having come up in discussions within their social networks. For each of these, there were a clear set of individual, social and material factors prompting discussion.

For example, climate change was seen to have individual relevance due to its impact on consumer decisions around issues such as electric vehicles or home heating, its perceived impact on the weather, including flooding, and, for some, individual emotional concern about its impacts. It was seen to have social relevance given its high profile and wide political implications, with considerable identity formation around views on how and to what extent government and individuals should be responding. There were also a wide range of material factors to prompt discussion, including broad media coverage about the real-world impacts across the world (e.g. extreme weather events) and observable changes to the weather in the UK.

The discussion of air quality

Participants were able to cite relatively few examples in which they had discussed air quality with others in their social network. This was due to a perceived lack of relevance at the individual and social levels, as well as a lack of material cues.

At an individual level, only those at greatest risk of the negative impacts of air pollution felt individually affected, with very little sense of personal risk for the majority. In addition to this, the issue was seen to have limited social relevance, in that there was no shared understanding of the importance of the issue and little impact on social identity formation. The one exception to this related to the introduction of the Ultra Low Emission Zone (ULEZ) in London, which was viewed as a negative political issue by some individuals and could therefore actually reinforce a lack of individual concern about air quality. This lack of individual and social relevance was accompanied by a lack of clear material cues to discussion, with no obvious visible impacts and little media coverage relating to the issue.

Given this, when asked to discuss air quality with their peers as part of this research, many participants found the issue challenging to raise. When conversations did feel more natural, this was because they were grounded in reference to some material cue or within the context of a social situation that gave the topic relevance. Examples of this included:

- Some participants with vulnerability to air pollution discussed this issue with their friends and family based around the presence of physical symptoms such as coughing
- A number of participants discussed air pollution in relation to either the use or potential purchase of a wood burning stove and their potential impact on health
- Some participants mentioned discussing the issue in a healthcare setting, such as peer-to-peer support groups, where issues related to health were seen as socially relevant

Prompting discussion of air quality

Given the present lack of individual relevance or social salience, prompting people to discuss or share information about air quality will depend on providing material cues that make air quality feel relevant to the individual and their life, and/or other people with whom they interact. This research suggested a range of considerations for maximising the impact of these material cues.

- **Messaging:** Participants agreed that messages need to both present a problem, to give them a reason to care, but at the same time present an actionable solution, to make this information meaningful. There was also consensus that messaging should be concise and hard hitting to 'cut through' competing messages.
- **Messenger:** Participants agreed that it is important for messages to be delivered by sources perceived as credible. The Met Office was seen as a particularly credible messenger, as it was perceived to be competent, unbiased and scientific. The NHS and other healthcare organisations were also perceived as credible. Views on the government were more mixed: although trust in politicians was universally low, there was more trust for some in information from government departments. Personal connections were not necessarily trusted in themselves but were seen as important messengers for information from other trusted sources.
- **Medium and channel of delivery:** Participants felt most open to information about air pollution when in outdoor urban areas that they associated with air pollution, such as at bus stops. They were also open to information in areas they associated with health, such as doctor's surgery. Mobile phones were seen as a particularly personal channel for delivery, but participants were not interested in downloading a specific air pollution-related app.
- **Topics of interest:** Indoor woodburning stood out as a topic with particular personal and social relevance for some, as information about air pollution was deemed a relevant purchase consideration, given the potential impacts on health in the home. Information about indoor air pollution also stood out for participants, as they typically associated air pollution with outdoor sources. Beyond this, participants felt they would be more likely to share information if it was framed in an engaging or entertaining form.

Communication approaches

The engagement materials shown to participants as part of this research (see Appendices A and B) were distinguished by the extent to which they engaged around two axes: individual or social relevance, and emotional or rational valence. Categorising engagement materials around these two axes suggests four distinct communication approaches, each of which has the potential to play a different and complementary role in an overall engagement strategy.

- **Information and advice** (individual and rational engagement)

For most of the audience, technical information about air quality or straightforward advice around how to mitigate impacts currently failed to engage, due to a lack of perceived individual relevance. However, advice about how to mitigate impacts were appreciated by participants with existing vulnerabilities as it empowered them to manage their condition. It could also play an important role with a more general audience once emotional engagement has been established.

- **Dramatise impacts** (individual and emotional engagement)

Dramatising the health impacts of air pollution could work to create widespread engagement, particularly when framed around the human impacts. Details of the case

of Ella Adoo-Kissi-Debrah were particularly emotive for participants, as this personalised the health impacts whilst also raising concerns about social justice. Creative executions bringing to life personal contributions or mitigating actions in surprising ways could also create emotional engagement.

- **Social norming** (social and rational engagement)

Participants agreed that building information about air pollution into social spaces has the potential to increase the visibility of the topic and signal its importance, creating new social norms and expectations. The most impactful idea in this territory was the integration of air quality reporting into weather forecasting. Participants also saw the potential to introduce a greater focus on air pollution into corporate Environmental, Social, Governance (ESG) policies, alongside those focused on carbon emissions. Some also suggested a role for government schemes, similar to the Energy Performance Certificate (EPC) rating.

- **Community engagement** (social and emotional engagement)

Participants felt that interactive community events had the greatest potential for driving engagement, due to their association with specific locales and pre-existing social connections. Schools in particular were seen as a key hub for community-based activities, due to their association with education and a strong emotional valence to the idea of improving the wellbeing of children. Voluntary groups campaigning on local issues were seen as another key hub. Some individuals saw interactive approaches, such as museum exhibitions, competitions or citizen science projects, as having strong potential to deepen engagement for those involved.

Implications

To maximise its effectiveness, a strategy for public engagement around air quality should incorporate a combination of interventions focused at the individual and social levels. These two approaches have the potential to be mutually reinforcing, as increased social salience is likely to empower individuals to speak about the issue affects them, further building social salience in a dynamic of positive reinforcement.

Findings suggest a range of potential approaches with the potential to help trigger discussion and information sharing:

Information and advice (individual/rational)

- Provide tools to help mitigate exposure (e.g., local pollution levels and mitigation advice) targeted at those with greatest vulnerability.
- Communicate with individuals around sources of indoor air pollution and measures they can take to reduce exposure.

Dramatise impacts (individual/emotional)

- Creatively bring to life the extent and health impacts of pollution.
- Communicate stories that humanise the health impacts and create an identifiable victim.

Social norming (social/rational)

- Continue to incorporate air quality reporting into weather reports, for example via the Met Office app.
- Introduction of the air quality equivalent of EPC ratings.

- Signposting to local air quality information in public spaces, for example via QR codes.

Community engagement (social/emotional)

- Delivery via schools – based around education and local action – for example at school drop-offs or the introduction of the School Streets initiative.
- Engagement with existing voluntary groups on local issues.

Findings also suggest opportunities to activate individual engagement via specific activities within different social spheres where air quality is deemed to have greater social relevance, including schools, voluntary organisations and leisure clubs focused on outdoor activities.

Finally, there are opportunities in the Healthcare and Professional sectors:

- **Healthcare:** At present healthcare providers were not typically discussing air quality, even with those at particular risk, and there was a strong desire amongst those receiving care for more information or signposting.
- **Professional:** For some care-related professions, such as social work, there was a view that an understanding of air quality could be incorporated into care provided to clients, if informed by appropriate training.

2. Background and aims

2.1. Background to the research

Air pollution is an environmental threat to human health and, while air pollution is harmful to everyone, its harms are not felt equally. It is a particular risk to some people, including elderly people, young children and people with underlying respiratory and/or cardiovascular conditions. In addition, some groups and communities experience poorer air quality where they live, work or go to school and are therefore disproportionately impacted by pollution. The provision of information about air quality has the potential to enable people to modify their behaviour to reduce their exposure, which could help reduce the severity of any symptoms they experience. It may also provide them with the knowledge and motivation to modify their behaviour to reduce their personal contribution to air pollution.

In 2021 Defra, the UK Health Security Agency (UKHSA) and the Department for Health and Social Care (DHSC) launched the Air Quality Information System (AQIS) review in response to growing awareness of the need to improve the provision of air quality information to the public. The AQIS review also forms part of the government's commitments to address matters of concern raised in the Prevention of Future Deaths coroner's report (April 2021) following the inquest into the death of Ella Adoo-Kissi-Debrah. The review is being guided by an external steering group consisting of multi-disciplinary experts spanning air quality science, health science, behavioural science and digital communications, as well as lay representation, representation from health charities and local and central government. The role of the steering group is to provide direction and oversight to the review. Ultimately, the review aims to propose a series of actionable and evidence-based recommendations for changes that could be made to improve the government's provision of air quality information.

To support this review, Defra commissioned this work to understand the opportunities for disseminating information about air quality via people's social and interpersonal relationships. Findings from this work will be synthesised with other work commissioned by the review and will feed into proposals for actionable and evidence-based recommendations to improve the government's provision of air quality information.

2.2. Research questions

This work aimed to answer the following key research question:

- In terms of spreading information and awareness about air quality, what are the opportunities afforded via an individual's interpersonal (social, professional, pastoral and educational) relationships?

In responding to this, the research considered how individuals receive information about air quality and comparable issues from different people, places and groups – as well as how they are then transmitting and sharing information with and amongst other people, places and groups. This required some understanding of how those individuals relate to air quality and other environmental issues, including existing levels of understanding and motivations to engage with different kinds of information.

As such, this work addressed the following objectives, considering any differences across a broad cross-section of the population, including those with particular vulnerabilities to air quality issues:

- **Map individual social networks**, considering the overall structure of connections, the different kinds of relationships, the offline and online locations in which these take place and the content and direction of communications.
- **Identify how individuals are discussing and sharing information about environmental issues and air quality specifically**, identifying the factors that drive discussion and the sharing of information.
- **Explore the potential for different kinds of information about air quality to drive discussion**, considering messaging, messengers, medium and the framing of communications.
- **Provide recommendations as to how to best leverage social networks to increase engagement with air quality information**, to inform the wider AQIS reporting process.

3. Methods

3.1. Qualitative methods

The research was conducted amongst 36 participants across three iterative stages of qualitative research:

1. **One-on-one depth interviews with all 36 participants** (conducted between 11th December 2023 and 19th January 2024) to:
 - Establish current understandings of and attitudes towards air quality.
 - Co-create a social network map for each participant, considering the different nodes in the network (people, places and groups) and the links (relationships and interactions) connecting these.
 - Explore when and where within these maps discussion and information sharing about environmental issues and air quality has occurred, considering what has prompted this.
 - Collect responses to a range of potential materials for dissemination, considering participant views on their likelihood of engaging with these or discussing them with others.
2. **A follow-up online activity completed by all participants** (conducted across the course of one week for each participant in between Stages 2 & 3) to:
 - Collect participant responses to a series of questions following up their responses to Stage 1 interview and collecting any further reflections.
 - Task participants with exploring the potential for the dissemination of air quality information within their own lives by:
 - i. Looking out for occasions or locations in which they feel open to or receptive to air quality information.
 - ii. Having a go at discussing air quality with others within their social network.
 - Record the results of these tasks on the online platform in either a text or video format.
3. **10 strategy development sessions re-convening all participants** (conducted between 15th of January 2024 and 2nd February 2024) to:
 - Discuss experiences of Stage 2.
 - Explore responses to a range of potential engagement materials aimed at prompting discussion or social engagement around the topic of air quality.
 - Identify where within social networks there was seen to be the greatest potential for dissemination, including what kind of information was most relevant in each setting.
 - Co-create strategies for leveraging social networks for dissemination, considering general lessons for messaging, messenger, channel and topic area, and specific approaches that are likely to have greatest impact.

All Stage 1 and 3 research was conducted online via Zoom, except for 4 interviews and 1 strategy development session amongst individuals who are digitally excluded, which were conducted face-to-face. Stage 2 was conducted on the Recollective online research platform, with an alternative paper copy provided to digitally excluded individuals.

Full topic guides and stimulus for stages 1 and 3 can be found in Appendices A and B.

3.2. Sample

The sample for this research included 36 participants, purposively selected to include coverage of groups that are at greater risk from the health impacts of air pollution, as well as a spread of other social situations and demographics. This included individuals with respiratory and cardiovascular conditions, low proficiency in English and digitally excluded participants (see Table 1)

Table 1 – Overall sample

Characteristic of interest	No. people	Additional Criteria	General criterial
Pregnant people	2		<p>Across the sample, a spread of:</p> <ul style="list-style-type: none"> • Ages (18-75+) • Gender • Ethnicity • UK locations • Educational attainment • Occupation type • Religious views • Political views • Attitudes to the environment <p>4 individuals who are digitally excluded (i.e., have low confidence with digital technology, low capability or low interest)</p>
Carers for young children	2	Children to be under 5	
Parent of a child with a cardiovascular condition (e.g. diabetes, heart disease)	2	Child to be affected by the condition to a moderate or severe degree	
Parent of a child with a respiratory condition (e.g. asthma)	2	Child to be affected by the condition to a moderate or severe degree	
Older adults	4	2 to be aged 65-75 2 to be aged 75+	
Carers of older adults	2	All to be caring for an older adult (aged 65+) at least 8 hours a week	
People with cardiovascular conditions (e.g. diabetes, heart disease)	4	To be affected by the condition to a moderate or severe degree	
People with respiratory conditions (e.g. asthma, COPD, bronchiectasis or emphysema)	4	To be affected by the condition to a moderate or severe degree	
General population	6	All to be BC1C2 social class	

People with lower socio-economic status	4	All to be DE social class 1 to be 18-24, 1 25-34, 1 35-44, 1 45+	
People with low proficiency in the English language	4	2 x Polish 2 x Bengali	

To help support cohesion and the identification of differences in views across the audiences, the Stage 3 strategy development sessions were structured around some of the key variables likely to affect attitudes to air quality (see Table 2)

Table 2 – Stage 3 group structure

Session no.	Participants	No. participants
1	Pregnant people, carers for young children and carers for older adults	~6
2	People with cardiovascular conditions (e.g., diabetes, heart disease) and parents of children with these conditions	~6
3	People with respiratory conditions (e.g., asthma, COPD, bronchiectasis or emphysema) and parents of children with these conditions	~6
4	Older adults	~4
5	General population	6
6	People with lower socio-economic status	~4
7	Digitally excluded people	4
8	People who speak Polish	2
9	People who speak Bengali	2

3.3. Interpreting the findings

All of the findings in this research are based on relatively small-scale qualitative data and should therefore be interpreted as indicative, rather than representative of the population as a whole. The conclusions and recommendations set out some ideas for communication and intervention based on the feedback and insight elicited in the research, but this does not constitute an exhaustive list of possible action points. Other research projects are also being conducted as part of the AQIS Review and so these findings need to be considered with reference to this other work too.

4. Mapping Social Networks

4.1. Introduction

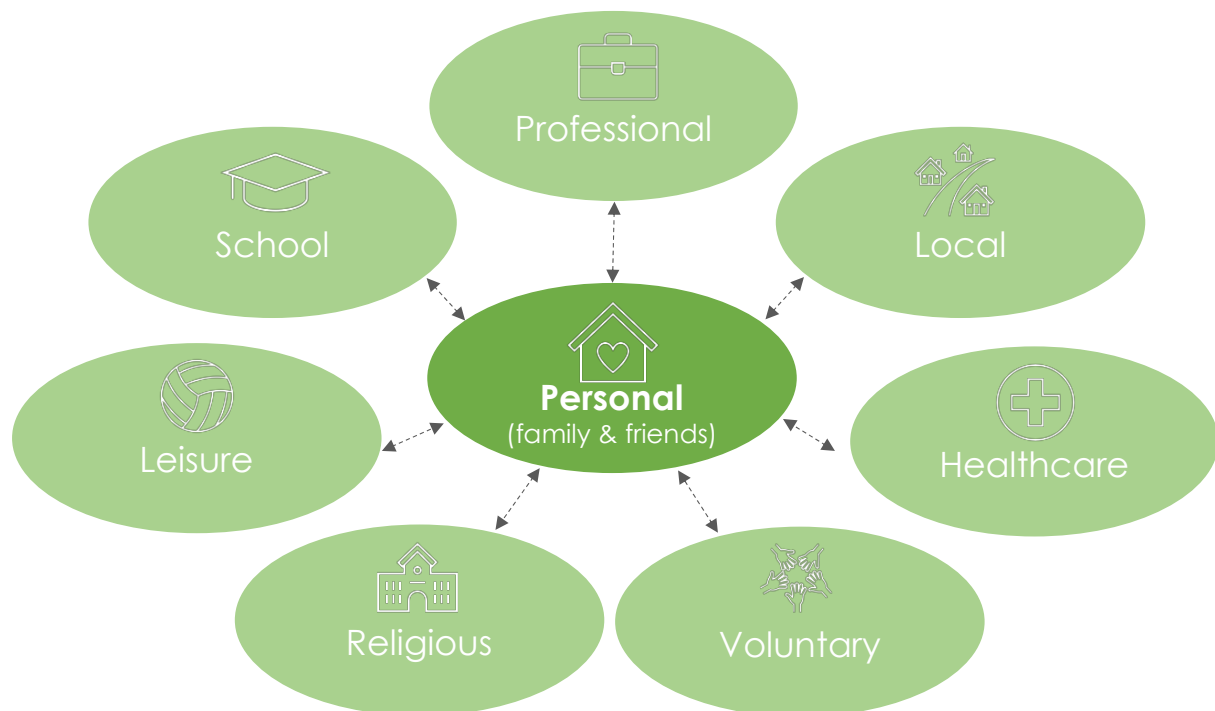
This section provides a framework for thinking about individual social networks, outlining how these are made up of a range of different social spheres, how relationships and the content of communication differ across these, and how the shape and structure of social networks differ across individuals.

4.2. The structure of social networks

For all individuals, social networks were made up of a core of close personal ties with friends and family. These connections were intimate, revolving around mutual support and obligation, and, whilst connected to the home, did not depend on any particular social setting or context.

Around this central hub, each individual had a periphery of other social 'spheres', each of which was associated with a specific social setting or activity (see Figure 1). The extent to which these other spheres were relevant to any given individual depended on their life situation and interests.

Figure 2 - Social spheres



Each sphere revolved around a different set of people, places, activities and concerns and therefore tended to be made up of a unique set of relationships. Typically, for any given individual the relationships within each sphere did not overlap with those in other spheres. However, there were sometimes exceptions to this, when, for example, a work colleague or neighbour could over time become a personal friend.

Communication within each sphere was situational, reflecting the particular relationships and concerns to which it related. In the following section, we outline the focus of each sphere, including the key people, places, concerns and methods of communication.

4.2.1. Personal sphere – Family

All individuals had a core of intimate personal connections to family. These were defined by biological or legal bonds, and characterised by inherent intimacy, obligation and often unconditional support.

Most individuals had a core of immediate family, which typically centred around the home and household, including primary partners and children. Extended family relationships differed across individuals, but most had some connections to their parents (including in-laws) and many to siblings or wider family. These extended relationships could be located locally or further afield, including internationally for some. It is also worth noting that not all relationships were cordial close, and some participants reported being estranged from ex-partners, parents or siblings. However, for almost all participants, some set of familial relationships sat at the centre of their social network.

The focus of relationships within this sphere was typically core life concerns at both a macro and micro level. At a macro level this could include health and wellbeing, childcare and upbringing, financial planning or support, and inheritance and legacy concerns. At a micro level this covered everyday life issues and activities, such as the running of the household, shopping, paying bills or organising time. The quality of connections could differ depending on the particular familial relationship. For example, relationships with parents tended to be based around mutual care and obligation, whereas relationships with siblings or cousins tended to include greater scope for choice around engagement, and could therefore be considered closer to friends.

Across relationship in this sphere, communication was generally intimate and multi-faceted. Face-to-face interaction was key and tended to be the focus for relationships centred around the home. For extended family relationships, face-to-face contact was also prioritised, with telephone and video calls an important substitute when this is not possible. These forms of communication were often supported by other approaches, such as messaging, and family WhatsApp groups were common for the sharing of news and photos.

It is worth noting that some younger participants lived with flatmates as opposed to family members, making these an alternative focus of discussions about shared household duties.

4.2.2. Personal sphere – Friends

All individuals had a group of connections with friends of varying degrees of closeness. These were defined by shared interests, equality and reciprocal emotional and practical support, and were typically developed through shared life experiences. There was occasional cross-over with other spheres where friendships had developed in shared educational or professional settings.

Most participants had a core group of close friends with whom they typically had their most intimate relationships with, outside of the family unit. These tended to center on socialising, shared experiences, shared hobbies, 'gossip', reminiscing or mutual support outside of the family. There were also often less intimate friendship groups which focused more on camaraderie and socialising, these often were made up of old school friends or (often former) colleagues. In addition, many participants had a loose network of acquaintances who they had familiarity with but whose relationship was contingent on a continuous reason to interact aside from friendship. The precise nature of friendships varied on the basis of

shared interests and concerns as well as factors such as distance and other commitments which determined how often they communicated.

Face to face communication was typically preferred, however, the frequency of such communication was influenced by a variety of factors such as intimacy of friendship, proximity to each other and the impact of commitments in other spheres. In-person communication tended to occur at home or in communal spaces outside home such as pubs, restaurants, gyms etc. Communication where face to face interaction was not possible was facilitated by social media, WhatsApp groups and telephone calls.

It is worth noting that several participants had acquaintances who they interacted with online and spoke to more regularly than their close friends but whom they saw as less intimate connections, often positioning them on the perimeter of their social network map. These were groups that either existed only online or had formed online, through platforms like Discord, which centered around hobbies such as food blogging or online gaming. Most participants who were part of such groups had joined them during or after the COVID-19 lockdowns.

4.2.3. Professional sphere

Most individuals had a Professional sphere to their social network, which were defined by a shared workplace, job, employer or field of interest. The extent of interaction with colleagues varied: most spent considerable time with colleagues whereas for others interactions were more minimal either due to working from home or working 'on the road' if their job involved site visits. For most participants, professional relationships were quite separate from the Personal sphere and lacked the same level of intimacy, although in some cases there was overlap where certain colleagues had become friends.

Communication within this sphere was made up of a mixture of formal and informal elements. Formal conversations tend to be structured meetings and interactions based around face-to-face, email and other social platforms, whilst informal conversations were characterised as 'water-cooler' discussion, gossip or 'banter' and were near ubiquitous for those working in person. There was qualitative variation in these professional relationships based on several factors including the type of work, seniority and the level of contact with clients.

Those in more 'blue collar' jobs often indicated that their workplace conversations covered a wider range of topics, whilst those in more 'white collar' roles indicated conversations stayed more 'professional'. These 'professional' conversations were often focused around workplace dynamics and culture, including the day-to-day fulfilment of role and collaboration with colleagues, professional development and training, industry trends and innovation, and gossip about the professional environment, relationships and career advancement.

Topics and depth of conversation also varied depending on the seniority of participants, with conversations between equals having a more informal quality than those with colleagues who were either more or less senior. Conversations with clients, where they occurred, also varied depending on the type of service being provided. One participant worked as a wedding photographer and, despite knowing clients socially, kept conversations strictly professional on the assumption that this is what the client desired, whereas those working in jobs such as hairdressers tended to be less formal in their interactions with clients.

Where conversations about 'topical issues', such as news stories, came up they tended to be either quite surface level, or if there was depth to them it was insofar as the issue related to their jobs. These could be prompted by emails from HR departments, and these prompts set both the tone and the focus for ensuing conversations. Individuals often stressed wanting to

stay away from topics that could be considered 'political' or controversial, due to a fear of alienating or offending colleagues. Some felt that the shift towards working from home had reduced the number of informal conversations taking place with colleagues as more and more communication occurs on official work channels and opportunities for 'spontaneous' discussion or 'water-cooler' discussions have reduced.

4.2.4. School sphere

Participants with children often had a social sphere based around their child or children's schooling. These develop through interactions around formal school events, as well as informally around pick-up and drop-off or pre/after-school clubs (particularly for younger children). Beyond this, parents will also interact with their child(ren) around lesson contents or engage around school projects.

Interactions within this sphere was made up a mixture of formal and informal elements. Communication with the school or teachers tended to be more formalised, taking place around parent-teacher meetings and official communications. It was more one-way, in that parents typically simply received information. Communication with other parents tended to be more informal and included conversations with other parents around children's wellbeing or school issues, small talk at school gates or sharing information on a parents' digital group-chat. In addition to the more formal communication between school and parents, the school indirectly influences communication amongst parents by setting the agenda for children's learning, which could influence the more informal conversations between parents or between parents and their child.

Interactions between parents tend to be fairly surface level, although – as for other spheres – there were cases in which specific parents had crossed over into the Personal sphere for some individuals. Discussions tended to focus on children's health and education, as well as other school issues, including child socialisation and peer relationships, quality of teaching and of the school environment, participation in extracurricular activities, and school policies and initiatives. Beyond this, participants also reported taking part in 'small talk' to pass the time and find common ground with other parents.

For many parents, interactions around children also extended to after-school clubs, which could be related to school or not. These included sports groups, Scouts and Rainbows, drama schools and others.

4.2.5. Local sphere

All participants had a local sphere defined by geographical proximity and characterised by shared local concerns, occasional support, and, for a minority, community involvement. What participants understood their 'local' area to be varied with many seeing this as immediate neighbours whilst others, particularly in rural areas or communal flats, tended to have greater engagement with a more extended 'local' community.

In most cases, interactions were occasional, limited and face-to-face, with participants only knowing neighbours well enough to say hello or occasionally talk about local issues, such as recycling or anything notable happening on the street. Quality of relationships could vary: for many they were friendly but very surface-level, for some they were non-existent or acrimonious, and for a few they had occasionally crossed over to become friends in their Personal sphere.

For the minority who had a greater level of interaction this was typically based around local community organisations, events or gatherings, or Residents' Associations. The latter were typically for those in flats who were also often members of WhatsApp groups used to discuss local logistical issues. A minority of individuals had also joined up to local Facebook groups,

which had become more popular during the pandemic, and had become a site for sharing local news and gossip, but had not generally led to more in-depth face-to-face relationships with neighbours.

4.2.6. Leisure sphere

For many participants, leisure activities created connections to others with shared interests. These were formed through and characterised by experiences of, and participation in, shared activities, hobbies and interests. These spheres could be self-contained or overlap with other spheres. For example, one retired participant had a hiking group made up of former colleagues and some individuals took part in leisure activities with personal friends. These spheres displayed a wide variety of types of interaction, from regular face-to-face communication to largely unidirectional online engagement.

The type of activity plays a determining role in what the primary form of communication is. Sports activities, in particular, tended to take place in-person and outdoors, although other activities such as craft groups could also be an opportunity to meet others face-to-face. These primarily face-to-face activities often have additional online channels for communication around logistics and between interactions, on social media pages, group chats or email. For other activities that we encountered, such as video gaming or food blogging, online spaces were the primary channel for communication.

Communications tended to focus around taking part in the activity in question, skill development of sharing expertise and logistics. This was often complemented by more 'social' communication occurring, for example, in the pub after a rugby match or choir rehearsal.

Online 'influencers' were another important connection within the Leisure sphere for some participants, around topics such as cooking, parenting or wellness. These relationships tended to be one-way and consumed more like media, but could be an important source of influence.

4.2.7. Voluntary sphere

A small minority of participants were involved in voluntary organisations or community groups, relating either to specific causes, localities or communities. Organisations in which participants volunteered included food banks, scout troops, local community youth groups (demonstrating an overlap between this sphere and the Local sphere) or church youth groups (which highlights the possible overlap with the Religious sphere).

Communication in this sphere typically involved a mixture of face-to-face elements, supported by online communications and platforms. The focus of conversations within this sphere was typically on the causes and projects of the voluntary group in question. Within this, there were some common areas of concerns, including logistical operations and delivery of services, fundraising or collection, how to improve awareness or outreach programs, and advocacy and awareness raising, including training for volunteers. These groups also tended to have a strong emphasis on inclusivity and community engagement. Activities often occurred in or involved other community hubs such as schools or religious centres.

Interactions could take place with other volunteers but also, to varying degrees, with beneficiaries of the service and others via awareness raising. In some cases, such as elderly befriending, individuals were engaged with beneficiaries but less involved with the group itself.

4.2.8. Religious sphere

A minority of participants were involved in a Religious sphere. For those involved, this was a key part of their social network. These spheres were defined by shared faith or spiritual

beliefs, and characterised by communal worship, shared values and support within the faith community. For the most devout, their faith community had a strong overlap with the Personal sphere, as their family also attended and the wider congregation was at the centre of their social life. However, this was not true for all, and connections within this sphere often lacked the intimate nature of those in the Personal sphere.

Compared to other spheres, communication was primarily face-to-face, with less formal online interaction, although there could be some communication between congregants outside of services. However, one participant was involved in primarily online 'spiritual' groups, who met on Zoom on a regular basis to discuss alternative practices.

The focus of interactions were communal worship, moral instruction and community engagement. These tended to take the form of regular worship services and religious ceremonies; religious education and study groups; and faith-based support networks. For some, there was additional community service and charity work (as indicated in section 4.2.7.).

These spheres tended to have two types of relationship: general relationships with other members of the group and then a specific relationship with the group leader. Interactions with other practitioners were mostly restricted to services, though in some cases could overlap with personal friends. The leader, however, could be cited as an important source of influence around spiritual and wider moral issues.

4.2.9. Healthcare sphere

For almost all participants, there was some degree of interaction with health services around specific issues. For many participants with health conditions or with young children, the Healthcare sphere played a more prominent role in their everyday life. This sphere was centred around health and wellness interactions, and characterised primarily by relationships with healthcare providers based on trust, expertise and the pursuit of health outcomes.

Interactions within this sphere tended to fall into three categories: general practitioners, providers of specialist services and peer-to-peer support groups.

Whilst all participants used a GP, relationships were generally weak due to irregular interaction. Additionally, many participants mentioned the challenge of getting an appointment or meeting a doctor face-to-face, which could be felt to have weakened relationships. Communications with healthcare providers generally took place via letter or phone, although some were using online services to book appointments. The focus of interactions with healthcare providers was described as often quite procedural, tending to focus on medical tests and check-ups, or logistical discussions around appointments and treatments.

Those with specific conditions could be making regular use of specialist services, for instance asthma check-ups. These interactions were generally focused on specific procedure and what little communication existed around this tended to be related to the condition, focusing on prevention or lifestyles.

Many participants were also engaging with online groups to share and identify information for managing conditions. Additionally, a small number were taking part in face-to-face peer support services, for instance around mental health. These services were taking place both face-to-face and via online platforms. There was a small potential for overlap here with the Leisure sphere: one participant followed social media 'influencers' who discussed mental health issues, which he understood to be both a leisure activity and a way of accumulating important information. For peer-to-peer interactions and services, the discussion was more wide-ranging and focused on prevention, such as potential treatment options, ways of

managing chronic conditions, and more holistic wellness or lifestyle changes. There was also an important element of peer support in these interactions, which could be characterised by a particular kind of intimacy formed around the shared health condition.

4.3. Individual variation in social networks

The structure and extent of any individual's social network was influenced by a range of demographic and individual factors.

4.3.1. Demographic factors

Lifestage

The age and family situation of an individual could have a significant impact on the spheres to which an individual was connected. A particularly important factor here was whether an individual had children, who opened up significant new connections into the School sphere, as well as often the Healthcare sphere. For working age adults, the Professional sphere was also typically an important element of networks. At retirement, there could therefore be a contraction of connections, although some individuals could replace professional connections with greater involvement in the Voluntary or Leisure spheres.

Ethnicity/nationality

Individuals from black, Asian or other minority ethnic backgrounds were more likely to have family living outside of the UK, sometimes including parents, with whom remote forms of communication, such as video calls, were particularly important. For some participants from Asian backgrounds in particular, familial connections were close-knit, with members of the extended family network, including grandparents and others, living together. Non-English speaking participants tended to have smaller social networks revolving around other speakers of their native language, alongside strong ties to family and friends in their country of origin.

Location

Individuals living in more rural locations were more likely to be connected to their Local sphere via either local events or online communities. This was in contrast to those in urban location, where relationships with neighbours were almost always quite superficial.

Socio-economic group

Participants in more professional jobs tended to draw a strong distinction between relationships in the Professional and Personal spheres, with little socialising with colleagues outside of the workplace. For those in more blue-collar and service jobs, as well as some younger individuals, there could be a greater crossover between the Professional and Personal sphere, with more time spent socialising with colleagues outside of the workplace.

4.3.2. Individual factors

Social-mindedness

The majority of participants had a relatively tight-knit 'core' to their social networks, focused on intimate relationships with a fairly small circle of close family and friends within the Personal sphere. Concerns about wellbeing and social issues tended to be restricted largely to this intimate core, with relationships in other spheres tending to be more transactional or narrow in their concerns.

For a minority of more socially-minded individuals, whilst social networks were still based around an intimate core of relationships with family and friends, there was a greater focus on social wellbeing, which could extend into activities in other spheres, including Voluntary, School or Leisure. These individuals also tended to work in more socially-minded professions, such as healthcare or charity work.

4.3. Network types

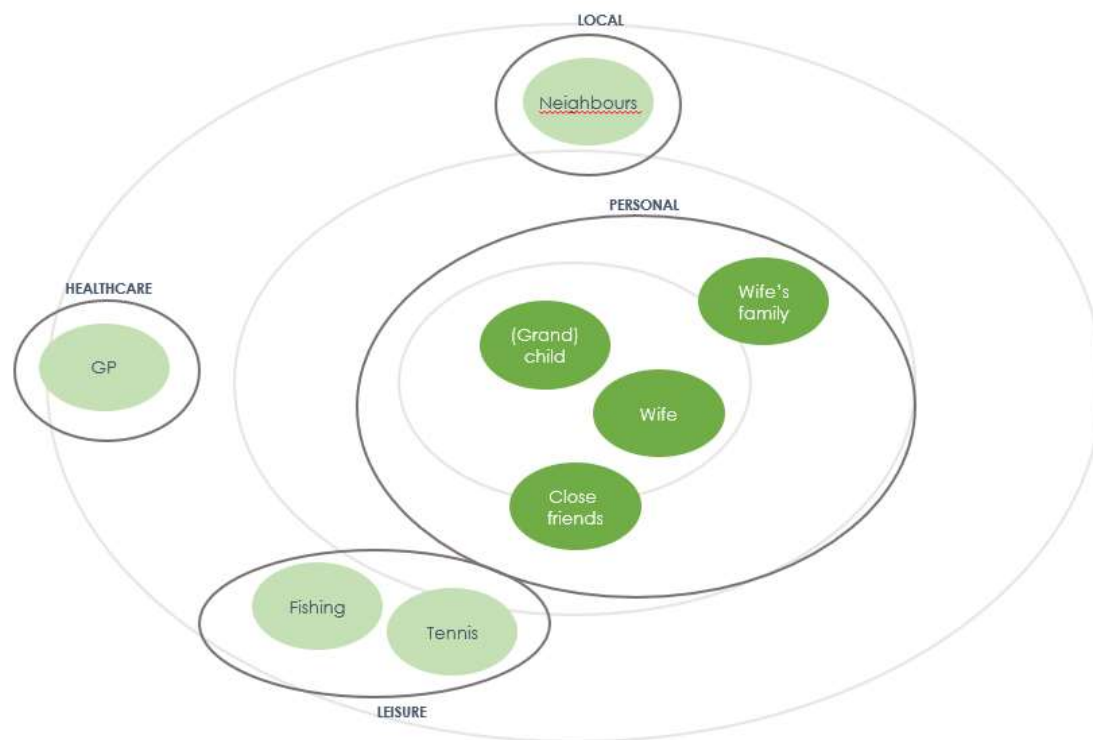
Across this research, we encountered a spread of different network types, differentiated by the extent and nature of connections each individual had to spheres beyond the Personal core.

Tight

For a minority within the sample, social networks were restricted primarily to the Personal sphere, with only relatively weak connections with a limited number of other spheres beyond that. These individuals tended to be younger individuals, who did not have children and whose relationships were based primarily around friends and the workplace, and older retired people, whose focus could be primarily on family.

Figure 2 – Tight social network example

John, retired, suburban London



John lives in South-West London with his wife. His grown daughter lives nearby with her partner and daughter.

He previously worked as an aircraft technician. Work was a big part of his life, but he is now retired and no longer sees his ex-colleagues.

John's primary focus is now on his family, particularly his grand-daughter, who he tries to spend as much time with as possible. In terms of extended family, he is closer to his wife's than his own.

With his wife, he also has a long-standing friendship with two other couples, who they occasionally see to socialise and go away on holiday with each year.

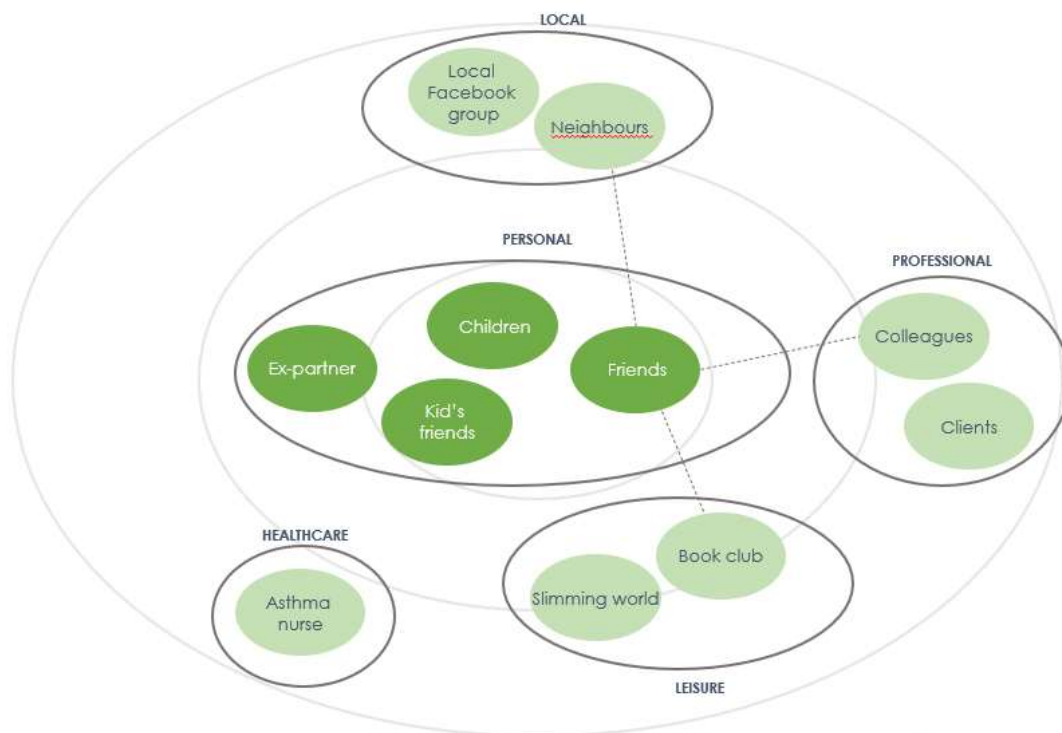
John has always enjoyed sport, and he regularly goes fishing and plays tennis – and although he does this with others, he rarely sees those individuals outside of those activities.

Distributed

For most individuals in our sample, the Personal sphere co-existed alongside a greater level of connection to other spheres, often prompted by the presence of children but also connections into work. However, for most individuals, connections across spheres were typically quite distinct, with only occasional overlap, for example, some individuals crossing over from other spheres into the Personal sphere over time as relationships became closer.

Figure 3 – Distributed social network example

Kerry, social worker, rural Midlands



Kerry lives in a rural village in the Midlands with her two grown children. She is separated from their father but still keeps in touch with him.

She is close to a group of old school friends, with whom she can pick up conversations any time. Beyond this, she also has a few close friends that she has picked up from other spheres, including one old neighbour, one ex-colleague and one friend that she met at a local book club.

Kerry works as a social worker and has good but professional relationships with colleagues, especially now that she is in a managerial role – and there is little overlap between her Professional and Personal spheres. She is less directly in contact with the clients she supports now, but still indirectly connected via her team.

Kerry has occasional contact with her neighbours around local issues or to say hello. She also joined a local Facebook group during Covid and occasionally posts or reads messages there.

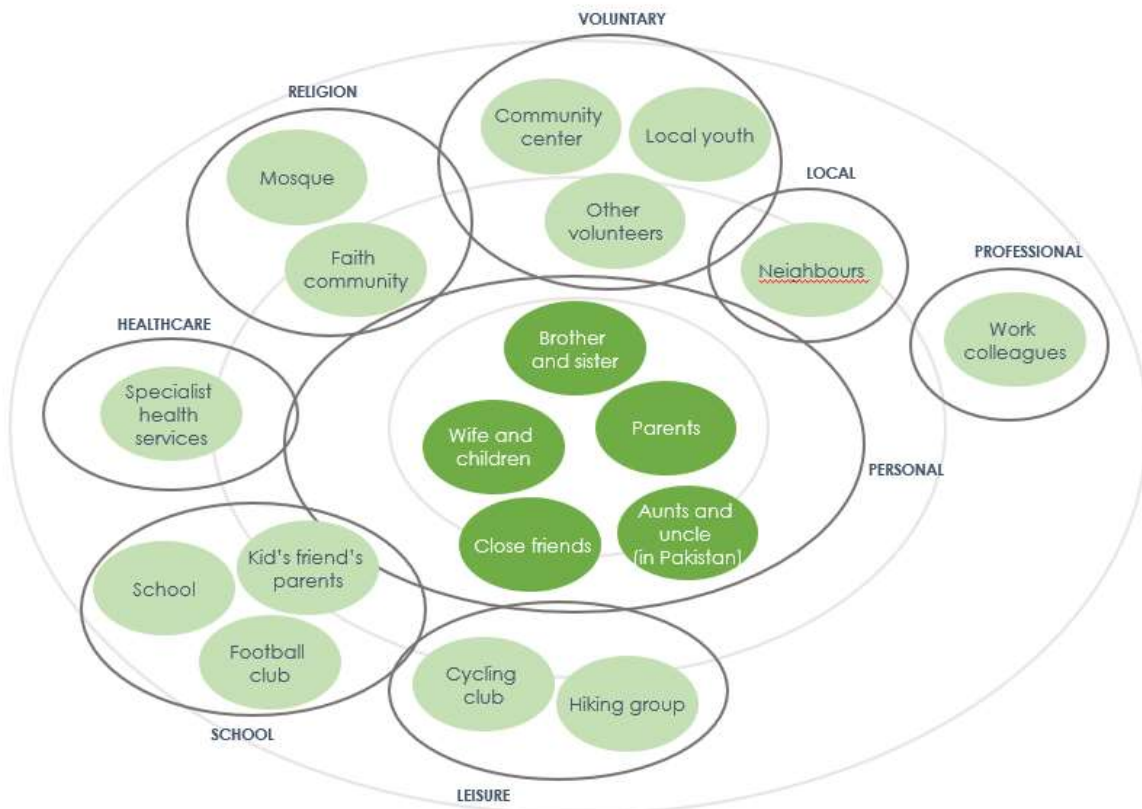
Kerry has asthma and sees the asthma nurse once a year, though the relationship is very functional. She is also a member of a Slimming World group, but only meets online.

Connected

For a small minority of more socially minded individuals, there was a greater level of connection to other spheres via more active participation in different communities. Whilst the Personal sphere was still central for these individuals, peripheral spheres tended to play a more important role in their lives, with a greater overlap in concern between spheres.

Figure 4 – Connected social network example

Mo, NHS Lawyer, urban Manchester



Mo lives in Manchester with his wife and two young girls, who suffer from respiratory health conditions. He also lives near to other parents and siblings, whilst maintaining close links to his extended family in Pakistan. He has a few close friends who he has known since childhood.

Mo's daughters are central to his life - and he wants to be a good role model for them and for his nephews and nieces. He is involved in their education and in helping with weekend activities via the local school. He has also made it a point to become friendly with their friends' parents. Given the health condition of his daughters, he is in ongoing contact with health services - and has developed personal relationships with those providing care.

Mo is also heavily involved in his local community via participation in a youth voluntary service. This is associated with the mosque that Mo attends each week, where he is involved in charity initiatives and friendly with other members of the community.

Mo works in a stressful job as a lawyer and tends to keep work separate from the rest of his life. In his spare time he enjoys cycling and hiking with local groups as a way to release stress.

5. The discussion of environmental issues including air quality

5.1. Introduction

This section begins by outlining how the discussion of environmental issues is driven by a combination of individual, social and material factors, before going on to provide some specific examples of when this has occurred for participants taking part in this research. It then details how a relative lack of individual and social relevance and material prompts can restrict opportunities for the discussion of air quality, again providing some examples of when this has occurred for participants taking part in the research.

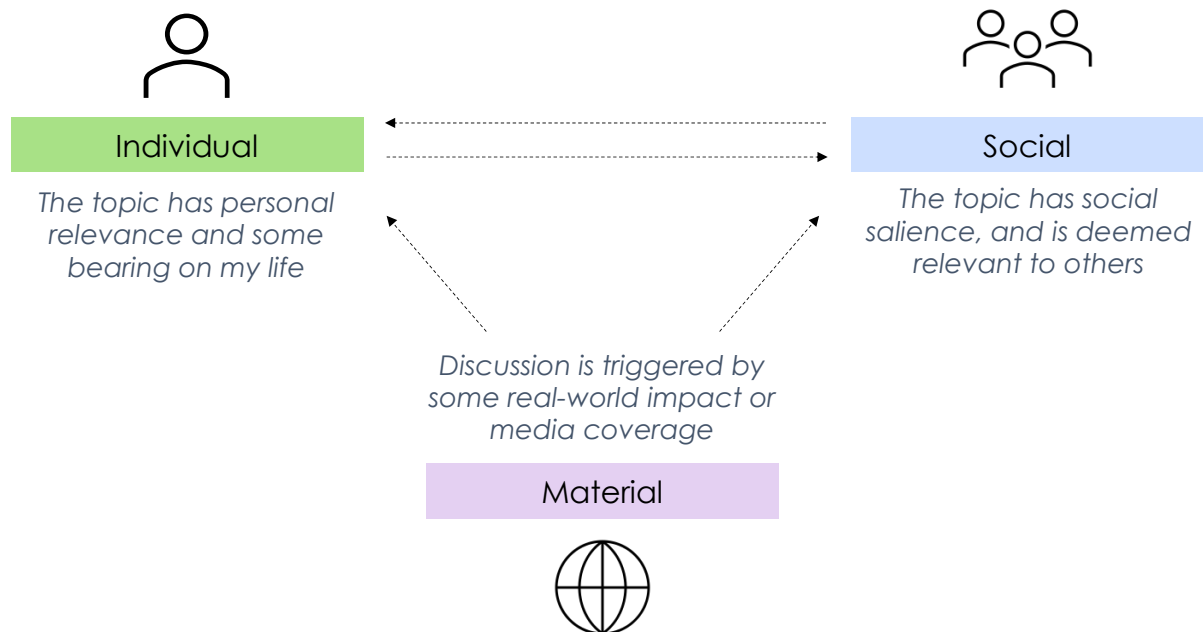
5.2. The drivers of discussion of environmental issues

Across participants in this research, the discussion of environmental issues was relatively infrequent and, when it did occur, it was driven by a combination of individual, social and material factors. At a basic level, this meant that the topic needed to feel meaningful to a particular individual and that individual also needed to believe it would be seen as a relevant topic by others for it to be deemed a worthwhile topic of conversation. With these conditions fulfilled, discussions could then be prompted by some kind of material prompt in the form of real-world impacts of media coverage (see Figure 5 below). The issues that came up most frequently in discussions due to a confluence of these factors were climate change, plastic waste and pollution.

At an individual level, issues were typically deemed to be relevant if they had some kind of direct impact on a person's life. For this to occur, there needed to be some basic awareness of the issues and understanding of its impacts. Alongside this, there typically needed to be some kind of emotional response to the issue in terms of its impact. If individuals felt some kind of agency or control in how they responded to an issue then this also increased individual relevance by affecting behaviour and decision-making. At a social level, the issue had to be deemed to have some kind of social salience or shared recognition as a topic of relevance. Discussion with others could therefore become a form of social bonding or finding common ground around an issue, or alternatively a way of providing social value by offering helpful information to others. In some cases, discussions could also be an important source of identity formation and group expression, allowing for the demonstration of shared values either in support of or opposition to an issue or cause. Individual relevance and social salience, whilst distinct, were also mutually reinforcing in that individual relevance was a fundamental ingredient in building social salience, which then in turn supported further expressions of individual concern.

Both individual and social relevance were informed by material factors, which were an important trigger to discussion taking place. Material factors could include felt or observed impact on the lived environment, such as littering or changes in the weather. Media coverage was another important factor here, playing a key role in increasing salience and building awareness of an issue. For the majority of participants in this research, salience was determined primarily by coverage in mainstream media channels online or on TV, or on social media posts linking to this kind of article. For a small minority of participants, this could involve coverage in 'alternative' news sources, around issues such as 5G. Another important trigger of discussion was actual behaviours or decisions brought about by changes in the policy or consumer landscape, such as recycling practices or public-facing certification schemes such as Energy Performance Certificate (EPC) ratings.

Figure 5 –Factors driving discussion of environmental issues



5.2. Examples of environmental discussion

The environmental issues that participants consistently cited as examples of issues that had come up in discussion – climate change, plastic waste and water pollution – all pulled on a combination of material, individual and social factors.

Climate change was seen to have had very wide and high-profile media coverage based on its observable real-world impacts across the world, in the form of rising temperatures, forest fires and other extreme weather events. Participants also felt that they were able to observe impacts in weather patterns in the UK, such as recent widespread flooding events and generally warmer seasons. The topic was seen to have individual relevance for many due to emotional concerns about its eventual impacts. Beyond this, it was seen to be having an effect on a whole range of individual consumer decisions due to its impact on government policy, on issues such as electric vehicles or home heating. Some participants mentioned that they had personal experience of the impacts of climate change, due to the effects on weather here or on relatives in other countries. The topic was deemed to have social relevance given its high profile and wide political implications, with considerable identity formation around views on how and to what extent government should be responding, for example to groups such as Just Stop Oil. There was also a shared language that had developed around the topic, using terms such as 'carbon footprint' or appearing in work Environmental Social and Governance (ESG) policies.

I wouldn't say I'm that aware of environmental issues but it does interest me. Especially with regards to the differences in the weather changes at the moment. I think there has been a lot of dramatic, drastic weather changes in different countries which is kind of unusual – Participant from General Population group

Plastic waste was seen to have achieved very high and sustained media coverage over the last few years, partly due to high-profile championing by David Attenborough but also a series of policies with direct impacts on behaviour, including recycling requirements and the

plastic bag charge. It was also seen to have a material impact on the visible environment due to littering. The topic had individual relevance for some due to an emotional pride in their local area. For others, pictures of impacts on wildlife were emotionally very affecting. Beyond this, there were concerns about impacts on the health of individuals from the presence of plastic in water. Recycling had also become an engrained habit for many, acting as both an individual and shared community of practice with neighbours subject to the same recycling regimes. Given its visible impact on the environment, the issue was also deemed to have social relevance to others, with identities formed around the idea of being a person who respects the local area.

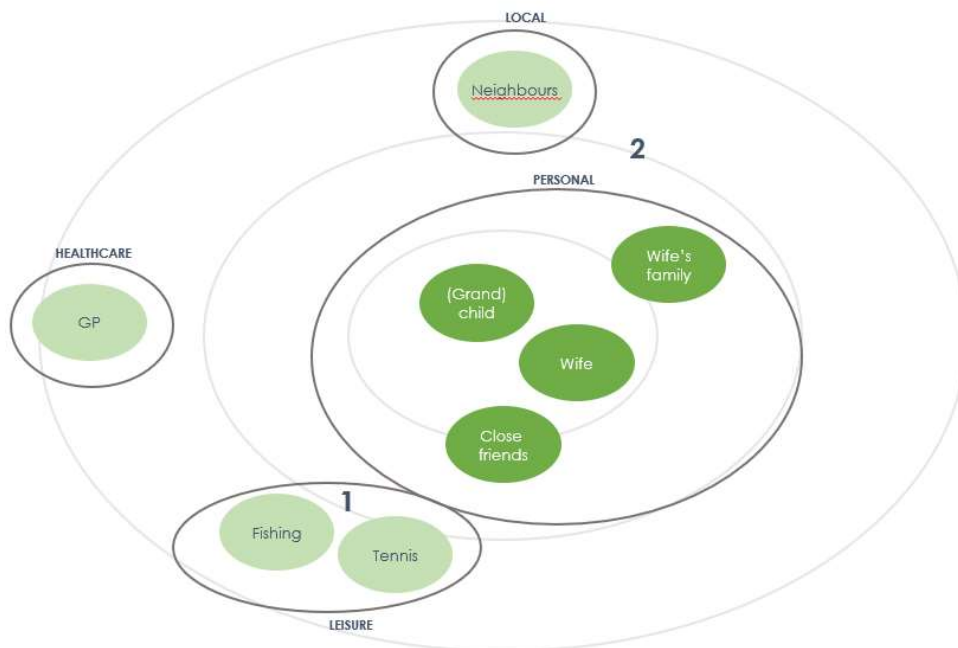
When people litter, when people throw things into the rivers. It's just a sad sight to see the beach just littered just fast moving consumer good packages left everywhere, the parks, the greenery littered with all those package - Individual with respiratory condition

Water pollution was also seen to have achieved very high levels of sustained media coverage over recent years. For some, material impacts were visible in the water quality in local waterways, particularly for those who enjoyed swimming, fishing or other outdoor activities. However, this issue was also seen to have wider relevance due to the related impact of water companies on water bills. Water pollution had gained social salience through public and shared moral outrage against water companies, who were seen to represent the failure of business to manage public services effectively. The issue also had political connotations that gave it social relevance, relating to the topic around nationalisation.

Figures 6, 7 and 8 provide some examples of where the discussion of environmental topics came up for participants across this research.

Figure 6 – Examples of environmental discussion: Tight social network

John, retired, suburban London



1. Water pollution and plastic waste

When John goes fishing, he is often struck by the extent of littering on the riverbanks or along the seafront. He has also noticed how dirty some of the waterways are, feeling that he sees first-hand what is reported in the media.

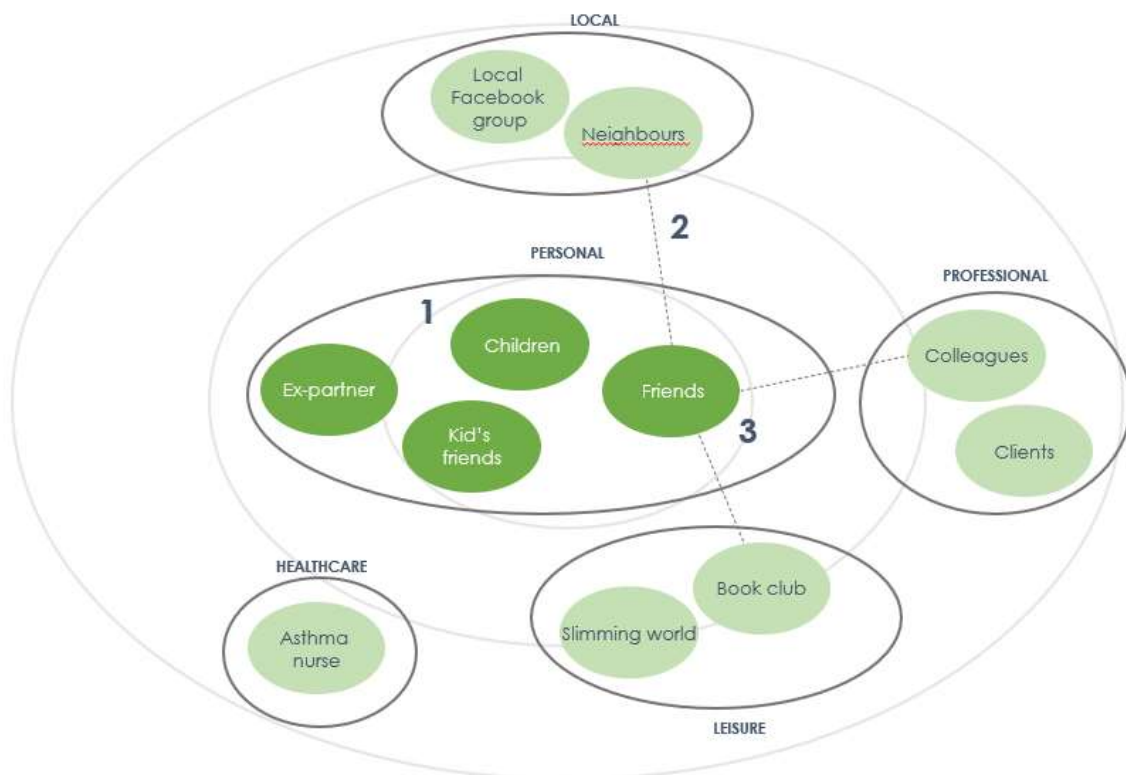
This has led to discussions with those he goes fishing with about the need to reduce waste and hold the water companies to account.

2. Flooding and climate change

There has recently been flooding in John's local area and this has been a topic of discussion with his wife and neighbours about which streets have been affected. This has led on to more general conversations about how the weather is changing and these events are becoming more common.

Figure7 – Examples of environmental discussion: Distributed social network

Kerry, social worker, rural Midlands



1. Electric vehicles and climate change

Kerry's son travels a lot for work and they have had discussions about electric vehicles. Whilst they are both aware of and concerned about climate change, they do not feel that electric vehicles are the solution, due to their relatively short range and the impacts of battery production. Instead they have discussed how it would make more sense for his work to more efficiently cluster his site visits.

2. Recycling and plastic waste

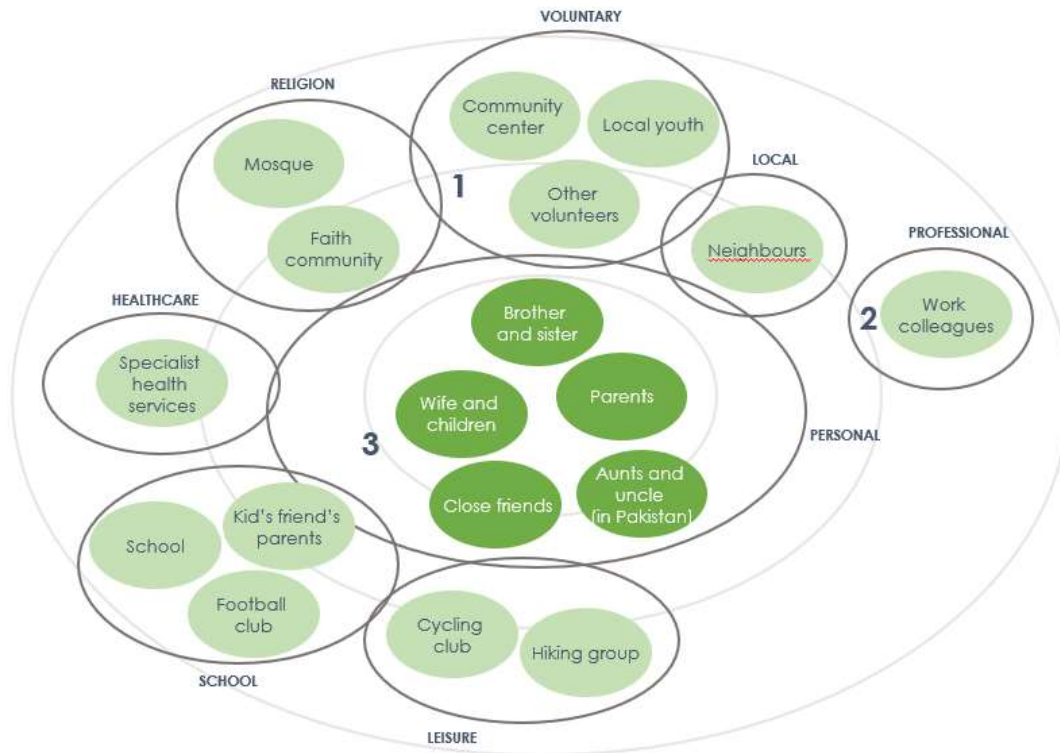
Kerry considers herself to be a serious recycler and she has discussed with one local neighbour the provision of services by the local council, as well as the ways in which some other neighbours do not appear to recycle properly.

3. Water pollution

Kerry has discussed water pollution when out hiking with a close friend, who is a keen wild swimmer and was outraged at the behaviour of water companies.

Figure 8 – Examples of environmental discussion: Connected social network

Mo, NHS Lawyer, urban Manchester



1. Litter and plastic waste

As part of his community work, Mo has run a series of litter collection events, involving young people and others, to encourage them to clean up and take pride in their local area.

2. Climate change and sustainability

Mo is aware of the importance of sustainability and climate emissions in his professional role, where it is often a consideration for policies. He has been involved with a sustainability group within his team, looking at ways that they could work more efficiently to manage their impacts, which has included working at home more frequently since the pandemic.

3. Climate change and travel

Mo has talked with his family and close friends about the impact of flying back to see his family in Pakistan and how this may become more expensive in the future.

5.3. Discussion of air quality

Compared to other environmental issues, participants in this research were able to cite few examples of discussing air quality within their social networks, and many struggled even when prompted to do so as part of this research. This was due to a perceived lack of relevance of air quality at the individual and social level, as well as a lack of material cues.

At a material level, participants felt there to be little in the way of real-world impacts, with many believing that air quality had improved over their lifetimes. Participants had limited awareness of media coverage of the issue, alongside a lack of high-profile policies to trigger behaviour or discussion. At an individual level, only those at greatest risk of the negative impacts of air pollution felt individually affected. For the majority, there was very little sense of risk of personal harm, emotional charge around the issue or agency over how one might reduce contributions or exposure. In addition to this, the topic was seen to have limited social relevance, in that there was no shared understanding of the importance of the issue and no clear victims or villains, meaning that it did not play a role in social bonding or identity formation.

Even though it's serious, it's just, it wouldn't really come up. I don't know. I just don't really see my friends talking about it, so I wouldn't bring it up as well. I guess if you had friends that were more into that stuff you'd feel more inclined to be having that conversation – Carer for young children

The one exception to this related to the introduction of the Ultra Low Emission Zone (ULEZ) scheme in London, which was a negative political issue for some of those who were more skeptical about environmental issues. For these individuals, an identification with the political view that ULEZ is unfair and unaffordable could actively reinforce their existing views about the fact there is no need to take action around air quality.

Don't get me wrong. I know that if you ended up sucking an exhaust pipe and all that, it's not gonna do you any good. I just don't believe those figures they've given to justify this. I just don't believe anyone has died of this. I always think there's underlying things there as well – Digitally Excluded individual

When asked to discuss air quality with their peers as part of this research, many participants found the issue challenging to raise, due to a lack of perceived social relevance or genuine material cues. Discussion could therefore feel awkward or forced. When conversations did feel more natural, this was because these were grounded in reference to some material cue or occurred within some social situation that gave the topic situational relevance. Even in these cases, for discussion to feel as though it would naturally occur, then the issue also had to have some kind of individual relevance, generally driven by a perceived vulnerability either of oneself or other close family members within the Personal sphere.

The kind of material triggers that could prompt discussion included the physical effects of air quality, such as coughing or other symptoms associated with respiratory conditions. It could also include tangible manifestations of air pollution in the lived environment, such as visible smoke or fumes, or heavy build ups of traffic in urban areas. Another common material prompt to discussion was woodburning stoves amongst those who either owned them or were thinking of buying one, or who had a close personal connection in the same situation. Given the location of wood burners in the home, information about their association with air quality was deemed personally relevant. As above, the ULEZ and other Clean Air Zones could also act as a material prompt to discussion, given their perceived financial impacts and political associations.

Now I know this [about wood burning stoves] I might tell my friend who has one... she has two young daughters and I don't think this is known – Carer for young children

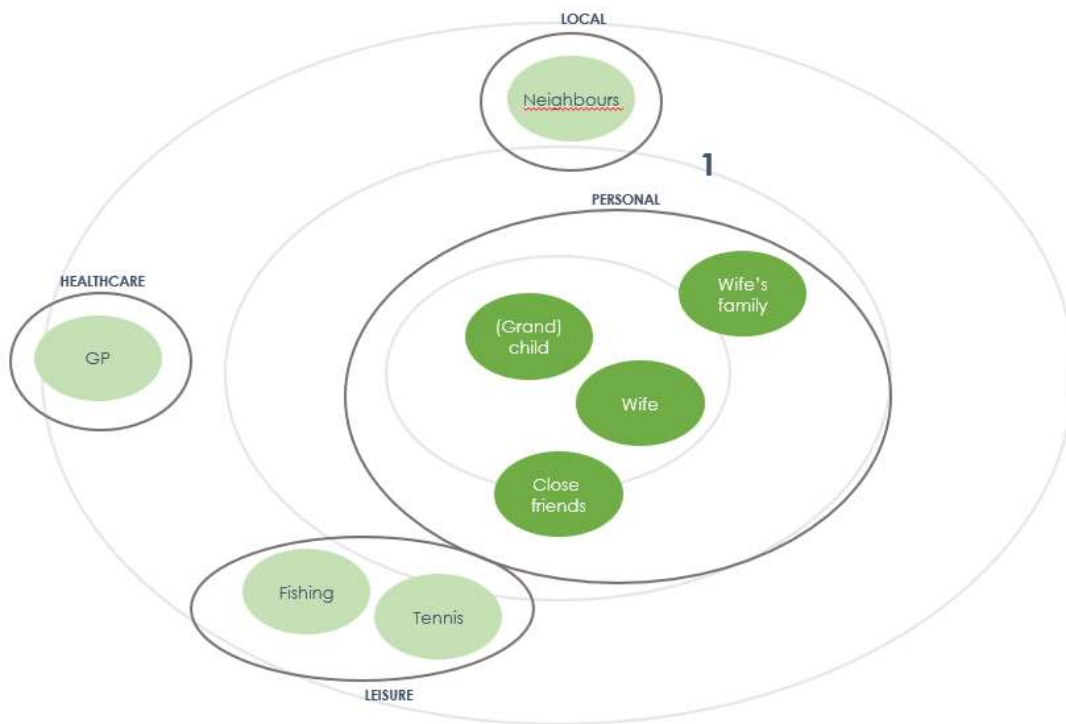
When it came to social salience, discussion about air quality was deemed more appropriate in some settings than others. For those who suffered from respiratory or other health issues associated with air quality, then the topic was deemed to have social relevance amongst other close personal connections with shared concerns about wellbeing. More generally though, the topic was deemed more appropriate in some spheres than others. Healthcare was an obvious area in which the topic had relevance, and several participants mentioned raising the issue on peer-to-peer health support groups relating to other conditions, such as stroke recovery and long Covid. Another relevant area was outdoor activities within the Leisure sphere, such as cycling or running clubs, where there was a focus on wellness and shared concern about exposure.

So it's been received a lot in terms of my cycling groups because often when we do cycling, you know we're behind cars and with fumes, but it's where people kind of have an interest or where they can connect, whereas some of my other friends, they listen, but they didn't really engage that much with it because it didn't feel like it impacted them – Parent of a child with a cardiovascular condition

Figures 9, 10 and 11 provide some examples of where the discussion of air quality had arisen for participants across this research.

Figure 9 –Examples of air quality discussion: Tight social network

John, retired, suburban London



John is sceptical about the impacts of air pollution – he feels that air quality has improved over his lifetime and sees it some degree of pollution as unavoidable.

1. ULEZ

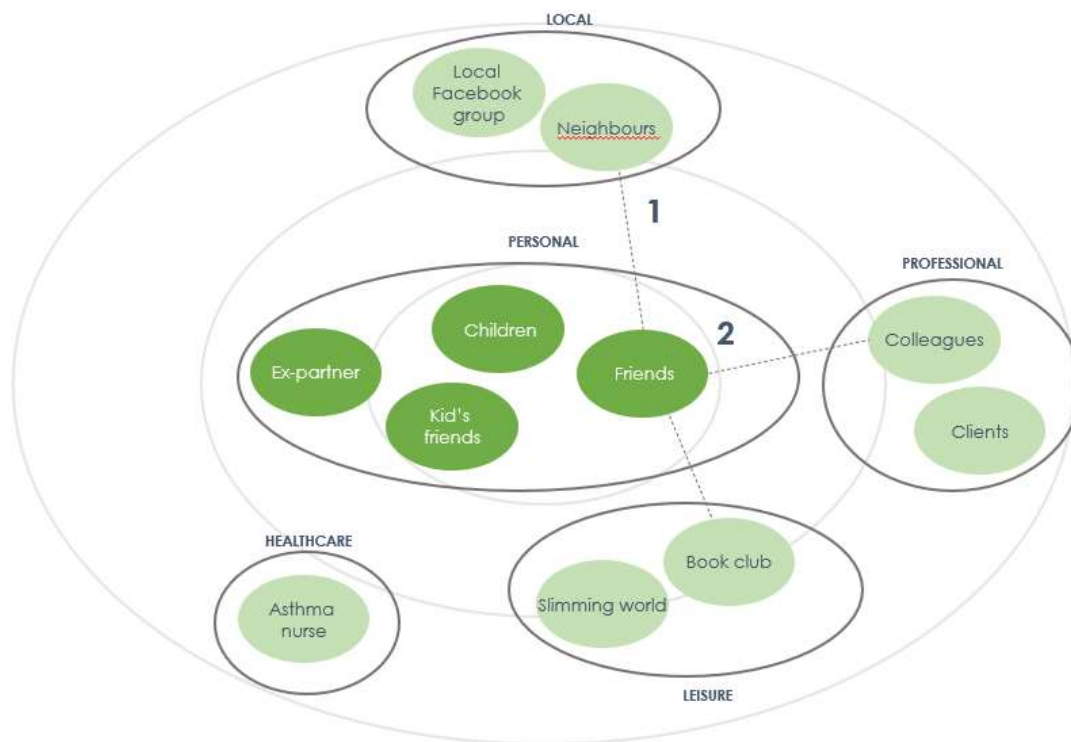
John lives on the edge of the ULEZ zone and the introduction of the charge has been an ongoing topic of conversation amongst his friends, family and neighbours.

Although John's car is not eligible, he is very negative about the introduction of the charge, which he sees as a 'tax' on the poor. He believes that air pollution is being used to justify what is actually a scheme to raise money. He feels that the scheme negatively impacts those with less money, and does not see any alternative to driving for most of the journeys that he makes.

The introduction of ULEZ has made John more cynical about air pollution, which he feels is being used as part of a wider environmental 'agenda' by politicians.

Figure 10 – Examples of air quality discussion: Distributed social network

Kerry, social worker, rural Midlands



Kerry has asthma and is concerned about air pollution but lives in a rural area so does not feel at risk and rarely discusses it with others.

1. Bonfires

Some of Kerry's local neighbours will occasionally have bonfires. This is a concern due to the potential health impacts and the unpleasant smell, which is annoying and inconvenient.

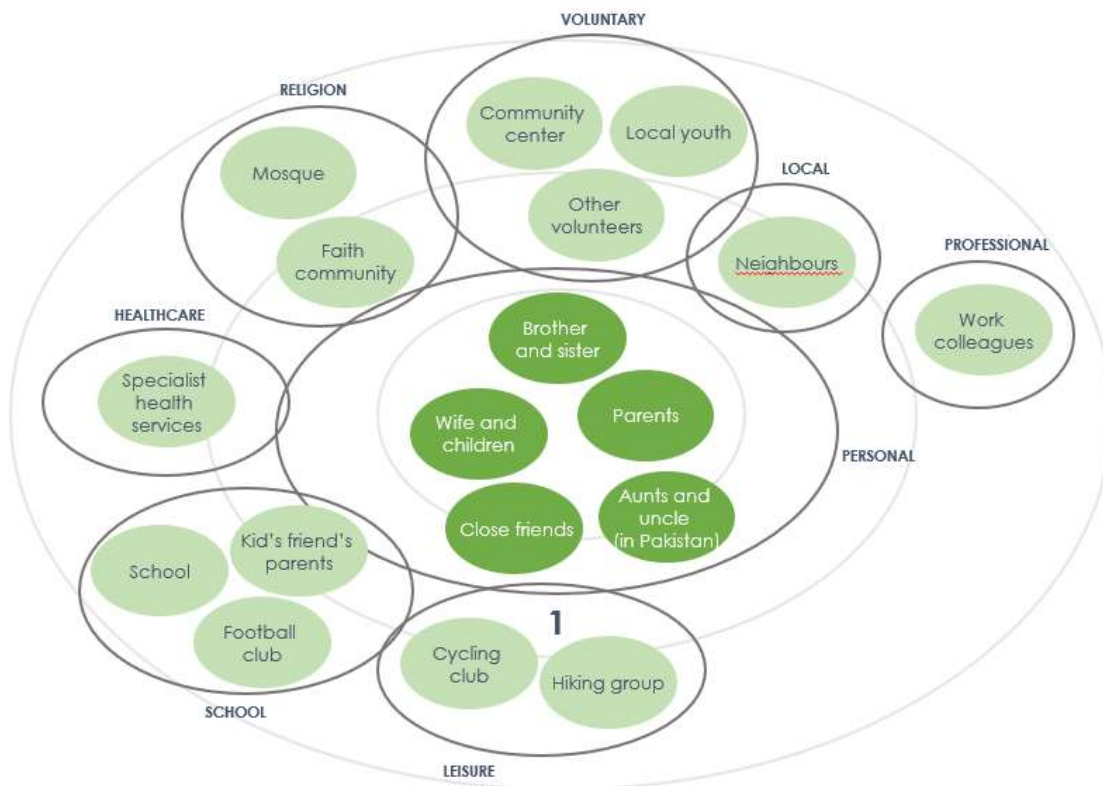
Kerry has not raised the issue directly with the people having bonfires but she has talked to some other neighbours and posted on her local Facebook group to raise awareness of her concerns. She also called the fire brigade to intervene one time.

2. Wood burning stoves

One of Kerry's close friends was thinking of buying a wood burning stove. Kerry mentioned the potential impacts on air quality and health to her friend, who was not aware of these.

Figure 11 – Examples of air quality discussion: Connected social network

Mo, NHS Lawyer, urban Manchester



Mo has two daughters with respiratory conditions and is concerned about the effects of air pollution on their health. He has discussed the issue with others who he feels share his concerns.

1. Cycling group

Mo has raised the issue of air pollution with others in his cycling group, both in-person and via posts on their online message board.

He has generally found people to be receptive to discussing this issue, based on a shared concern about exercising in outdoor areas. This has led to discussions about the best time to cycle based on likely air quality.

6. Prompting discussion of air quality

6.1. Introduction

Given the lack of social salience or widespread individual relevance at present, prompting people to talk or share information about air quality will depend on providing material cues that make air quality feel relevant to the individual and their life, and/or other people with whom they interact. In this section, we outline responses to a wide range of potential materials that were shown to research participants, drawing out lessons for what was effective in terms of message, messenger, channel and topics to drive engagement. We then provide a model for thinking about different potential engagement opportunities, distinguishing them by whether they focus more on creating individual or social engagement, and whether they have a more emotional or rational valence. For details of the materials tested, see Appendix B.

6.2. General learning

Messaging

When it came to messaging, some consistent themes emerged in participant responses. Firstly, participants agreed that messages should be framed to include both problem and solution. For the problem element, participants indicated that the low salience of air quality meant that messaging needed to stress why they should care about the issue. At the same time, to be meaningful they felt that any statement of the problem should be accompanied by messaging about what they could do in response. To make a response feel more achievable, there was a preference for small and concrete actions in a specific setting – such as not driving to school on a number of days per week, or seeking further information before buying a wood burner.

“People need to be won over first. They need short quick stats... then provide people with a positive outcome. Also communicate what people are doing already to help and how they can continue to help” – Participant from General population group

Secondly, there was consensus that messaging should be concise and hard hitting to ‘cut through’ competing messages. Shocking statistics, especially around health or children, or novel information, for example around the high level of pollution associated with wood-burning stoves, were felt to be effective. Memorable visible metaphors or images were also felt to be important, given the relative invisibility of the real-world impacts of the issue. Human stories helping to personalise impacts were also considered to be effective. When information was presented to participants about the death of Ella Adoo-Kissi-Debrah, they felt that this was extremely impactful and suggested that more could be done to illustrate how other people have been affected by air pollution. In contrast to this, participants had little patience for messaging that they deemed too technical: for example, terms such as ‘PM2.5’ were not widely understood and as such acted as a clear barrier to engagement.

Messengers

Participants agreed that it is important that messages are delivered by sources that they deem credible and trustworthy, in general and in relation to this topic.

Overall, the Met Office was best received as a potential messenger, as participants perceived it as a competent, scientific, unbiased and relevant messenger. Some participants likened air pollution information to information that the Met Office currently delivers about pollen counts and UV levels. Only some participants were aware it already provides

information about air quality but most were open to it making this information more prominent at times when air pollution is high.

Participants also considered the NHS and other healthcare organisations as credible sources of information, given their existing association with health.

Views on the government were more mixed: trust in politicians was almost universally low, but some were more open to trusting information delivered by government departments if participants perceived them as being more functional rather than political. Some were therefore more open to hearing from 'The Department for Environment Food and Rural Affairs' than 'the Government'. However, a sizeable minority reported that they would mistrust any information from the government related to air pollution as part of a wider political 'agenda'.

"I know what the government are like, they'll give you the information they want you to have, but all the worst case scenarios they don't want you to know" - Individual with low socio-economic status

In this context, people without technical expertise, including friends and family, religious leaders and influencers, were seen by participants as having a key role in passing on information produced by experts. This was because – whilst these personal connections were not deemed to have expertise – participants felt that information passed on by them would have individual and social relevance, which would mean they would be more likely to engage with it than if the information had been passed on by an expert.

Medium and channel of delivery

When asked about where they might be most open to receiving information about air quality, participants responded that they would be most likely to notice or pay attention in areas that they associate with outdoor air pollution. They particularly mentioned out-of-home advertising in urban areas, at bus stops or on public transport, or with health, such as hospitals, doctors' surgeries or waiting rooms.

The delivery of information via mobile phones, whether via messaging or an app, was also seen as a uniquely personal and direct way to communicate where possible. However, given the current lack of engagement with the issue, participants were not interested in downloading a specific air pollution related app. As such, delivery would need to come within pre-existing apps that are deemed to have some relevance, for instance, built in weather apps, or an NHS or Met office app.

"The government should piggyback on something that already exists, things that people are already used to seeing or listening to... I would look at this if it was in the Met app but I wouldn't download one specially" – Participant from General population group

More generally, it was felt that the delivery of information about air quality would be best facilitated within pre-existing trusted channels. Participants indicated they would be open to communication through existing documentary series or via already well-known public figures.

Topics of interest

Indoor woodburning stood out as a topic with particular personal or social relevance and therefore greater relevance for information-sharing. Several participants were either considering buying a wood burning stove or knew someone else who was. Here information about polluting impacts was often 'new news' and was deemed a relevant purchase

consideration, given the potential impacts on health in the home. In this context, it was seen as a worthwhile and relevant topic of conversation.

"That news (about wood-burners) was an eye-opener actually, as I was thinking of getting one and hadn't actually thought about air pollution... I will think twice now" -
Parent of a child with respiratory condition

Information about indoor air pollution also stood out for participants, as they typically associated air pollution with outdoor sources. However, compared to woodburning, participants did not consider it to be a topic with much potential for discussion, as they felt it was an unavoidable issue to which we are all exposed and did not obviously feed into any kind of decision-making,

Beyond these specific topics, participants felt that they would be more likely to share information if it was framed in an engaging or entertaining form, as this was the kind of 'information' that they would share anyway. For example, this could include documentaries and other filmed or visual media, including very well produced communication materials. Information framed as health advice could also be considered worthwhile for sharing, provided it was deemed relevant to the person in question and that it included clear concrete actions that could be taken to prevent harm.

6.3. A model for differentiating engagement approaches

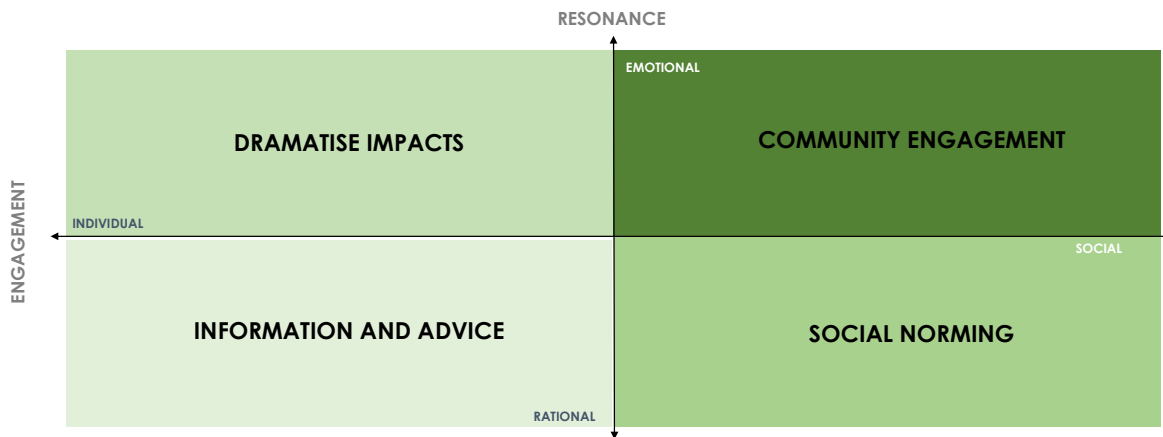
Overall, the different engagement materials shown to participants could be differentiated on the extent to which they engaged around two axes: individual or social relevance, and emotional or rational valence.

The individual-social axis represents the extent to which an engagement idea helps to drive individual or social relevance. Engagement at the individual level is based on the provision of information directly to individuals that is focused on developing or establishing individual knowledge and understanding, has the potential to drive individual action but is unlikely to shift the social landscape or drive discussion. Engagement at the social level, on the other hand, is conceived as information that is feeding into social channels, is focused on developing shared knowledge and understanding, and has the potential to shift social norms and open up space for discussion.

The emotional-rational axis represents the way that information is framed. Rational information draws more on statistics and technical details and appeals more to logic, analysis and objective reasoning. Emotional information, on the other hand, appeals more to feelings, intuitions and subjective experiences, drawing on real-life stories as illustration and working with surprise or other strong emotions.

Differentiating engagement materials according to these two axes creates four quadrants (see Figure 12). All four of these had some role to play in engagement, depending on the audience, meaning that all have the potential to play a complementary role in an overall engagement strategy.

Figure 12 – Four differentiated quadrants for engagement

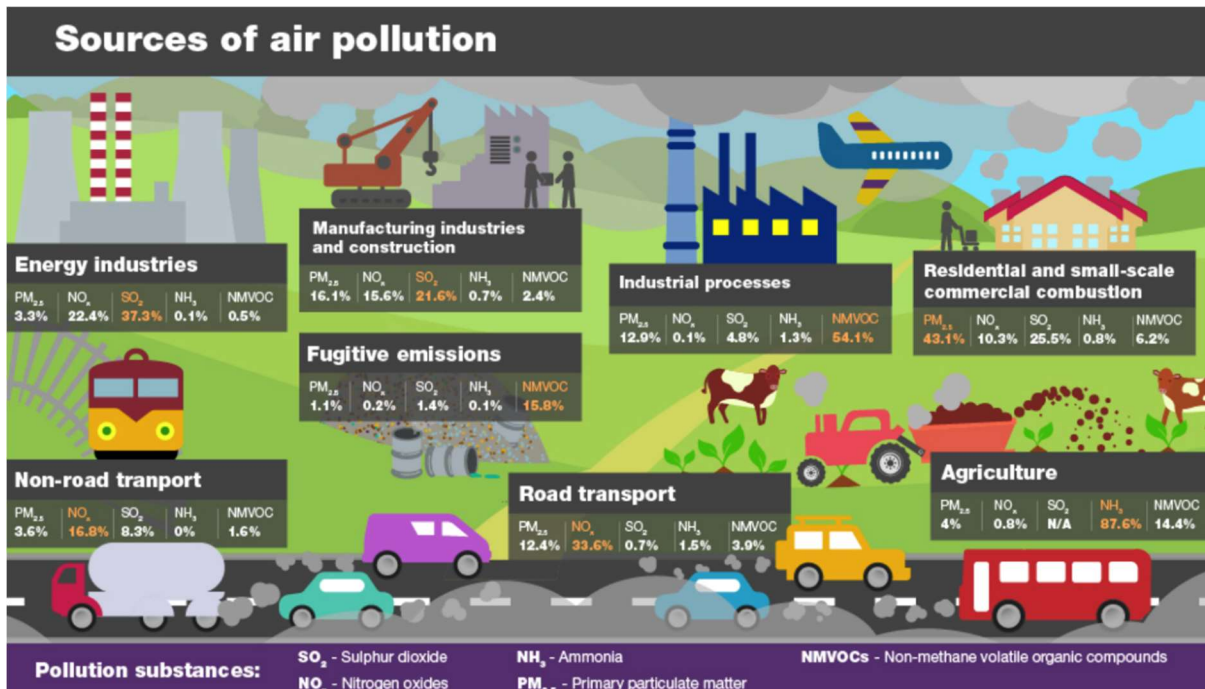


6.4. Communication approaches

Information and advice

Engagement at an individual and rational level encompassed technical information about air quality and straightforward advice around how to mitigate the impacts or reduce exposure to air pollution. Materials categorised in this way included Public Health England infographics about sources of air pollution (see Figure 13) as well as online resources providing localised air quality information, such as Defra's UK Air site.¹

Figure 13 – Public Health England infographic on sources of air pollution



For most of the audience, this type of information currently failed to engage them, due to the information being insufficiently emotionally resonant or participants lacking a concern with the issue. Pre-existing infographics were typically seen as too technical and dry; while

¹ <https://uk-air.defra.gov.uk/>

technical information about local air quality levels could be deemed interesting in theory, few used these in practice when given the opportunity within the research process.

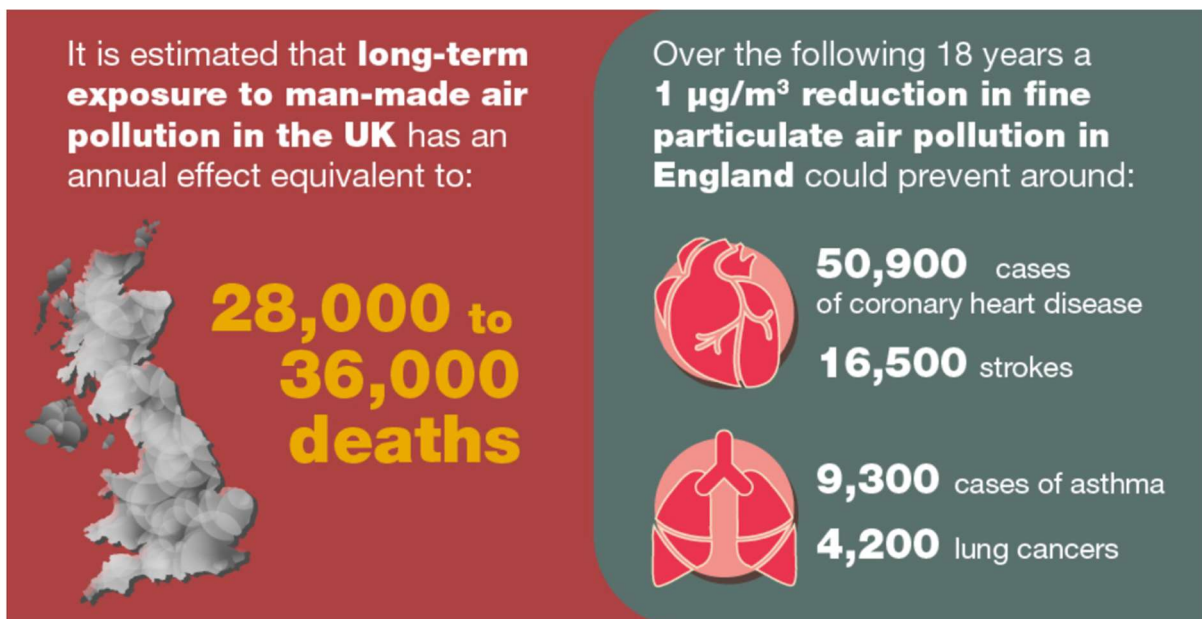
However, advice about actions that could be taken to mitigate impacts were appreciated by participants with existing vulnerabilities who were already emotionally engaged with the topic. In particular, information about local air quality levels and actions that could be taken to mitigate impacts were seen as relevant, as this could provide the tools to plan activities to reduce exposure. For this kind of information, healthcare providers were generally seen as the most appropriate messenger.

More generally, participants believed that rational information and advice is important as a follow-up once emotional engagement has already been created with the issue of air quality, to provide a sense of greater understanding and control. In these cases, directions focusing on a narrow range of achievable actions were considered most useful and most likely to be put into action by people receiving the information.

Dramatise impacts

Engagement at an individual and emotional level encompassed information about the health impacts of air pollution, often framed around human stories, and included creative treatments bringing to life the impacts or extent of air pollution. Materials categorised in this way included Public Health England (PHE) infographics about the effect of air pollution on health (see figure 14), documentaries about air pollution and marketing campaigns.

Figure 14 – Public Health England infographic on health impacts of air pollution



Dramatising the impacts of air pollution tended to engage some participants and so seems to be an important means of creating widespread engagement. This is due to information about human health impacts being generally more engaging than information about air pollution itself by providing a 'reason to care'. This was particularly the case when information was presented via 'human stories' that personalised the impacts. Details of the case of Ella Adoo-Kissi-Debrah were particularly emotive for participants, as this introduced participants to the real life impacts that air pollution can have on people whilst simultaneously raising concerns about social justice. General statistics sometimes also created cut-through, although participants felt that there could be benefits to further personalising information via case studies or focusing on the impact on individual lives.

Creative executions bringing to life particular contributors or mitigating actions in creative ways could also create impactful communications. In some cases these worked via the presentation of surprising statistics, for instance on the contribution to air pollution of wood-burning. In other cases, they successfully visualised air pollution, as in the example of Croydon Council's Engine Off, Every Stop campaign (see Figure 15). Creative executions or video media were also considered inherently more 'share-able' than more static or text-based sources and so participants felt they were likely to drive social engagement.

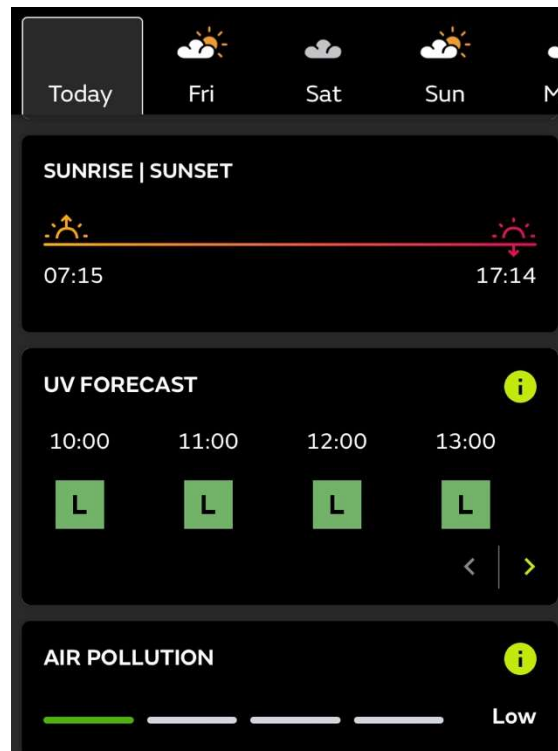
Figure 15 – Anti-idling campaign



Social norming

Engagement at a social and rational level related to the presentation of air quality information in public spaces to help raise the salience of the topic. Materials categorised in this way included air pollution information incorporated into weather reporting, the provision of local air quality information in situ in local areas and the integration of air quality information into internal or external corporate communications.

Figure 16 – Air quality information within the Met Office Weather app



Participants agreed that building information about air pollution into social spaces has the potential to increase the visibility of the topic and signal its importance, creating new social norms and expectations. It also has the potential to directly trigger or support discussion, especially in the Personal and Local spheres.

The most impactful idea in this territory was the integration of air quality reporting into weather forecasting. Most participants were not aware that this was already covered by some apps and supported the idea of increasing its prominence. Some favourably compared the idea of highlighting air quality information with the way in which the weather forecast has educated people to care about UV levels. There was agreement that the issue could be given more salience through highlighting high air pollution events either in TV weather reports or push notifications via the Met Office app.

Participants also saw the potential to introduce a greater focus on air pollution into corporate policies and communications at both an internal and external level. At an internal level, participants believed that a focus on air quality would be appropriate in corporate ESG policies alongside carbon emissions. Some also supported the re-introduction or re-prioritisation of schemes such as carpooling that had declined over the COVID-19 pandemic. Participants also thought that air quality information could be integrated into the marketing of products and services associated with lower emissions in the same way as carbon emissions are at present. For example, they felt that a reduction in air quality emissions could be associated with choices such as taking the train, when compared with driving a personal car, and that this could be signalled as part of the purchase process. Whilst this was not seen as a motivating factor in any purchase decision, it was seen as a way to support purchase decisions by providing an additional 'feel good' factor, to draw attention to the issue of air quality.

Some also suggested a role for government schemes to raise the salience of air quality information and signal the gravity of the issue. For example, a scheme similar to Energy Performance Certificate ratings for air pollution could be attached to purchases associated with air quality, such as motor vehicles or heating systems. Some participants also supported the idea of displaying local air quality information in public spaces. Digital billboards were well received as a dynamic and interactive way of doing this, but participants felt that this could also be achieved more affordably via QR codes associated with specific local monitoring stations.

Community engagement

Engagement at a social and emotional level encompassed social events and campaigns based around specific social groups and localities. Approaches categorised in this way included school or voluntary group campaigns, particularly when drawing on interactive approaches.

Participants felt that interactive community engagement events had the greatest potential for driving engagement with the issue, due to their association with specific locales and pre-existing social connections. Actions of this sort rely on activity from those who are already engaged with the issue but have the potential for spillover effects into the wider community.

Schools in particular were seen as a key hub for community-based activities, with participants feeling that the provision of information about air quality has a good fit with the educational setting. There was also strong emotional valence in the idea of increasing the safety of school children. Whilst focused on the children, parents agreed that they tend to engage with the content of their children's studies and so felt that this was an effective way to also open them up to learning about the issue. Participants perceived campaigns as having the greatest potential for impact if they focused on specific actions such as a reduction in use of cars for pick-ups and drop-offs.

Participants highlighted the potential for community or voluntary groups that are already campaigning around issues facing local communities to engage with issues of air quality, if they can be provided with relevant information. For example, one participant who was heavily involved in the board of their housing development saw a role for them in disseminating information around the impacts of wood-burning, given its widespread adoption amongst residents.

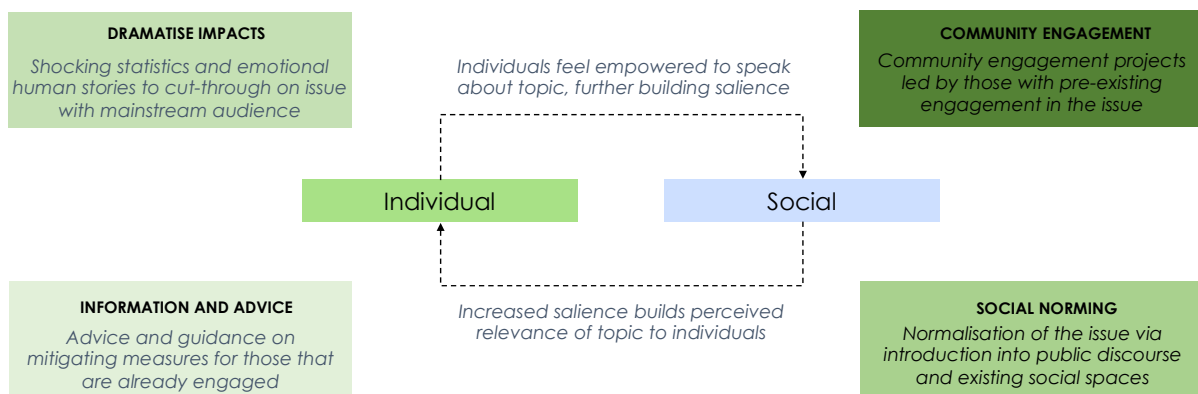
Some individuals saw interactive exhibitions, such as art or museum exhibitions, competitions or citizen science projects, as having the potential to deepen engagement and boost the social and personal relevance of air quality. These types of events were seen as particularly relevant for school or community projects, where engagement focuses on children, as participants did not otherwise feel that they would go out of their way to engage in this kind of exhibition given low pre-existing levels of engagement with the topic.

7. Implications

These findings suggest a number of implications for the consideration of how to leverage social connections to create engagement with air quality information.

To maximise its effectiveness, a strategy for public engagement around air quality should incorporate a combination of interventions focused at the individual and social levels, as each has the potential to support the other. Interventions aimed at raising the social salience of the topic, will build the perceived relevance of the topic of air quality as a relevant subject for discussion. This in turn has the potential to help empower individuals who do feel affected by air pollution to speak about the topic, further building social salience and creating a positive feedback loop (see Figure 17).

Figure 17 – Positive feedback loop between individual and social engagement approaches



The findings of this research suggested considering engagement around four quadrants, differentiated by whether they are targeted at creating individual or social impact, and whether they operate at a more emotional or rational level. For each of these quadrants, findings suggested a range of potential approaches with the potential to help trigger discussion and information sharing:

Information and advice (individual/rational)

- Provision of tools to mitigate exposure (e.g., local pollution levels and mitigation advice) targeted at those with greatest vulnerability.
- Communication with individuals around sources of indoor air pollution and measures they can take to reduce exposure.

Dramatise impacts (individual/emotional)

- Creatively bring to life the extent and health impacts of pollution.
- Communicate stories that humanise the health impacts and create an identifiable victim.

Social norming (social/rational)

- Continued incorporation of air quality reporting into weather reports, for example via the Met Office app.

- Introduction of the air quality equivalent of EPC ratings.
- Signposting to local air quality information in public spaces, for example via QR codes.

Community engagement (social/emotional)

- Delivery via schools – based around education and local action – for example at school drop-offs or the introduction of the School Streets initiative.
- Engagement with existing voluntary groups on local issues.

When it comes to targeting, a small number of individuals categorised as 'Connected' within our sample had a greater number of social connections into different spheres and a greater overlap in interest between activities in those spheres and their own Personal sphere. As such, these individuals do potentially have a greater capability to discuss and spread information about air quality with a wider group. Their impact is likely to be particularly pronounced in cases in which they have a pre-existing individual concern with the topic of air quality, due to either themselves or another individual with whom they have a close personal connection being at greater risk of the impact of air pollution.

However, in practice it is likely to be extremely challenging to target these individuals with specific campaigns. As such a strategy should instead aim to activate these individuals through engagement within the social spheres in which they are likely to be already active. These include:

Schools

- Given high existing levels of engagement around children's education and safety, schools are a key hub for engaging parents to both learn about and take action on air pollution.
- Activities are likely to be most effective if integrated into relevant and interactive projects, such as citizen science projects to measure local pollution levels, or if framed around actual measures, such as the introduction of School Streets or other mitigation measures.

Voluntary organisations

- Whilst only a small minority of individuals were involved in voluntary organisations, they were generally people with wide social networks and the drive to create change within their communities.
- For those organisations that are already focused on local issues, the provision of information about how to consider local air quality could therefore be a natural extension to pre-existing activities about improving living standards.

Leisure (when focused on outdoor activities)

- Local leisure clubs focused on running, cycling or other outdoor activities have potential for engagement, as air quality is a relevant factor for planning activities.
- Air quality is a natural conversation within this setting, with the potential for those involved other spheres to discuss this issue with their connections more widely.

Beyond this, there are also opportunities to leverage opportunities with the Healthcare and Professional spheres:

Healthcare

- At present healthcare providers were not typically discussing, providing or signposting to guidance around how to mitigate against the effects of air pollution, even when providing specialist respiratory care.
- There was a strong desire from those receiving care for more information, which they felt was an important preventative measure and has the potential to signal the importance of the issue and empower them to better protect themselves.

Professional

- Those working in corporate environments felt that air quality could be incorporated into ESG policies in the same way as carbon emissions often is to encourage further salience of the issue in professional settings.
- For some care-related professions, such as social work, there was also a view that an understanding of air quality could be incorporated into care provided to clients, if informed by appropriate training.

In conclusion, an overarching strategy for engaging the public around air pollution should incorporate a range of more individual and social approaches. It should also consider how to prompt emotional engagement as well as communicate rational information. To maximise its reach, it should also consider how to engage through social spheres beyond the Personal, including through schools and voluntary organisations, and via healthcare providers.

To build on this work, there would be value in reviewing the current provision of information in line with the communication quadrants and social spheres. This will help to identify where there are currently gaps in provision and where there may therefore be most opportunity to develop interventions to build engagement. A consideration of social and individual engagement could also be built into the evaluation of any future interventions, to ensure that there is a due consideration of impact at each of these levels.

Appendix A: Stage 1 materials

Topic Guide

1. Introduction

(3 mins)

Introduce the research, set the tone of the session, provide clarity on what is expected of the participant and start to build rapport

Introduce the session

- Introduce moderator and Kantar Public – an independent social research agency
- Research is being conducted on behalf of Defra to understand how information about the environment might most effectively be shared across social groups and connections
- Introduce overall approach – Today’s session is part of a three-stage process – and following today we would like you to complete some activities as part of your everyday life, before getting together for one final discussion with a group of other participants
- Introduce today’s approach – we will be conducting an exercise to map out some of your social connections using Zoom Whiteboard tool, then discussing where within this information about some specific environmental issues might be most relevant, interesting or shareworthy
- Set tone for interview - there are no right or wrong answers, please just please be open and contribute your honest views
- Interview length – 90 minutes
- Research is confidential – your personal details will not be shared with Defra and participation will not affect your relationship with Defra
- Research is voluntary – you are free to pause or end at any time – although the incentive will be paid following participation in the group stage
- Any questions?

Recording

- Ask participant for permission to record, then start recording and confirm consent
 - [Note: Verian will ensure that recordings of groups or depth interview responses are only conducted with consent and only used for the purposes for which the consent was given]

2. Participant lifestyles and key relationships (12 mins)

Develop a broad contextual understanding of lives, lifestyles and priorities, identifying key relationships within this, to establish basis for social network mapping exercise

Moderator: Explain to participant that you would like to begin by finding out a little about their life – and that you don't expect to cover everything here but would like to get a broad understanding to help get some bearings for the social network mapping exercise

Keep a note of key details throughout to set initial direction for mapping

Participant introduction

- Ask participant to introduce themselves
 - Ensure coverage of occupation, family / living arrangements, hobbies, life priorities

Interpersonal relationships

- Who are the people you interact with most in your everyday life?
 - For each of these, how would they describe these relationships?
- What are the places that you visit regularly?
 - For each of these, briefly explore interactions with other people – how would they describe these?
- Are you part of any group or communities?
 - Probe offline and online
 - For each of these, briefly explore interactions with other people – how would they describe these?

3. Social Network Mapping

(30 mins)

Create a network map with participant on Zoom Whiteboard, plotting out key social nodes and connections, considering quality and directionality of relationships

Moderator: Explain to participant that you would now like to work together to create a map of their key social relationships, considering the different kinds of interactions that they might have with the people, places and groups discussed already (and any others) and the kind of topics they might discuss with them

Record responses on Zoom Whiteboard throughout

Identifying nodes

- Building on previous discussions, create a set of people, places, groups that can act as nodes – these can be based around different groups, places, or other organisations that arise naturally for individuals
 - Develop a spontaneous list
 - Then check against list to ensure coverage:
 - Family
 - Friends
 - Work
 - Education
 - Kids activities
 - Leisure / hobbies
 - Worship
 - Health / exercise

Mapping nodes

- *Map nodes with participant – talking through their reasoning as they do so*
- *Throughout annotate based on their descriptions, using arrow and text features on whiteboard*
- *Ensure coverage of nodes at different levels of distance (e.g. inner circle, acquaintances, looser connections)*
- For each:
 - Ask where they would place it on the map, considering distance from them and from other nodes
 - Ask them to expand on any key sub-relationships (people, places or groups) relating to each and add post-its for these
 - Ask them to describe the kind of relationships and interactions they have with or around each node considering:
 - The content of interactions – what kind of things are they interacting around?
 - The means of interaction – considering how and where these happen (e.g. online vs different offline spaces)?
 - The quantity of interactions – how often?
 - The quality of interactions – how meaningful?
 - The direction of interactions – how do interactions differ in terms of give and take?
 - Ask them to briefly describe any overlap or interactions with other nodes

Reflection on map

- Ask participant to consider completed map
 - How do they feel looking at it? What has it revealed to them if anything?

- Is there anything that they would like to add?

4. Environmental issues in social networks (10 mins)

Use network map to explore how information about environmental issues has worked its way through social networks in the past to draw out lessons for air quality

Moderator: Explain that you would now like to consider how information about certain kind of topics have spread through their social networks in the past

Continue to annotate map based on discussions (**Green** text for annotation)

- (If not already covered)
 - To what extent to you discuss topical issues with others in your network?
 - What kind of things prompts discussion?
 - How do they discuss (e.g. face-to-face, sharing articles etc.)?

Salience of environmental issues

- What environmental issues would they consider to be topical or relevant at the moment?
 - Why these?
 - If not mentioned, then probe around:
 - Climate change
 - Recycling
 - Plastic waste
 - Habitat destruction
 - If air quality / pollution comes up then note but hold off on discussion until next section
- Where do they get information on these topics?
 - Probe around use of:
 - Traditional media
 - Social media
 - Other self-learning
- Do they ever talk about environmental issues within their social networks?

- If so then what issues? Why these?

Environmental issues within social networks

- Explore how interactions around environmental issues have taken place in their social network:
 - Where within the map are they receiving information? Why these?
 - Are there cases in which they are actively discussing or sharing information? Why these?
 - And in what way are they sharing it?
 - What is it that has triggered the sharing or discussion of information?
 - What is it that makes a topic worthwhile of discussion – and how does this differ across different parts of their network?
 - How do they decide whether to trust information? Do they do any fact-checking?
- Thinking across all of this - how would they describe the way that environmental issues are discussed within their networks?

5. Air Quality in Social Networks

(15 mins)

Assess understandings of air quality / pollution issues, then use network map to explore opportunities for dissemination through networks

Moderator: Explain that you would now like to discuss air quality specifically, which will be the key focus for the rest of the research process

Continue to annotate map based on discussions (**Blue** text for annotation)

Understandings and attitudes towards air quality

- What are their associations with the words 'air quality'?
- How relevant an issue do they feel this is (in comparison to previous issues discussed)?
- To what extent do they perceive themselves to be at risk due to air quality?
- Have they ever taken any actions in relation to air quality?
 - If so then what have they done and what motivated / triggered this?
 - Probe into medical care for those with experience of respiratory issues
- Is there any information that they would like about air quality?

Moderator: Explain that you would now like to show them some information about air quality – and show **STIM 1 A-C**

Response to information

- What information is new / surprising / interesting?
- Where would they expect to receive this information?
 - Why these sources?
- Is there anything in here that they would consider sharing with others?
 - If so then what, why and with whom?

Air quality messengers and messages

- Have they ever received, discussed or shared information about air quality within their networks?
 - If so then what, why and with whom?
 - What informed or stimulated this discussion?
- Which nodes within their maps could be credible sources for AQ information? Why these?
 - Would they add any places or people to the map?
- What kind of information or messages might they consider sharing with other social connections? Why these?
- Gauge – and probe where relevant - relative response to:
 - General vs specific information
 - Air quality vs air pollution information
 - Focus on protective vs contributing behaviour

6. Response to stimulus examples

(15 mins)

Explore potential of a range of different types of information relating to air quality for dissemination through social networks

Moderator: Explain that you would now like to show a series of examples of different kinds of information about air quality and would like to discuss how and in what ways these might be relevant within their social networks

Show **STIM 2 A - F**, rotating order across interviews

Explore response to stimulus

- Spontaneous impressions
- Perceived relevance and interest
- Where within their social network map might they expect to find out about this? Why here?
- Might they be interested in discussing or sharing this with others?

- Why / why not?
- Where within their social network might they do so?
- What about it is shareworthy?
- Gauge – and probe where relevant - relative response to:
 - General vs specific information
 - Air quality vs air pollution information
 - Focus on protective vs contributing behaviour

Overall response

- Looking back on everything, what kind of information is most interesting to them?
- Where in the map are the best messengers for receiving this information?
- In what cases and with whom might they transmit this information?

7. Thanks and next steps

(5 mins)

Close interview and explain next steps

Thanks and close

- Thanks for participation in interview
- Collect any final thoughts
- Explain interim-task activities and next steps
 - We will email you in the New Year with details of the activities that we would like you to carry out before we next meet – this should happen about two weeks before your group discussion
 - You will need to log onto an online platform twice – once to answer a few brief questions to read more detailed directions for the task; then again to record some of your thoughts on completing these two activities:
 - **ACTIVITY ONE:** Look out for moments within your everyday life where you feel most receptive to hearing messages about air quality – who are the different people, groups or places within your social network associated with these moments?
 - **ACTIVITY TWO:** Have a go at sharing information about air quality with others within your social networks. We would like you to talk to people within your network, but you may also want to show them some of the materials or links we have provided to inform this conversations.

We would like you to think about which different people, groups or places within your social network do these discussions feel most natural? What topics or materials feel most appropriate for stimulating discussion?

- Remind of date for the Group Session
- Thanks again!

Air Quality information

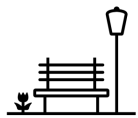
What might you share or discuss with others in your social network?

Interim activity materials

November 2023

What is air pollution?

Air pollution refers to the presence of substances in the air that are harmful to living organisms



Outdoor Air Pollution:

Caused by emissions from vehicles, industries, home heating and natural sources like wildfires.



Indoor Air Pollution:

Comes from sources like household cleaning products, cooking, tobacco smoke, and heating appliances.



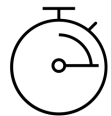
What are the impacts of air pollution?

Poor air quality is the largest environmental risk to public health in the UK



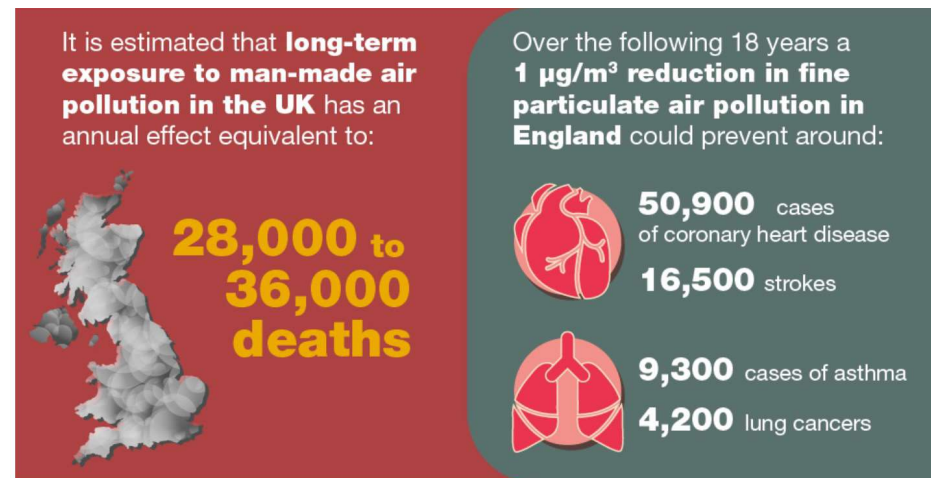
Long-term exposure:

Reduces life expectancy, mainly due to cardiovascular and respiratory diseases and lung cancer



Short-term exposure:

Causes a range of health impacts, including effects on lung function, exacerbation of asthma and increases in respiratory and cardiovascular hospital admissions



<https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution>

What actions can I take around air pollution?

Individuals can take a range of steps to reduce their exposure and their contribution to air pollution

REDUCE EXPOSURE



- Limit outdoor activities and exercise
- Go out earlier in the day
- Stay on quieter, back streets where possible
- Keep your car windows closed in slow moving traffic
- Check air quality services to plan your behaviour accordingly

REDUCE CONTRIBUTION

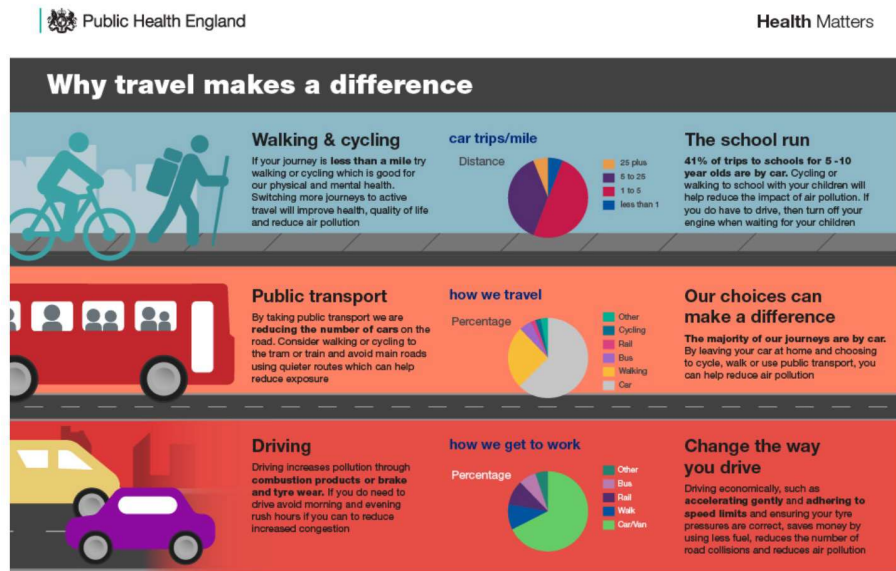
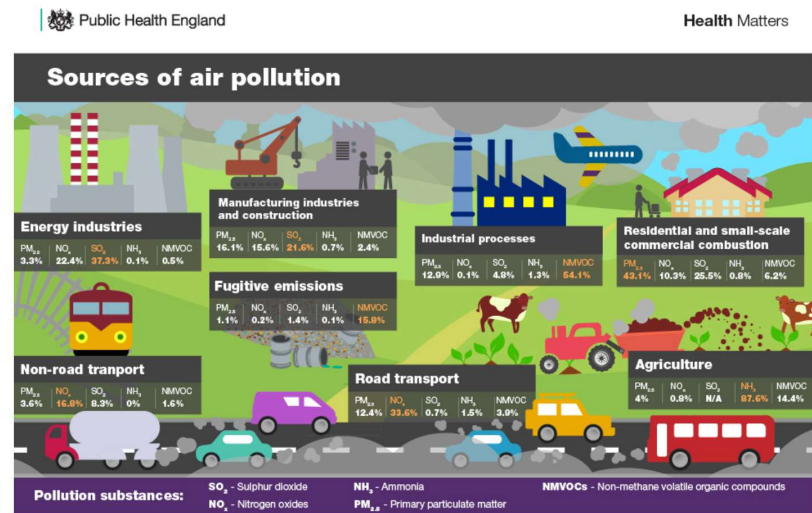


- Cut down on car use
- Use public transport or active travel where possible
- Use local shops and amenities
- Work from home
- Arrange car-sharing
- Avoid burning at home

Air quality information and infographics

The key air pollutants

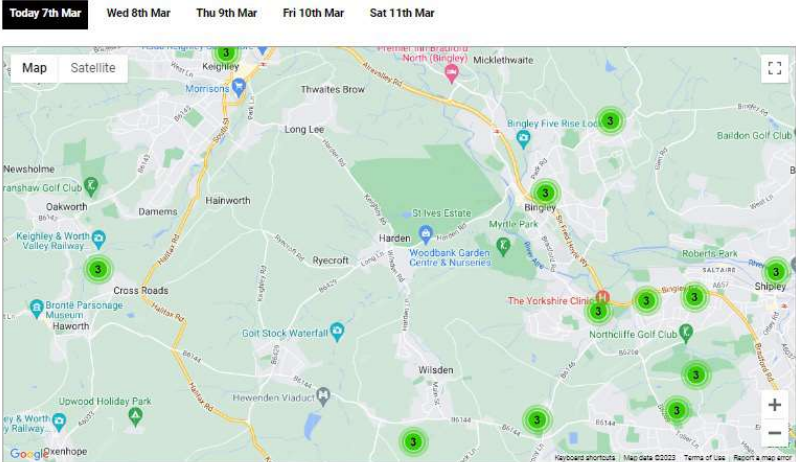
Air pollution is a complex mix of particles and gases of both natural and human origin. Particulate matter (PM) and nitrogen dioxide (NO₂) are both major components of urban air pollution. Currently, there is no clear evidence of a safe level of exposure below which there is no risk of adverse health effects. Therefore, further reduction of PM or NO₂ concentrations below [air quality standards](#) is likely to bring additional health benefits.



Using public transport also makes a difference, as it reduces the number of cars on the road. Walking or cycling to work or to get to public transport whilst avoiding polluted routes, such as main roads, can help to improve health and reduce exposure.

<https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution>

Defra: UK AIR – Air Information Resources



The nearest locations to your postcode region are shown below and highlighted on the map.

- What do the forecasts mean?
- How are the forecasts produced?
- Health advice associated with air pollution

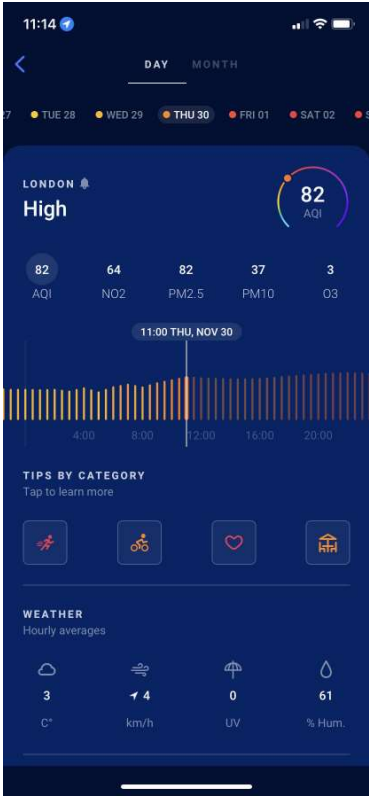
Recommended Actions and Health Advice

Air Pollution Banding	Value	Accompanying health messages for at-risk individuals*	Accompanying 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.

*Adults and children with heart or lung problems are at greater risk of symptoms. Follow your doctor's usual advice about exercising and managing your condition. It is possible that very sensitive individuals may experience health effects even on Low air pollution days. Anyone experiencing symptoms should follow the guidance provided below.

<https://uk-air.defra.gov.uk/>

Other online resources and apps



Plume Labs app



AIR QUALITY DATA CONTRIBUTORS

35 Stations operated by

10 Contributors [SEE ALL](#)

Join the movement!

Get a monitor and contributor to air quality data in your city.

[BECOME A CONTRIBUTOR](#)

Find out more about contributors and data sources

WEATHER

US AQI **LIVE AQI INDEX** **Moderate**

55

OVERVIEW

What is the current air quality in London?

Air pollution level	Air quality index	Main pollutant
Moderate	55 US AQI	PM2.5

Pollutants	Concentration
PM2.5	14 µg/m³
PM10	17.5 µg/m³
O3	5.2 µg/m³
NO2	42 µg/m³
SO2	4 µg/m³

! PM2.5 x2.8 **PM2.5 concentration** in London is currently 2.8 times the WHO annual air quality guideline value

HEALTH RECOMMENDATIONS

What is the current air quality in London?

- Sensitive groups should reduce outdoor exercise
- Close your windows to avoid dirty outdoor air [GET A MONITOR](#)
- Sensitive groups should wear a mask outdoors [GET A MASK](#)
- Sensitive groups should run an air purifier [GET AN AIR PURIFIER](#)

<https://www.iqair.com/gb/uk/england>

News articles

Revealed: almost everyone in Europe is breathing toxic air

Guardian investigation finds 98% of Europeans breathing highly damaging polluted air linked to 400,000 deaths a year

● **Europe's pollution divide: see how your area compares**



📷 Only 2% of Europeans breathe air within WHO guidelines for fine particulate pollution, with 30 million living in areas four times over those limits. Composite: Guardian Design/Getty Images

Europe is facing a “severe public health crisis”, with almost everyone across the continent living in areas with dangerous levels of air pollution, an investigation by the Guardian has found.

How to improve your indoor air quality at home

The air you breathe can have a significant impact on your health, so read our guide to find out how to breathe cleaner air at home.

PG Patrick Gallagher
Researcher & writer




In this article

↓ [Indoor air pollution puts our health at risk](#)

↓ [12 tips to reduce pollution in your home](#)

Documentaries

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Ella's Fight: Clean Air For All

Ella Kissi-Debrah is thought to be the first person in the world to have air pollution listed as a cause of death. Ten years on we follow her family's fight for clean air for all.

🕒 18 mins 18 Feb 2023 Available for 2 months ⓘ

<https://www.bbc.co.uk/iplayer/episode/p0f3y29g/ellas-fight-clean-air-for-all>

two Fighting for Air

Home



Last on

BBC TWO Sun 19 Aug 2018
18:00
BBC TWO EXCEPT SCOTLAND

This programme is not currently available on BBC iPlayer

Dr Xand van Tulleken stages the first ever large-scale experiment of its kind, looking for ways to reduce air pollution in the UK. Can air quality be improved for a single day? 🕒 1 hour

Show more

Ads and marketing communications



pollute
COMPLETE
YOUR HOME
WITH A
WOODBURNER.

Levels of harmful pollution are three times higher in homes using wood burning stoves.
Be enlightened. Don't light them.

11/2017
11/2017
11/2017
11/2017
11/2017

Visit cleanairhub.org.uk to find out more.
Statistics refer to research by experts from the University of Sheffield and University of Nottingham in 2020 into airborne particulate pollution.

global
action
plan



An idling engine
can produce
this much pollution
in one minute.*

SUPPORTED BY
MAYOR OF LONDON CROYDON www.croydon.gov.uk Idling damages the health of those around you. Engine off. Every stop. *According to research by IRL.

Idling Action London

Appendix B: Stage 3 materials

Topic Guide

1. Introduction

(5 mins)

Introduce the research, set the tone of the session, provide clarity on what is expected of the participant and start to build rapport

Introduce the session

- Introduce moderator and Kantar Public – an independent social research agency
- Remind participants of the purpose of the research
 - Conducted on behalf of Defra to understand how information about the environment might most effectively be shared across social groups and connections
- Thank for participation in the depth interview and for carrying out interim activity
- Introduce today's approach – group discussion to share experiences of the activity, reflect on some of the things that came up in the interviews, look at some more ideas around air quality and think together about what could be done to best create engagement around this topic
- Set tone for interview
 - There are no right or wrong answers, please just be open and contribute your honest views
 - Please do contribute and also allow others to contribute
 - Respect different views and experiences
- Discussion length – 90 minutes
- Research is confidential – your personal details will not be shared with Defra and participation will not affect your relationship with Defra
- Research is voluntary – you are free to pause or end at any time – although the incentive will be paid following participation in the group stage
- Any questions?

Recording

- Ask for permission to record, then start recording and confirm consent

Participant introductions

- Explain to participants that they have all been selected to take part in the group according to certain criteria relevant to air quality (*say what this is for specific group*) but may otherwise have quite different views or experiences
- Ask each participant to briefly introduce themselves to the rest of the group – name, living situation, work

2. Reflection on the interim activities (15 mins)

Collect views on the interim activity and reflections since their interview to establish participant views and set ground for ongoing discussions

Moderator to acknowledge that they have looked at the interim activity responses and explain that we will begin by discussing their experiences and any other thoughts that they may have had around the topic of air quality since we last met

Reflections since we last met

- Any general reflections since we last met
- What is most memorable about air quality from the last session
- Anything about how their views on air quality has changed – if so then why

Overall experience of activities

- How did they find the activities
- What stood out to them
- Anything surprising or interesting that came up

Experience of receiving information

- How did they find this task
- Did they come across any information on air quality
 - If so, when and where
 - To what extent was this interesting or engaging
 - Did they do anything about it (including talking to others)
- In what situations did they feel most receptive to information on air quality
 - Why these situations
 - What kind of information felt relevant

Experience of sharing information

- How did they find this task
- What information did they choose to share – why this
- How did they share the information – why like this
- How did others receive the information
 - What – if anything – did they find interesting or engaging
 - Why do they think this is

3. Response to engagement materials

(35 mins)

Introduce and collect response to stimulus bringing to life engagement ideas to understand potential to create engagement of drive discussion

Moderator to explain that we would now like to show some scenarios in which they might come across engagement materials relating to air quality that we have developed based on responses to the interviews

For each we would like to understand how likely they would be to engage with this – and how likely they might be to share or discuss it with others

Show STIM 1 A- I: Engagement ideas (rotate order across groups - spending longer on those that engage interest to understand drivers)

Response to each idea

- Spontaneous thoughts
- How do they feel seeing this
- How would they respond to this – why
 - Would they engage
 - Would they take any further action after having seen it, why / why not
 - Probe: seek out further AQ info – if so then via what channels
- Would they discuss or share this with others
 - Why / why not
 - If so then who would they share it with – anyone they would not share it with
- Explore responses to particular messengers, messages and media
 - Explore whether changing any of these changes the response
 - Prompt with the questions added into the notes sections for each element of the stimulus as appropriate

Overall thoughts

- Which of these stands out most as something with which they would engage – and why
- Which of these stands out as something they might share or discuss with others – and why

4. Potential for leveraging social connections (15 mins)

Introduce summary of social nodes from interview stage and discuss at which points there is greatest potential for spreading information about air quality

Moderator to acknowledge mapping exercise and explain that every individual is different and has a different life and set of connections – but that we have pulled out some of the key places, sets of people and online modes of communicating from across interviews to look at in more depth today

Some of these will be more or less relevant to different individuals and that is fine – we would like to explore which from these they feel have the most potential for points at which they might be open to receiving or sharing information around air quality

Show STIM 2 – Social connections

Overall thoughts

- When they look at these, which most stand out to them as relevant within their lives
 - *Moderator to acknowledge any differences among participants*
- Are there any places, people, or online points of interaction that they feel are missing

Potential for engagement

- For each 'sphere' of connections (e.g. Personal, local, professional, education etc.) seek to understand (spending more time on those that are more relevant)
 - What do they see as the opportunities for creating engagement around air quality
 - What do they see as the opportunities for receiving information about air quality
 - What do they see as the opportunities for talking about or sharing information about air quality
- Thinking back on the ideas that they have seen as relevant, where do they feel they best fit within their social networks
- What do they see as the role for online connections as compared to offline connections
 - What is the role for social media

Overall

- Overall, where within their social networks do they feel there is most potential to raise awareness or create engagement with air quality

- Does the kind of information that is relevant differ within different parts of their network – if so, then how and why
- What do they think is needed to tip this into a higher profile social issue

5. Co-Creation exercise

(15 mins)

Work with participants to develop ideas based on everything they've seen that they feel have the most potential to raise awareness of and engagement with air quality for them and others in their social network

Moderator to explain that we would now like to work together considering everything we've discussed to think about what Defra or others might do to engage them and others in their social network with air quality

Work with participants to summarise content of discussions and come up with 2-3 different approaches, considering message, messenger, medium – show STIM 3 to remind of ideas explored today but push them to think beyond these as well

Overall

- Thinking back over everything they've seen what do they feel would work best to:
 - Engage them with the topic of air quality
 - Prompt them to discuss or share information about air quality with others
- What makes something engaging or worthy of discussion that needs to be considered when thinking about how to engage people with the topic of air quality

Motivating components

- Gauge into and where relevant probe into specific motivating elements ...
 - Messengers
 - Views on Government/ Defra as a messenger
 - Who should they be working with to build credibility
 - Who could be a credible 'Clean-air' ambassador
 - Topics or messages
 - Health risks
 - Focus on vulnerable people – if so, who
 - Indoors versus outdoor air pollution
 - Mitigating actions – to protect yourself or others, to reduce contribution
 - Actions of industry / government
 - Medium of delivery

- Online vs other
- Presentation of information – relative importance of
 - Technical / scientific info
 - Case studies / real life stories
 - Statistics, data
 - Ability to self-assess home / local area
- Framing
 - Positive or negative in terms of the issue
 - Individual or collective actions

6. Close

(5 mins)

Collect final thoughts and close session

Final thoughts

- What information or idea relating to air quality do they think they are most likely to take away from this research
- For Defra or anyone else involved in spreading awareness about air quality – what would be the one thing you would want them to take away about your views

Thank and close

- Thanks for participation in all three stages of research process
- Explain about incentive process - £140 paid by recruiter

Stimulus

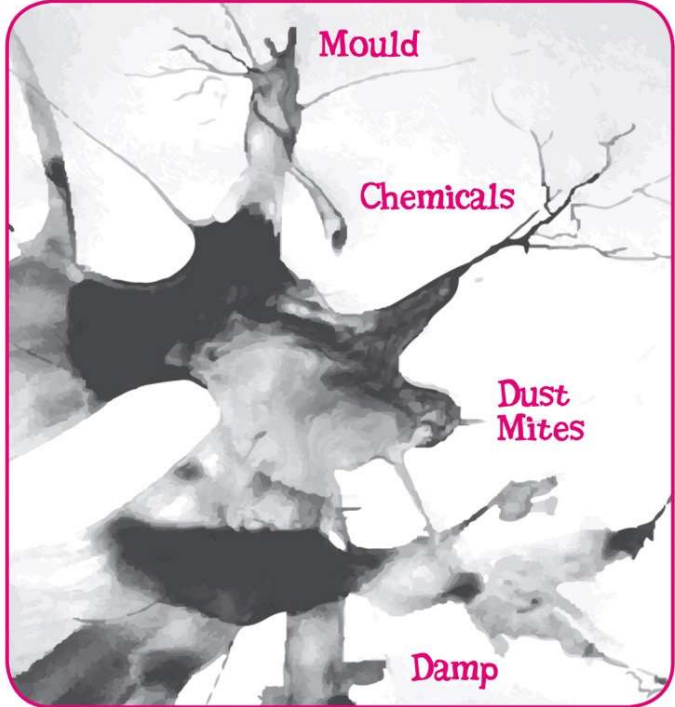
You receive a text from your GP directing you towards a website with information on how to reduce your contribution and exposure to air pollution...

A



A leaflet is posted through your door by the local council with advice on how to improve indoor air quality...

B



Mould


Chemicals

Dust Mites

Damp

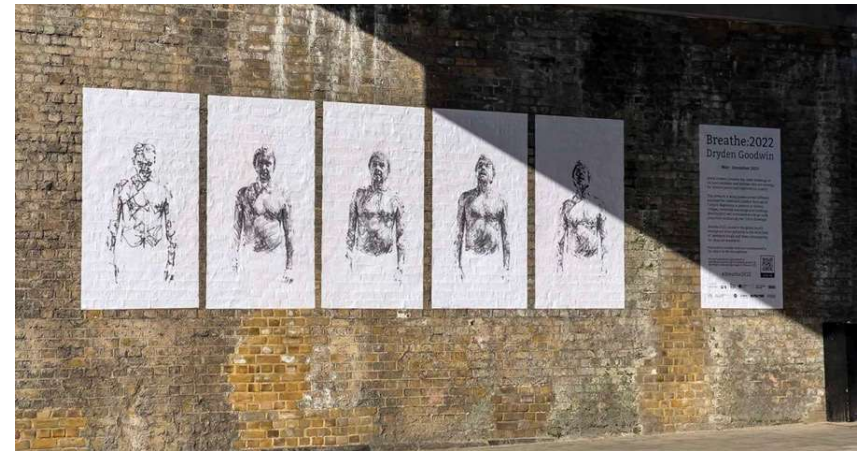
**What's in the air
in your home?**

Advice on improving indoor air quality



You hear about an art exhibition focused on creatively bringing to life the impacts of air pollution, which is organised by a local community group and sponsored by the local council...

C



Your child's school runs a campaign for Clean Air Week to raise awareness of the issue of air pollution, encourage children to walk to school who can, encourage parents to turn off their car engines near school, and raise funds for a 'green wall' to reduce the children's exposure to air pollution...

D

Air pollution is 30% higher on the school run



What one more thing can you do to travel differently one day a week?

Small actions make a big difference.
Explore doingurbit.info for small ways to breathe easier.

air aware
Staffordshire



You come across a post from a charity on social media providing information about the impact of wood burners on air pollution...

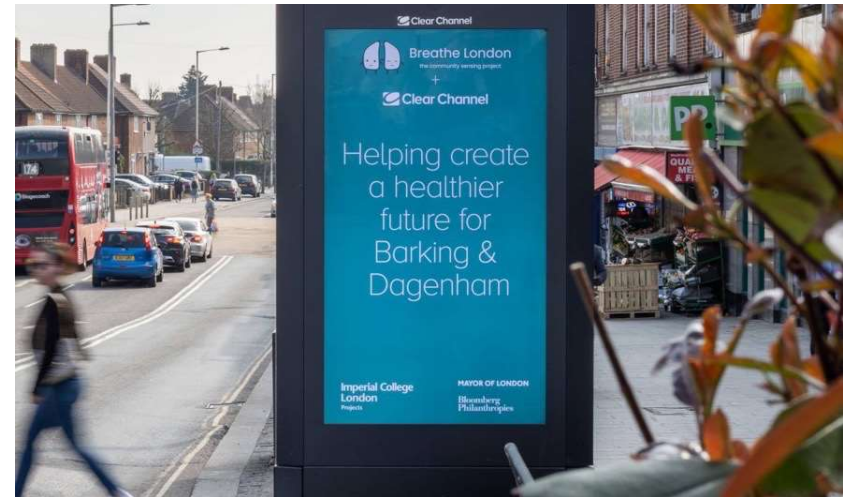
E

Domestic burning in wood stove and open fires was the biggest single source of harmful PM2.5 pollution in 2021, releasing more particulates than either road traffic or industrial combustion

<https://www.gov.uk/government/statistics/emissions-of-air-pollutants/emissions-of-air-pollutants-in-the-uk-particulate-matter-pm10-and-pm25>

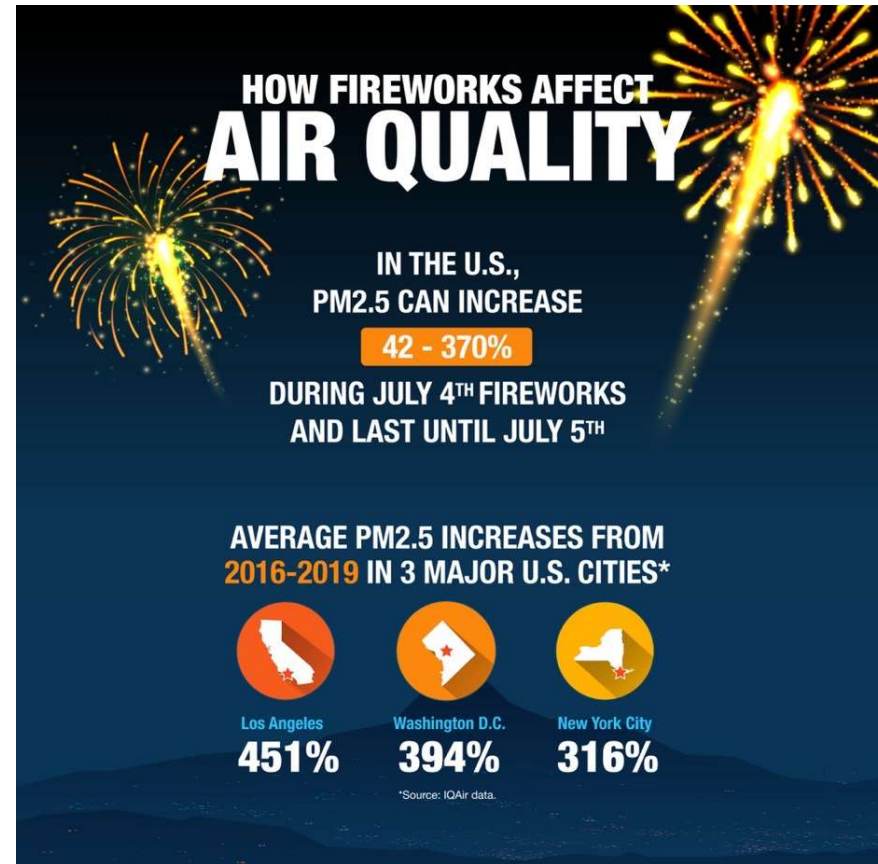
You're walking down your local high street and come across a digital billboard giving local air quality information that is sponsored by the billboard company and a well-known university...

F



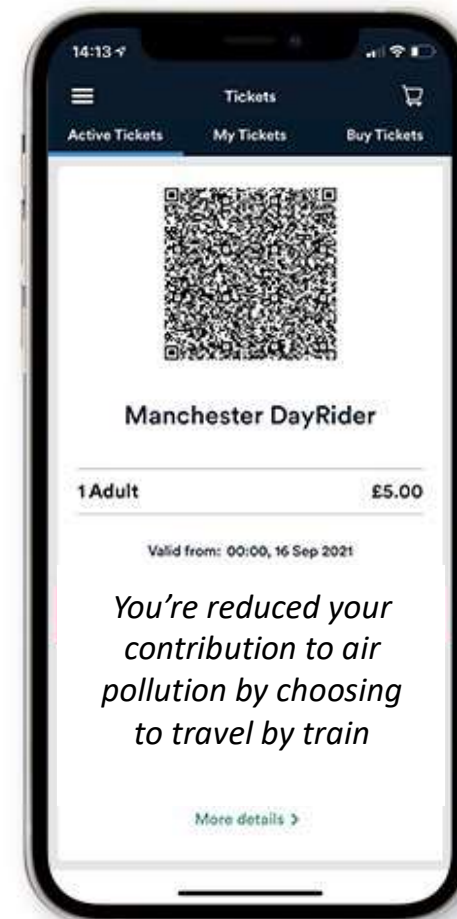
You're watching the news prior to 5th November and there is a story about how it is typically the worst night in the year for air pollution, with interviews with some individuals talking about how it impacts their health conditions...

G

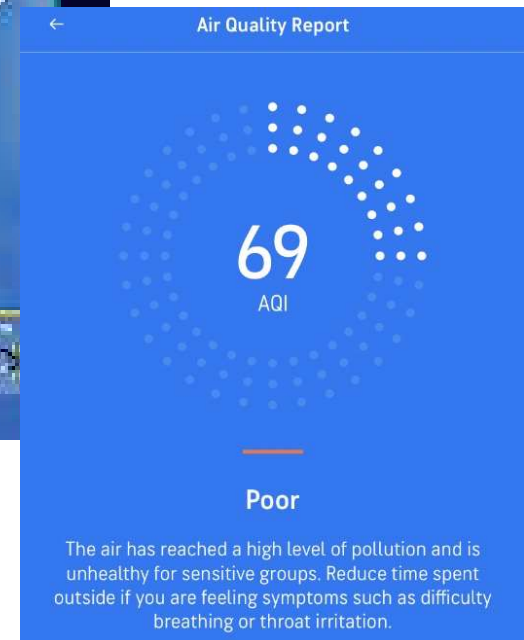


You book a bus ticket to travel to another city and on the ticket is a message saying that you have reduced your contribution to air pollution by choosing this travel option, with a link to more information...

H



You receive an alert from the weather app on your phone to notify you about poor air quality in your local area...

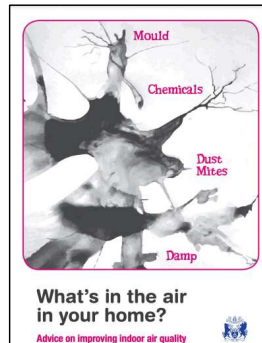




A



B



C



D



E



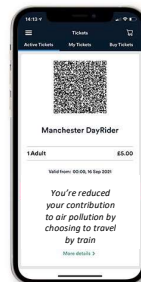
F



G



H



I

