

# Wales Air Quality Awareness Survey

**Baseline Report  
September 2025**

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# WALES AIR QUALITY AWARENESS

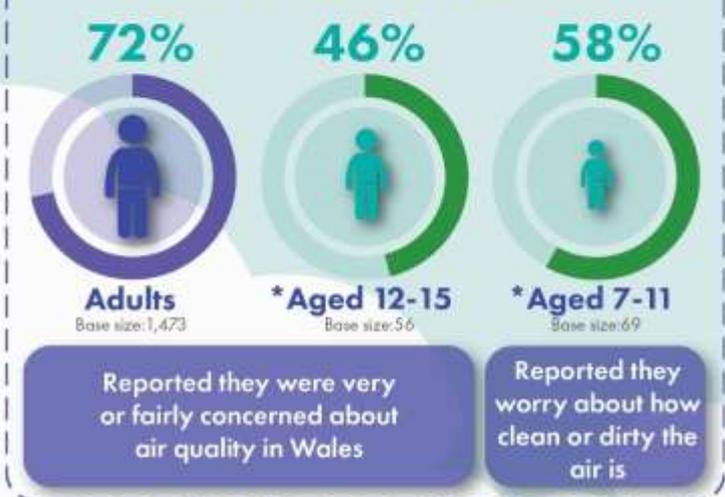
## PUBLIC AWARENESS OF AIR QUALITY:



## PERCEPTION OF AIR QUALITY CHANGE:



## CONCERN ABOUT AIR QUALITY:



## BEHAVIOURAL BARRIERS:



## HEALTH IMPACTS AWARENESS (ADULTS):

Awareness of the health conditions linked to air pollution



## PERCEIVED IMPACT OF INDIVIDUAL ACTIONS:



Note:

- \* Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.
- A random probability 'push-to-web' methodology was used to gather representative data of Welsh residents aged 7 and above. This resulted in samples of 1,474 adults, 56 children aged 12-15, and 70 children aged 7-11.

# Executive Summary

This report presents the findings of a research project conducted by Ipsos in partnership with Air Quality Consultants (AQC) that was commissioned by the Welsh Government. Its primary aim was to establish a baseline of public awareness, attitudes, behaviours, and self-reported health and wellbeing impacts related to air quality in Wales. This evidence base will support the implementation of the Environment (Air Quality and Soundscapes)(Wales) Act 2024 and informs the development of the 'Promoting Awareness of Air Pollution Delivery Plan'.

## 1.1 Methodology

The research employed a random probability 'push-to-web' survey methodology, inviting a representative sample of Welsh residents aged 7 and above to participate. Age-appropriate questionnaires were developed for adults and two child age groups (7-11 and 12-15). Fieldwork was conducted between June and July 2025, achieving a 24% response rate and samples of 1,474 adults, 56 children aged 12-15, and 70 children aged 7-11. Data were weighted to ensure representativeness, though findings for children should be interpreted as illustrative and with lower statistical confidence due to smaller sample sizes and variations in question wording.

## 1.2 Key findings

The following summarises the main insights gathered from the research, providing a baseline of public awareness, understanding, and engagement with air quality in Wales. These findings are also visually represented in the infographic on the previous page.

- **Baseline awareness and concern about air quality:** Overall, 44% of adults report knowing a great deal or a fair amount about air quality. News outlets are their primary information source, with 56% of adults citing television news. Children aged 12-15 most frequently cite schools and teachers (50%). Concern about air quality is high among adults (72% very or fairly concerned), though lower among children (58% for those aged 7-11, 46% for those aged 12-15). Perceptions of air quality change over the past 10 years are divided, with 32% of adults reporting worsening, 28% no change, and 24% improvement. A majority of adults (74%) report noticing signs of possible air pollution in their local area.
- **Understanding of outdoor air quality:** Public understanding of outdoor air quality in Wales is shaped by the visibility of pollution sources. Adults perceive coastal and rural areas without industry as having better air quality (85% good/very good for coastal, 83% for rural) than industrial or high-traffic areas (67% poor/very poor for industrial, 54% for roads). This perception leads to a belief among adults (57%) that air pollution is "mostly a problem in cities, not rural areas," a view largely shared by children (69% of those aged 12-15, 58% of those aged 7-11). Most adults (93%) understand that air pollution can be present without being visible. Adults mainly recognise industry (93%) and transport (91%) as major pollution sources, but less so domestic heating (70%) and agriculture (64%). Over half of adults (53%) attribute most pollution to large industries rather than individual actions.
- **Understanding of indoor air quality:** The pattern of understanding visible pollution sources extends to indoor air quality. The majority of adults (74%) perceive the air quality inside their home as good or very good. Fewer than half of adults (41%) believe that indoor air quality can be worse than outdoor air

quality. Awareness of indoor pollution sources is high for lack of ventilation (85%) and damp/mould (81%), but lower for chemical sources from household products (53%) and home heating systems (47%).

- **Understanding of impacts and health risks:** Worry about the impacts of air pollution is present, but adults are more concerned about broader environmental and societal issues, such as future generations (80%) and climate change (77%), than their own personal health (57%). This pattern is also observed among children. Awareness of specific health conditions linked to air pollution is high for respiratory issues, with 95% of adults identifying respiratory diseases and 82% identifying asthma. However, knowledge is lower for systemic health impacts like dementia (15%), stroke (14%), and diabetes (7%). While medically vulnerable groups (e.g., those with respiratory conditions, 96%; older people, 92%) are recognised as being at risk, there is less awareness of the vulnerability of people from low-income backgrounds (59%). Scepticism regarding the severity of health impacts is low among adults, with very few (15%) agreeing that the health impacts of air pollution are overstated.
- **Current behaviours and attitudes towards action:** Current behaviours influencing air quality are driven by practical considerations. Car travel is dominant, with 91% of adults having used a car in the past week, primarily due to convenience (75%) and travel time (65%). Home heating is reliant on combustion-based fuels, with gas used by 87% of households, and a minority using solid fuels (15%) or oil (9%). Low-carbon heating solutions like heat pumps have low uptake (under 5%). The most commonly reported pro-air quality behaviours include walking or cycling for short journeys (67%) and turning off idling engines (51%). Attitudes towards taking action indicate a public that is broadly willing but faces barriers. 40% of adults reported being willing to take more action but were unsure what to do. Another 39% are held back by practical obstacles, such as poor public transport (35% of those with barriers) and cost (23% of those with barriers), or by a belief that their individual actions will not make a meaningful difference (21%). A majority of adults (65%) believe that individual actions can make a meaningful difference to air quality.

### 1.3 Conclusion

The research indicates that the public in Wales is concerned about air quality, but their understanding is often incomplete and influenced by the visibility of pollution sources. Knowledge is highest for visible sources like transport and industry and for well-known health impacts such as respiratory conditions, with less awareness of domestic sources or systemic health issues. This focus on large-scale sources shapes the perception of air pollution as primarily a problem for cities and industries. Concern is frequently directed more towards wider society and the environment than personal health. While a willingness to contribute to solutions exists, it is often outweighed by a reliance on current behaviours driven by convenience and cost. A lack of actionable knowledge for a portion of the public, combined with structural and financial constraints, presents obstacles to behaviour change. Bridging these knowledge gaps and addressing structural barriers will be critical for effective public health communications and policy development under the Environment (Air Quality and Soundscapes)(Wales) Act 2024 and the 'Promoting Awareness of Air Pollution Delivery Plan'.

# 1 Introduction

This report presents the findings of a research project conducted by Ipsos in partnership with Air Quality Consultants (AQC) and commissioned by the Welsh Government. The overall aim was to establish a baseline of current public awareness, attitudes, behaviours, and self-reported health and wellbeing impacts related to air quality in Wales. The research was undertaken to support the implementation of the Environment (Air Quality and Soundscapes)(Wales) Act 2024 ('the 2024 Act') and the development of the 'Promoting Awareness of Air Pollution Delivery Plan'. Air pollution is a major public health issue, with an estimated mortality burden of 1,000–1,400 deaths per year attributed to long-term exposure to outdoor air pollution in Wales. The 2024 Act seeks to address this by setting new air quality targets and creating duties for Welsh Ministers to promote awareness of the risks. Understanding current public perspectives is therefore vital to inform and assess these efforts.

Ipsos was commissioned to carry out a representative survey of people living in Wales, covering both adults and children, to understand current public perspectives on air quality. The survey aimed to:

1. Measure levels of public awareness and concern about air quality, both outdoors and indoors, including perceived changes over time and personal experiences with air pollution.
2. Assess understanding of the nature and sources of outdoor and indoor air pollution, including differences by location, visibility of air pollutants, and key contributing factors.
3. Gauge awareness and perceptions of the health impacts of air pollution, including knowledge of related health conditions, level of worry, perceived vulnerability of different groups, and any scepticism regarding the severity of impacts.
4. Examine current behaviours that influence air quality, such as travel and home heating choices, as well as self-reported actions taken to improve air quality.
5. Explore attitudes towards taking action on air quality, perceived effectiveness of different measures, and readiness for behaviour change.

The survey findings, summarised in this report, will provide the Welsh Government with a robust baseline of evidence on current public awareness, attitudes, behaviours and self-reported impacts. This will support the promotion and monitoring of the 'Promoting Awareness of Air Pollution Delivery Plan' and enable evaluation of the 2024 Act and associated policies over time.

## 1.1 Method Note

A random probability 'push-to-web' methodology<sup>1</sup> was used to gather representative data of Welsh residents aged 7 and above. A random, disproportionately stratified sample of 4,750 addresses was drawn from the Post Office Address File, boosting representation for smaller local authorities and stratifying by Index of Multiple Deprivation. This approach aimed to ensure a representative sample of the Welsh population. Age-appropriate survey versions were developed, with shorter, modified versions for children aged 7–11 and 12–15, alongside a full version for those aged 16+. To ensure clarity and suitability, 30 cognitive interviews were conducted across these age groups, informing questionnaire development and refinement.

Fieldwork took place between June 4th and July 31st, 2025, achieving a 24% response rate. This resulted in samples of 1,474 adults, 56 children aged 12–15, and 70 children aged 7–11. Participants received incentives

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<sup>1</sup> A push-to-web survey is a methodology that uses offline contact (in this instance, via post) to direct people to complete a web-based questionnaire online, with a paper questionnaire option offered in follow-up reminders.

for completing the survey. Each sampled address received up to three mailings. The first two encouraged online completion, while the third included paper questionnaires to accommodate diverse preferences and access needs. The data were weighted using inverse probability sample design weights and calibrated to official population statistics (age, gender, region, and IMD quintile). However, due to smaller sample sizes, child weights were calibrated for gender only. Two-tailed t-tests and thematic coding were used for data analysis, ensuring robust statistical analysis and capturing nuanced qualitative feedback.

While the survey included children aged 7-11 and 12-15, their achieved sample sizes (70 and 56 respectively) are considerably smaller than that for adults (1,474). Consequently, findings related to children should be interpreted as illustrative and with lower statistical confidence compared to adult data. Furthermore, variations in question wording between age groups mean direct comparisons between adult and child responses should be made with caution.

More detailed methodological information, including specific limitations, can be found in the Annex: Methodology.

## 1.2 Structure of the report

This report is organised to systematically present the quantitative research findings related to air quality awareness and behaviour in Wales, as follows:

- Chapter 2 - Baseline Awareness and Concern about Air Quality: Presents findings on public awareness and concerns regarding air quality, examining perceived changes over time and primary sources of information.
- Chapter 3 - Understanding of Outdoor Air Quality: Explores public understanding and perceptions of outdoor air quality, focusing on variations by location and identifying significant pollution sources.
- Chapter 4 - Understanding of Indoor Air Quality: Analyses public perceptions of indoor air quality, including on awareness regarding potential indoor pollutants and comparison to outdoor air quality.
- Chapter 5 - Understanding of the Impacts of Air Pollution: Presents findings on public understanding of the health impacts related to air pollution, focusing on awareness of vulnerable groups and associated health conditions.
- Chapter 6 - Current Behaviours and Attitudes Influencing Air Quality: Presents findings on current behaviours and attitudes affecting air quality, highlighting the readiness for behavioural changes and perceived barriers.
- Chapter 7 - Conclusions: Summarises key insights and offers recommendations for policy and public awareness enhancement based on the quantitative research outcomes.
- Annex: Methodology: Provides detailed descriptions of the quantitative research methodologies employed in the study.

## 2 Baseline Awareness and Concern about Air Quality

This chapter establishes baseline data on public awareness and concern regarding air quality in Wales. It examines perceptions of change over time, personal experiences with air pollution, and sources of information, providing a foundation for tracking future trends.

### Key Findings

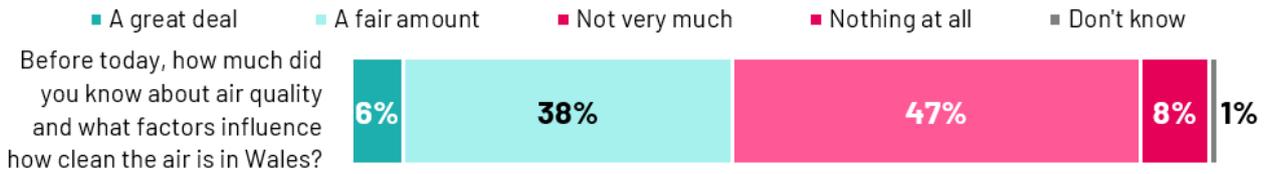
- Awareness of air quality in Wales varies across age groups, with 44% of adults reporting knowing a great deal or a fair amount about the topic. Among adults, higher awareness was consistently associated with higher socioeconomic status (higher income and degree-level education) and reporting that air quality had improved in the past 10 years.
- For children aged 12-15, 39% said they knew a lot or a little about air quality in Wales. For children aged 7-11, 48% reported some level of knowledge. Direct comparisons should be made with caution due to smaller sample sizes and variations in question wording.
- Adults primarily obtain information about air quality from news outlets (56% television news, 35% online news, 35% social media, 32% print media). Children aged 12-15 most frequently cite school/teachers (50%) and social media (36%).
- Concern about air quality is high among adults in Wales, with 72% reporting they are very or fairly concerned. Higher concern among adults was associated with perceived changes in air quality (regardless of whether it was perceived as better or worse) and higher knowledge levels. Concern was lower among children, with 58% of those aged 7-11 and 46% of those aged 12-15 reporting it.
- Perceptions of air quality change over the past 10 years are divided among adults, with 32% reporting worsening, 28% reporting no change, and 24% reporting improvement. Higher knowledge levels and concern about air quality were consistently associated with perceiving improvement.
- A majority of adults (74%) report noticing signs of possible air pollution in their local area. Most commonly they report seeing visible signs such as smoke from chimneys, haze, unusual smells or odours, exhaust fumes (48%), damp/mould indoors (38%), and dust/soot outdoors (33%). Those perceiving worsening air quality were consistently more likely to report these signs.

### 2.1 Level of awareness about air quality

Baseline awareness of air quality in Wales varies across age groups. Among adults, 44% reported knowing a great deal or a fair amount about air quality, while 55% reported knowing not very much or nothing at all. For children aged 12-15, 39% said they knew a lot or a little about air quality in Wales, compared to 59% who said they knew nothing or not very much. Children aged 7-11 reported some level of knowledge, with 48% saying they knew a lot or a little about clean and dirty air, compared to 44% who said they knew nothing or not very much.<sup>2</sup> These findings are shown in Figure 2.1:

<sup>2</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

**Figure 2.1: Awareness of air quality in Wales**



A1. Before today, how much did you know about air quality and what factors influence how clean the air is in Wales?  
Base: All Adults (1,473)



C1. How much do you know about air quality in Wales?  
Base: All Children aged 12-15 (55)



B1. How much do you know about clean and dirty air?  
Base: All Children aged 7-11 (70)

Several factors appear to be associated with higher levels of air quality awareness among adults, with several adult subgroups being statistically more likely than average to report that they knew a great deal or a fair amount about air quality in Wales.<sup>3</sup>

- Demographically, male respondents and those from any ethnic minority background reported higher awareness than average (49% and 63% respectively).
- Socioeconomic factors also appear to play a role, with higher awareness observed among the highest earners (household income over £90,000, 62%) and those with degree-level education (51%).
- Geographic variations in awareness were also observed, with residents of Gwynedd reporting notably higher awareness (64%) than average.
- Awareness also appears to be linked to perceptions of air quality, with those who reported that air quality had improved in the past 10 years demonstrating higher awareness (63%), and similarly for those who reported concern about air quality (48%).

## 2.2 Sources of information about air quality

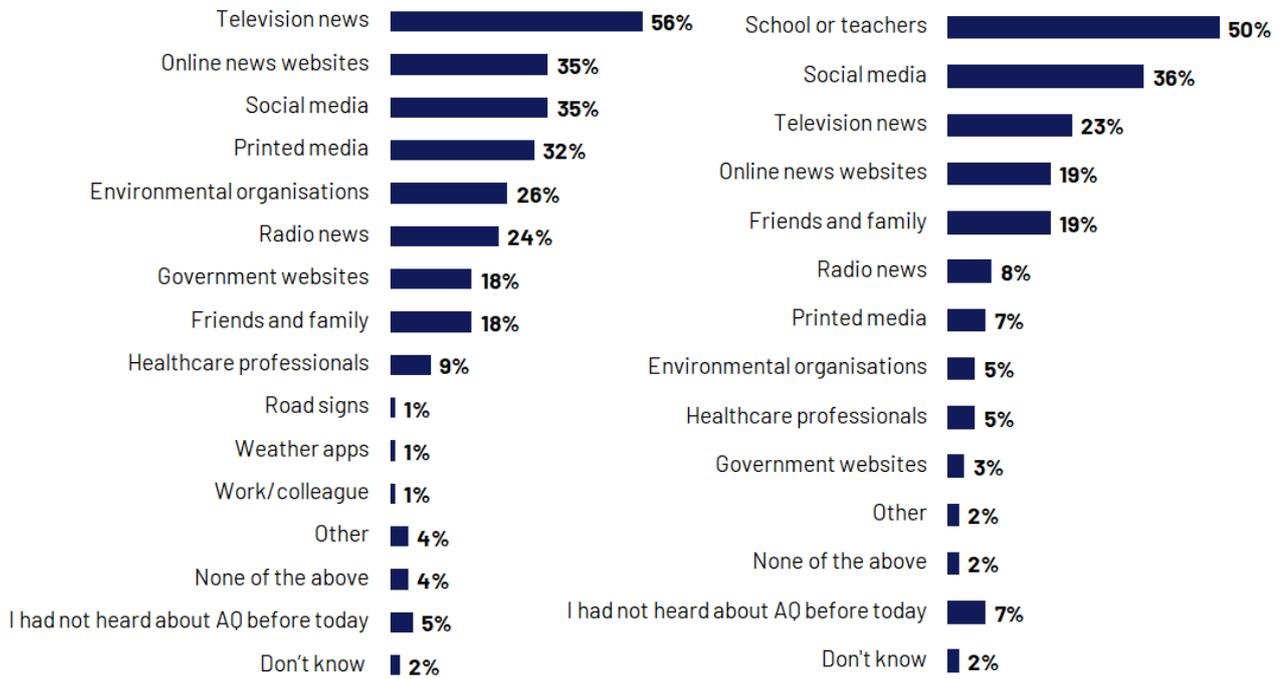
Adults and children report relying on distinct sources for air quality information. News outlets were identified as the most common source of information on air quality among adult participants. It was most common for adults to report that they had heard about air quality from television news (56%), followed by online news websites (35%). Social media was the third most cited source (35%) with printed media in fourth (32%).

For children aged 12-15, distinct sources of information were reported. It was most common for them to report hearing about air quality from their school or teacher, with half (50%) reporting this, followed by

<sup>3</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

social media (36%). Comparatively, only 23% of children aged 12-15 reported hearing about air quality from the television news. This question was not asked of children aged 7-11.<sup>4</sup>

**Figure 2.2: Sources of information on air quality**



A6: Before today, from which of the following sources have you heard about air quality?  
Base: All Adults(1,472)

C6: Before today, from which of the following sources have you heard about air quality?  
Base: All Children aged 12-15(54)

Several factors appear to be associated with the sources from which adults in Wales receive information about air quality. These subgroups were statistically more likely than average to report that they had heard about air quality via television news.<sup>5</sup>

- Geographically, those in Bridgend (71%), Caerphilly (69%), and Ceredigion (71%) were more likely to cite television news as a source.
- Older participants, specifically those aged 45-64 (62%), those aged 65-84 (69%), or those aged 85+ (73%), were also statistically more likely than average to report hearing about air quality from television news. This aligns with broader media consumption trends among older demographics.
- Those reporting they had ‘a fair amount’ of knowledge about air quality (65%) were also more likely to cite television news.
- Demographically, White participants (57%) were statistically more likely than average to report television news as an information source. Further research could explore potential reasons for this difference.

### 2.3 Level of concern about air quality

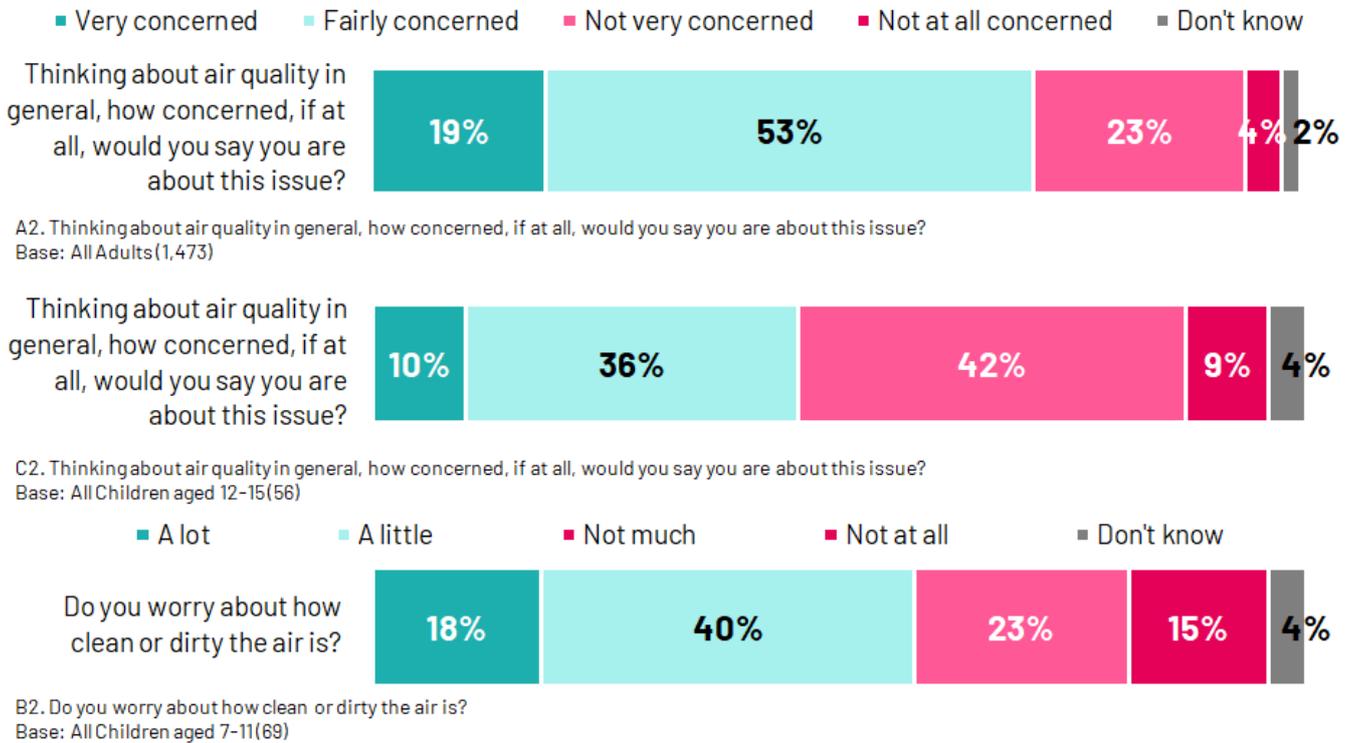
Overall, the level of concern about air quality in Wales was high among adults, with 72% reporting that they were very or fairly concerned about air quality in Wales. Concern was lower among children with 58% of

<sup>4</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

<sup>5</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

children aged 7-11 reporting they worry about how clean or dirty the air is, and 46% of children aged 12-15 reporting they were very or fairly concerned about air quality.<sup>6</sup>

**Figure 2.3: Concern about air quality in Wales**



Several factors appear to be associated with higher levels of concern about air quality among adults in Wales. The following subgroups were statistically more likely than average to report that they were very or fairly concerned about air quality.<sup>7</sup>

- Those who reported that air quality had either got better (82%) or got worse (80%) in the past 10 years were more likely to express concern. This heightened concern among those perceiving change, regardless of direction, could indicate increased sensitivity to the issue among those who have observed changes.
- Socioeconomically, those living in areas with IMD quantile 4 (the second most deprived areas) were also more likely to be concerned (78%).
- Those reporting they had a 'fair amount' of knowledge about air quality (78%) also showed higher levels of concern.
- Those aged 65-84 (77%) were also statistically more likely than average to report being very or fairly concerned about air quality. This might reflect increased health concerns among older adults.
- Demographically, female participants (75%) and those who are not working (75%) were more likely to report concern.

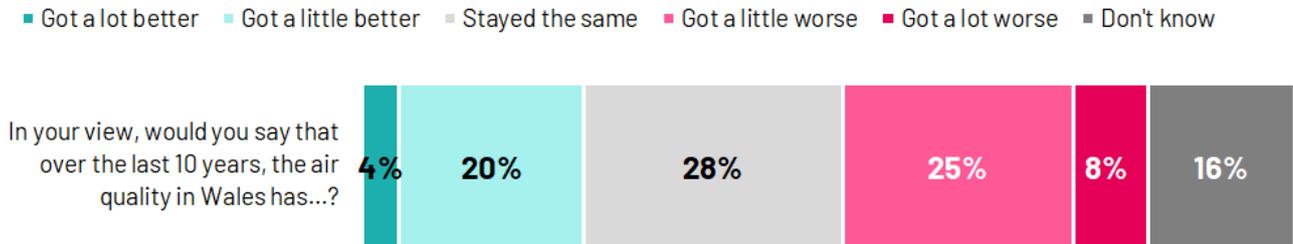
<sup>6</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

<sup>7</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

## 2.4 Perceived change in air quality over time

Perceptions of air quality change over the past 10 years are divided – a third (32%) of adult participants thought that the air quality in Wales had got worse in the past 10 years, 28% thought it had stayed the same, and a quarter (24%) thought it had got better.

**Figure 2.4: Perceived change in air quality over time**



A3. In your view, would you say that over the last 10 years, the air quality in Wales has...?  
Base: All Adults (1,473)

Several factors appear to be associated with the perception that air quality in Wales has improved over the past 10 years. Several subgroups were statistically more likely than average to report that air quality had got better.<sup>8</sup>

- Those reporting they had a great deal (44%) or a fair amount (33%) of knowledge about air quality were more likely to perceive improvement. Similarly, those who are very or fairly concerned about air quality (27%) were also more likely to report improvement. This could suggest that increased knowledge about air quality leads to a more nuanced understanding of changes over time.
- Geographically, those living in Rhondda Cynon Taf (36%) and those living in South Wales more broadly (26%) were more likely to report improvement. This is notable given that Rhondda Cynon Taf has had several Air Quality Management Areas (AQMAs) in place, suggesting efforts to address local air quality challenges. While the area has recently had a high number of AQMAs revoked (12), there are currently 6 active AQMAs.<sup>9</sup>
- From a socioeconomic perspective, those living in the least deprived areas (IMD quantile 1) were also more likely to perceive improvement (29%).

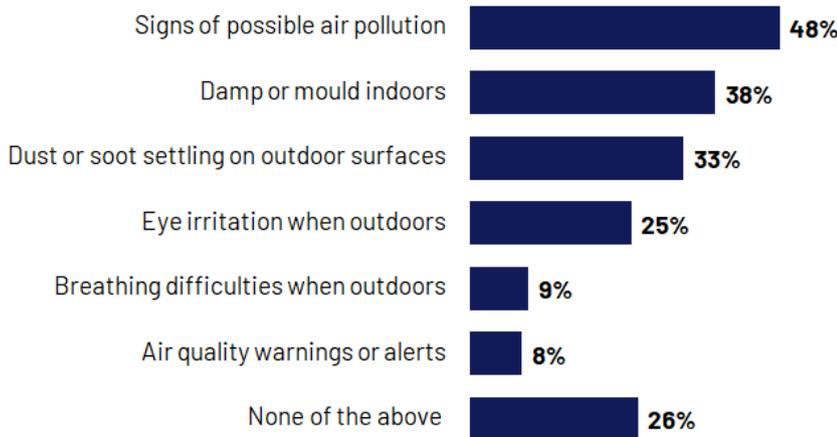
## 2.5 Personal experience with air pollution

A majority of adults (74%) reported noticing signs of air pollution in their local area. The most common observations included visible signs of possible air pollution (e.g. smoke from chimneys, haze, unusual smells or odours, exhaust fumes) (48%), damp or mould indoors (38%), dust or soot settling on outdoor surfaces (33%).

<sup>8</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

<sup>9</sup> For more information see: <https://www.airquality.gov.wales/laqm/air-quality-management-areas>

**Figure 2.5: Signs of possible air pollution (adults)**



A5: In the past 12 months, have you personally experienced or noticed any of the following in your local area?  
 Base: All Adults (1,466)

Two subgroups were consistently statistically more likely than average to report the top three signs of air pollution: individuals working full or part-time and those who perceive air quality to have worsened. The data is shown in Table 2.1:<sup>10</sup>

**Table 2.1: Signs of possible air pollution (adults), key subgroups**

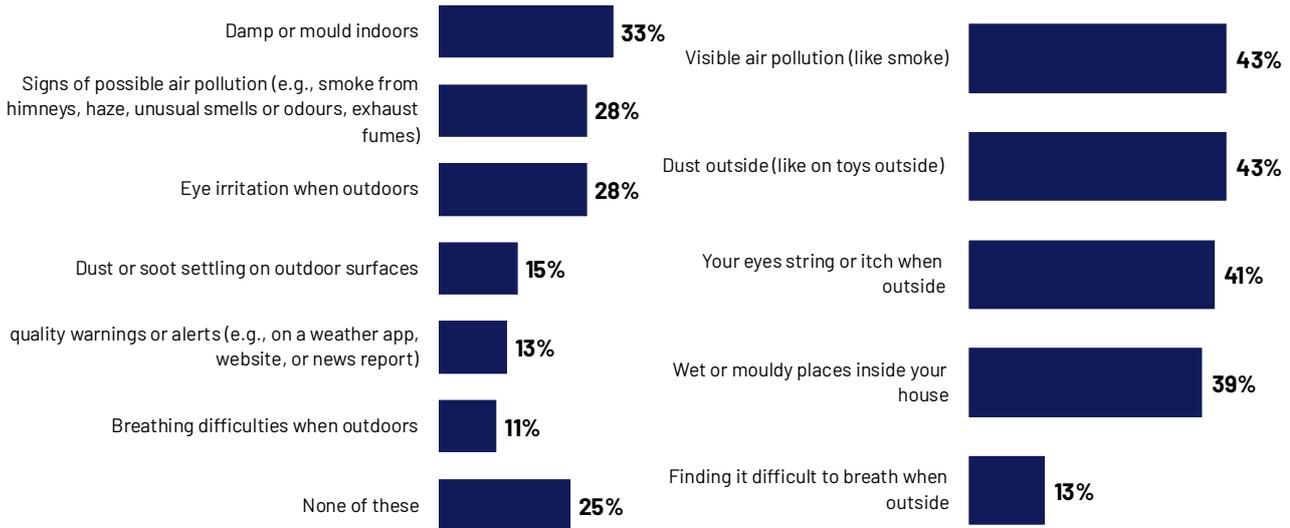
	Average	Those who perceive AQ to have worsened	Those working full or part time
<b>Signs of possible air pollution (e.g. smoke from chimneys, haze, unusual smells or odours, exhaust fumes)</b>	<b>48%</b>	62%	51%
<b>Damp or mould indoors</b>	<b>38%</b>	45%	46%
<b>Dust or soot settling on outdoor surfaces</b>	<b>33%</b>	44%	39%

For children, the reported experiences with potential signs of air pollution varied by age group. For children aged 12-15, a third (33%) reported they had noticed damp or mould indoors, with 28% noticing signs of possible air pollution and the same proportion reporting eye irritation when outdoors. For children aged 7-11, 43% reported they had seen visible air pollution, and dust outside, while 41% reported having their eyes sting or itch when outside.<sup>11</sup> This data is shown in Figure 2.6:

<sup>10</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

<sup>11</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

**Figure 2.6: Signs of possible air pollution (children)**



C5: In the past year, have you personally experienced or noticed any of the following in your local area? Please select all that apply.  
 Base: All Children aged 12-15 (56)

B5: Have you experienced any of these things around your home or school?  
 Base: All Children aged 7-11 (70)

## 2.6 Conclusion

This chapter has established baseline data on public awareness and concern regarding air quality in Wales, revealing variations across different age groups and subgroups. Specifically, awareness levels were higher among those with higher socioeconomic status and those who perceived air quality to have improved. Adults relied heavily on news outlets for information, especially older adults and television news, while schools were the primary source for older children. Concern was higher among adults than children, particularly among those who perceived changes in air quality and those with higher knowledge levels. Perceptions of air quality change over the past decade were mixed, with more positive perceptions linked to higher knowledge and concern. Finally, most adults reported noticing signs of possible air pollution, especially those who perceived worsening air quality. These baseline findings provide a crucial foundation for tracking future trends and understanding how public perceptions of air quality evolve. Further research is needed to explore the factors underlying these variations in more detail and to understand their implications for air quality management and public health in Wales.

## 3 Understanding of Outdoor Air Quality

Building on the baseline levels of awareness and concern, this chapter provides a baseline of public understanding of outdoor air pollution in Wales. It assesses perceptions of air quality across different locations (such as rural vs. industrial), explores the understanding of pollution's visibility, and identifies which sources, from large industry to domestic heating, the public attributes to poor air quality.

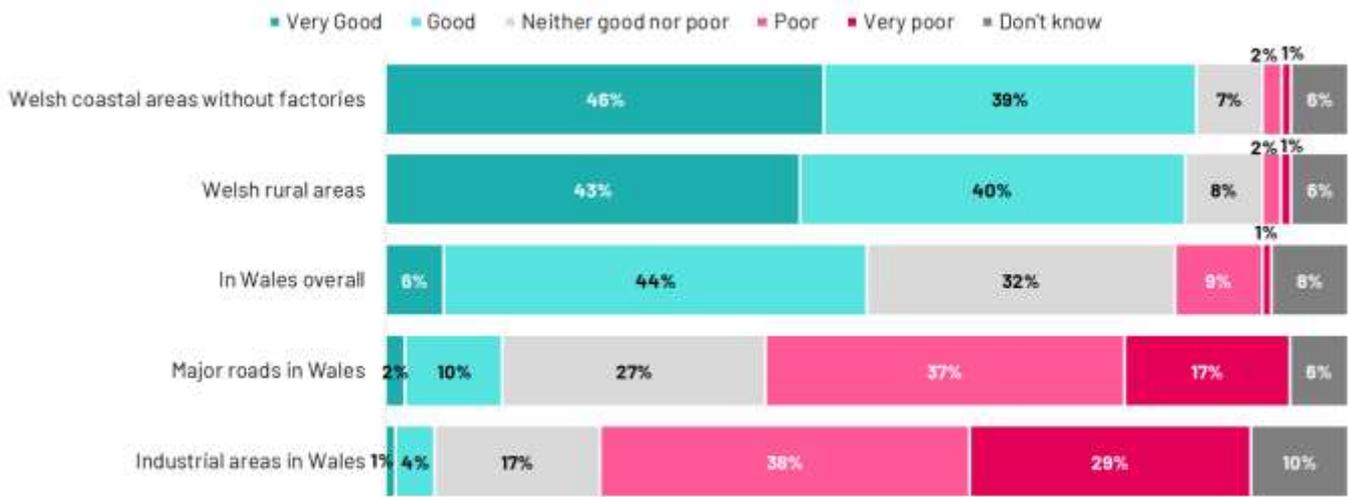
### Key Findings

- Adults perceive coastal/rural areas without industry as having better air quality (85% good/very good for coastal, 83% for rural) than industrial/high-traffic areas (67% poor/very poor for industrial, 54% for roads). Higher earners and those perceiving stable/improving air quality rate air quality more positively overall.
- Adults rate the air quality in their local area better (61% good/very good) than their nearest town/city centre air quality (39% good/very good). Positive local ratings are more common in North Wales, Mid Wales, Ceredigion, Gwynedd, and Isle of Anglesey, and among those with positive perceptions of air quality change or higher knowledge.
- Most adults (57%) believe air pollution is mainly a problem in cities, rather than rural areas. Among adults, this view is more common among residents of Caerphilly and Carmarthenshire, men, those with GCSE/O-Level education, those who reported that air quality had improved or stayed the same, and those not concerned about air quality. For children, 69% of 12-15-year-olds and 58% of 7-11-year-olds also held this view.
- Most adults (93%) understand that air pollution can be present without being visible. For children, 75% of 12-15-year-olds and 62% of 7-11-year-olds also reported this understanding.
- Adults mainly recognise industry (93%) and transport (91%) as major pollution sources, less so domestic heating (70%) and agriculture (64%). Children's views are similar, with age variations.
- Over half of adults (53%) attribute most pollution to large industries rather than individual actions. This view was more likely among younger adults, Flintshire residents, students, and those with lower educational attainment. For children, 54% of those aged 12-15 and 59% of those aged 7-11 also held this view.

### 3.1 Differences in outdoor air quality by location

Adults perceive coastal and rural areas to have significantly better air quality than industrial or high-traffic areas. Adult survey participants were asked to rate the air quality across different locations in Wales. Coastal and rural areas without industry were considered to have the best air quality—85% of participants reported that they thought air quality in Welsh coastal areas without factories was good or very good, 83% said the same about Welsh rural areas. Conversely, industrial and high traffic areas were considered to have the worst air quality—67% said that the air quality in industrial areas in Wales was poor/very poor, and 54% said the same about major roads in Wales. The findings are illustrated in Figure 3.1:

**Figure 3.1: Perception of air quality in different locations in Wales**



A4. From what you know or have heard, how would you rate the air quality in the following locations?  
 Base: All Adults Your immediate neighbourhood (1,471); Your nearest town/city centre(1,467); Inside your home (1,469); Welsh coastal areas without factories(1,469); Welsh rural areas(1,461); Major roads in Wales(1,468); Industrial areas in Wales(1,451); In Wales overall(1,426)

Higher earners (specifically those earning £70,000–£89,999) and those perceiving stable or improving air quality were statistically more likely than average to rate air quality as good across the listed areas.<sup>12</sup> The data is shown in Table 3.1:,, below.

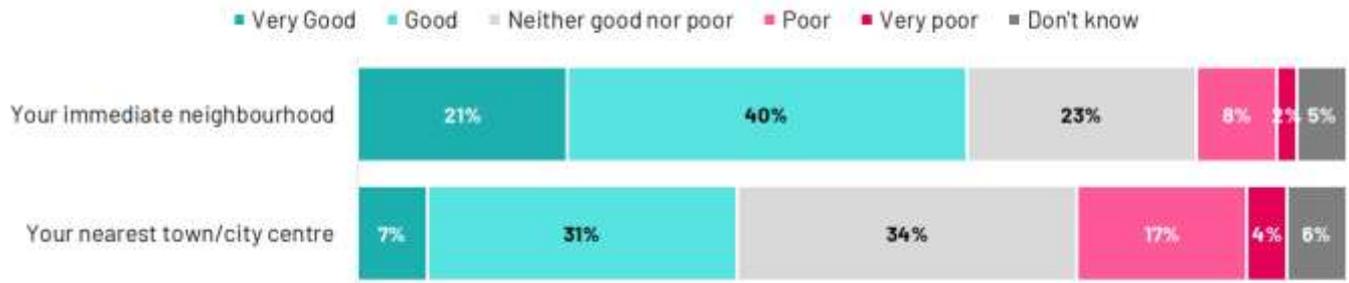
**Table 3.1: Perception of air quality as good or very good in different areas across Wales, by key subgroup**

	Average	Household income of £70,000–£89,999	Report AQ has got better in past 10 yrs
<b>Welsh coastal areas without factories</b>	<b>85%</b>	92%	93%
<b>Welsh rural areas</b>	<b>83%</b>	93%	91%
<b>In Wales overall</b>	<b>50%</b>	71%	73%
<b>Major roads in Wales</b>	<b>13%</b>	27%	18%
<b>Industrial areas in Wales</b>	<b>6%</b>	18%	11%

Participants generally rated air quality in their immediate neighbourhood more favourably than in their nearest town/city centre. Overall, 61% reported that the air quality in their immediate town/neighbourhood was good or very good, with just 10% saying it was poor or very poor. Fewer (39%) reported that the air quality in their nearest town/city centre was good/very good, and 21% said it was poor/very poor. This difference in perception might be due to town/city centres generally having higher traffic density and more commercial activity, which could influence how people perceive air quality, regardless of actual pollutant levels. This data is shown in Figure 3.2:

<sup>12</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

**Figure 3.2: Perception of air quality in local area**



A4. From what you know or have heard, how would you rate the air quality in the following locations?  
 Base: All Adults Your immediate neighbourhood (1,471); Your nearest town/city centre (1,467); Inside your home (1,469); Welsh coastal areas without factories (1,469); Welsh rural areas (1,461); Major roads in Wales (1,468); Industrial areas in Wales (1,451); In Wales overall (1,426)

Several subgroups were consistently more likely than average to report that the air quality in their local area was good/very good. Geographically, those living in North Wales, Mid Wales, Ceredigion, Gwynedd, and Anglesey were statistically more likely to perceive good/very good air quality in their local area. These areas generally have lower population densities and less industrial activity compared to other parts of Wales, which contributes to the perception of good air quality. Those who reported that air quality had got better or stayed the same in the past 10 years, as well as those reporting ‘a fair amount’ of air quality knowledge, were also statistically more likely to rate their local air quality as good or very good. This could suggest that individuals who perceive improvement or have greater knowledge about air quality are more attuned to local variations and more likely to report positive aspects of their local air quality. The data is shown in Table 3.2: and Table 3.3:, below.<sup>13</sup>

**Table 3.2: Perception of air quality as good or very good in local area, by geographic subgroups**

	Average	Region		Local Authority		
		North Wales	Mid Wales	Ceredigion	Gwynedd	Isle of Anglesey
<b>Your immediate neighbourhood</b>	<b>61%</b>	68%	80%	74%	81%	77%
<b>Your nearest town /city centre</b>	<b>39%</b>	50%	51%	54%	65%	59%

**Table 3.3: Perception of air quality as good or very good in local area, by other subgroups**

	Average	Report AQ has got better in past 10 yrs	Report AQ to have stayed the same	A ‘fair amount’ of AQ knowledge
<b>Your immediate neighbourhood</b>	<b>61%</b>	76%	71%	67%
<b>Your nearest town /city centre</b>	<b>39%</b>	54%	50%	43%

Air pollution was predominantly perceived to be a problem in cities rather than rural areas by all surveyed groups. Among adults, 57% agreed that ‘air pollution is mostly a problem in cities, not rural areas.’ For children, 69% of those aged 12-15 agreed with this statement and 58% of those aged 7-11 agreed that dirty

<sup>13</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

air is mostly in cities, not in the countryside.<sup>14</sup> This perception is consistent with other findings in this report, as it reflects the association of cities with traffic and industry. These are the main factors that adults identified as the two primary sources of outdoor air pollution (see Section 3.3).

**Figure 3.3: Air pollution in cities compared to rural areas**



Several subgroups of adults were statistically more likely than average to agree that air pollution is mostly a problem in cities, not rural areas.<sup>15</sup> These are:

- Those living in Carmarthenshire (69%).
- Demographically, men (61%) and respondents with an education level at GCSE/O-Level (67%) were more likely to hold this view.
- Those who reported that air quality had improved (66%) or stayed the same (63%), as well as those who reported they were not concerned about air quality (65%), were also statistically more likely to agree.

### 3.2 Understanding of air pollution visibility

While a high proportion of all surveyed groups understood that air pollution can affect people and be present, even when it’s not visible, there is a clear trend related to age. The vast majority (93%) of adults reported that air pollution can affect people even when it’s not visible. For children, 76% of those aged 12-15, and 62% of children aged 7-11 reported this understanding.<sup>16</sup> This suggests that the concept of invisible pollution is less firmly grasped by younger children.

<sup>14</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

<sup>15</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

<sup>16</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

**Figure 3.4: Air pollution visibility**



Several subgroups of adults were statistically more likely than average to agree with this understanding.<sup>17</sup> These groups included:

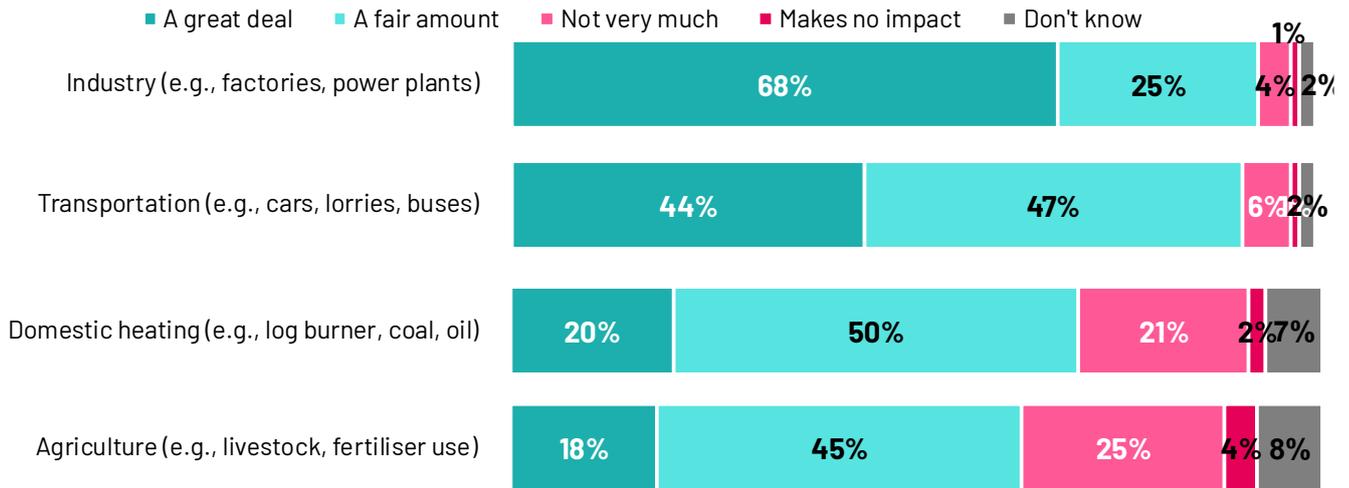
- Socioeconomically, those with a household income of £30,000–£39,999 (99%) were more likely to agree, as were degree holders (97%).
- Those expressing concern about air quality (those very/fairly concerned, 97%) and those perceiving change in air quality (those who thought that air quality had got better (96%) or got worse (96%) in the past 10 years) were also more likely to agree. This suggests that people who are already engaged with the issue are more likely to be aware that pollution is not always visible.
- Demographically, this included women (95%) and White participants (94%).
- Those who reported not knowing very much about air quality (95%) and those working full or part time (95%) were statistically more likely to agree. This aligns with findings in Chapter 2 that this group was also more likely to report noticing physical signs of air pollution in their area.

### 3.3 Main sources of outdoor air pollution

The vast majority of adults identified industry and transportation as the primary contributors to poor outdoor air quality in Wales, but fewer were aware of the impacts of domestic heating and agriculture. 93% of adult participants reported that they understood industry (e.g. factories, power plants) to contribute a great deal or a fair amount to poor outdoor air pollution in Wales and 91% said the same for transportation. However, slightly fewer (70%) reported that they understood domestic heating (e.g. log heating, coal or oil) and agriculture (e.g. livestock, fertiliser use) (64%) to contribute a great deal or a fair amount to poor outdoor air quality.

<sup>17</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

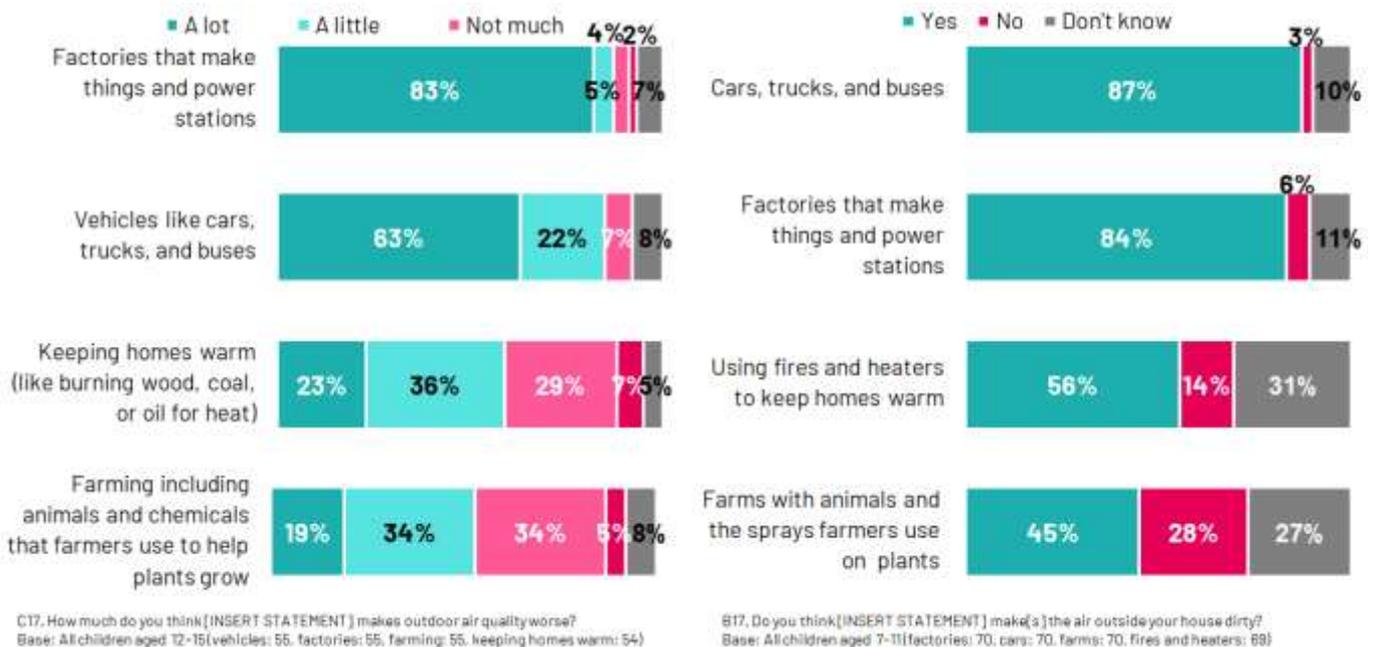
**Figure 3.5: Contributors to outdoor air pollution in Wales (adults)**



A17. How much do you think each of the following contributes to, or worsens, outdoor air quality in Wales? For each item, please select one option from the scale below.  
 Base: All Adults answering (transportation: 1,465, industry: 1,460, agriculture: 1,465, domestic heating: 1,466)

This perception was broadly similar among children, although recognition of domestic and agricultural sources was lower. Among children aged 12–15, 88% reported that they thought factories contributed a lot or a little to outdoor air quality, and 85% said the same about vehicles like cars, trucks and buses. Fewer (59%) thought that keeping homes warm contributed a lot, or a little, to poor outdoor air quality in Wales, and 53% said the same about farming including animals and chemicals that farmers use to help plants grow. For children aged 7–11, 87% reported that cars, trucks and buses contributed to dirty air, while 84% said the same about factories. Fewer (56%) reported that using fires and heaters to keep homes warm contributed to dirty air, and 45% said the same for farms.<sup>18</sup>

**Figure 3.6: Contributors to outdoor air pollution (children)**

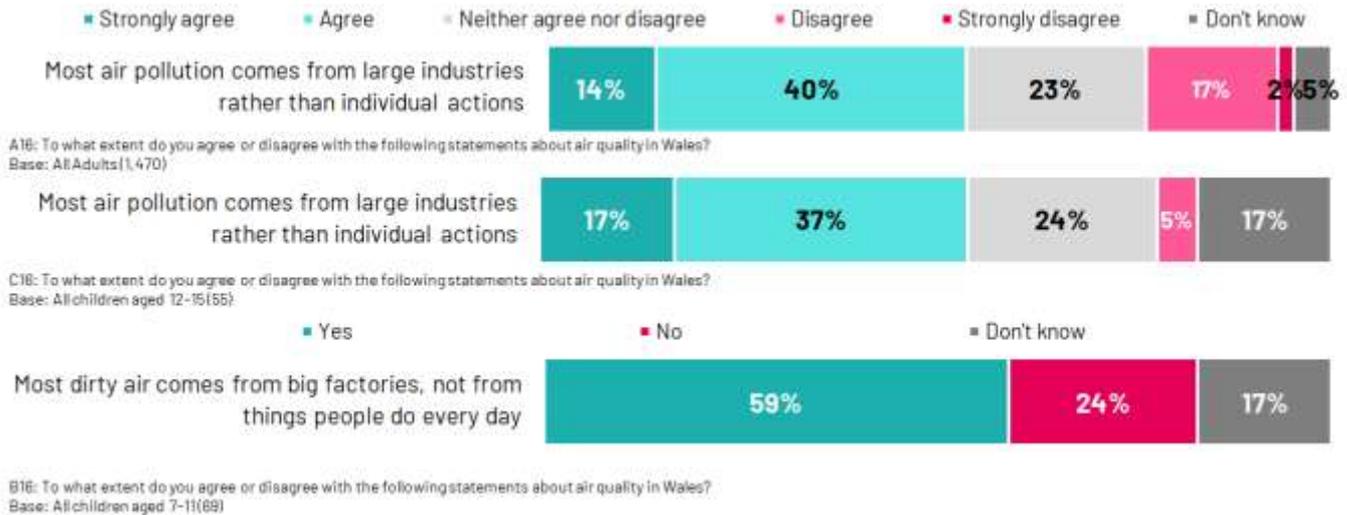


Overall, over half of all surveyed groups agreed with the statement that large industries, rather than individual actions, are the primary source of air pollution. 53% of adult participants agreed that most air

<sup>18</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7–11s, 56 for 12–15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

pollution comes from large industries rather than individual action, and 54% of those aged 12–15 agreed with this same statement. Among children aged 7–11, 59% reported that most dirty air comes from big factories, not things people do every day.<sup>19</sup> This suggests a tendency to place responsibility for air pollution on external, large-scale entities rather than on personal or collective behaviours (this is discussed further in Attitudes towards taking action on air quality). This could act as a barrier to public engagement in individual-level actions to improve air quality.

**Figure 3.7: Sources of outdoor air pollution**



For adults, several subgroups were statistically more likely than average to agree with the statement that most air pollution comes from large industries rather than individual outcomes.<sup>20</sup> These were:

- Geographically, those living in Flintshire (67%) were more likely than average to agree. This likely reflects the local prominence of, and historical reliance on, heavy industry in the area, shaping residents' views on the primary sources of pollution.<sup>21</sup>
- Demographically, younger people aged 16–29 (68%), students (73%) and those with education levels up to GCSE/O-Level (65%) were more likely to agree.

### 3.4 Conclusion

This chapter has explored public understanding of the characteristics and sources of outdoor air pollution in Wales, revealing a consistent set of beliefs across different age groups. The findings show a clear public perception that air quality is better in rural and coastal areas compared to urban and industrial zones. There is also a widespread understanding that air pollution can be invisible. Notably, all surveyed groups tend to attribute the majority of pollution to large-scale sources like industry and transport, with less recognition of the impact of domestic or agricultural activities or their own actions. This suggests a potential gap in public knowledge, with a tendency to view air pollution as a large-scale, industrial problem rather than something influenced by individual or local behaviours. Furthermore, the perception that pollution is primarily a problem for cities and large industries could present a barrier to engaging the public in behaviour change initiatives.

<sup>19</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7–11s, 56 for 12–15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

<sup>20</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

<sup>21</sup> <https://www.flintshire.gov.uk/en/Business/Flintshire-and-Wrexham-Investment-Zone.aspx>

# 4 Understanding of Indoor Air Quality

This chapter examines public understanding of indoor air pollution. It assesses how indoor air quality is perceived in comparison to outdoor air quality and explores public awareness of the various sources of indoor pollution, from damp and mould to household chemical products.

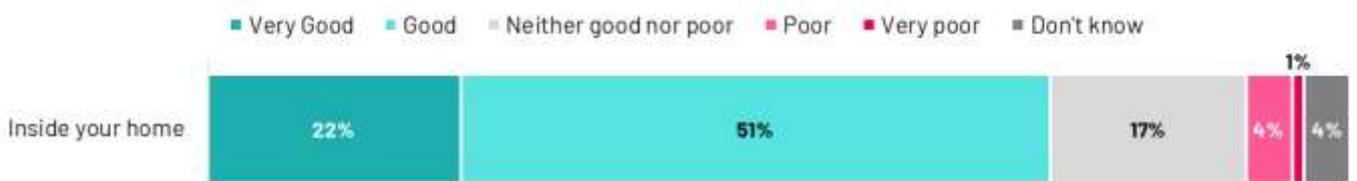
## Key Findings

- The majority of adults (74%) perceive the air quality inside their home as good or very good. This perception is more common among those with higher incomes, those living in less deprived areas, and residents of Mid Wales.
- Fewer than half of adults (41%) believe that indoor air quality can be worse than outdoor air quality. For children, just under half (49%) of those aged 7-11 agreed that air inside the house can be dirtier than air outside. Just 28% of children aged 12-15 agreed that air quality inside the home can be worse than outdoor air quality.
- Awareness of the sources of indoor pollution varies significantly among adults. While there is high recognition for traditional contributors such as lack of ventilation (85%) and damp/mould (81%), there is much lower awareness of chemical sources from household products (53%).
- Adults who are already concerned about air quality are consistently more likely to identify the full range of factors that contribute to poor indoor air quality.

### 4.1 Perception of indoor air quality compared to outdoor air quality

The majority of adults perceive the air quality inside their own home as good. Overall, 73% rated the air quality inside their home as good or very good, and just 5% rated it poor or very poor. The breakdown is shown in Figure 4.1:

Figure 4.1: Perception of air quality the home



A4. From what you know or have heard, how would you rate the air quality in the following locations?  
 Base: All Adults Your immediate neighbourhood (1,471); Your nearest town/city centre (1,467); Inside your home (1,469); Welsh coastal areas without factories (1,469); Welsh rural areas (1,461); Major roads in Wales (1,488); Industrial areas in Wales (1,451); In Wales overall (1,426)

Several subgroups were statistically more likely than average to agree that the air inside their home was good or very good.<sup>22</sup> These were:

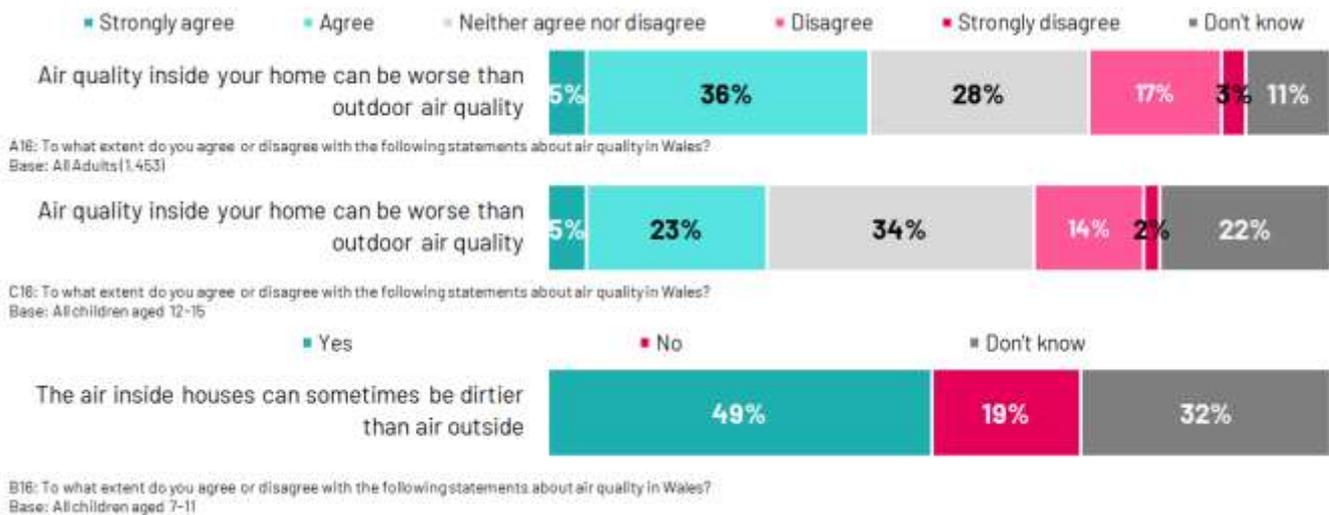
- Residents of Mid Wales (85%), and specifically Powys (93%), were considerably more likely to report good indoor air quality. This may be linked to the perception that these rural areas have better outdoor air quality, a belief which may extend to the indoor environment.
- Socioeconomically, those living in the least deprived areas (IMD quantile 1)(79%) and those earning £70,000–£89,999 annually (87%) were also more likely to perceive good indoor air quality.

<sup>22</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

- Those who felt air quality had got better (84%) or stayed the same (81%) in the past 10 years were more likely to report good indoor air quality. Similarly, those not very or not at all concerned about air quality (80%) were also more likely to rate their indoor air quality as good.
- Those with an education up to A-levels (83%) and those not working (79%) were also more likely to perceive good indoor air quality, as were older adults (aged 65–84) (82%).

Opinion is divided among adults on whether indoor air can be worse than outdoor air. When asked if the air quality inside a home can be worse than the air quality outdoors, 41% of adult participants agreed, while 20% disagreed. For children, just under half (49%) of those aged 7-11 agreed that air inside the house can be dirtier than air outside. Just 28% of children aged 12-15 agreed that air quality inside the home can be worse than outdoor air quality.<sup>23</sup>

**Figure 4.2: Perception of indoor vs outdoor air quality**



Several subgroups were statistically more likely than average to agree that the air quality inside their home can be worse than outdoor air quality.<sup>24</sup> These were:

- Those with higher socioeconomic status and education level were consistently more likely than average to agree that indoor air can be worse than outdoor air. This includes those with higher household incomes (e.g., 64% for those earning £90,000+), those living in the least deprived areas (47%), and those with a degree-level education (53%). This pattern was also seen in related demographic groups, such as those aged 30-44 (57%) and those working full or part-time (47%). This suggests that a more detailed understanding of environmental health risks is more common among these groups.
- Those reporting that air quality had got better in the last 10 years (51%) were more likely to agree, as were those reporting a fair amount of knowledge about air quality (47%), and those very or fairly concerned about air quality (43%). This could suggest that a heightened awareness of air quality issues, in general, leads to a greater appreciation of the potential for indoor air pollution.

<sup>23</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

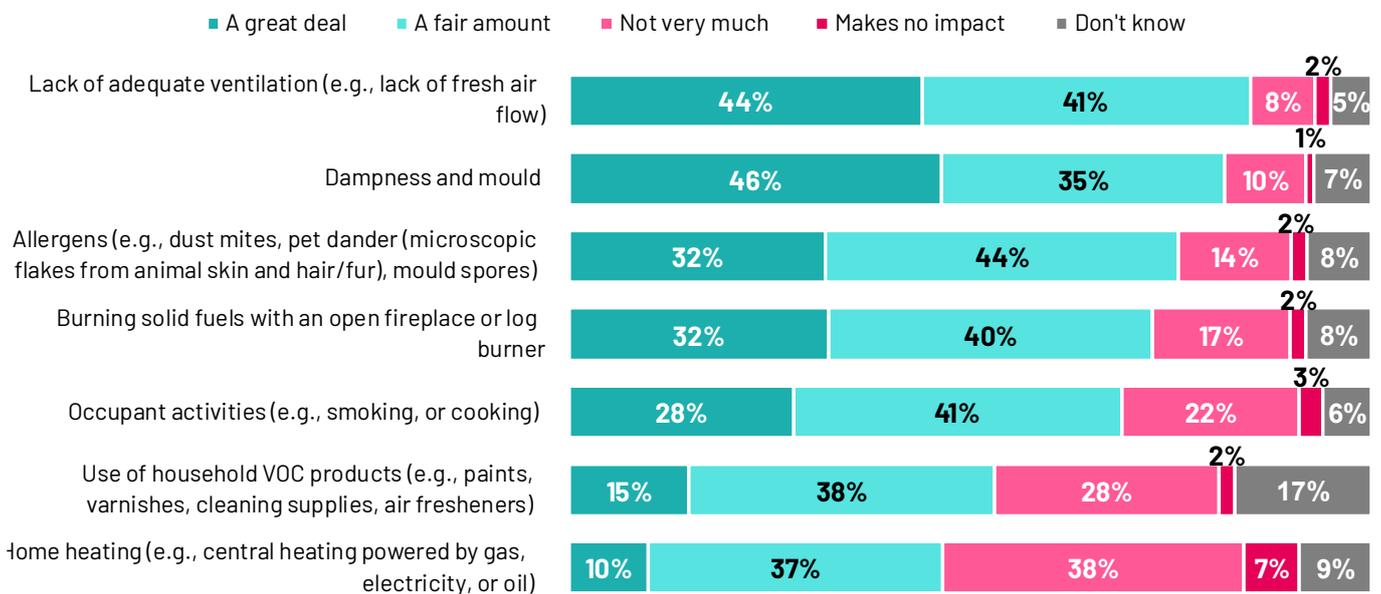
<sup>24</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

## 4.2 Factors contributing to indoor air quality

Adults have a strong understanding of issues which may increase indoor air pollution like poor ventilation and damp, but less awareness of chemical sources like VOCs. When adult survey participants were asked to rate contributors to indoor air quality, there was high recognition for conditions like lack of adequate ventilation (85%), dampness and mould (81%), as well as sources such as allergens (76%). Recognition was lower for other sources including the burning of solid fuels (72%) and occupant activities like cooking (69%). Awareness dropped significantly for chemical sources, with only 53% identifying VOC household products (e.g., paints, cleaning supplies).

Additionally, 47% identified home heating systems (e.g. central heating powered by gas, electricity or oil) as contributors to poor indoor air quality. However, these heating systems can improve indoor air quality by controlling humidity levels and preventing conditions that encourage mould growth, although some, like gas heating systems, may emit pollutants such as NOx. The breakdown is shown in Figure 4.3:

**Figure 4.3: Factors contributing to poorer indoor air quality (adults)**



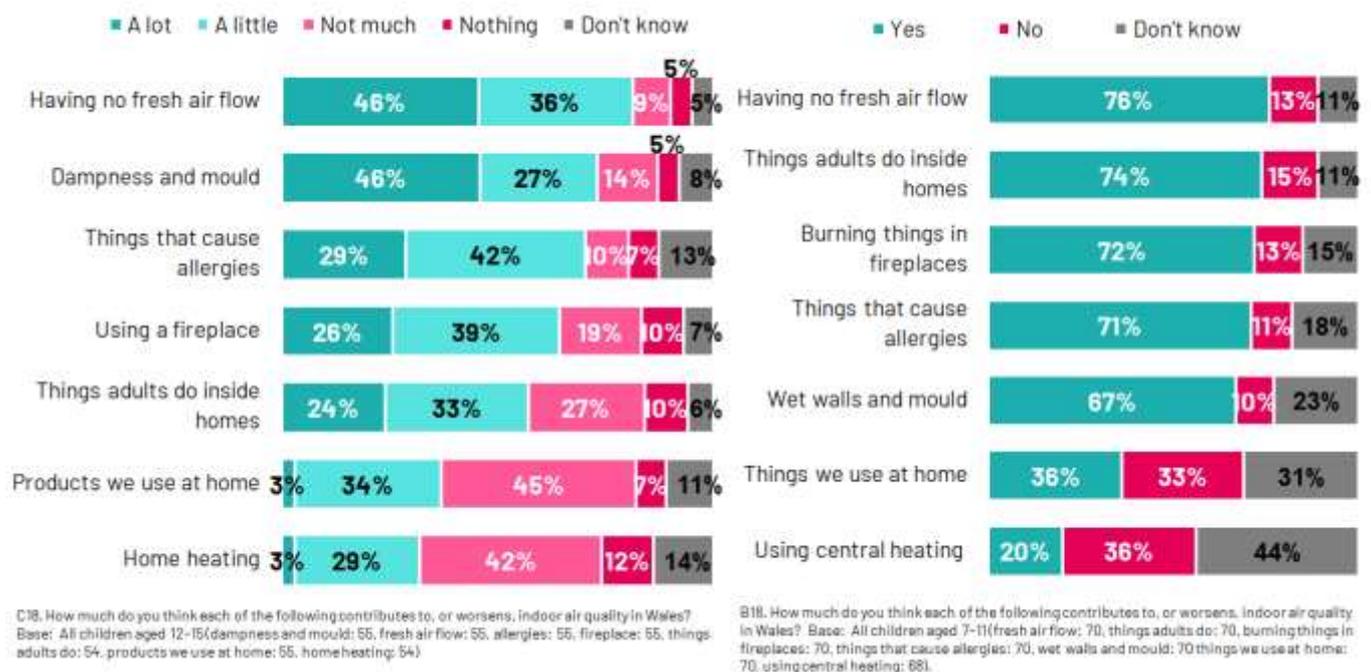
A18. How much do you think each of the following contributes to, or worsens, indoor air quality in Wales?  
 Base: All Adults (dampness and mould: 1,465, lack of adequate ventilation: 1,466, burning solid fuels: 1,467, allergens: 1,467, occupant activities: 14,66, household VOC products: 1,466, home heating: 1,467)

There was one subgroup who was consistently more likely than average to agree that each of these factors contributed to, or worsens, indoor air quality in Wales: those who reported they were very/fairly concerned about air quality. This is somewhat unsurprising, as it indicates that individuals who are already concerned about the topic are more likely to be informed about the specific factors that can influence it. The data is shown in 0

**Table 4.1: Factors contributing to poorer indoor air quality, by subgroup**

	Average	Very/fairly concerned about air quality
Lack of adequate ventilation (e.g., lack of fresh air flow)	85%	89%
Dampness and mould	81%	85%
Allergens (e.g., dust mites, pet dander, mould spores)	76%	81%
Burning solid fuels with an open fireplace or log burner	72%	77%
Occupant activities (e.g., smoking, or cooking)	69%	74%
Use of household VOC products (e.g., paints, varnishes, cleaning supplies, air fresheners)	53%	58%
Home heating (e.g., central heating powered by gas, electricity, or oil)	47%	51%

**Figure 4.4: Factors contributing to poorer indoor air quality (children)**



For children, findings also provide insights into their understanding of indoor air quality contributors. Children aged 12-15 identified lack of fresh air flow (82%), dampness and mould (73%) and allergens (71%) as key contributors to poorer indoor air quality. Awareness among this group was lower concerning the role of domestic products (37%) and home heating (33%), likely reflecting their limited scope of knowledge and understanding typical of their age. Children aged 7-11 pointed to lack of fresh air flow (76%), adult activities (74%), fireplace use (72%) and allergies (71%) as the as primary contributors to indoor air quality.<sup>25</sup>

<sup>25</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

### 4.3 Conclusion

This chapter established a baseline of public understanding regarding indoor air quality, identifying key perceptions of risk and sources. The findings show that while most adults feel the air inside their home is good, fewer than half believe it can be worse than the air outdoors. This varied most strongly with socioeconomic status, with higher income and educated adults more likely to perceive poor quality indoor air as a potential issue. Awareness of what causes poor indoor air quality also varied significantly: while traditional sources like damp and poor ventilation were well understood, there was lower awareness of chemical pollutants from everyday household products and heating systems. These findings highlight lower levels of public awareness around the risks posed by less visible, chemical sources of indoor pollution.

# 5 Understanding of the Impacts of Air Pollution

This chapter examines public understanding of the impacts of air pollution on both people and the environment. It assesses the level of worry these impacts cause, explores awareness of the specific health conditions linked to poor air quality, and examines who in society is perceived to be most at risk.

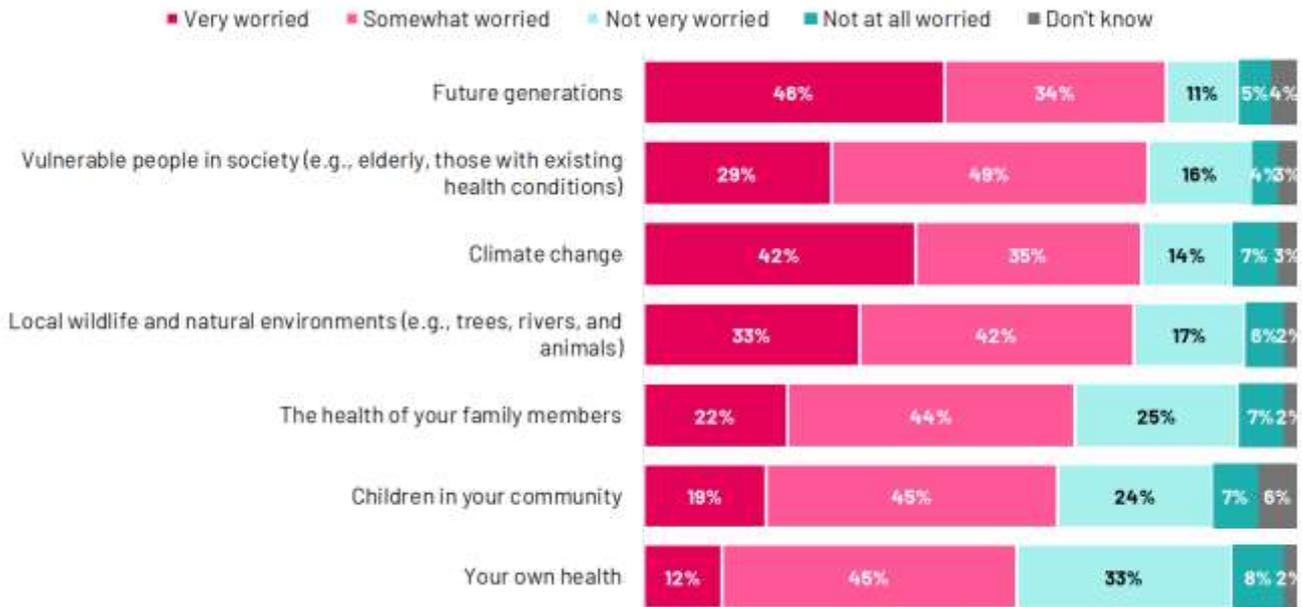
## Key Findings:

- Adults are more worried about the environmental and societal impacts of air pollution (80% for future generations, 77% for climate change) than they are for their own personal health (57%). This pattern was observed among children, who also prioritise worry for others and the environment over their own health.
- There is high awareness that air pollution impacts medically vulnerable groups, such as people with respiratory conditions (96%) and older people (92%), but significantly lower awareness of the heightened risk for people from low-income backgrounds (59%).
- Awareness of the health conditions linked to air pollution is high for respiratory issues (95% for respiratory diseases, 82% for asthma) but lower for systemic health risks like dementia (15%), stroke (14%), and diabetes (7%).
- Scepticism about the severity of air pollution's health impacts is low among adults (15% agree they are overstated). Around a third (32%) of children aged 12-15 agreed that the health impacts of air pollution are often presented as more serious than they are.

## 5.1 Level of worry about impacts of poor air quality

Worry about the impacts of air pollution is high, but adults are consistently more concerned about the environment and future generations than their own personal health. As shown in Figure 5.1: - 80% of adult participants reported they were very or somewhat worried for future generations, 77% reported the same for climate change and 75% reported the same for local wildlife and natural environments. With the exception of vulnerable people, the level of worry was somewhat lower for the impacts on different groups in society. 77% reported they were very or somewhat worried about vulnerable groups in society, 66% reported the same for the health of their family members, and 64% reported the same for children in their community. Interestingly, a smaller proportion (57%) reported they were very or somewhat concerned for their own health.

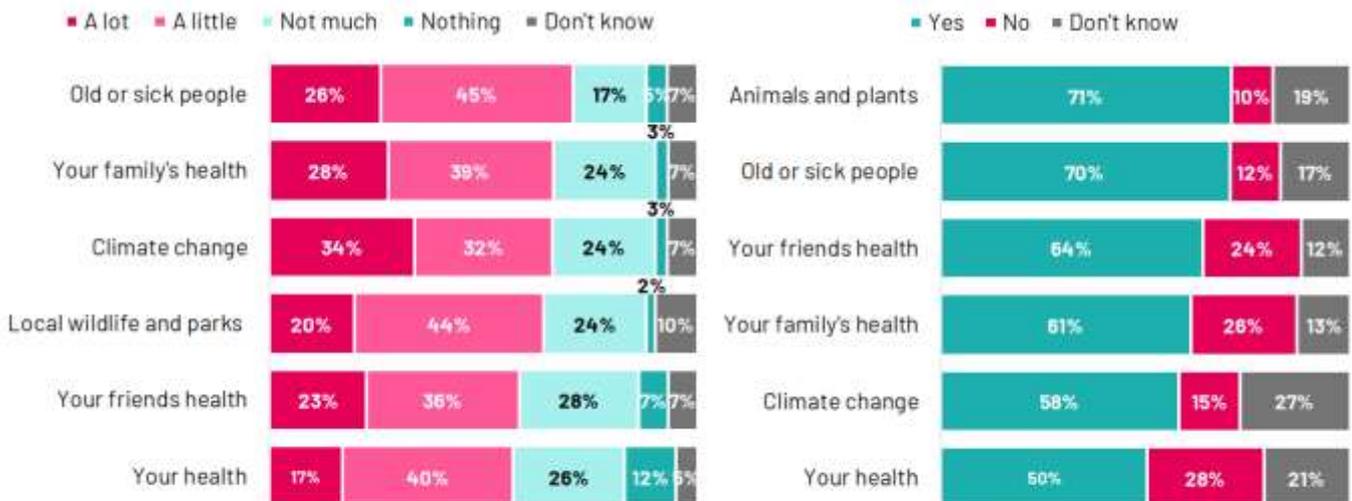
**Figure 5.1: Level of worry about the effects of air pollution (adults)**



A18. How worried, if at all, are you about the effects of air pollution on each of the following? Base: All Adults (Future generations: 1,485; climate change: 1,462; local wildlife: 1,462; vulnerable people: 1,485; health of family: 1,463; children in community: 1,463; your own health: 1,486)

For children, concern was similarly focused on the health of older people and wider environmental issues. 71% of children aged 12-15 reported they were a lot or a little worried about the effects of air pollution on old or sick people, and two-thirds (66%) reported the same for their family’s health and climate change. For children aged 7-11, 71% reported they were worried about animals and plants and 70% said the same about old or sick people. Consistent with adults, a smaller proportion of children also reported they were worried about their own health. 57% of children aged 12-15 reported they were a lot or a little worried, and 50% of children aged 7-11 reported they were worried about their own health.<sup>26</sup> This data is shown in Figure 5.2: overleaf.

**Figure 5.2: Level of worry about the effects of air pollution (children)**



C19. Do you worry about the effects of air pollution on [INSERT STATEMENT]? Base: All children aged 12-15 (climate change: 55; your family's health: 55; old or sick people: 55; your friends health: 54; local wildlife and parks: 55; your health: 55)

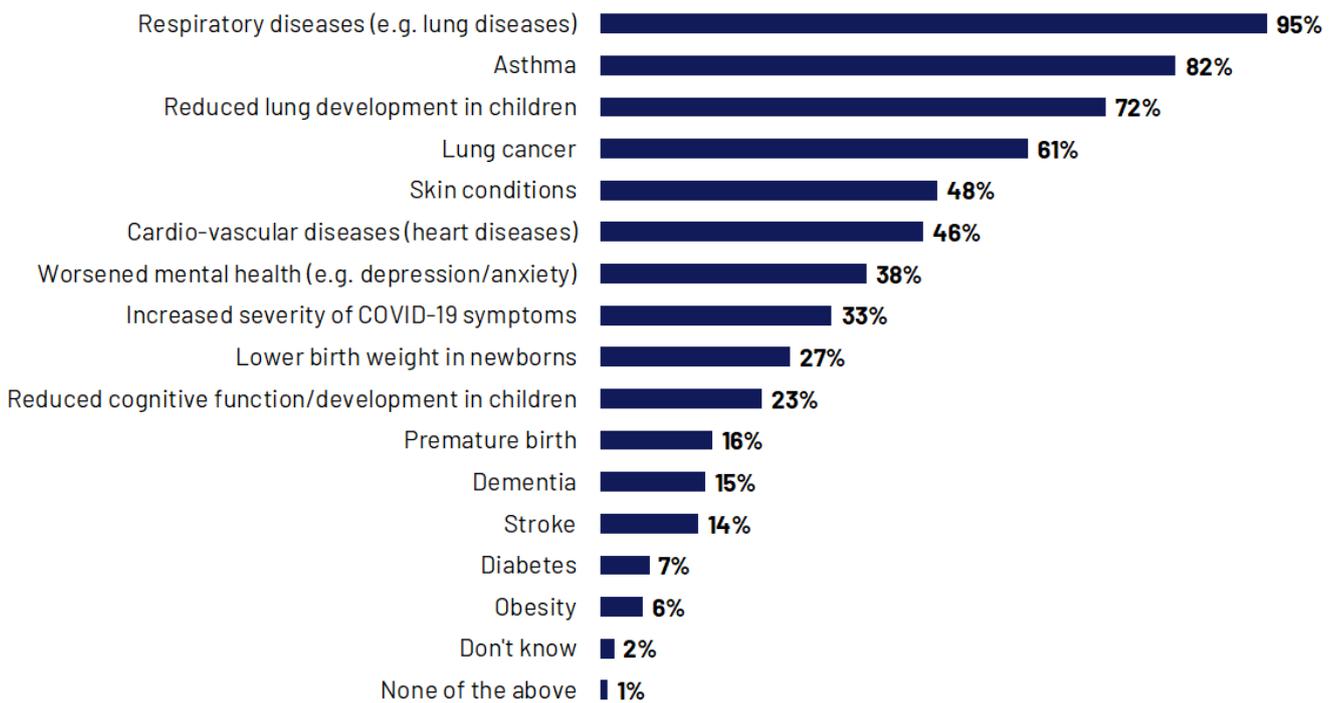
B19. Do you worry about the effects of air pollution on [INSERT STATEMENT]. Base: All children aged 7-11 (animals and plants: 69; old or sick people: 70; your friend's health: 70; your family's health: 70; climate change: 70; your health: 70)

<sup>26</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

## 5.2 Awareness of air quality related health conditions

There was also varying awareness of the different types of conditions which can be caused or worsened by air pollution. While respiratory impacts are more well known, participants reported lower awareness of wider cardiovascular, neurological, and metabolic impacts. The majority of adult participants understood that air pollution can cause or worsen respiratory conditions and harm the lungs – respiratory conditions (95%), asthma (82%), reduced lung development in children (72%) and lung cancer (61%). However, there were much lower levels of awareness of the association with premature birth (16%), dementia (15%), stroke (14%), diabetes (7%) and obesity (6%). Just 1% reported that air pollution would not cause or worsen any of the above conditions.

**Figure 5.3: Perception of health conditions which can be caused by or worsened by air pollution**



A21: From what you know or have heard, which of the following health conditions do you believe can be caused or worsened by air pollution?  
 Base: All Adults(1,465)

Three subgroups frequently reported above-average incidences of the top three health issues possibly caused or worsened by air pollution: individuals with a degree-level education, those who are very or fairly concerned about air quality and those who perceive air quality to have worsened.<sup>27</sup> The data is shown in Table 5.1:

<sup>27</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

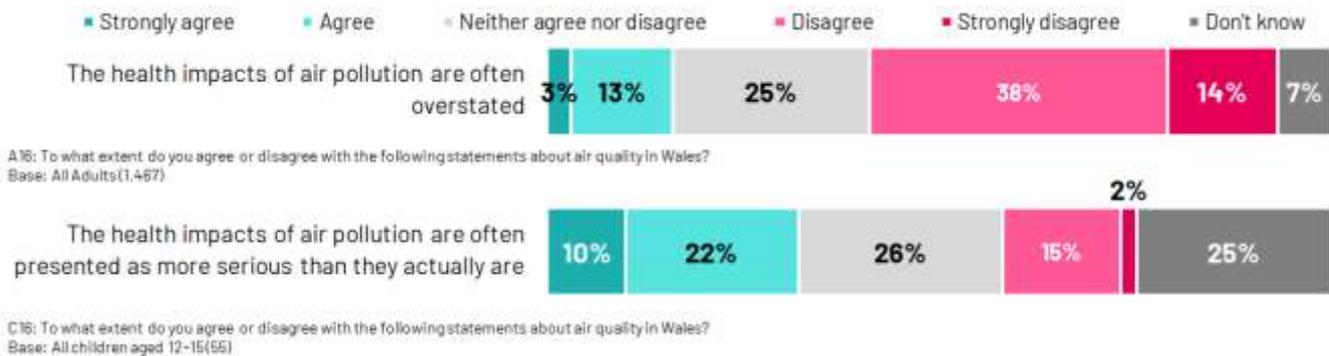
**Table 5.1: Health conditions caused or worsened by air pollution, by subgroup**

	Average	Very/fairly concerned about air quality	Perceive air quality to have worsened	Degree-level education
<b>Respiratory diseases (e.g. lung diseases)</b>	<b>95%</b>	97%	97%	97%
<b>Asthma</b>	<b>82%</b>	85%	86%	88%
<b>Reduced lung development in children</b>	<b>72%</b>	77%	76%	78%

### 5.3 Level of scepticism regarding severity of health impacts

The scepticism about the health impacts of air pollution is low among adults, with very few (15%) agreeing that the health impacts of air pollution are overstated. However, this was notably higher among children aged 12-15, with around a third (32%) indicating they agreed that the health impacts of air pollution are often presented as more serious than they are. This suggests a greater degree of scepticism among this group.<sup>28</sup> This question was not asked of children aged 7-11. The data is shown in Figure 5.4:

**Figure 5.4: Perception of severity of health impacts**



Various subgroups were more inclined, statistically, to believe that the health consequences of air pollution are often overstated. These were:

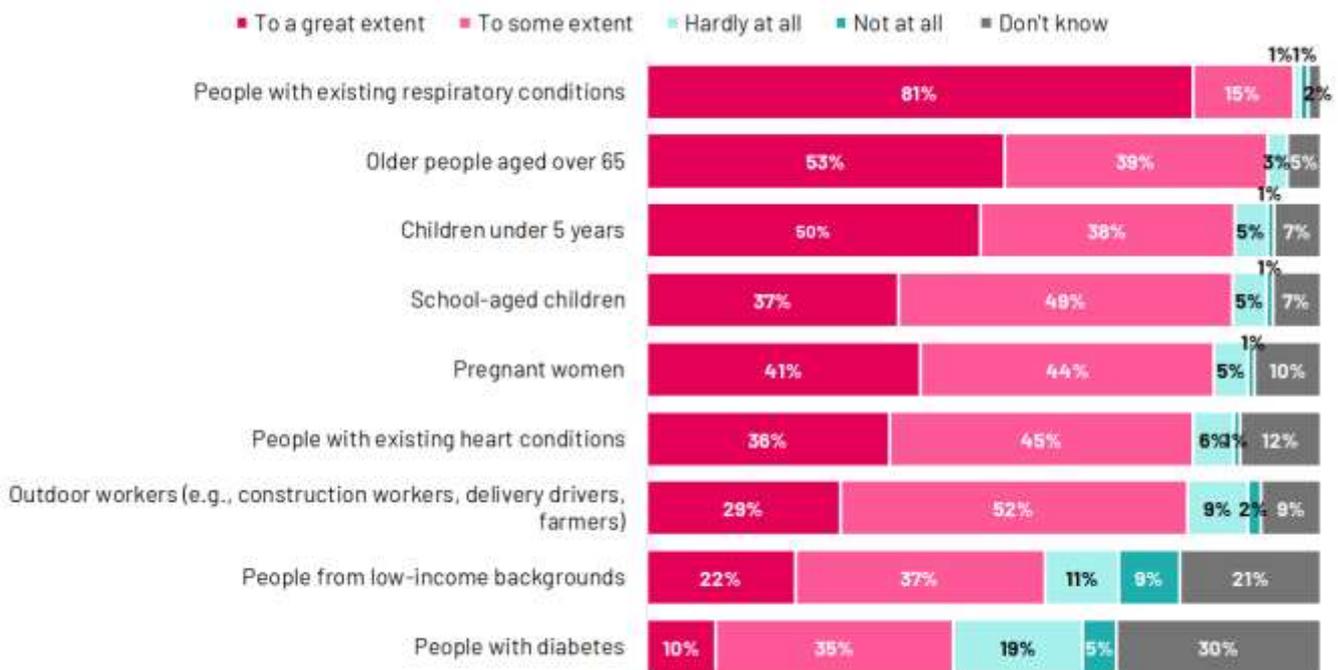
- Those who reported that air quality had worsened (21%) or stayed the same (21%), as well as those who reported they were not concerned about air quality (23%), were statistically more likely to agree. Despite perceiving a decline in air quality, perceived health risks are still considered overstated, suggesting a disconnect between actual exposure and risk perception.
- Scepticism was also more likely among groups with lower socioeconomic status and educational attainment. Those living in the most deprived areas (IMD quantile 5 - 22%) and those with no qualification (28%) were both more likely than average to agree that the health impacts of air pollution are exaggerated. This may reflect several factors, including potentially lower levels of access to detailed environmental health information or differing levels of trust in official sources.
- Geographically, those living in Merthyr Tydfil (46%) were more likely to agree.
- Those from any ethnic minority background also reported higher levels of agreement than average regarding the severity of the health impacts of air pollution (38%).

<sup>28</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

### 5.4 Perceived vulnerability of different groups

There is widespread understanding that air pollution affects medically vulnerable people, but far less awareness of its impact on socioeconomically disadvantaged groups. The vast majority of adult participants understood that poor air quality impacts the health of a variety of different groups of people, in particular people with respiratory conditions (96%), older people (92%) and children under 5 years old (88%), as well as school-aged children (86%), pregnant women (85%), people with existing heart conditions (81%) and outdoor workers (81%). There was less awareness that air pollution can have an impact on the health of people from low-income backgrounds (59%), and under half (45%) reported the same for people with diabetes. This could indicate a knowledge gap around the social determinants of health, where factors like income can increase a person's exposure and susceptibility to pollution.

**Figure 5.5: Perception of impact of air pollution on the health of different groups (adults)**

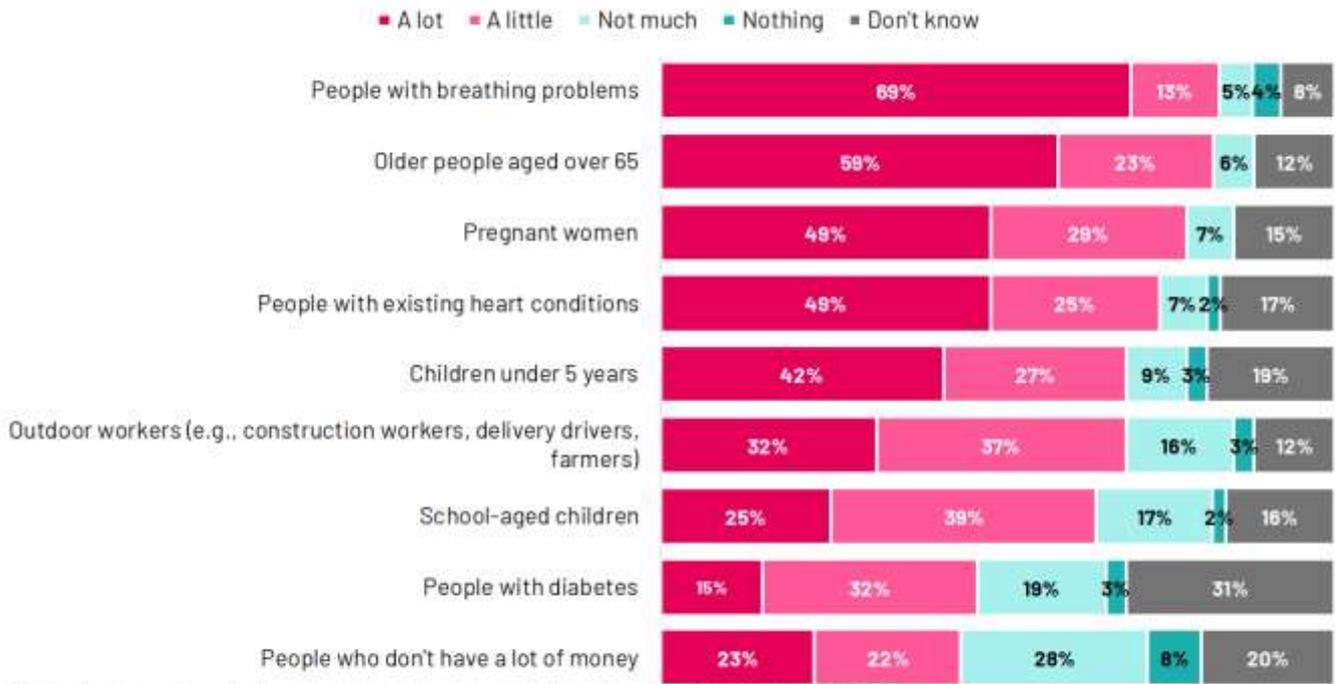


A22. Based on what you know or have heard, to what extent, if at all, do you think air pollution affects the health of each of the following groups?  
 Base: All Adults (existing respiratory conditions: 1464, aged over 65: 1464, children under 5 years: 1456, pregnant women: 1464, School-aged children: 1458, existing heart conditions: 1461, outdoor workers: 1465, Low-income backgrounds: 1464, people with diabetes: 1458)

This knowledge gap between medical and social vulnerability was also evident among surveyed children of all ages. The majority children aged 12-15 understood that poor air quality impacts the health of people with breathing difficulties (82%), and older people (82%), along with most other vulnerable groups. Fewer understood the impacts of poor air quality on the health of people with diabetes (47%) and people who don't have a lot of money (45%).<sup>29</sup> This data is shown in Figure 5.6., overleaf.

<sup>29</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

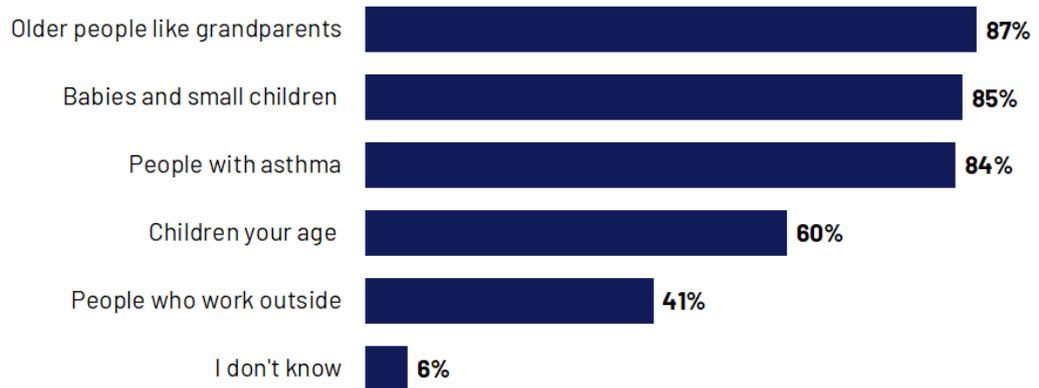
**Figure 5.6: Perception of impact of air pollution on the health of different groups (children aged 12-15)**



C22. Based on what you know or have heard, to what extent, if at all, do you think air pollution affects the health of each of the following groups?  
 Base: All children aged 12-15 (people with breathing problems: 55, older people aged over 65: 55, people with heart conditions: 55, pregnant women: 55, children under 5: 55, outdoor workers: 53, schoolaged children: 55, people who don't have a lot of money: 55, people with diabetes: 55)

Likewise, children aged 7-11 also reported that dirty air can make older people (87%), babies and small children (85%) and people with asthma (84%) sick. Fewer than half of children understood that dirty air can have an impact on people who work outside (41%).<sup>30</sup> This data is shown in Figure 5.7:

**Figure 5.7: Perception of impact of air pollution on the health of different groups (children aged 7-11)**



B22. Which of these people do you think dirty air might make sick? Select as many as you want?  
 Base: All children aged 7-11(70)

<sup>30</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

## 5.5 Conclusion

This chapter established a baseline of public understanding of the impacts of air pollution, identifying consistent patterns in how risk and vulnerability are perceived. The findings show that worry was consistently higher for environmental issues and the health of others than for personal health. Awareness of health impacts also varied: while respiratory conditions were well understood, there was lower awareness of systemic risks like dementia or stroke. Similarly, medically vulnerable groups were more readily identified as being at risk than socioeconomically disadvantaged groups. Finally, scepticism about the severity of health impacts was low among adults but notably higher among older children. These findings highlight lower levels of public awareness around the personal, systemic, and social dimensions of air pollution's impact.

# 6 Current Behaviours and Attitudes Influencing Air Quality

This chapter explores current public behaviours and attitudes that influence air quality. It examines day-to-day travel and home heating habits, identifies which actions people report already taking, and assesses attitudes towards doing more, including the public's willingness, perceived barriers, and beliefs about which actions are most effective.

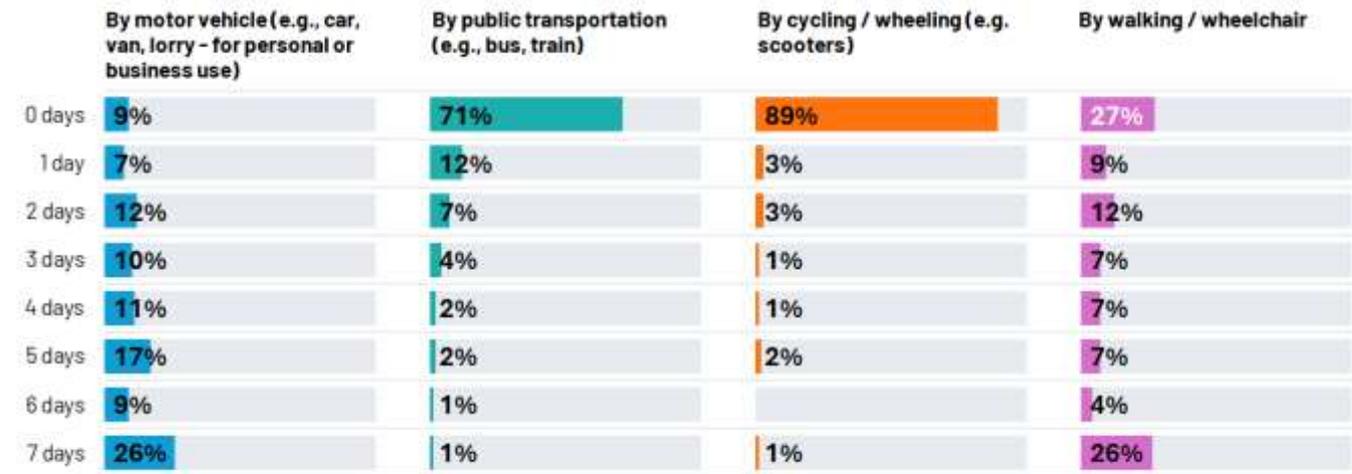
## Key Findings

- Car travel is the dominant mode of transport, with 91% of adults having travelled by car in the past week. This is primarily driven by convenience (75%) and travel time (65%), with cost (46%) being a less critical factor.
- The largest single group of adults (40%) are willing to take more action on air quality but are unsure what to do. A similar proportion (39%) are held back by practical barriers like poor public transport (cited by 35% of those with barriers) and cost (23%), or by a belief that their actions won't make a difference (21%).
- The most commonly reported behaviours that have co-benefits for air quality are walking or cycling for short journeys (67%) and turning off idling engines (51%).
- Home heating is dominated by gas (used in some form by 87% of households), with a significant minority using solid fuels (15%) or oil (9%). Uptake of low-carbon technologies like heat pumps is very low (under 5%).
- Adults perceive transport-related actions as most effective for improving air quality (e.g., 91% for walking/cycling), which aligns with the perception of transport as a primary pollution source.

## 6.1 Current travel behaviours

Car travel is the dominant mode of transport for adults, with walking being the only other frequently used mode. A very high proportion (91%) of adults had used a motor vehicle to travel at least once in the past week, with a quarter every day (26%), while 73% had walked or used a wheelchair at least once in the past week, and the same proportion did this daily as for cars (26%). This drops for public transportation and cycling or wheeling – 29% had travelled by public transport at least once in the past week, and 11% said the same for cycling or wheeling. The breakdown of days travelled by each mode is shown in Figure 6.1:

**Figure 6.1: Travel frequency and mode (adults)**



AB: On how many days over the past week did you personally travel...? Enter 0-7 days for each.  
 Base: All Adults (1,455)

Several adult subgroups were consistently more likely than average to travel by car at least once in the past week.<sup>31</sup> These groups are:

- Those working full or part-time (95%) and those with further education qualifications (other higher education below degree level - 99% - showed especially high rates of car travel).
- Those with higher household incomes, specifically those earning £50,000-£69,999 (98%) and £70,000-£89,999 (100%), and those living in the least deprived areas (IMD quantile 1 - 96%) were more likely to travel by car.
- Interestingly, those reporting a fair amount of knowledge about air quality (95%) were also more likely to travel by car.
- Demographically, those aged 45-64 (94%) were more likely than average to have travelled by car in the past week, as were white respondents (92%).

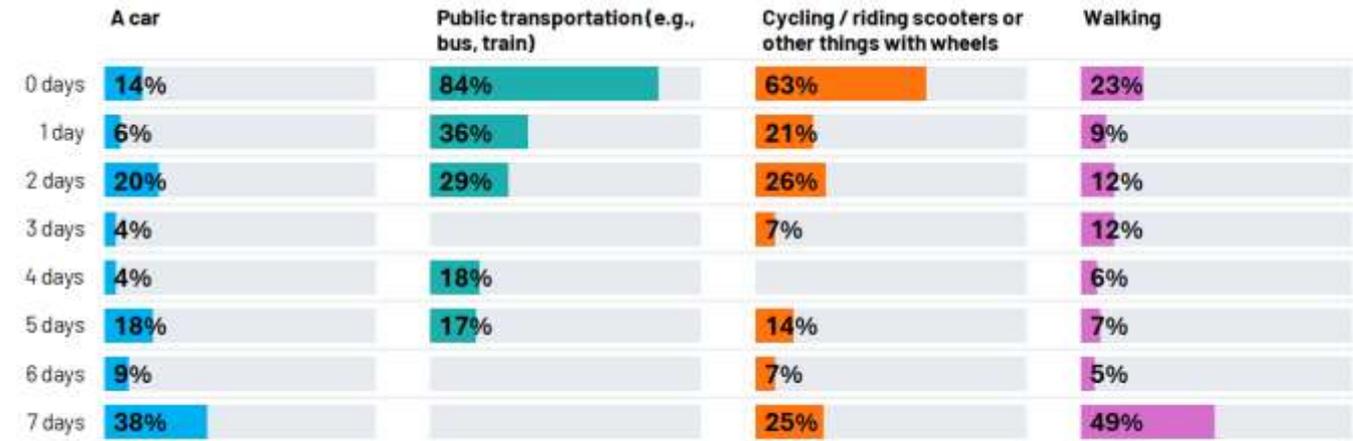
This data paints a picture of car dependency being highest among those who are working and have higher incomes, likely reflecting commutes and lifestyles built around private vehicle use. The finding that those with a fair amount of air quality knowledge are also more likely to travel by car highlights a significant gap between awareness and behaviour.

For children aged 7-11, the car and walking were the most used forms of transportation. Most (87%) surveyed children aged 7-11 reported they had travelled by car in the past week, and three quarters (76%) said the same for walking. Over a third (36%) had travelled by bike or scooter, and just 11% had travelled by public transport (bus or train).<sup>32</sup> The breakdown of days travelled by each mode is shown in Figure 6.2:

<sup>31</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

<sup>32</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

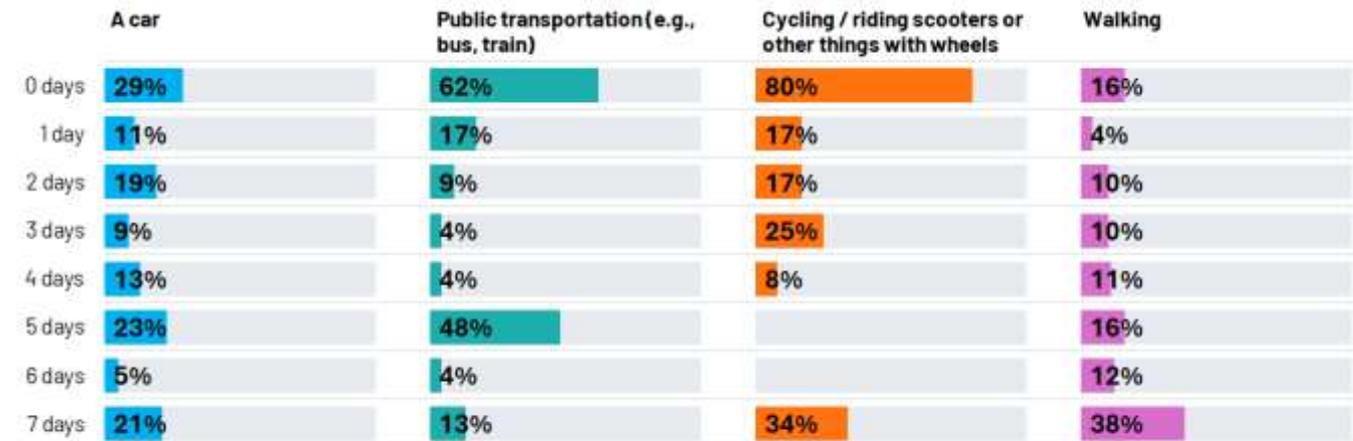
**Figure 6.2: Travel frequency and mode (children aged 7-11)**



88b: On how many days over the past week did you personally travel...? Enter 0-7 days for each.  
 Base: All Children aged 7-11 A car (60); A bus or a train (11); A bike or scooter (26); Walking (54)

However, among older children aged 12-15, walking was the most popular mode of transport in the past week, with 84% reporting they had travelled by walking in the past week. 73% reported they had travelled by car, 40% reported the same for public transport and 23% reported the same for cycling / riding scooters. This could reflect their increased independence and ability to walk to school or to see friends, reducing their reliance on being driven by parents.<sup>33</sup> The breakdown of days travelled by each mode is shown in Figure 6.3:

**Figure 6.3: Travel frequency and mode (children aged 12-15)**



C8b: On how many days over the past week did you personally travel...? Enter 0-7 days for each.  
 Base: All Children aged 12-15 A car (39); Public transportation (21); Cycling / riding scooters or other things with wheels (11); Walking (46)

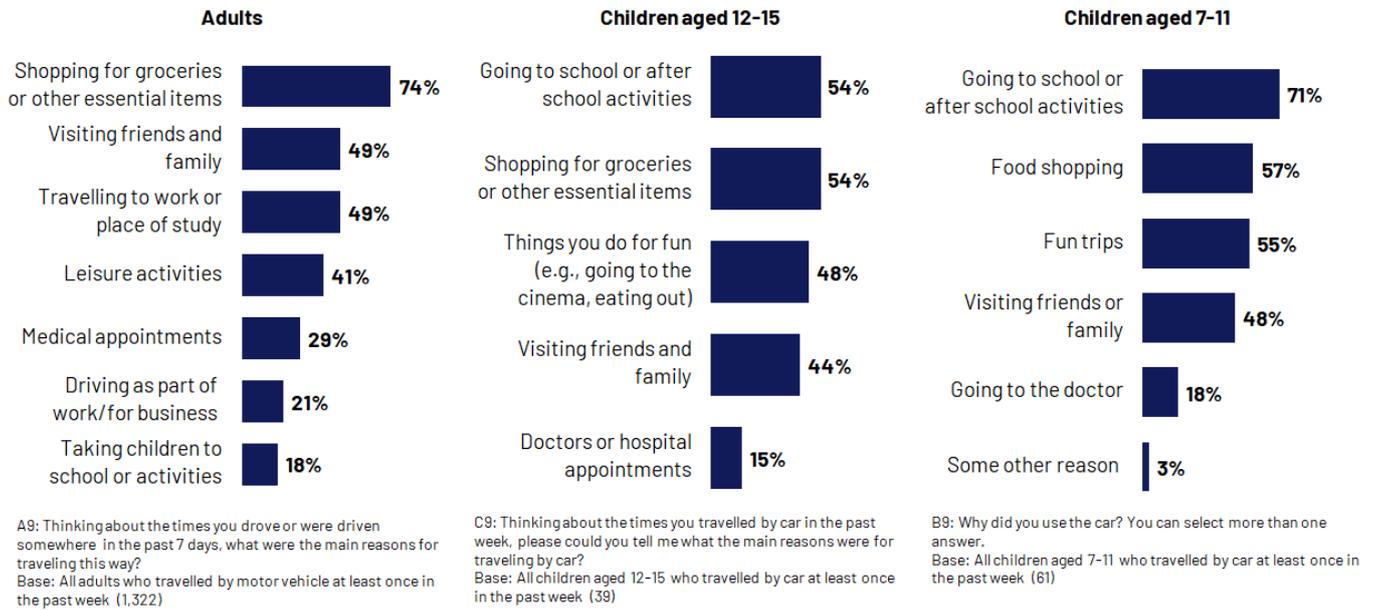
**Factors influencing travel mode**

When it came to the reasons for travelling by car, it was most common for adults to report that they used the car for shopping or other essential items – 74% reported this. Around half (49%) reported that they used the car for visiting friends/family and travelling to their work/place of study. For children, it was most common for them to report travelling by car to go to school or after school activities (54% of children aged 12-15, and 71% of children aged 7-11), followed by shopping for groceries / food (54% children aged 12-15, and

<sup>33</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

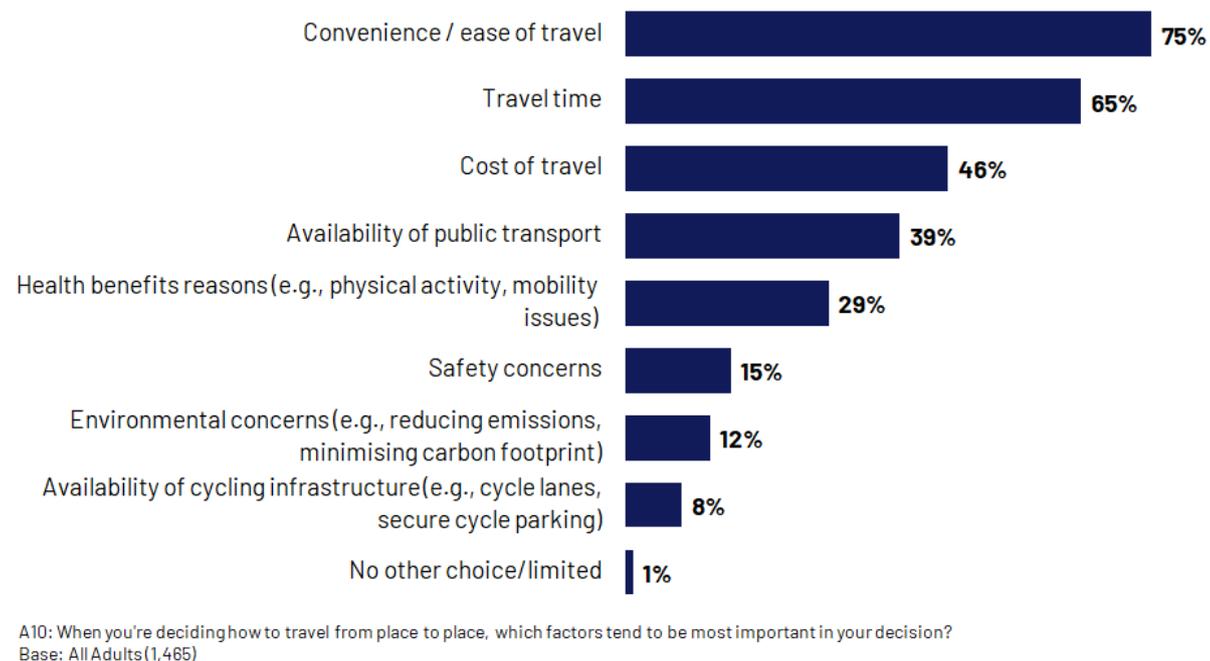
57% of children aged 7-11), and leisure or fun activities (48% of children aged 12-15 and 55% of children aged 7-11).<sup>34</sup> The breakdown is shown in Figure 6.4:

**Figure 6.4: Reasons for travelling by car all groups**



When choosing how to travel, convenience and time are the overwhelming priorities for adults. In the survey respondents were asked about the factors which influence their decision on how to travel. It was most common for them to report that the key factor in their decision was around convenience or ease of travel (75%), followed by travel time (65%) and cost of travel (46%). The breakdown is shown in Figure 6.5:

**Figure 6.5: Factors influencing decision on how to travel**



<sup>34</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

Several subgroups are significantly more likely to prioritise different factors in their decision on how to travel.<sup>35</sup> These are:

- Older adults are more likely to prioritise health benefits (36% of those aged 65–84, and 51% of those aged 85+). Women focus on health benefits (32%) and safety concerns (19%). Younger adults (16–29) and those aged 30–44 prioritise travel time (77% and 79%, respectively).
- Individuals with higher incomes (£70,000–£89,999 and £90,000+) are more likely to prioritise reducing travel time (82%–88%). Middle-income earners (£50,000–£69,999) are more inclined towards convenience and ease (88%). Those earning £40,000–£49,999 place more emphasis on the cost of travel (59%).
- People concerned about air quality are more likely to prioritise health benefits (33%) and environmental concerns (15%) in their decision-making.
- Residents of Cardiff are more likely to prioritise the cost of travel (62%) and availability of public transport (51%). Monmouthshire residents tend to focus on health benefits (52%) and environmental concerns (25%).
- Those with degree-level education or above, including SVQ Level 5, are more likely to prioritise convenience and ease (82%), along with travel time and cost considerations.

## 6.2 Current home heating behaviours

The methods used for home heating have direct and varied implications for both indoor and outdoor air quality, with the data, as expected, showing a heavy reliance on gas. The vast majority of households use gas for heating, with 77% of adult survey participants reporting they used gas-fired central heating and a further 10% using other gas-burning heating appliances. Gas combustion is a known source of outdoor nitrogen oxide (NO<sub>x</sub>) pollution, and can be a source of indoor pollution also.

A notable minority of households use other combustion-based fuels like solid fuel and oil. In total, 11% use solid fuel-burning appliances and 4% use solid fuel-burning central heating. A further 9% use oil-fired central heating. The domestic burning of these fuels is a significant contributor to fine particulate matter (PM<sub>2.5</sub>) pollution. Among those who burn solid fuels, most use it as a supplementary heat source, with 73% reporting they use it for some of their heating.

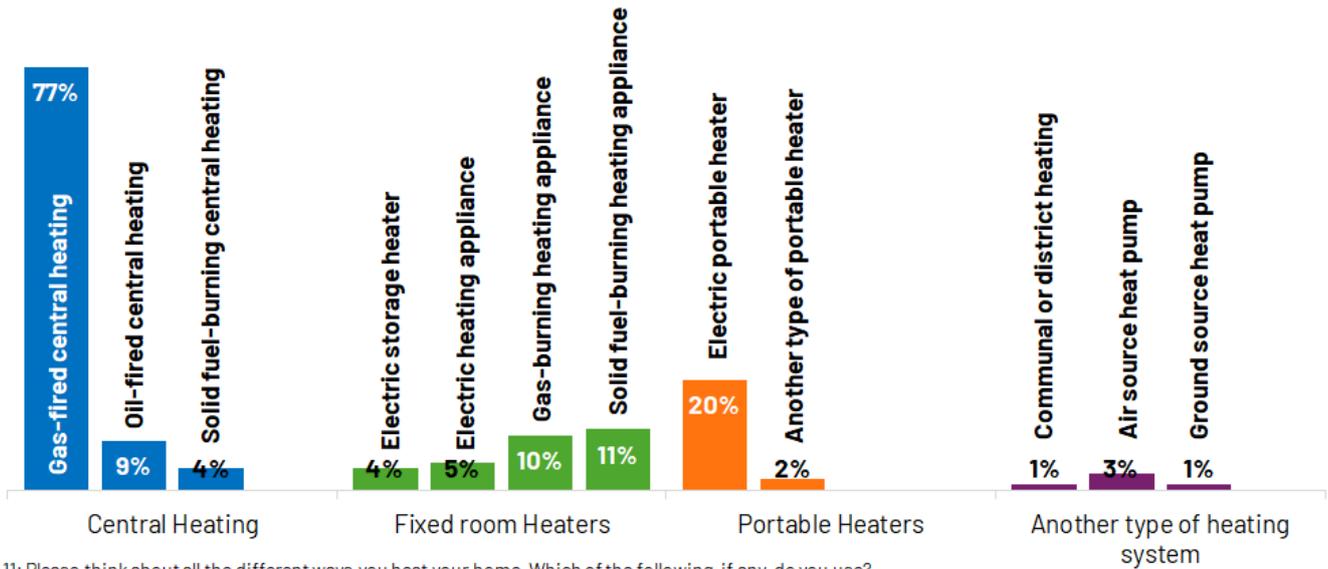
Electric heating is also used by a notable minority of households. In total, 15% of households use some form of electric heating, combining those who use electric portable heaters (10%) and other electric heating appliances (5%). Electric heating is zero-emission at the point of use, meaning it does not produce local combustion-related pollution.

The uptake of low-carbon heating solutions is currently very low. Fewer than 5% of households reported using a heat pump or communal heating, indicating that these newer technologies are not yet in widespread use.

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<sup>35</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

**Figure 6.6: Methods of home heating**

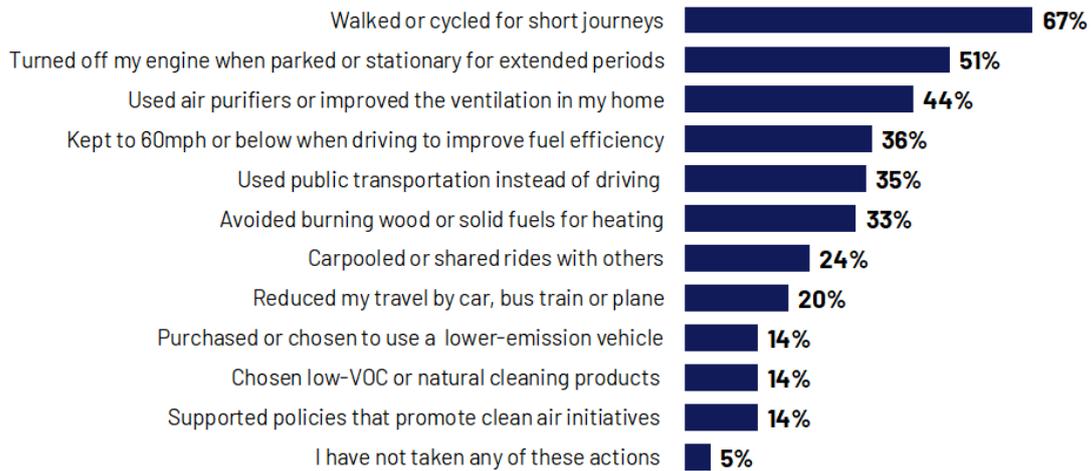


A11: Please think about all the different ways you heat your home. Which of the following, if any, do you use?  
 Base: All Adults (1,470)

### 6.3 Prevalence of behaviours with air quality benefits

The most commonly reported behaviours that have co-benefits for air quality are those that are low-cost and can be easily integrated into existing routines. The survey asked about the actions taken among adults in the past four weeks, which could contribute to improved air quality.<sup>36</sup> Of these, it was most common (67%) for respondents to report walking or cycling for short journeys and turning off engines when parked or stationary for extended periods (including using automatic stop-start technology in newer vehicles) (51%).

**Figure 6.7: Personal actions taken over past four weeks**



A23. Thinking about your own day-to-day life in the past four weeks, which of these actions, if any, have you personally taken? Base: All Adults (1,460)

<sup>36</sup> It is important to note that the question measured the prevalence of these behaviours, not the motivation for them. Participants were not asked if they took these actions specifically to improve air quality. The findings therefore represent a baseline of current activity that has co-benefits for air quality, which can be used for comparison in future research.

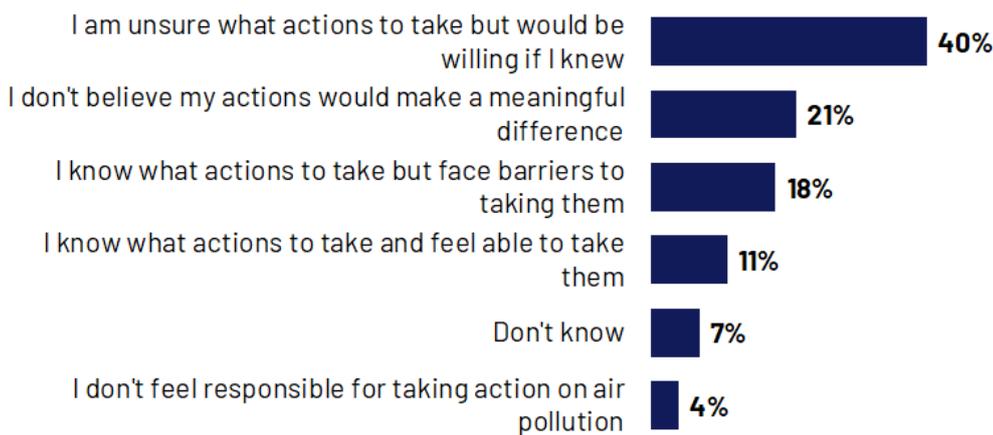
Several subgroups are significantly more likely to prioritise the top five personal actions in their day-to-day life to combat air pollution.<sup>37</sup> These are:

- Those who are already engaged with the issue report being more likely to act, than average. Individuals who are very/fairly concerned about air quality are more likely to walk or cycle for short distances (70%), enhance their indoor air quality (49%), and drive more efficiently (38%). This suggests that awareness and concern about air quality issues may be associated with greater likelihood of taking action, though further research would be needed to support this.
- Demographically, older adults (aged 65-84) are consistently more likely to take actions related to driving, such as turning off their engine when stationary (58%) and driving at lower speeds (50%).
- Women are notably more likely than men to focus on actions to enhance their indoor air quality (50%).
- Younger adults and students are the most likely group to use public transport. Those aged 16-29 (48%) and students (61%) are significantly more likely to travel by public transport instead of driving..
- Socioeconomic status and location also influence behaviours. Walking or cycling for short journeys is more common among those in less deprived areas (74%), students (84%), and degree holders (75%). Using public transport is a higher priority for residents of Cardiff (58%), where infrastructure is more comprehensive .

### 6.4 Attitudes towards taking action on air quality

When it comes to taking more action on air quality, the public is divided between a large group who are willing but lack knowledge, and another significant group who are held back by practical or psychological barriers. The largest single group (40%) reported that they are unsure what actions to take but would be willing if they knew. In contrast, a similar combined proportion (39%) are effectively unable or unwilling to act. This includes the 18% who reported facing direct practical barriers, and the 21% who did not believe their actions would make a meaningful difference, representing a significant psychological barrier of futility.

**Figure 6.8: Sentiment on taking actions to address air quality (adults)**



A14a: Which of the following statements best describes how you feel about taking action on air pollution?  
 Base: All Adults (1,465)

<sup>37</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

Several subgroups were statistically more likely than average to agree with each of the statements, showing distinct demographic and attitudinal profiles<sup>38</sup>, and providing potential pointers on where communications could be targeted: These were:

Those who know what actions to take and feel able to take them (average 11%):

- Residents of the Isle of Anglesey (33%) were more likely to agree they know what actions to take and feel able to take them
- Those with a 'great deal' of air quality knowledge (28%) and those who perceive that air quality has got better (22%) were more likely to say this
- Demographically, those from any ethnic minority background (24%), those earning £50,000–£69,999 (18%), and those aged 45–64 (15%) were more likely to say this

Those who know what actions to take but face barriers to taking them (average 18%):

- Those who perceive that air quality has got better (49%), have a 'fair amount' of air quality knowledge (31%), and are concerned about the issue (22%) were more likely to say this.
- Geographically, residents of Cardiff (32%) and Ceredigion (30%) were more likely to say this.
- Socioeconomically, those with a degree (27%), those living in the least deprived areas (25%), and those in the £20,000–£39,999 income brackets were more likely to say this.

Those who are unsure what actions to take but would be willing to if they knew (average 40%):

- Those who report they don't have much / any knowledge about air quality (50%), those who perceive air quality has worsened (49%), and those who are concerned about the issue (42%) were more likely to say this.
- Demographically and socioeconomically, young adults aged 16–29 (49%), women (46%), and those working full or part-time (43%) were more likely to say this.

Those who don't believe their actions would make a meaningful difference (average 21%):

- Demographically and socioeconomically, older adults aged 65 and over (31–38%), those earning £70,000–£89,999 (31%), and those not working (28%) were more likely to agree.
- Geographically, residents of Denbighshire (33%) were more likely to agree.
- Those who are not concerned about air quality (30%) and those who perceive that air quality has stayed the same (28%) were more likely to agree.

Those who don't feel responsible for taking action on air pollution (average 4%):

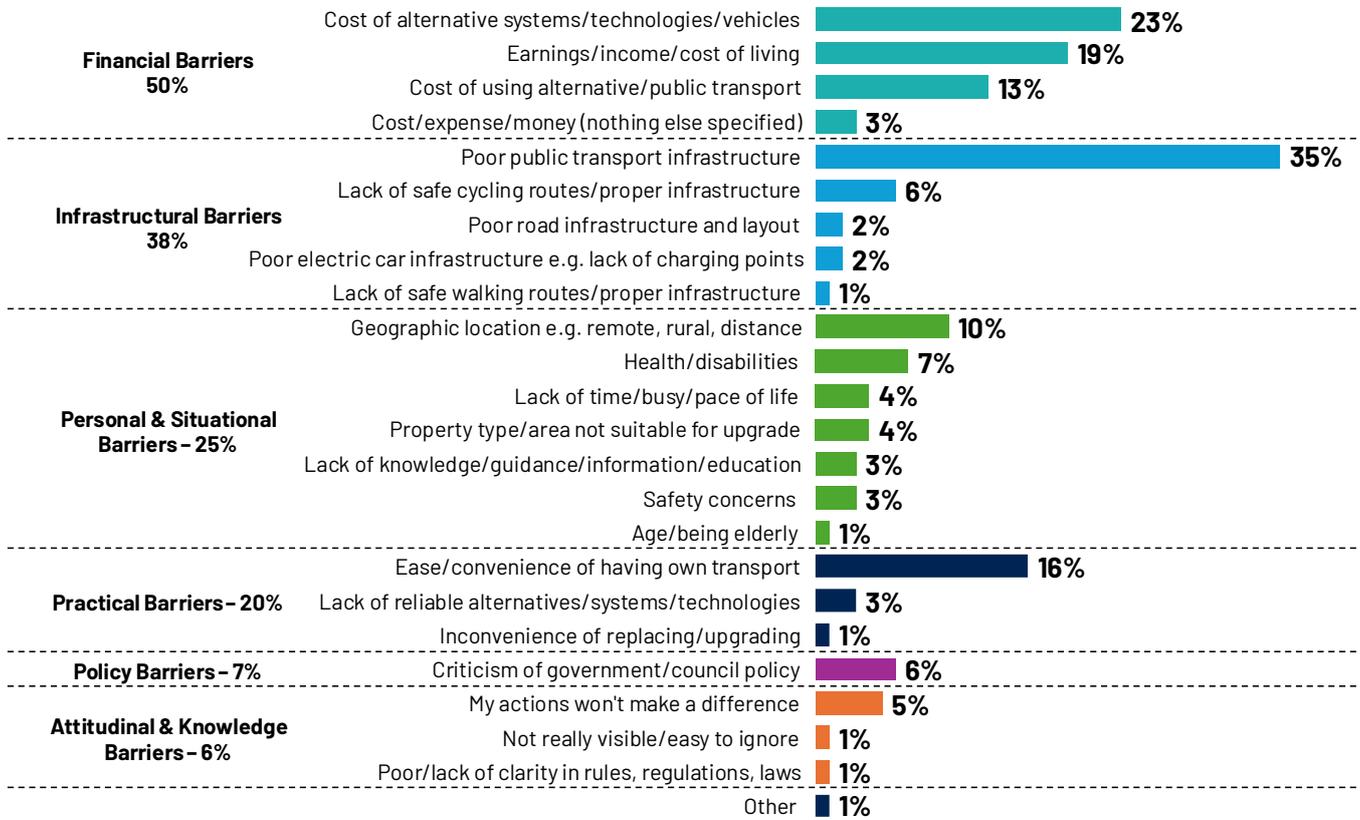
- Geographically, residents of Rhondda Cynon Taf (12%) were more likely to agree.
- Demographically, those aged 85+ (9%) were more likely to agree.
- Attitudinally, those with no knowledge of air quality (9%) and those not concerned about the issue (6%) were more likely to agree.

Financial barriers emerged as the primary barriers for people to take actions on air quality. In an open-ended survey question, we asked those who reported facing barriers to action what these barriers were. Half of respondents (50%) reported that financial barriers were the main reason they could not take action on air quality, followed by 38% saying the same for infrastructural issues. A quarter of respondents (25%) reported barriers around their personal situation, including where they live, health issues, and time availability, while 20% reported the same for practical barriers such as the ease or convenience of having their own transport. Fewer (7%) reported barriers related to policy/government support, and 6% reported

<sup>38</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

the same for barriers around their attitude/knowledge of air quality. The full breakdown of findings is shown in Figure 6.9:Figure 6.9:

**Figure 6.9: Barriers to taking action on air pollution**



A14b: What barriers do you face to taking action on air pollution?  
 Base: All adults who face barriers to taking action on air pollution (262)

Several subgroups were statistically more likely than average to report facing different barriers.<sup>39</sup> These were:

- Financial constraints were a frequently cited barrier, with those who perceive that air quality has improved being more likely than average (62%) to mention this theme. This was driven by specific concerns around the cost of alternative energy-efficient systems (cited more by older adults, 35%), a lack of government incentives (also cited more by older adults, 12%), and the cost of using public transport (cited more by residents of South Wales, 20%).
- Infrastructural and practical transport issues were another major theme, cited more often by those who perceive air quality has worsened (55%) and those in the least deprived areas (48%). This was mainly driven by concerns about poor public transport infrastructure. Separately, women were more likely than average to cite a practical barrier (28%), specifically the convenience of personal transport (23%).
- Personal circumstances were a key barrier for specific groups, with women (36%) and those aged 65-84 (35%) being more likely to cite this theme. This was primarily related to health and disabilities, which were a significant barrier for non-workers (17%) and older individuals (15%).
- Policy-related barriers were more likely to be mentioned by older adults, with those aged 45-64 being more likely than average (12%) to cite a policy barrier, specifically a lack of government incentives.

<sup>39</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

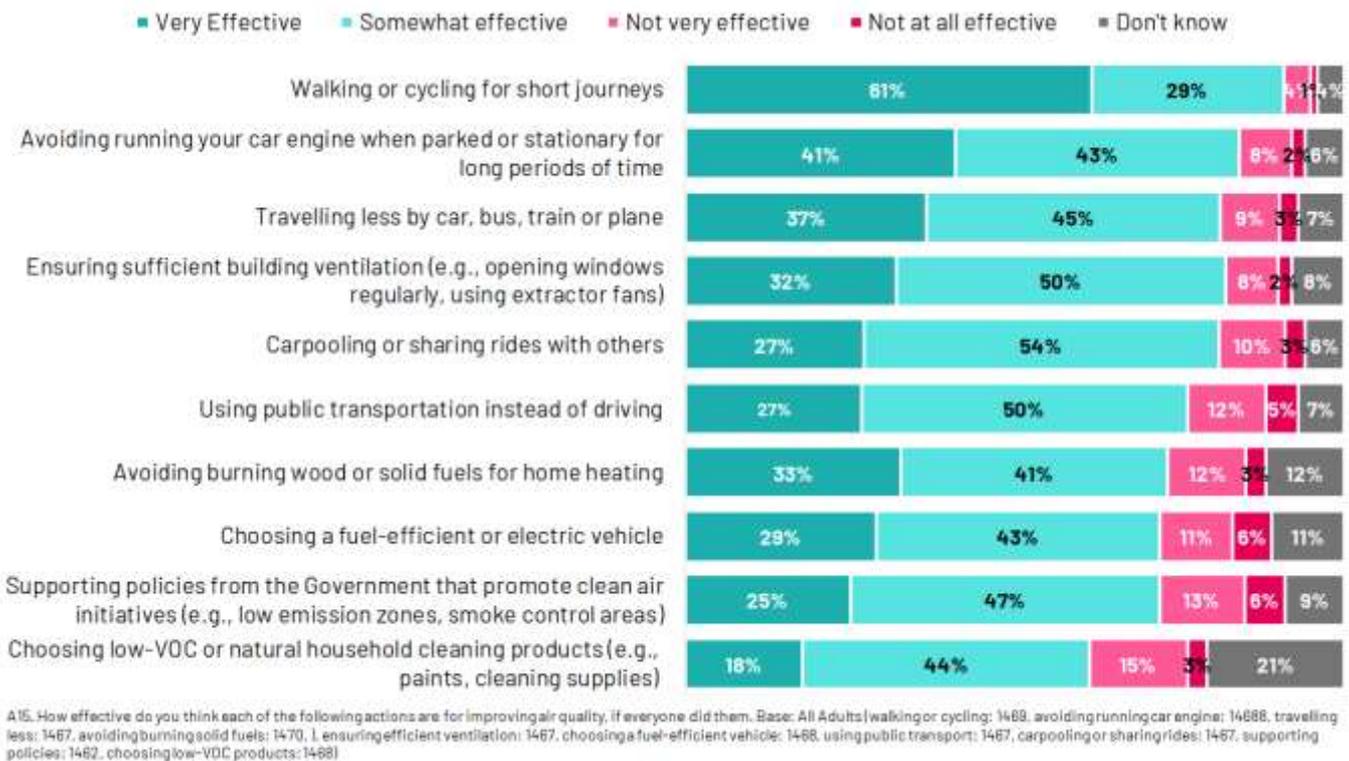
- Attitudinal and knowledge barriers were most common among those with low self-reported knowledge about air quality, with this group being more likely than average (15%) to cite an attitudinal barrier, such as the belief their actions won't make a difference.

### 6.5 Perceived effectiveness and impact of actions for improving air quality

Public perception of which actions are most effective aligns closely with their understanding of the main sources of pollution, with a strong focus on transport. The vast majority (90%) reported that walking or cycling for short journeys would be very or somewhat effective for improving air quality, if everyone did this, 84% said the same for avoiding running your car engine when parked or stationary, 82% said the same for travelling less by car, bus, train or plane, and 82% said the same for ensuring efficient building ventilation. This mirrors the findings from Chapter 3, where transport was identified as a primary pollution source.

Much fewer, 62%, reported that choosing low-VOC or natural household cleaning products would be very or somewhat effective for improving air quality, which also aligns with the lower awareness of chemical pollutants identified in Chapter 4.

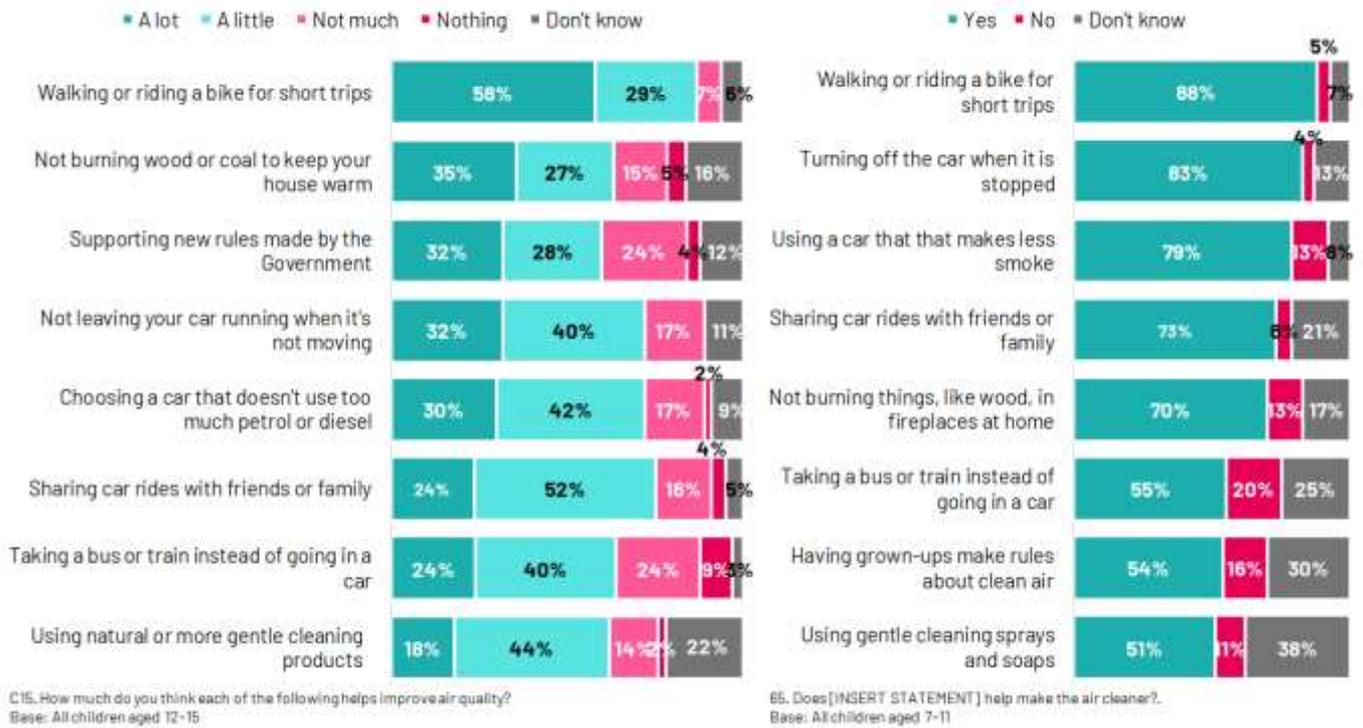
Figure 6.10: Effectiveness of different actions for improving air quality (adults)



For children, the vast majority of children also agreed that walking or riding a bike for short trips would be effective for improving air quality/making clearer air. 8% of children aged 7-11 said this would make the air cleaner, and 87% of children aged 12-15 said this would improve air quality a lot or a little. Similarly, fewer children agreed that using natural/gentle cleaning sprays and soaps would be effective for improving air quality. 62% of children aged 12-15 said this would help a lot or a little, and 51% of children aged 7-11 said this would make the air cleaner.<sup>40</sup> The full breakdown is shown in Figure 6.11:

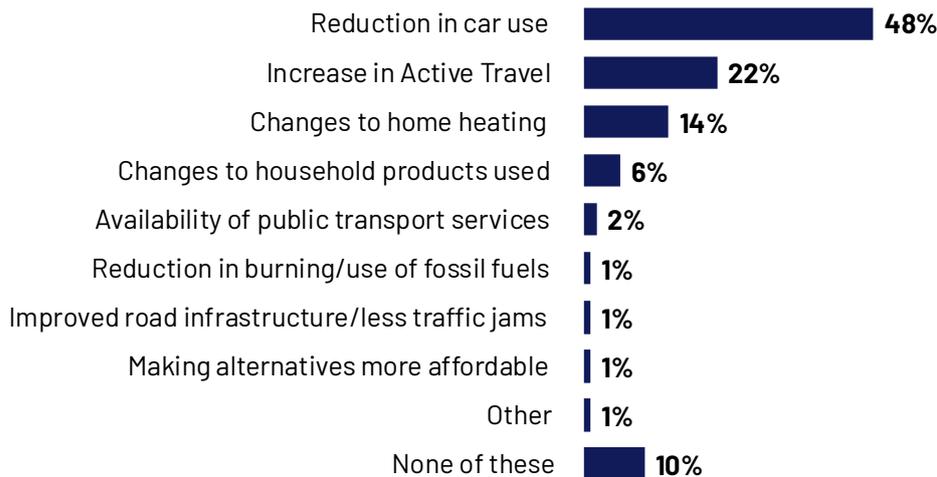
<sup>40</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

**Figure 6.11: Effectiveness of different actions for improving air quality (children)**



When asked what single action would have the most impact on air quality, adults overwhelmingly pointed to transport-related changes, mirroring their perception of the main sources of pollution. When asked which one action could most improve air quality in their area, just under half of respondents (48%) reported that a reduction in car use would most improve air quality in their area, while 22% said the same for increasing active travel and 14% said the same for changes to home heating. Just 6% reported that changes to household products would most improve air quality.

**Figure 6.12: Action perceived to most improve air quality (adults)**

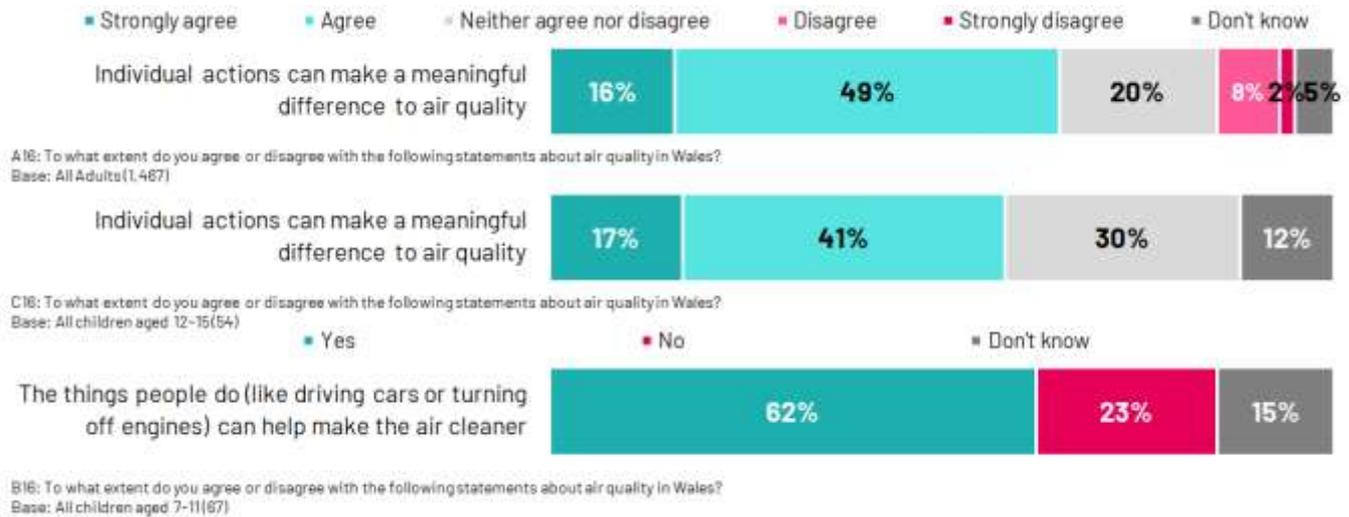


A26. Based on your current understanding of air quality, which ONE of the following changes do you think could most improve air quality in your area?  
Base: All Adults (1,454)

Despite the focus on large-scale sources like industry, a majority of all surveyed groups believe that individual actions can make a meaningful difference. Around two thirds (65%) of adult respondents agreed that individual actions can make a meaningful difference to air quality. For children, a slightly smaller

proportion agreed with this sentiment – 62% of children aged 7-11 agreed that the things people do (like driving cars or turning off engines) can help make the air cleaner, and 58% of 12-15 year olds agreed that individual actions can make a meaningful difference to air quality.<sup>41</sup>

**Figure 6.13: Impact of individual actions on air quality**



Several adult subgroups were statistically more likely than average to report that they agreed that individual actions can make a meaningful difference to air quality.<sup>42</sup> These groups are:

- Those who perceive that air quality has changed, either for better (75%) or worse (72%), show a strong agreement that individual actions can make a difference.
- Similarly, those who are very/fairly concerned about air quality (73%) and those who report having a fair amount of air quality knowledge (70%) also show higher levels of agreement.
- Demographically, female respondents (70%) and those who earn £50,000-£69,999 (75%) were more likely to agree with the statement, as were those from any ethnic minority background (84%).
- Certain geographic areas showed notably higher agreement, specifically Bridgend (81%) and Ceredigion (78%).

## 6.6 Conclusion

This chapter established a baseline of current public behaviours and attitudes towards addressing air quality. The findings show that car travel is the dominant mode of transport, driven primarily by convenience and time, while home heating is dominated by combustion fuels, mainly gas. Regarding attitudes, the public was divided: a large group of adults reported being willing to act but were unsure what to do, while another significant group was held back by practical barriers like cost and infrastructure, or by a belief that their actions would not make a difference. Notably, those who were already more concerned about air quality were more likely to report taking action, suggesting that awareness may play a role in motivating behaviour. These findings highlight the different factors that influence public behaviour, from practical considerations like cost to personal beliefs about effectiveness. This data provides a benchmark for future public health communications and policy development. Further research could explore the most

<sup>41</sup> Please note: Child survey results are based on smaller sample sizes (70 for 7-11s, 56 for 12-15s) and should be interpreted as illustrative. Variations in question wording also mean direct comparisons with adult data should be made with caution. Refer to the Annex: Methodology for full details.

<sup>42</sup> All subgroup differences presented here are statistically significant at the 95% confidence level (5% risk level).

effective messages for the group who are willing but unsure, and how best to address the structural and financial barriers that prevent others from acting.

# 7 Conclusions

This report has presented the findings of a research project commissioned by the Welsh Government to establish a baseline of public awareness, attitudes, and behaviours concerning air quality in Wales. It has detailed current levels of public awareness, attitudes, and behaviours, as well as self-reported impacts on health and wellbeing, based on a representative survey of the Welsh population, including both adults and children. The findings are intended to support the implementation of the Environment (Air Quality and Soundscapes)(Wales) Act 2024 and inform the ongoing development of the 'Promoting Awareness of Air Pollution Delivery Plan'. This chapter summarises the key findings from the report.

## Public Awareness and Understanding of Air Pollution

The research provides a baseline of public awareness and understanding of air pollution, which indicates a pattern of knowledge shaped by the visibility of the source. Public knowledge is highest for the most visible and traditionally recognised sources of pollution. For example, recognition is high for outdoor pollution from industry (identified as a contributor by 93% of adults) and transport (91%), but awareness is significantly lower for the impact of more diffuse sources like domestic heating (70%) and agriculture (64%). This pattern is mirrored in the understanding of indoor air quality: while a large majority recognise risks from poor ventilation (85%) and damp or mould (81%), awareness of chemical pollutants from everyday household products (53%) and central heating systems (47%) is lower.

The public's primary focus on transport and industry as the key drivers of air pollution is further reinforced by their perceptions of where it occurs. This is demonstrated by the finding that a majority of adults (57%) perceive air pollution as "mostly a problem in cities, not rural areas." Similarly, people rate the air quality in their own neighbourhood (61% good/very good) and inside their homes (74% good/very good) more positively than that of their nearest town or city centre (39% good/very good) – locations typically associated with higher levels of traffic and commercial activity. This focus on large-scale sources is also reflected in who is seen as responsible, with over half of adults (53%) agreeing that most air pollution comes from large industries rather than the cumulative effect of individual actions.

## Understanding of Impacts and Health Risks

The research indicates that while overall worry about the impacts of air pollution is high among adults, this concern is more frequently directed towards wider environmental and societal issues than personal health. For example, 80% of adults reported being worried about the impact on future generations and 77% about the impact on climate change. In contrast, a notably smaller proportion (57%) reported being worried about the effect on their own health. This suggests that while the risks of air pollution are broadly acknowledged, they are often perceived as a more immediate threat to others, the environment, and the collective future than to oneself.

A similar pattern is evident in the public's understanding of the specific health conditions linked to air pollution. There is widespread recognition of the connection to respiratory issues, with 95% of adults identifying respiratory diseases and 82% identifying asthma as conditions that can be caused or worsened by poor air quality. However, awareness is substantially lower for other serious health impacts; for instance, only 15% of adults associated air pollution with dementia, 14% with stroke, and 7% with diabetes. This knowledge gap also extends to perceptions of vulnerability. While the risks for medically vulnerable groups are well understood—such as for people with existing respiratory conditions (96%) and older people (92%)—

there is considerably less recognition of the heightened risk for people from low-income backgrounds (59%).

### **Current Behaviours and Attitudes Towards Action**

The research shows that current behaviours with an impact on air quality are largely shaped by practical considerations, while attitudes towards taking action reveal a public that is broadly willing to contribute but is held back by specific barriers. Daily travel habits are dominated by car use, with 91% of adults having travelled by car in the past week. The primary drivers for this choice are not environmental but practical, with convenience (75%) and travel time (65%) being the most influential factors. Similarly, home heating is dominated by combustion-based fuels, with gas being used in some form by 87% of households, reflecting the existing infrastructure and cost considerations.

When it comes to changing these behaviours, the findings identify a significant gap between willingness and action. The largest single group of adults (40%) reported that they are willing to take more action to improve air quality but are unsure what to do, which suggests that there is a potential that increasing awareness could change behaviour. For others, the barriers are more concrete. A combined 39% of adults are held back either by practical obstacles (18%) or by a belief that their individual actions will not make a meaningful difference (21%). For those who face practical barriers, the most frequently cited issues were the poor availability or reliability of public transport (35%) and the high cost of alternatives (23%). This indicates that while a sense of personal responsibility exists, it is often outweighed by a lack of actionable knowledge and significant structural or financial constraints.

In summary, the research indicates that the Welsh public is concerned about air quality but possesses an understanding of the issue that is specific and, in key areas, incomplete. Knowledge is highest in relation to visible sources like transport and industry and well-known health impacts such as respiratory conditions, with significantly less awareness of the role of domestic sources or the link to systemic health issues like dementia and stroke. This focus on large-scale sources shapes the perception of air pollution as primarily a problem for cities and industries, and concern is often directed more towards wider society and the environment than personal health. While there is a notable willingness to contribute to solutions, this is frequently outweighed by a reliance on current behaviours driven by convenience and cost. A lack of actionable knowledge for a large portion of the public, combined with significant practical barriers such as cost and infrastructure for others, present key obstacles to behaviour change. Overall, the baseline evidence suggests that while public concern provides a foundation for engagement, bridging the gap between this concern and meaningful action will depend on addressing these specific knowledge gaps and practical constraints.

# Annex: Methodology

## 8.1 Survey design

The survey provides representative data on the resident population of Wales aged 7 and above. The survey was delivered using a random probability ‘push-to-web’ survey methodology, whereby a random sample of residents were contacted by letter and invited to complete the questions online, with a paper version offered with the second reminder to ensure that those less comfortable using the internet were able to participate. Different versions of the survey were fielded to reflect child cognition levels, with shorter, modified versions for 7-11s and 12-15s, and the full version for those aged 16 and over.

## 8.2 Questionnaire development

The questionnaire was developed as a self-completion instrument by Ipsos and Air Quality Consultants, in consultation with the Welsh Government. Initially a version was developed and agreed for adults, which was then modified for children based on expert advice from Ipsos’ child research team. These modifications included language simplification, scale adjustments including reducing the number of options, and removing some questions entirely particularly for the 7-11 age group. The questionnaire then underwent two rounds of cognitive testing which led to modifications, mainly for children. A total of 30 cognitive interviews were completed, with 5 per group each round (adults, 7-11s, 12-15s).

## 8.3 Sampling and recruitment

A random sample of 4,750 Welsh addresses was drawn from the Post Office Address File (PAF). The sample was drawn disproportionately by Welsh local authority (LA), to boost numbers of cases in local authorities with smaller populations, aiming for a minimum achieved sample size of 50 completed surveys in each. The sample within local authorities was stratified proportionally by Index of Multiple Deprivation (IMD) rank to improve representation.

Each address was contacted by post up to three times. The invitation and first reminder mailing both included a letter inviting up to two adults to complete the survey, using a website address and login code, or QR code. The second reminder (third mailing) included a similar letter and four paper questionnaires (two for adults and a version for each child age group), and a freepost return envelope, inviting participation on paper (or online). All printed materials, and the online questionnaire, were provided in both English and Welsh.

The letters also explained that children would be able to take part, but initially requested that an adult complete the survey. The first adult to complete was asked to provide the ages of other members of the household, with prompts then provided on which other individuals would be able to complete. Subsequent individuals used the same login code, and were able to select themselves from a list of enumerated people (including children), up to a maximum of two adults and two children per household at which point the survey was closed. Adults were offered £10 in vouchers, conditional on completion, and children £5.

The data were weighted following best practices principles, including use of inverse probability sample design weights, and calibration to reliable population statistics (ONS 2024 mid-year estimates on age in four bands by gender, region in four grouped categories, and IMD quintile). Child weights were similarly constructed, with calibration adjustments for gender only given small sample sizes.

## 8.4 Data collection

Fieldwork took place between 4<sup>th</sup> June and 31<sup>st</sup> July (2025) with achieved samples of 1,474 adults aged 16 and over, 56 age 12-15 and 70 age 7-11. These numbers break down as follows by mode:

- Adults: 1,009 online and 465 paper completes
- Children aged 12-15: 37 online and 19 paper completes
- Children aged 7-11: 45 online and 25 paper completes

A total of 1,132 households took part in the survey, giving a response rate of 24%.

## 8.5 Data analysis

All the differences presented in the report are statistically significant. For significance testing, Ipsos employed the standard two-tailed t-test, comparing columns to the overall total, adjusting for overlaps in the samples to account for correlations among tested variables. This is the industry standard for statistical testing.

Where open-ended questions, or 'other, specify' answer codes were shown in the survey, participants were provided with a text box in which to provide their feedback. To analyse these qualitative responses, we employed a thematic coding approach whereby each response was systematically categorised into distinct themes. It should be noted that respondents could mention multiple themes within a single response, and all relevant themes were captured in our analysis.

## 8.6 Limitations

The study followed best practice survey methodology, employing random probability sampling and push-to-web data collection. This means that the results can be generalised to the wider Welsh population with confidence. Nevertheless, some limitations apply, namely:

- While the response rate (24%) is in line with other government surveys in Wales, such as Food and You 2 which Ipsos conducts for the Food Standards Agency, this means that the majority of sampled households did not take part, giving the potential that some survey results may be affected by non-response bias leading to inaccuracies.
- The report compares results for adults with children, however some of these differences may be a result of wording differences in the questions, differences in how children interpret the questions, or the smaller sample sizes achieved with children.
- The child samples have some limitations, namely relatively small sample sizes (56 and 70 completes, respectively), which also placed limitations on the corrective weighting that could be applied (inverse probability weights and calibration to gender only). This gives a greater likelihood of sample biases for children.

# Our standards and accreditations

Ipsos' standards and accreditations provide our clients with the peace of mind that they can always depend on us to deliver reliable, sustainable findings. Our focus on quality and continuous improvement means we have embedded a right first time approach throughout our organisation.



## ISO 20252

This is the international specific standard for market, opinion and social research, including insights and data analytics. Ipsos UK was the first company in the world to gain this accreditation.



## Market Research Society (MRS) Company Partnership

By being an MRS Company Partner, Ipsos UK endorse and support the core MRS brand values of professionalism, research excellence and business effectiveness, and commit to comply with the MRS Code of Conduct throughout the organisation & we were the first company to sign our organisation up to the requirements & self-regulation of the MRS Code; more than 350 companies have followed our lead.



## ISO 9001

International general company standard with a focus on continual improvement through quality management systems. In 1994 we became one of the early adopters of the ISO 9001 business standard.



## ISO 27001

International standard for information security designed to ensure the selection of adequate and proportionate security controls. Ipsos UK was the first research company in the UK to be awarded this in August 2008.



## The UK General Data Protection Regulation (UK GDPR) and the UK Data Protection Act 2018 (DPA)

Ipsos UK is required to comply with the UK General Data Protection Regulation (GDPR) and the UK Data Protection Act (DPA). These cover the processing of personal data and the protection of privacy.



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Ipsos UK is signed up as a Fair Data company by agreeing to adhere to twelve core principles. The principles support and complement other standards such as ISOs, and the requirements of data protection legislation. .

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