NIHR | Health Determinants Research Collaboration Coventry

Data Catalogue – Information Pack 5

Air Quality

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Definition: How do we define Air Quality?

Air quality refers to the concentration of pollutants in the air at a specific location. Air quality is a measure of how clean or polluted the air is and can be impacted by factors such as human activity, weather, geography, transport. Poor air quality can be harmful to human physical health, including links to respiratory and cardiovascular conditions (GOV UK, 2019; NASA, 2024).

An Air Quality Management Area (AQMA) for Coventry was declared in 2009 because of high levels of nitrogen dioxide (NO2).

Key contact within Coventry City Council

If you are wanting to know more information about air quality, have any specific questions about the accessible data, or are keen to research air quality, please contact:

- Steve Dewar. E: steve.dewar@coventry.gov.uk

Why is Air Quality a wider determinant of health?

Air quality is considered a wider determinant of health because it is an environmental factor that shapes health outcomes beyond and individuals' biology or personal choices. It is the largest environmental risk to public health in the United Kingdom, affecting people across their entire life course.

Key reasons why air quality is considered a wider determinant of health include:
- **Environmental inequity**: exposure is often beyond an individual's control. Low-income and marginalised communities frequently live in highly polluted areas, such as near busy roads or industrial zones, leading to significant health inequalities.
- **Lifelong impact**: it affects health from the womb to old age. Exposure can lead to low birth weight, stunted lung development in children, and chronic conditions like Cardiovascular Disease, Dementia and Cancer in later life.
- **Economic burden**: poor air quality imposes massive costs on society. In the UK, health impacts are estimated to cost the economy between £8 billion and £20 billion annually due to healthcare needs and lost productivity.
- **Co-benefits of improvement**: addressing air quality often requires changes to other wider determinants, such as transport and urban planning. Initiatives like promoting active travel (walking/cycling) improve air quality whilst also increasing physical activity and mental wellbeing.
- **Intersection with climate**: pollutants that harm health often drive climate change. Strategies to reduce emissions simultaneously address environmental sustainability and immediate public health.

Unlike some pollutants that act slowly, Nitrogen Dioxide (NO2) has both immediate (acute) and long-term (chronic) effects on the human body including inflammation of the airways, reduced lung function, and increased vulnerability (weakening of immune system).

Key literature signposting

Air Quality Consultants. (2008). *Review of bus fleet compositions and implications for emissions reduction strategies*.

Canaday, F. T., Georas, S. N., Croft, D. P. (2024). Examining the impact of air pollution, climate change, and social determinants of health on asthma and environmental justice. *Current Opinion in Pulmonary Medicine, 30,* 276-280.

Gov UK. (2018). *Health Matters: Air Pollution*.

Hoffmann, B., Boogaard, H., de Nazelle, A., Andersen, Z. J., Abramson, M., Brauer, M., Brunekreef, B., Forastiere, F., & Thurston, G. (2021). WHO air quality guidelines 2021 – aiming for healthier air for all: A joint statement by medical, public health, scientific societies, and patient representative organisations. *International Journal of Public Health, 66.*

Leicester City Council. (2025). *Air Quality Action Plan 2025-2030*.

Monteiro, A., Figueiredo, E., Rodrigues, V., Cardoso, C., Lopes, M., Roebeling, P., Relvas, H., Seixas, P., Gouveia, S., Gomes, A., Martins, A., Gama, C., Aragao, A., Miranda, A. I., & Hayes, E. (2026). Air pollution and environmental justice: A systematic literature review on methodological approaches. *Heliyon, 12,* e44289.

Patel, L., Friedman, E., Johannes, S. A., Lee, S. S., O'Brien, H. G., & Schear, S. E. (2021). Air pollution as a social and structural determinant of health. *The Journal of Climate Change and Health,* e100035.

Public Health England. (2019). *Review of interventions to improve outdoor air quality and public health*.

Royal College of Physicians. (2016). *Every breath we take: The lifelong impact of air pollution*.

Royal College of Physicians. (2025). *A breath of fresh air: Responding to the health challenges of modern air quality*.

UK Health Security Agency. (2023). *Health Effects of Climate Change (HECC) in the UK: 2023 Report*.

Publicly accessible data on Air Quality

1. Fingertips: https://fingertips.phe.org.uk/

Fingertips is a large public health data collection maintained by Public Health England. Data within Fingertips is organised into themed profiles. When searching for air quality data, you can select from ICB's, NHS Regions, Districts and counties.

Fingertips provides data on:
- Fraction of mortality attributable to particulate air pollution (presented in percentages)
- Air pollution: fine particulate matter (using concentrations of PM2.5)

This data source allows for comparison between specific locations, all districts within the West Midlands, and England.

Please note: data from air quality sources may have limitations when interpreting and transferring data to explore air quality in the wider area. For example, air quality measurement requires specific tools and technology which may be localised to the place where it is installed. Results can also be hindered by factors such as humidity, dust, seasons (time of year) and the overall sensitivity of the sensors. Therefore, it is best to ensure that data is examined carefully and only assumptions are made surrounding air quality and the correlation with mortality.

2. Department for Environment Food & Rural Affairs (DEFRA): https://uk-air.defra.gov.uk/networks/network-info?view=aurn

The Automatic Urban and Rural Network (AURN) is the UK's largest automatic monitoring network and is the main network used for compliance reporting against the Ambient Air Quality Directives. It includes automatic air quality monitoring stations measuring oxides of nitrogen (NOx), sulphur dioxide (SO2), ozone (O3), carbon monoxide (CO) and particles (PM10, PM2.5). The AURN currently uses 193 sites and has 305 approved sites in total. For Coventry, there are two sites:

- Coventry Allesley
- Coventry Binley Road

Information about these locations can be found on the main page, under the AURN monitoring dropdown tab.

Interactive monitoring networks map
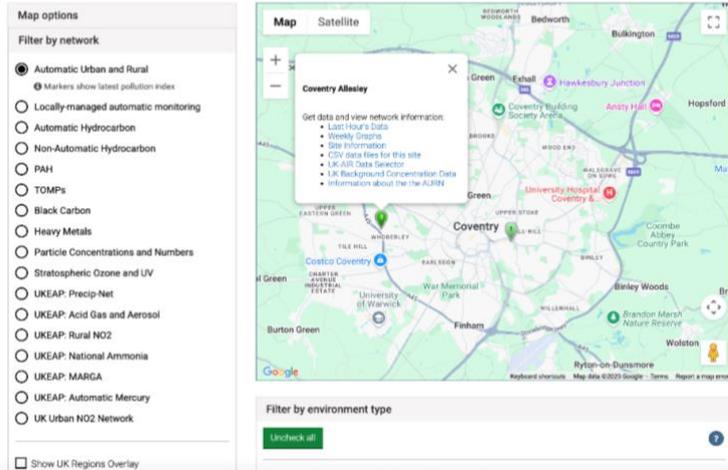
The interactive monitoring networks map option also allows for you to see measurements across multiple locations. You are also able to view a variety of data for each site (as seen in image).

3. West Midlands Air Quality Data Platform:
https://experience.arcgis.com/experience/41445259d79c4fb7aa95f98291fb9582

The WM Air Quality Data platform shows the air quality sensor measurements of several pollutants that can be harmful to health and air quality. Particulates (PM10, PM2.5 and PM1), Nitrogen Dioxide (NO2), and Ground level ozone (O3) are measured within this platform.
There are 10 sensor sites within Coventry:
- Eden Girls School
- King Henry VIII School
- Buckingham Rise
- University Hospital Coventry and Warwickshire
- Stoke Primary School
- The Xcel Leisure Centre
- Stoke Heath Primary School
- Henley Green Medical Centre
- Willenhall Community Primary School
- Families for All Hub

To search for these locations in the 7- or 10-day charts, you will need to use the location specific name.
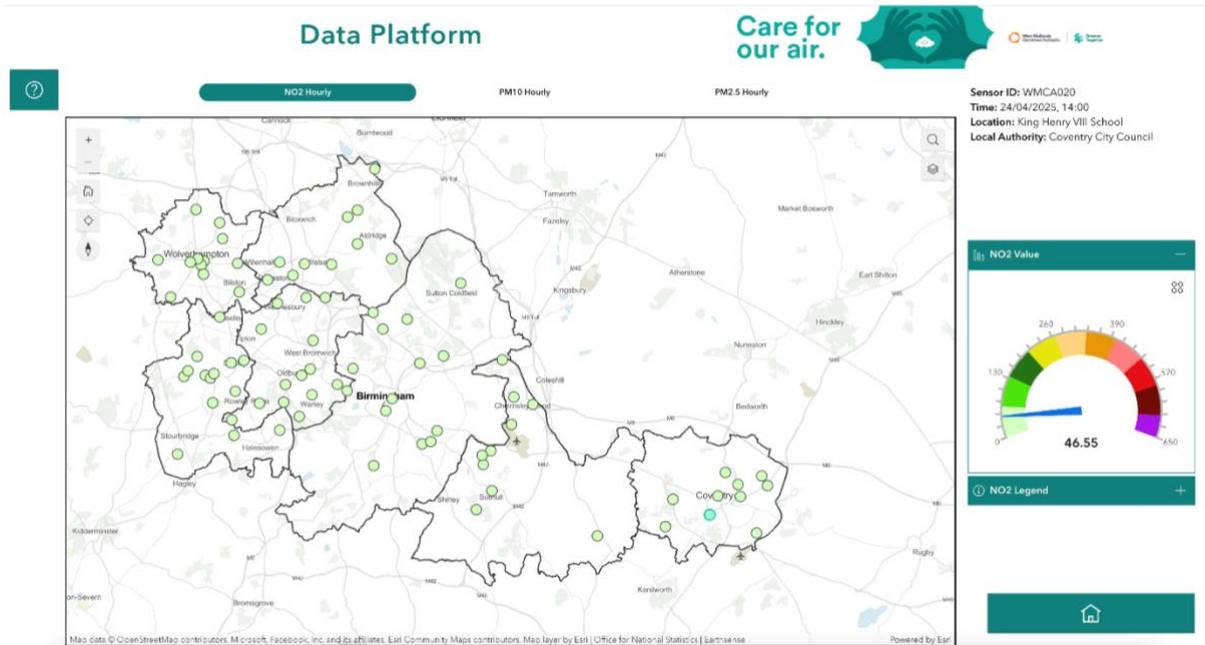
The data platform is an interactive map which shows information from all sensors across the West Midlands for NO2, PM10 and PM 2.5 and is frequently updated – showing live figures. This allows for direct comparisons for all WM Air sensors across the West Midlands, with reliable and up-to-date information.
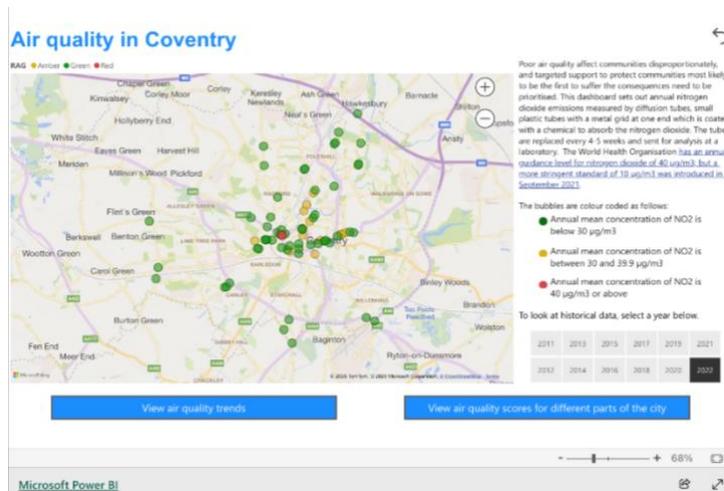
4. Coventry City Council – Air Quality:
https://www.coventry.gov.uk/pollution-1/air-quality/3

Coventry City Council has a range of information and resources for air quality monitoring including:
- Transport and air quality in Coventry
- Coventry local air quality action plan
- Monitoring air quality in Coventry

Monitoring air quality in Coventry

The monitoring air quality in Coventry page explores pollution monitoring, and how nitrogen dioxide is measured using Diffusion tubes. This includes an interactive map showing nitrogen dioxide level in Coventry which can be explored and compared by Ward and is updated once per year.

Air quality assessments and reports are available, which include raw data from monitoring results within the reports and analysed data presented in graphs comparing yearly figures. Reports start from 2006 (screening assessment) and available to download via PDF.
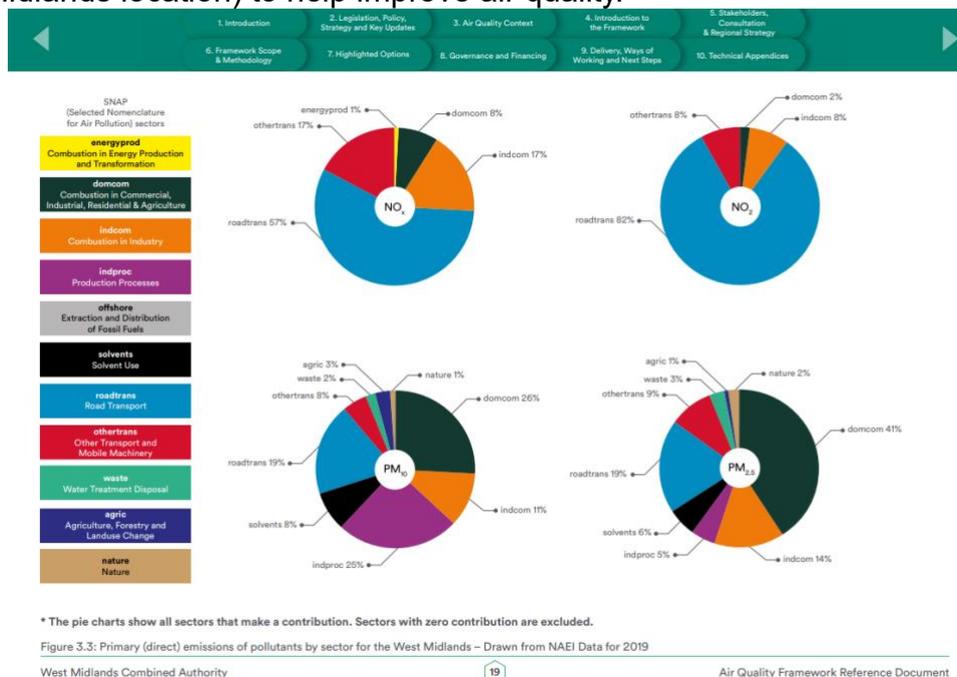
You can find air quality assessments and reports here: https://www.coventry.gov.uk/downloads/download/618/air_quality_in_coventry

5. West Midlands Combined Authority: Air Quality - https://www.wmca.org.uk/what-we-do/environment-energy/air-quality/

The West Midlands Combined Authority (WMCA) have been working with local authorities within the West Midlands and key stakeholders to help design and deliver a clear plan for cleaner air within the West Midlands.

The Air Quality Framework Reference Document provides 145 options which can be implemented to help improve air quality. These options can be applied to any local (West Midlands location) to help improve air quality.

* The pie charts show all sectors that make a contribution. Sectors with zero contribution are excluded.

Figure 3.3: Primary (direct) emissions of pollutants by sector for the West Midlands – Drawn from NAEI Data for 2019

West Midlands Combined Authority   19   Air Quality Framework Reference Document

Within the document, there are sources of accessible data for air quality and air pollution within the West Midlands. The accessible data includes:
- Identifying sources of air pollution by specific pollutant
- Mapping of air pollutants within the West Midlands
- Trends of air pollutants for the UK from 1970-2021.