

Air Quality: Sandwell

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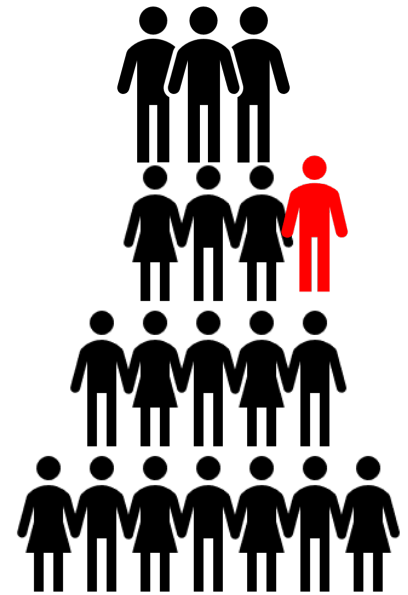
Air Pollution: Overview

- **Nitrogen Dioxide** (NO_2)
 - Primarily caused by combustion engines (e.g. **petrol/diesel cars**)
- **Ground level Ozone** (O_3)
- **Carbon Monoxide and Carbon Dioxide** (CO and CO_2)
- **Particulate Matter** ($\text{PM}_{2.5}$ and PM_{10})
 - 50% of $\text{PM}_{2.5}$ generated in towns and cities is from **wood-burning stoves** and **coal fires**¹
 - PMs have the **greatest** associated **health risks**
 - PAH's are **carcinogenic** and form from **wood burning**
- **Sulphur Dioxide** (SO_2)
 - 22% comes from **domestic burning**
- **Ammonia** (NH_3)
 - **Agriculture** is the main source



Air Pollution: The Impacts

- Long-term exposure to air pollution is **killing 1 in 19 people** in the **UK**¹
- People with **asthma, pneumonia, diabetes**, and **respiratory** and **cardiovascular diseases** and the **elderly** and **children**, are especially susceptible and vulnerable to the effects of PM³
 - Sandwell has a higher than average emergency hospital admission rate for **respiratory illnesses**
 - Sandwell has the **highest diabetes prevalence** in the West Midlands, and the second highest **in all of the UK**²
- According to a report by the European Court of Auditors, more than **10 times** as many people die as a result of **air pollution** than are **killed in road accidents**





Air Pollution: Health



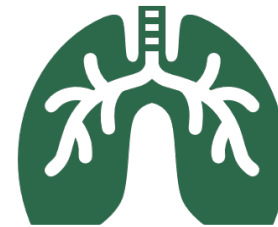
Chronic Respiratory
Diseases (e.g.
Asthma)



Stroke



Heart Disease



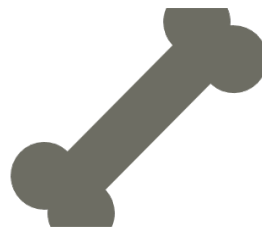
Lung Cancer²



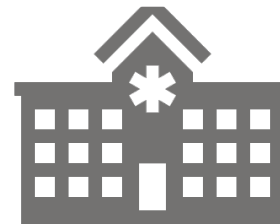
Kidney Failure



Increase Infant
Mortality Rate



Osteoporosis



Cancer



Sight Loss⁴



Air Pollution: Health

- The Department of Health's Committee on the Medical Effects of Air Pollutants (COMEAP) has combined the results of many studies looking at the link between cardiovascular mortality and exposure to black smoke and $PM_{2.5}$ to produce **an average effect of a 1.5% increase in mortality for each $10 \mu g / m^3$ increase in levels of $PM_{2.5}$**
- In **England**, the total **cost due to $PM_{2.5}$ to the NHS and social care** in 2017 was estimated to be **£41.2million**, rising to £76.1million when diseases are included where there is less robust evidence for an association¹



Air Pollution: Mental Health

- Air pollution is linked to mental health problems. This includes **depression**, a reduction in intelligence equivalent to having **lost a year at school** (further impacted by Covid), and **aggressive** behaviour¹
 - Research has also found an increased risk of **bipolar** disorder, **schizophrenia** and **personality disorders**²





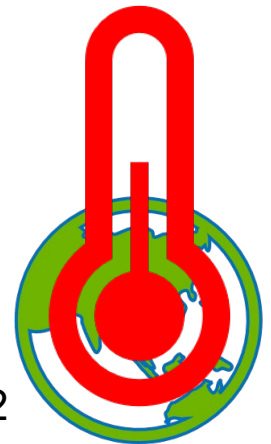
Air Pollution: Mental Health

- **Children** have been found to be more **anxious** and **suicidal** in areas of deprivation that has worse air pollution³
- In 2015, Sandwell's estimated rate of 10.7% of 5-16 year olds with mental health disorders is the **highest** in the West Midlands region⁴
 - In 2019, Sandwell also had a **below average** GCSE attainment rate⁵
 - Higher levels of air pollution exposure as children have been linked to below average **thinking** skills⁶



Air Pollution: Climate Change

- Many of the **sources of both CO₂ and local air pollution** are the **same**, including vehicle exhausts, factory chimneys, energy and heating¹
 - Road traffic is one of the largest sources of both greenhouse gases and air pollution
- **Burning wood** is degrading ecosystems and **undermining climate goals**, according to the European Commission's Joint Research Centre²



List of air pollutants and greenhouse gases

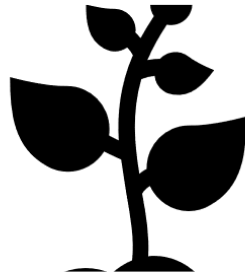
	Air pollutant	Greenhouse gas	Impacts human health
Particulate matter (PM2.5)	✓	✗	✓
Sulphur dioxide	✓	✗	✓
NO2	✓	✗	✓
Ground-level ozone	✓	✓	✓
Carbon monoxide	✓	✗	✓
Carbon dioxide	✗	✓	✗
Black carbon	✓	✓	✓
Lead	✓	✗	✓
Particulate matter (PM10)	✓	✗	✓
Methane	✓	✓	✓



Air Pollution: The Environment



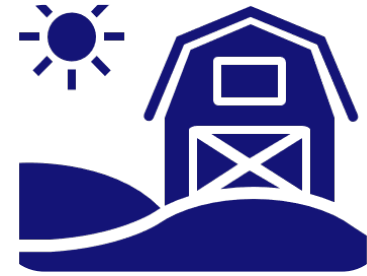
Acidic Lakes & Canals¹



Depleting Nutrients in Soil



Making Climate Change Impacts Worse



Reduced Growth & Crop Yield²



Acid Rain



Reproductive Failure & Birth Defects in Wildlife





Air Pollution: COVID-19

- Patterns of higher rates of coronavirus **incidence** and **deaths** in areas with high levels of **air pollution**¹
- A small rise in people's long-term exposure to **air pollution** is associated with an **11%** increase in **deaths** from Covid-19²
- Another recent study suggests that **15%** of all Covid-19 **deaths** around the world are attributable to **dirty air**²
- Sandwell was one of the **worst Local Authorities** affected by Covid-19³



Sandwell: So What's the Problem?

- In 2005, monitoring found that national standards **were not being met**, so Sandwell was declared an **Air Quality Management Area** (AQMA)
 - Mainly due to NO₂ levels
 - In 2019, Sandwell **still** had 7 areas exceeding national standards
- In 2011, Sandwell had **190** hospital admissions for COPD and **244** asthma admissions **above** national average. This cost Sandwell **£640,000¹**

Sandwell: So What's the Problem?

- Of the 72 areas with **dangerous** levels of PM_{2.5}, only Leicester and **Sandwell** were not in London²
- Sandwell has the **highest morbidity burden** in the West Midlands associated with PM air pollution
 - Sandwell has the **highest attributable deaths** percentage (6.9%) to PM outside of London



Asthma in Children and Young People

Indicator	Period	England	West Midlands region	Birmingham	Coventry	Dudley	Herefordshire	Sandwell	Shropshire	Solihull	Staffordshire	Stoke-on-Trent	Telford and Wrekin	Walsall	Warwickshire	Wolverhampton	Worcesters
Hospital admissions for asthma (under 19 years)	2018/19	178.4	220.6	289.3	335.1	82.3	170.6	268.3	267.9	151.5	161.9	198.4	350.3	265.4	184.1	218.1	104.7
Admissions for asthma for children aged 0 to 9	2018/19	220.4	293.0	341.5	476.3	76.6	224.0	353.1	439.8	210.8	235.5	291.7	493.9	304.7	260.2	275.6	152.2
Admissions for asthma for young people aged 10 to 18	2018/19	127.9	136.0	225.8	137.6	89.1	111.1	159.6	110.7	85.4	75.8	95.4	204.8	217.4	105.5	143.3	51.3

Air Quality Action Plan (AQAP)

1. Develop specific measures with local communities to reduce NO2 hotspots.
2. Promote public transport, walking, cycling and switching to zero emission vehicles.
3. Review the Council's impact on air quality including Council fleet and employee vehicles.
4. Support and encourage taxi drivers to switch to low emission vehicles.
5. Apply existing and adapt new planning development policies to support air quality improvements.
6. Publicity campaigns to encourage behavioural change around physical health and increasing use of low emission vehicles.
7. Partnership working with Birmingham City Council to minimise potential negative impact of the Clean Air Zone.

Faith Centres Air Quality Project

- The Air Quality team has been successful in bidding for funding from DEFRA
- The project is working with faith centres in Sandwell to help improve local air quality via behavioural change
- 8 faith centres will receive a screen in their centre that is linked to an air quality monitor put in nearby, and a toolkit and questionnaire



Air Pollution in Sandwell

- Approximately **2.5 million** cases of non-communicable diseases attributable to air pollution are predicted by 2035 if PM_{2.5} and NO₂ stay at current levels, making air pollution an important public health priority¹
- How can the Council, the CCG and Acute Trust come together to tackle the issue?
- **If we managed to change behaviour so drastically in the space of a year for Covid, what could we do for air pollution and climate change?**

Any questions?