6.4.9 Air quality

Why is this issue important?

Air pollution has short and long-term health effects including worsening the health of those with cardiovascular[1] and respiratory disease; infants; aggravating asthma and in the longer term, reducing life expectancy at a population level.[2] Some people with cardiovascular and respiratory diseases, especially older people, can be adversely affected by day-to-day changes in air pollutants, including an increased risk of hospital admission and death.[3]

Health effects vary depending on where people live and the type of pollutant mix they are exposed to. Across the UK it is estimated that 40,000 deaths are brought forward due to air pollution,[3] with 340,000 years of life lost.[4]

Exposure to nitrogen dioxide in the formative years can inhibit lung growth and lifelong lung capacity and influence respiratory vulnerability later in life.[5] Childhood exposure to pollutants has been linked with inhibited brain development and learning difficulties.[6]

Key outcomes

- ***Air pollution – the fraction of mortality attributable to particulate air pollution (Public Health Outcomes Framework)***

Impact in Brighton & Hove

Population and individual exposure to local airborne pollutants is higher at recognised roadside locations within the city's 2015 Air Quality Management Area (AQMA) – this is the area which it considers that English and EU limits for Nitrogen Dioxide (NO_2) are at risk of not being met. It includes the centre of Brighton & Hove, parts of Portslade and part of Rottingdean.

Compared with the whole city and England the main AQMA has a higher proportion of deaths due to lung cancer, circulatory disease and stroke. It also has higher likelihood of hospital admission for all cases including respiratory disease and stroke. Male life expectancy is three years lower in the management area than England.[7]

Airborne fine particles (referred to as $PM_{2.5}$) are monitored in Preston Park as part of the UK monitoring network. Since 2015 the City Council has also monitored levels close to North Street and Lewes Road. Compared with background concentrations mapped nationally, higher concentrations of fine particulate are recorded close to North Street.

The Public Health Outcomes Framework assesses the percentage of adult mortality (for those aged 30 or over) attributable to long-term exposure to particulate air pollution. The annual value for Brighton & Hove is 5.1%, close to England (5.3%). This has changed little since 2010 (5.4%).[8] For all pollutants (not just particulate air pollution) 11% of all-cause mortality is attributable to airborne pollution.

Ground level ozone pollutant concentrations are monitored against limit values at both Stanmer and Preston Parks. Higher concentrations of ozone are most likely to be recorded in rural areas during sunny conditions and can also have influence on respiratory inflammation in combination with other pollutants.

Concentrations of Nitrogen Dioxide (NO_2) continue to exceed national limits in certain streetscapes[9] in Brighton, Portslade and Rottingdean High Street. NO_2 monitoring records suggest that average concentrations were higher in 2013 than 2008. In most places recorded levels improved in 2014 and 2015.

Within the city, road transport is the primary cause of breaches of the NO_2 limit value, with commercial

[1] COMEAP. Cardiovascular Disease and Air Pollution; 2006. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/304668/COMEAP_cardiovascular_disease_and_air_pollution.pdf

[2] Health Protection Agency. Health Protection in the 21st Century; 2005. Available at: http://antibiotic-action.com/wp-content/uploads/2011/07/HPA-Health-protection-in-the-21st-century-2005.pdf

[3] COMEAP. The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom; 2010 pending update on the influence of Nitrogen Dioxide fhttps://www.gov.uk/government/uploads/system/uploads/attachment_data/file/304641/COMEAP_mortality_effects_of_long_term_exposure.pdf

[4] Public Health England http://www.phoutcomes.info/public-health-outcomes-framework#gid/1000043/par/E12000008/ati/102/page/6/

[5] Environmental Pollution and the Developing Lung; 2015. Available at: http://journals.lww.com/clinpulm/Abstract/2015/07000/Environmental_Pollution_and_the_Developing_Lung.4.aspx

[6] How air pollution alters brain development; 2016 found at https://www.degruyter.com/view/j/tnsci.2016.7.issue-1/tnsci-2016-0005/tnsci-2016-0005.xml

[7] Air Quality Action Plan Focus Area Community Insight Report found at: http://www.brighton-hove.gov.uk/content/environment/air-quality-and-pollution/air-quality-management-city

[8] Public Health England. Public Health Outcomes Framework. Available at: http://www.phoutcomes.info/

[9] A "streetscape" is defined as the area immediately parallel (10m either side) of an urban transport corridor.

and domestic heating combustion such as wood and coal burning making a smaller contribution to concentrations in the environment.

Roadside breaches of the NO_2 limit value occur predominantly within nine metres of certain road carriageways and at many locations the residential façade is less than six metres from the road kerb. Stop-start traffic, heavy vehicles, acceleration of diesel vehicles and the proximity of building enclosure next to traffic are factors which can result in the air quality limit value being exceeded.

The urban fringe especially around Woodingdean, Rottingdean and Saltdean is not as well served with transport choice. Compared with the city centre there is high dependency on private cars to get around.

It has been estimated that between 2,000 and 2,500 homes in the city are exposed to concentrations above the standard[10] over durations of a year or more. This figure is reducing and the Air Quality Action Plan has a measure to eliminate the number of dwellings exposed to pollution at the legal limit.

In most places within the city private cars contribute no more than half of roadside NO_2 pollution with trucks, vans, taxis and buses contributing up to three quarters. There is however considerable variation and on some streets the contribution from one vehicle type can be negligible to small. For example there are no bus routes along Viaduct Road and few private cars on sections of North Street and Western Road.

Where we are doing well

The city centre has excellent transport choice. Active travel is being promoted and cycling is on the increase. Brighton & Hove's bus use is the highest in the UK outside of London with 44 million passenger movements each year.

The Sussex airAlert service[11] provides real time information on pollution episodes across the region with messages relating to predicted pollution levels and health advice actions that can be taken. The majority of those signed up are older people.

Local inequalities

National research[12] has shown that higher relative concentrations of pollution are observed in the most deprived populations. An equalities impact assessment and Communities Insight Report was submitted with the 2015 Brighton & Hove Air Quality Action Plan. This indicates higher incidence of lung cancer and hospital admissions in the air quality management area. The area includes a mix of land use at roadsides including a high proportion of flats above commercial premises, town house conversions, houses in multiple occupations, accommodation for students and private sector housing.

Some parts of the city centre are desirable well connected areas to live in with high rental/ purchase prices, so areas of poorer air quality locally are not always within more deprived areas.

In Brighton & Hove a broad cross section of people are affected by pollution, most especially whilst in the home and car.

Predicted future need

Monitoring across the city suggests pollution levels have improved in recent years. In the near future one of the main threats to this improving trend is emissions from construction which includes trucks and fixed diesel generators.

Funding is being sought from government and industry grants and developer contributions to support measures in the Air Quality Action Plan and work towards compliance with the national air quality strategy.

More needs to be done to encourage sustainable travel for short journeys and to reduce emissions from heavy and light vehicles especially those within the AQMA and bus Low Emission Zone.

What we don't know

The Air Quality Action Plan is to explore alternative vehicle technologies in order to reduce emissions where reduction is needed most. There are no guarantees regarding future emission performance in the AQMA where road links typically have stop-start drive circuits, accelerations and hill climbs.

[10] 40 µg/m^3

[11] Sussex Air Alert; 2016 found at: https://www.airalert.info/Splash.aspx

[12] DEFRA. Air Quality and Social Deprivation in the UK: an environmental inequalities analysis; 2006.

6.4.9 Air quality

Key evidence and policy

National evidence includes:

- Committee on the Medical Effect of Air Pollutants http://www.comeap.org.uk/
- DEFRA (2016) Air Quality Policy Guidance https://consult.defra.gov.uk/communications/laqm_changes/supporting_documents/LAQM%20Policy%20Guidance%202016.pdf

The key performance indictor in the city's Local Air Quality Action Plan is to reduce the number of people living in the area above NO_2 limit values. The improvement needed is challenging and the measures multifaceted. Actions include:

- Grant funded retrofit and design work on bus and taxi fleets for lower emissions of NOx 2014-2016 investment £1.5 million
- Procurement of new cleaner buses 2015-17 investment £12 million
- Tailpipe testing of buses and taxis
- Exploring funding to improve roadside air quality in Rottingdean and Portslade
- Active travel initiatives
- Bike share schemes
- Alternatives to diesel including petrol, hybrid and electromotive – car club and car share
- Educational initiatives to encourage behaviour change, supported by travel plan measures, car clubs and providing information on traffic flow.

Recommended future local priorities

1. Progress the ongoing Air Quality Action Plan
2. Continued design, testing and retrofit of buses and taxis
3. Continued procurement of new cleaner low emissions buses and taxis
4. Seek opportunities to work with the Harbours Authority and use grants to fund low emission lorries
5. Consider the impact of planning applications on the AQMA / Air Quality Action Plan on a case by case basis
6. Development Control linked with National Planning Policy Framework, the Sussex and national planning guidance for air quality; design and ventilation strategy encouraged to mitigate residential exposure to ambient pollution.

Key links to other sections

- Road safety
- Physical activity and active travel
- Coronary heart disease
- Respiratory disease
- Cancer
- Maternal and infant health

Further information

Brighton & Hove City Council Air Quality Action Plan http://www.brighton-hove.gov.uk/index.cfm?request=b1000293

Sussex-Air http://www.sussex-air.net/

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