Heeley, Sharrow, Millhouses & Nether Edge 2008

Air Quality

Health Effects of Air Pollution

Some Health Trends

Sheffield Neighbourhoods Information System (SNIS)
Community Air Quality Monitoring of Nitrogen Dioxide for 2008

Heeley

Nether Edge

National Air Quality Annual Average objective to be reached by December 2005. Set at this level to protect public health.
Community Air Quality Monitoring of Nitrogen Dioxide - Annual Averages

Heeley

Nether Edge
# Health Effects of Air Pollution

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Effects related to short-term exposure</th>
<th>Effects related to long-term exposure</th>
</tr>
</thead>
</table>
| Particulate matter                             | • Lung inflammatory reactions  
  • Respiratory symptoms  
  • Adverse effects on the cardiovascular system  
  • Increase in medication usage  
  • Increase in hospital admissions  
  • Increase in mortality                  | • Increase in lower respiratory symptoms  
  • Reduction in lung function in children  
  • Increase in chronic obstructive pulmonary disease  
  • Reduction in lung function in adults  
  • Reduction in life expectancy, owing mainly to cardiopulmonary mortality and probably to lung cancer |
| Ozone                                          | • Adverse effects on pulmonary function  
  • Lung inflammatory reactions  
  • Adverse effects on respiratory symptoms  
  • Increase in medication usage  
  • Increase in hospital admissions  
  • Increase in mortality                  | • Reduction in lung function development                                    |
| Nitrogen dioxide (in ambient air, NO₂ serves as an indicator for a complex mixture of mainly traffic-related air pollution) | • Effects on pulmonary function, particularly in asthmatics  
  • Increase in airway allergic inflammatory reactions  
  • Increase in hospital admissions  
  • Increase in mortality                  | • Reduction in lung function  
  • Increased probability of respiratory symptoms |
Air Pollution and Noise: their effects on human health and social inclusion - a review of recent literature

Executive Summary

This review of recent papers looks at the growing body of evidence of how environmental factors, and particularly road-traffic related air pollution, affect health. Some of the most recent studies focus on the effects of small particulates which penetrate to the lungs and their adverse effects on cardiovascular disease, coronary heart disease, and stroke. Other studies have highlighted the disproportionate burden of environmental degradation, particularly air quality and noise, on deprived communities, with consequent impacts on increasing social deprivation.

Children (and the unborn foetus) are especially vulnerable to the effects of air pollution, because their lungs, metabolic and immune systems are still developing, they have higher rates of respiratory infections, and have activity patterns which lead to higher exposure. The effects in childhood and foetal development can include:

- aggravation of asthma
- increased cough and bronchitis
- low birth weight
- infant deaths (due to respiratory and Sudden Infant Death Syndrome)
- pre-term births
- birth defects

leading to effects throughout adult life:

- premature ageing
- higher risk of infection
- susceptibility to tobacco smoke
- susceptibility to occupational exposure.

Air pollution has been associated with a range of health impacts, including:

- aggravating and causing respiratory disease (including asthma, bronchitis, emphysema, etc.)
- increased risk of cardiovascular disease and death
- increased risk of coronary heart disease and death
- increased risk of stroke
- eye disease
- DNA damage.
Examples of the costs of air pollution from Europe, the UK and Sheffield

<table>
<thead>
<tr>
<th>European Union</th>
<th>kills 370,000 people per year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>reduces life expectancy by up to 9 months on average</td>
</tr>
<tr>
<td></td>
<td>costs between €427 billion and €790 billion per year</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>6,500 deaths brought forward (in 2002)</td>
</tr>
<tr>
<td></td>
<td>6,400 hospital admissions (in 2002)</td>
</tr>
<tr>
<td></td>
<td>A 1 mg/m³ decrease in PM_{2.5} would give between 1.5 and 3.5 extra days of life per person</td>
</tr>
<tr>
<td></td>
<td>NOx damage per tonne emission for 2010 €3,900 (low estimate)</td>
</tr>
<tr>
<td></td>
<td>PM_{2.5} damage per tonne emission for 2010 €37,000 (low estimate)</td>
</tr>
<tr>
<td></td>
<td>SO₂ damage per tonne emission for 2010 €6,600 (low estimate)</td>
</tr>
<tr>
<td>Sheffield</td>
<td>6% coronary heart disease deaths</td>
</tr>
<tr>
<td></td>
<td>11% stroke deaths</td>
</tr>
<tr>
<td></td>
<td>Annual health costs of £48.1m (low estimate) based on:</td>
</tr>
<tr>
<td></td>
<td>8,000 tonnes per annum NOx emissions (£20.9m)</td>
</tr>
<tr>
<td></td>
<td>1,480 tonnes per annum SO₂ emissions (£6.5m)</td>
</tr>
<tr>
<td></td>
<td>1,190 tonnes per annum PM_{10} emissions (£20.7m - costs estimated on PM_{2.5} being 70% of PM_{10})</td>
</tr>
<tr>
<td></td>
<td>Estimated annual cost benefits of introducing a Low Emission Zone between £1.8 million and £11.4 million per year (compared with inner relief road, costing £59m capital costs, bringing annual cost benefits of £0.03m to £0.2m)</td>
</tr>
</tbody>
</table>
Air Pollution and Noise: their effects on human health and social inclusion - a review of recent literature

Noise and health
As well as the adverse effects of air pollution on health, road traffic generates noise which affects health in the following ways:
- annoyance
- sleep disturbance
- quality of sleep
- ischaemic heart disease
- impaired performance by school children
- some evidence to suggest that it may cause low birthweight in babies and psychiatric disorders.

Conclusion
The growing body of evidence would suggest that bolder and more effective measures should be taken to reduce people's exposure to air pollution and noise attributable to road-traffic and thus reduce their risk of disease and mortality due to cardiovascular, respiratory, and other symptoms. The evidence suggests that there is no safe level of exposure to particulate matter, and especially to very small particles (PM_{2.5}) which penetrate into the lungs. Many studies highlight the possible under-estimates of the health effects of traffic-related air pollution and noise, due to problems in isolating these from other effects on health.

The most deprived communities experience the worst environmental degradation. The implications for policy therefore would seem to be to target measures to reduce air pollution in deprived areas and highly populated urban areas, where the relatively small individual health benefits can make a big impact because they reach a large population. Concerns about the U.K.’s ability to meet current targets to reduce air pollution, particularly in urban areas, further emphasise the need for reducing motor vehicle traffic but at the same time enhancing alternatives such as walking, cycling, and public transport.

Revised January 2006
“Cardiovascular disease is very common and, as exposure to air pollution, both in the long and short term contributes to initiation and exacerbation of disease, it is likely that even modest reductions in exposure will result in significant health gain.”

The term cardiovascular disease includes all diseases of the heart and blood vessels including stroke.
The effects of air pollution on children’s health and development: a review of the evidence

While recognizing the need for further research, current knowledge about the health effects of air pollution is sufficient for a strong recommendation to reduce children’s current exposure to air pollutants, in particular to the pollutants related to traffic. The experts who conducted this review consider that such reductions in levels of air pollution will lead to considerable children’s health benefits.
Life Expectancy and Deaths

Female Life Expectancy

Male Life Expectancy

Mortality all causes aged <75

Mortality cancer aged <75


Life Expectancy calculation based on a method calculated by the West Midlands Public Health Observatory.
Deaths


All mortality rates expressed as European Age Standardised rates per 100,000 population except infant deaths aged <1 year expressed as rate per 1,000 live births.

2008HSMNHealthAir
Hospital Admission Rates - *Emergency Admissions / A&E*

**Emergency Admissions to hospital for CHD (all ages)**

- **1997/98 - 2001/02**
- **1998/99 - 2002/03**
- **1999/00 - 2003/04**
- **2000/01 - 2004/05**
- **2001/02 - 2005/06**
- **2002/03 - 2006/07**

- **Heeley**
- **Sharrow**
- **Millhouses**
- **Nether Edge**
- **Sheffield**

**Admissions to hospital for cancer (all ages)**

- **1997/98 - 2001/02**
- **1998/99 - 2002/03**
- **1999/00 - 2003/04**
- **2000/01 - 2004/05**
- **2001/02 - 2005/06**
- **2002/03 - 2006/07**

**Admissions to hospital for chronic diseases (all ages)**

- **1997/98 - 2001/02**
- **1998/99 - 2002/03**
- **1999/00 - 2003/04**
- **2000/01 - 2004/05**
- **2001/02 - 2005/06**
- **2002/03 - 2006/07**

**Admissions to hospital for diabetes (all ages)**

- **1997/98 - 2001/02**
- **1998/99 - 2002/03**
- **1999/00 - 2003/04**
- **2000/01 - 2004/05**
- **2001/02 - 2005/06**
- **2002/03 - 2006/07**

Data Source: Inpatient Minimum Data Sets, 2002/03-2006/07; Population Health Register extracts, 2002/03-2006/07.

All rates expressed as European Age Standardised rates per 100,000 population.

† Chronic Diseases include CHD, diabetes and respiratory diseases include COPD and asthma.
Hospital Admission Rates - Other Admissions

Admissions to hospital for COPD (all ages)

Admissions to hospital for Stroke (all ages)

Admissions to hospital for asthma (all ages)

Admissions to hospital under mental health specialties (all ages)

Data Source: Inpatient Minimum Data Sets, 2006/07; Population Health Register extracts, 2006/07.

All rates expressed as European Age Standardised rates per 100,000 population except emergency admissions aged <18yrs expressed as rate per 1,000 population.
Data source: Sheffield City Council Neighbourhoods, 2008
Asthma

air pollution

Could this be your child? Drive less and he/she could need inhalers less.

25% of car journeys less than 2 miles

Think about walking, cycling or taking a bus / tram for better health all-round.

NHS Sheffield
Public Health
722 Prince of Wales Road
Darnall
Sheffield
S9 4EU

East End Quality of Life Initiative
C/o 10 Montgomery Terrace Road
Sheffield S6 3BU
Tel. 0114 285 9911/9931
What can you do to tackle climate change?

With the Stockholm Environment Institute, Sheffield City Council has developed a carbon footprint for the city.

Sheffield's total carbon footprint (based on 2004/05 consumption figures) is 5,798,361 tonnes per year. This compares to the UK's total carbon footprint of 698,568,010 tonnes per year.

Sheffield’s Carbon Footprint

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>34%</td>
</tr>
<tr>
<td>Transport</td>
<td>25%</td>
</tr>
<tr>
<td>Consumer</td>
<td>11%</td>
</tr>
<tr>
<td>Private Services</td>
<td>9%</td>
</tr>
<tr>
<td>Public Services</td>
<td>8%</td>
</tr>
<tr>
<td>Capital Investment</td>
<td>5%</td>
</tr>
<tr>
<td>Food</td>
<td>8%</td>
</tr>
<tr>
<td>Other</td>
<td>0%</td>
</tr>
</tbody>
</table>

Here are some simple energy saving ideas that you can do to help reduce Sheffield’s carbon footprint, and save money:

- Boil only as much water in an electric kettle as you need
- Switch off the lights when you leave a room
- Switch off the TV, computer, etc at the wall; don’t leave them on standby
- Take a 3-minute shower

Why bother about climate change?

Isn’t it just about ice sheets and polar bears?

Or does it affect me in Sheffield?

More ways to help save the planet and get fit:

- Use public transport more
- Walk and cycle more
- Cut down on car use

Climate change experts tell us that this is the sort of thing we need to expect for the future.

BBC News 26 June 2007