Health co-benefits of climate change mitigation policies

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Health co-benefits of the ‘low-carbon’ economy
(Haines et al Lancet 2009)

Through policies in several sectors e.g.

- Housing
- Transport
- Food and agriculture
- Electricity generation
The scale of the challenge
(UK Committee on Climate Change)


2006 emissions

695 Mt CO₂e

International aviation & shipping*
UK non-CO₂ GHGs
Other CO₂
Industry (heat & industrial processes)
Residential & Commercial heat
Domestic transport
Electricity Generation

2050 objective

159 Mt CO₂e

77% cut (= 80% vs. 1990)

184
134
103
108
98
42

* bunker fuels basis
Benefits of household energy efficiency in the UK (combined insulation and ventilation control improvements) (Wilkinson et al 2009)

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Reduced exposures e.g. to fine particles, radon, cold, mould, tobacco smoke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature deaths averted</td>
<td>~ 5400/ year</td>
</tr>
<tr>
<td>Mt-CO$_2$ saved (vs 1990)</td>
<td>55</td>
</tr>
</tbody>
</table>
Health and GHG benefits of Indian improved stove programme -150 m over 10 years

Wilkinson P Smith KR et al 2009

• 2 Million premature deaths averted (mainly women and children)

• Reductions in black carbon, methane, ozone precursors $\sim 0.5-1.0$ billion tonnes of CO$_2$ eq over the decade

Cost <$50 per household every 5 years
Urban Transport Pathways modelled: Increased active travel and low carbon driving in London and Delhi (Woodcock et al. 2009)
London travel patterns

- Car
- Rail
- Bus
- Walk
- Bicycle
- Motorcycle

Legend:
- Red: Baseline
- Blue: 2030: Lower Carbon Driving
- Green: 2030: Increased Active Travel

km per person per week
Health benefits in London: alternative scenarios

DALYs per million population

Lower Carbon Driving | Increased Active Travel | Combination

0 | 0 | 0
Estimated health effects of increased active travel in London -- reductions in diabetes, large bowel cancer and depression not shown (from Woodcock et al 2009)

<table>
<thead>
<tr>
<th>Disease</th>
<th>Change in disease burden</th>
<th>Change in premature deaths</th>
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<tbody>
<tr>
<td>Ischaemic heart disease</td>
<td>10-19%</td>
<td>1443-2207</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>10-18%</td>
<td>866-1271</td>
</tr>
<tr>
<td>Dementia</td>
<td>7-8%</td>
<td>195-250</td>
</tr>
<tr>
<td>Breast cancer</td>
<td>12-13%</td>
<td>203-211</td>
</tr>
<tr>
<td>Road traffic crashes</td>
<td>19-39%</td>
<td>47-86</td>
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### Estimated health effects of increased active travel in Delhi

- Reductions other health outcomes not shown (from Woodcock et al 2009)

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<td>7-19 %</td>
<td>840-2280</td>
</tr>
<tr>
<td>Road traffic crashes</td>
<td>27-69 %</td>
<td>1170-2990</td>
</tr>
<tr>
<td>Diabetes</td>
<td>6-17 %</td>
<td>180-460</td>
</tr>
<tr>
<td>Depression</td>
<td>5-8 %</td>
<td>NA</td>
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</table>
Figure 1: Potential annual NHS expenditure averted by year and health outcome from Increased Active Travel scenario
Figure 3: Sensitivity Analyses showing NHS expenditure averted over 20 years for various parameters.
Food and Agriculture Sector

- ~80% of total emissions in sector from livestock production
- Reducing animal source saturated fat by 30% in the UK could reduce heart disease deaths by ~ 15% (~18,000 premature deaths) and a similar % in São Paulo, Brazil (Friel, Dangour et al. Lancet 2009)
Electricity generation - Air pollution impacts vs CO$_2$ emissions

Premature Deaths Avoided in 2030 from reduced particulate air pollution due to lower carbon electricity generation  

(Markandya et al 2009 Lancet)
Reductions in emissions of CO2 from electricity in 2030 (full trade approach) in millions of tonnes
Conclusions

Policies that address both public health and climate change are more attractive than focusing on either in isolation. The health gains associated with climate change mitigation policies are additional to benefits from reducing climate change. These health co-benefits can help avert health service costs and offset the costs of low carbon policies.
Low carbon policies can improve health in the near term as well as reducing the risks of dangerous climate change.

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Involving 55 researchers from UK, USA, India, Canada, Australia, Spain, France, New Zealand, WHO Geneva

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