Welcome

Cheshire & Merseyside Air Quality CPD Event

Wednesday 11th November 2015

Select Stadium Widnes Cheshire

Working together to improve health and wellbeing in Cheshire and Merseyside
Overview

• Public Health England's air pollution objective
• Burden of air pollution on health / Public Health Outcomes Framework
• Role and responsibilities
• Air pollution episodes
• Public Health England's air pollution programme
• Examples of local interventions
Public Health England’s Air Pollution Objective

*Develop a programme in support of national and local government to reduce 25,000 deaths each year in England attributable to air pollution*

The new public health arrangements for England provide an opportunity to join up national-level research and advice on air pollution & climate change with local-level influencing and action

Public Health England is keen to ensure that the design and development of action on air pollution occurs at all appropriate levels, local, regional and national, including creating opportunities for actions to be co-ordinated by all stakeholders
COMEAP (2010) estimated the mortality burden of human-made particulate pollution in UK in 2008 as:

- an effect equivalent to approximately 29,000 deaths
- a loss of 340,000 years of life
- average loss of 6 months of life expectancy from birth

https://www.gov.uk/government/groups/committee-on-the-medical-effects-of-air-pollutants-comeap
Local mortality associated with PM$_{2.5}$

Guidance on estimating mortality attributable PM$_{2.5}$ at Local Authority level

- Attributable fraction:
  - UK: 5.3
  - England: 5.6

- Attributable deaths:
  - UK: 29,000
  - England: 25,000

- Years of life lost:
  - UK: 307,000
  - England: 265,000


(Gowers et al. 2014)
Public Health England

Public Health Outcomes Framework

http://www.phoutcomes.info/
More than 5% of ‘deaths’ (5.3%) in England are attributable to long-term exposure to particulate air pollution, according to the latest data.

This estimate makes air pollution the largest environmental risk linked to deaths every year.

While this is the fourth year of data, it is too early to read a trend because individual years are likely to fluctuate due to changes in weather conditions.

It is important to understand that long-term exposure to air pollution is not thought to be the sole cause of deaths. Rather, it is considered to be a contributory factor, probably to many more than 25,000 deaths.
Comparing risk factors

Long-term exposure (over several years) to particulate air pollution affects deaths from the same sorts of diseases as smoking.

But some deaths are largely caused by smoking or there is at least a close link to it.

The same is true of alcohol. The table shows estimates of yearly mortality in England and the number of deaths for which the risk factor is the main cause of death.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Annual attributable mortality in England</th>
<th>Deaths for which the risk factor is the main cause of death</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term exposure to particulate air pollution</td>
<td>25,000</td>
<td>Small number</td>
</tr>
<tr>
<td>Alcohol</td>
<td>22,481</td>
<td>6,000</td>
</tr>
<tr>
<td>Smoking</td>
<td>79,700</td>
<td>43,400</td>
</tr>
</tbody>
</table>
Long-term exposure to air pollution is associated with a significant health burden at population level. It is likely to be a contributory factor in initiation, progression and exacerbation of a number of diseases.

The most consistent and convincing evidence suggests an important role for fine particulate matter (PM$_{2.5}$) in causing observed adverse health effects, although other pollutants (including NO$_2$, O$_3$ and SO$_2$) are also linked with health effects.

While air pollution is generally considered a contributory factor to mortality, there is evidence that outdoor air pollution causes lung cancer. Diesel engine exhaust, outdoor air pollution and particulate matter have all been classified by the World Health Organization (WHO) as carcinogenic to humans.
Short-term episodes of elevated levels of outdoor air pollution

Air pollution episodes - transient elevated concentrations of air pollutants, such as particulate matter or O$_3$ - typically occur several times a year in the UK.

These events are often due to weather or particular events, such as Saharan dust-storms or agricultural fires on the continent.

Short-term exposure to elevated levels of air pollution can cause a range of acute health problems, including exacerbation of asthma, effects on lung function, increases in hospital admissions and increased mortality.

(Committee on the Medical Effects of Air Pollutants (COMEAP), 1998, 2001, 2011)
Air Pollution Episodes

• PHE has been working with Defra to help disseminate health advice when there are high pollution episodes
• Met Office air pollution maps
• Real-time syndromic surveillance data
• Ambulance data
Roles & Responsibilities

- **EU**: National Emission Ceilings, Euro standards, Air Quality Directives
- **Defra**: National Air Quality Strategy, air quality monitoring, DAQI, NAP
- **DfT**: Sustainable local transport white paper, ultra-low emission vehicles
- **DCLG**: Planning system, building standards
- **DECC**: Energy policy and climate change mitigation
- **EA**: Granting permits for industry, climate ready
- **Met Office**: Air pollution modelling and forecasts, climate projections
- **LAs**: Local Air Quality Management System, planning, permits, LEZ
- **DPH**: Health & Wellbeing Boards, etc.
- **PHE**: Health advice, exposure reduction, health co-benefits?
- **Others**: Academic community, consultancies, professional bodies (IAQM, CIEH), Local support groups, Charities (GAP, BHF/BHF) citizen groups, patients, etc.
PHE’s Air Pollution Programme

Public Health England has developed an outline programme in support of national and local government to reduce mortality in England attributable to air pollution.

• Air Pollution and Public Health advisory group with representatives from local authorities, government, academia and professional bodies was established in 2014.

• This work programme was also informed by a wider stakeholder event in February 2015 and discussion within COMEAP.
Focusses on:

1. Raising public and professional awareness through sustained public health engagement with local authorities and other stakeholders

2. Providing evidence on the health effects of air pollutants and developing a practical framework for local authorities to evaluate the health benefits of local interventions, such as active travel, aiming to reduce exposure to air pollution and provide wider public health benefits
PHE’s national work programme

‘Awareness’ deliverables (led by our Environmental Hazards and Emergencies Department):

• Report listing local and regional forums and networks related to air quality and health, evaluating PHE engagement, and summarising their activities and best practices
• Production of a “resource pack” containing information regarding air pollution and health (impacts, indicators, health messages)
• An annual event to share good practice regarding interventions that benefit air pollution and health
• Development of a future (2016/17) communications campaign on air pollution and health, promoting active travel
• Media pack for episodes of poor air quality (this is not part of the business plan, but has been developed by our comms for LAs)
PHE’s national work programme

‘Evidence’ deliverables (led by our Air Pollution and Climate Change Team):

• Updated PHOF indicator 3.01 – Fraction of mortality attributable to particulate air pollution
• Quantification of (national) mortality attributable to NO2 (in tandem with COMEAP publication, expected in December)
• Paper quantifying (national) health impacts attributable to ozone
• Journal articles evaluating the impact of air quality episodes in March/April 2014 on healthcare demand and mortality
• Inclusion of air pollution in CMO’s annual report
• An annual review meeting on indoor and outdoor air pollution research
• Report on methods for assessing the health benefits of local transport-related interventions (eg, active travel schemes / local traffic plans)
• List of environmental health indicators that can be used to show the health impacts and/or benefits of local policies and interventions related to air pollution and climate change
Supporting local interventions

- Low Emission Zones
- Pedestrianisation schemes
- Public transport improvements
- Park & ride schemes
- Active travel (cycling and walking)
- Traffic calming schemes
- Urban parks and forests
- Green walls and roofs
Local Authority partnerships

Evolving from the Air Quality Beacon Councils group

Low Emission Strategies Partnership established in 2008, as an informal group working together to reduce road transport emissions.

Among useful tool kits are a ‘the Hub’ a central information resource for Low Emission Strategies (LES) interventions and impacts, Planning guidance and a LES toolkit.

http://www.lowemissionstrategies.org/
Local health interventions

Barts Health NHS Trust Cleaner Air project
5 key things to help Barts Health community breathe cleaner air

1. Physicians helping patients to understand how they can improve the quality of the air they breathe

2. Health professionals advising patients during home visits on ways to keep warm

3. Breathing spaces create healthy green havens

4. Staff and patients switch to walking or cycling on low pollution routes

5. Helping our partners to adopt low pollution behaviours

http://www.globalactionplan.org.uk/barts-health-cleaner-air-programme
Local Health Interventions

Cont. Barts Health Trust

1. Protecting Patients – Clinicians at Barts Health to provide advice to vulnerable patients on how to reduce their exposure to air pollution.

2. Community Based Emissions – patients in Tower Hamlets will receive energy packs to help them stay Warm and Well in their homes over winter. Packs will help reduce boiler emissions a cause of air pollution.

3. Breathing Spaces – creating Cleaner Air Zones around hospital sites with no-vehicle idling and green spaces.

4. Active Travel – working with Barts Health staff to become more active and reduce emissions from staff commuting.

5. Trust Transport – Barts Health leading the way in improving air quality by reducing emissions from their own vehicles, suppliers and working with local businesses to reduce their contribution to air pollution.

http://www.globalactionplan.org.uk/barts-health-cleaner-air-programme
An infant school was chosen for the first trial of ivy walls, as children are more vulnerable to the effects of air pollution, and the playground stands immediately alongside a busy stretch of Bearwood Road, Sandwell West Midlands.

Around 34m length of boundary Ivy fencing facing Bearwood Road has now been installed.
Defra led project

1. Communication with the public about air pollution
2. Air pollution an emerging public health issue
3. Engaging local decision makers
4. Understanding air pollution in your area
5. Getting to grips with air pollution

“Air” Text Messaging

- Bespoke alerting services are not countrywide
- Defra/Met Office air quality forecasts, Air Quality Index, existing local alert services (e.g., airText, airAlert), current use of Twitter (retweets by PHE), and traditional media coverage
- Qualitative research suggests opt-in public alerting services (such as text messaging services) are appreciated by their users, though an overall picture and evaluation of alerting systems seems lacking at the national level.
Acknowledgements

- PHE’s Air Pollution and Public Health Advisory Group
- Committee on the Medical Effects of Air Pollutants (COMEAP)
- Department of Health, Defra, DfT, DCLG, DECC, EA
- The new National Institute for Health Research Health Protection Research Unit (NIHR HPRU) in Environmental Change and Health (led by the London School of Hygiene & Tropical Medicine)
- IAQM, CIEH
Thank You
Cheshire & Merseyside Air Quality CPD Event
Challenges involved in Action Planning
News headlines September 1966

95 Persons Perish As British Airliner Crashes In Yugoslavia

Chartered Craft Carried 117 On Vacation Flight

Thant Rejects New Term

If Any U.S. Boost Is Approved—
No Tax Increases Before January 1

Somebody Goofed On Bridge!

Faith Speeds Away From Mainland

Texas Crash Kills Five Teen Boys

Deaths

Weather
News headlines December 1957

Lewisham train crash 90 people die, 176 injured
News headlines: 2010

95 Warrington people died from exposure from poor air quality in 2010 and in 2011, 2012, 2014, 2015...

Newspaper headline??
What is our air quality like?

Similar to most towns in the region.

Exceedances for NO\textsubscript{2} at residential locations close to major roads

3 Air Quality Management Areas

A number of locations close to the objective level
Where do we monitor?

Selby Street
   Urban Background location
   NOx, SO$_2$, PM$_{10}$, PM$_{2.5}$

Chester Road
   Roadside NOx
Where do we monitor?

Parker Street
  Roadside NOx

43 Diffusion tubes
  NO₂
Which pollutants are of concern?

Nitrogen dioxide

<table>
<thead>
<tr>
<th></th>
<th>Annual Mean Concentration (\mu g/m^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2007</td>
</tr>
<tr>
<td>Selby St</td>
<td>24</td>
</tr>
</tbody>
</table>

Annual fluctuations due to meteorological conditions.
NO$_2$ data
Which pollutants are of concern?

$\text{PM}_{2.5}$

Measured at Selby Street background site. Part of the national network that informs pollution warnings

<table>
<thead>
<tr>
<th></th>
<th>Annual Mean Concentration $\mu g/m^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
</tr>
<tr>
<td>Selby Street</td>
<td>14</td>
</tr>
</tbody>
</table>

No roadside measurements have ever been done
Short term peaks

Transboundary pollution episodes
March/April 2014
Short term peaks

Bonfire night 2014 PM$_{2.5}$
Sources

Industry

Domestic Heating/biomass boiler systems

Shipping (Manchester Ship Canal)

Garden bonfires/chimineas/BBQs

Trains

But the major source is....
## Road traffic

<table>
<thead>
<tr>
<th></th>
<th>Car Petrol %</th>
<th>Car Diesel %</th>
<th>LGV HGV %</th>
<th>Buses %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic</td>
<td>90</td>
<td>9</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>NOx</td>
<td>11.3</td>
<td>50.0</td>
<td>27.6</td>
<td>11.1</td>
</tr>
<tr>
<td>PM2.5</td>
<td>18.9</td>
<td>52.1</td>
<td>23.3</td>
<td>5.7</td>
</tr>
</tbody>
</table>
Actions taken

Action Plan contained within LTP.

Cycling

61% increase since 2004
101 Km of off road cycle ways
Bike hire schemes at the train station
Work place travel plans
Actions taken

ECO Stars Fleet Recognition Scheme
   47 members
   3,282 vehicles

Smoke Control Areas
   Majority of Warrington is covered since the 1970s
Actions taken

Road infrastructure improvements
  Key locations on Parker Street and Sankey Way to improve traffic flow

Planning applications
  Screened for air quality impacts
  Change design/layout
  NO$_2$ filtration systems
Actions taken

Electric car charging

5% of all new spaces now required to have charging points
But have these resulted in significant improvements?

The UK Government predicts that the NO$_2$ objectives will be met by 2020 under the current action plan.

And if they are not, what then?
What is needed?

Require significant reduction in traffic volume

Get people out of their cars!

Reduce HGV emissions

Change from fossil based fuels to alternatives
Challenges faced

Development and growth

10% increase in population in next 20 years
Additional 850 homes to be built per year

Additional traffic, additional receptors

“Sustainable” Growth?
Challenges faced

Using the ‘correct’ evidence

We focus on NO$_2$, not on PM$_{2.5}$

“Accuracy” of data and modelling

Health evidence –understanding short term compared to long term exposure

Meteorology
  Short term impacts vs long term trends
Challenges faced

Using the ‘correct’ evidence

Models predicted that there would be no exceedances by 2010. Predicted improvements have not been seen in monitored data.
Challenges faced

Communication

Public apathy

The right messages to the right people

Deprived areas and/or groups with existing health concerns

Use of social media
Challenges faced

Statutory duty

Tied to national objectives. But does this limit actions to improve air quality further?

Objectives do not cover PM$_{2.5}$ at a local level

National Policies

Need to link up with economic policies – tax incentives have led to big increase in diesel usage which were mainly based on carbon savings.

Restrict exposure or reduce emissions? Need policies on both
Challenges faced

Funding and resources

Cost of operating monitoring sites

Staffing levels and resources

National grants
Ultimate Challenge

Improve Health for all residents of Warrington

Need to link AQ policies with health, transport, and economy

29,000 deaths related to PM$_{2.5}$
23,500 deaths related to NO$_2$

4.8% of mortality in Warrington related to PM$_{2.5}$ which is just under 100 people a year...

Plus restrictions on day to day live for those most vulnerable
What we would like

Health evidence at ward level of the impact of pollution

Evidence of increase in GP and hospital emissions for short term pollution episodes

Health teams to advise us which pollutants need monitoring and where?

Pollution advice to the most vulnerable in society

How can Environmental Protection teams support health policies

“Northern Powerhouse” – Regional air quality and health policies
Richard Moore

Environmental Protection Officer (Air)
Tel: 01925 442596
rmoore@warrington.gov.uk
Cheshire & Merseyside Air Quality CPD Event
Practical measures that have brought about improvements in Sefton’s AQ

Greg Martin
Rob Marrs
Pollution Control Team
The Situation in Sefton

• NAQS objectives complied with in Sefton for:
  • Carbon Monoxide
  • Lead
  • Benzene
  • 1,3 Butadiene
  • Sulphur Dioxide

• NAQS objectives not complied with for:
  • Nitrogen Dioxide (Annual Av 40 ug/m³) and historically
  • Particulate Matter PM10 (Daily Av 50ug/m³ not exceeded more than 35 times a year)
Air Quality Management Areas

- If NAQS objectives not met LA has to declare an AQMA for that defined area.
- LA has to develop an action plan for each area to bring levels of pollutants back in line with NAQS objectives.
- 5 AQMA’s identified in Sefton
Millers Bridge AQMA

- N02, PM10 NAQS exceedances Declared in 2009
- Traffic and Port main sources.

Action Plan
- Intensive road washing.
- Close work with Agencies regulating processes on the docks
- Hurry Call System.

Current Levels
PM10 now compliant
N02 still showing exceedences.
Princess Way AQMA

- Declared for N02 exceedances.
- Main source HGV emissions.
- Problem likely to be exacerbated by increase in port traffic as L2 terminal opens.
- Action plan still needs to be finalised as a major highways scheme is required to deal with the increase in traffic. Highways England responsible for this project.
Hawthorne Road/ Church Road AQMA

- Declared in 2012 for N02 exceedances.
- Main source of N02 at this location is road traffic.
- Showed compliance in 2013.
- May be affected by increase in port traffic – Action plans need to be developed.
ACTION PLANS

Hurry Call System
Intensive Road Washing Project
ECOSTARS
HURRY CALL SYSTEM

- Traffic Light Priority system.
- Implemented in 2011 as part of Seftons AQ Action Plan.
- Identified that HGV’s leaving Port of Liverpool in this location were a major source of NO2 and PM10.
- Gives priority to HGV’s leaving the Port of Liverpool heading up Miller’s Bridge.
- Activates in non rush hour conditions.
The system is successfully facilitating the passage of HGVs through the traffic lights at Millers Bridge, instead of stop/start at the traffic lights, thus helping to reduce NO2 and PM10 emissions at the junction.

Levels of PM10 have now reduced to below NAQS objectives in this area, however hard to evaluate the effect the Hurry call system is specifically having on lowering emissions.

Successful as part of a package of measures.
INTENSIVE ROAD WASHING

• Investigations carried out identified that resuspension is an important source of particulate matter in the Millers Bridge AQMA.

• Studies in Dusseldorf have shown reductions in PM when intensive road washing introduced. (6% reduction in number of exceedence days)
ROAD CLEANING

• programme of manual ‘digging out’ and washing of pavements and more intensive sweeping of the roads was developed.

• Manual pavement and carriageway washing at the Millers Bridge AQMA was conducted by Sefton Council’s Operational Service department during 2010.
Road Cleaning Evaluation

- To take account of variations due to meteorological conditions, the ratio of daily mean PM10 in the AQMA to an urban background site was compared for 2009 and 2010.
- This trial has indicated reduced PM10 levels during 2010 spring/summer months.
Figure 1: Effect of Road Sweeping and Manual Pavement and Carriageway Cleaning and Washing on PM$_{10}$ Concentrations
ECOSTARS

- Recognition of best practice in clean and energy efficient operations
- Member vehicles and operating practices are assessed, to recognise levels of environmental and energy-saving performance and a star rating is applied.
- Guidance and advice provided on how further cost savings and environmental improvements can be achieved
Why EcoStars for Sefton

- 3 Air Quality Management Areas A5036 for nitrogen dioxide
- HGVs significant source in these AQMAs
- EcoStars offers a way to reduce emissions with potential benefits to fleet operators
The Sefton Scheme

• Managed by Sefton Council
• Free local membership scheme
• Open to operators of vehicle fleets (trucks, vans, coaches and buses) that use the A5036
• Operators do not need to be based in Sefton
Operator Benefits

- Recognition at both vehicle and management level for current operational practices
- Advice on measures which could help to improve performance (AQ, GHG, £)
- Opportunities to raise profile with other operators, customers & local communities

Membership package:
- Star rating Certificate
- ‘Road map’ for operational & environmental efficiency
- Ongoing guidance to progress
Local Authority Benefits

A tool to help with:
- Reduction in air pollutants ($NO_x$, $PM_{10}$)
- Reduction in GHG emissions
- Work to meet EU limits and National LAQM obligations
- A communication channel with goods vehicle, bus & coach operators
An Example of Emissions Benefits

Clipper Logistics emissions per fleet km - % compared to date joined ECO Stars

- NOx
- PM10
- CO2

Year
- At registration
- start 2010
- start 2011
- start 2012

Emissions per fleet km - % compared to date joined ECO Stars
Thankyou for Listening

QUESTIONS?
Cheshire & Merseyside Air Quality CPD Event
West Yorkshire Air Quality and Health Strategy Project:

A collaborative approach to improving air quality and health, a Bradford Council case study

Dr Sara Ahern
11\textsuperscript{th} November 2015
The West Yorkshire Problem

- one of only three areas in the UK predicted not to meet EU directives by 2030
- 5-6% of all deaths are attributable to particulate pollution
- this is expected to rise to 10% when NO2 figures are released
- estimated annual health cost ~£524m, equivalent of just over 1,000 deaths/year
Integrating the air quality agenda

- Fleet development
- Development control policies
- Procurement policies
Collaborative work

- Health economics
- Infographics
Collaborative work

- Low Emissions Zone Feasibility Study
- Health Impact Assessment

Estimated reduction in the number of children and young people (0-18yrs) developing asthma (Leeds and Bradford Districts)
The West Yorkshire Low Emissions Group

“A vibrant West Yorkshire economy, where people use transport and power and heat their homes and businesses in a way which improves air quality to create a safer and healthier environment for people to live, work and invest.”

- to meet the air quality limit values by 2020.
- to reduce emissions from transport
- to avoid activity which has an adverse impact on air quality and to prioritise activity which delivers co-benefits of cutting carbon emissions and reducing environmental noise

Public consultation ends 11th December 2015
http://www.bradford.gov.uk/bmdc/Consultations/west_yorkshire_low_emission_draft_strategy
The Project

• outcome of a joint bid submitted to Defra in 2013
• focused on behaviour change
• targeting different ‘levels’ of the population
  – individual / community level
  – decision maker level
• aims to pull together ongoing active travel and air quality work - joint aims and synergies
Who is involved?

- 5 WY local authorities
- Metro (within Combined Authority)
- Public Health England
- Born in Bradford

Regional, Cross-sector, Cross-departmental
Born in Bradford

- Birth cohort study of 13,500 children
  - describe health and ill-health and their causes
  - develop, design and evaluate interventions to promote health
  - provide a model for integrating research into practice
  - build and strengthen local research capacity in Bradford
Born in Bradford is one of the biggest and most important medical research studies undertaken in the UK.

The project started in 2007 and is looking to answer questions about our health by tracking the lives of 13,500 babies and their families and will provide information for studies across the UK and around the world.

The aim of Born in Bradford is to find out more about the causes of childhood illness by studying children from all cultures and backgrounds as their lives unfold.

“It’s like a medical detective story really - trying to piece together the clues in people’s lifestyles, their environments and their genetic make-up, as we try to determine why some children fall sick and some remain healthy.”

Professor John Wright
Director of Born in Bradford

www.borninbradford.nhs.uk  @BiBresearch  @BiBparents  Born in Bradford
Ambient air pollution and low birthweight: a European cohort study (ESCAPE)

Dr. Marie Pedersen, PhD, Lise Giorgi-Aleman, MSc, Claire Bernard, MSc, Immacolata Aguilera, PhD, Prof. Anja-Marie Nybo Andersen, PhD, Prof. Ferran Ballester, PhD, Rui M. L. Brandão, PhD, Leda Chetti, PhD, Marta Granà, MSc, Anja Danielsen, PhD, Audrius Budeikis, PhD, Moniek van Eijden, PhD, Marka Rostafićk, PhD, Ana Fernández-Somoano, PhD, Miriam F. Fernández, PhD, Prof. Francesco Forastiere, PhD, Urske Gehringer, PhD, Prof. Regina Grazalevičienė, PhD, Olga Graziela, PhD, Barbara Huel, PhD, Gerard Hoek, PhD, Kees de Hoogh, PhD, Edith H. van den Hooven, MSc, Siobhan Hägberg, PhD, Vincent W. V. Jaddoe, PhD, Claudia Kliemper, PhD, Michal Korsse, MSc, Ursula Kramar, PhD, Alcione Ledzinski, PhD, Johanna Lepelase, PhD, Prof. Per Nordal, PhD, Wendie Nystad, PhD, Enridil Patalasaro, PhD, Daniela Pinto, PhD, Prof. Dirkje Peumans, PhD, Dan Raaschou-Nielsen, PhD, Peter Rudnai, MD, Prof. Jordi Sunyer, PhD, Prof. Europides Stathopoulou, PhD, Nieme Seiffert, PhD, Elisabeth Thiering, PhD, Prof. Doris Toffeln, FRCOG, Milad Yarrou, MD, Tanja G. M. van der Vleuten, PhD, Alex Wijs, PhD, Michael Wilhelm, PhD, John Wright, FRCP, Prof. Mark J. Newnham, PhD, Prof. Gábor Pithart, PhD, Prof. Bert Brunekreid, PhD, Prof. Manolis Kogevinas, PhD, Rémy Slama, PhD

† Joint last authors

Minimise authors
The HELIX Project

www.projecthelix.eu

Integrating environmental and health data to advance knowledge of the role of environment in human health and well-being.

WHY HELIX?
Due to our ever-changing environment and habits, exposure to environmental contaminants is growing increasingly complex. The totality of environmental (non-genetic) exposures from conception until old age is defined as the "exposome". The HELIX "health-life exposome" approach involves combining all environmental hazards that mothers and children are exposed to, and linking this to the health, growth and development of children.

OBJECTIVES
- To measure a range of chemical and physical environmental hazards in food, consumer products, water, air, noise, and the environment, in pre and postnatal periods;
- To define multiple exposure pathways and exposure variability (gene-behavioral, behavioral, psychosocial);
- To quantify uncertainties in exposure modeling;
- To determine molecular profiles and pathways associated with multiple exposures.

The Human Early-Life Exposome (HELIX): Project Rationale and Design
Martine Vrijheid,1,2,3 Rémy Slama,4 Oliver Robinson,1,5,6,7,8,9,10 Peter van den Hazel,10 Cathrine Thomsen,11 John Wright,9 Toby J. Athersuch,6,11 Arcis Avellana,11 Xavier Baxaaga,11,12,13 Celine Brochot,11 Luca Bucchi,11 Mariona Bustamante,12,13,14 Angel Carracedo,12,15 Maribel Casas,11 Xavier Estival,12,13,14 Leslay Fairley,11,14,15 Juan R. Gonzalez,11,12 Berit Granum,11,16,17 Regina Gražulevičienė,11 Kristine B. Gutzkow,15 Jordi Juviles,11,12,13 Hector C. Keun,11 Manolis Kogevinas,11,12,13,14 Rosemary R. McClellan,9 Helle Margrete Metzler,11 Eduard Sabido,11 Per E. Schwarz,9 Valerie Schepis,11 Jordi Sunyer,11,12,13,14,15
Elizabeth J. Want,11 Florence Zeman,11 and Mark J. Newnham11,13

BACKGROUND: Developmental periods in early life may be particularly vulnerable to impacts of environmental exposures. Human research on this topic has generally focused on single-exposure/health effect relationships. The "exposome" concept encompasses the totality of exposures from conception onward, complementing the genome.

OBJECTIVES: The Human Early-Life Exposome (HELIX) project is a new collaborative research project that aims to implement novel exposure assessment and biomarker methods to characterize early-life exposure to multiple environmental factors and associate these with omics biomarkers and of how simultaneous environmental risk factors interact among themselves, with individual characteristics (e.g., genetics), and with epigenetics, can help elucidate their causes (Bouzorgi et al. 2011; Gallacher et al. 2011; Trasande et al. 2009; Van den Bergh 2011). Up to now, the field of environment and child health has almost uniquely focused on
Who else is involved?

- **Academic Steering Group:**
  - Dr Rosie McEachan
    Bradford Institute for Health Research
  - Prof Mark Conner and Dr Ian Kellar
    School of Psychology, University of Leeds
  - Dr James Tate
    Institute for Transport Studies, University of Leeds
  - Dr Audrey de Nazelle
    Centre for Environmental Policy, Imperial College London
  - Prof Frank Kelly
    Centre for Environment and Health, Kings College London
  - Dr Bronia Arnott
    Institute for Health and Society, Newcastle University
  - Dr Tim Chatterton
    Geography and Environmental Management, Uni of West England
Why is this project important?

– addressing key public health priorities:
  
  • reducing exposure to air pollution
  • increasing physical activity in children
  • reducing health inequalities

– creating a healthier and safer environment for communities

– evidence of action by participating authorities

– will contribute to evidence base
Why is this project important?

– increasingly LAs are looking to make use of systematic and validated knowledge in developing services and policy

– collaboration between LAs and the research community is extremely valuable
  - pooling of skills and resources
  - knowledge transfer
  - opportunities for funding

– chance to build networks that may be beneficial for future work

– opportunity to help set the research agenda
Influencing change

Part 1

• Promoting behaviour change at an individual level by encouraging communities to engage in active travel

Part 2

• Influencing policy decision making at a local and regional level by raising awareness of air quality and its impact on health
What does this look like?

Part One

Qualitative work

• Exploration of barriers and enablers to engaging in active transport for school travel

Quantitative work

• Characterising parents and children who engage in active transport for school travel and those who primarily drive

• Evaluation of existing intervention to promote walking to school

Planned output: Behaviour change tool kit for LAs and schools
Part Two

Qualitative work

• Exploration of barriers to developing and implementing policies which aim to improve air quality

• Investigation into how we most effectively communicate the importance of improving air quality to key stakeholders and decision makers

Planned output: Effective communication tool for local authority AQM teams
Challenges

- Communication
- Bringing people together
- Maintaining engagement
Thank you to:

Project Group  Sally Jones, Sarah Possingham, Rosie McEachan
Our LA partners
Our Academic Steering Group
Our funders

Any questions?
Cheshire & Merseyside Air Quality CPD Event
It’s all happening IN HALTON

www.halton.gov.uk
Air Quality

The Perception Gap

The Halton experience

Sarah Johnson Griffiths
Public Health Consultant
The Perceptions
“Those coming into Widnes, even from very dark and gloomy skies, enter the town with a certain awe and horror, and wonder if life can be sustained”

Widnes in the late 19th Century

Some images are just representations – not actually from Halton!
“Only have to look at my car in the morning and judging by the smell, heaven knows what is being chugged out over the bridge”

“I have a pulmonary embolism and find it hard to breathe at the best of times.....I NEED to breathe fresh air and doubt that this will be possible in the Runcorn polluted atmosphere.”

“Doctors put are ill health down to smoking ...But no one has mentioned the highly toxic air pollution can also affect our health...I have COPD . Who do we blame for that?”

“when out walking I often find there is a terrible chemical smell in the air that makes my eyes water and throat hurt but no one has ever given an explanation or admitted it exists”

“This has been going for sometime and the council and the company refuse to do anything”

“Emissions which smell are obvious and can't be said to be benign and dangerous emissions don't necessarily smell”

“I have asthma and my wife has skin problems that only developed after moving to our new house”

“I grew up in Halton and there wasn't a family that hadn't been affected by cancer. Something needs to be done for the health of the residents”

“More of our local friends seem to be getting cancer. Also we are looking at the chimney from our house and garden. It is constantly pumping out muck. It needs to be monitored.”

“Air pollution is killing people, failing to monitor is criminal”

“Air monitors required in Halton, Cheshire
TO: HALTON BOROUGH COUNCIL

5,625 of 6,000 signatures

This petition is being run by a political candidate 38 Degrees is independent of all political parties.

“Doctors put are ill health down to smoking ...But no one has mentioned the highly toxic air pollution can also affect our health...I have COPD . Who do we blame for that?”

“I have asthma and my wife has skin problems that only developed after moving to our new house”

“I never has asthma before I moved to Runcorn”

www.halton.gov.uk
The Reality
Halton Borough Council DOES monitor air quality

We even have a continuous PM$_{2.5}$ monitor
Air Quality in Halton is well within UK and EU objective levels, with the exception of 1 small AQMA exceeding annual average NO$_2$. 

www.halton.gov.uk
Halton

• Poor air quality does affect health
• AQ objectives are set at levels to protect health
• Halton’s air quality objectives are within these levels
• Traffic is the cause of the AQMA NO$_2$ area and we need to address this
• Until we remove the belief that AQ is the cause of all ills, we can’t effectively tackle the actual cause of all ills
Public concerns are real!

- Air quality concerns may not be based on ‘fact’ and scientific evidence
- Perceptions can spread and escalate if untreated
- Perceptions are as ‘harmful’ as the issue itself
- Responding to concerns takes considerable resource
- Why is there a ‘perception’ gap?

www.halton.gov.uk
Prevention is better than cure

- Why are the council not believed?
- What fuels the negative public perceptions?
- How do we work with the public to understand the facts?
- How do we better describe risks?
- How can we use time and resource more effectively?
Cheshire & Merseyside Air Quality CPD Event
Thank you for attending

The presentations can be accessed via
www.champspublichealth.com