HEALTH EFFECTS OF LONG-TERM EXPOSURE TO AIR POLLUTANTS IN SCOTLAND

Christina Yap[1], Iain J Beverland[1], Raymond M Agius[2], David Hole[3], Chris Robertson[1], Geoff Cohen, Deborah Henderson[1], George Morris[4], Mathew R Heal[5], Gerry Fowkes[5], Robert Elton[5]

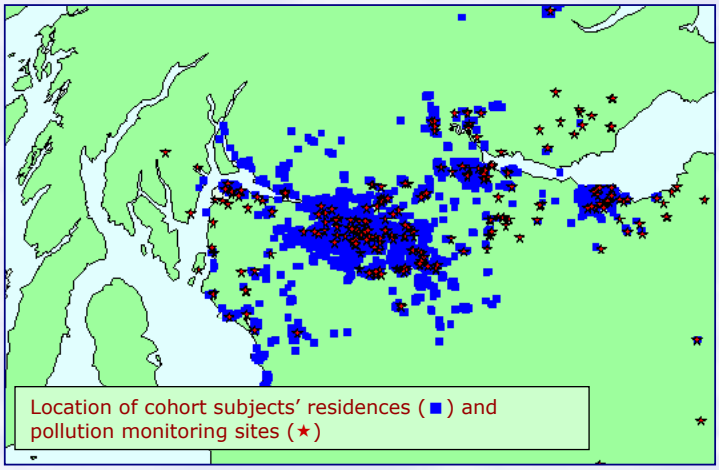
AIRNET
A Thematic Network on Air Pollution and Health

NERAM
Network for Environmental Risk Assessment and Management

1. Introduction

- It is increasingly recognised that health impacts of air pollution may depend largely on the effects of long-term exposures
- Interacting effects of long and short-term exposures are poorly understood
- Current epidemiological methods are limited by poor exposure classification
- Scotland has very high nationally reported mortality rates for both coronary heart disease & lung cancer. Correspondingly epidemiologists have already established cohorts in urban areas with detailed baseline data on risk factors
- Many subjects reside in areas with detailed long-term records for black smoke and SO_2

Historical air pollution (smog from coal fires) in Edinburgh



Location of cohort subjects' residences (■) and pollution monitoring sites (★)

2. Objectives

To investigate and quantify:

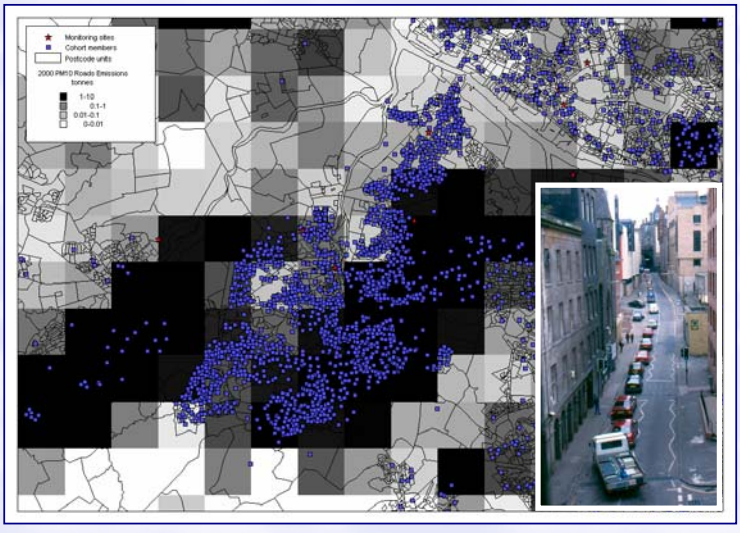
- cause-specific health effects of long-term exposure to air pollutants;
- extent of cause-specific shortening of life from short-term exposures to air pollutants;
- effects of pollutant exposure on possible susceptible population sub-groups;
- coherence in medical outcomes, confounding effects, and biologically relevant exposure/latency periods;
- use of different exposure metrics.

3. Some aspects of study design

- Outcomes in 26,360 subjects in 3 cohorts will be studied between 1975 and 2002.
- Detailed baseline risk data & unique advantages of the Scottish Health Record Linkage system (including algorithmic linking of individual hospital admission & mortality records) will enable novel ways of quantifying effect magnitudes in susceptible population sub-groups & coherence in medical outcomes.
- The potential for confounding & effect modification by both individual & aggregate level factors (including smoking, deprivation, occupation, prior ill health, physiological factors, and gaseous co-pollutants) will be examined.
- Extensive (>50 year duration) pollution exposure databases will enable investigation of exposure & latency durations & temporal changes in pollution concentrations that are most relevant to health outcomes.
- Alternative exposure metrics based on inventoried, source-specific, pollutant emissions will be investigated.

4. Anticipated benefits to end-users

- Quantification of the health impacts of long-term exposure to air pollutants
- Research will inform policy on future air quality standards in relation to exposure metrics, magnitudes & durations
- Identification of susceptible population sub-groups that may require additional protection



Residence location of cohort subjects in Paisley & Renfrew superimposed on the National Atmospheric Emissions Inventory grid for traffic related particles (PM_{10}).

[1]University of Strathclyde, [2]University of Manchester , [3]University of Glasgow, [4]Scottish Centre for Infection & Environmental Health, [5]University of Edinburgh