

# MCS

Data Note: MEDIX air pollution data at ward level, linked to MCS1 and MCS2

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CLS Data Note / User guide to the data  
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## Introduction

It has been recently estimated that outdoor air pollution results in around 40,000 deaths per year in the UK. This is predominantly caused by harmful toxins emitted by diesel engines such as nitrogen dioxide (NO<sub>2</sub>) and particulate matter (e.g., PM<sub>10</sub>; Royal College of Physicians (2016). Air pollution has been associated with a number of adverse respiratory and cardiovascular health outcomes in UK adults and children (Guarnieri, & Balmes, 2014; Schwartz et al., 2005). There is a need for further research into the effects of air pollution on health and well-being of children in the UK. Yet data on air pollution exposures have not routinely been linked with data on child health and well-being. This data note describes a novel linkage between data at small-area level on air pollutant exposures in the UK and data from the UK's Millennium Cohort Study (MCS). The MCS is a longitudinal survey of 19,519 UK children born during the year 2000 or shortly thereafter, and their families.

These data on air pollutants come from the Multiple Environmental Deprivation Index (MEDIX), an ordered measure of physical environmental deprivation (as opposed to social deprivation) that represents the balance of pathogenic and salutogenic characteristics in each UK 2001 Census Area Statistics (CAS) ward. Five environmental dimensions with relevance for human health in the UK are addressed in the MEDIX: air pollution, climate, UV radiation, industrial facilities and green space. It is generally available (Pearce et al., 2010; Richardson et al., 2009; 2010; Shortt et al., 2010; <http://cresh.org.uk/cresh-themes/environmental-deprivation/medix-and-medclass/>). MEDIX is measured once, using data from 1991-2006.

In MEDIX, air pollution is measured with annual mean concentrations within each 2001 UK CAS ward of particulate matter (PM<sub>10</sub>), nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), and carbon monoxide (CO). Means are population weighted using output area (OA) units, and cover the years 1999-2003 except for CO, which covers 2001-2006. These data are taken from 1 km grids, modelled from National Atmospheric Emissions Inventory data. The annual mean values have been converted to deciles across all wards in the UK prior to linking them with MCS sweeps 1 (age 9 months) and 2 (age 3 years). The available variables are listed below.

## Variables

MCS Sweep 1 linked to MEDIX air pollution data

MCSID	MCS research id
AACTRY00	MCS Sweep 1 country of residence
APWSO2D	Annual mean SO <sub>2</sub> (ug.m-3) (1999-2003) decile

APWPM10D	Annual mean PM10 (ug.m-3) (1999-2003) decile
APWNO2D	Annual mean NO2 (ug.m-3) (1999-2003) decile
APWCOD	Annual mean PW_CO (ug.m-3) (1999-2003) decile
AEWRURUR	2005 ONS Rural Urban Classification – England and Wales
ASCRURUR	2005 ONS Rural Urban Classification – Scotland
ANIRURUR	2005 ONS Rural Urban Classification – Northern Ireland

MCS Sweep 2 linked to MEDIX air pollution data

MCSID	MCS research id
BACTRY00	MCS Sweep 1 country of residence
BPWSO2D	Annual mean SO2 (ug.m-3) (1999-2003) decile
BPWMP10D	Annual mean PM10 (ug.m-3) (1999-2003) decile
BPWNO2D	Annual mean NO2 (ug.m-3) (1999-2003) decile
BPWCOD	Annual mean PW_CO (ug.m-3) (1999-2003) decile
BEWRURUR	2005 ONS Rural Urban Classification – England and Wales
BSCRURUR	2005 ONS Rural Urban Classification – Scotland
BNIRURUR	2005 ONS Rural Urban Classification – Northern Ireland

## References

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