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Ambient Air Pollution and Health in Northern Ireland

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The breathing of polluted air is associated with the development and exacerbation of various health conditions, and the cost of treating such conditions is substantial. However, while the correlation with respiratory-related health conditions is well documented, less is known about this relationship from a longitudinal perspective and how pollution affects other health problems, such as neurodegenerative diseases (e.g. dementia) or diseases of the endocrine system (e.g. diabetes). More research is therefore needed to better identify the health risks and costs of pollution.

The aim of this study is to investigate the relationship between exposure to ambient air pollution and health outcomes at the individual level. The analysis is based on data from the Northern Ireland Longitudinal Study (NILS) - a representative 28% sample of the Northern Ireland population drawn from an administrative health database and linked to Census returns and other administrative databases - linked with routinely collected prescriptions data. Exposure to air pollution is assessed by linking modelled background pollution data at a 1x1 km grid square resolution to residential address. Annual measures of eight separate pollutants will allow us to examine cumulative exposure between 2001 and 2016.

Regression analysis will be used to estimate the health effects of exposure to air pollution. Preliminary analysis currently underway will focus on outcomes such as self-reported health at the 2011 Census (e.g. the presence of breathing difficulties and memory loss) and all-cause and respiratory-related mortality since 2001. Stage two of the analysis will utilise the prescriptions linkage to define illness-specific health outcomes using receipt of medicines prescribed by General Practitioners (GPs) to treat cardiovascular- and respiratory-related health conditions as well as diabetes, dementia and Parkinsonism. Longitudinal analysis will enable us to assess whether these relationships are affected by unobserved confounders. Preliminary results for both stages of the analysis are expected by autumn 2019.

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