A life course approach to neighbourhood effects seminar
University College London, UK
28-29th June, 2017

ABSTRACTS

**Neighborhoods and Health over the Life Course: Cumulative or Lagged Exposures?**
Philippa Clarke, Research Professor, Institute for Social Research, Department of Epidemiology, University of Michigan

While there has been repeated evidence that residence in a socioeconomically disadvantaged neighborhood may be detrimental for health, little research has examined the impact of repeatedly living in a disadvantaged environment over the life course. This paper considers two alternative approaches to examining the impact of neighborhood characteristics on health over adulthood. One approach models the lagged effects of early life disadvantage for subsequent health later in adulthood. A second approach considers the cumulative effect of living in a disadvantaged neighborhood over time. Strengths and limitations of both approaches are considered, and data-related challenges are discussed.

**Long-term exposure to poverty among children and how it correlates with adult outcomes**
Link to video
Lina Hedman, Research Fellow, Institute for Housing and Urban Research, Uppsala University

There is increasing scholarly interest in long-term and even intergenerational transmission of neighbourhood paths. Studies from both sides of the Atlantic have documented that the neighbourhood status experienced during childhood correlates with the neighbourhood status experienced in adulthood, as well as with other outcomes reflecting individual socio-economic status. With this study, we contribute to this still relatively small literature by following the neighbourhood paths of children, analysing to what extent these cross deprived areas. Long-term exposure to poverty concentrations may have lasting effects on individual performances, and it has been argued that children are especially vulnerable. Yet, most studies looking at long-term neighbourhood paths follow adults or reduce childhood trajectories to a single point-in-time measurement. We select all children born 1984-1986 and monitor their neighbourhood status every fourth year, starting in 1990. These time points reflect the four phases of “pre-school period (age 4-6), “early school period” (age 8-10), “mid school period” (age 12-14) and “late school period” (age 16-18). We then use these paths to i) identify significant risk factors related to being
Exposed to different levels of, and long-term, deprivation, ii) analyse to what extent different paths correlate with socio-economic outcomes, including neighbourhood status, in adulthood (age 28-30). The study is conducted in Sweden, using register data available for the period 1990-2014.

**Analysing the effect of area of residence over the life course in multilevel epidemiology**

*Link to video*

Øyvind Næss, Senior Scientist Norwegian Institute of Public Health, Associate Professor University of Oslo

I will present multilevel models of individuals’ residential history at multiple time points through the life course and their application, and discuss some advantages and disadvantages for their use in epidemiological studies. This will include review of research using longitudinal multilevel models in studies of neighbourhood effects, statistical multilevel models that take individuals’ residential history into account, and the application of these models in the Oslo mortality study. Measures of variance have been used to investigate the contextual impact of membership to collectives, such as area of residence, at several time points. The few longitudinal multilevel models that have been used suggest that early life area of residence may have an effect on mortality independently of residence later in life although the proportion of variation attributable to area level is small compared to individual level. The following multilevel models have been developed: simple multilevel models for each year separately, a multiple membership model, a cross-classified model, and finally a correlated cross-classified model. These models have different assumptions regarding the timing of influence through the life course. To fully recognise the origin of adult chronic diseases, factors at all stages of the life course at both individual and area level needs to be considered in order to avoid biased estimates. Important challenges in making life course residential data available for research and assessing how changing administrative coding over time reflect contextual impact need to be overcome before these models can be implemented as normal practice in multilevel epidemiology.

**Multilevel cross-classified designs to explore early life school, neighbourhood and family influences on adult health**

*Link to video*

Ruth Dundas, Senior Investigator Scientist, MRC/CSO Social and Public Health Sciences Unit, University of Glasgow

There is a need to assess multiple domains of socioeconomic context to enable researchers to study and identify the timing and settings of interventions to address the inequalities that exist across the lifecourse. Multilevel models allow for individual factors (eg biological, lifestyle) and clustered groupings (eg neighbourhoods, schools) to be studied at the same time. This enables investigation of the extent to which the different levels interact with each other or act independently of each other. Using the Aberdeen Children of the 1950s study, we examined the combined long-term influence of the school attended, and area of residence in childhood, on adult health. A total of 6285 children aged 5-12 in 1962 were followed-up at mean age 47 years. Cross-classified multilevel logistic regression was used to estimate the contribution of
family, school and area of residence to adult self-reported health and GHQ-4, adjusting for childhood family, school, and neighbourhood level factors as well as current adult social position. Early life social position was associated with poor adult self-rated health but not poor GHQ-4. There were small contextual associations between childhood school (median odds ratio [MOR]=1.08) and neighbourhood (MOR=1.05) environments and adult self-rated health. The share of the total variance in health at the family level was 10.1%. Clustering at the family level is frequently ignored due to the small cluster size; but it can be important as we showed (variance partition coefficient 10%). The consequence of ignoring family as a level on the variance partition coefficient and other general contextual effects is unclear. We adapt multilevel modelling methodology proposed and used elsewhere in other disciplines such as education to investigate the impact of small cluster size on variance partition coefficients and general contextual effects.

**Linking local labour market conditions across the life course to retirement age: Health, employment and educational pathways, using the National Survey of Health and Development**

*Emily Murray, Senior Research Associate, Research Department of Epidemiology and Public Health, University College London*

A growing body of literature has documented that residence in areas with higher levels of unemployment at older ages is related to higher chances of not being in work; usually shown for disability pension usage. Planning interventions to retain older workers based on these findings may however be inefficient, or mis-targeted, if relationships are due to interactions between local labour market conditions and individual characteristics earlier in the life course. Structural Equation Modelling, and data from the MRC National Survey of Health and Development was used to explore 5 hypothesized life course pathways linking labour market conditions (percentage unemployed persons ‘i.e. area unemployment’ in local authorities) at three life periods (childhood aged 4y, young adulthood aged 26 and mid-life aged 53) to age of retirement: (1) residential tracking (2) adulthood health, (3) educational achievement, (4) employment status and (5) occupational social class. Initially, pathways between life course area unemployment, each individual mediator (i.e. health aged 26 and 53) and retirement age were assessed individually. Then joined together in a full model, where mediation pathways were investigated. Assessing the area tracking model only, area unemployment at earlier ages was associated with area unemployment at the subsequent age, with higher area unemployment aged 53 associated with earlier retirement ages. When additional pathways were individually added to the area tracking model, only the addition of the employment status pathway – and not health, social class or educational achievement - attenuated the aged 53 area unemployment and retirement age relationship. As well, area unemployment aged 4 was only related aged 26 health status, and not aged 26 employment status, social class or educational achievement. Aged 26 area unemployment was however related to aged 53 health, employment status and social class; although the association with social class was attenuated when all three pathways were combined. Local area unemployment influenced retirement age not at mid-life, but indirectly through unemployment levels in earlier in life affecting health and employment status at mid-life, which are strong predictors of early retirement. Interventions to promote Extended Working should focus on creating
employment opportunities and preventing ill-health for individuals during their prime working years, rather than near state pension ages, to be most effective.

**Where is it? When is it? What is it like? What can we do with it?**

*Link to video*

**Paul Norman, Lecturer in Human Geography, School of Geography, University of Leeds**

“You're the Cheshire cat, aren't you?” “I was the Cheshire cat,” he replied with a slightly aggrieved air, “but they moved the county boundaries, so technically speaking I’m now the ‘Unitary Authority of Warrington Cat’, but it doesn’t have the same ring to it.” (Fforde 2002: 164)

This presentation is a game of uneven halves: The first ‘half’ of this presentation will take small area data from the 1971, 1981, 1991, 2001 and 2011 Censuses across GB and show how boundary definitions have changed over time and demonstrate how the geographies can be harmonised to contemporary areas (Super Output Areas and Datazones). This presentation will then show how area measures (e.g. deprivation) can be calculated in a comparable way and therefore how areas change their characteristics over time (e.g. become less deprived than other areas). The second ‘half’ of this presentation will show how similar information has previously been attached to individual records in the ONS Longitudinal Study for England & Wales. The changing deprivation experience of cohorts will be illustrated and this will help inform research questions which can be addressed using the cohort studies.

**How Accurate are Decennial Census Measures of Neighbourhoods in Assessing Neighbourhood Effects?**

*Link to video*

**Owen Nicholas, Research Associate, Research Department of Epidemiology and Public Health, University College London**

The neighbourhood in which we live is considered to be an important factor in our lives, in particular during childhood development, influencing our later health by a variety of mechanisms. There is a growing literature relating aspects of neighbourhoods, and their accumulation, to a variety of outcomes. We ask the question "What error might be expected in analyses which categorise individuals according to area, and consider area measures to be constant, or linearly interpolated, between observation times?". Our methods are based on stochastic evolution models and modelled distributions for exposure to "home" and "neighbouring" areas. Our data are England and Wales lower super output area averages of Census data taken every 10 years from 1971 to 2011. Our results pertain to the degree of regression dilution bias which might be found in studies which use averages of census measures, and their accumulation, as exposures in their analyses where the study does not account for error in temporal value and area categorisation. Initial results indicate that there is at least a 10% regression dilution bias in studies using measurements averaged over neighbourhoods of 1,500 people taken every 10 years. In conclusion we alert researchers to the dangers of neglecting
measurement error when using Census data as a proxy for neighbourhood characteristics.

**Does your childhood neighbourhood have a bearing on the self-rated health in later life?**

*Link to video*

*Stephen Jivraj, Lecturer in Population Health, Research Department of Epidemiology and Public Health, University College London*

The proposition that adolescent place of residence might be associated with later life outcomes through a number of mechanisms has been proposed, and investigated, both empirically and conceptually. However, it has not been systematically researched at the neighbourhood level in Britain. New linkage of British birth cohort data - the 1958 National Child Development Study and the 1970 British Cohort Study cohorts (comprising more than 17,000 births in each study) - together with census data (1971, 1981, 1991, 2001 and 2011) allows aspects of neighbourhood deprivation, as measured at lower super output level using the Townsend index, during childhood to be analysed in association with later life health and socio-economic outcomes, in ages up to 55. We study the association between neighbourhood deprivation and self-rated health captured in the birth cohort data, adjusting for family social class in childhood, taking care to compensate for spatial and temporal uncertainty in neighbourhood measures. We summarise and contrast findings across domains of outcomes within the two cohorts, between the cohorts, and in the context of the existing literature. We find evidence that aspects of early life neighbourhood are associated with later life self-rated health in early midlife, but these inequalities to not expand with age up to 55.