Using address information from health card registrations : Perspectives from Northern Ireland using the Northern Ireland Longitudinal Study (NILS)

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Outline

- Introduction and context
- The data
  - The NILS and migration
  - The problem: defining non-response and lagged response
- Modelling approach
- Results
- Implications

Introduction

- Address information from health cards is currently important
  - For health programmes – monitoring, interventions
  - For UK longitudinal studies (eg NHSCR and the ONS England & Wales LS; BSO and the NILS)
  - Other statistical purposes – migration estimates
- And, post 2011, depending on census developments, these or similar data might be important as part of administrative data systems as replacements/supplements to the census

Introduction

- Important, therefore, to know how accurate these data are, what sorts of errors there might be, and their social/demographic/ geographic incidence
- The presentation aims to begin to answer these questions
  - Who fails to report or lags in reporting moves?
  - Where do they live?
- Not a complete answer – key verb is ‘to begin’

The data

- The analysis is based on the NILS – a large data linkage study
- Address information is provided from the Business Service Organisation (BSO) in regular 6-monthly downloads
- These downloads start in April 2001 (eg not the year before the census)
- Address information can be coded to Super Output Area (SOA)

The data

- The SOA recorded in the 2001 Census is a ‘gold standard’ – it can be compared with that reported via the Health Card Registration System when recording address changes
- A non-reported move occurred when:
  - A move via BSO was reported 2001-2007 but neither the origin or destination SOA matched the SOA that was recorded in the 2001 Census – the assumption being that a move occurred that was not reported

The data

- A lagged move was defined when: (a) a move from SOA A to B was reported in the one-year census migration question but the same move was reported more than a year after the census in the BSO downloads; (b) when no move was reported in the census one-year migration question but the BSO reported a move to SOA of census enumeration – the assumption being a pre-April 2000 move was not reported until several years had elapsed

The data

- The reference category for the outcome variables was (i) those who reported a one-year migration move (as in the census) within one year of the census via BSO and (ii) those whose SOA of enumeration matched the SOA from which BSO recorded them moving (75% of all migrants)
- The absence of BSO data for comparison with the one-year migration census question, April 2000-2001 restricts the analysis
  - Some timely BSO reporters in 2000-2001 cannot be counted
  - Pre-2000 period is therefore a blank – difficult to estimate length of lags nor accurately estimate the size of the problem – need more data

Modelling approach

- Age, gender (known from the literature) but also limiting, long-term illness, SES, marital status, education and tenure explored – individual-level variables
- Ecological variables – population density, social deprivation, percentage catholic, percentage limiting long-term illness (some known from the literature) – best formulation, deprivation or illness (and no religion)

Modelling approach

- Descriptive analysis – overall patterns, bivariate relationships
- MLM approach – but most interest in model coefficients (eg fixed effects) and not the random part of the model
- Analysis exploratory – what other factors besides age and gender influence lagging and non-response?

Results

Lags in reporting – significance at 5% level in red)

Variable	Odds Ratio
Gender: Female (Ref Cat)	1.00
Male	1.97
Age: 25 – 34 (Ref Cat)	1.00
35 – 44	1.13
45 – 54	1.52
55 - 64	1.29
65 - 74	1.29
LLTI: No (Ref Cat)	1.00
Yes, ill	0.73
Education: Educational qualifications (Ref Cat)	1.00
No educational qualifications	0.92
SES: Professional (Ref cat)	1.00
Intermediate	0.96
Self-employed	1.21
Low supervisor	1.03
Routine	1.06
Not working	1.08
Student	0.97
Community Background. Catholic (Ref Cat)	1.00
Protestant	1.05
None	0.92
Other	1.32
Tenure: Owner Occupier (Ref Cat)	1.00
Social rented	0.62
Private rented	0.38
Marital status: Married (Ref Cat)	1.00
Single	1.25
Remarried	0.76
Separated	1.05
Divorced	1.07
Widowed	0.95

Non reporting – significance at 5% level in red)

Variable	Odds Ratio
Gender: Female (Ref Cat)	1.00
Male	2.43
Age: 25 – 34 (Ref Cat)	1.00
35 – 44	0.90
45 – 54	0.97
55 – 64	0.88
65 – 74	0.66
LLTI: No (Ref Cat)	1.00
Yes, ill	0.81
Education: Educational qualifications (Ref Cat)	1.00
No educational qualifications	0.91
SES: Professional (Ref cat)	1.00
Intermediate	0.93
Self-employed	0.93
Low supervisor	0.83
Routine	0.79
Not working	1.08
Student	1.12
Community Background. Catholic (Ref Cat)	1.00
Protestant	0.98
None	0.82
Other	0.81
Tenure: Owner Occupier (Ref Cat)	1.00
Social rented	0.62
Private rented	0.67
Marital status: Married (Ref Cat)	1.00
Single	1.74
Remarried	1.06
Separated	1.45
Divorced	1.43
Widowed	1.30

Results

- More likely to lag in reporting
  - Males, older age groups, self employed, single, other community background
- Less likely to lag in reporting
  - Those with limiting long-term illness, social and private renters, remarried
- More likely to non-report moves
  - Males, single, separated, widowed and divorced
- Less likely to non-report
  - Older people, those with limiting long-term illness, lower SES, other community background, social and private renters

Implications

- Differences between ‘laggers’ and ‘non-reporters’
- Non-reporters more similar to those who are hard to survey (or to enumerate) in censuses in that they tend to be younger and male and other marital statuses than married
- Commonality between laggers and non reporters is limiting long-term illness – those who are ill are less likely to lag and to non-report – not surprising since they are more likely to be in contact with the health system

Implications

- Those who lag differ in some ways from the stereotype of young and male (tend to be older, owner occupiers)
- But the analysis also suggests that besides the categories associated with transience (eg youth, males, urban areas) other factors such as lower SES (relative to professionals) is associated with lower non reporting
- Risks of non reporting (and lagging to some extent) seem thus to be twofold:

Implications

- More problems with greater transience/ deprivation
  - Younger people
  - Males
  - Urban areas
- But also with more affluence and better health
  - Owner occupiers
  - Those with no limiting long-term illness

Implications

- Suggests two distinct types of lack of engagement and two challenges
- Health card registration systems sometimes find it hard to deal with groups that are difficult to capture in surveys and the census
- But, by their nature, it may well be they also sometimes miss out the more healthy and the more affluent who do not engage with them for different reasons

Implications

- When screening or monitoring the population, the healthy need to be given special attention….
- For statistical purposes, efforts should be made to tease out these patterns – some unexpected parts of the population could be missed out
- Perhaps address/geographical information should be included in the Quality and Outcomes Framework (QOF)

Implications

- For the NILS, our judgement is that although some moves are not reported on time, most address changes are captured eventually
- The proportion of address changes missed altogether is probably small and inaccuracies are also probably also small
- These issues are likely to become more important if the UK Census is abandoned after 2011 and replaced by data linkage and administrative schemes – further work of the Beyond 2011 programme will be significant

Further work

- However…..the available data are insufficient to explore fully address accuracy, and there is scope for more NILS-based work using both the 2001 and 2011 Censuses
- This might inform wider developments in the rest of the UK
- The suggested work programme (starting later in 2011) will
  - Match April 2001 BSO SOA with April 2001 Census SOA

Further work

- The suggested work programme (starting later in 2011) will
  - Match April 2001 XUPRN SOA with April 2001 Census XUPRN
  - Consider the spatial distances when 2001 BSO SOA ≠ 2001 Census SOA
  - Consider the spatial distances when 2001 BSO XUPRN ≠ 2001 Census XUPRN
  - Explore the time lag until BSO SOA = 2001 Census SOA and BSO XUPRN = 2001 Census XUPRN (laggers)

Further work

- The suggested work programme (starting later in 2011) will
  - Explore the situation when BSO SOA and BSO XUPRN never match 2001 Census SOA and XUPRN (non-reporters)
  - Include information on GP practices (grouped by QOF scores) to grasp better individual, neighbourhood and institutional factors that shape address reporting

Further work

- The suggested work programme (starting later in 2011) will
  - The 2011 Census will provide an opportunity to compare BSO information on address information the year before the census 2010-2011 with the one-year migration question
- Any views on this programme?
- Any experience of healthcard (or other administrative) systems in other countries?

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