



# NILS-RSU

NORTHERN IRELAND LONGITUDINAL STUDY  
RESEARCH SUPPORT UNIT

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**Northern Ireland Longitudinal Study:  
Linking the Northern Ireland Longitudinal Study  
to the 1991 Census**

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NILS Working Paper 5.0

March 2015

**NILS Research Support Unit**

A background to the NILS is available in NILS Working Paper 1 and the NILS Matching methodology is available in NILS Working Paper 3.1.

## 1. Census 1991 NILS Integration

The NILS is based upon a Health Card data spine. To maintain the NILS data structure, an April 1991 download would be required for integrating the 1991 Census into the NILS. As the Health and Social Care Business Services Organisation (BSO) do not hold historical Health Card data, it was decided to use the April 2001 download and 'roll back' the data to April 1991 to produce a proxy Health Card dataset.

Table 1 below shows the proportions of NILS Health Card Data to Census population for 2001 and 2011. Using an average of the 2001 and 2011 proportions, an estimate of the number of expected eligible NILS members based on the 1991 Census population count can be produced. This yields a potential 469,613 eligible NILS members to be potentially linked to the 1991 Census.

**Table 1: 1991, 2001 and 2011 NILS Members as proportions of corresponding Census**

	NILS Health Card Data	Census Population	%
<b>2011</b>	538,648	1,810,863	29.7%
<b>2001</b>	508,279	1,685,267	30.0%
<b>1991 (estimate)</b>	469,613	1,573,282	29.8%

## 2. Matching Results

Following the matching process, 438,488 matches between NILS members and 1991 Census data were confirmed. The match rate for NILS members to Census 1991 can be calculated by taking the total number of matches as a proportion of the estimated number of potential people that could be matched. It is not possible to create links for some NILS members to the 1991 Census due to Health Card List Inflation<sup>1</sup>. Unlike 2001 and 2011, there was no estimated enumeration undercount in 1991 which will not factor in the overall match rate calculation.

$$\frac{438,488}{469,613 - 22,072} = 97.9\%$$

Table 2 shows the match rate for the 1991 data in comparison to equivalent rates for the 2001 and 2011 Censuses. It can be seen that the match rate is comparable to the 2001 and 2011 Censuses. More information on these can be found on the NILS-RSU website under further reading<sup>2</sup>.

It should be noted that these figures relate to analysis undertaken in September 2014 and the figures will change as we will continue to attempt linkage to unmatched NILS members after each BSO data download.

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<sup>1</sup> List inflation can be caused by population movement without GP knowledge e.g. people emigrating, migrants returning home and deaths of residents outside the jurisdiction. Another identified causation is non-entitled users such as Republic of Ireland residents accessing Northern Ireland health services. In 2001, the Census published figure of the Northern Ireland population was 4.7% lower than the number of patients registered in the Health Data at that time. For 1991 assuming List Inflation as 2001, estimate of List Inflation for 1991 NILS members (469,613 \* 4.7%) = 22,072

<sup>2</sup> <http://www.qub.ac.uk/research-centres/NILSResearchSupportUnit/GuidesResources/FurtherReading/>

**Table 2: NILS 1991, 2001 and 2011 Census Match Rates**

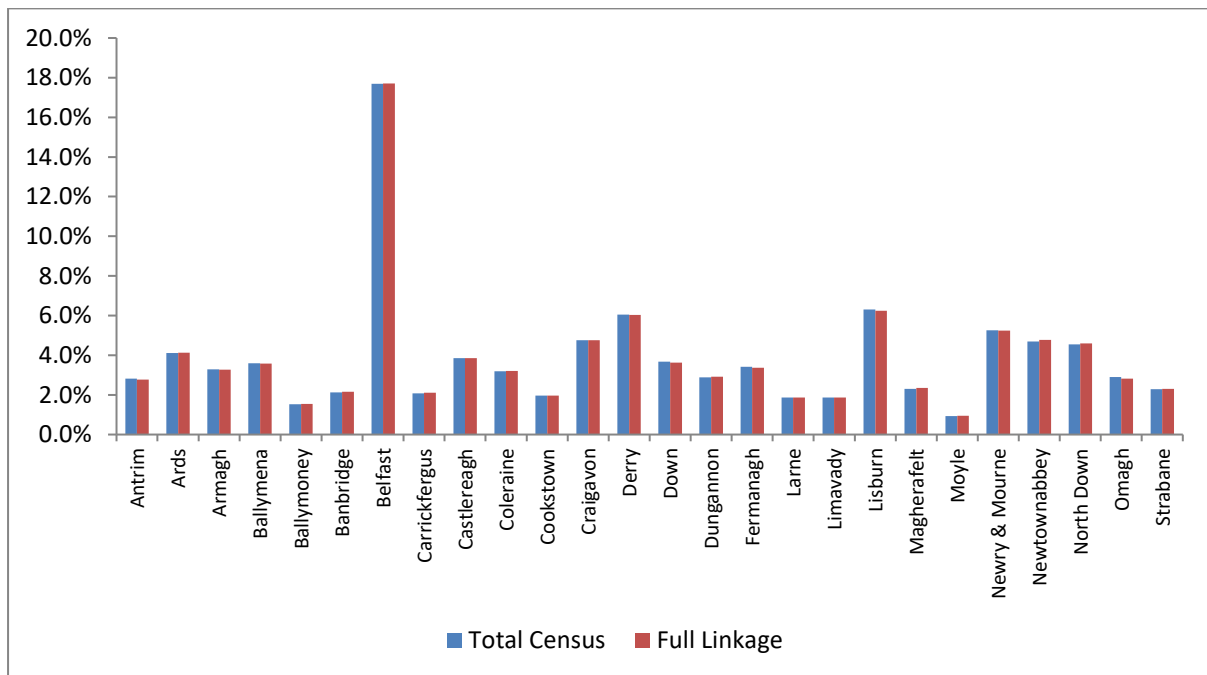
	Health Card Data Count	Links <sup>2</sup>	% Matched
<b>2011</b>	491,111	481,268	98.0%
<b>2001</b>	460,904	450,910	97.8%
<b>1991</b>	447,542	438,488	97.9%

**3. NILS Census 1991 Data Comparison – Full 1991 Census**

Graphs 1-3 demonstrate how representative the NILS 1991 Census linkage data is in comparison to the full 1991 Census using area, age and gender information.

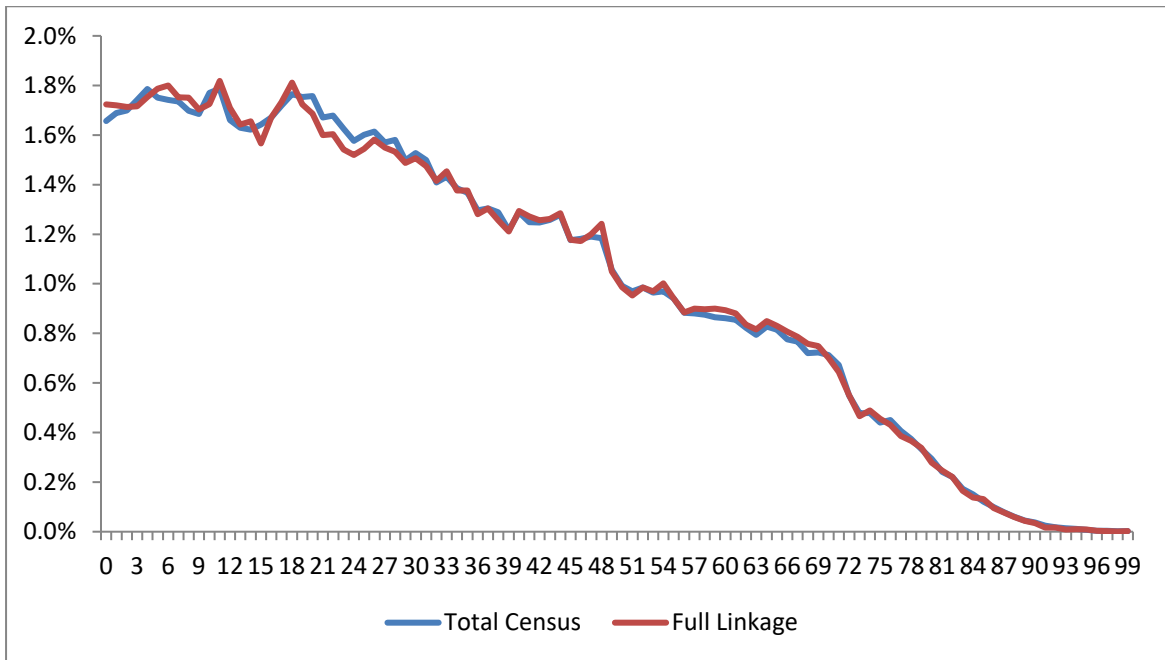
Graph 1 shows the Local Government District distribution of the full 1991 Census alongside NILS 1991 Census linked data. It can be seen from the bar-chart that the linked data is comparable across all districts.

**Graph 1: Distribution of 1991 Census Data: District**

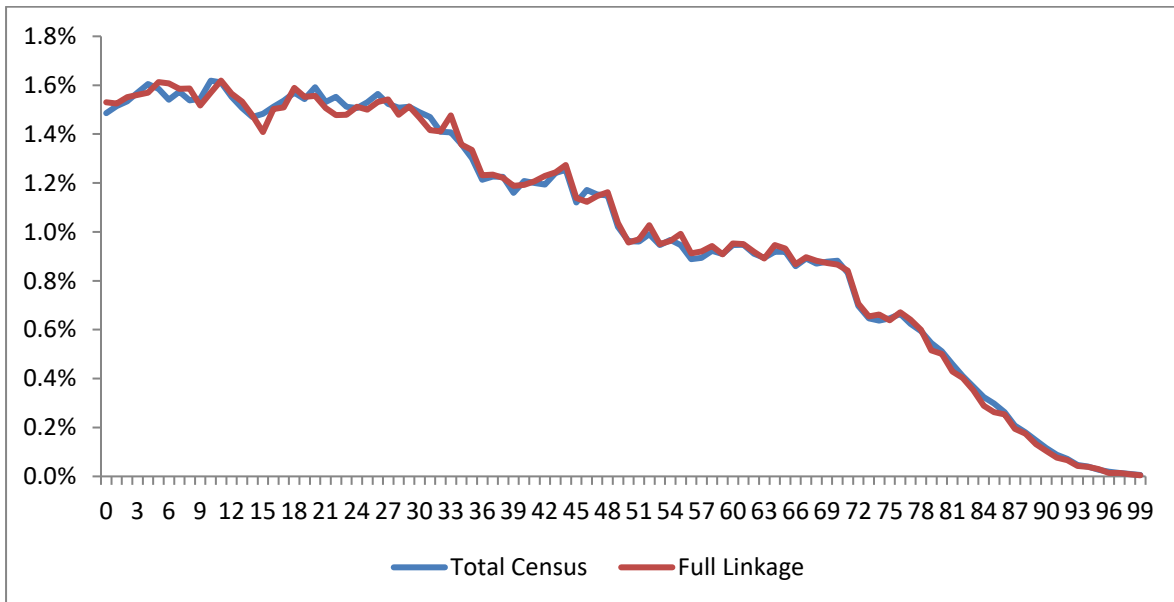


Graphs 2 and 3 show the distribution of Male and Female subjects by single year of age. In both graphs the linked data are comparable to the distribution shown in the full Census data.

**Graph 2 Distribution of 1991 Census Data: Male Single Year of Age**



**Graph 3 Distribution of 1991 Census Data: Female Single Year of Age**



#### 4. Comparison to England and Wales and Scottish Longitudinal Studies

As the England and Wales (E&W LS) and Scotland (SLS) Longitudinal Studies already have the 1991 Census incorporated into their data, a comparison can be drawn with the NILS 1991 Census Linkage.

The structure of NILS is different to the E&W LS and SLS in that both studies use Census information to identify study members whereas NILS uses Health Card registration data to identify members. However, a backward linkage comparison can be made of linkage rates of all LS members being identified in the 2001 Census and also having a 1991 Census Link.

Table 4 below shows the number of members in each LS identified in the 2001 Census. The table also shows the number and calculated proportion of these members who also have a 1991 Census link. It can be seen from the table that NILS linkage results are consistent to those in the other Longitudinal Studies.

**Table 3 UK LS Backward Linkage Comparison**

	<b>Members in 2001 Census</b>	<b>Members in 2001 Census also in 1991 Census</b>	<b>%</b>
<b>E&amp;W LS</b>	539,665	418,562	77.6%
<b>SLS</b>	256,377	193,733	75.6%
<b>NILS</b>	450,910	353,778	78.5%

Further analysis of the backward linkage data by age and gender can be seen from the Graph 6. The graph shows that the NILS has comparable backward linkage trends across all age groups to those experienced in the E&W LS and SLS.

**Graph 6: Census 2001 to 1991 Backward Linkage Comparisons across Three LS by Age-group and Gender**

