



**Northern Ireland Longitudinal Study:
Linking the Northern Ireland Longitudinal Study
to the 2011 Census**

NILS Working Paper 4.0

December 2013

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](#). This paper gives the matching results for the 2011 link to the NILS.

The total number of NILS members at April 2011 was 538,648. Using the NILS matching methodology a total of 474,896 records were matched to the 2011 Census data.

It is not possible to create links for some NILS members to the Census 2011 data for two reasons:

- (i) Health Card List Inflation, and
- (ii) Census person Imputation

It is therefore necessary to take these two factors into account when calculating the NILS match rate.

At April 2011 the full BSO List included 1,887,886 persons, 77,023 more people than the Census 2011 estimate of 1,810,863. This difference is known as List Inflation and, as there is no Census return, there is no possibility of creating a link between the Census data and the NILS data. This would therefore indicate that the list inflation rate is 4.1%.

Total Estimated List Inflation for NILS members (538,648 * 4.1%) = 21,976

The Census data contained 84,900 imputed records¹ estimated from the Census Coverage survey assessment and an additional 5,318 records that were processed as part of the Census but names data are not available as they were late returns. These 90,218 records cannot be matched to the NILS data as they do not have any of the key demographic details to enable matching. This would therefore indicate an imputation rate of 4.8%.

Total Estimated Enumeration for NILS members (538,648 * 4.8%) = 25,741

The match rate for NILS members to Census 2011 can be calculated by taking the total number of matches as a proportion of the estimated number of potential people that could be matched.

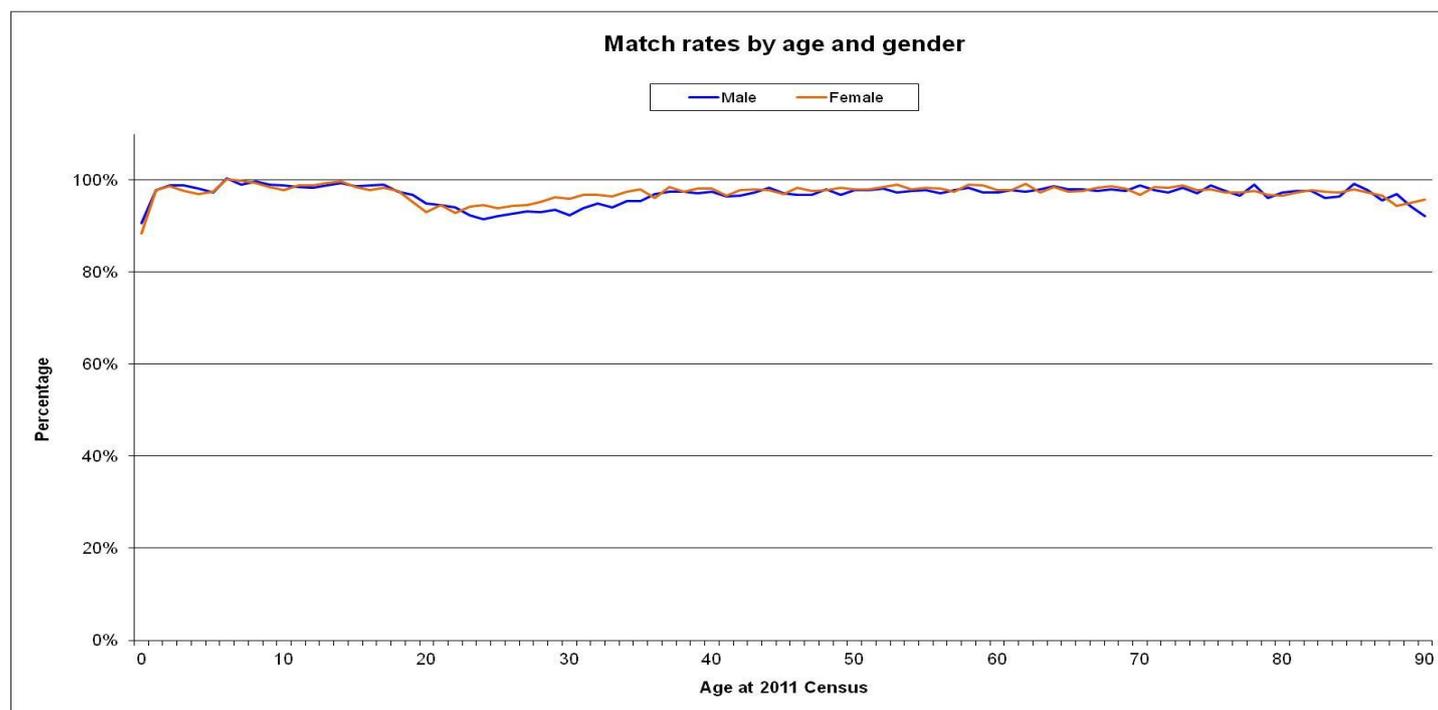
$$\frac{474,896}{538,648 - 21,976 - 25,741} = 96.7\%$$

¹ See http://www.nisra.gov.uk/Census/pop_QA_2011.pdf for more information

The overall match rate for the NILS 2011 link is 96.7%. The corresponding match rate for 2001 was 97.1%

It should be noted that these figures relate to analysis undertaken in December 2013 and the figures will change because we will continue to attempt to link those unmatched NILS members after each download from the BSO (in case the more up to date information facilitates a match).

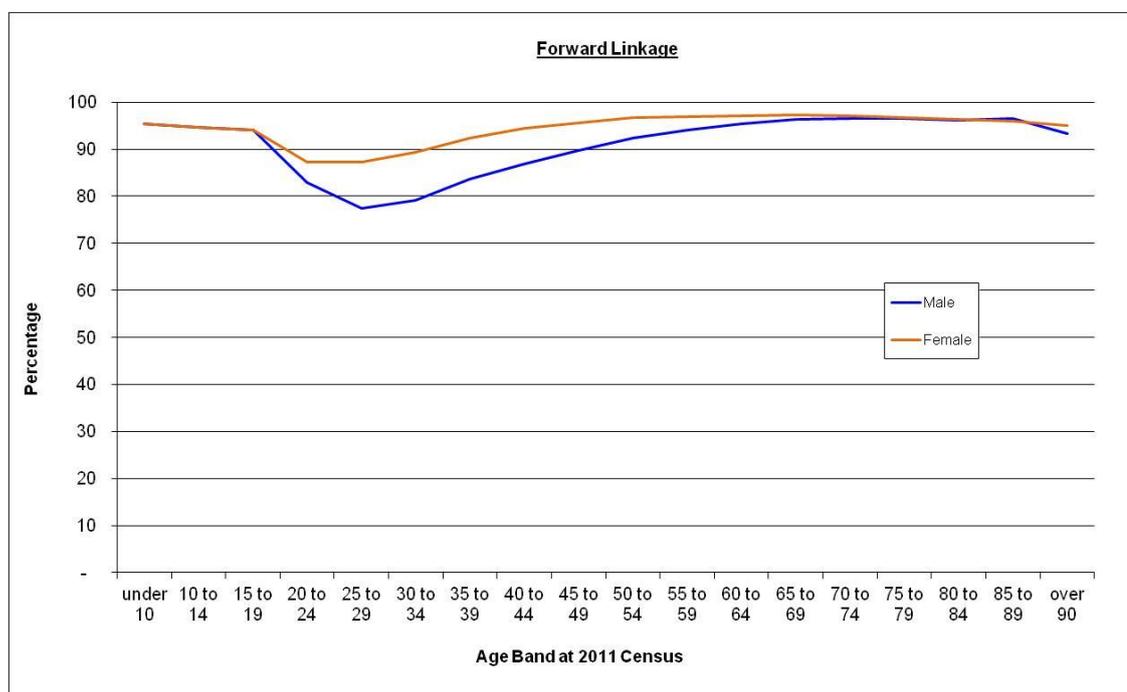
Under enumeration in the Census and imputation is known to vary by age, gender and geographical area and therefore will affect the number of potential people that could be matched, for example it is thought to disproportionately affect younger adult males from deprived inner city areas. The following graph showing the match rates by age and gender shows that young adult males (22 year olds-36 year olds) are harder to link than young adult females and all other ages have a similar match rate regardless of gender (See graph 1).



Graph 1

Forward linkage

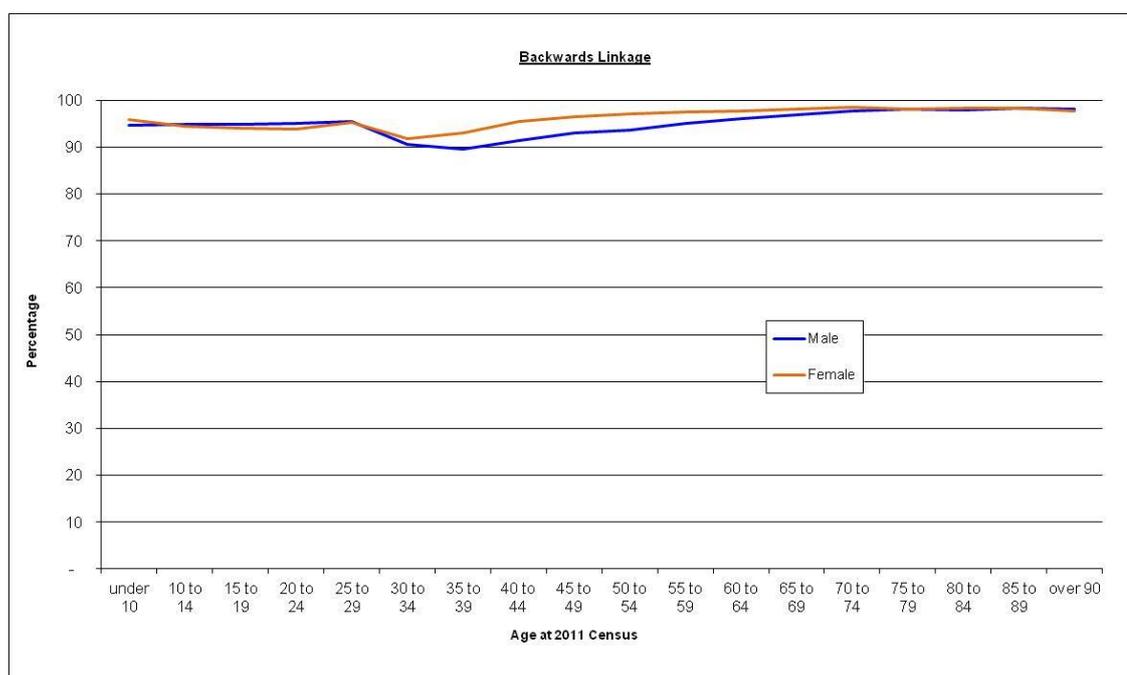
The ONS Longitudinal Study (LS) and also the Scottish Longitudinal Study (SLS) calculate forward linkage by comparing members who were present in the 2001 Census (excluding members who either died or emigrated between Censuses) against the members in 2011 Census resulting in a NILS forward linkage rate of 91.7%. That is 8.9% of people who were present in the 2001 census and expected to have a 2011 link did not have a 2011 link.



Graph 2

Backward linkage

The LS and SLS calculate backward linkage as those members who were present in the 2011 Census and linked to a 2001 census record compared to those who would also have been expected to be in the 2011 and 2001 census. The NILS backward linkage rate is 95.0%. That is 5.0% of people had a 2001 link and were expected to obtain a 2011 link but no link was found.



Graph 3

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