

# Life Expectancy for Northern Ireland Information Paper & Methodology Guide

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They undergo regular quality assurance reviews to ensure they meet customer needs.



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**This paper describes the quality of the estimates; the methodology used and details any points that should be noted when using the outputs for geographical areas within Northern Ireland.**

## **Background**

Life expectancy is the most commonly used measure to describe the health of the population and provides a useful measure of relative mortality. It is also a good measure of the extent of health inequalities as typically there are very distinct differences in life expectancy between areas.

The life expectancy figures published by NISRA are all period life expectancies. Period life expectancies are calculated using age specific mortality rates for a given period, with no allowance for any future changes in mortality. This means that period life expectancy at birth is the average number of years a baby can expect to live should current age specific mortality rates remain constant for the remainder of their life. Life expectancy at birth also provides an objective means of comparing trends in mortality, over time and between areas.

## **Relevance**

In the public sector, **Life expectancy estimates for administrative areas within Northern Ireland** can be used by the Department of Health and Social Services NI (DHSSPSNI), primary care organisations, public health observatories, local authorities and in the private sector, by pensions and insurance companies for planning their financial services.

On 1 April 15, there was a reorganisation of local government in Northern Ireland which reduced the 26 Local Government Districts to 11 new Local Government Districts. Data based on both the old and new boundaries are available on the NISRA website.

## **How the Output is created**

To calculate life expectancy by geographical area within Northern Ireland, population and death data are required.

[Mid-year Population Estimates](#) for each area broken down by sex and 5 year age bands (above the age of 0) are used. More information on the how these estimates are produced are available the [Northern Ireland Population Estimates: Methodology](#) paper on the NISRA website.

The number of deaths registered by year of registration, sex and 5 year age band in the same format as the population data are also required. More information on the quality of death registration data in Northern Ireland is provided in [Quality Assessment for Northern Ireland Deaths](#) available on the NISRA website.

NISRA use the Chiang II method when calculating life expectancy figures. This is consistent with Office for National Statistics (ONS) and National Records of Scotland (NRS) who also use this method producing life expectancy estimates. The methodology used is published by ONS in the following report, [GSSM series –](#)

[number 33 Life expectancy at birth: methodological options for small populations](#) which can be found within the Government Statistical Service Methodology (GSSM) series section of their website.

The life expectancy figures are a three year average and are produced by aggregating deaths and population data for the relevant three year period. Three years of data are needed to provide large enough numbers to ensure that the figures published are sufficiently robust. The useful effects of increasing the number of years used (n) needs to be weighed against the fact that the resultant life expectancy is an average of 3 years and assumes that the underlying life expectancy has not changed over the years under investigation. For example, if n is equal to 10, then the implicit assumption is that life expectancy has not changed over those 10 years. As n increases, the confidence interval decreases, but the validity of the assumption decreases too.

### ***Abridged life tables released with the report***

With the **Life expectancy estimates for administrative areas within Northern Ireland**, abridged life tables are provided. These tables give expectation of life at an 'exact age'. This is the average number of years that those at this age would survive thereafter, if they experienced the particular area's age specific mortality rates for the time period throughout the remainder of their life.

In the extracts from period life tables the column headed  $l_x$  shows the numbers who would survive to exact age of x, out of 100,000 persons who, from birth, were subject to the mortality probabilities indicated by the deaths for the corresponding time period. The column headed  $e_x$  shows the expectation of life – that is, the average number of years of life left to persons aged exactly x who are subject to the corresponding years mortality probabilities from age x onwards.

## **Quality of the output**

Life expectancy, like most statistics, is an estimate which is subject to a margin of error. The accuracy of the results can be indicated by calculating a confidence interval (included in the Chiang II method) which provides a range of values within which the true underlying life expectancy would lie (with 95 per cent probability). Life expectancy for an area can be said to be significantly different from, for example the Northern Ireland level, if the 95 per cent confidence intervals do not overlap. There is no simple 'rule of thumb' for the size of confidence intervals. But they largely depend on the size of the population, so confidence intervals for areas with smaller populations tend to be wider. It is also worth noting that life expectancy results in these areas can be affected by the random variation in the number of annual deaths and the effects of migration on the population. This means that the results can vary from year to year. Life expectancy is subject to random fluctuations in the number of deaths and the age at death.

The Northern Ireland level life expectancy estimates are for use only as a comparator for the corresponding geographical areas within Northern Ireland. The definitive Northern Ireland-level life expectancy estimate (based on national life tables) is published by the Office for National Statistics (ONS) and can be found within the National Life tables section of their website. The differences occur because of the differences between complete (single year of age) and abridged (grouped years) life tables, as well as the number of years data used in calculating the life expectancy figures.

Details of Demography & Methodology Branch's approach to revisions are available in the [Vital Events Revisions Policy](#).

## Timeliness & Punctuality

Historically ONS produced life expectancy by geographical area within Northern Ireland as part of a wider output. Following an [ONS Consultation on Statistical Products](#) in 2013, the scope of the ONS Sub-National Life Expectancy Statistics Bulletin was reduced to cover only England and Wales rather than the UK. NISRA has assumed responsibility for these estimates from 2014, publishing estimates from Autumn 2015 onwards.

Life expectancy estimates for administrative areas within Northern Ireland (Local Government District, Health Trust and Parliamentary constituency areas) are published in autumn following the release of annual death registration data and mid-year population estimates for the previous year. This means that estimates are available 10 to 11 months after the end of the reference period. The [Vital Statistics Publication Schedule](#) is available on the NISRA Website and is published at the start of each financial year.

In addition, the release date for life expectancy estimates is announced on the [UK Statistics Release Calendar](#) 28 days in advance. In the unlikely event of a change to the Publication Schedule, the public would be advised of the change via the NISRA website and any pre-announced dates would be updated on the Release Calendar. A full explanation of the reason(s) for the change would be provided as set out in the Code of Practice for Official Statistics.

## Accessibility & Clarity

The [NISRA website](#) is the primary vehicle for the release of life expectancy estimates in Northern Ireland. A combination of narrative, charts, graphs and data (specifically tailored to draw out the key findings from the statistics) may be downloaded in PDF and Microsoft Excel format. This paper also includes details about the methods used to calculate life expectancy figures and how to interpret them.

In terms of feedback from users, a user satisfaction survey was conducted by the NINIS management team, the results of which can be accessed via this link NINIS User survey: [NINIS Customer Survey 2014](#) Life Expectancy estimates by Northern Ireland administrative geographies are available on the Northern Ireland Neighbourhood Information System (NINIS). A combination of interactive maps, charts, graphs and data may be created and downloaded in Microsoft Excel, CSV & PDF formats.

## Coherence & Comparability

Life Expectancy estimates for Northern Ireland are available at 2 levels:

### *Northern Ireland Level*

Estimates at Northern Ireland level are published annually by ONS and give statistics on period life expectancy by single year of age and sex. These can be found within the [National Life tables](#) section of their website or on the [NISRA website](#).

Cohort life expectancies are worked out using age-specific mortality rates which allows for known or projected changes in mortality rates from relevant year based population projections. Northern Ireland Cohort life expectancies can be accessed from the Reference tables section of the Office for National Statistics [website](#). Life expectancy figures used for international comparisons are taken from the Statistics area of the [Eurostat](#) website.

## ***Life expectancy estimates for administrative areas within Northern Ireland***

The report on period life expectancy for administrative areas within Northern Ireland (Local Government District, Health Trust and Parliamentary constituency areas) is published by NISRA and can be found within the [Life Expectancy section](#) of the NISRA website. Life expectancy is an indicator of mortality which takes into account differences in the age structures of populations. Results for local areas can therefore be meaningfully compared, as can results for males and females. All figures for life expectancy for 2001–03 onwards were calculated using the same method and are therefore comparable.

In addition, the Information & Analysis Directorate (IAD) within the Department of Health, Social Services & Public Safety (DHSSPS) publish further life expectancy estimates, including Healthy Life Expectancy and Disability-Free Life Expectancy, as part of the *Northern Ireland Health & Social Care Inequalities Monitoring System* (HSCIMS) to allow for an assessment of health inequality gaps between different areas and population groups, including the most and least deprived areas in Northern Ireland. These can be found within the [Health Inequalities section](#) of the IAD webpage.

Estimates produced by IAD are not directly comparable with those produced by NISRA as different methods are used to allocate geography; IAD allocate geography based on Small Area (SA) death and population counts whereas NISRA allocate geography based on UPRN/Postcode for death counts and use published population mid year estimates for administrative areas. Other methodological differences, such as treatment of deaths to under 1 year olds and addition of an 85 - 89 and over 90 age band, will be brought in line in 2016. However geographical differences will remain and caution should be taken when comparing IAD and NISRA published figures on the same geographical areas.

The life expectancy figures calculated by NISRA include the deaths of non-residents. Deaths of Northern Irish residents occurring in Northern Ireland are assigned to place of normal residence whereas deaths of non-residents are allocated to place of death. Currently ONS and National Records of Scotland (NRS)/NISRA differ in the approach taken to deal with non-resident deaths for sub-national life expectancy figures. ONS do not include deaths of non-residents for sub-national life expectancy figures for England and Wales, whereas NISRA and NRS do. Work is planned to bring the methods of the three organisations more in line.

Death registrations are assigned to geographical areas by linking the postcode of usual residence of the deceased to the latest version of the Central Postcode Directory (CPD). This means that figures for each three-year period may be based on slightly different boundaries, where, for example, postcodes are re-allocated from one area into another. The impact on life expectancy results is minimal and comparability over time is not therefore affected.

## **Assessment of User Needs & Perceptions**

All Vital Statistics publications specifically invite users to provide any feedback they might have in respect of the content, format and relevance of the release. No negative feedback on Life Expectancy estimates has been received as part of this process.

We continue to welcome feedback from users on the content, format and relevance of this data series. Please take a few minutes to leave some feedback for the Vital Statistics Team at [dmb.nisra@dfpni.gov.uk](mailto:dmb.nisra@dfpni.gov.uk)

## Useful Links

The latest Life Expectancy estimates in Great Britain and Ireland are available at the following links:

[Northern Ireland](#)

[England and Wales](#)

[Scotland](#)

[Republic of Ireland](#)

All media inquiries should be directed to DFP Communications Office:

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Email: [dfp.pressoffice@dfpni.gov.uk](mailto:dfp.pressoffice@dfpni.gov.uk)

## Contacts

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