



Extra healthy years or just extra years?

What can we know from the data we have on the island of Ireland?

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List of Abbreviations

- BHPS:** British Household Panel Survey
- CARDI:** Centre for Ageing Research and Development in Ireland
- CSO:** Central Statistics Office
- DFLE:** Disability-Free Life Expectancy (DFLE (65))
- Partial DFLE:** Partial Disability-Free Life Expectancy (DFLE (65-74))
- ECHP:** European Community Household Panel
- EHEMU:** European Health Expectancy Monitoring Unit
- EUROSTAT:** Statistical Office of the European Union
- EU-SILC:** European Union Survey on Income and Living Conditions
- GHS:** General Household Survey
- HALE:** Health Adjusted Life Expectancy
- HLE:** Healthy Life Expectancy (HLE (65))
- HLY:** Healthy Life Years
- IPH:** Institute of Public Health in Ireland
- LE:** Life Expectancy (LE (65))
- Partial HLE:** Partial Healthy Life Expectancy (HLE (65-74))
- Partial LE:** Partial Life Expectancy (LE (65-74))
- NI:** Northern Ireland
- NICHS:** Northern Ireland Continuous Household Survey
- NIHPS:** Northern Ireland Household Panel Survey
- NIHS:** Northern Ireland Health Survey
- NIHSWB:** Northern Ireland Health and Social Wellbeing Survey
- NISRA:** Northern Ireland Statistics and Research Agency
- NS-SEC:** National Statistics Socio-economic Classification
- ONS:** Office for National Statistics
- RoI:** Republic of Ireland
- SC:** Social Class
- SEG:** Socio-economic group
- SF-36:** Short Form Health Survey
- SHARE:** Survey of Health, Ageing and Retirement in Europe
- SLÁN:** Survey of Lifestyle, Attitudes and Nutrition

1. Introduction

As life expectancy continues to rise, the prevalence of chronic conditions is increasing in our society. However, we do not know if the extra years of life gained are being spent with disability and illness, or in good health. Furthermore, it is unclear if all groups in society experience their extra years of life in the same way. This report examines patterns of health expectancies across the island of Ireland, examining any North-South and socio-economic differences as well looking at differences in data sources.

Key facts

Increasing life expectancy

The older population (aged 65 or over) on the island of Ireland is growing and becoming a larger percentage of the total population. Republic of Ireland Census 2011 revealed that 12% of the RoI population was aged 65 or over (CSO, 2012), and Northern Ireland Census 2011 revealed that 13% of the NI population was aged 65 or over (NISRA, 2012). By 2041 the population aged 65 or over is projected to reach 22% in RoI and 24% in NI (McGill, 2010). It is unclear, however, if this increasing longevity will be enjoyed equally by all strata of society.

Increasing prevalence of chronic conditions

A series of studies by the Institute of Public Health in Ireland (IPH) found that the number of people living with a chronic condition is expected to increase dramatically by 2020 and that disproportionately more of these people will belong to the older population. Where data was available, IPH also found that people living in more deprived areas of NI and RoI were more likely to have a chronic condition compared with those living in more affluent areas (Balanda et al. 2010, Institute of Public Health, 2012).

IPH conducted this study, with support from the Centre for Ageing Research and Development in Ireland (CARDI), to deepen understanding of increasing life expectancy in Ireland, North and South.

Data on mortality and morbidity amongst people aged 65 years or over were examined in order to identify whether or not gains in life expectancy are offset by the prevalence of illness and disability.

Specifically, this study:

- Reviewed existing data sources, assessed the comparability of national and international data sources and documented any data limitations
- Included an analysis of patterns of health expectancies across the island including an assessment of socio-economic and North-South differences.

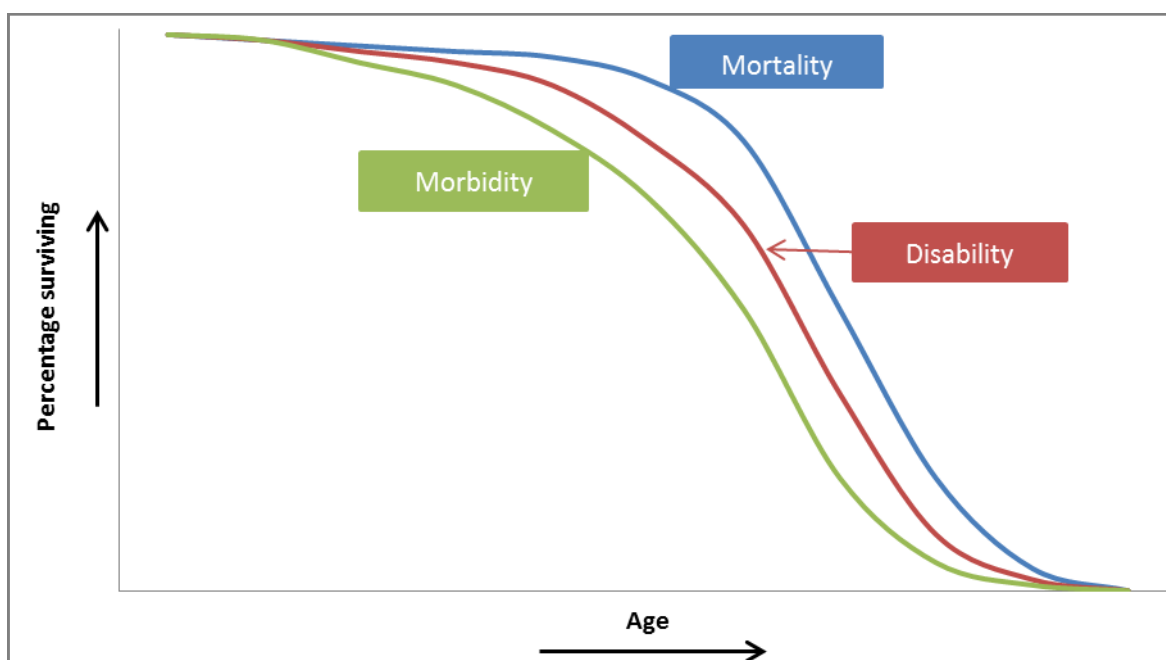
The study concentrated on a number of indicators dealing with disability and (self-rated) general health:

- Life expectancy (LE) - how long we can expect to live
- Disability-free life expectancy (DFLE) - how long we can expect to live without limitations on our daily activities
- Relative duration of freedom from disability (%DFLE/LE) - the percentage of remaining years expected to be free of disability
- Healthy life expectancy (HLE) - how long we can expect to live in (self-rated) good health
- Relative duration of good health (%HLE/LE) - the percentage of remaining years expected to be spent in good health.

Figure 1 below shows a series of three survival curves labelled mortality, morbidity and disability. The mortality curve represents the effects of mortality on overall survival; the morbidity curve represents the probability of surviving to a given age free from chronic morbidity; and the disability curve represents the probability of surviving to a given age free of illness and disability.

If the relative duration of freedom from illness and disability is increasing (ie the morbidity and disability curves move to the right) then a “compression of morbidity” is said to be occurring. If the reverse is happening whereby we are spending relatively more of the remaining years with illness and disability (ie the morbidity and disability curves move to the left), then an “expansion of morbidity” is said to be occurring. To make the most of increasing life expectancy, it is better that it is accompanied by compression of morbidity rather than expansion of morbidity.

Figure 1: Mortality, morbidity and disability survival curves (adapted from The Aging Population in the Twenty-First Century: Statistics for Health Policy, 1988)



2. Wider context

Throughout the EU-27, women tend to live longer than men although men tend to spend a greater proportion of their shorter lives free of disability. In 2010 Eurostat reported that in the EU-27, the expected number of healthy life years (the number of years spent without disability) remaining at age 65 was 8.7 years for men and 8.8 years for women. Considerable differences were observed, across EU-27 member states, with healthy life expectancy ranging from 3.3 years to 14.1 years for men and from 2.8 years to 15.5 years for women (EHEMU, 2010).

It is interesting to note in recent studies looking at this issue, one example of compression of poor health can be found in Austria between 1978 and 1998 (Doblhammer & Kytir, 2001). However a study (with morbidity defined in terms of major diseases such as cancer or diabetes) found little empirical evidence to support a recent compression of morbidity in the United States between 1998 and 2008 (Crimmins & Beltran-Sanchez, 2010).

3. Methodological differences that matter

3.1 Introduction

Part of the reason for the mixed story described in Section 2 may be the differences in the methodologies used in different studies. To explore this on the island of Ireland, mortality data and population figures were obtained from the Central Statistics Office (CSO) in RoI and the Northern Ireland Statistics and Research Agency (NISRA) in NI. To calculate DFLE and HLE, the prevalence of disability and (self-rated) poor health were incorporated into the life tables used to calculate LE.

We identified several potential sources of disability and (self-rated) general health data; eight in RoI and five in NI.

Table 1 shows that these data sources often tap into different aspects of health and healthcare, or take different approaches to important methodological issues.

Table 1: Methodology issues in comparing data sources from NI, RoI and Europe

<p>How the question is phrased: different aspects of health and healthcare</p>	<p>Some questions (such as those in European Union Survey on Income and Living Conditions (EU-SILC)) ask respondents to compare themselves to some normative group: I “... have you been limited ... in activities people usually do, because ...”</p> <p>Other questions (such as those in NIHSWB) ask respondents to describe how they would be in a particular situation: <ul style="list-style-type: none"> • “Please note: If you are receiving medication or treatment, please consider what you were like without medication or treatment” </p> <p>Some questions make no reference to the time; others ask respondents to consider a time period: <ul style="list-style-type: none"> • “over the last 12 months” (NIHSWB) • “at least the last 6 months” (EU-SILC) </p> <p>Some questions use quite general descriptions of health status while others are more specific: <ul style="list-style-type: none"> • “any longstanding illness, or disability, infirmity or mental health problem” (EU-SILC) </p> <p>Other questions (such as those in SHARE) ask respondents to rank the “severity” of any limitation: <ul style="list-style-type: none"> • “severely limited, Limited but not severely, Not limited” </p>
<p>How the responses are formatted</p>	<p>The number of response categories included in rating scales varies.</p> <p>How positively or negatively possible responses are expressed also varies.</p>
<p>How the questions are administered</p>	<ul style="list-style-type: none"> • Face-to-face interviews • Self-administered postal surveys
<p>How respondents are selected</p>	<p>Some data sources use independent cross-sectional sampling such as SLÁN (Department of Health and Children, 1998, 2002 & 2007) and NIHSWB Survey (Department of Health, Social Services and Public Safety, 1997, 2001, 2005/06).</p> <p>Others are panel surveys such as the Northern Ireland Household Panel Survey (NIHPS) and European Community Household Panel Survey (ECHP).</p> <p>Others use a hybrid approach such as the longitudinal rotating panel design used by the EU-SILC and Northern Ireland Continuous Household Survey (NICHHS).</p>
<p>Socio-economic classifications used</p>	<p>Sometimes the occupational coding available in census data, mortality data and health survey data are not the same. For example, in this study a combination of CSO social class (SC) and socio-economic group (SEG) classifications had to be used in RoI. In NI, a slight modification of the three level NS-SEC social class classification was needed.</p> <p>Socio-economic data is sometimes not available for all the relevant ages. For example; because social class variables were only asked of those aged 16-74 in the NI population census, only partial health expectancies could be used for social class analyses there. Partial expectancies reflect experiences between ages 65-74 only (rather than from age 65 to death) and are more difficult to interpret.</p>
<p>North–South comparisons</p>	<p>Data sources from NI and RoI:</p> <ul style="list-style-type: none"> • Look at different aspects of health or healthcare • Take quite different approaches to a number of important methodological issues listed above.

Often the impact of these methodological differences is exacerbated by changes made in different waves of the one data source. For example, if a question has been phrased differently throughout different waves, this can make true comparisons across waves difficult.

3.2 What is the impact of different methodologies?

The approach taken to these methodological issues can have significant impact on the findings. For example, in this study, methodological problems in both jurisdictions precluded any assessment of possible social gradients in DFLE and HLE¹, and any analysis of any socio-economic differences amongst females.

A series of case studies revealed that some approaches are particularly sensitive to biases with some approaches inflating health expectancy estimates while others deflate them.

This section presents three case studies that deal with:

- How the questions are phrased and how the responses are formatted (social desirability biases associated with peoples' tendencies to view/present themselves as better than average and to avoid extreme responses)
- How the questions are administered (non-response bias and social desirability biases)
- How respondents are selected (attribution bias and selection bias).

¹ Assessments of socio-economic differences had to be (tentatively) based on comparisons of amalgamations of the lowest and highest social groupings rather than comparisons of all social groupings

3.2.1 Case study one: Differences within Northern Ireland

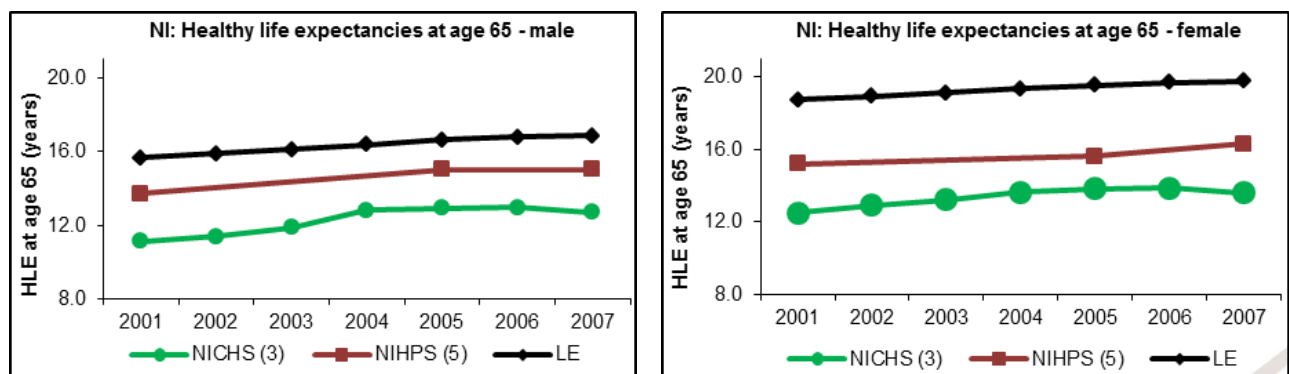
The NICHHS and the NIHPS use very different sampling designs and very different general health questions².

NIHPS surveys:	NICHHS surveys:
<p>Routine follow-up of an original cohort over a long period</p> <p><i>Please think back over the last 12 months about how your health has been. Compared to people of your own age, would you say that your health has, on the whole, been:</i></p> <ul style="list-style-type: none"> • Excellent • Good • Fair • <i>Poor</i> • <i>Very Poor</i> 	<p>Repeated independent cross-sectional samples</p> <p><i>Over the last 12 months would you say your health has, on the whole, been:</i></p> <ul style="list-style-type: none"> • Good • Fairly good • <i>Not good</i>

The literature suggests (Jürges et al, 2008; WHO, 1996; Idler, 1993) that the estimated prevalence of (self-reported) good health will tend to be larger when:

- Measured using questions with 5-point response categories and relatively negative response wording (NIHPS) than with questions using 3-point response categories and relatively positive response wording (NICHHS)
- Measured using panels surveys (NIHPS) than with repeated independent cross-sectional samples (NICHHS)
- Measured with questions requiring normative comparisons (NIHPS) than with questions not requiring such comparisons

Figure 2



As expected, HLE estimates based on NIHPS (5) are larger than those based on NICHHS (3). However, we do not know how much of the difference between NIHPS figures and NICHHS figures is caused by these methodological differences and how much is due to the fact the questions tap into different aspects of health.

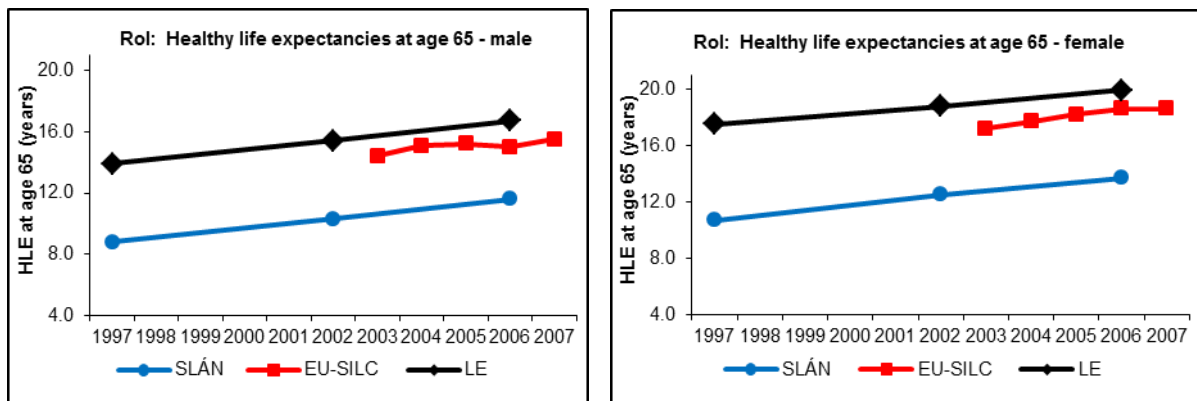
² Responses in red were used to define "poor health"

3.2.2 Case study two: Differences within Republic of Ireland

In a more complicated case study, the SLÁN in RoI and the EU-SILC use slightly different sampling designs and slightly different general health questions³.

SLÁN Surveys ⁴ :	EU-SILC Surveys:
Repeated independent cross-sectional samples	Routine follow-up of a rotating panel over a long period
<i>In general would you say your health is:</i>	<i>How is your health in general?</i>
<ul style="list-style-type: none"> • Excellent • Very Good • Good • Fair • Poor 	<ul style="list-style-type: none"> • Very Good • Good • Fair • Bad • Very Bad
<p>The literature suggests (Jürges et al, 2008; WHO, 1996) that the estimated prevalence of (self-reported) good health will tend to be larger when:</p> <ul style="list-style-type: none"> • Measured using questions with relatively negative response wording (EU-SILC) than using questions with relatively positive response wording (SLÁN) • Measured using rotating panels samples (EU-SILC) than in repeated independent cross-sectional samples (SLÁN) 	

Figure 3



As expected, HLE estimates based on EU-SILC are larger than those based on SLÁN. However, we do not know how much of the difference between EU-SILC figures and SLÁN figures is caused by these methodological differences and how much is genuine because the questions tap into different aspects of health.

³ Responses in red were used to define “poor health”

⁴ Part of SF-36 (a generic health survey with 36 questions yielding an 8-scale profile of functional health and wellbeing scores)

3.2.3 Case study three: North-South comparisons

This is the most complicated case study. The usual general health question (called HLE-NIHSWB below) in the NIHSWB survey (1997, 2001, 2005) was the same as the question used in the NICHHS (see case study one 3.2.1). However, in two different survey years a second health question was added:

- In 1997 the NIHSWB included the general health question that was used in all waves of SLÁN in RoI (called HLE2-NIHSWB or HLE-SLÁN)
- In 2005 the NIHSWB included the general health question that was used in all waves of EU-SILC in RoI (called HLE3-NIHSWB or HLE-EU-SILC)

Therefore 1997 and 2005 provide an opportunity to make North-South comparisons using similar general health questions⁵. While both NIHSWB and SLÁN surveys use repeated independent cross-sectional samples the EU-SILC used rotating panel design. Different methods of administering the questions also confound these comparisons.

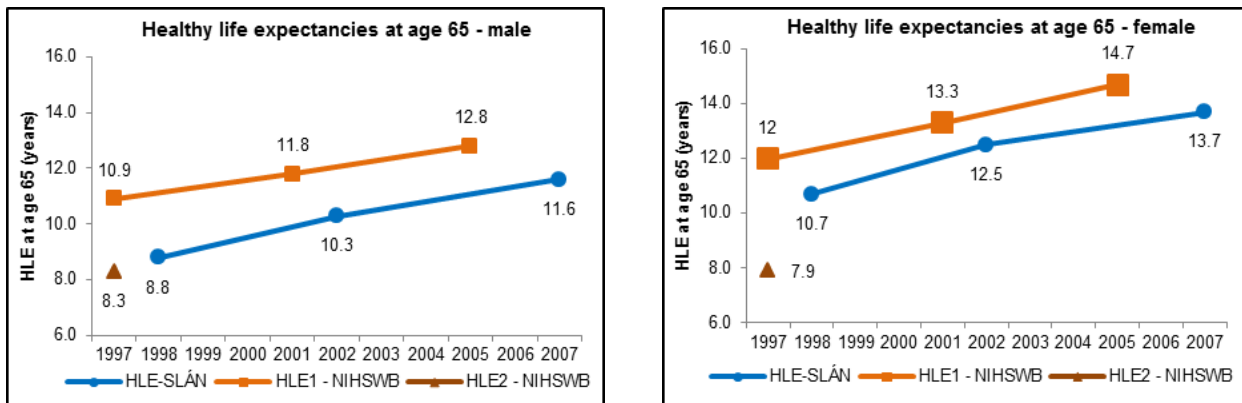
<p>NIHSWB survey 1997, 2001, 2005 (HLE1 - NIHSWB): Independent cross-sectional samples, face-to-face interviews. <i>Over the last 12 months would you say your health has, on the whole, been:</i></p> <ul style="list-style-type: none"> • Good • Fairly good • Not good 	
<p>NIHSWB survey 1997 (HLE2 - NIHSWB): Cross-sectional sample, face-to-face interviews. <i>In general, would you say your health is:</i></p> <ul style="list-style-type: none"> • Excellent • Very Good • Good • Fair • Poor 	<p>SLÁN Surveys (RoI) 1998, 2002, 2006⁶: Independent cross-sectional samples, self-administered postal questionnaire in 1998 & 2002; face-to-face interviews in 2006. <i>In general, would you say your health is:</i></p> <ul style="list-style-type: none"> • Excellent • Very Good • Good • Fair • Poor
<p>NIHSWB survey 2005 (HLE3 - NIHSWB): Cross-sectional sample, face-to-face interviews. <i>How is your health in general?</i></p> <ul style="list-style-type: none"> • Very Good • Good • Fair • Bad • Very bad 	<p>EU-SILC survey (RoI) 2003, 2004, 2005⁷: Longitudinal rotating panel sample, face-to-face interviews. <i>How is your health in general?</i></p> <ul style="list-style-type: none"> • Very Good • Good • Fair • Bad • Very bad
<p>North-South comparison based on SLÁN general health question (1998) and NIHSWB (1997)</p>	
<p>The literature suggests (WHO, 1996; Ekholm et al 2009) that the estimated prevalence of (self-reported) good health will tend to be:</p> <ul style="list-style-type: none"> • Smaller in NI when measured using the HLE-SLÁN question than when using the usual NIHSWB question (HLE1-NIHSWB) due to different number of categories • Larger when using self-administered postal questionnaire (SLÁN) than when using a face-to-face interview (NIHSWB) 	

⁵ Responses in red were used to define “poor health”

⁶ Part of SF-36

⁷ EU harmonised question

Figure 4a Rol SLÁN compared with NIHSWB



A simple North-South comparison based on the usual NIHSWB question in 1997 and the SLÁN question (HLE1-NIHSWB and HLE-SLÁN) in 1998 indicates that the estimated HLE in NI is larger than it is in Rol.

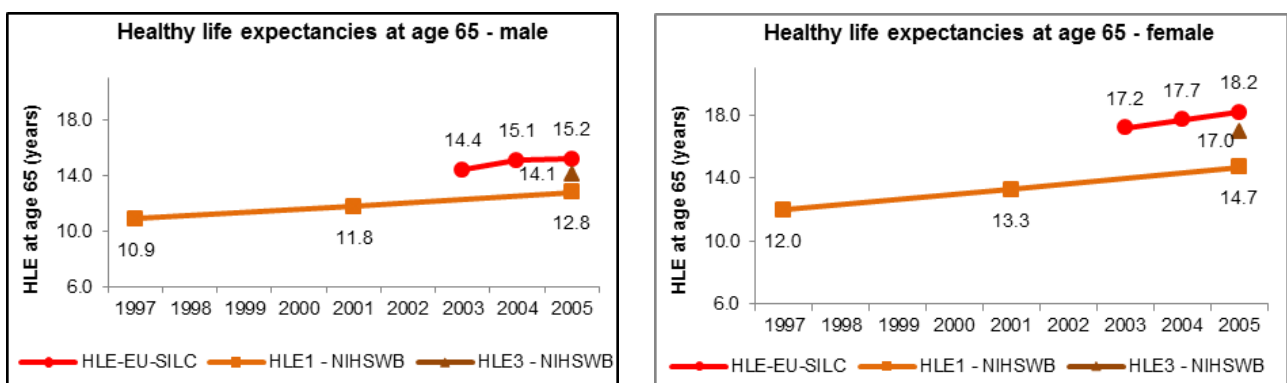
However, a North-South comparison based on the same SLÁN question (HLE2-NIHSWB and HLE-SLÁN) shows that the estimated HLE in Rol was larger than it was NI. Of course, we expect less positive responses in face-to-face interviews (NIHSWB) than in self-completed postal questionnaires (SLÁN) (Smith and White, 2009).

North-South comparison based on EU-SILC general health question (2005)

The literature suggests (Idler, 1993; Jürges et al, 2008; WHO, 1996) that the estimated prevalence of (self-reported) good health will tend to be:

- Larger in Rol when measured in rotating panel samples (EU-SILC) than when measured in repeated independent cross-sectional samples (SLÁN)
- Larger when using the EU-SILC (or HLE3-NIHSWB) question than using the usual NIHSWB questions (HLE1-NIHSWB)

Figure 4b Rol EU-SILC compared with NIHSWB



A simple North-South comparison based on the usual NIHSWB question and the SLÁN question in 2006 indicates that the estimated HLE in NI is larger than it is in RoI (Figure 4a).

A North-South comparison based on the EU-SILC question in 2005 (HLE-EU-SILC or HLE3-NIHSWB) indicates that estimated HLE in RoI is larger than that in NI in 2005 (Figure 4b).

We expect less positive responses in repeated independent cross-sectional samples (NIHSWB) than in rotating panel surveys (EU-SILC in RoI) (Smith and White, 2009)⁸.

3.3 Summary

The case studies revealed that:

Normative references, the time period the question focuses on, and the phrasing of possible responses can either inflate or deflate health expectancy estimates.

The effects of some methodological differences (eg differences between self-administered postal surveys and face-to-face interviews) may be ameliorated by statistical techniques such as post-hoc adjustment for non-response bias and complex survey design. However, these are less effective when data sources being compared differ in a number of ways.

Hybrid survey designs such as longitudinal rotating panel designs appear to address the attrition bias associated with long running panel surveys, and the resulting health expectancy estimates are less likely to be inflated.

Key data sources differ methodologically in ways that are not related to any shared underpinning health definition, policy or intervention target. Using the same name for two measures does not mean they measure the same aspect of health or healthcare. These differences undermine international comparisons, North-South comparisons, assessments of gender differences and socio-economic variation. If significant changes have been made to the waves of the same data source then the assessment of temporal trends is undermined.

It is important to be aware how complex measures such as health expectancies have been derived and not to make comparisons to other measures unless they have been derived in a similar way.

⁸ We do not know how much of the difference between NIHSWB and SLÁN figures are caused by methodological differences and how much is due to genuine North-South differences in health expectancies

4. What the SLÁN Surveys tell us about Republic of Ireland (RoI)

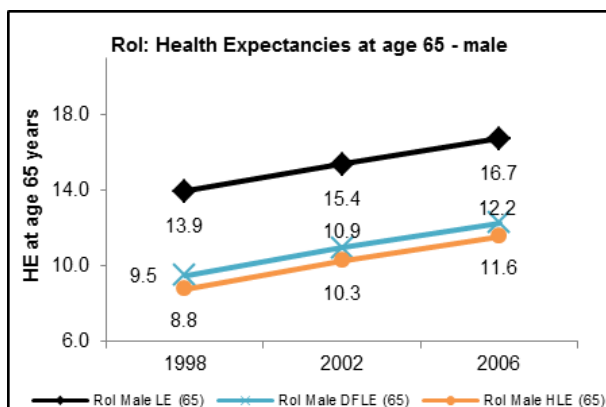
Primary analyses for RoI used the Survey of Lifestyle, Attitudes and Nutrition (SLÁN) in 1998, 2002 & 2006. This data source was the only readily available data from which relatively comparable sets of disability prevalence and self-reported health by age, sex and socio-economic groups could be generated for several years.

The surveys, based on repeated independent cross sectional samples, used the following general health and disability questions⁹:

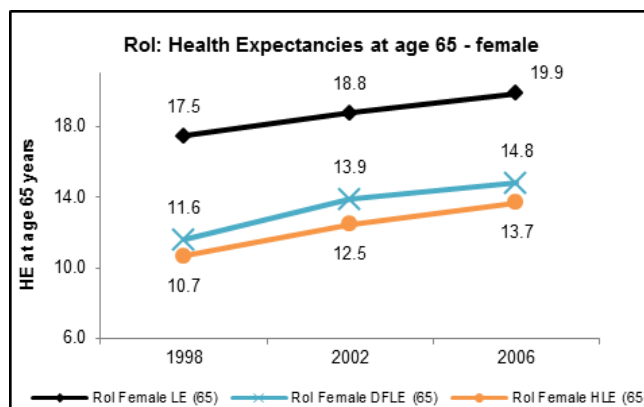
<p><i>In general would you say your health is</i> ¹⁰</p> <ul style="list-style-type: none"> • Excellent • Very Good • Good • Fair • Poor 	<p><i>Is your daily activity or work limited by long-term illness, health problem or disability?</i></p> <ul style="list-style-type: none"> • Yes • No • Do not have any of the above ¹¹
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Figure 5: Health expectancies at age 65 in RoI (1998-2006)

Males



Females



⁹ Responses in red were used to define "poor health"

¹⁰ Part of SF-36

¹¹ Not a response category in 2006

Gender differences in health expectancies (2006)

Unlike most international studies, SLÁN suggests that both males and females in RoI are expected to live slightly longer without disability than they are expected to live in (self-rated) good health. For all health expectancies at age 65, females enjoy a significant advantage over males of about 20% in 2006. There was no evidence the female advantage had changed between 1998 and 2006. In 2006, males and females aged 65 years could expect to spend similar percentages of their remaining years with disability and similar percentages of their remaining years in (self-rated) poor health.

Compression / expansion of morbidity amongst males aged 65 years (1998 – 2006)

Amongst males in RoI, LE at age 65 years increased by about 3 years during the period 1998 – 2006. Other health expectancies increased by about 2.5 years. The absolute number of years spent with disability or spent in poor health was unchanged between 1998 and 2006. Because LE was increasing, SLÁN suggests there was a small decrease in the relative duration of disability (from 32.1% to 26.9%) and a small decrease in the relative duration of poor health (from 37.1% to 30.9%). Amongst males, there was a small compression of disability and poor health in older age.

Compression / expansion of morbidity amongst females aged 65 years (1998 – 2006)

Amongst females in RoI, at age 65 years LE increased by about 2.5 years during the period 1998-2006 (slightly less than males). DFLE and HLE increased by about 3 years and slightly more quickly than LE. The absolute number of years spent with disability or spent in poor health slightly decreased between 1998 and 2006. Consequently, SLÁN suggests there was a decrease in the relative duration of disability (from 33.6% to 25.6%) and a decrease in the relative duration of poor health (from 38.8% to 31.1%). Amongst females, there was a small compression of disability and poor health in older ages.

(Tentative) findings about socio-economic differences amongst males aged 65 years from SLÁN surveys in RoI (1998, 2002 and 2006) ¹²

<i>Socio-economic inequalities in health expectancies (2006)</i>	Compared to those in the highest Socio-economic group (SEG), RoI males aged 65 years in the lowest SEG can expect to live 20% fewer years free of disability and 28% less in (self-rated) good health.
<i>Trends in socio-economic inequalities (1998-2006)</i>	Comparing 1998 and 2006, amongst males aged 65 years in RoI the SEG gap in LE and DFLE appear to have increased while the SEG gap in HLE appears to have decreased.
<i>Socio-economic group differences in compression / expansion (2006 vs 1998)</i>	Comparing 1998 and 2006, males aged 65 years in RoI appear to have experienced an expansion of disability in the highest SEG, a compression in the middle SEG, and little change in the relative duration of disability in the lowest SEG. Comparing 1998 and 2006, males aged 65 years in RoI appear to have experienced an expansion of poor health in the highest SEG and little change in the relative duration of poor health in the middle SEG and lowest SEG.

Commentary

In 2006 the words “or work” were deleted from the disability question “is your daily activity or work limited by long-term illness, health problem or disability” used in the previous two waves of SLÁN although it is not expected to affect the findings significantly.

Often there were no clear gradients in time plots – the 1998 and 2002 surveys were self-administered postal surveys while the 2006 survey comprised face-to-face interviews, and this may have affected the time plots in DFLE and HLE.

¹² Extreme caution is needed when interpreting socio-economic findings as socio-economic data are problematic; particularly when interpreting trends. Often there was no clear gradient in time plots and particular care is required when interpreting trends in socio-economic inequalities

5. What the NIHSWB Surveys tell us about Northern Ireland (NI)

Primary analyses for NI used the Northern Ireland Health and Social Wellbeing Survey (NIHSWB) in 1997, 2001 & 2005/06. This data source was the only readily available data from which relatively comparable sets of disability prevalence and self-reported health by age, sex and social class groups could be generated for several years.

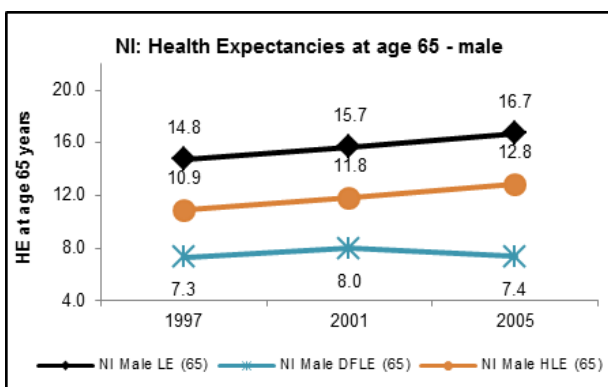
The surveys were based on repeated independent cross sectional samples and used the following general health and disability questions¹³.

<p><i>Over the last 12 months would you say your health has, on the whole, been</i></p> <ul style="list-style-type: none"> • Good • Fairly good • Not good 	<p><i>Do you have any long-standing illness, disability or infirmity? By long standing I mean anything that has troubled you over a period of time or that is likely to affect you over a period of time.</i></p> <ul style="list-style-type: none"> • Yes • No <p><i>Does this illness or disability limit your activities in any way?</i></p> <ul style="list-style-type: none"> • Yes • No
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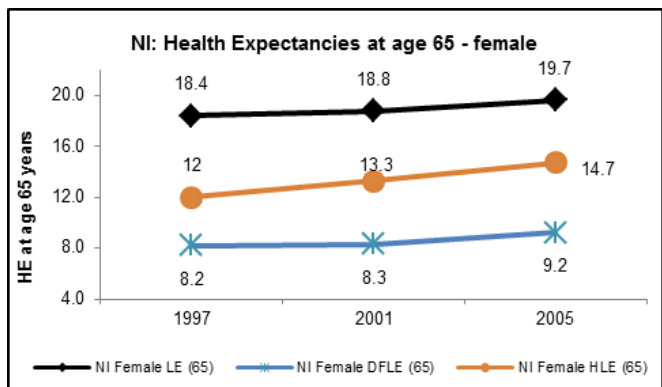
The NIHSWB surveys were administered through face-to-face interviews. Social class analyses in NI are based on partial health expectancies that deal only with those aged 65-74 years.

Figure 6: Health expectancies at age 65 in NI (1997-2005)

Males



Females



¹³ Responses in red were used to define "poor health"

Gender differences in health expectancies (2006)

The NIHSWB suggests that both males and females in NI are expected to live considerably longer in (self-rated) good health than they are expected to live without disability. The opposite was observed with the SLÁN in RoI.

For all health expectancies at age 65, females enjoy a significant advantage over males (approximately 25% for DFLE and approximately 15% for LE and HLE) in 2005¹⁴.

In 2005, males and females aged 65 years could expect to spend similar percentages of their remaining years with disability and similar percentages of their remaining years with poor health.

Compression / expansion of morbidity amongst males aged 65 years (1997 – 2005)

Amongst males in NI, there was an expansion of disability and a (slight) compression of poor health in older ages during the period 1997 - 2005. The NIHSWB suggests there was an increase in the relative duration of disability (from 50.3% to 56.0%) and a slight decrease (from 26.1% to 23.3%) in the relative duration of poor health among males. LE increased by about 3 years, HLE increased by about 2 years and DFLE had shown little change. The absolute number of years spent with disability increased and the absolute number of years spent in poor health was unchanged.

Compression / expansion of morbidity amongst females aged 65 years (1997 – 2005)

Among females in NI there was little change in the relative duration of freedom from disability and a compression of self-rated poor health during the period 1997 - 2005. The NIHSWB suggests there was a slight decrease in the relative duration of disability (from 55.5% to 53.2%) and a decrease in the relative duration of poor health (from 34.9% to 25.2%) among females. LE at age 65 years increased by about 1.5 years, HLE had increased by about 2.5 years and DFLE had increased by about 1 year. The absolute number of years spent with disability was unchanged and the absolute number of years spent in poor health decreased.

(Tentative) findings about social class differences amongst males aged 65 years from NIHSWB surveys in NI¹⁵

<i>Social class inequalities in health expectancies (2005)</i>	Compared to those in the highest social class, NI males aged 65 years in the lowest social class can expect to live 34% fewer years aged 65-74 free of disability and 24% fewer in (self-rated) good health.
<i>Trends in socio-economic inequalities (1997 - 2005)</i>	Comparing 1997 and 2005 amongst males in NI the social class gap in partial LE (65-74 years) appears to have decreased; the social class gap in partial HLE (65-74 years) appears to have decreased slightly while the social class gap in partial DFLE (65-74 years) appears to have increased.
<i>Social class differences in compression / expansion of morbidity (2005 vs 1997)</i>	Comparing 1997 and 2005 amongst males in NI there appears to have been an expansion of disability between ages 65-74 in all social classes. Comparing 1997 and 2005; amongst males in NI there appears to have been little change in the relative duration of poor health between ages 65-74 in the highest and lowest social classes, and a compression of poor health between ages 65-74 in the middle social class.

¹⁴ Unlike the SLÁN in RoI, there was some small evidence that these female advantages had decreased for LE and HLE, but increased for DFLE, between 1997 and 2005.

Are UK comparisons based on NICHHS valid?

Because there are only relatively small differences in the disability questions in the NIHSWB and NICHHS the values of DFLE reported here are similar to those reported by the Office of National Statistics (ONS). Consequently, values of and recent changes in %DFLE/LE are similar.

The story about HLE is more complex because, after 2005, the NICHHS in NI and the equivalent GHS in England used a 3-point and a 5-point general health question. The NIHSWB used the 3-point general health question which gives lower poor health rates and higher HLE values than the 5-point question. As a consequence:

- Findings reported here from NIHSWB are broadly similar to those based on the 3-point question used in NICHHS
- Findings reported here from NIHSWB are not comparable to those based on the 5-point question used in NICHHS

Findings reported here from NIHSWB are consistent with findings for 2005-07 and 2008-10 that were published recently by ONS (although ONS compared 5-point questions used in NICHHS and the NIHS) (ONS, 2012).

Commentary

In 1997 and 2005 the illness and activity limitation questions were sequenced. In 2001, however, the activities limitations question in the NIHSWB survey was asked independently of the illness question. In addition, the 2001 activities limitation question includes the clause “substantially limits” and asked respondents on medication to compare themselves to when they were not taking medication. These changes tended to produce lower estimates of DFLE in 2001 compared to 1997 and 2005.

Social class analyses in NI are based on partial health expectancies that deal only with those aged 65-74 years. This is because social class data in the NI population census is only collected among those aged under 75 years¹⁶.

¹⁵ Socio-economic gaps are represented by ((partial) DFLE in lowest SC / (partial) DFLE in highest SC) and ((partial) HLE in lowest SC / (partial) HLE in highest SC). Large ratio corresponds to a small socio-economic difference; a small ratio a large socio-economic difference. An increasing ratio represents a decrease in the socio-economic difference, a decreasing ratio an increase in the socio-economic difference. There may be a further socio-economic deficit in LE but this is not included in this calculation

¹⁶ In this study, both were used to identify those with a disability.

6. Conclusions

6.1 Summary of findings

- The current national sources of health data are inadequate for monitoring trends and socio-economic patterns in LE, DFLE and HLE.
- Investigations into socio-economic inequalities in the health of the older population, North and South, are particularly hampered by significant data limitations, especially among females and people not in employment.
- Any conclusions about North-South differences in DFLE and HLE based on current data sources are very tentative.
- Inequalities in mortality reported in earlier IPH studies (Balanda & Wilde, 2001) are reflected in inequalities in DFLE and HLE. Despite important data limitations, socio-economic inequalities in DFLE and HLE appear to be greater than socio-economic inequalities in LE. Because of limitations in current data sources in both NI and RoI any broader conclusions about the socio-economic gap in LE, DFLE and HLE and socio-economic patterns in recent changes in the relative duration of freedom from disability and good health are not possible.

6.2 Recommendations

A number of data and research recommendations would support stronger examinations of life expectancy and morbidity in the future.

1. Relevant information standards should be urgently developed and implemented to address data inadequacies. Greater harmonisation through alignment with survey instruments such as the EU-SILC and the European Health Interview Survey in both jurisdictions will strengthen North-South comparability.
2. Further analysis of existing national and international data sources is required to better understand the inconsistencies and clarify these findings.
3. Greater use of data linkage studies and longitudinal studies (with their associated micro-simulation methods for calculating health expectancies) are needed to help us better understand changes in life expectancy and other health expectancies.

Notwithstanding the data limitations, the following recommendations would help facilitate more responsive policy and practice:

1. The use of LE in policy debates and service planning should be augmented by the use of DFLE and HLE to reflect broader life course influences and quality of life in later years.
2. Because different disability and (self-rated) general health measures lead to different findings, greater discussion is needed to identify the different measures that are relevant to different policy and service areas. In this regard, it would be useful to:
 - Clarify the role of different health expectancies, and the data that they require, that tap into different aspects of health and healthcare, and ensure they are fit for current policy and practice.
 - Develop more specific health expectancies such as those associated with particular clinical conditions (such as Dementia free LE) or utilisation of particular services.

6.3 Overall conclusions

With an ageing population across the island of Ireland, it is important to understand the impact of chronic conditions as well as physical and mental health problems on our health as we grow older. It is a great success story that life expectancy is increasing, but measures such as DFLE and HLE must also be brought into the policy debate in order to reflect broader life course influences and quality of life in later years. Greater harmonisation of the approach to data gathering methodology will lead to more reliable data on health inequalities, enabling a more targeted approach to healthy ageing.

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Appendix 1

List of health questions used in different data sources in NI

Source	Year	Disability questions	Self-rated health questions
Northern Ireland Household Panel (NIHPS)	2001 – 2008	<p>Can I check, do you consider yourself a disabled person?</p> <ol style="list-style-type: none"> 1. Yes 2. No <p>Does your health in any way limit your daily activities compared to most people of your age?</p> <ol style="list-style-type: none"> 1. Yes 2. No <p>Does your health limit the type of work or the amount of work you can do? (Include both paid and unpaid work)</p> <p>Does your health keep you from doing some types of work?</p>	<p>Please think back over the last 12 months about how your health has been. Compared to people of your own age, would you say that your health has, on the whole, been:</p> <ol style="list-style-type: none"> 1. Excellent 2. Good 3. Fair 4. Poor 5. Or Very Poor? 6. Don't know
Northern Ireland Health and Social Wellbeing Survey (NIHSWB)	1997	<p>Do you have any long-standing illness, disability or infirmity? By long standing I mean anything that has troubled you over a period of time or that is likely to affect you over a period of time.</p> <p>Does this illness or disability limit your activities in any way?</p>	<p>Over the last 12 months would you say your health has, on the whole, been:</p> <ol style="list-style-type: none"> 1. Good 2. Fairly good 3. Not good <p>Part of SF-36: In general, would you say your health is:</p> <ol style="list-style-type: none"> 1. Excellent 2. Very good 3. Good 4. Fair 5. Poor

Source	Year	Disability questions	Self-rated health questions
Northern Ireland Health and Social Wellbeing Survey (NIHSWB)	2001	<p>Do you have any long-standing illness, disability or infirmity? By long standing I mean anything that has troubled you over a period of time or that is likely to affect you over a period of time.</p> <p>Do you have any health problem or disability that substantially limits your ability to carry out day-to-day activities? (Please note: If you are receiving medication or treatment, please consider what it would be like without the medication or treatment?)</p>	<p>Over the last 12 months would you say your health has, on the whole, been:</p> <ol style="list-style-type: none"> 1. Good 2. Fairly good 3. Not good
Northern Ireland Health and Social Wellbeing Survey (NIHSWB)	2005	<p>Do you have any long-standing illness, disability or infirmity? By long standing I mean anything that has troubled you over a period of time or that is likely to affect you over a period of time.</p> <p>Does this illness or disability limit your activities in any way?</p>	<p>Over the last 12 months would you say your health has, on the whole, been:</p> <ol style="list-style-type: none"> 1. Good 2. Fairly good 3. Not good <p>How is your health in general? Would you say it was:</p> <ol style="list-style-type: none"> 1. Very good 2. Good 3. Fair 4. Bad 5. Very bad
Northern Ireland Continuous Household Survey (NICHHS)	1984 - 2009	<p>Do you have any long-standing illness, disability or infirmity? By long standing I mean anything that has troubled you over a period of time or that is likely to affect you over a period of time.</p> <p>Does this illness or disability limit your activities in any way?</p>	<p>Over the last 12 months would you say your health has, on the whole, been:</p> <ol style="list-style-type: none"> 1. Good 2. Fairly good 3. Not good

Appendix 2

List of health questions used in different data sources in RoI

Source	Year	Disability questions	Self rated health questions
Survey of Life-styles, Attitudes, and Nutrition (SLÁN)	1998 2002	Is your daily activity or work limited by long-term illness, health problem or disability: 1. Yes 2. No 3. Do not have any of the above	In general would you say your health is: 1. Excellent 2. Very Good 3. Good 4. Fair 5. Poor
Survey of Life-styles, Attitudes, and Nutrition (SLÁN)	2006	Is your daily activity limited by long-term illness, health problem or disability: 1. Yes 2. No 3. Do not have any of the above	In general would you say your health is: 1. Excellent 2. Very Good 3. Good 4. Fair 5. Poor
EU Survey of Income and Living Conditions (EU-SILC)	2003 - 2008	For at least the last 6 months have you been limited in activities people usually do, because of a health problem? (If limited, specify whether strongly limited or limited). 1. Yes, strongly limited. 2. Yes, limited. 3. Not limited.	How is your health in general? 1. Very good 2. Good 3. Fair 4. Bad 5. Very bad



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