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AN ROINN

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MÁNNYSTRE O

**Poustie, Resydènter Heisin
an Fowk Siccar**

NI Health & Social Care Inequalities Monitoring System

Life Expectancy Decomposition

An overview of changes in Northern Ireland life expectancy

2001-03 to 2006-08



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2001-03 to 2006-08

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Contents

	Page number
Executive Summary	3
1 Introduction and methodology	5
1.1 Northern Ireland Health and Social Care Inequalities Monitoring System	5
1.2 Life expectancy	5
1.3 Life expectancy gap	6
1.4 Deprivation classification	7
1.5 Rural classification	7
1.6 Health and Social Care Trusts	7
1.7 Population	7
1.7.1 <i>Population trends</i>	7
1.7.2 <i>Small area population estimates</i>	8
1.8 Classification of cause of death	8
1.8.1 <i>Registration vs actual time of death - the effect on suicide figures</i>	9
1.9 Mortality by gender and age	10
2 Northern Ireland life expectancy	11
2.1 Gender differences in NI life expectancy	11
2.2 Decomposition of the change in NI life expectancy by age	12
2.3 Decomposition of the change in NI life expectancy by cause of death	12
3 Life expectancy and deprivation	15
3.1 Life expectancy in the most deprived areas	17
3.2 Decomposition of the change in life expectancy by age	17
3.3 Decomposition of the change in life expectancy by cause of death	18
4 The deprivation gap	20
4.1 Decomposition of the deprivation gap by age	21
4.2 Decomposition of the deprivation gap by cause of death	21
4.3 Inequality gap - the most deprived areas compared with the least deprived areas	23
4.3.1 <i>Inequality gap between the most and the least deprived areas by age</i>	24
4.3.1 <i>Inequality gap between the most and the least deprived areas by cause of death</i>	24
5 Life expectancy in rural areas	27
5.1 Decomposition of the change in rural life expectancy by age	28
5.2 Decomposition of the change in rural life expectancy by cause of death	28
6 The rural life expectancy gap	30
6.1 Decomposition of the NI-rural life expectancy gap by age	31
6.2 Decomposition of the NI-rural life expectancy by cause of death	31
7 Life Expectancy in HSC Trusts	34
7.1 Belfast HSC Trust	35
7.2 Northern HSC Trust	35
7.3 South-Eastern HSC Trust	36
7.4 Southern HSC Trust	36
7.5 Western HSC Trust	36
8 Other mortality definitions	37
8.1 Amenable mortality	37
8.2 Smoking related deaths	38
8.3 Alcohol related deaths	39
Appendices	
Appendix 1 - Causes of death - definitions	40
Appendix 2 - HSC Trust details	41
Appendix 3 - Other mortality definitions	44



Executive Summary

Chapter 1 – Introduction & methodology

Life expectancy at birth is the average number of years a person can expect to live should current mortality patterns stay constant. This report details how trends in mortality by age and cause of death explain recent changes in life expectancy. The results are examined in the context of changes in the recording, measuring and classification of demographic data over recent years.

Chapter 2 – Life expectancy in Northern Ireland

In 2006-08 male life expectancy reached 76.4 years which represented a 0.8 year increase from 2001-03. Female life expectancy also increased by 0.8 years to reach 81.3 years in 2006-08. These improvements were driven by falling mortality due to circulatory disease amongst those aged 60 years or more.

Chapter 3 – Life expectancy in deprived areas

Improvements in life expectancy in the 20% most deprived areas were markedly less than those seen across Northern Ireland as a whole. The male life expectancy was 71.8 years in 2006-08 which represented a 0.2 years increase from 2001-03. Female life expectancy increased by half a year to reach 78.4 years in 2006-08. Mirroring the Northern Ireland picture, these increases were driven by falling mortality in those aged over 60 from circulatory disease. The improvement was however largely offset by higher mortality rates among 15-59 year old males.

Chapter 4 – The deprivation gap

As life expectancy in the most deprived areas did not improve to the same extent as in the wider region, the life expectancy deprivation gap widened over the period. The male deprivation gap increased from 4.1 to 4.6 years and the female gap increased from 2.6 to 2.9 years between 2001-03 and 2006-08. For both genders, relatively higher mortality rates for cancer and circulatory disease in the most deprived areas compared with NI generally were the main contributors to the deprivation gaps in 2006-08.

Chapter 5 – Life expectancy in rural areas

The male life expectancy in rural areas was 77.7 years in 2006-08, which represented an increase of 1.1 years since 2001-03. Female life expectancy in rural areas also increased by 1.1 years to reach 82.6 years in 2006-08. These increases can be almost exclusively explained by improved mortality due to circulatory disease among the over 60 year olds for both genders.

Chapter 6 – The rural life expectancy gap

Rural areas have in general higher life expectancy than Northern Ireland overall and the life expectancy gap widened between 2001-03 and 2006-08 from 1.0 to 1.3 years for males and 1.1 to 1.4 years for females. In 2006-08, the female rural gap was mainly caused by relatively lower mortality rates among the over 60 year olds in rural areas for a range of causes of death. Lower mortality rates for lung cancer and respiratory disease across age groups in rural areas were the main contributors to the male gap.

Chapter 7 – Life expectancy in HSC Trusts

The highest expectancy of life among the five HSC Trusts occurred in the South Eastern Trust in 2006-08 for both genders. The higher life expectancy was due to lower than average mortality rates for cancer and circulatory disease. Conversely, the Belfast Trust had the lowest life expectancy for both males and females. In general, the lower life expectancy was due to higher mortality rates for cancer, circulatory disease and digestive disease for both genders relative to the Northern Ireland average.

Chapter 8 – Additional mortality definitions

The effect upon life expectancy of additional broader mortality definitions, namely amenable mortality (deaths that should not occur in the presence of good healthcare), smoking related deaths and alcohol related deaths were studied for Northern Ireland overall and its most deprived areas.

A reduction in amenable mortality between 2001-03 and 2006-08 contributed to improving life expectancy in both the most deprived areas and the wider region by around half a year for both genders. However, amenable mortality remained higher in deprived areas than in Northern Ireland overall and accounted for about one-fifth of both the male and female deprivation gaps in 2006-08 (0.9 years and 0.6 years respectively).

A reduction in smoking related deaths improved life expectancy in Northern Ireland as a whole as well as in the most deprived areas. Smoking related mortality however remained higher in deprived areas than in Northern Ireland generally and contributed around a third of the female deprivation gap (0.9 years) and a quarter of the male deprivation gap (1.2 years).

Alcohol related deaths had relatively little impact on the overall change in life expectancy for both males and females in Northern Ireland and its most deprived areas between 2001-03 and 2006-08. Relatively higher alcohol related mortality in the most deprived areas than regionally did however contribute 0.6 years to the male deprivation gap and 0.2 years to the female gap in 2006-08.

1 - Introduction and methodology

1.1 Northern Ireland Health and Social Care Inequalities Monitoring System

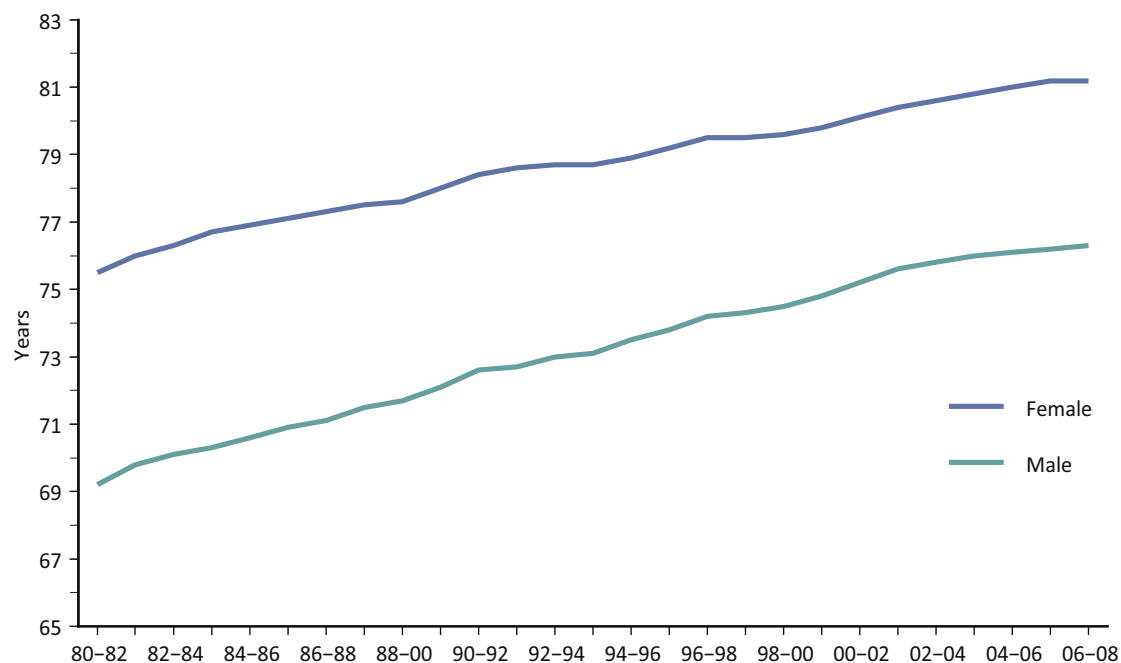
The NI Health and Social Care Inequalities Monitoring System (HSCIMS) was developed by the Information Analysis Directorate (IAD) within the Department of Health, Social Services and Public Safety (DHSSPS). Established in 2002, the HSCIMS comprises a basket of indicators which are monitored over time to assess area differences in mortality, morbidity, utilisation of and access to health and social care services in Northern Ireland. The HSCIMS has over recent years developed from the regional monitoring system to include additional health inequalities analyses and its various reports produced to date can be downloaded from the DHSSPS website¹. This report builds on the HSCIMS

report “Health and Social Care Inequalities Monitoring System – Changes in the life expectancy gap 1999/01 – 2004/06” which was published as a Northern Ireland Statistics and Research Agency (NISRA) occasional paper by IAD in 2008.

1.2 Life expectancy

Life expectancy at birth is the average number of years an individual can expect to live under current age-specific mortality rates. Figure 1 shows there has been a steady growth in life expectancy over the last quarter of a century for both males and females in Northern Ireland, which has been accompanied by a narrowing of the differential between the sexes.

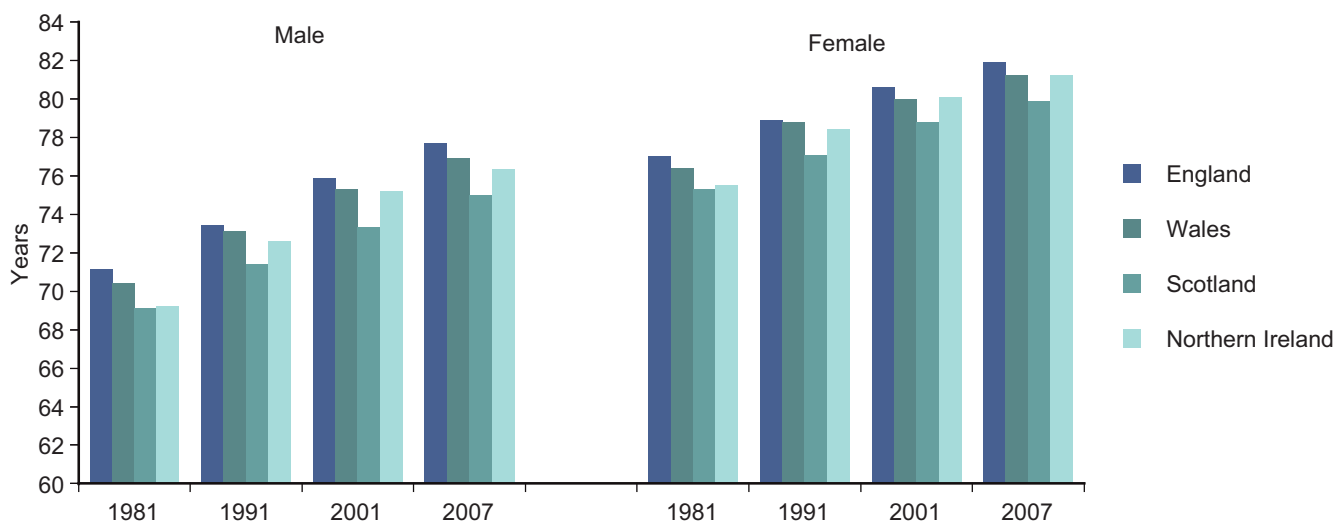
Figure 1. Life expectancy in Northern Ireland 1980-2008



Source: Government Actuary Department/ Office for National Statistics

¹ www.dhsspsni.gov.uk/index/stats_research/stats-equality.htm

Figure 2. Life expectancy trends in the UK.



Source: Government Actuary Department/ Office for National Statistics
 Note: All figures are based on a three-year period

Figure 2 sets out how life expectancy has improved in the UK since the 1980s. England consistently had the highest life expectancy over the period with life expectancy in Scotland, the lowest, lagging two to three years below England. Over the period, life expectancy in Northern Ireland rose faster than any of the other UK countries, from being on a par with Scotland at the beginning of the period to growing to a similar level as Wales.

1.3 Life expectancy gap

A life expectancy gap is simply defined as the difference between the life expectancy estimates, either between two populations at a given point in time, or within a single population between two points of time. Life expectancy gaps for the most deprived areas and rural areas are routinely calculated for the regional HSCIMS. One of the main DHSSPS Public Service Agreement (PSA) targets² is to reduce the life expectancy gap between the most deprived areas and NI generally.

To measure the contribution of age-specific mortality rates to the change in the life expectancy gap over time, a life table decomposition method (Arriaga, 1984)³ for both age and cause of death is used. It assumes that the distribution of deaths by cause is constant within the age groups in each population. This allows

the contribution of differences in all-cause mortality in a specific age group to be distributed proportionately to specific causes of death by using the differences in cause-specific mortality rates within each age group in each population.

As with the initial 2008 life expectancy decomposition report, this report will examine the extent to which certain age groups and causes of death contribute to the gap in life expectancy for deprived and rural areas. Causes of death have been disaggregated further from the original report to include 26 specific causes of death⁴, with the remaining causes of death not specified grouped into 'other causes of death' (see appendix 1). There are also additional analyses presented that look at the decomposition of changes in life expectancy over time as well as sub-regional life expectancy gaps at HSC Trust level. The calculation of life expectancy follows the widely accepted practice of using a three year average of deaths and population. Due to the year-on-year variability of mortality that can exist, especially in smaller populations, a three year average produces a more robust estimate. Therefore the two time periods under examination in this report refer to the three year time periods, 2001 to 2003 and 2006 to 2008.

² DHSSPS - By encouraging people to take preventative measures and promoting access to health and social services, reduce the gap in life expectancy between those living in the fifth most deprived areas and the Northern Ireland average by 50 per cent for both men and women between 2000 and 2012.

³ Full details of the methodology can be found in "Demography Measuring and Modelling Population processes" Preston et al, 2001.

⁴ External causes of death has been disaggregated into suicide (includes events of undetermined intent), road traffic accidents and other accidents, covering 95% of all external causes of death in 2006-08. These are the causes referred to when using the term 'main external causes of death' through this report. The remaining WHO external causes are included in 'other causes of death'. See also appendix 1.

1.4 Deprivation classification

In line with the HSCIMS, this report identifies deprived areas according to the 2005 Northern Ireland Multiple Deprivation Measure (NIMDM)⁵ based on the small area geography of Super Output Areas (SOA). The NIMDM provides a relative ranking of the SOAs across Northern Ireland, bringing together 43 different indicators covering aspects of income, employment, health, education, proximity to services, living environment and crime & disorder, allowing the most and the least deprived areas to be identified. It is worth noting that the health domain includes indicators such as suicide rates, potential years of life lost etc., which means that, by definition, there will be some correlation between deprivation rank and certain health outcomes, like life expectancy.

A Northern Ireland deprivation measure only existed at Ward level prior to 2005, and the NIMDM 2005 has therefore been applied to both the 2001-03 and the 2006-08 data. NISRA updated the NIMDM in 2010, however, due to the reference period of the data examined in this report, it is not applied to the data, but will be used for HSCIMS life expectancy calculations from 2007-09 onwards.

1.5 Rural classification

As with the HSCIMS, the definition of rural areas applied to 2001-03 and 2006-08 data in this report is consistent with that outlined in the “Report of the Inter-Departmental Urban-Rural Definition Group” (NISRA 2005)⁶. The group divided NI into 8 broad settlement bands with the following bands being considered as rural areas; “intermediate settlement”, “village” and “small village, hamlet and open countryside”. These classifications were applied to the 2001 Census population and hence, if the exercise was to be repeated today, the boundaries of settlements may be drawn differently due to internal migration since 2001.

1.6 Health and Social Care Trusts

This report has been extended to include life expectancy at Health and Social Care Trust level (and hence, also Local Commissioning Groups as their geographical boundaries are coterminous with Trust boundaries). Changes in the overall life expectancy within each of the HSC Trusts over time are analysed, in addition to the life expectancy gap between each Trust and the Northern Ireland average.

1.7 Population

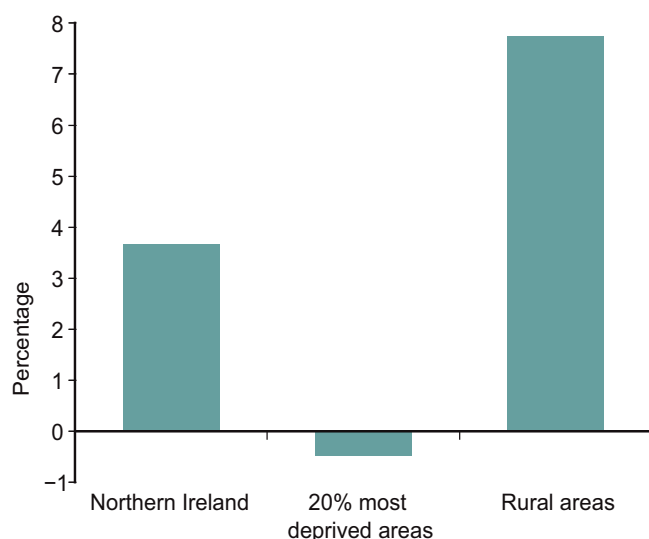
Population is a vital part of the life expectancy calculation. Together with the population’s mortality patterns, changes to a population’s size or age distribution will have an impact on its life expectancy.

1.7.1 Population trends

The population in Northern Ireland is both growing and ageing. Between 2001 and 2008, the population grew from 1,689,319 to 1,775,003 – an increase of 85,684 persons (5%). Population projections indicate that the Northern Ireland population will have grown to 1.9 million by 2020⁷. Figure 3 sets out the percentage change in the NI population overall, the 20% most deprived areas and rural areas between 2001-03 and 2006-08. As can be seen, the growth in the population in rural areas (8%) was double that of the population in general (4%), whereas the population in deprived areas stayed much the same (less than 1% decrease).

The report ‘Small Area Population Estimates for Northern Ireland (2008)’⁸ (see also section 1.7.2) explains how the fastest growing areas from 2001 to 2008 tended to be rural areas within commuting distances to major urban centres. By contrast, the majority of urban areas lost population. As many of the most deprived areas tend also to be the most

Figure 3. Percentage change to the population between 2001-03 and 2006-08.



Source: Project Support Analysis Branch, DHSSPS

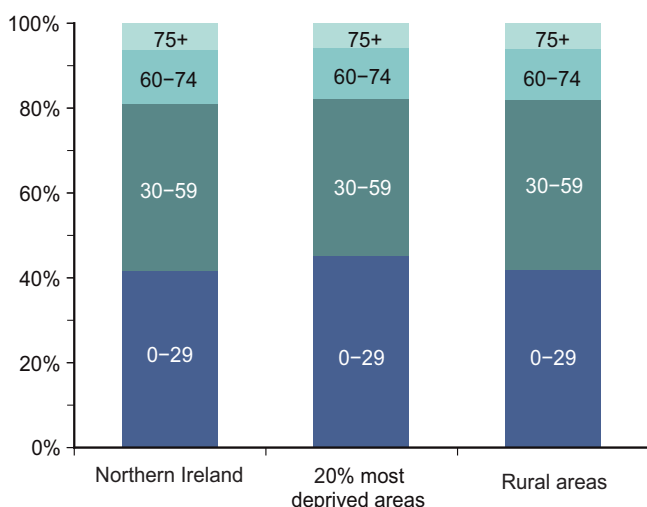
⁵ Further details on the NIMDM 2005 can be found at www.nisra.gov.uk/aboutus/default.asp2.htm.

⁶ Further details on the Urban-Rural definition can be found at www.ninis.nisra.gov.uk/mapxtreme_towns/Reports/ur_report.pdf.

⁷ <http://www.nisra.gov.uk/demography/default.asp20.htm>.

⁸ “Small Area Population Estimates for Northern Ireland (2008)”, June 2010, T Dignan, J Jpelaar, D Marshall, C Watson. NISRA Occasional paper no. 30.

Figure 4. Populations' age distribution (2006-08).



Source: Project Support Analysis Branch, DHSSPS

urbanised, these areas lagged behind the Northern Ireland average in population growth over this period. Evidence from this and other studies⁹ indicate that there has been a trend of the most able (and hence healthy) people in the deprived areas to move into nearby less deprived areas. This has led to less variability within the most deprived areas and hence has created more extreme averages of health outcomes. This will in turn affect life expectancy and the deprivation gap.

In 2001-03, 13% of the population were aged over 65 years old, compared with 14% in 2006-08. Population projections indicate that by 2020 as much as 17% of the population will be over 65 years old. Figure 4 sets out the age distribution for Northern Ireland overall, the 20% most deprived areas and rural areas in 2006-08. It clearly shows that although the most deprived areas had a slightly higher proportion of younger inhabitants, the age distribution was in general very similar across the three populations.

1.7.2 Small area population estimates

Population estimates disaggregated to a relatively small geographical area level (SOA) are necessary to calculate many of the various HSCIMS indicators for deprived and rural areas. Due to the lack of sufficiently disaggregated population estimates prior to 2010, HSCIMS indicators were calculated using a reworked

population base. This reworked population was estimated using age and gender specific growth rates (derived from Mid-Year Estimates (MYE)) and applying them to the 2001 Census small area population figures. In 2010, NISRA, after undertaking an extensive exercise, published their MYE figures for the first time at SOA level¹⁰. These Small Area Population Estimates (SAPE) were produced for 2001 to 2008. The NISRA SAPE figures estimated that in recent years the population in the most deprived areas had not increased in line with the overall population growth in Northern Ireland (see section 1.7.1). This meant that the reworked HSCIMS population estimate had generally been overestimating the populations within these areas which in turn meant that inequality gaps calculated between deprived areas and the wider region were perhaps underestimated to a degree. The opposite was true for the rural population where the population size had been underestimated under the previous methodology.

All of the HSCIMS indicators have subsequently been reworked using the updated SAPE figures, including life expectancy. Figures published in this report may therefore vary slightly from those published in previous HSCIMS reports.

1.8 Classification of cause of death

Even though the overall number of deaths in Northern Ireland is relatively consistent year-on-year (remaining generally between 14,000 and 15,000), the distribution of specific causes of death will vary over time. Improvements in treatments, detection, immunisations and preventive measures for specific causes of death can reduce mortality rates and thereby lead to an increase in life expectancy.

This paper is based on the single main underlying cause of death classification which simplifies the fact that a death can be due to a variety of different causes. This can lead to an underestimation of the impact of common conditions associated with multiple causes of death (e.g. diabetes, influenza and pneumonia). A change in the coroner's classification of main cause of death between 2000 and 2001 saw a major shift of the impact of some causes of death. This in particular affected pneumonia, which saw a large drop between the two years. This, along with the change in disease classification coding from ICD-9 to ICD-10 in 2000, led to the decision to change the base reference period for this report. The base period in the initial report was 1999-01, in line with the DHSSPS PSA target baseline, however by using 2001-03 as the base year for this

⁹ Multiple Deprivation Measure 2010 (http://www.nisra.gov.uk/deprivation/nimdm_2010.htm); Shuttleworth, I and Gould, M. 'Modelling short-distance residential moves using the Northern Ireland Longitudinal Study' - presented at the British Society of Population Studies Annual Conference, University of Exeter, 13th - 15th September 2010.

¹⁰ www.nisra.gov.uk/demography/default.asp125.htm

report, errors due to coding inconsistencies associated with the main cause of death are reduced.

Figure 5 shows the recent trends within Northern Ireland of death by selected causes. Proportionately, between 2001 and 2008, there has been a large reduction in circulatory deaths (from 40% to 32%). Conversely there has been an increase in deaths due to cancer over the period (from 25% to 27%). In 2001, deaths related to external factors such as accidents and suicides accounted for less than 4% of all deaths whereas in 2008, these causes of deaths made up 6%. The proportion of deaths due to causes of death not specified elsewhere increased from 13% to 17%.

1.8.1 Registration vs actual time of death – the effect on suicide figures

All death figures used in this report are based on the year that the death was registered and not the year in which the death occurred. While the vast majority of deaths are registered shortly after death, there may be a delay registering some deaths. Events such as infant death or suicide are usually referred to a coroner and this legal process can take some time. In 2008, around 92% of all deaths were registered in the year the death occurred.

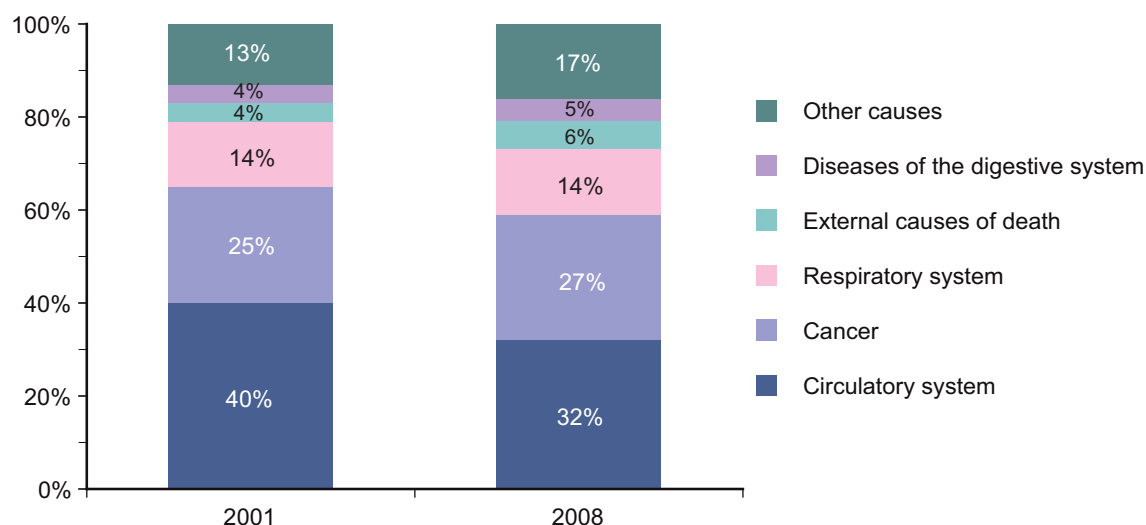
When a death, suspected to be due to suicide, has been referred to a coroner, the delay created between occurred and registered time of death can be several years. This means that it can be some time before a complete picture emerges of the true number of suicides occurring in any given year. For example,

figures from NISRA show that, of the 282 suicides registered in 2008, only 98 actually occurred during that year with the remainder occurring in earlier years.

Accounting for suicides by year of registration is consistent with how suicides are reported by NISRA, Office for National Statistics and also in the monitoring of PSA targets. The obvious problem with this approach is that it can give a less accurate reflection of current suicide trends. A change to the configuration of coroner's services in 2004, when the coroner's districts in NI were combined into one central service, meant that the backlog of suicide inquests which had built up was subsequently cleared over the years following 2004. This resulted in the number of suicides registered during the 2001-03 baseline period being 12% lower than the number of suicides that actually occurred during that period. The clearing of the backlog of inquests also meant that the number of registered suicides in recent years may be artificially inflated.

To estimate the impact of the likely undercount in 2001-03 and subsequent overcount of suicide in more recent years, actual suicides were substituted for registered suicides into the life table decomposition formulae for NI males¹¹. At the time of writing, a proportion of the suicides that occurred in the 2006-08 period were still undergoing the lengthy inquest process, thus it is not yet possible to say how many suicides actually occurred during 2006-08. Therefore 2005-07 data was compared and contrasted with the 2001-03 data instead. The reworked figures showed that the overall increase to male life expectancy between 2001-03 and

Figure 5. Proportion of the main causes of death.



Source: Project Support Analysis Branch, DHSSPS

¹¹ As more males compared to females commit suicide, it was assumed that the male decomposition would be affected to a greater extent.

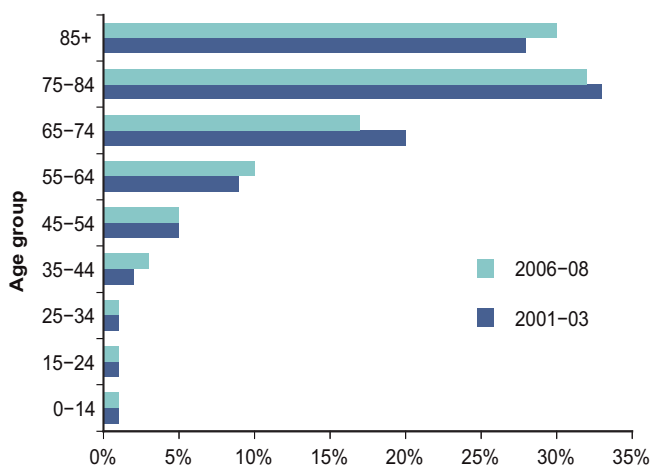
2005-07 (+0.7 years) was not affected by using the occurred suicide figures. However, occurred suicide accounted for 0.1 year of the change in life expectancy compared with 0.2 years using registered suicides. It should be noted that it is likely that the 2005-07 data will be more artificially inflated than the 2006-08 deaths used in this report (as the clearing of the backlog of suicide registration started in 2005), so therefore the effect of using registered deaths would be less than that estimated above. However, care should still be taken when interpreting some of the results in this report, particularly in relation to the contribution of suicide to the change in life expectancy over time and at different geographies.

The influence of the registration issue on the most deprived areas seemed to be less marked. Whilst there were 11% less registered compared to occurred suicides in deprived areas in 2001-03, the number of occurred and registered suicides were similar in 2005-07¹². Life expectancy decomposition analysis in this report for deprived areas may therefore be less affected by the issue with occurred and registered time of death than the region overall.

1.9 Mortality by gender and age

Women generally live longer than men and subsequently death rates, particularly in the middle and older age groups, are higher for men than women.

Figure 6. Percentage of all NI deaths by age 2001-03 and 2006-08.



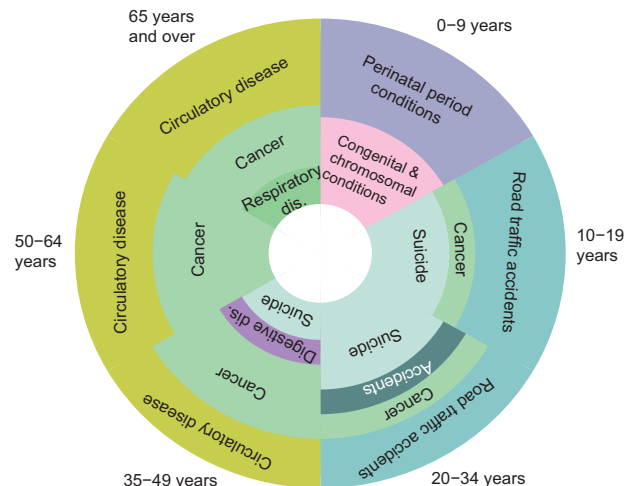
Source: Project Support Analysis Branch, DHSSPS

¹² General Registers Office. Data registered up to end of June 2010.

¹³ The proportions of each cause of death by age band in this chart are broadly indicative, including only causes of death that have an impact of 10% or more for the age group and excluding the contribution of other causes of death not specified.

¹⁴ "Demography Measuring and Modelling Population processes" Preston et al, 2001.

Figure 7. Causes of death¹³ impacting age groups (2006-08).



Source: Project Support Analysis Branch, DHSSPS

Figure 1 above shows that the gap between female and male life expectancy has narrowed in Northern Ireland since the early 1980s; however it is still quite substantial (4.9 years).

A death before the age of 75 is classified within the HSCIMS as a premature death. In both 2001-03 and 2006-08 around three-fifths of all deaths occurred either in the 75th year or later, meaning that almost forty percent of deaths had occurred prematurely (figure 6). Around one third of female deaths occurred prematurely compared with around half of all male deaths.

Life expectancy at birth is a weighted summary of age-specific mortality rates and is sensitive to mortality changes at young ages¹⁴. As similar proportions of all deaths in Northern Ireland occurred before the age of 15 in both 2001-03 and 2006-08 (figure 6), young age mortality had relatively little impact on the overall change in life expectancy over the period.

Figure 7 sets out the major causes of death at different stages in life. Conditions originating in the perinatal period and congenital & chromosomal abnormalities dominate the early years of life, followed by external causes of death like accidents and suicide, before cancer, circulatory and respiratory diseases start making an impact from middle age onwards.

2 - Northern Ireland life expectancy

2.1 Gender differences in NI life expectancy

Between 2001-03 and 2006-08, male life expectancy at birth increased from 75.6 to 76.4 years (+0.8 years) (figure 8). Similarly, female life expectancy increased by 0.8 years from 80.5 to 81.3 years¹⁵. The gap between male and female life expectancy was fairly substantial and remained constant over the period at 4.9 years. Men had a relatively higher death rate across all ages

compared with females in 2006-08, with the over 60 year olds contributing the most to the gender gap (3.1 years). Furthermore, the gender differential was mainly due to higher mortality rates among men for coronary heart disease (CHD), respiratory diseases, lung cancer and the main external causes of death.

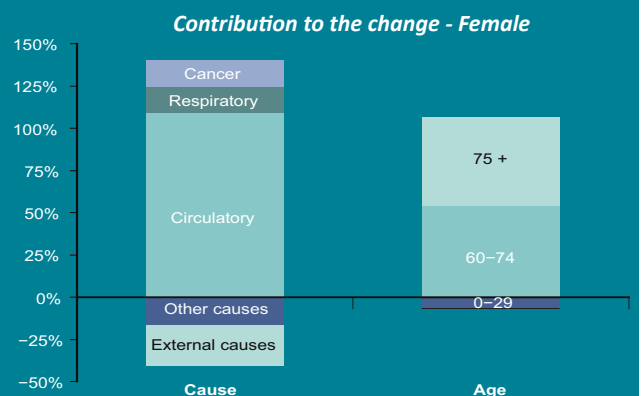
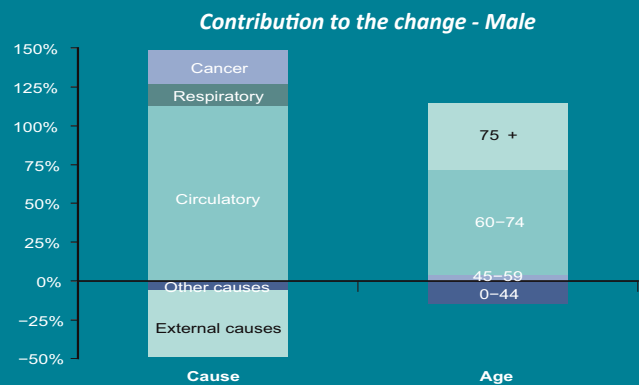
Summary - Change in NI life expectancy between 2001-03 to 2006-08

Male life expectancy

- In 2006-08 male life expectancy reached 76.4 years which represented a 0.8 year increase from 2001-03.
- Four fifths of the total change to the life expectancy over the period was caused by lower mortality rates within the population aged over 60 years old.
- Higher mortality among males aged under 45 years old reduced life expectancy to an extent.
- Most of the change in male life expectancy was due to lower mortality rates for circulatory disease in 2006-08.
- The increase in male life expectancy due to reducing death rates for circulatory disease, respiratory disease and cancer was partially offset by increasing mortality for the main external causes of death (i.e. suicide and accidents) and other causes of death not elsewhere specified.

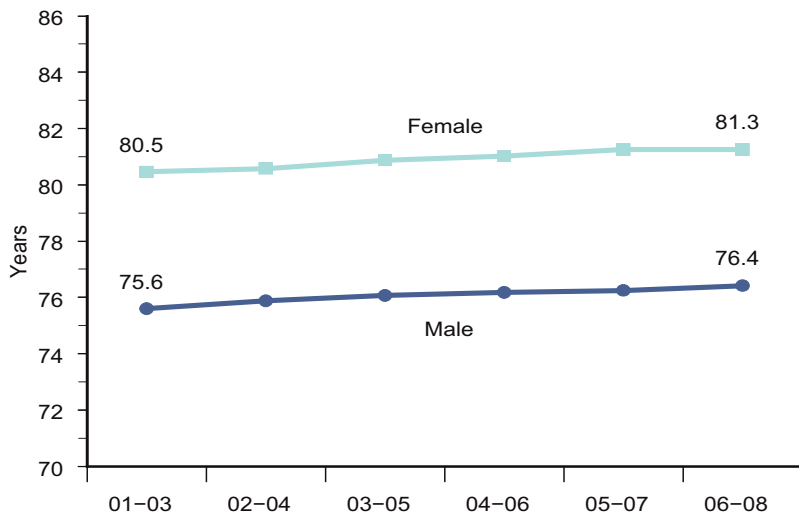
Female life expectancy

- Female life expectancy increased by 0.8 years from 2001-03 to reach 81.3 years in 2006-08.
- The increase was almost exclusively due to improved mortality rates for females aged over 60 years of age.
- The majority of the change to female life expectancy was caused by lower mortality rates for circulatory disease.
- Increasing mortality for external causes (e.g. suicide and accidents) of death and other causes of death not elsewhere specified had a negative effect upon female life expectancy.



Source: Project Support Analysis Branch, DHSSPS

Figure 8. Life expectancy trend 2001-03 to 2006-08.



Source: Project Support Analysis Branch, DHSSPS

2.2 Decomposition of the change in NI life expectancy by age

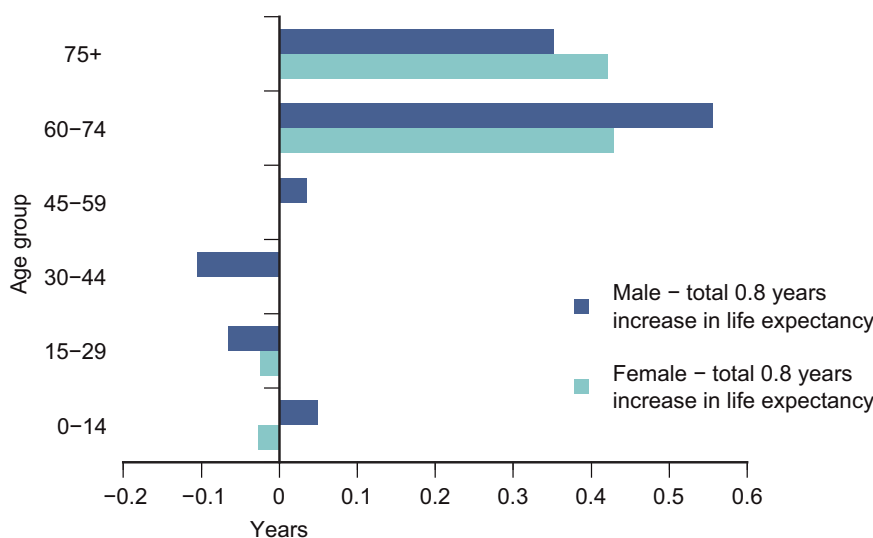
The increase in life expectancy between 2001-03 and 2006-08 for both males and females (0.8 years respectively) was due mainly to falling mortality for persons aged over 60 years (figure 9). However, increases in mortality in the main external causes of death (suicide, road traffic accidents and other accidents) among the male 15-44 age group reduced overall life expectancy by 0.2 years. The mortality rate

for females aged under 30 also had a negative effect on the overall female life expectancy, albeit a relatively small impact.

2.3 Decomposition of the change in NI life expectancy by cause of death

Figure 10 sets out the contribution of different causes of death to the change in Northern Ireland life expectancy from 2001-03 to 2006-08. Improvements in mortality due to circulatory diseases such as CHD and stroke

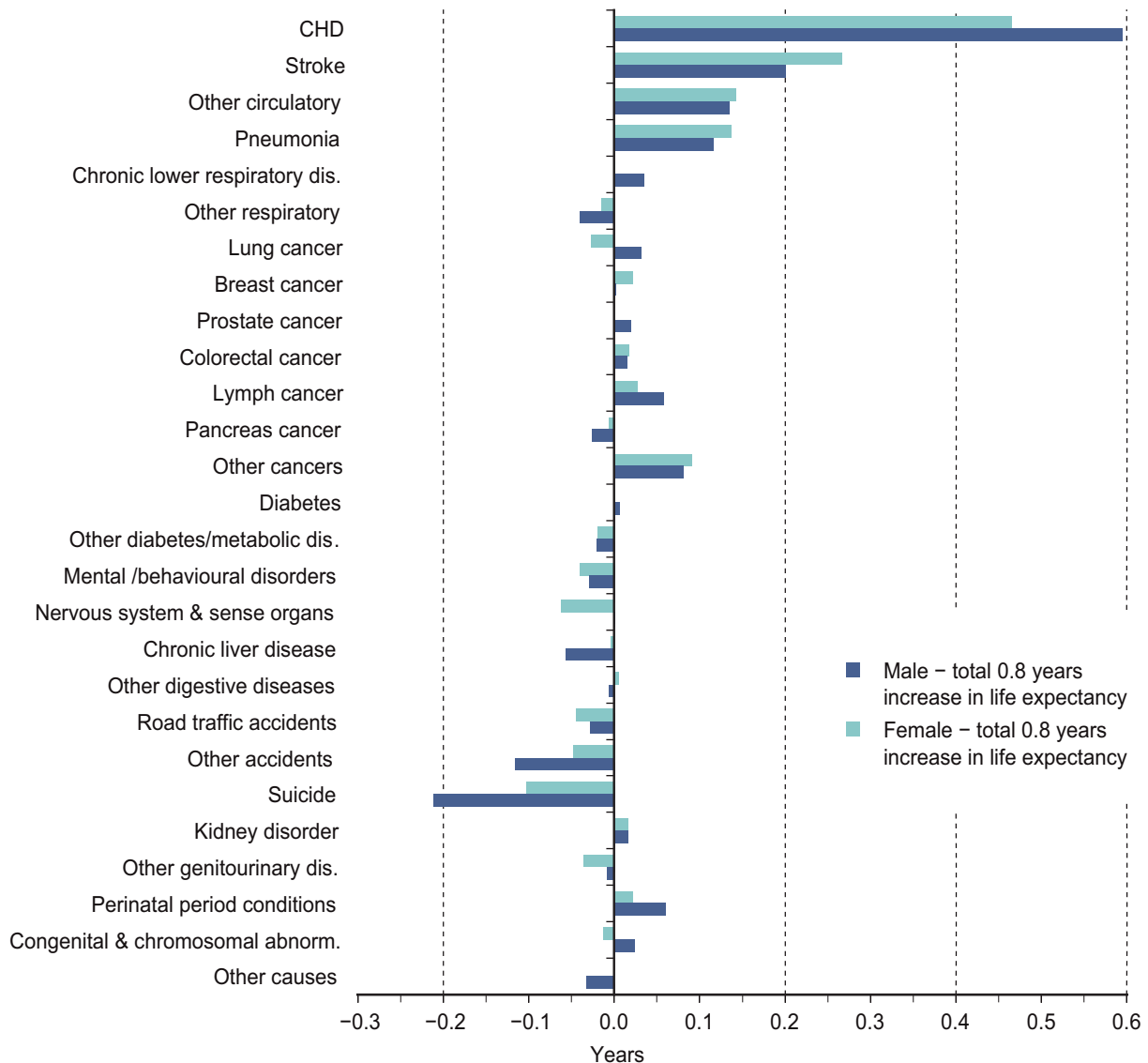
Figure 9. Contribution to the change in life expectancy between 2001-03 and 2006-08 by age (years).



Source: Project Support Analysis Branch, DHSSPS

¹⁵ The figures for NI quoted here will differ slightly from the official figures calculated by the Government Actuary Department (as in figure 1). This is due to slight differences in the methodology involved in their calculation.

Figure 10. Contribution to the change in NI life expectancy between 2001-03 and 2006-08 by cause of death (years).



Source: Project Support Analysis Branch, DHSSPS

had the greatest positive impact on life expectancy (increase of 0.9 years for both genders). Reducing mortality due to CHD alone resulted in an increase of 0.6 years for males and 0.5 years for females. This can be linked to more widespread and earlier treatment of circulatory disease, particularly with the increasing use of preventive drugs such as statins and antihypertensive drugs which have a positive impact on treating patients with circulatory conditions¹⁶. In 2009, statins were dispensed to a quarter of a million people in Northern Ireland¹⁷.

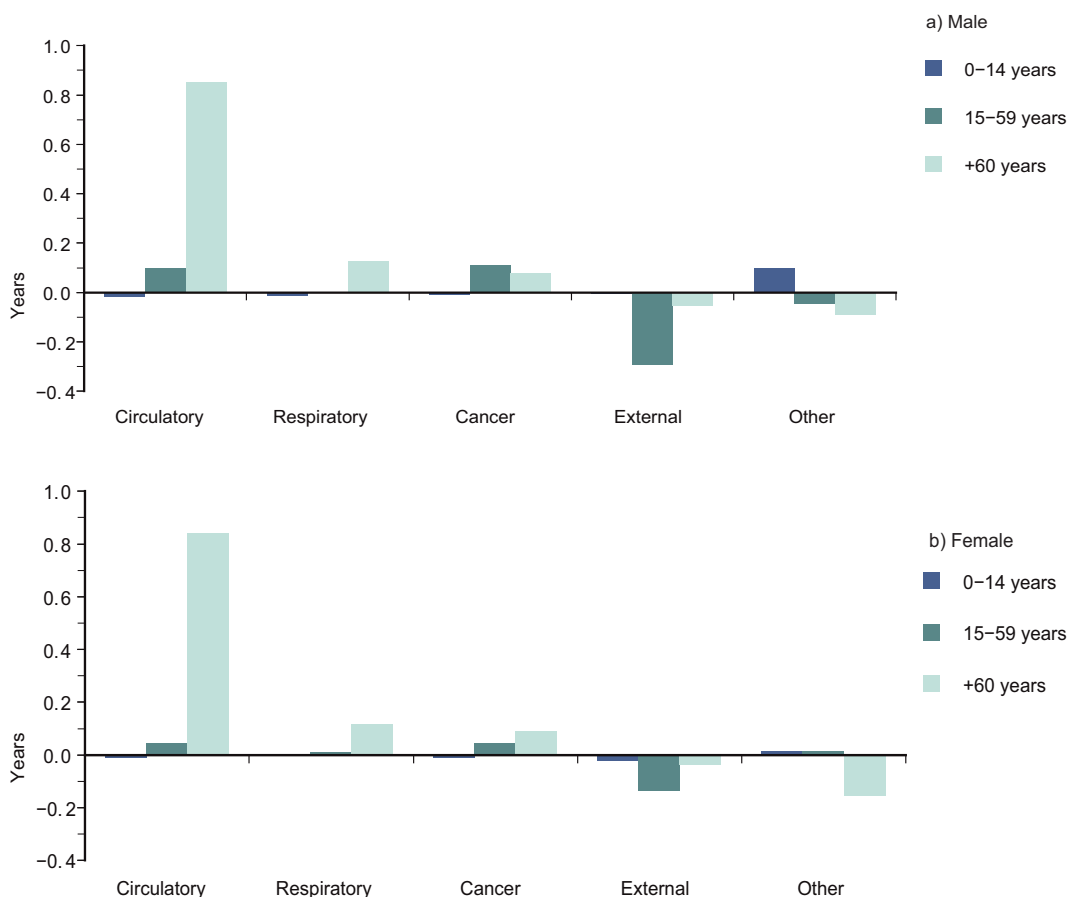
There were relatively minor changes in mortality for each of the individual main cancer sites, however, in total, reduced death rates due to cancer added approximately 0.2 and 0.1 years respectively to male and female life expectancy. Conversely, increasing mortality over time due to the main external causes of death (suicide, road traffic accidents and other accidents) reduced life expectancy by 0.4 year for males and 0.2 years for females¹⁸.

¹⁶ British Heart Foundation www.bhf.org.uk

¹⁷ Electronic Prescribing and Eligibility System, Business Services Organisation.

¹⁸ See discussion in section 1.8.1.

Figure 11. Contribution to the change in male (a) and female (b) life expectancy between 2001-03 and 2006-08 by age and selected causes of death.



Source: Project Support Analysis Branch, DHSSPS

Figures 11 a and b set out how the impact of circulatory disease, respiratory disease, cancer and the main external causes of death (i.e. suicide and accidents) on selected age groups contributed to the overall change in life expectancy. Mortality rates for circulatory disease fell for the over 60 year olds (hence increasing life expectancy for this age group) however remained fairly similar for the younger age groups. The main external causes of death reduced male life expectancy among the 15-59 age group whereas its effect on female life expectancy for the same age group was not as substantial (-0.1 year).

It is worth noting that overall, even though there are only about 800 deaths due to external causes occurring yearly (accounting for about 6% of all deaths in 2006-08), compared with, for example, around 5000 circulatory deaths, external causes of death accounted for about one-third of all male deaths in the 15-59 age group in 2006-08 and around one-sixth among females, hence having a considerable impact on life expectancy for this age group¹⁹.

¹⁹ See discussion in section 1.8.1.

3 - Life expectancy and deprivation

“Put simply, the higher one’s social position, the better one’s health is likely to be. These serious health inequalities do not arise by chance, and they cannot be attributed simply to genetic makeup, ‘bad’, unhealthy behaviour, or difficulties in access to medical care, important as those factors may be. Social and economic differences in health status reflect, and are caused by, social and economic inequalities in society.”

The Marmot Review, 2010

Life expectancy has maintained its position as one of the overarching national health inequality targets due to its strong correlation with deprivation. Figure 12 provides an illustrative example of how life expectancy can vary quite dramatically within a fairly restricted geographical

area, such as in this case along one of the bus routes in South Belfast. In this instance, life expectancy increases from more deprived city centre areas through to more affluent suburban areas. It should be noted that the figures presented are at electoral ward level and that

Summary - Change in life expectancy in deprived areas between 2001-03 and 2006-08

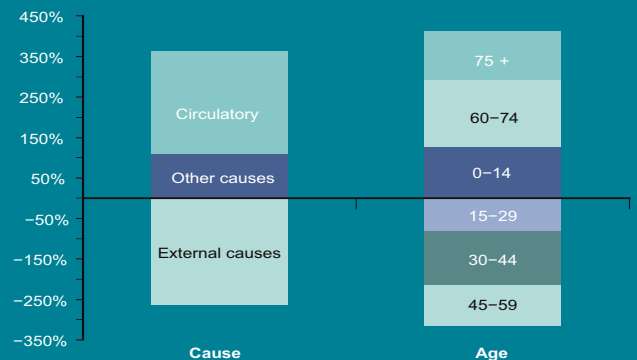
Male life expectancy in deprived areas

- The male life expectancy in deprived areas was 71.8 years in 2006-08.
- Male life expectancy increased by 0.2 years between 2001-03 and 2006-08.
- The increase in life expectancy for children and the over 60 year olds was almost totally offset by increasing death rates among the 15 to 59 year olds.
- Improvements in mortality due to circulatory disease contributed 0.6 years to the change in male life expectancy in deprived areas; this was offset by rising death rates due to external causes (i.e. suicide and accidents) (-0.6 years).

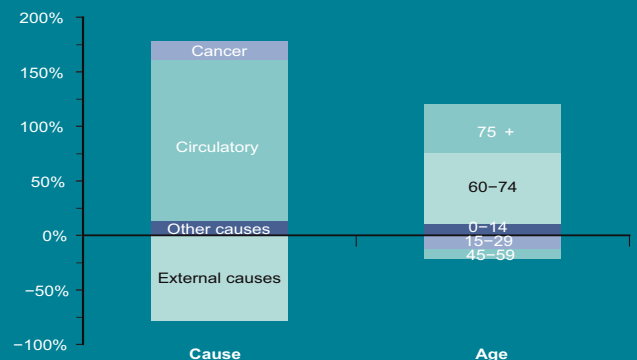
Female life expectancy in deprived areas

- Female life expectancy in deprived areas increased by 0.5 years between 2001-03 and 2006-08 to reach 78.4 years.
- Most of the increase to female life expectancy was due to improved mortality among the over 60 year olds.
- Circulatory disease added 0.8 years to female life expectancy in deprived areas over the period.
- Increasing mortality rates for the main external causes (i.e. suicide and accidents) reduced life expectancy by 0.4 years.

Contribution to the change in life expectancy - male

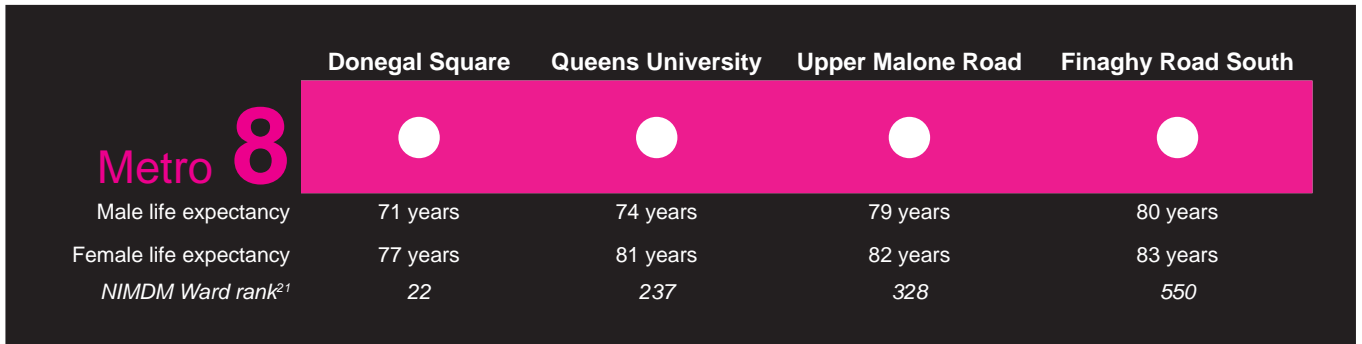


Contribution to the change in life expectancy - female



Source: Project Support Analysis Branch, DHSSPS

Figure 12. Life expectancy²⁰ at selected points along a Belfast Metro line (2006-08).



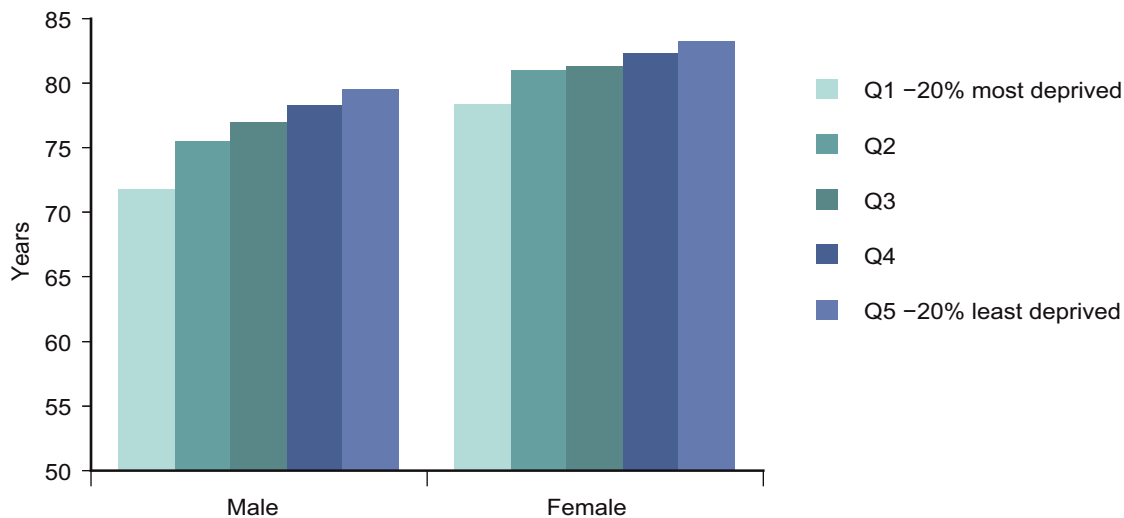
Source: Project Support Analysis Branch, DHSSPS

there will be small pockets of more or less deprived areas within these wards where life expectancy will differ greatly from that shown.

The level of deprivation within an area has an impact upon the average life expectancy of its inhabitants, where people in the least deprived areas can expect to live longer on average than people in more deprived areas. Figure 13 compares life expectancy for each of

the deprivation quintiles and shows how life expectancy improves as the level of deprivation decreases. The gradient of the change from most deprived to least deprived (sometimes called the social gradient) shows to what extent inequalities exist across the population. The life expectancy gradient is steeper for males than for females, which would indicate that there are wider inequality gaps for males.

Figure 13. Life expectancy by deprivation quintiles (2006-08).

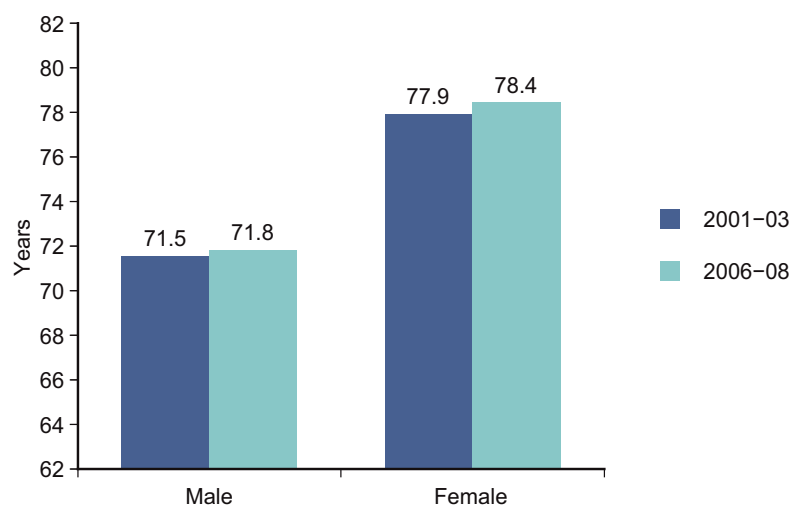


Source: Project Support Analysis Branch, DHSSPS

²⁰ These figures are included for illustrative purposes only and are subject to statistical error; the areas have small population sizes which affect the robustness of the statistical calculations. Figures presented have been calculated at ward level and therefore cover a wider area than just that immediately surrounding the Metro stop illustrated.

²¹ 2010 NI Multiple Deprivation Measure (www.nisra.gov.uk). Rank of the 582 Electoral Wards where rank 1 is the most deprived Ward and rank 582 is the least deprived Ward.

Figure 14. Life expectancy in the 20% most deprived areas.



Source: Project Support Analysis Branch, DHSSPS

3.1 Life expectancy in the most deprived areas

Life expectancy in the 20% most deprived areas in Northern Ireland was 71.8 years for males and 78.4 years for females in 2006-08 (figure 14). This represented a 0.2 year increase for males and 0.5 year increase for females from the base period 2001-03 (table 1).

3.2 Decomposition of the change in life expectancy by age

An improvement in mortality rates for the over 60 year age group between 2001-03 and 2006-08 contributed to an increase in life expectancy within deprived areas of 0.7 years for males and 0.6 years for females (figure

15). In addition, a fall in mortality rates for males aged under 15 years led to a 0.3 years increase to overall life expectancy. These improvements were however largely offset by increasing mortality rates for males in the 15-59 year age group, which reduced life expectancy by 0.8 years. This was mainly due to increased suicide rates within this age band. Although suicides accounted for only 3% of all deaths in deprived areas in 2006-08, it accounted for 17% of all male deaths in the 15-59 age group (9% among females). Hence, life expectancy for this age group will be sensitive to any change in suicide figures²². There was little change in mortality rates over the period for females under 60 years.

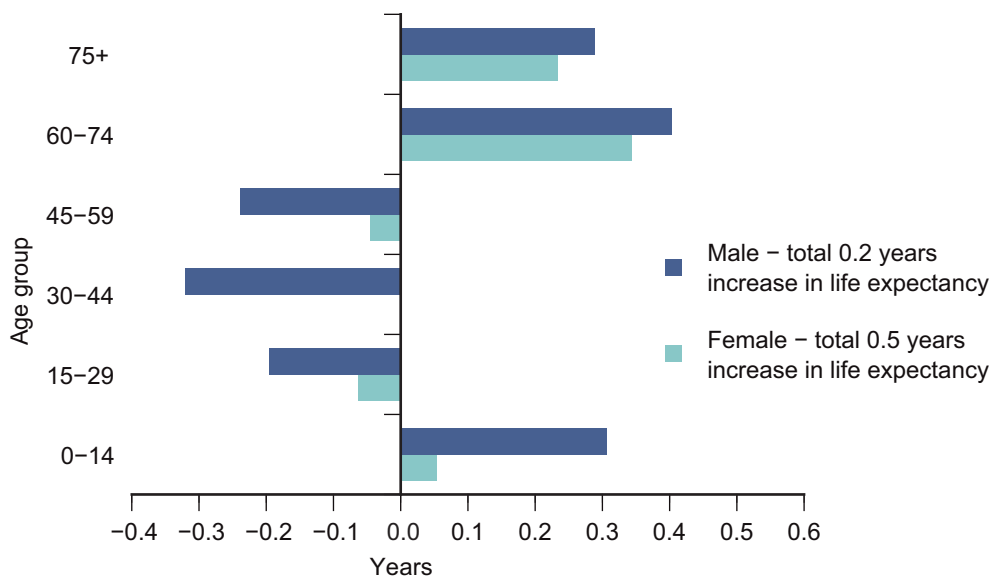
Table 1. Life expectancy for NI and its 20% most deprived areas.

		Life Expectancy		Change from 01-03 to 06-08
		2001-03	2006-08	
Male	Northern Ireland	75.6	76.4	0.8
	20% most deprived areas	71.5	71.8	0.2
Female	Northern Ireland	80.5	81.3	0.8
	20% most deprived areas	77.9	78.4	0.5

Source: Project Support Analysis Branch, DHSSPS
Note: Numbers may not sum due to rounding.

²² See also discussion in section 1.8.1.

Figure 15. Contribution to the change in life expectancy in the 20% most deprived areas between 2001-03 and 2006-08 by age (years).



Source: Project Support Analysis Branch, DHSSPS

3.3 Decomposition of the change in life expectancy by cause of death

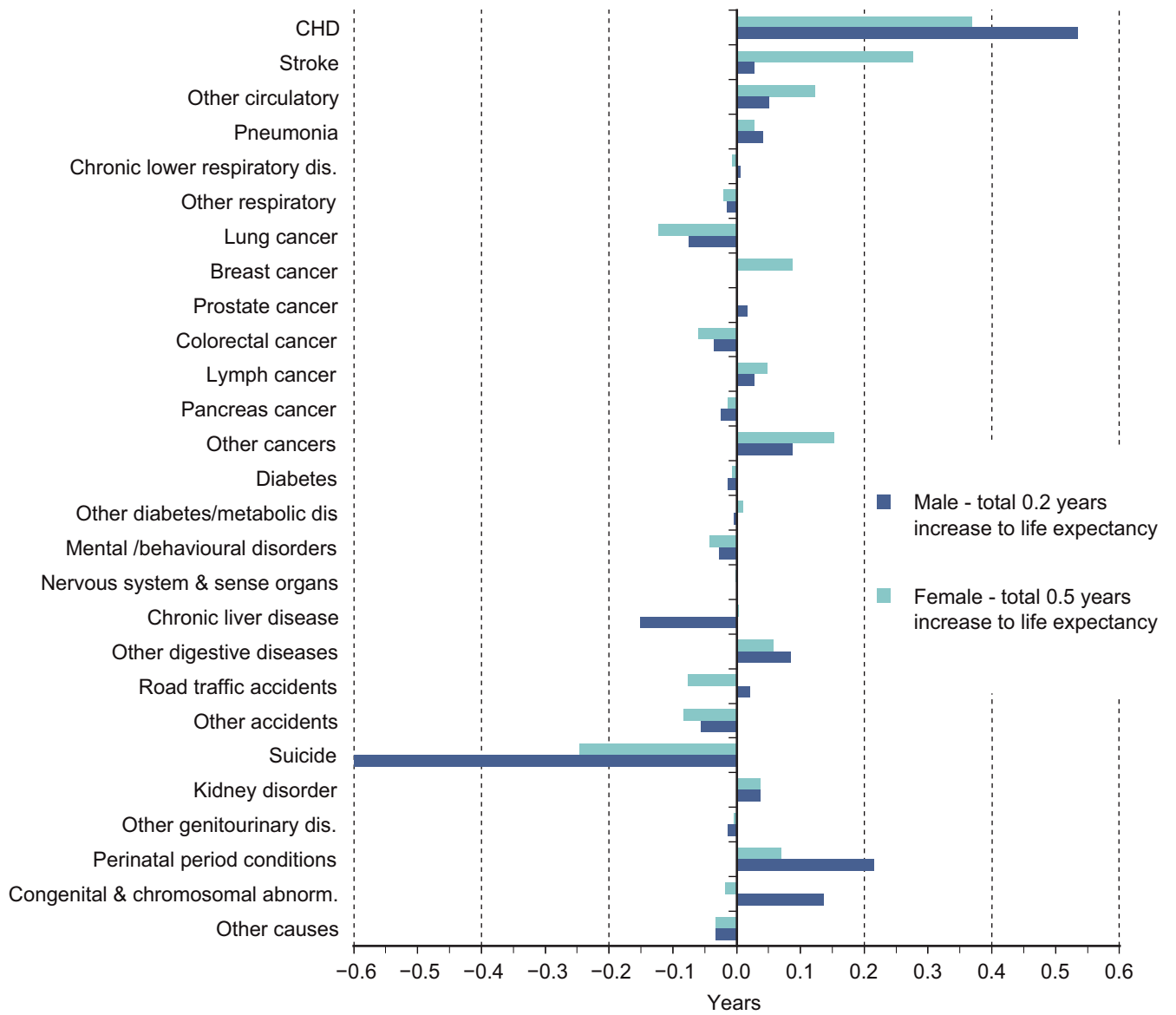
Similar to life expectancy in Northern Ireland overall, improved mortality rates for CHD, between 2001-03 and 2006-08, was the largest contributor to the improvement in life expectancy in the most deprived areas for both females and males (+0.4 and +0.5 years respectively). However, the improvements in male mortality due to pneumonia, stroke and 'other circulatory diseases' that occurred in the wider region were not repeated in deprived areas (figure 16). Mortality rates for conditions that affect the early years of life (such as perinatal conditions and congenital & chromosomal abnormalities) improved for males in deprived areas over the period, leading to an increase in male life expectancy. Conversely, an increase in mortality due to chronic liver disease contributed to reducing it.

Overall, cancer had very little impact on the change in life expectancy in deprived areas for both males and females over the period. Examining the different cancer sites did however show that, for both genders, increasing death rates due to lung cancer and colorectal cancer reduced the life expectancy between 2001-03 and 2006-08 while lower death rates due to breast cancer (among females) and 'other cancers' not elsewhere specified improved the life expectancy over the same period.

Increased suicide rates within deprived areas had a substantial negative impact on the change in life expectancy for both males (-0.6 years) and females (-0.2 years). In fact, the negative impact that suicide had on male life expectancy in deprived areas (-0.6 years) was three times that in the wider region (-0.2 years)²³.

²³ See also discussion in section 1.8.1.

Figure 16. Contribution to the change in life expectancy for the 20% most deprived areas between 2001-03 and 2006-08 by cause of death (years).



Source: Project Support Analysis Branch, DHSSPS

4 - The deprivation gap

Between 2001-03 and 2006-08, mortality rates in the 20% most deprived areas improved at a slower rate than the NI average, leading to an increase in the deprivation gap over the period from 4.1 to 4.6 years for males and 2.6 to 2.9 years for females (table 2)²⁴.

Table 2. Life expectancy gaps between Northern Ireland and its 20% most deprived areas (years).

	2001-03	2006-08	Change from 01-03 to 06-08
Male	-4.1	-4.6	-0.6
Female	-2.6	-2.9	-0.3

Source: Project Support Analysis Branch, DHSSPS

Note: Numbers may not sum due to rounding.

Note: Negative numbers indicate that deprived areas had higher death rates than in NI overall. Conversely, positive numbers indicate that deprived areas had lower death rates.

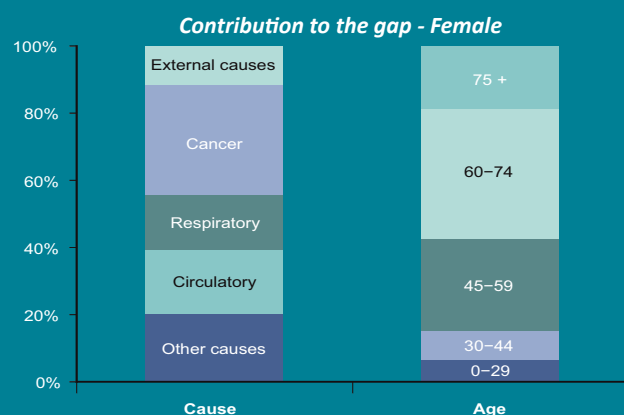
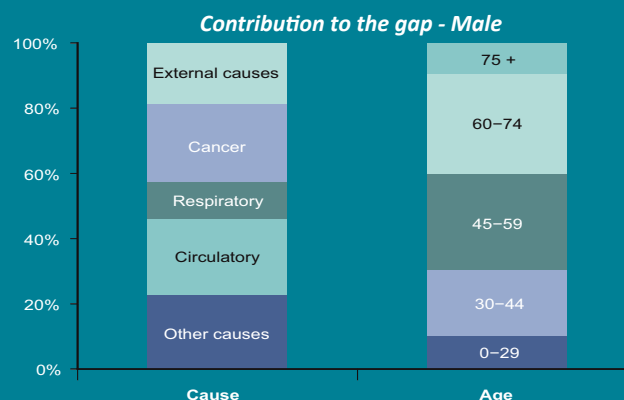
Summary - The deprivation gap 2006-08

Male deprivation gap

- The male life expectancy deprivation gap was 4.6 years in 2006-08 which represented a 15% increase from 2001-03.
- Three fifths of the male deprivation gap was caused by relatively higher mortality rates among the under 60 year olds in deprived areas.
- Circulatory disease, cancer and other causes of death not elsewhere specified accounted for approximately a quarter each of the 2006-08 male deprivation gap.

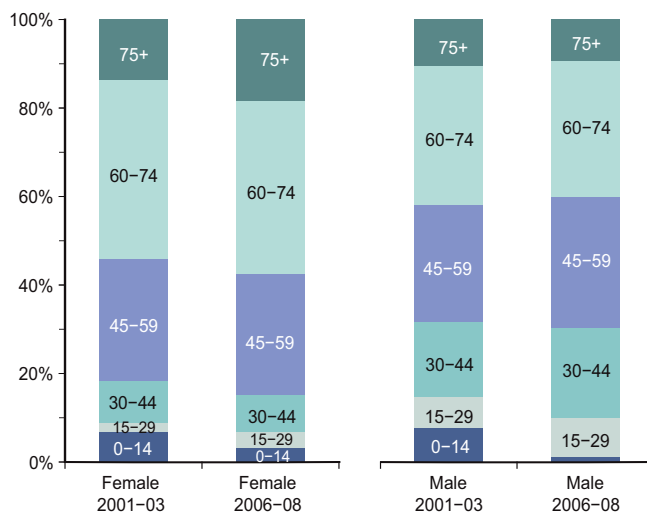
Female deprivation gap

- The female life expectancy deprivation gap was 2.9 years in 2006-08 (a 12% increase from 2001-03).
- Higher mortality rates among over 60 year olds in deprived areas led to three-fifths of the female deprivation gap.
- Relatively higher death rates in deprived areas for cancer caused one third of the female gap.



Source: Project Support Analysis Branch, DHSSPS

Figure 17. Contribution to deprivation gaps by age groups (%).



Source: Project Support Analysis Branch, DHSSPS

4.1 Decomposition of the deprivation gap by age

Figure 17 sets out how differences in mortality by age contributed to the deprivation gaps in 2001-03 and 2006-08. Over the period more than half of the female gap was attributable to relatively higher death rates among the over 60 year olds in deprived areas. This compares with approximately two-fifths of the male gap being attributed to the same age group. The contribution of the under 15 years age group to the male gap had almost disappeared in 2006-08 due to relatively improved mortality rates for this age group in deprived areas. However, in proportionate terms, between 2001-03 and 2006-08 there was generally little change in the contribution from different age groups to the gender gaps.

4.2 Decomposition of the deprivation gap by cause of death

Relatively higher mortality in deprived areas than in Northern Ireland generally for CHD, suicide, lung cancer, chronic liver disease and ‘other cancers’ not elsewhere specified were responsible for most of the male life expectancy gap in 2006-08 (figure 18). Similarly for females, the gap was primarily due to higher mortality in deprived areas for lung cancer, CHD, chronic lower respiratory disease, and ‘other cancers’ not elsewhere specified.

Table 3. Contribution to the deprivation gap by age groups (years).

Age group	Female		Male	
	2001-03	2006-08	2001-03	2006-08
75+	-0.4	-0.5	-0.4	-0.4
60-74	-1.0	-1.1	-1.3	-1.4
45-59	-0.7	-0.8	-1.1	-1.4
30-44	-0.2	-0.2	-0.7	-0.9
15-29	-0.1	-0.1	-0.3	-0.4
0-14	-0.2	-0.1	-0.3	-0.1
Total	-2.6	-2.9	-4.1	-4.6

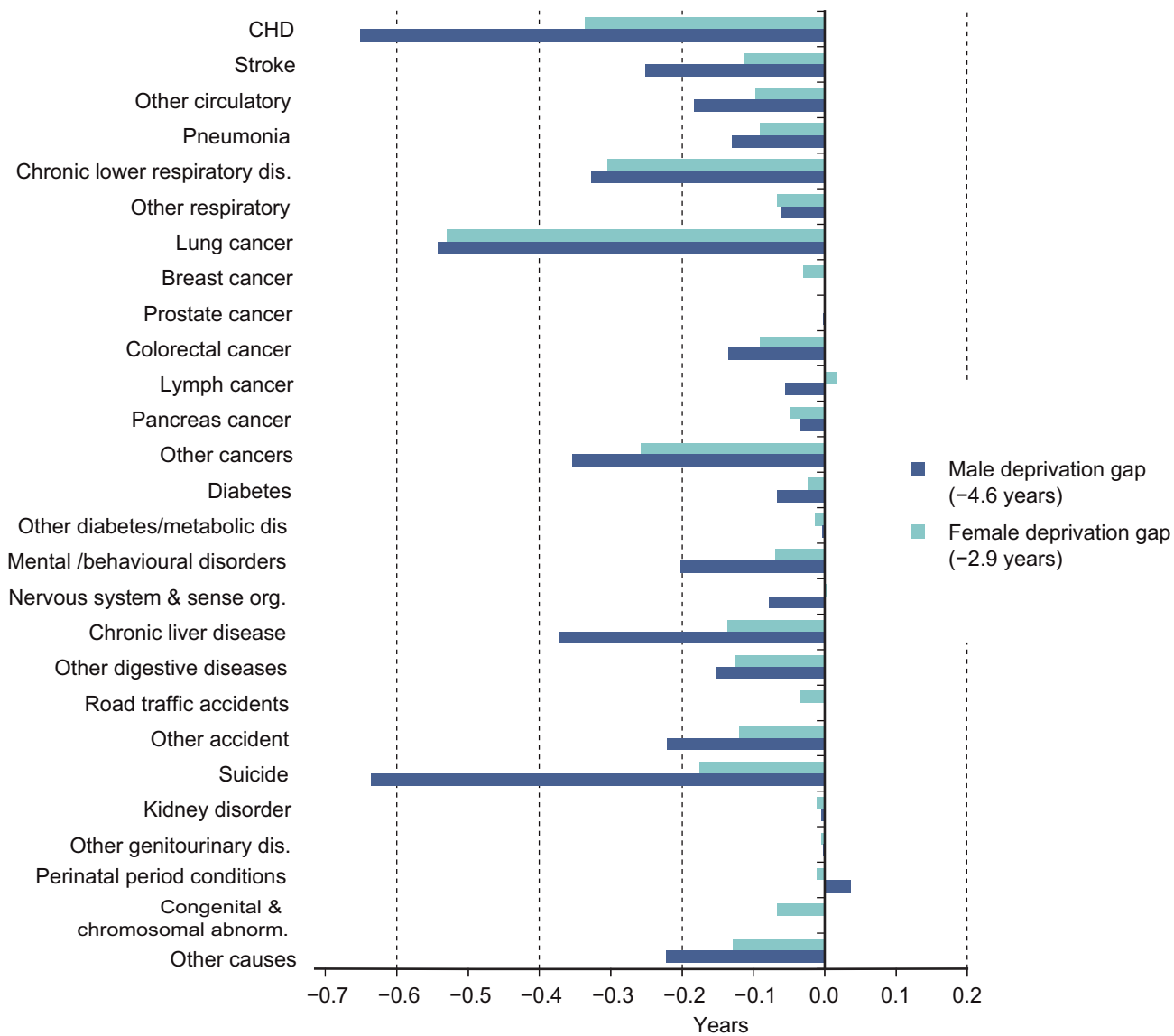
Source: Project Support Analysis Branch, DHSSPS
Note: Numbers may not sum due to rounding.

Between 2001-03 and 2006-08, a larger increase in female mortality in deprived areas relative to NI overall due to suicide, respiratory disease (particularly pneumonia) and lung cancer contributed to widening the deprivation gap (figure 19). Although a lower death rate for circulatory disease contributed to the increase in female life expectancy in deprived areas over the period, this decline in mortality was at a slower rate than in the wider region, hence circulatory disease also contributed to widening the deprivation gap.

A relatively larger increase in mortality due to suicide, lung cancer and circulatory disease (particularly stroke) for males in deprived areas all contributed to widening the deprivation gap. The impact of suicide per se resulted in the gap widening by 0.4 years. Lower mortality due to conditions occurring in the early years of life (perinatal conditions and congenital & chromosomal abnormalities) in deprived areas than in NI as a whole narrowed the male deprivation gap by 0.3 years over the period.

²⁴ Increasing gaps might to some extent be explained by recent migration trends from the most deprived areas (see section 1.7.1).

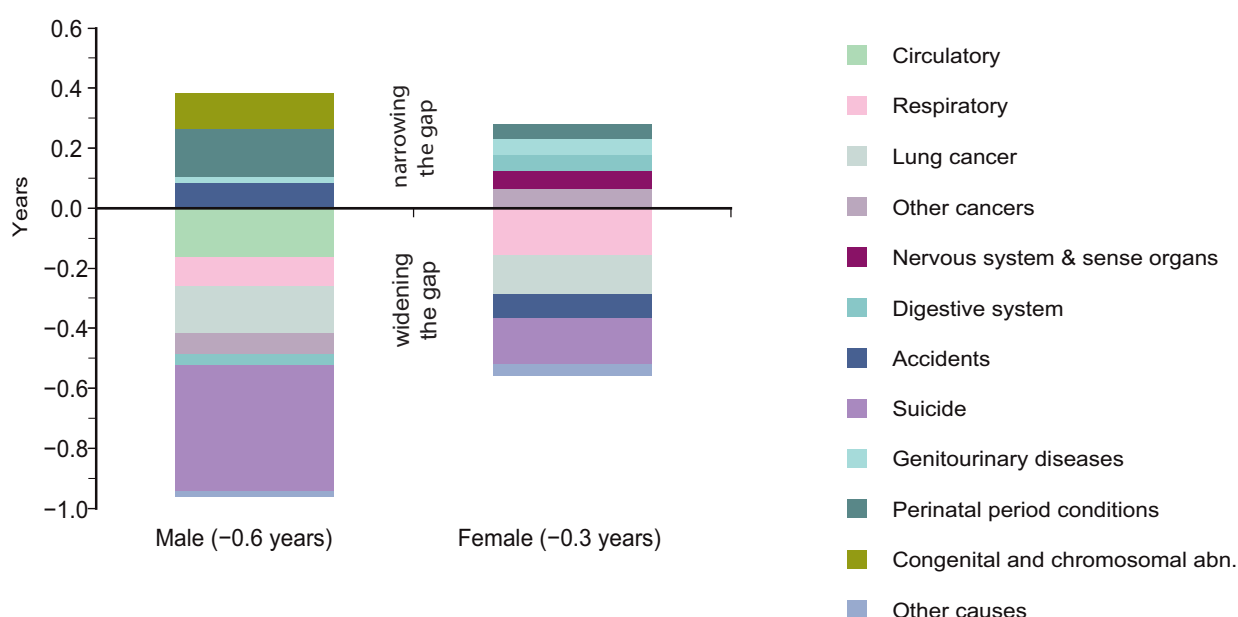
Figure 18. Contribution to the life expectancy gap between Northern Ireland and its 20% most deprived areas (2006-08) by cause of death (years).



Source: Project Support Analysis Branch, DHSSPS

Note: Negative numbers indicate that deprived areas had higher death rates than NI overall. Conversely, positive numbers indicate that deprived areas had lower death rates.

Figure 19. Contribution to the change in the life expectancy gap between Northern Ireland and its 20% most deprived areas between 2001-03 and 2006-08 (years).



Source: Project Support Analysis Branch, DHSSPS

Note: Positive numbers indicate that deprived areas had a relative improved mortality rate compared to than of the whole region. Conversely, negative numbers indicate that deprived areas had a relative worsened mortality rate.

4.3 Inequality gap – the most deprived areas compared with the least deprived areas

Examining the difference between the most and the least deprived areas in Northern Ireland gives further indication of the extent of the inequality gap. In 2006-08 the life expectancy gap between the 20% most deprived

and 20% least deprived areas in Northern Ireland was 7.8 years for males and 4.9 years for females. It had widened by 0.6 years for both genders from 2001-03²⁵ (table 4).

Table 4. Life expectancy at birth for the 20% most deprived areas and 20% least deprived areas and corresponding deprivation gap (years).

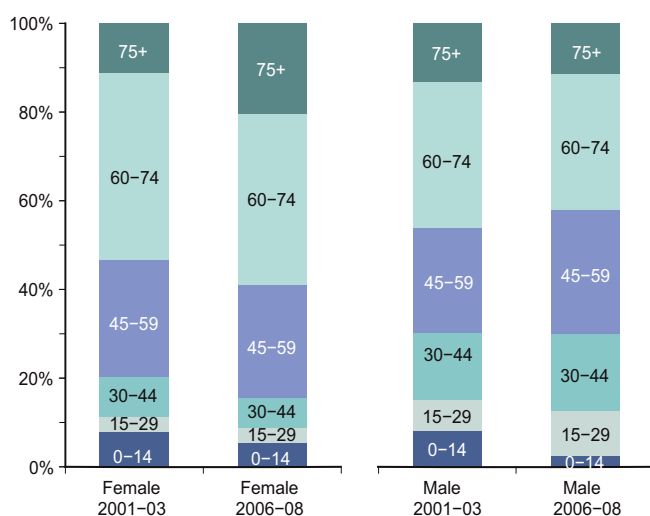
	2001-03	2006-08	Change from 01-03 to 06-08
Male life expectancy in the 20% least deprived areas	78.7	79.5	0.9
Male life expectancy in the 20% most deprived areas	71.5	71.8	0.2
Male deprivation gap	-7.1	-7.8	-0.6
Female life expectancy in the 20% least deprived areas	82.2	83.3	1.1
Female life expectancy in the 20% most deprived areas	77.9	78.4	0.5
Female deprivation gap	-4.3	-4.9	-0.6

Source: Project Support Analysis Branch, DHSSPS

Note: Numbers may not sum due to rounding.

²⁵ See section 1.7.1.

Figure 20. Contribution to the deprivation gaps between the 20% most and 20% least deprived areas by age groups (%).



Source: Project Support Analysis Branch, DHSSPS

4.3.1 Inequality gap between the most and the least deprived areas by age

Figure 20 shows how differences in mortality by age contributed to the deprivation gap between the most and the least deprived areas in 2001-03 and 2006-08. The age contributions were very similar to that of the gaps between the most deprived areas and Northern Ireland as a whole. Throughout the period, more than half of the female gap was caused by higher death rates among the over 60 year olds in deprived areas whereas approximately two-fifths of the male gap was caused by the same age group.

4.3.2 Inequality gap between the most and the least deprived areas by cause of death

Mortality rates in the most deprived areas were relatively worse than in the least deprived areas for most of the causes of death examined in this report (figure 21). Relatively higher death rates for lung cancer, CHD, chronic lower respiratory disease and 'other cancers' contributed half a year or more each to the female gap.

Table 5. Contribution to the deprivation gaps between the 20% most and 20% least deprived areas by age groups (years).

Age group	Female		Male	
	2001-03	2006-08	2001-03	2006-08
75+	-0.5	-1.0	-0.9	-0.9
60-74	-1.8	-1.9	-2.3	-2.4
45-59	-1.1	-1.2	-1.7	-2.2
30-44	-0.4	-0.3	-1.1	-1.3
15-29	-0.2	-0.2	-0.5	-0.8
0-14	-0.3	-0.3	-0.6	-0.2
Total	-4.3	-4.9	-7.1	-7.8

Source: Project Support Analysis Branch, DHSSPS
Note: Numbers may not sum due to rounding.

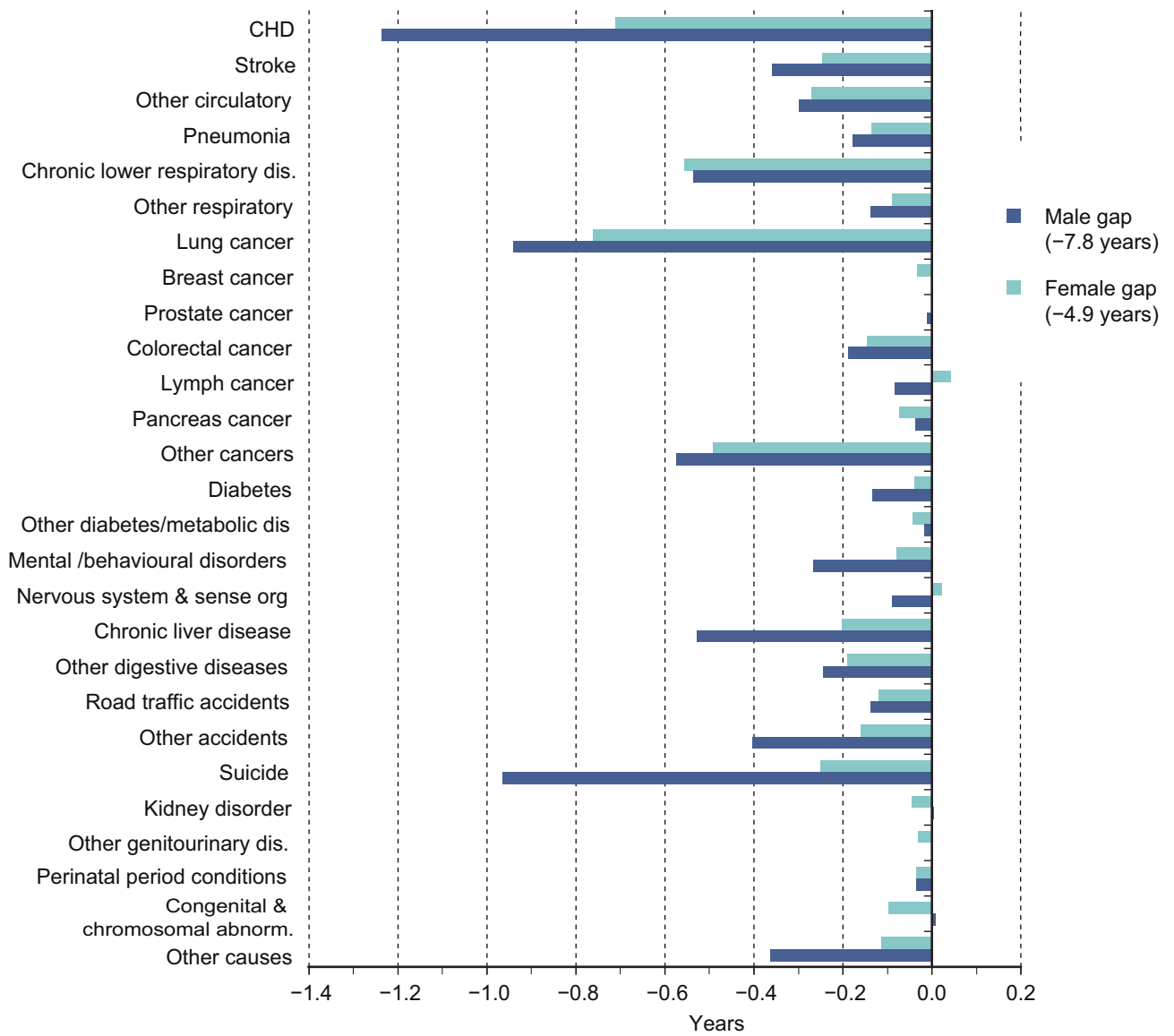
Higher death rates for CHD, suicide and lung cancer contributed around a year each to the male gap.

Figure 22 below sets out how a relative increase in mortality from respiratory disease (particularly pneumonia), suicide, lung cancer and circulatory disease in the most deprived areas contributed to the widening of the female life expectancy gap between 2001-03 and 2006-08.

The relative increase in mortality rates for suicide, lung cancer and the digestive system (particularly chronic liver disease) in the most deprived areas resulted in a widening of the male gap between the most and the least deprived areas. Suicide alone increased the gap by 0.6 years over the period²⁶. This increase to the gap was partially offset by improved mortality rates over the period in the most deprived areas for conditions of the early years of life (perinatal conditions and congenital & chromosomal abnormalities).

²⁶ See discussions in sections 1.7.1 and 1.8.1.

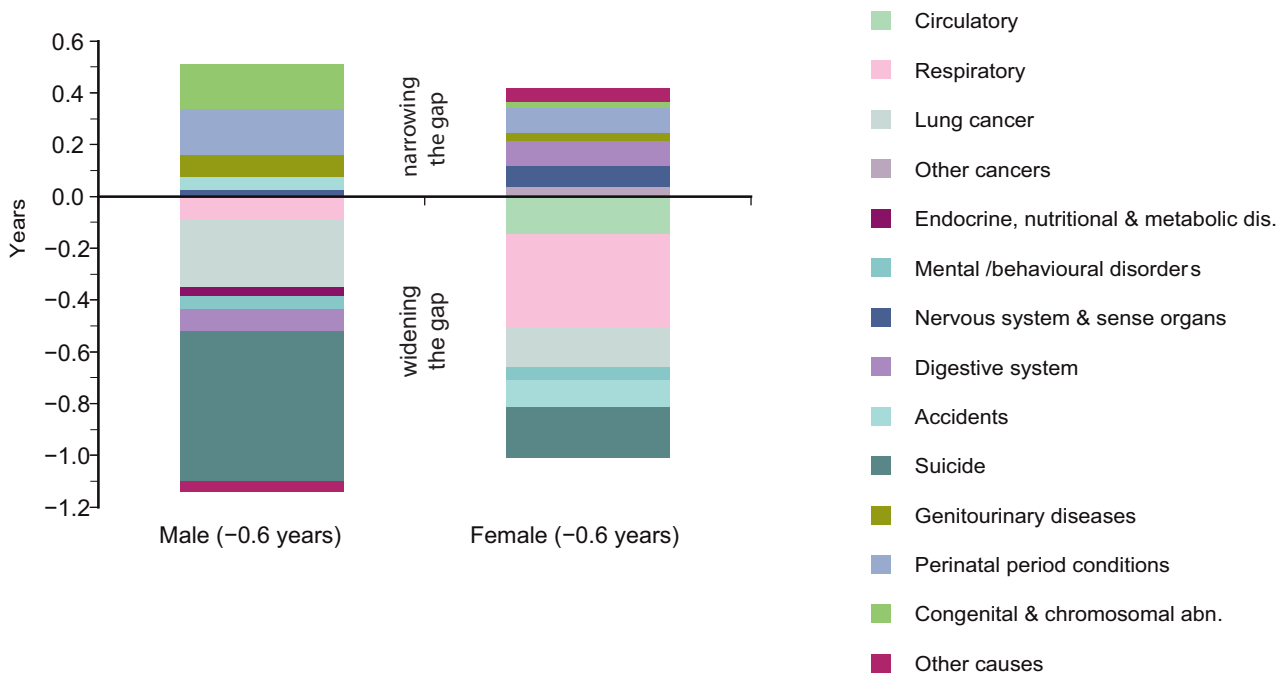
Figure 21. Contribution to the life expectancy gap between the 20% most deprived and 20% least deprived areas in Northern Ireland (2006-08) by cause of death (years).



Source: Project Support Analysis Branch, DHSSPS

Note: Positive numbers indicate that deprived areas had lower death rates than the least deprived areas. Conversely, negative numbers indicate that deprived areas had higher death rates.

Figure 22. Contribution to the change to the life expectancy gap between the 20% most deprived and 20% least deprived areas between 2001-03 and 2006-08 (years).



Source: Project Support Analysis Branch, DHSSPS

Note: Positive numbers indicate that the most deprived areas have had a relatively improved mortality rate compared to than of the least deprived areas. Conversely, negative numbers indicate that the most deprived areas have had a relatively worsened mortality rate.

5 - Life expectancy in rural areas

Life expectancy in rural areas was higher than in Northern Ireland overall and stood at 77.7 years for males and 82.6 years for females in 2006-08 (figure

23). This represented a 1.1 year increase from 2001-03 for both genders (table 6).

Table 6. Life expectancy for Northern Ireland and rural areas (years).

		2001-03	2006-08	Change from 01-03 to 06-08
Male	Northern Ireland	75.6	76.4	0.8
	Rural areas	76.6	77.7	1.1
Female	Northern Ireland	80.5	81.3	0.8
	Rural areas	81.6	82.6	1.1

Source: Project Support Analysis Branch, DHSSPS

Note: Numbers may not sum due to rounding.

Summary: Change in life expectancy in rural areas between 2001-03 to 2006-08

Male life expectancy in rural areas

- The male life expectancy in rural areas was 77.7 years in 2006-08, which represented a 1.1 year increase since 2001-03.
- The increase in male life expectancy was almost exclusively due to improved mortality among the over 60 year olds.
- Improvements in mortality due to circulatory disease contributed 1.2 years to the change in male life expectancy in rural areas; this was partly offset by rising death rates due to the main external causes (i.e. suicide and accidents) and causes not elsewhere noted (-0.5 years).

Female life expectancy in rural areas

- Female life expectancy in rural areas increased by 1.1 years between 2001-03 and 2006-08 to reach 82.6 years.
- The increase to female life expectancy was mainly due to improved mortality among the over 60 year olds.
- Over the period circulatory disease added 1.2 years to the change in female life expectancy.
- Increasing mortality rates for the main external causes of death (i.e. suicide and accidents) and causes not elsewhere noted reduced life expectancy in rural areas by 0.3 years.

Source: Project Support Analysis Branch, DHSSPS

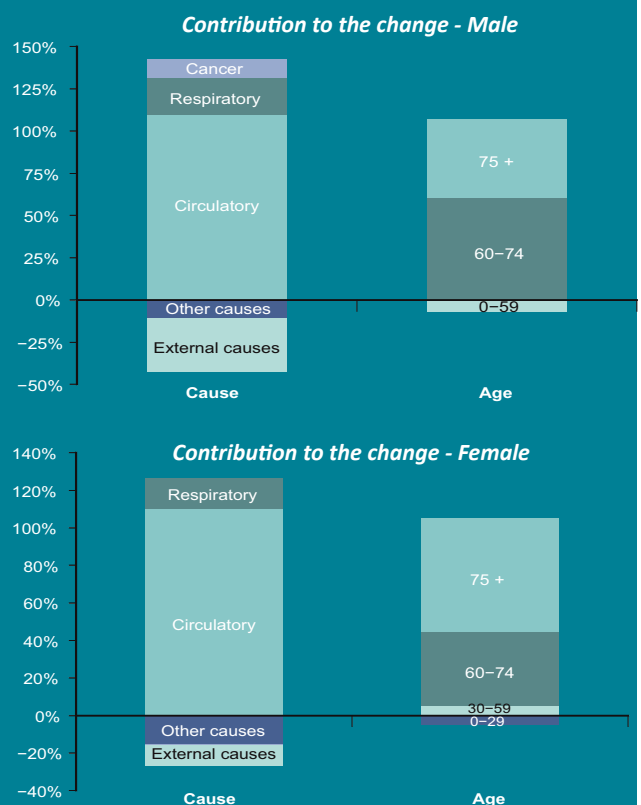
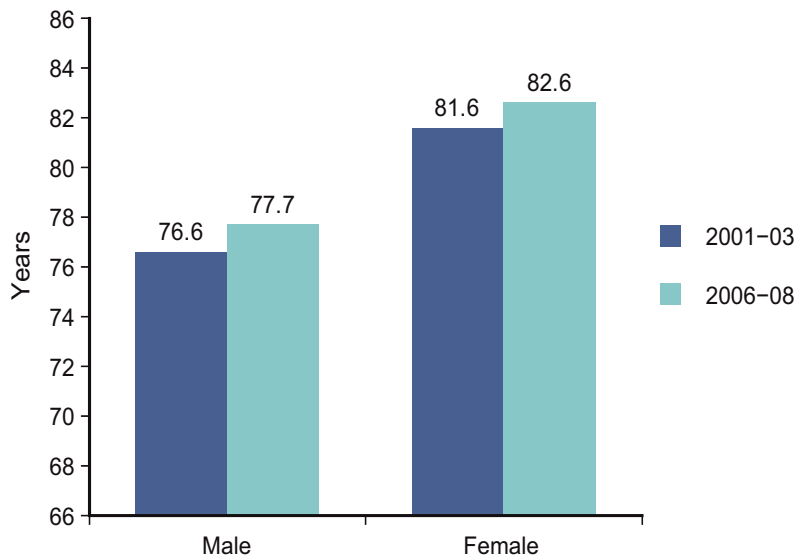


Figure 23. Life expectancy in rural areas (years).



Source: Project Support Analysis Branch, DHSSPS

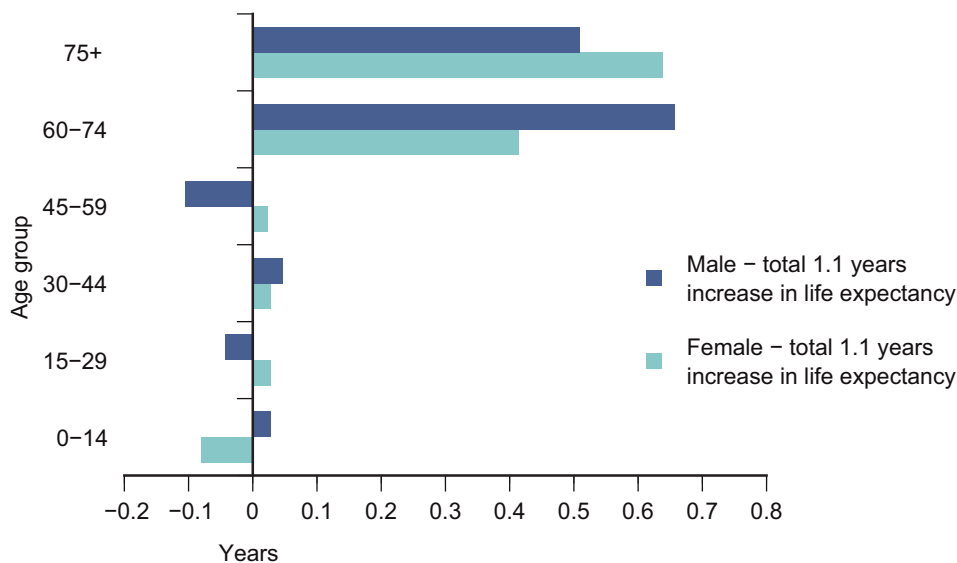
5.1 Decomposition of the change in rural life expectancy by age

The increase in life expectancy in rural areas over the period was due to improved mortality rates for the over 60 year age groups (figure 24). Conversely, there were slight increases to death rates for females under 15 years and for males between 45-59 years, however they had relatively minor impact on life expectancy.

5.2 Decomposition of the change in rural life expectancy by cause of death

Between 2001-03 and 2006-08, improved mortality rates for circulatory and respiratory diseases caused life expectancy to increase in rural areas (by 1.2 years and 0.2 years respectively for both genders, figure 25). However, an increase in suicides and deaths due to 'other accidents' (other than road traffic accidents) caused male life expectancy to reduce by 0.3 years²⁷. Higher mortality due to lung cancer caused female life expectancy to fall slightly (by 0.1 year). Differences in mortality for the remaining causes of death examined had only a minor impact on life expectancy over the period.

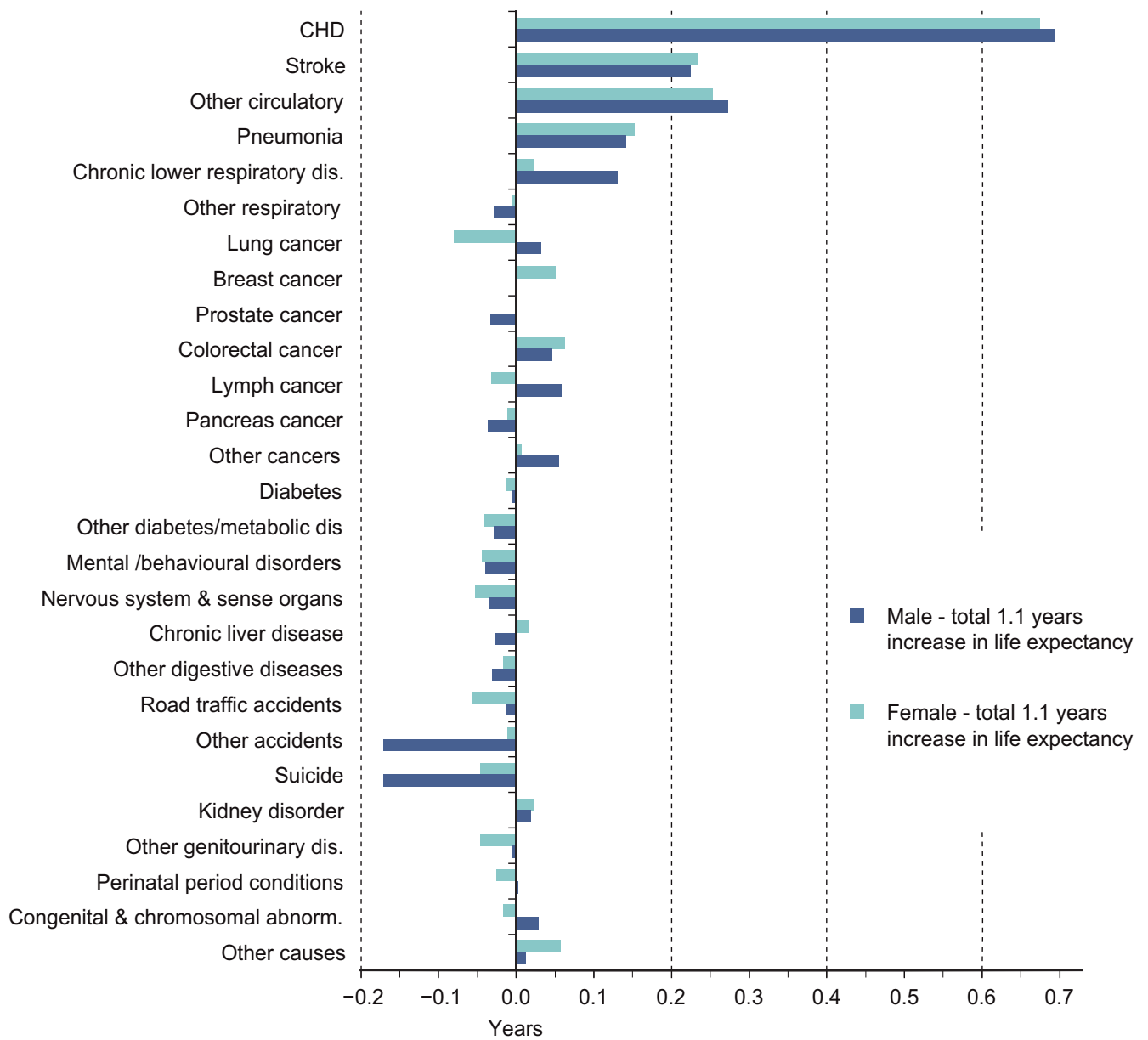
Figure 24. Contribution to the change in rural life expectancy between 2001-03 and 2006-08 by age (years).



Source: Project Support Analysis Branch, DHSSPS

²⁷ See discussion in section 1.8.1.

Figure 25. Contribution to the change in rural life expectancy between 2001-03 and 2006-08 by cause of death (years).



Source: Project Support Analysis Branch, DHSSPS

6 - The rural life expectancy gap

Similar to other gaps examined in this report, the rural life expectancy gap is simply the difference in life expectancy between rural areas and Northern Ireland generally. As life expectancy is higher for rural areas than for Northern Ireland, the rural gap is in the opposite direction to the deprivation gap. Between 2001-03 and

2006-08, mortality rates in rural areas improved at a faster rate than in Northern Ireland overall, leading to an increase in the NI-rural gap over the period from 1.0 to 1.3 years for males and 1.1 to 1.4 years for females (table 7).

Table 7. Life expectancy gap between Northern Ireland and rural areas (years).

	2001-03	2006-08	Change from 01-03 to 06-08
Male	1.0	1.3	0.3
Female	1.1	1.4	0.3

Source: Project Support Analysis Branch, DHSSPS

Note: Numbers may sum due to rounding.

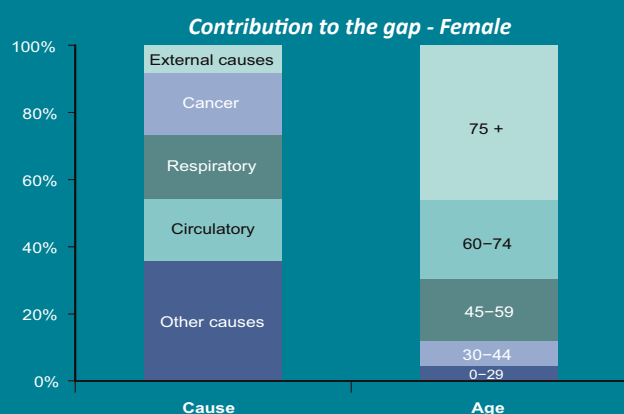
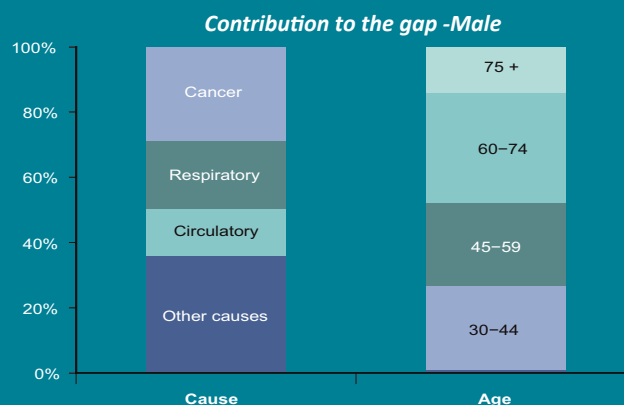
Summary - The rural life expectancy gap 2006-08

Male life expectancy

- The NI-rural male life expectancy gap widened by almost a third from 2001-03 to reach 1.3 years in 2006-08.
- Lower death rates in rural areas relative to NI overall for the under 60 year old age group accounted for almost half the gap.
- Relatively lower mortality rates in rural areas for cancer and other causes of death not elsewhere specified explained two-thirds of the male gap.

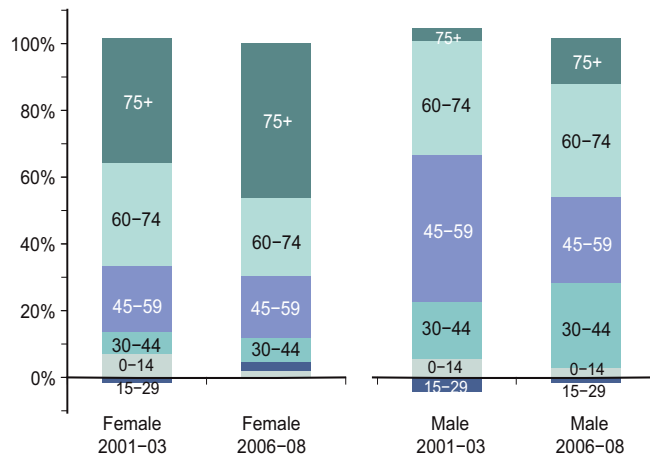
Female life expectancy

- The NI-rural female life expectancy gap widened by more than a quarter from 2001-03 to 1.4 years in 2006-08.
- Lower death rates in rural areas for over 60 year olds relative to those in the wider region explained two-thirds of the rural gap.
- Lower death rates in rural areas generally than in NI across a range of causes of death contributed to the rural female gap.



Source: Project Support Analysis Branch, DHSSPS

Figure 26. Contribution to the NI – rural life expectancy gap by age groups (%).



Source: Project Support Analysis Branch, DHSSPS

Table 8. Contribution to the NI – rural life expectancy gap by age groups (years).

Age group	Female		Male	
	2001-03	2006-08	2001-03	2006-08
75+	0.4	0.6	0.0	0.2
60-74	0.3	0.3	0.3	0.4
45-59	0.2	0.3	0.4	0.3
30-44	0.1	0.1	0.2	0.3
15-29	0.0	0.0	0.0	0.0
0-14	0.1	0.0	0.1	0.0
Total	1.1	1.4	1.0	1.3

Source: Project Support Analysis Branch, DHSSPS
Note: Numbers may not sum due to rounding.

6.1 Decomposition of the NI – rural life expectancy gap by age

Although the magnitude of the gaps between the regional average and rural areas were similar for males and females over the period (table 7), the age contributions to the respective gender gaps were quite different (figure 26). For instance, the over 75 year olds accounted for almost half the female gap in 2006-08 compared with just over a tenth of the male gap.

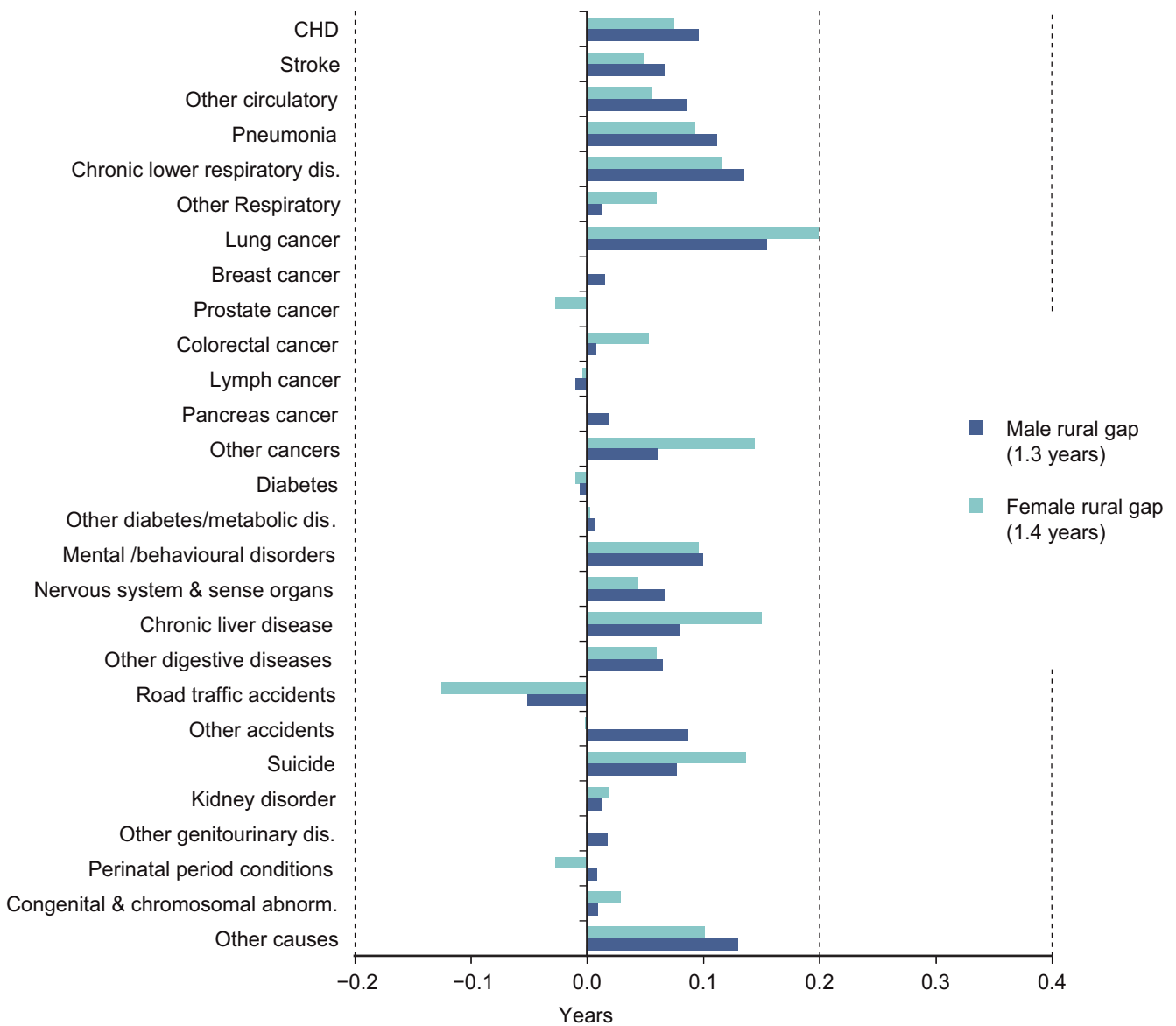
Over the period there was an increase in the contribution to the female rural gap by the over 75 year olds, accompanied by a decrease in the contribution by the 60-74 age group. There were also changes in the age distribution of the male gap, with a decrease in the contribution from the 45-59 age group accompanied by increases in the contribution from the 30-44 and the over 75 year old age groups.

6.2 Decomposition of the NI – rural life expectancy gap by cause of death

Overall, in 2006-08, females in NI had higher death rates than in rural areas for the majority of causes of death examined (figure 27). Relatively lower death rates in rural areas for circulatory disease and respiratory disease contributed 0.3 years respectively to the gap, while lung cancer contributed 0.2 years. The increase in the gap from 2001-03 (+0.3 years) was due mainly to a relative larger decline in mortality rates for circulatory disease in rural areas than regionally (figure 28).

Relatively lower mortality rates for cancer and respiratory diseases in rural areas contributed 0.4 years and 0.3 years respectively to the male gap in 2006-08 (figure 27). However, rural areas had relatively higher death rates due to road traffic accidents which caused the gap to reduce by 0.1 years. The increase in the male gap over the period (+0.3 years) can mainly be explained by a relatively larger fall in mortality rates for circulatory and respiratory diseases in rural areas (figure 28).

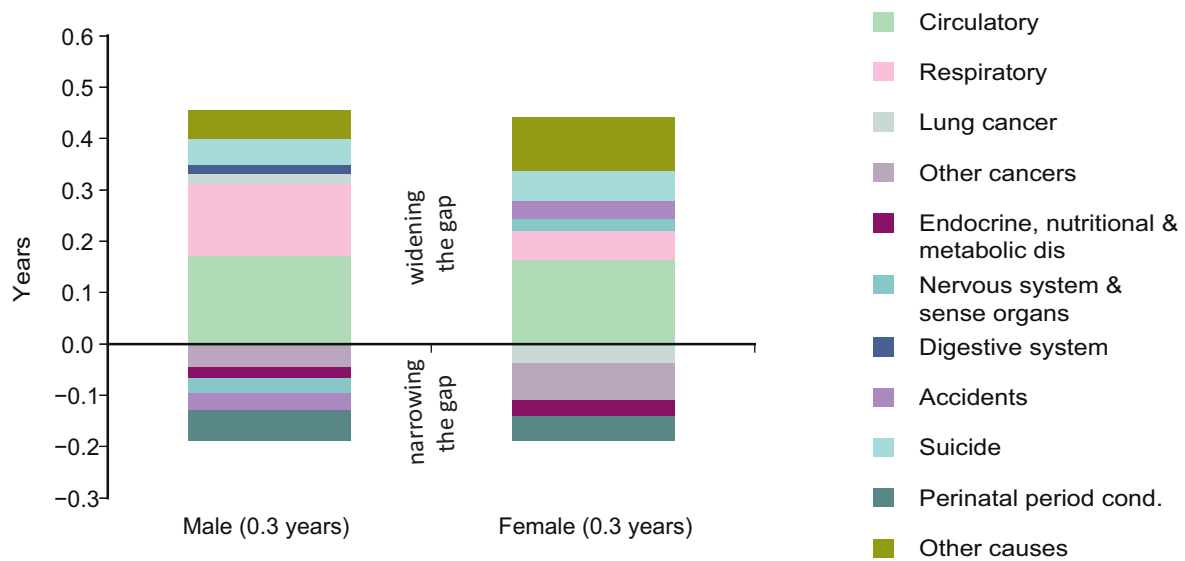
Figure 27. Contribution to the life expectancy gaps between Northern Ireland and its rural areas (2006-08) by cause of death (years).



Source: Project Support Analysis Branch, DHSSPS

Note: Positive numbers indicate that rural areas had lower death rates than NI overall while negative numbers indicate that rural areas had higher death rates than in NI.

Figure 28. Contribution to the change in the life expectancy gap between Northern Ireland and its rural areas between 2001-03 and 2006-08 (years).



Source: Project Support Analysis Branch, DHSSPS

Note: Positive numbers indicate that rural areas had a relatively improved mortality rate compared to than of the whole region. Conversely, negative numbers indicate that rural areas had a relatively worsened mortality rate.

7 - Life Expectancy in HSC Trusts

The highest expectancy of life among the five Health and Social Care Trusts for both males and females occurred in the Northern and the South Eastern Trusts (table 9). The largest increase in life expectancy between 2001-03 and 2006-08 occurred in the South Eastern Trust for males (+1.3 years) and in the Western Trust for females (+1.1 years). Belfast Trust saw the smallest increase in life expectancy over the period for both males and females (+0.3 years).

Table 10 sets out the size of the NI-Trust life expectancy gaps and shows to what extent the gaps changed between 2001-03 and 2006-08. For both genders, the South Eastern Trust had the largest positive gap (relatively higher life expectancy than NI overall) in 2006-08 and the Belfast Trust the largest negative gap (relatively lower life expectancy). The South Eastern, Northern and Southern Trusts all had higher male and female life expectancy than Northern Ireland overall in 2006-08 (figure 29).

Table 9. Life expectancy for the HSC Trusts in 2001-03 and 2006-08 (years).

	Male life expectancy		Change from 01-03 to 06-08	Female life expectancy		Change from 01-03 to 06-08
	2001-03	2006-08		2001-03	2006-08	
Northern Ireland	75.6	76.4	0.8	80.5	81.3	0.8
Belfast Trust	74.1	74.4	0.3	79.8	80.1	0.3
Northern Trust	76.3	77.3	1.0	80.9	81.8	0.8
South-Eastern Trust	76.5	77.9	1.3	81.1	81.8	0.8
Southern Trust	75.8	76.6	0.7	80.4	81.5	1.0
Western Trust	75.0	75.6	0.6	79.9	81.0	1.1

Source: Project Support Analysis Branch, DHSSPS

Note: Numbers may not sum due to rounding.

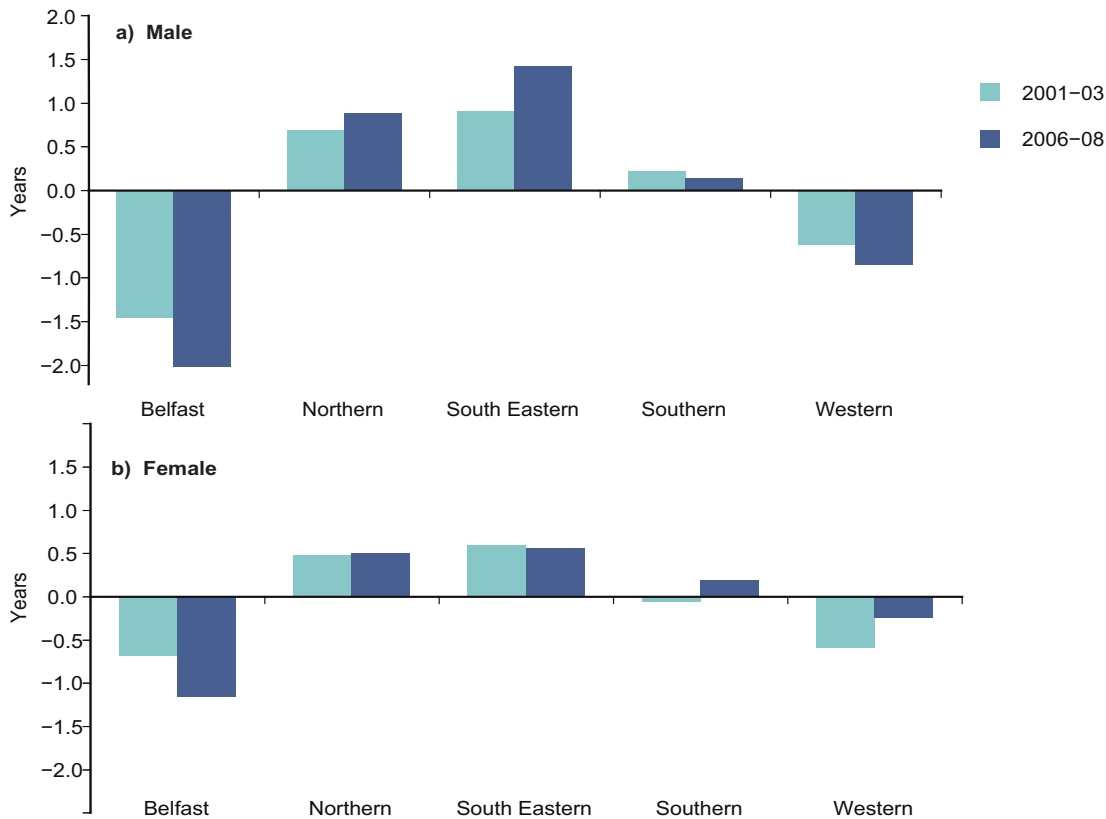
Table 10. Life expectancy gap between NI and the HSC Trusts in 2001-03 and 2006-08 (years).

	Male life expectancy gap		Change from 01-03 to 06-08	Female life expectancy gap		Change from 01-03 to 06-08
	2001-03	2006-08		2001-03	2006-08	
Belfast Trust	-1.5	-2.0	-0.6	-0.7	-1.2	-0.5
Northern Trust	0.7	0.9	0.2	0.5	0.5	0.0
South-Eastern Trust	0.9	1.4	0.5	0.6	0.6	-0.0
Southern Trust	0.2	0.1	-0.1	-0.1	0.2	0.2
Western Trust	-0.6	-0.9	-0.2	-0.6	-0.2	0.4

Source: Project Support Analysis Branch, DHSSPS

Note: Numbers may not sum due to rounding.

Figure 29. Male (a) and female (b) life expectancy gap between NI and the HSC Trusts



Source: Project Support Analysis Branch, DHSSPS

7.1 Belfast HSC Trust

Male life expectancy in the Belfast Trust in 2001-03 was 1.5 years below the NI average and, by 2006-08, the gap had increased to 2.0 years (table 10). The 2006-08 NI-Trust gap can mainly be explained by higher mortality rates for cancer, circulatory disease, digestive disease (particularly chronic liver disease), respiratory disease and suicide in the Belfast Trust. Lung cancer, on its own, accounted for 0.4 years of the gap. See appendix 2 for more details.

In 2001-03 female life expectancy in the Belfast Trust was 0.7 years below the NI level. By 2006-08 the gap had increased to 1.2 years (table 10). Trust mortality was higher for most of the causes of death studied, with higher death rates for cancer (especially lung cancer) and digestive disease being responsible for the largest proportions of the gap. See appendix 2 for more details.

7.2 Northern HSC Trust

Male life expectancy in the Northern Trust was 0.7 years above the regional average in 2001-03. By 2006-08 the gap had increased to 0.9 years (table 10). Lower death rates within the Northern Trust for cancer, respiratory disease, circulatory disease and suicide were the main contributors to the gap. See appendix 2 for more details.

Female life expectancy in the Northern Trust was 0.5 years higher than the NI average in both 2001-03 and 2006-08 (table 10). The largest difference in mortality rates between the Trust and NI generally was for cancer, which contributed 0.2 years to the gap in both 2001-03 and 2006-08. See appendix 2 for more details.

7.3 South Eastern HSC Trust

Male life expectancy in the South Eastern Trust was 0.9 years higher than in Northern Ireland as a whole in 2001-03 and the gap had increased to 1.4 years in 2006-08 (table 10). The main causes contributing to the gap in 2006-08 were lower mortality rates in the South Eastern Trust for the main external causes of death (i.e. accidents and suicide), circulatory disease and cancer (particularly lung cancer). See appendix 2 for more details.

Female life expectancy in the South Eastern Trust was 0.6 years higher than the NI average in both 2001-03 and 2006-08 (table 10). Lower death rates for cancer and circulatory disease were the main contributors to the gap over the period. See appendix 2 for more details.

7.4 Southern HSC Trust

Male life expectancy in the Southern Trust was slightly higher than that in Northern Ireland as a whole over the time period (table 10). Lower mortality rates for digestive disorder (particularly chronic liver disease) and cancer (particularly lung cancer) in the Southern Trust than in the wider region were offset by higher mortality for road traffic accidents and circulatory disease. See appendix 2 for more details.

Female life expectancy in the Southern Trust was broadly similar to the NI average in 2001-03 but increased to 0.2 years higher in 2006-08 (table 10). Slightly lower mortality rates in the Trust for respiratory disease, disorders of the nervous system and the digestive system contributed to the gap, however they were partially offset by higher mortality rates across a range of causes of death. See appendix 2 for more details.

7.5 Western HSC Trust

In 2001-03 male life expectancy in the Western Trust was 0.6 years less than the NI average. By 2006-08 the gap had increased to 0.9 years (table 10). The main causes contributing to the gap in 2006-08 were higher death rates for the main external causes of death (i.e. accidents, road traffic accidents and suicide), circulatory disease and respiratory disease. See appendix 2 for more details.

In 2001-03, female life expectancy in the Western Trust was 0.6 years less than in NI generally. By 2006-08, the gap had reduced to 0.2 years (table 10). Improved mortality rates in the Trust for CHD, cancer and genitourinary diseases were responsible for the narrowing of the gap over time. Slightly higher death rates within the Trust for circulatory and respiratory disease contributed to the 2006-08 gap. See appendix 2 for more details.

8 - Other mortality definitions

Studies of avoidable mortality have generally been based on the underlying assumption that for some diseases, such as female breast cancer, there is the potential for health care services to prevent almost all deaths, at least within certain age groups. These would be conditions amenable to medical intervention. Some studies have used wider definitions of avoidable mortality which have included causes open to “primary” intervention. Smoking and alcohol-related deaths and suicides, for example, may be considered preventable through public health policies and wider social interventions. A third category is premature mortality. Research into premature mortality has centred on quantifying mortality within definitions based on age at death.

While age and suicide have been widely covered throughout this report, the following chapter will focus on amenable mortality, smoking related deaths and alcohol-related deaths.

8.1 Amenable mortality

Amenable mortality is based on the concept that deaths from certain causes should not occur in the presence of timely and effective healthcare²⁸. The causes of death and specific age ranges that are considered to be amenable to good healthcare are set out in [appendix 3](#). A reduction in amenable mortality between 2001-03 and 2006-08 contributed to improving life expectancy in both Northern Ireland overall and its deprived areas by about half a year for both males and females ([table 11](#)).

Table 11. Amenable mortality’s contribution to the change in life expectancy between 2001-03 and 2006-08 (years).

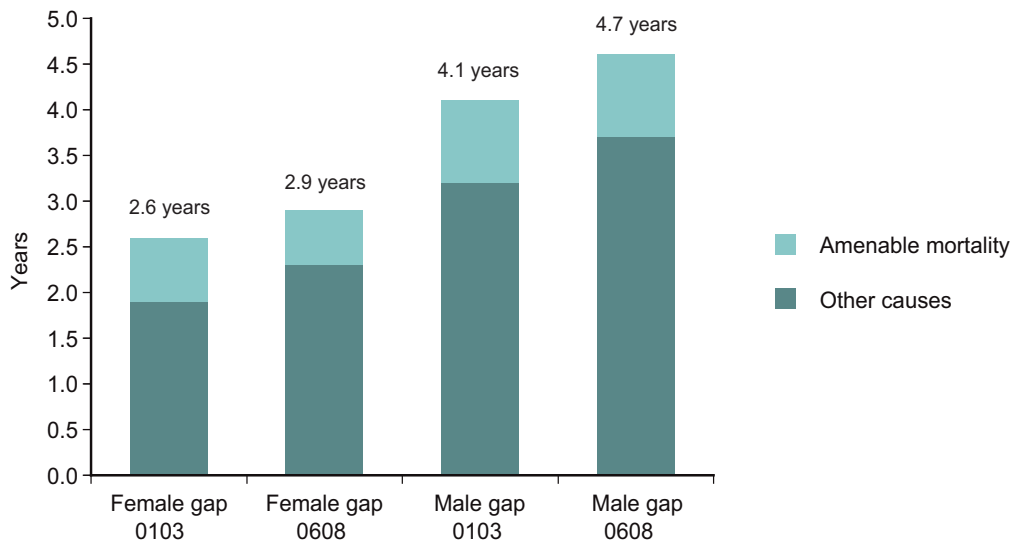
		Change in life expectancy due to amenable mortality	Total change in life expectancy
Male	Northern Ireland overall	0.5	0.8
	20% most deprived areas	0.4	0.2
Female	Northern Ireland overall	0.4	0.8
	20% most deprived areas	0.5	0.5

Source: Project Support Analysis Branch, DHSSPS

Note: Numbers may not sum due to rounding.

²⁸ Nolte & McKee 2003, 2004.

Figure 30. **Amenable mortality - deprivation gap (years).**



Source: Project Support Analysis Branch, DHSSPS

Although there has been a reduction in deaths due to amenable causes overall, amenable mortality remains higher in deprived areas than in the region in general. It constituted around one fifth of the male inequality gap in both 2001-03 and 2006-08 (0.9 years of the gap) (figure 30). Relative improvements in female amenable mortality in deprived areas compared with the region overall, caused its contribution to the gap to reduce slightly, from 0.7 to 0.6 years. This, in combination with the general increase in the female gap, led amenable mortality's proportion of the gap to reduce from around a quarter in 2001-03 to a fifth in 2006-08.

8.2 Smoking related deaths

Smoking remains the single greatest cause of preventable illness and premature death in Northern Ireland, and is also the leading cause of health inequalities in our society²⁹. About one in three people in manual socio-economic groups smoke compared with one in ten in the managerial and professional socio-economic groups³⁰. Although smoking prevalence has generally reduced since the early 1980s, the proportionate decrease is more pronounced within the managerial and professional socio-economic groups than in the manual socio-economic groups.

Table 12. **Smoking related deaths and alcohol related deaths' contribution to the change in life expectancy between 2001-03 and 2006-08 (years).**

		Change in life expectancy due to		Total change in life expectancy
		smoking related deaths	alcohol related deaths	
Male	Northern Ireland overall	0.3	-0.1	0.8
	20% most deprived areas	0.2	-0.1	0.2
Female	Northern Ireland overall	0.2	0	0.8
	20% most deprived areas	0.1	0	0.5

Source: Project Support Analysis Branch, DHSSPS

Note: Numbers may not sum due to rounding.

²⁹ Chief Medical Officer's Annual Report 2009.

³⁰ The continuous household survey 2009/10, Central Survey Unit, NISRA.

A relatively higher death rate due to lung cancer was the largest contributor to the female life expectancy deprivation gap and third largest for males. Smoking is also closely linked to several other causes of death; other types of cancers, circulatory and respiratory diseases and digestive disorders. Further information on the causes of death that are considered to be due to smoking are set out in [appendix 3](#). A separate life table decomposition³¹ examining smoking related deaths revealed that, between 2001-03 and 2006-08, a reduction in smoking related mortality increased both male and female life expectancy by 0.3 years and 0.2 years respectively ([table 12](#)). A reduction in smoking related deaths in deprived areas contributed to improving male and female life expectancy in these areas as well, albeit a relatively small increase (0.2 and 0.1 years respectively).

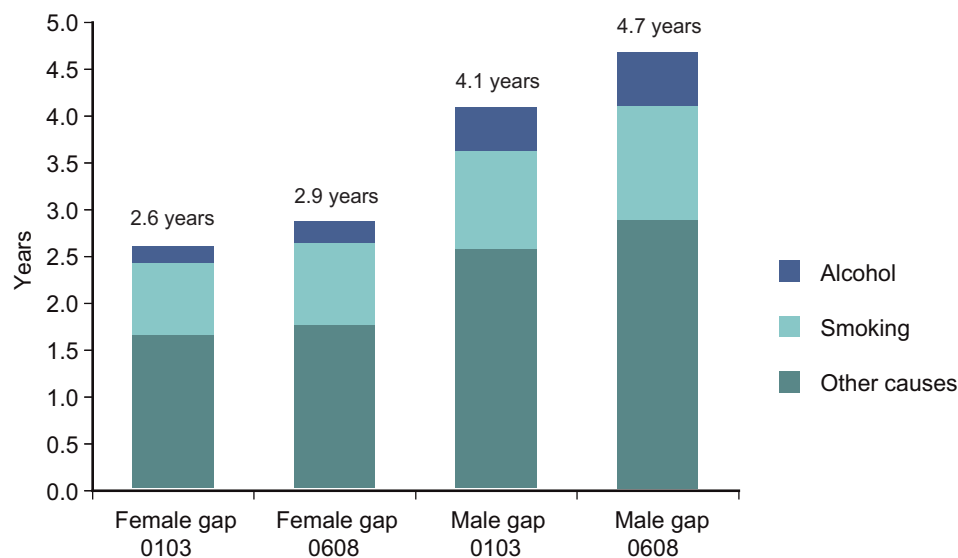
Relatively higher smoking related mortality in deprived areas contributed around a third of the female deprivation gap (0.9 years). Around a quarter of the male deprivation gap (1.2 years) can be attributed to smoking ([figure 31](#)). Therefore smoking prevalence (even though declining) still has a large impact on the life expectancy deprivation gap.

8.3 Alcohol related deaths

Over the past 15 years, Northern Ireland has seen a notable increase in the number of people drinking alcohol and, more worryingly, in the number of people drinking in excess of the recommended daily limit³². Changes in licensing laws, the effects of the peace process and the rapid growth of the leisure industry have been noted as possible reasons why consumption in Northern Ireland has increased at a much greater pace than the rest of the UK³³.

The causes of death that are considered to be alcohol related are set out in [appendix 3](#). Despite alcohol consumption increasing in recent years, alcohol related deaths have had relatively little impact on the overall change to life expectancy for both males and females in Northern Ireland between 2001-03 and 2006-08 ([table 12](#)). This was also the case for the most deprived areas. Differences in alcohol related mortality between the most deprived areas and Northern Ireland overall did however contribute 0.6 years to the male deprivation gap in 2006-08 compared with 0.5 years in 2001-03. The female gap due to alcohol related deaths remained constant at 0.2 years over the period. This constitutes around a tenth of the total life expectancy deprivation gap over the period for both males and females ([figure 31](#)).

Figure 31. Smoking related mortality and alcohol related mortality - deprivation gap (years).



Source: Project Support Analysis Branch, DHSSPS

³¹ As amenable mortality overlaps to some extent with smoking related deaths, the decomposition using smoking and alcohol related deaths is separate from the decomposition using amenable mortality.

³² "Alcohol misuse – can we really afford it?" HSC Public Health Agency 2010 (<http://www.publichealth.hscni.net/news/alcohol-misuse-%E2%80%93-can-we-really-afford-it>).

³³ "Drinking in the UK: an exploration of trends", 2009, Joseph Rowntree Foundation.

Appendix 1 - Causes of death - definitions

A1-1 Specific causes of death included in the analysis in this report.

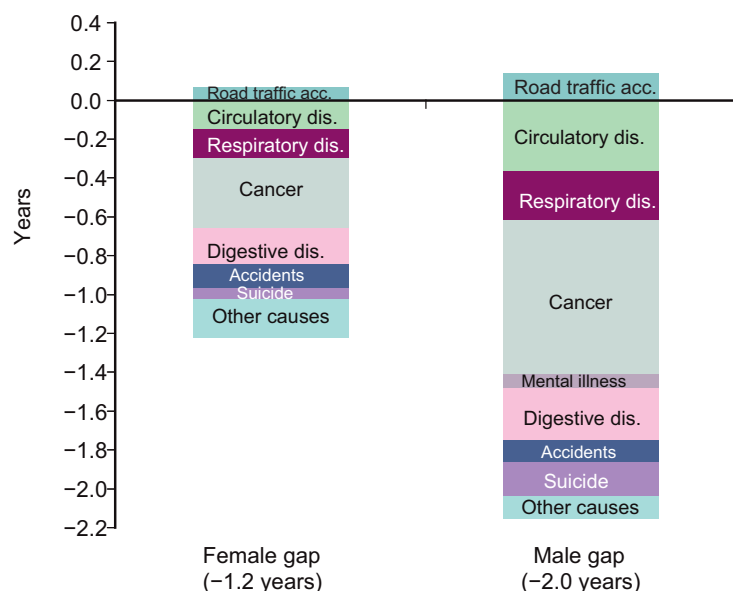
Cause of death	ICD10 code
Diseases of the circulatory system	I00-I99
Cerebrovascular disease (CHD)	I60-I69
Ischaemic heart disease (stroke)	I20-I25
All other circulatory diseases	
Respiratory disease	J00-J99
Pneumonia	J12-J18
Chronic lower Respiratory disease	J40-J47
All other Respiratory disease	
Malignant neoplasms (Cancer)	C00-C97
Malignant neoplasm of trachea, bronchus and lung	C33-C34
Malignant neoplasm of breast *	C50
Malignant neoplasm of prostate **	C61
Malignant neoplasm of colon, rectum, and anus	C18, C19-C21
Malignant neoplasm of pancreas	C25
Malignant neoplasm of pancreas of lymphatic, haematopoietic and related tissue	C81-C96
All other malignant neoplasms	
Endocrine, nutritional and metabolic diseases	E00-E90
Diabetes mellitus	E10-E14
All other endocrine, nutritional and metabolic diseases	
Mental/ behavioural disorder	F00-F99
Diseases of the genitourinary system	N00-N99
Diseases of the kidney and ureter	N00-N29
All other genitourinary	
Diseases of the nervous system and the sense organs	G00-H95
Diseases of the digestive system	K00-K93
Chronic liver disease	K70, K73-K74
All other diseases of the digestive system	
Road traffic accidents	V01-V99, Y85
Accidents	V01-X59, Y86
Other accidents (Accidents excluding Road traffic accidents)	
Intentional self-harm and event of undetermined intent (suicide)	X60-X84, Y87.0, Y10-Y34, Y87.2
Certain conditions originating in the perinatal period	P00-P96
Congenital malformations, deformations and chromosomal abnormalities	Q00-Q99
Other causes (all causes not covered by the above categories)	

* Breast cancer can occur among men, however it is very rare. Male breast cancer incidences are therefore included in 'other cancer' in this report.

** Prostate cancer only occurs among men and is therefore not included for females in this report.

Appendix 2 - HSC Trust details

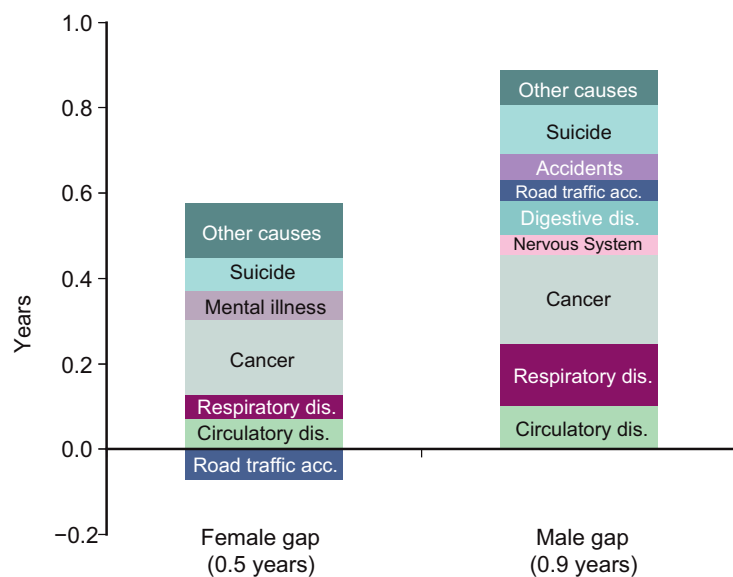
A2-1 Life expectancy gap between NI and the Belfast HSC Trust 2006-08.



Source: Project Support Analysis Branch, DHSSPS

Note: Positive numbers indicate that the Trust had relatively lower death rates than NI overall while negative numbers indicate that the Trust had higher death rates than NI.

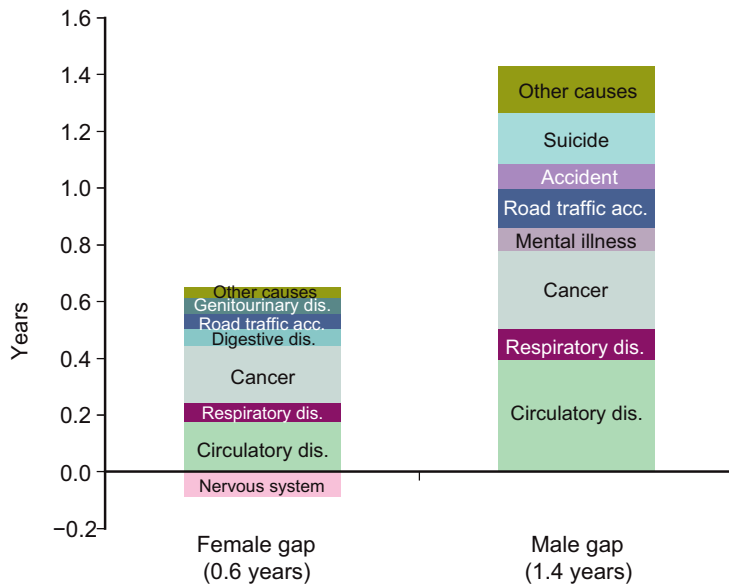
A2-2 Life expectancy gap between NI and the Northern HSC Trust 2006-08.



Source: Project Support Analysis Branch, DHSSPS

Note: Positive numbers indicate that the Trust had relatively lower death rates than NI overall while negative numbers indicate that the Trust had higher death rates than NI.

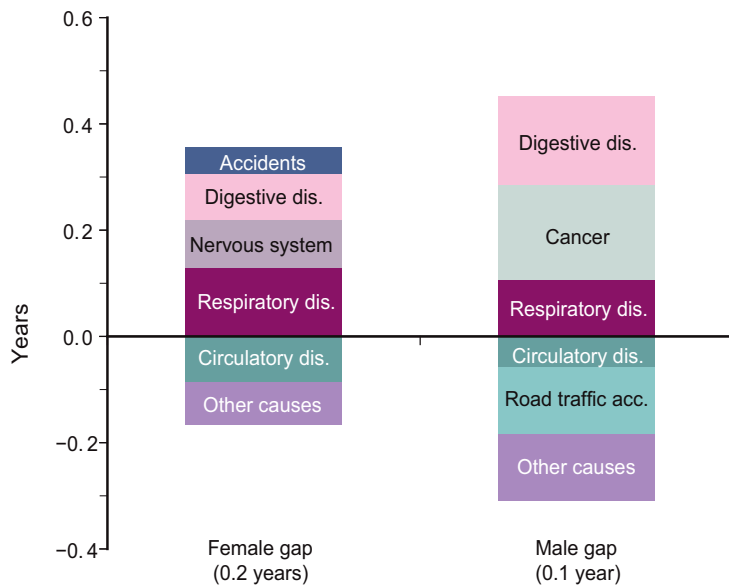
A2-3 Life expectancy gap between NI and the South Eastern HSC Trust 2006-08.



Source: Project Support Analysis Branch, DHSSPS

Note: Positive numbers indicate that the Trust had relatively lower death rates than NI overall while negative numbers indicate that the Trust had higher death rates than NI.

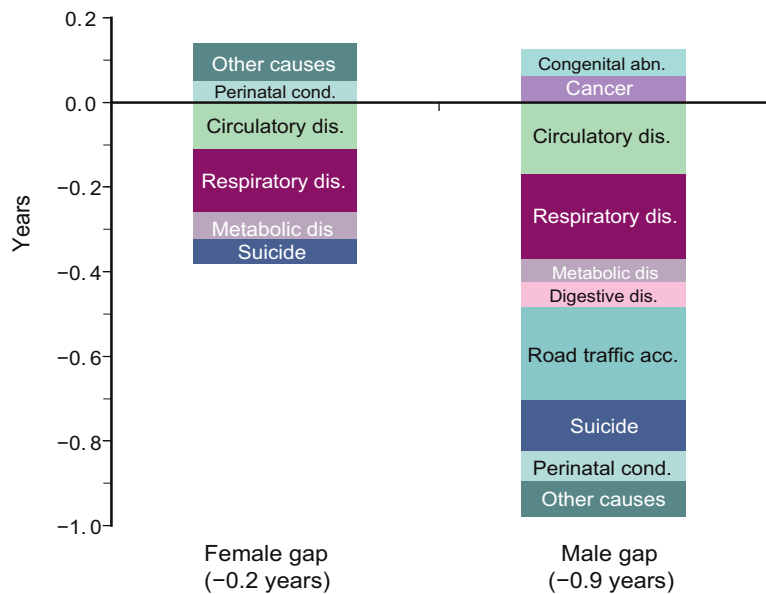
A2-4 Life expectancy gap between NI and the Southern HSC Trust 2006-08.



Source: Project Support Analysis Branch, DHSSPS

Note: Positive numbers indicate that the Trust had relatively lower death rates than NI overall while negative numbers indicate that the Trust had higher death rates than NI.

A2-5 Life expectancy gap between NI and the Western HSC Trust 2006-08.



Source: Project Support Analysis Branch, DHSSPS

Note: Positive numbers indicate that the Trust had relatively lower death rates than NI overall while negative numbers indicate that the Trust had higher death rates than NI.

Appendix 3 - Other mortality definitions

A3-1 Causes of death considered amenable to health care.

Cause of death	Age	ICD10 code
Intestinal Infections	0-14	A00-9
Tuberculosis	0-74	A15-9, B90
Other infections (diphtheria, tetanus, poliomyelitis)	0-74	A36, A35, A80
Whooping cough		A37
Septicaemia	0-74	A40-41
Measles		B05
Malignant neoplasm of colon and rectum	0-74	C18-21
Malignant neoplasm of skin	0-74	C44
Malignant neoplasm of breast	0-74	C50
Malignant neoplasm of cervix uteri	0-74	C53
Malignant neoplasm of cervix uteri and body of uterus	0-44	C54, C55
Malignant neoplasm of testis	0-74	C62
Hodgkin's disease	0-74	C81
Leukaemia	0-44	C91-5
Diseases of the thyroid	0-74	E00-7
Diabetes mellitus	0-49	E10-4
Epilepsy	0-74	G40-1
Chronic rheumatic heart disease	0-74	I05-9
Hypertensive disease	0-74	I10-3, I15
Cerebrovascular disease	0-74	I60-9
All respiratory diseases (excluding pneumonia and influenza)		J00-9, J20-99
Influenza	0-74	J10-11
Pneumonia	0-74	J12-8
Peptic ulcer	0-74	K25-7
Appendicitis	0-74	K35-8
Abdominal hernia	0-74	K40-6
Cholelithiasis and cholecystitis	0-74	K80-1
Nephritis and nephrosis	0-74	N00-7, N17-9, N25-7
Benign prostatic hyperplasia	0-74	N40
Maternal death	All	O00-99
Congenital cardiovascular anomalies	0-74	O20-8
Perinatal deaths, all causes, excluding stillbirths	All	P00-96, A33
Misadventures to patients during surgical and medical care	All	Y60-9, Y83-4
Ischaemic heart disease*	0-74	I20-5

Source: Nolte and McKee (2003)

* Only 50% of IHD deaths are added to the deaths that are amenable to health care total.

A3-2 Causes of deaths attributable to smoking.

Cause of death	ICD10 code	Attributable Percentage	
		Men	Women
Cancer			
Lung	C33 - C34	90%	79%
Upper Respiratory	C32, C14.0	77%	58%
Oesophagus	C15	70%	72%
Bladder	C67	49%	20%
Kidney	C64	41%	7%
Stomach	C16	35%	10%
Pancreas	C25	26%	30%
Unspecified site	C80	33%	7%
Myeloid Leukaemia	C92	19%	10%
Respiratory			
Chronic obstructive lung disease	J44	87%	83%
Pneumonia 35-64	J18	33%	53%
Pneumonia 65+	J18	23%	13%
Circulatory			
Ischaemic heart disease 35-54	120-125	55%	63%
Ischaemic heart disease 55-64	120-125	41%	36%
Ischaemic heart disease 65-74	120-125	25%	18%
Ischaemic heart disease 75+	120-125	9%	5%
Cerebrovascular disease 35-54	160-169	56%	53%
Cerebrovascular disease 55-64	160-169	33%	38%
Cerebrovascular disease 65-74	160-169	16%	31%
Cerebrovascular disease 75+	160-169	4%	2%
Aortic Aneurysm	171	64%	66%
Myocardial Degeneration	151.5	27%	18%
Atherosclerosis	170	21%	21%
Digestive			
Stomach/Duodenum Ulcer	K25-26	53%	59%
Diseases Prevented by Smoking			
Parkinson's disease	G20	-51%	-30%
Endometrial cancer	C54	NA	-16%

Source: NISRA

A3-3 Causes of deaths attributable to alcohol.

Description	ICD10 code
Mental and Behavioural disorders due to use of alcohol	F10
Degeneration of the nervous system due to alcohol	G31.2
Alcoholic polyneuropathy	G62.1
Alcoholic cardiomyopathy	I42.6
Alcoholic gastritis	K29.2
Alcoholic liver disease	K70
Chronic hepatitis, not elsewhere classified	K73
Fibrosis and cirrhosis of liver (Excluding K74.3-K74.5-Biliary cirrhosis)	K74
Alcohol induced chronic pancreatitis	K86.0
Accidental poisoning by and exposure to alcohol	X45
Intentional self-poisoning by and exposure to alcohol	X65
Poisoning by and exposure to alcohol, undetermined intent	Y15

Source: NISRA



Also available from NI Health & Social Care Inequalities Monitoring System (NIHSCIMS)

NIHSCIMS Third Update Bulletin 2009

Regional analysis on health inequalities between the most deprived areas and Northern Ireland overall as well as between rural areas and Northern Ireland overall.

www.dhsspsni.gov.uk/index/stats_research/stats-equality.htm

NIHSCIMS Sub-regional Inequalities - HSC Trusts 2010

Sub-regional analysis at HSC Trust level examining health inequality gaps within each Trust as well as compared to the Northern Ireland average.

www.dhsspsni.gov.uk/index/stats_research/stats-equality.htm

Accessibility to services 2010

Average travel time to health and social care services (e.g. maternity unit, nursing home) for areas such as the most and least deprived areas, rural areas, Trusts etc. compared with the NI average.

Information available on request from healthinequalities@dhsspsni.gov.uk

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www.dhsspsni.gov.uk/index/stats_research/stats-equality.htm