

Life expectancy

Ref

Why is it important?

Life expectancy and mortality can be used as important measures of the overall health of County Durham's population, and as an indicator of inequality both between and within areas. Reductions in premature mortality over time can demonstrate improvement in the health status of the population as a whole, and result in increases in life expectancy. Reducing health inequalities and early deaths are encompassed in the three strategic priorities of the County Durham Joint Health and Wellbeing Strategy. In order to achieve these strategic priorities focus must include action to address the social determinants of health. The extensive evidence base on health inequalities demonstrates the need for policy makers to focus actions on the social determinants of health as the most effective way of addressing the issue (Marmot, 2010).

Life expectancy tells us how long a child born today would be expected to live, if they experienced the current mortality rates of the area they were born in throughout their lifetime. There are a number of ways of expressing life expectancy; at birth, at age 65, healthy life expectancy (HLE) and disability-free life expectancy (DFLE). Mortality can also be used as an effective measure of health and wellbeing and inequality within and between areas. High rates of premature mortality are indicative of poor health and wellbeing within an area.

As life expectancy continues to increase in County Durham it is important to determine whether these additional years of life are being spent in good health or prolonged poor health and dependency. Healthy life expectancy adds a quality of life dimension to life expectancy. Healthy life expectancy at birth is the average number of years a person would expect to live in good health based on contemporary mortality rates and prevalence of self-reported good health. It is an estimate of lifetime spent in 'very good' or 'good' health, based on how individuals perceive their general health, taking account of the quality as well as the length of life. Healthy life expectancy is an important summary measure of mortality and morbidity.

Disability free life expectancy (DFLE) is the average number of years a person could expect to live without illness or a health problem that limits daily activities. It estimates a lifetime free from a limiting persistent illness or disability. DFLE is closely linked to deprivation and the social determinants of health. Those people living in the most deprived communities will spend more of their shorter lives in poor health, from illnesses such as diabetes, chronic obstructive pulmonary disorder (COPD), cardio-vascular disease (CVD) or cancer. The inequality at birth indicator illustrates the range of DFLE across an area from the most affluent to most deprived areas.

This importance is reflected in life expectancy being included in two overarching outcomes of the Public Health Outcomes Framework (PHOF):

Outcome 1: Increased healthy life expectancy.

Outcome 2: Reduced differences in life expectancy and healthy life expectancy between communities.

Geographical variations in life expectancy can largely be accounted for by individual and area-based deprivation. There is a clear social gradient to many measures of health, including life expectancy. The more deprived an area is, the poorer the health outcomes. The Marmot Review (2010) showed that people living in the most deprived areas will on average, die seven years earlier than people living in the least deprived areas. The difference in disability-free life expectancy is even greater, with the average difference between the most and least deprived areas being 17 years. This means that those living in the most deprived areas not only die sooner, but they will also spend more of their lives living with a disability. For society to have a healthy population it is essential to take action to both raise the general level of health and flatten the social gradient. This section expands why the topic is of strategic importance to the County Durham Partnership or specific thematic partnerships.

Summary

Life Expectancy

Life Expectancy for men and women has been improving over time. However, life expectancy remains worse than the England average. Health inequalities remain persistent and pervasive.

- Men:
 - 74.9 - 2001/03
 - 78.3 - 2015/17 (England: 79.6)
- Women:
 - 79.2 - 2001/03
 - 81.4 - 2015/17 (England: 83.1)

Healthy Life Expectancy

- Healthy life expectancy at birth is lower than England
- Whilst healthy life expectancy in males has shown little change over time since 2009/11, it has decreased in females from a high of 60 in 2009/11 to 58.7 in 2015/17.
- The absolute gap between life expectancy and healthy life expectancy in County Durham is increasing. Both men and women are living 1.2 years longer in poor health than they did in 2009/11.

Levels of deprivation and rates of premature mortality are higher

For men:

- Around one quarter of the gap between County Durham and England (25.9%) is caused by higher rates of mortality from external causes (including death by injury, poisoning and suicide).

For women:

- Around one-third of the gap between County Durham and England (31.3%) is caused by higher rates of cancer mortality.

Inequality

There is inequality in life expectancy between County Durham and England.

The relative gap between County Durham and England has seen little variation over time. It now stands at 1.6% for men and 2% for women.

Durham data – the local picture and how we compare

Life Expectancy

People in County Durham are living longer. Life expectancy for men and women has been improving over time (figure 1 & 2).

Although, life expectancy in women decreased from a high of 81.5 in 2010/12 to a low of 81.2 in 2013/15, it is now increasing and currently stands at 81.4

Men have a significantly lower life expectancy than women in County Durham.

Life expectancy at birth in County Durham (2015-17) remains significantly lower than England for both men and women (figure 2).

Life expectancy has been improving over time in County Durham for men and women. Compared to 2001-03, men in County Durham now live 3.4 years longer, and women live 2.2 years longer (figure 3)

Figure 1: Life expectancy figures, men and women, County Durham and England (2009/11, 2012/14, 2015-17). Source: PHOF, PHE.

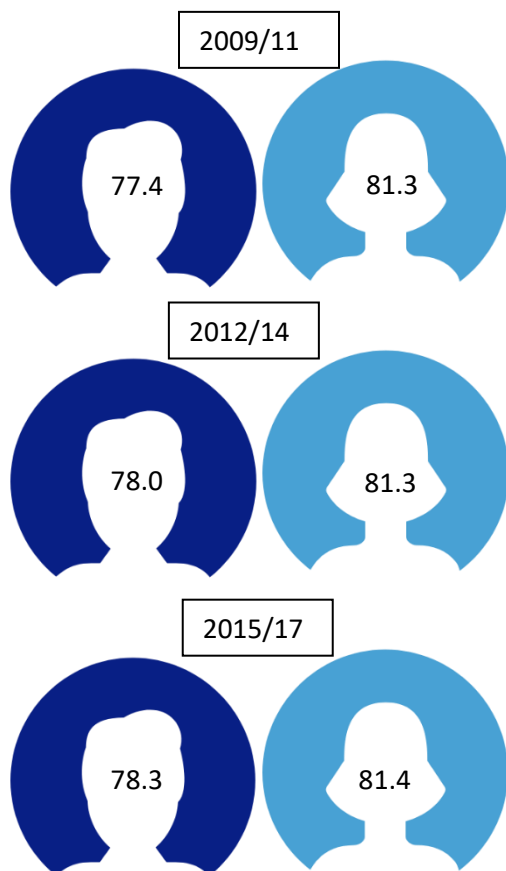
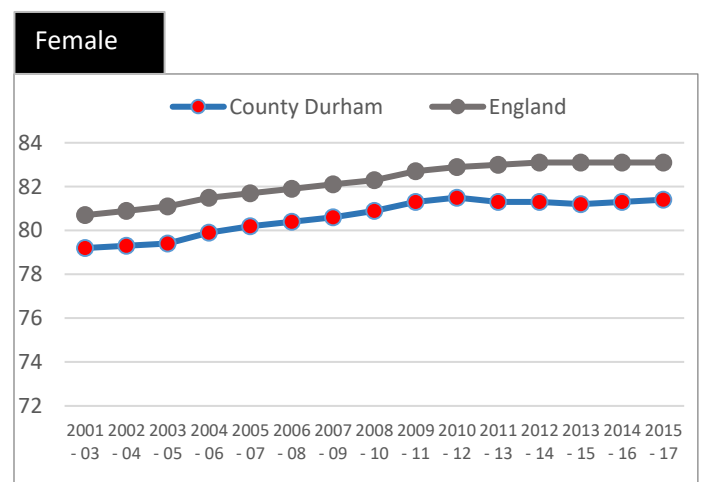
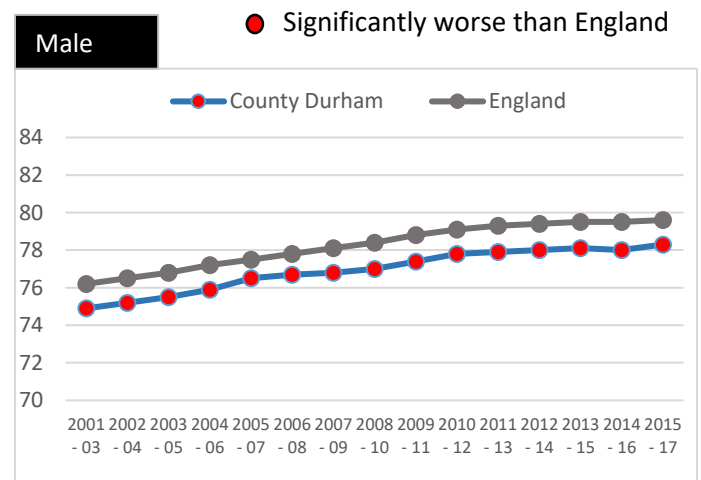


Figure 2: Life expectancy at birth over time, men and women, County Durham and England, 2001-2003 to 2015-17. Source: Public Health Outcomes Framework (PHOF), Public Health England (PHE).



Health Life Expectancy

Healthy life expectancy is the number of years one might to expect living in good health.

Male and female healthy life expectancy in County Durham are not significantly different (figure 3).

Whist healthy life expectancy in males has shown little change over time since 2009/11, It has decreased in females from a high of 60 in 2009/11 to 58.7 in 2015/17 (figure 3).

Healthy life expectancy at birth in County Durham (2015-17) remains significantly lower than England for both men and women (figure 4).

The absolute gap between life expectancy and healthy life expectancy in County Durham is increasing (figure 5). Both men and women are living 1.2 years longer in poor health than they did in 2009/11.

Figure 3: Healthy Life expectancy at birth, men and women, County Durham, North East and England (2009/11, 2012/14,(2015-17). Source: PHOF, PHE.

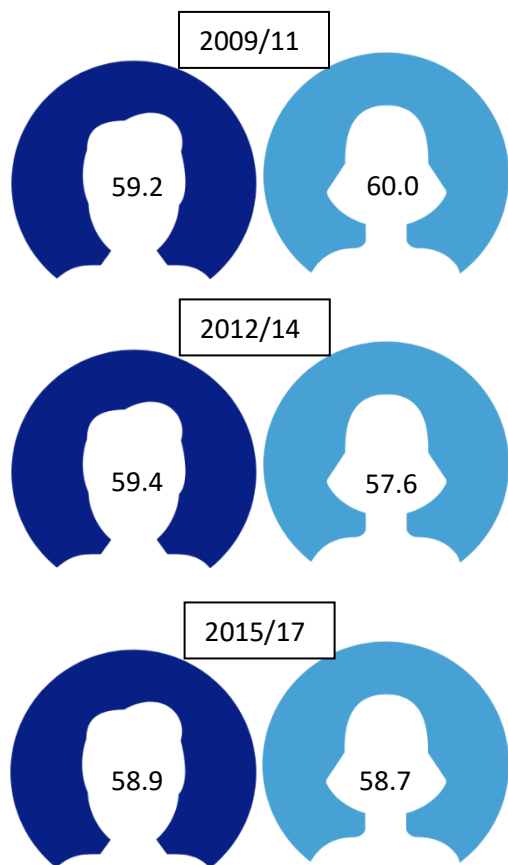


Figure 4: Healthy life expectancy over time, male and female, County Durham and England, 2009-11 and 2015-17. Source: PHOF, PHE.

● Significantly worse than England

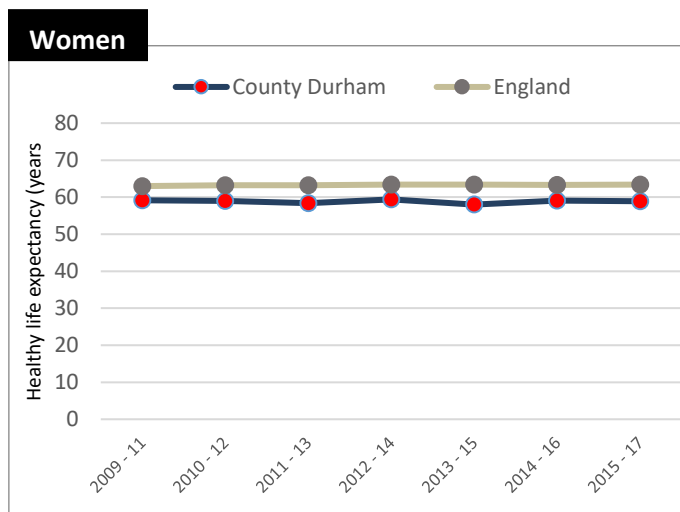
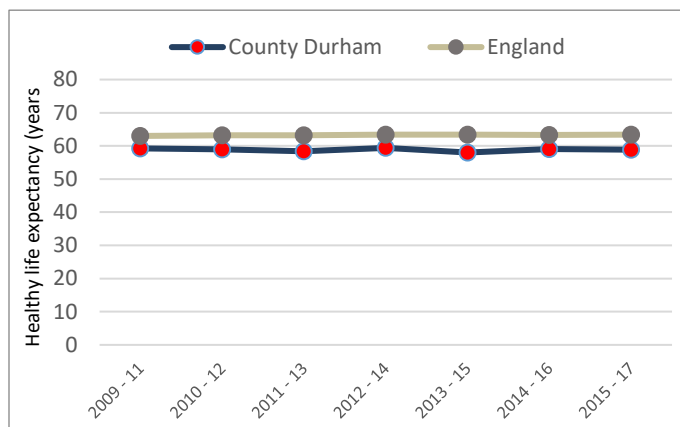
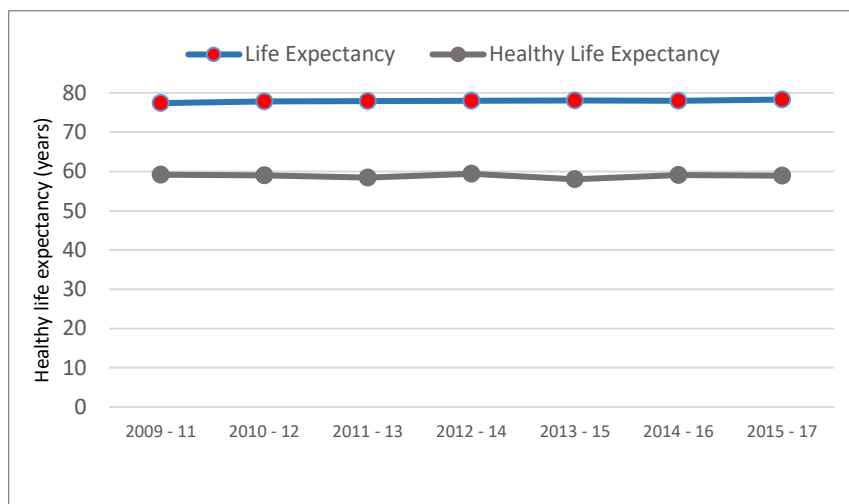


Figure 5: The gap between life expectancy and healthy life expectancy over time, male and female, County Durham 2009-11 to 2015-17. Source: PHOF, PHE.



Health inequality gaps in life expectancy

Absolute health inequality gaps between England and County Durham are the difference between the value for England and the value for County Durham for any given indicator.

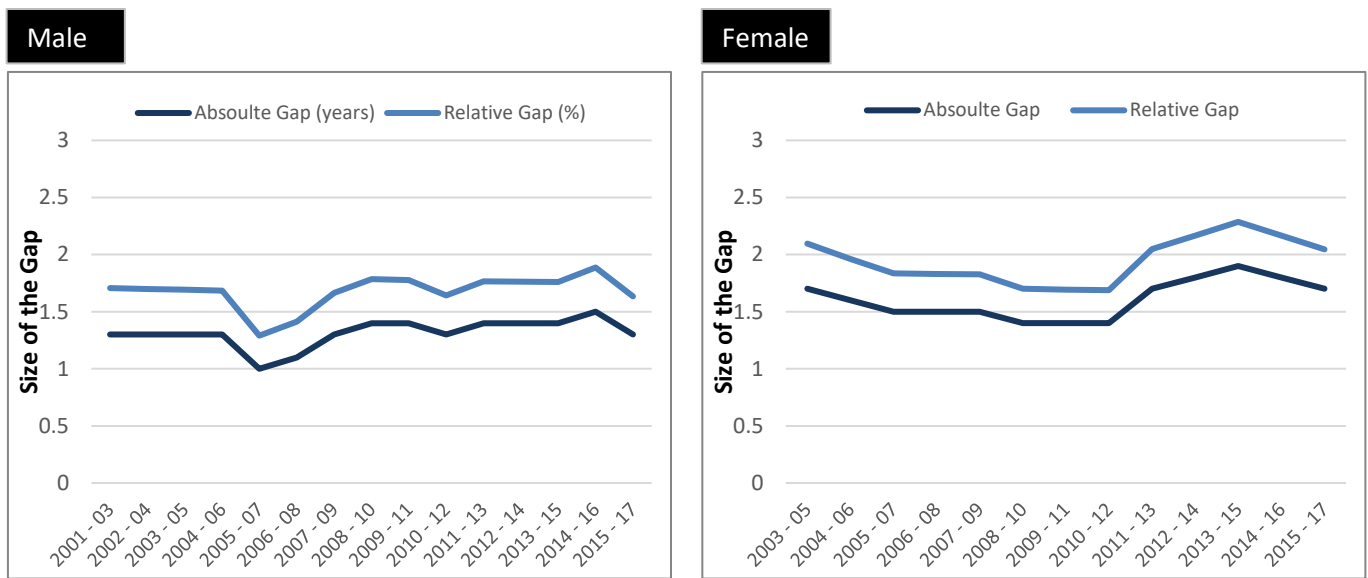
For example, for male life expectancy (2015-17), the England value is 79.6 years compared to 78.3 years for County Durham, so the absolute gap is -1.3 years (Table 1). In order to allow comparison between different measures, the relative inequality gap is used. This is calculated by dividing the absolute gap (as described above) by the value in the standard or less deprived area, in this case England. A relative gap closer to 0 indicates less inequality.

Table 1: Comparing life expectancy and absolute and relative inequality gaps, men and women, County Durham and England, 2001-03 and 2015-17. Source: PHOF, PHE.

Life expectancy (years)		Men	Women
Life expectancy at birth in County Durham	2015-17	78.3	81.4
Life expectancy at birth in England	2015-17	79.6	83.1
Absolute gap in life expectancy between County Durham and England (years)	2015-17	1.3	1.7
Relative gap (%)	2015-17	1.6%	2.0%
Life expectancy at birth in County Durham	2001-03	74.9	79.2
Life expectancy at birth in England	2001-03	76.2	80.7
Absolute gap in life expectancy between County Durham and England (years)	2001-03	1.3	1.5
Relative gap (%)	2001-03	1.6%	1.8%

- The relative gap in life expectancy at birth between County Durham and England is 1.6% for men and 2.0 % for women. This has seen little variation over time, meaning the relative gap between County Durham and England has not closed in terms of life expectancy at birth. Using male life expectancy as an example, the absolute gap between County Durham and England is 1.3 (the absolute gap in years) divided by 79.6 (life expectancy for England), which expressed as a percentage is 1.6% (relative gap).

Figure 6: Absolute and relative gaps in life expectancy at birth over time, men and women, County Durham and England, 2001-03 to 2015-17. Source: PHOF, PHE.



- The size of the absolute and relative gap in life expectancy between County Durham and England has seen little change over time for both men and women (figure 6).

For male healthy life expectancy (2015-17), the England value is 63.4 years compared to 58.9 years for County Durham, so the absolute gap is -4.5 years (Table 2).

In order to allow comparison between different measures, the relative inequality gap is used. This is calculated by dividing the absolute gap (as described above) by the value in the standard or less deprived area, in this case England. A relative gap closer to 0 indicates less inequality

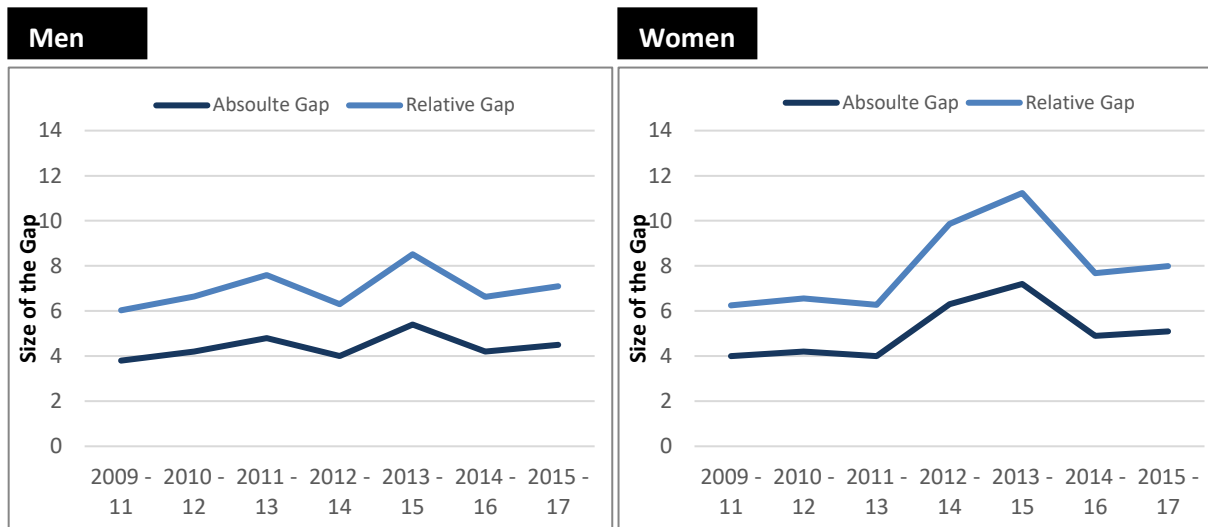
Table 2: Comparing healthy life expectancy and absolute and relative inequality gaps, male and female, County Durham and England, 2009-11 and 2015-17. Source: PHOF, PHE.

Healthy life expectancy (HLE) (years)		Men	Women
HLE at birth in County Durham	2015-17	58.9	58.7
HLE at birth in England	2015-17	63.4	63.8
Absolute gap in HLE between County Durham and England (years)	2015-17	4.5	5.1
Relative gap (%)	2015-17	7.1	8
HLE at birth in County Durham	2009-11	59.2	60
HLE at birth in England	2009-11	63	64
Absolute gap in HLE between County Durham and England (years)	2009-11	3.8	4
Relative gap (%)	2009-11	6	6.3

- The relative gap in healthy life expectancy at birth between County Durham and England is 7.1% for men and 8 % for women. For men the gap has grown over time, from 6% in 2009-11 to 7.1% in 2015-17, meaning the relative gap between County Durham and England has increased in terms of healthy life expectancy at birth.

- For women this gap has grown over time, from 6.3% in 2009/11 to 8% in 2015/17. Using female healthy life expectancy as an example, the absolute gap between County Durham and England is 5.1 (the absolute gap in years) /63.8 (life expectancy for England), which expressed as a percentage is 8%.

Figure 7: Absolute and relative gaps in healthy life expectancy at birth over time, men and women, County Durham and England, 2009-11 to 2015-17. Source: PHOF, PHE.



- The size of the absolute and relative gap in healthy life expectancy between County Durham and England has increased for both men and women since 2009/11. There were increases in 2013-15, the gaps then decreased in 2014-16 but have climbed again in 2015-17 and still remain higher than 2009-11 levels (figure 7).

There is a negative relationship between deprivation and life expectancy in County Durham. (figure 8)

A positive correlation coefficient means that as one variable is increasing the value for the other variable is also increasing – the line on the graph slopes up from left to right. Height and weight have a positive correlation: children get heavier as they grow taller.

A negative correlation coefficient means that as the value of one variable goes up the value for the other variable goes down – the graph slopes down from left to right. Higher deprivation associated with lower life expectancy, giving a negative correlation between the two variables.

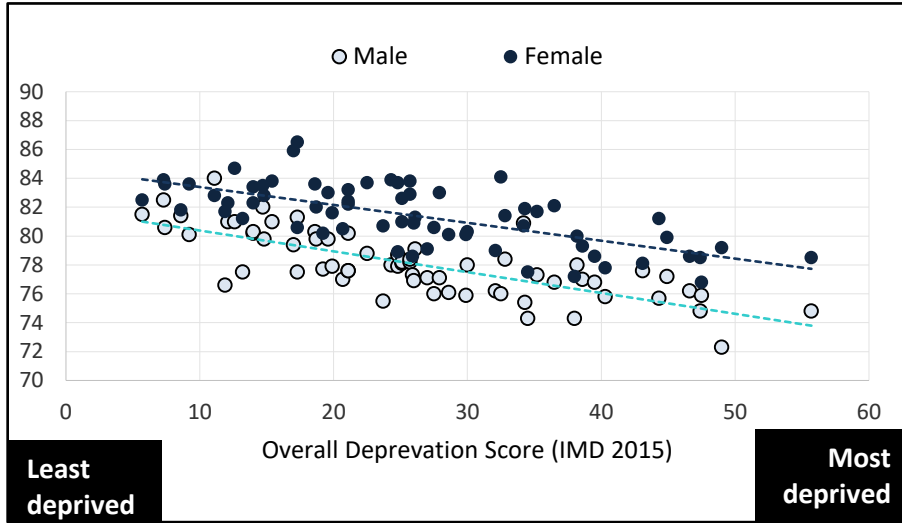
There is also inequality in life expectancy within County Durham. The distribution of male and female life expectancy by MSOA (middle super output area) is unequal in County Durham, it is lower in the most deprived areas (figure 9).

The correlation co-efficient (CC) measures the strength and direction of a linear relationship between two quantitative variables. There is a strong relationship between male and female life expectancy and deprivation in County Durham (male cc=0.8, female cc=0.7).

-1 or +1 = perfect, 0.7 to 1 = strong, 0.3 to 0.7 = moderate, 0 to 0.3 = weak

The Slope Index of Inequality (Sii) in life expectancy is a single measure representing the size of the gap in life expectancy between the most and least deprived areas (deciles, or 10%) of a population. It provides a consistent measure of health inequalities across populations and takes into account the position of all groups across the [social] gradient simultaneously.

Figure 8: Life expectancy at birth for male and females, by County Durham MSOAs and IMD2015 deprivation score (overall), 2013-17. Source: ONS, 2015



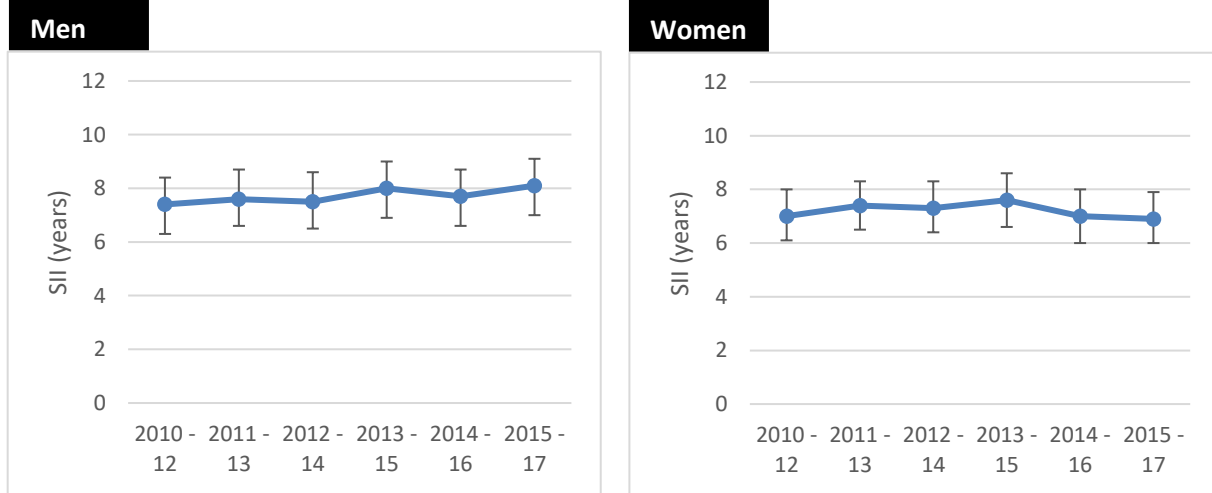
Male CC=0.8

Female CC=0.7

Strength of relationship (correlation co-efficient):
 -1 or +1 = perfect
 0.7 to 1 = strong
 0.3 to 0.7 = moderate
 0 to 0.3 = weak

NB: The y axis (Life Expectancy – years) does not go to 0.

Figure 9: Slope index of inequality in life expectancy at birth within County Durham, with 95% confidence intervals, men and women, based on local deprivation deciles. Source: PHOF, PHE.



- The gap between the most deprived and least deprived areas within County Durham is 8.1 years for men and 6.9 years for women (figure 9).
- These inequality gaps in life expectancy within County Durham have not changed significantly over time for men or women.

Segmenting life expectancy by cause of death

Public Health England's 'Segment Tool' provides information on life expectancy and the causes of death that are driving inequalities in life expectancy at national, regional and local area levels. Targeting the causes of death which contribute most to the life expectancy gap should have the biggest impact on reducing inequalities.

For men and women, the tool provides data tables and charts showing the breakdown of the life expectancy gap in 2015-17 for two comparisons:

1. The gap between the Local Authority as a whole and England as a whole (figure 10).
2. The gap between the most deprived quintile and the least deprived quintile within the Local Authority (figure 11).

The gap between County Durham and England

The PHE Segment Tool (figure 10) shows the main contributors to the lower life expectancy in County Durham compared to England. It illustrates that:

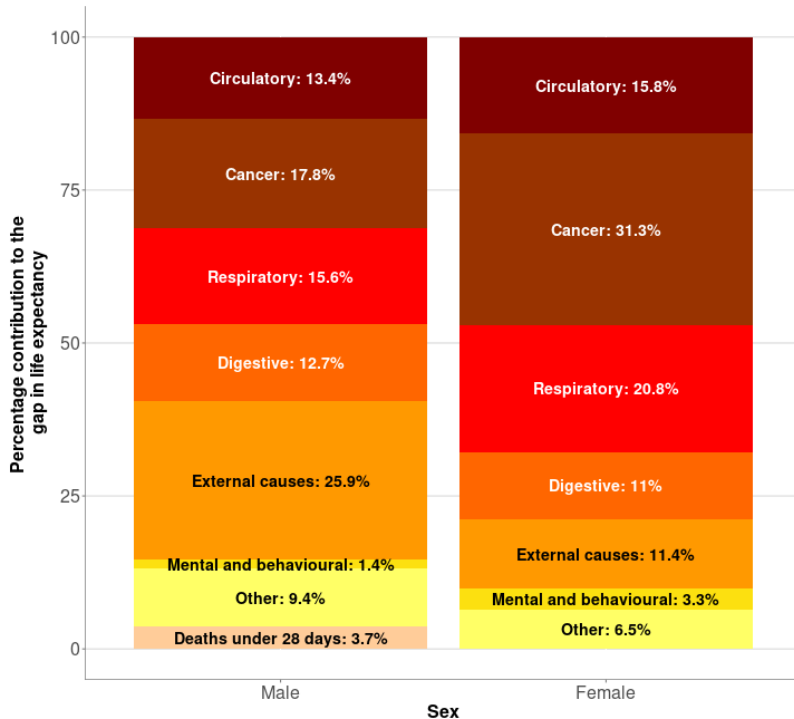
For men:

- Around one quarter of the gap between County Durham and England (25.9%) is caused by higher rates of mortality from external causes (including death by injury, poisoning and suicide).
- Around one-fifth of the gap between County Durham and England (17.8%) is caused by higher rates of cancer mortality.
- Respiratory disease mortality accounts for 15.6% of the gap between County Durham and England.

For women:

- Around one-third of the gap between County Durham and England (31.3%) is caused by higher rates of cancer mortality.
- Respiratory mortality accounts for just one-quarter (20.8%) of the gap between County Durham and England.
- Circulatory mortality accounts for 15.8% of the gap between County Durham and England.

Figure 10: Scarf chart showing the breakdown of the life expectancy gap between County Durham as a whole and England as a whole, by broad cause of death, 2015-17. Source: PHE Segment Tool, 2019.



For men external causes and cancer are the biggest contributors to the life expectancy gap between County Durham and England. There were 216 excess male cancer deaths¹ in the period 2015-17 and 82 excess male deaths for external causes (table 3). Respiratory disease accounts for the third largest contribution to the male life expectancy gap (15.6%) and was responsible for 189 excess deaths in the same period.

For women, cancer and respiratory conditions are the biggest contributors to the life expectancy gap between County Durham and England. There were 349 excess female cancer deaths in the period 2015-17, and 318 excess female deaths for respiratory disease. Circulatory disease accounts for the third largest contribution to the female life expectancy gap (15.8%) and was responsible for 276 excess deaths in the same period.

Table 3: Breakdown of the life expectancy gap between County Durham as a whole and England as a whole, by broad cause of death, 2015-17. Source: PHE Segment Tool, 2019.

Broad Cause of Death	Male				Female			
	Number of deaths in local authority	Number of excess deaths in local authority	Number of years of life gained/lost*	Contribution to the gap (%)	Number of deaths in local authority	Number of excess deaths in local authority	Number of years of life gained/lost*	Contribution to the gap (%)
Circulatory	2,104	130	0.17	13.4	2047	276	0.29	15.8
Cancer	2493	216	0.23	17.8	2300	349	0.57	31.3
Respiratory	1196	189	0.2	15.6	1338	318	0.38	20.8
External Cause	417	82	0.33	25.9	267	63	0.21	11.4

¹Excess deaths are the number of 'extra' deaths that occur in an area because it has a higher mortality rate for that cause of death than the comparator area. If these deaths were prevented, then the contribution of that cause of death to the overall life expectancy gap would be eliminated.

The gap within County Durham

The PHE Segment Tool (figure 11) also shows the main contributors to the lower life expectancy in the more deprived areas of County Durham, compared to the less deprived areas (the gap between the most deprived quintile [20%] of the selected local authority and the least deprived quintile of the local authority). It illustrates that:

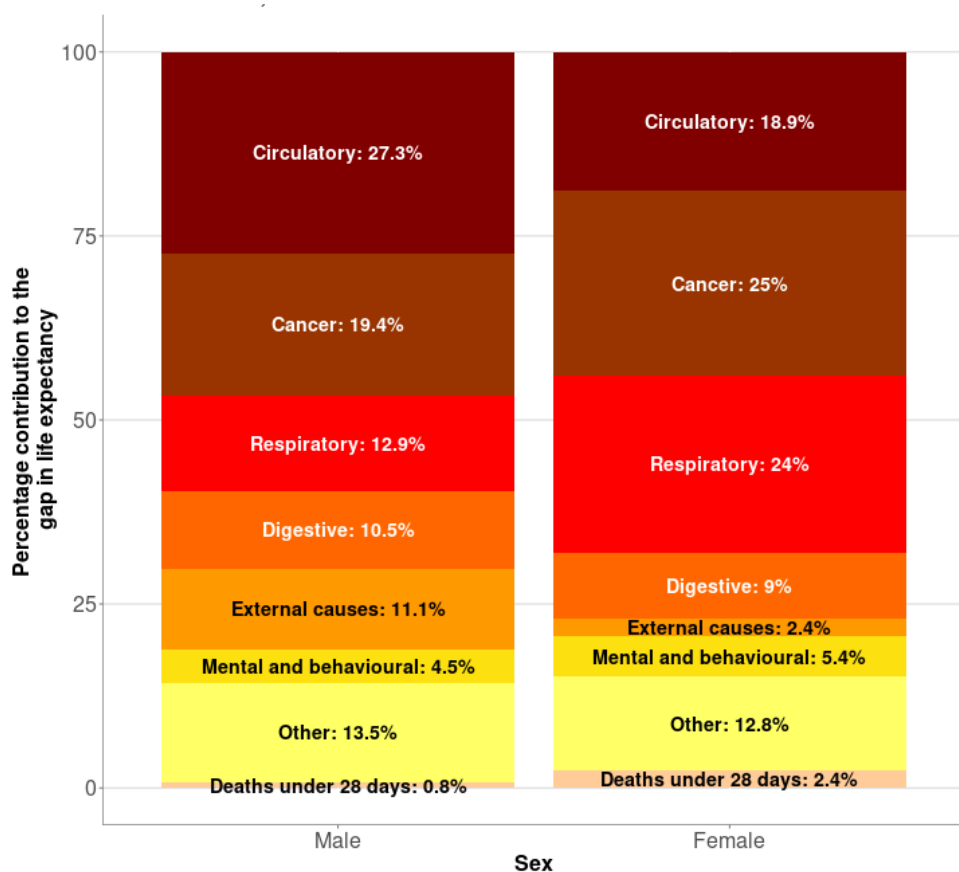
For men:

- Around one-quarter (27.3%) of the gap between the most and least deprived communities in County Durham is caused by higher rates of circulatory disease.
- Cancer mortality is the second biggest contributor to the gap between the least and most deprived in County Durham for men (19.4%) followed by respiratory disease (12.9%).

For women:

- One quarter (25%) of the gap between the most and least deprived communities in County Durham is caused by higher rates of cancer mortality.
- Respiratory disease is the second biggest contributor to the gap between the least and most deprived in County Durham (24%) followed by circulatory (18.9%).

Figure 11: Scarf chart showing the breakdown of the life expectancy gap between the most and least deprived quintiles in County Durham, %, by broad cause of death, 2015-17. Source: The Segment Tool, PHE, 2019.



The PHE Segment Tool shows the relative contribution to the difference in life expectancy made by various causes of death 1) between County Durham and England and 2) between the most and least deprived areas of County Durham. Results for County Durham illustrate the key role played by avoidable causes of death such as coronary heart disease and lung cancer on inequalities in life expectancy. It should be noted that deaths in younger people contribute to a larger proportion of the gap, as more years of life are lost.

Groups most at risk

Life expectancy and premature mortality are closely linked. Simply put, the healthier people are, the longer they are likely to live, and live in good health. Areas with low life expectancy will experience relatively high rates of premature mortality. Variations in life expectancy linked to deprivation are associated with variations in morbidity and mortality from different conditions or diseases. Long term conditions, such as CHD, stroke and cancer, are among the leading causes of premature mortality in County Durham and make a major contribution to the life expectancy gap between County Durham and England as a whole (for further see the 'Health inequalities and social determinants of health' and 'premature and preventable mortality' factsheets). In addition to those with long term conditions some people are more vulnerable to shorter life expectancy, and healthy life expectancy, than others. These groups include:

Men

Women are likely to live longer lives both locally and nationally. Life expectancy for women in County Durham is currently 81.4 years, 3.1 years longer than their local male counterparts. However, this gap between men and women in County Durham has been reducing slowly over time (PHE Public Health Outcomes Framework).

People living in poverty

There is a clear social gradient nationally and locally in life expectancy i.e. lower life expectancy and higher mortality rates in the more deprived areas. There is a correlation between deprivation and life expectancy for men and women in County Durham with the gap in life expectancy between the most and least deprived areas being 8.1 years for men and 6.9 years for women.

Vulnerable groups

Vulnerable and disadvantaged groups are disproportionately affected by health inequalities with the result being reduced life expectancy. This can affect various groups and communities including; black and minority ethnic groups; those living with a disability; people with poor mental health or learning difficulties; lesbian, gay, bisexual, transgender (LGBT) people; Gypsies, Roma and Travellers (GRT); asylum seekers and refugees; carers; ex service personnel. These groups are more likely to have poor access

People living in poverty

People from lower socio-economic groups have increased risk of developing a long term illness, and premature mortality is strongly associated with deprivation. Health inequalities are apparent for virtually all causes of death, with people living in poverty more likely to die younger.

Smokers

Smoking is the behaviour with the strongest association with premature death and shorter life expectancy, particularly in relation to heart disease, lung cancer and respiratory conditions. Smoking is the biggest single contributor to the shorter life expectancy experienced locally and contributes substantially to the cancer burden. Smoking has been identified as the single biggest cause of inequality in death rates between rich and poor in the UK. Death rates from tobacco are two to three times higher among disadvantaged social groups than among the better off (ASH, 2012).

People with poor access to health services

Timely and appropriate access to health services can be a major factor in premature death.

People living in poor quality housing

Housing conditions are associated with premature death and are a particular factor when it comes to respiratory conditions and accidents.

People with excess weight and low levels of physical activity

Obesity and physical activity are risk factors for premature death, particularly in relation to heart disease and stroke.

People with alcohol and/or substance misuse problems

Substance misuse increases the likelihood of premature death, both from health conditions and due to accidents or suicide.

Risk-taking behaviours

Risky sexual behaviours, dangerous driving and failing to adequately protect in the sun can increase the likelihood of premature death.

Those who are reluctant to seek help

A reluctance to seek help from health professionals can lead to later detection of disease and a greater likelihood of ill health and death.

How does this topic link to our strategies and plans?

Life expectancy, healthy life expectancy and disability free life expectancy can be used as indicators of inequality between and within areas. Improvements in these measures over time can demonstrate improvement in the health status of the population as a whole and result from reducing levels of premature mortality.

Improving life expectancy, and reducing inequality in life expectancy, is a cross cutting theme which is reflected and referenced in many strategies and plans for County Durham. For example

- County Durham Joint Health and Wellbeing Strategy 2016-2019
- Children, Young People and Families Plan 2015-18
- Durham County Council CAS Service Plan 2016-19
- Safe Durham Partnership Plan 2015-18
- Sustainable Community Strategy 2014-2030

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Approver: Public Health SMT

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Data sources:

[**Public Health Outcomes Framework, Public Health England \(PHE\)**](#)

PHE Segment Tool

Slope index of inequality (SII) in life expectancy (LE) at birth by sex for Upper Tier Local Authorities (UTLAs) in England, 2009 to 2013, ONS