

Statistical bulletin

# Health state life expectancies, UK: 2017 to 2019

The number of years people are expected to spend in different health states among local authority areas in the UK.



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Release date:  
25 January 2021

Next release:  
To be announced

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# 1 . Main points

- This release is calculated based on figures prior to the coronavirus (COVID-19) pandemic and will not reflect the impact of the pandemic on health state life expectancies.
- In 2017 to 2019 healthy life expectancy (HLE) at birth in the UK for males was 62.9 years, showing no significant change since 2014 to 2016; however, HLE for females showed a significant decrease from 63.7 years in 2014 to 2016 to 63.3 years in 2017 to 2019.
- The gap in years lived in good health between males and females has narrowed since 2009 to 2011, largely as a result of female HLE being lower in subsequent periods.
- In 2017 to 2019, disability free life expectancy (DFLE) in the UK was 62.3 years for males and 61.0 years for females; there was a significant decrease of more than a year in DFLE since 2014 to 2016 for females, but no significant change was observed for males.
- Unlike at birth, there was a statistically significant increase in HLE at age 65 years for males in the UK rising from 10.2 years in 2014 to 2016 to 10.4 years in 2017 to 2019; female HLE also increased from 10.8 years to 11.0 years between the same periods but this was not statistically significant.
- DFLE at age 65 years in the UK showed no significant changes in 2017 to 2019 for either sex, at 9.7 years for males and 9.6 years for females.

## 2 . Health state life expectancies at birth in the UK

### Summary of latest national health state life expectancies

For the most recent changes mentioned throughout this release we have generally compared the years 2014 to 2016 and 2017 to 2019, as these are the latest non-overlapping periods used in estimating health state life expectancies. For data at a sub-national level please see [accompanying dataset](#). Please note this release focuses on healthy life expectancy and disability free life expectancy figures; for a complete breakdown of life expectancy figures please refer to the [Life expectancy for local areas of the UK: between 2001 to 2003 and 2017 to 2019 release](#).

Any change mentioned throughout this release is deemed to be statistically significant unless otherwise stated.

Table 1: Summary statistics of latest healthy life expectancy estimates; UK and countries, 2017 to 2019

	<b>Males</b>			<b>Females</b>		
	<b>Healthy life</b>	<b>Change since 2014 to 2016</b>		<b>Healthy life</b>	<b>Change since 2014 to 2016</b>	
		<b>Months</b>	<b>Weeks</b>		<b>Months</b>	<b>Weeks</b>
<b>UK</b>	62.9	-1.7	-7.3	63.3	* -4.6	-19.8
<b>England</b>	63.2	-1.6	-6.8	63.5	-3.5	-15.1
<b>Wales</b>	61.2	-4.9	-21.4	62.1	-6.0	-26.1
<b>Scotland</b>	61.7	-6.5	-28.2	61.9	* -16.4	-71.5
<b>Northern Ireland</b>	61.2	9.8	42.8	62.2	-3.2	-14.1

Source: Office for National Statistics

#### Notes

1. \* denotes countries where healthy life expectancy has changed significantly either positively or negatively from 2014 to 2016 based on non-overlapping confidence intervals.
2. Gain in healthy life expectancy in months was calculated by subtracting healthy life expectancy at birth in 2014 to 2016 from that in 2017 to 2019 and multiplying by 365.25 and dividing by the average days per month factor 30.4375.
3. Gain in healthy life expectancy in weeks was calculated by subtracting healthy life expectancy at birth from 2014 to 2016 from 2017 to 2019 and multiplying by 52.1786.

Table 2: Summary statistics of latest disability-free life expectancy estimates; UK and countries, 2017 to 2019

	Males		Females			
	Disability-free life Expectancy in 2017 to 2019 (years)	Change since 2014 to 2016		Disability-free life Expectancy in 2017 to 2019 (years)	Change since 2014 to 2016	
		Months	Weeks		Months	Weeks
<b>UK</b>	62.3	-2.8	-12.0	61	* -12.5	-54.3
<b>England</b>	62.7	-1.9	-8.3	61.2	* -12.6	-54.8
<b>Wales</b>	59.6	-5.0	-21.9	59.1	-2.8	-12.0
<b>Scotland</b>	60.9	* -11.6	-50.6	60.1	* -17.9	-77.7
<b>Northern Ireland</b>	60.4	1.1	4.7	61.1	-4.2	-18.3

Notes

1. \* denotes countries where disability-free life expectancy has changed significantly either positively or negatively from 2014 to 2016 based on non-overlapping confidence intervals.
2. Gain in disability-free life expectancy in months was calculated by subtracting disability-free life expectancy at birth in 2014 to 2016 from that in 2017 to 2019 and multiplying by 365.25 and dividing by the average days per month factor 30.4375.
3. Gain in disability-free life expectancy in weeks was calculated by subtracting disability-free life expectancy at birth from 2014 to 2016 from 2017 to 2019 and multiplying by 52.1786.

**Female healthy life expectancy (HLE) at birth was significantly lower in 2017 to 2019 compared with 2014 to 2016, which acted to further reduce the gap in the years lived in good health between males and females**

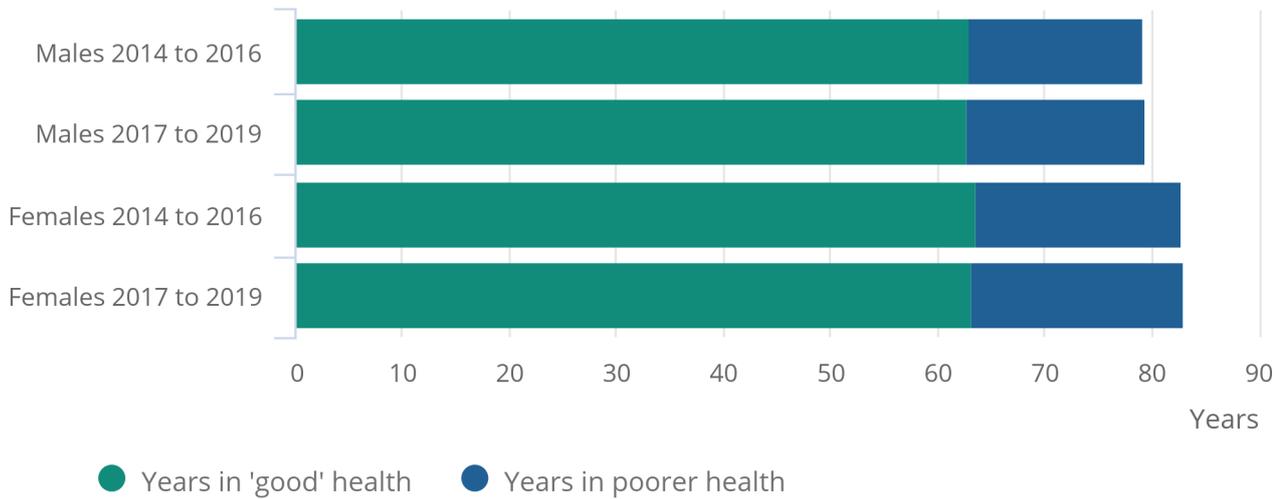
Although (HLE) at birth among females in the UK decreased from 63.7 years in 2014 to 2016 to 63.3 years in 2017 to 2019, they continue to report higher HLE than males (Figure 1). HLE at birth for males in the UK in 2017 to 2019 was 62.9 years, a small not statistically significant fall since 2014 to 2016.

**Figure 1: Healthy life expectancy for females at birth has significantly decreased since 2014 to 2016**

Healthy life expectancy, UK, 2014 to 2016, 2017 to 2019

Figure 1: Healthy life expectancy for females at birth has significantly decreased since 2014 to 2016

Healthy life expectancy, UK, 2014 to 2016, 2017 to 2019



Source: Office for National Statistics

Notes:

1. Survey respondents who answered their general health as “very good” and “good” were classified as having good health. Those who answered “fair”, “bad” and “very bad” were classified as having poorer health.

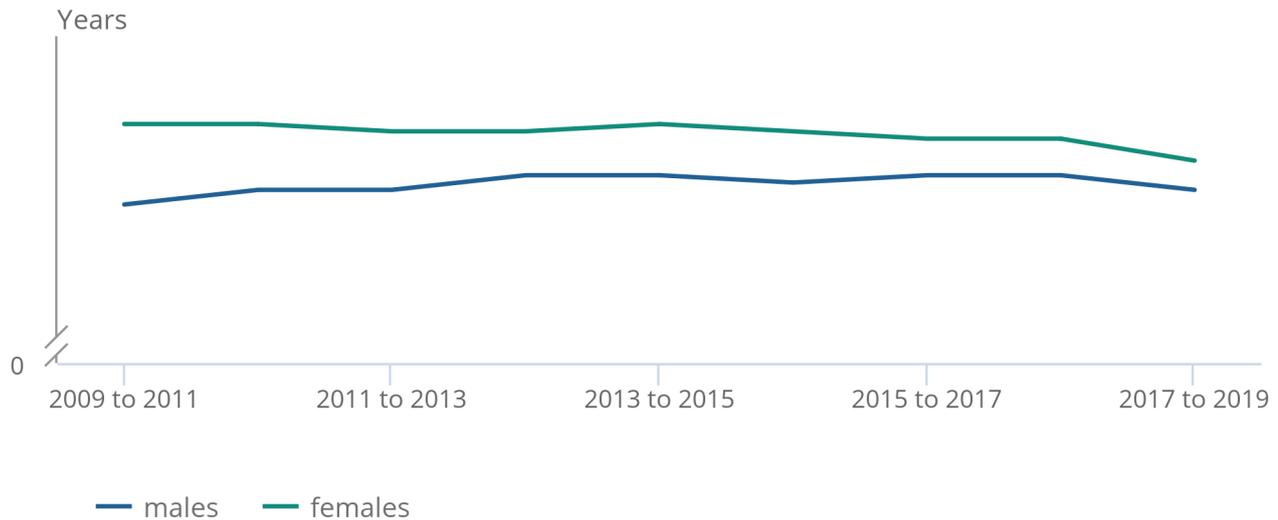
Female HLE in 2017 to 2019 was almost five months shorter than in 2014 to 2016, and the lowest it has been since the time series began in 2009 to 2011. In 2009 to 2011 there was a difference of 1.1 years between male and female HLE at birth. Since then female HLE has declined, while male HLE remains higher in 2017 to 2019 than it was in 2009 to 2011, resulting in the gap between males and females narrowing to 0.4 years (Figure 2).

**Figure 2: Since 2009 to 2011 there has been a narrowing in the gap in healthy life expectancy at birth between males and females**

Healthy life expectancy, UK, 2009 to 2011 to 2017 to 2019

Figure 2: Since 2009 to 2011 there has been a narrowing in the gap in healthy life expectancy at birth between males and females

Healthy life expectancy, UK, 2009 to 2011 to 2017 to 2019



Source: Office for National Statistics

Notes:

1. Chart axis does not start at 0.

Despite the growth in life expectancy in the UK for both males and females at birth, the proportion of life spent in good health has decreased since 2009 to 2011. Since 2009 to 2011, it has decreased from 79.9% to 79.2% for males and from 77.4% to 76.2% for females.

**Disability-free life expectancy (DFLE) at birth was 62.3 years for males and 61.0 years for females in 2017 to 2019, falling for each sex since 2014 to 2016, but only significantly for females**

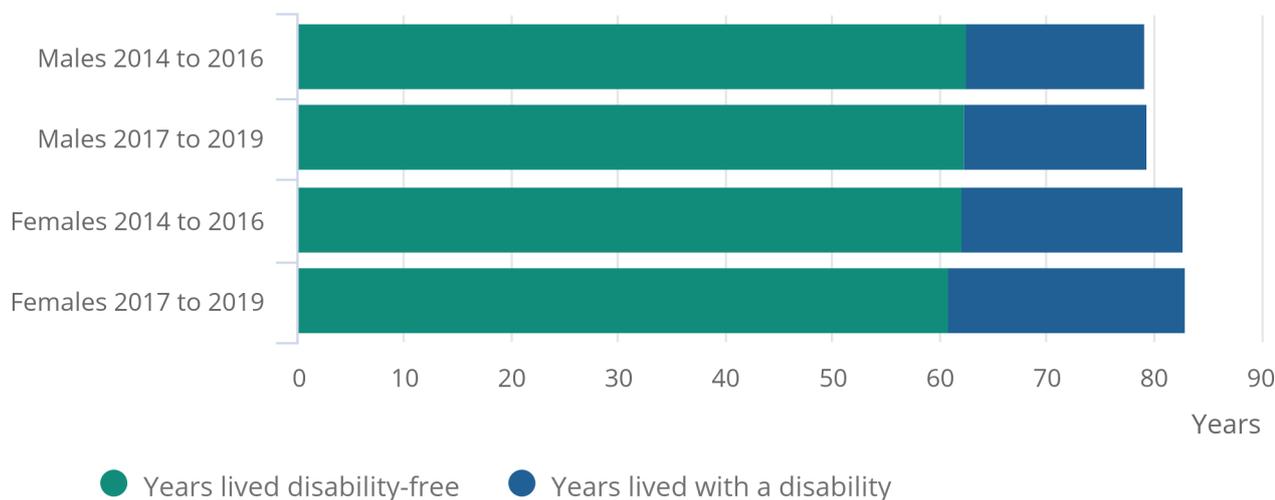
In 2017 to 2019 male DFLE at birth stood at 62.3 years, with female DFLE at 61.0 years, a difference of 1.3 years (Figure 3). This is a much wider difference than in 2014 to 2016 when it stood at 0.5 years. This increase in the divide between males and females has been driven by the steady decrease in DFLE for females at birth since 2014 to 2016.

**Figure 3: Disability free life expectancy at birth for females fell by 1.1 years since 2014 to 2016**

Disability-free life expectancy, UK, 2014 to 2016, 2017 to 2019

Figure 3: Disability free life expectancy at birth for females fell by 1.1 years since 2014 to 2016

Disability-free life expectancy, UK, 2014 to 2016, 2017 to 2019



Source: Office for National Statistics

Notes:

1. Years disability free is an estimate of the average number of years lived without activity restriction resulting from a long-lasting physical or mental health condition: it is based upon a self-rated assessment of how health conditions and illnesses reduce an individual's ability to carry out day-to-day activities. Conversely, years with disability are the years lived with activity restriction.

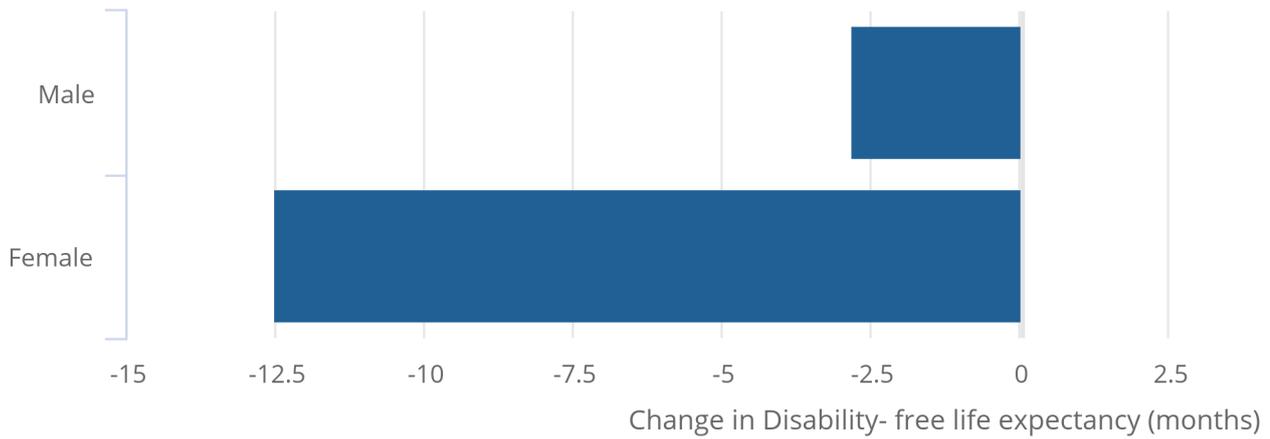
There was a sharp decline in female DFLE at birth in the UK in 2017 to 2019, falling by 12.5 months compared with 2014 to 2016 (figure 4). For males a 2.8 months fall was observed but this was not significant. The percentage of life spent disability-free for females now stands at 73.5 per cent, a fall from 74.9 per cent in 2014 to 2016. For males the equivalent percentages were 78.5 per cent and 78.9 per cent.

**Figure 4: Since 2014 to 2016 there has been a widening of the gap in disability-free life expectancy at birth between males and females, due to larger decreases for females**

Change in disability-free life expectancy in months, UK, 2014 to 2016 and 2017 to 2019

Figure 4: Since 2014 to 2016 there has been a widening of the gap in disability-free life expectancy at birth between males and females, due to larger decreases for females

Change in disability-free life expectancy in months, UK, 2014 to 2016 and 2017 to 2019



Source: Office for National Statistics

### 3 . Health State Life Expectancies at age 65 years in the UK

## Summary of latest national health state life expectancies

Table 3: Summary statistics of latest health state life expectancy estimates at age 65 years; UK, 2017 to 2019

Sex	Healthy life Expectancy in 2017 to 2019 (years)	Change since 2014 to 2016		Disability-free life Expectancy in 2017 to 2019 (years)	Change since 2014 to 2016	
		Months	Weeks		Months	Weeks
<b>Males</b>	10.4	* 3.0	13.0	9.7	1.9	8.3
<b>Females</b>	11.0	1.4	6.3	9.6	0.0	0.0

Source: Office for National Statistics

### Notes

1. \* denotes where health state life expectancy has changed significantly either positively or negatively from 2014 to 2016 based on non-overlapping confidence intervals.
2. Gain in health state life expectancy in months was calculated by subtracting the health state life expectancies at birth in 2014 to 2016 from that in 2017 to 2019 and multiplying by 365.25 and dividing by the average days per month factor 30.4375.
3. Gain in health state life expectancy in weeks was calculated by subtracting the health state life expectancies at birth in 2014 to 2016 from that in 2017 to 2019 and multiplying by 52.1786.

## Healthy life expectancy (HLE) at age 65 years has improved for both males and females since 2009 to 2011

HLE at age 65 years in 2017 to 2019 was 10.4 years for males and 11.0 years for females. The trajectory is favourable for those at age 65 years; males were observed to statistically significantly increase their HLE by 3 months, suggesting those at retirement age are extending their healthy life span. Since 2009 to 2011, there has been a 4 per cent improvement in HLE for females and a 6 per cent improvement for males.

The percentage of life spent in good health has increased for both males and females aged 65 years from 54.8% to 55.5% for males between 2014 to 2016 and 2017 to 2019 and from 51.7% to 51.9% respectively for females.

The proportion of life spent disability free for males aged 65 years increased from 51.5% to 51.7% since 2014 to 2016, while for females it decreased from 46.0% to 45.6%. These changes are affected by the increase in male life expectancy at age 65 years of 0.23 years and an increase in female life expectancy of 0.18 years in the same period. Life expectancy was growing more quickly between these periods than DFLE for both sexes. However, males were living more years both disability-free and with disability than in 2014 to 2016 causing their proportion of life disability-free to grow slightly; for females there was no change in years lived disability-free but years lived with disability increased causing the proportion of life disability-free to reduce.

## 4 . Data

### [Health and disability-free adjustment factor](#)

Dataset | Released 25 January 2021

The proportions used whilst estimating the good health and disability-free prevalence rates for health state life expectancies, UK.

### [Health and disability free census prevalence](#)

Dataset | Released 25 January 2021

The census prevalence used whilst estimating the good health and disability-free prevalence rates for health state life expectancies, UK.

### [Health state life expectancy - all ages, UK](#)

Dataset | Released 25 January 2021

Pivot tables for health state life expectancy by sex and area type, divided by two-year intervals starting from 2009 to 2011.

### [Health state life expectancy estimates template](#)

Dataset | Released 25 January 2021

Template for creating life expectancy and health expectancies estimates.

## 5 . Glossary

### Period life expectancy

The life expectancy estimates reported in this bulletin are period-based. Period life expectancy (LE) at a given age for an area is the average number of years a person would live, if he or she experienced the particular area's age-specific mortality rates for that time period throughout his or her life.

### Health state life expectancy

A generic term for summary measures of health that add a quality dimension to estimates of life expectancy by dividing expected lifespan into time spent in different states of health. In this release health state life expectancy encompasses measures based on health-related wellbeing (healthy life expectancy) and functional health status (disability-free life expectancy).

### Healthy life expectancy

An estimate of lifetime spent in "very good" or "good" health, based on how individuals perceive their general health.

### Disability-free life expectancy

An estimate of lifetime free from a limiting persistent illness that limits day to day activities: it is based upon a self-rated assessment of how health conditions and illnesses reduce an individual's ability to carry out day-to-day activities. Day-to-day activities include:

- washing and dressing
- household cleaning
- cooking
- shopping for essentials
- using public or private transport
- walking a defined distance and climbing stairs
- remembering to pay bills
- lifting objects from the ground or a work surface in a kitchen
- other moderate manual tasks such as gardening, gripping objects such as cutlery

## 95% confidence intervals

A measure of the uncertainty around a specific estimate. It is expected that the interval will contain the true value on 95 occasions if repeated 100 times. As intervals around estimates widen, the level of uncertainty about where the true value lies increases. The size of the interval around the estimate is strongly related to both the number of deaths, prevalence of health states as well as the size of the underlying population. At a national level the overall level of error will be small compared with the error associated with a local area or a specific age and sex breakdown. Therefore, the widths of the confidence intervals reported in this release will have sizeable differences.

## Statistical significance

The term "significant" refers to statistically significant changes or differences. Significance has been determined using the 95% confidence intervals, where instances of non-overlapping confidence intervals between estimates indicate the difference is unlikely to have arisen from random fluctuation. In some circumstances significance has also been tested using z scores.

## 6 . Measuring the data

This statistical bulletin presents estimates of life expectancy, healthy life expectancy and disability-free life expectancy for the UK, constituent countries, regions, local government administrations including combined authorities and Welsh health boards.

Life expectancy estimates are calculated using all causes of death. Please note, this release is calculated based on figures before the coronavirus (COVID-19) pandemic.

### Data sources

Life expectancy uses death registrations data held by the Office for National Statistics, which are compiled from information supplied when deaths are certified and registered as part of civil registration. Mid-year population estimates by age, sex and geographical area are used in combination with death registrations to calculate age-specific mortality rates used in life tables.

In addition, health state life expectancies use data collected as part of [the Annual Population Survey \(APS\) \(PDF, 689KB\)](#) and Census 2011 data. The APS is a continuous survey of households in the UK, containing annual data. Each three-year pooled APS dataset contains approximately 170,000 households and 320,000 individuals. The primary purpose of the APS is to provide estimates for labour market and socio-economic analysis at subnational level and the APS is the recommended source of statistical information for analysis at unitary authority and local authority district level.

Health state prevalence rates are obtained from the three-year reweighted APS data set used in healthy life expectancy and disability-free life expectancy calculations.

As the method requires imputation and modelling, Census 2011 data is used to produce imputation adjustment factors and census-based health state prevalence. These figures are made available with the datasets accompanying the release.

There were boundary changes in this release that had differential impacts for life expectancy and health state life expectancy.

The county of Buckinghamshire has been abolished and is no longer a two-tier authority. A new unitary authority of Buckinghamshire has been created which contains all previous county districts.

The estimates for the new boundary have been made available for 2017 to 2019. For previous year's estimates please refer to Buckinghamshire county and the county districts individually. These are available in the [Health state life expectancy, all ages, UK dataset](#).

The boundary changes are shown below in Table 4.

Table 4: Boundary changes in England affecting this release

<b>Old code</b>	<b>Old name</b>	<b>New code</b>	<b>New name</b>
E10000002	Buckinghamshire	E06000060	Buckinghamshire

## Method for estimating life expectancy

The life expectancy estimates reported in this bulletin are period-based life expectancies. Unlike the other life expectancy publications, the subnational life expectancy estimates use an abridged life table method. A life table is a demographic tool used to analyse death rates (also called mortality rates) and calculate life expectancies at various ages.

Abridged life tables use the age-specific mortality rates for an area aggregated over three years, for example 2016 to 2018, which is based on the age-group death count divided by the age-group population count. A template is available, which shows [how the abridged life table is deployed to derive life expectancy estimates](#).

Abridged life tables are used in preference to complete life tables for smaller populations, such as local authorities, because death counts can be too sparse for examining mortality for single years of age, and mid-year population estimates are not available or sufficiently reliable to produce these by single year of age.

## Confidence intervals

Life expectancy estimates are presented with 95% confidence intervals. 95% confidence intervals (CIs) allow the user to judge their precision and identify significant differences between data points (area, sex, age and time period). For life expectancy, the 95 per cent confidence interval (CI) for each area was calculated using the revised Chiang method (Chiang II), allowing the calculation of the variance of the mortality rates for those age groups with no deaths registered in the analysis period. To enable the calculation of a confidence interval for the final age band, the method developed by [Silcocks et al \(2001\)](#) has been used.

## Method for estimating health state life expectancies

Health state life expectancies are calculated using the Sullivan life table method. The data required are age and sex specific prevalence of the population in "good" health (healthy) and "free from activity restriction" (disability-free) obtained from the APS, and age-specific mortality rates from the abridged period life table.

Health state prevalence rates are obtained from a specially created three year reweighted APS data set. Prevalence rates are imputed for those aged less than 1 year, 1 to 4 years, 5 to 9 years, 10 to 14 years, 85 to 89 years and 90 years and above. A census adjustment is applied to these ages which applies the proportional difference in younger ages found at the 2011 Census to the rate observed in the APS for those aged 16 to 19 years, and to older ages to that observed in the age group 80 to 84 years. This is because the survey does not cover younger age groups and only sparsely amongst the very old.

The resulting age, sex and area specific prevalence estimates are then adjusted using linear regression to produce fitted age, sex and area specific prevalence rates to use in the Sullivan life table.

The Sullivan health state life expectancies reflects the current health of a real population adjusted for mortality levels and independent of age structure. It represents the number of remaining years, at a particular age, which an individual can expect to live in a healthy or disability-free state.

## Confidence intervals

Health state life expectancies in this release are presented with 95% confidence intervals that are calculated by taking account of the variance of the prevalence of health states, the design effect of the survey in addition to the variance around the summary measure itself.

Subnational life expectancy estimates for Scotland's council areas and Northern Ireland's local government districts have been calculated using the same method as for England and Wales. Responsibility for the production of other statistics for Scotland and Northern Ireland are with the [National Records Scotland \(NRS\)](#) and [Northern Ireland Statistics and Research Agency \(NISRA\)](#) respectively.

Subnational HLE and DFLE estimates for Wales, Scotland and Northern are also available:

- [Public Health Wales Observatory](#) (PHW)
- [Scottish Public Health Observatory](#) (ScotPHO)
- [Department of Health Northern Ireland](#)

## Quality

## Early access for quality assurance purposes

We provide early access for quality assurance purposes to a small number of external bodies including Public Health England, Department of Social Care, Welsh Government National Records Scotland, Northern Ireland Research and Development Agency, Public Health Wales. The recipients are not permitted to share the findings or the report wider within their organisations or to external organisations. The report is provided to them to quality check findings and offer their insights into how we have interpreted the data and communicated it. We independently produces these statistics, and ultimately determines the focus, content, commentary, illustration and interpretation of these measures presented in bulletins.

More quality and methodology information on strengths, limitations, appropriate uses, and how the data were created is available in the [Health State Life Expectancies QMI](#).

## 7 . Strengths and limitations

The strengths of the health state life expectancies release are:

- it provides coverage of UK local areas with estimates that are comparable with national and regional estimates
- health state life expectancies are estimated using the same sources of data, namely the Annual Population Survey (APS) and the 2011 Census.
- estimates based on abridged life tables have been shown to closely align with those based on complete life tables
- the mortality data used give complete population coverage and ensure the estimates are of high precision, and representative of the underlying population at risk
- the provision of health state life expectancy summary measures provide a quality of life dimension to length of life, which is useful for assessing health and social care needs and fitness for work to changing state pension ages

The limitations of the health state life expectancies release are:

- the APS sample sizes for some local authority populations are small, leading to volatility in estimates and wide confidence intervals.
- survey data is not routinely collected for those aged under 16 years and only sparsely for those aged 85 years and above, requiring imputation of prevalence for these age groups.
- Census 2011 based imputation adjustments and prevalence used in the modelling are temporal and therefore prone to change as they are applied further away from the census
- the measures of health status are subjective self-reports and may be affected in their perception by demographic, cultural and socioeconomic factors.

## 8 . Related links

### [Method changes to life and health state expectancies](#)

Methods paper | 29 November 2016

Report outlining the changes to life expectancy, healthy life expectancy and disability-free life expectancy.

### [Proposed method changes to UK health state life expectancies](#)

Methods paper | 7 December 2017

This report assesses three methods for future estimation of health state life expectancies and is consulting on these methods.

### [Health state life expectancies, UK: 2016 to 2018](#)

Statistical bulletin | 25 January 2021

The number of years people are expected to spend in different health states among local authority areas in the UK.

### [Life expectancy for local areas of the UK: between 2001 to 2003 and 2017 to 2019](#)

Statistical bulletin | 24 September 2020

Subnational trends in the average number of years people will live beyond their current age measured by "period life expectancy".

### [Health state life expectancies by national deprivation deciles, England: 2016 to 2018](#)

Statistical bulletin | 27 March 2020

Life expectancy and years expected to live in "Good" health using national indices of deprivation to measure socioeconomic inequalities in England.

### [Health state life expectancies by national deprivation deciles, Wales: 2016 to 2018](#)

Statistical bulletin | 27 March 2020

Life expectancy and years expected to live in "Good" health using national indices of deprivation to measure socioeconomic inequalities in Wales.

### [National life tables - life expectancy in the UK: 2017 to 2019](#)

Statistical bulletin | 24 September 2020

Trends in the average number of years people will live beyond their current age measured by period life expectancy, analysed by age and sex for the UK and its constituent countries.

### [Life Expectancy in Northern Ireland 2016-18](#)

Statistical bulletin | 4 December 2019

This report presents the latest official estimates of life expectancy for Northern Ireland, as well as healthy and disability-free life expectancy. This is a new, annual publication that is replacing the Health Inequalities -- Life Expectancy Decomposition series.

### [Life Expectancy for Administrative Areas within Scotland 2016-2018](#)

Statistical release | 12 December 2018

Annual publication of life expectancy at birth' estimates for administrative areas, including Council areas, NHS board areas and Scottish Parliamentary constituencies.