Office for National Statistics

Statistical bulletin

# Socioeconomic inequalities in avoidable mortality in Wales: 2019

Avoidable mortality in Wales, using measures of multiple deprivation to measure socioeconomic inequalities.

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Next release:
To be announced

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# 1 . Other pages in this release

Socioeconomic inequalities in avoidable mortality in England: 2019

# 2 . Main points

- The proportion of total deaths in 2019 that were avoidable in Wales continued to be substantially larger in the most deprived areas compared with the least deprived areas.
- Avoidable deaths accounted for nearly two-fifths (39.4%) of all male deaths in the most deprived areas of Wales compared with less than one-fifth (18.9%) in the least deprived areas in 2019; for females it was 27.6% and 12.4% respectively.
- Overall, while avoidable mortality rates are lower than they were in 2001 across all levels of area deprivation, in recent years the speed of improvement has reduced and mortality rates have increased in some cases.
- The largest reduction in the avoidable mortality gap between the most and least deprived areas of Wales was observed for diseases of the circulatory system; in contrast the gap for diseases of the respiratory system saw the largest increase between 2001 and 2019.
- The Slope Index of Inequality (SII) indicated there were 400.8 additional deaths per 100,000 males living in the most deprived areas of Wales compared with the least deprived areas and 249.3 additional deaths per 100,000 females living in the most deprived areas compared with the least, in 2019.

Please note avoidable mortality data currently go up to 2019, which means coronavirus (COVID-19) deaths are not included. We are speaking to the Organisation for Economic Co-operation and Development (OECD) regarding whether COVID-19 will be included in the avoidable mortality definition in the future.

# 3 . Socioeconomic inequalities in avoidable mortality

Data in this release have been created using the international avoidable mortality definition (DOC, 421KB) and are based on those aged under 75 years. When discussing avoidable deaths, the following terms are used:

- preventable mortality - deaths that can be mainly avoided through effective public health and primary prevention interventions
- treatable mortality - deaths that can be mainly avoided through timely and effective healthcare interventions, including secondary prevention and treatment
- avoidable mortality - deaths defined as either preventable or treatable

As a general rule, causes of death are classified as either preventable or treatable mortality. However, there are some exceptions where specific causes of death are equally proportioned between both.

The focus of this bulletin will be on avoidable mortality, however, data for treatable and preventable mortality can be found in the accompanying datasets.

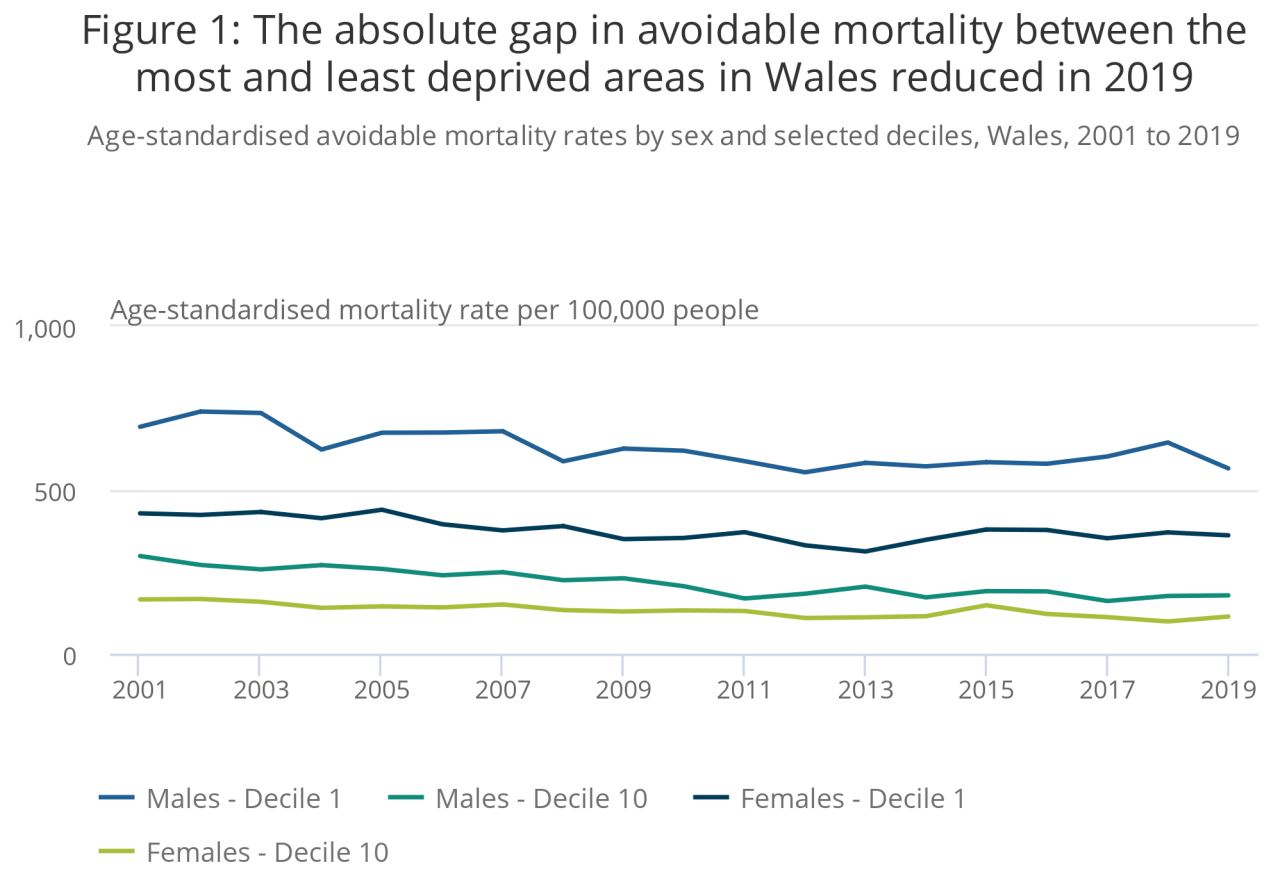
In 2019, the male age-standardised avoidable mortality rate in the most deprived areas of Wales (decile 1) was 566.1 deaths per 100,000 males, a statistically significant higher rate than the 178.1 deaths per 100,000 males observed in the least deprived areas (decile 10). Similarly, the female age-standardised avoidable mortality rate also showed a statistically significant contrast with 361.6 deaths per 100,000 females in the most deprived areas compared with 113.5 deaths per 100,000 females in the least deprived areas. Mortality rates for males remained statistically significantly higher than females across all deprivation deciles.

Avoidable mortality rates between 2001 and 2019 decreased for males and females living in the most and least deprived areas of Wales, however, these decreases were only statistically significant for males living in the most and least deprived areas and females living in the least deprived areas (Figure 1).

From the second decade, improvements in avoidable mortality have been much smaller than those observed in the first decade, with the mortality rate for males living in the least deprived areas actually worsening by 5.6% between 2011 and 2019. Most recently, between 2018 and 2019, avoidable mortality rates non-significantly decreased for those living in the most deprived areas and non-significantly increased for those living in the least deprived areas. Overall, the absolute gap in avoidable mortality between the most and least deprived areas was narrower in 2019 compared with 2001 for both sexes.

**Figure 1: The absolute gap in avoidable mortality between the most and least deprived areas in Wales reduced in 2019**

**Age-standardised avoidable mortality rates by sex and selected deciles, Wales, 2001 to 2019**




**Source: Office for National Statistics – Deaths registered in Wales**

**Notes:**

1. Figures are for deaths registered in each calendar year.
2. Figures for Wales exclude deaths of non-residents.
3. Age-standardised mortality rates are expressed per 100,000 people and standardised to the 2013 European Standard Population. Age-standardised mortality rates are used to allow comparison between populations that may contain different proportions of people of different ages.
4. Deprivation deciles are based on the Welsh Index of Multiple Deprivation (IMD), which is the official measure of relative deprivation. WIMD 2005 was used for data years 2001 to 2004, WIMD 2008 was used for years 2005 to 2007, WIMD 2011 was used for years 2008 to 2010, WIMD 2014 was used for years 2011 to 2014 and WIMD 2019 was used for years 2015 to 2019.
5. Decile 1 represents the most deprived areas and decile 10 represents the least deprived areas.

# 4 . Socioeconomic inequalities in avoidable mortality by cause

Under the avoidable mortality definition, causes of avoidable death can be categorised into seven broad cause groups. This section will focus on neoplasms, diseases of the circulatory system and diseases of the respiratory system as these three groups account for over 75.0% of all avoidable deaths in 2019 so have the greatest influence on the trend. These causes differ to those covered in the England-specific bulletin because death counts are smaller in Wales, which means complete data time series were not available for all broad causes. Data for all broad cause groups are available in the accompanying datasets.

## Neoplasms

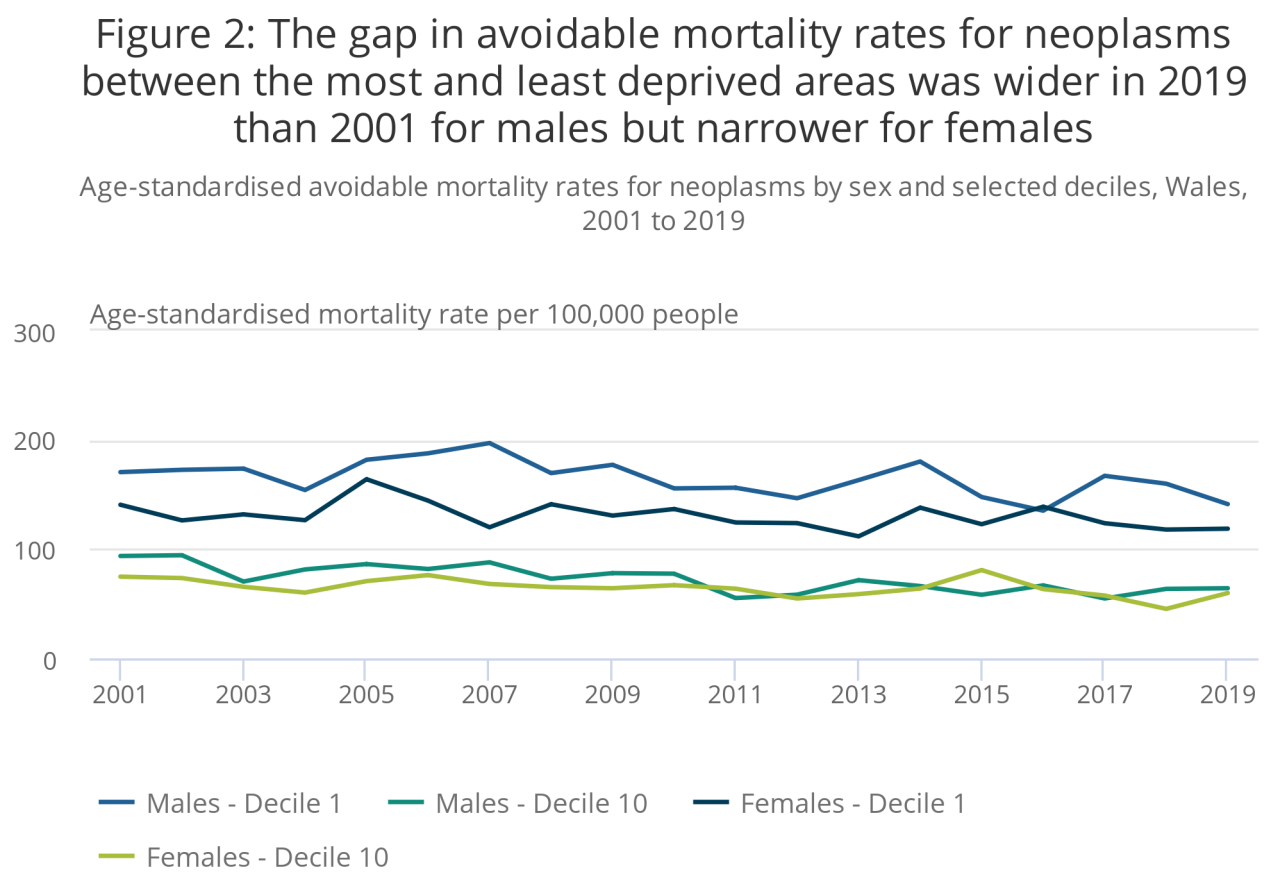
Between 2001 and 2019, avoidable mortality rates for neoplasms have fluctuated with overall non-significant decreases for males and females living in both the most and least deprived areas of Wales (Figure 2). Most recently, between 2018 and 2019, non-significant changes were also observed.

Absolute decreases in mortality rates between 2001 and 2019 were similar for males living in the most deprived areas (29.3 deaths per 100,000 males) and the least deprived areas (29.5 deaths per 100,000 males), whereas females living in the most deprived areas had a larger absolute decrease (21.9 deaths per 100,000 females) compared with those living in the least deprived areas (15.0 deaths per 100,000 females). These overall changes led the absolute gap in 2019 to be narrower for females but slightly wider for males.

The higher rates observed in the most deprived areas compared with the least deprived areas support findings from Public Health Wales who report increasing death rates from all cancers from the least to the most deprived areas of Wales.

**Figure 2: The gap in avoidable mortality rates for neoplasms between the most and least deprived areas was wider in 2019 than 2001 for males but narrower for females**

**Age-standardised avoidable mortality rates for neoplasms by sex and selected deciles, Wales, 2001 to 2019**




**Source: Office for National Statistics – Deaths registered in Wales**

**Notes:**

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3. Age-standardised mortality rates are expressed per 100,000 people and standardised to the 2013 European Standard Population. Age-standardised mortality rates are used to allow comparison between populations that may contain different proportions of people of different ages.
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5. Decile 1 represents the most deprived areas and decile 10 represents the least deprived areas.

## Diseases of the circulatory system

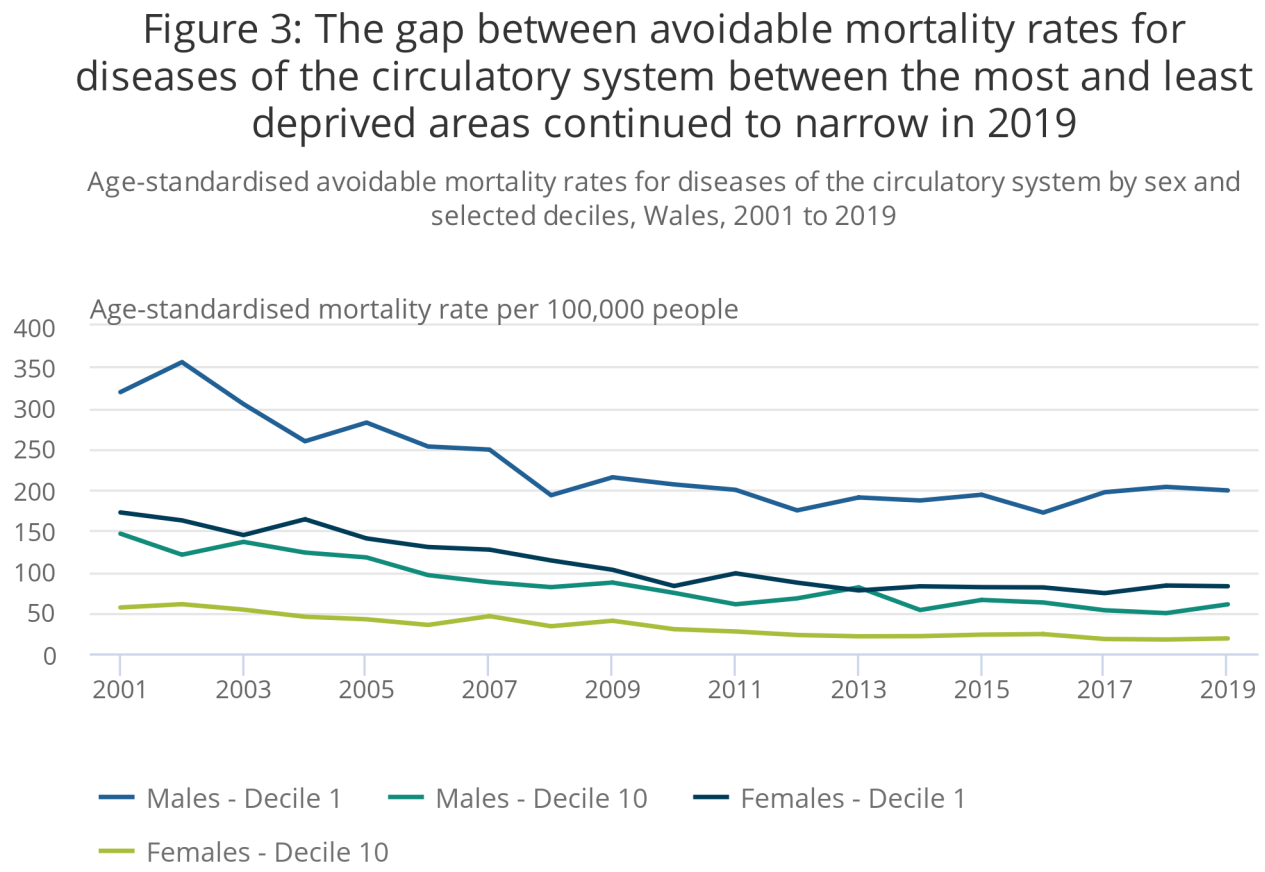
Between 2001 and 2019, avoidable mortality rates for diseases of the circulatory system statistically significantly decreased for males and females living in both the most and least deprived areas of Wales (Figure 3).

The majority of these reductions occurred during the first decade where mortality rates generally decreased year-on-year, with an overall statistically significant decline between 2001 and 2010. In contrast, during the second decade, improvements in mortality rates have stalled with overall non-significant changes; this is most evident in males where mortality rates for the most and least deprived areas decreased by 0.4% and 0.2% respectively.

The largest absolute decreases since 2001 were observed in the most deprived areas with a decline of 120.0 deaths per 100,000 males and 90.1 deaths per 100,000 females. These overall decreases led to a narrowing in the absolute gap between those living in the most and least deprived areas in 2019 compared with 2001.

**Figure 3: The gap between avoidable mortality rates for diseases of the circulatory system between the most and least deprived areas continued to narrow in 2019**

**Age-standardised avoidable mortality rates for diseases of the circulatory system by sex and selected deciles, Wales, 2001 to 2019**




**Source: Office for National Statistics – Deaths registered in Wales**

**Notes:**

1. Figures are for deaths registered in each calendar year.
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5. Decile 1 represents the most deprived areas and decile 10 represents the least deprived areas.

## Diseases of the respiratory system

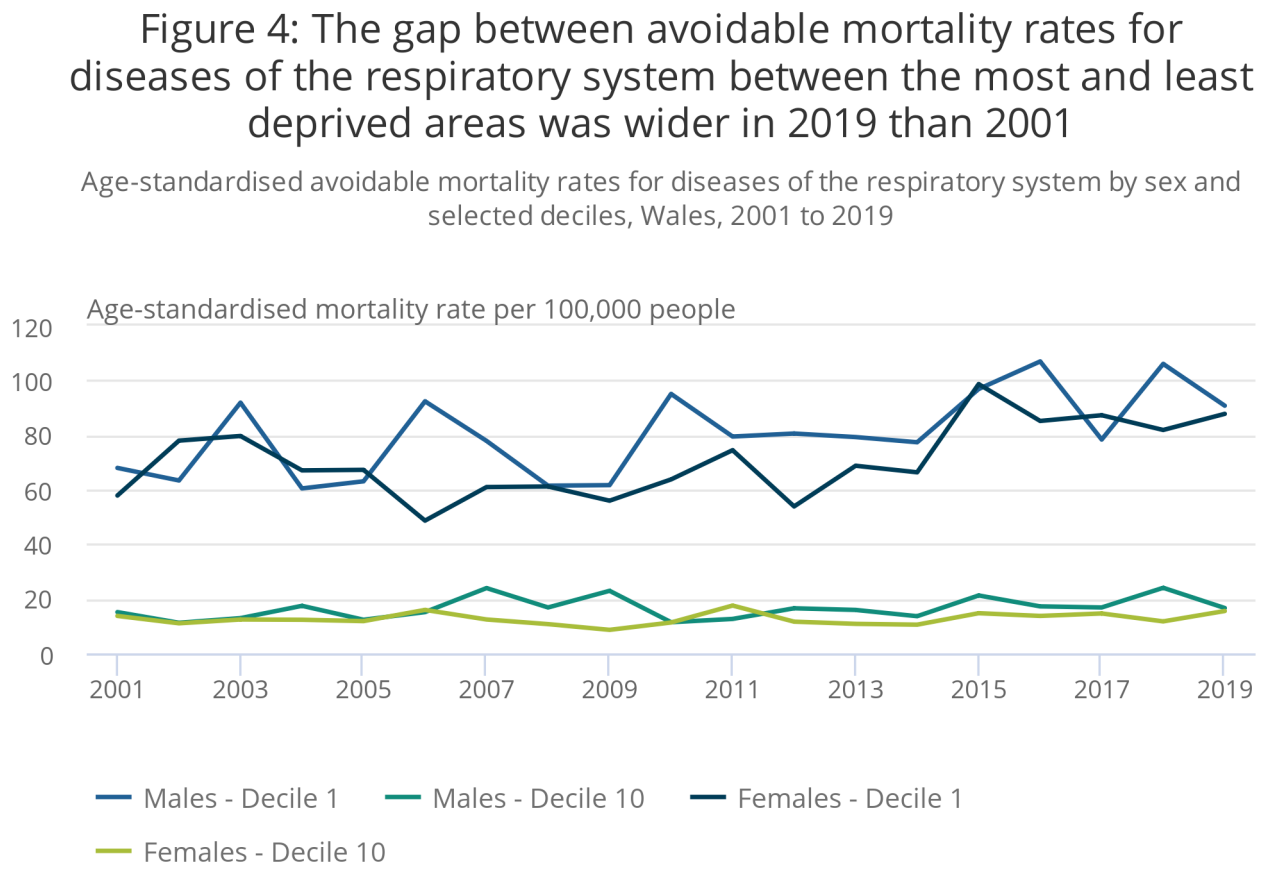
Avoidable mortality rates for diseases of the respiratory system were sharply contrasting between those living in the most and least deprived areas of Wales, with rates in the former compared with the latter 5.5 times higher for males and 5.7 times higher for females in 2019 (Figure 4).

Between 2001 and 2019, avoidable mortality rates for diseases of the respiratory system non-significantly increased for both sexes living in the most and least deprived areas. The largest percentage increases for males and females were observed among those living in the most deprived areas (33.6% and 51.7% respectively) compared with those living in the least deprived areas (9.9% and 13.1% respectively). These overall increases led the absolute gap in 2019 between those living in the most and least deprived areas to widen compared with 2001.

The substantially higher rates observed in the most deprived areas compared with the least deprived areas could be linked to differential smoking prevalence and exposure to air pollution, with these two factors combined found to have a role in increasing risk of respiratory-related mortality.

**Figure 4: The gap between avoidable mortality rates for diseases of the respiratory system between the most and least deprived areas was wider in 2019 than 2001**

**Age-standardised avoidable mortality rates for diseases of the respiratory system by sex and selected deciles, Wales, 2001 to 2019**




**Source: Office for National Statistics – Deaths registered in Wales**

**Notes:**

1. Figures are for deaths registered in each calendar year.

2. Figures for Wales exclude deaths of non-residents.

3. Age-standardised mortality rates are expressed per 100,000 people and standardised to the 2013 European Standard Population. Age-standardised mortality rates are used to allow comparison between populations that may contain different proportions of people of different ages.

4. Deprivation deciles are based on the Welsh Index of Multiple Deprivation (IMD), which is the official measure of relative deprivation. WIMD 2005 was used for data years 2001 to 2004, WIMD 2008 was used for years 2005 to 2007, WIMD 2011 was used for years 2008 to 2010, WIMD 2014 was used for years 2011 to 2014 and WIMD 2019 was used for years 2015 to 2019.

5. Decile 1 represents the most deprived areas and decile 10 represents the least deprived areas.

# 5 . The Slope Index of Inequality (SII) in avoidable mortality

The Slope Index of Inequality (SII) is used to assess the absolute inequality in avoidable mortality and represents the difference between the hypothetical "most" and "least" deprived areas on the deprivation scale taking into account inequality across all adjacent deciles.

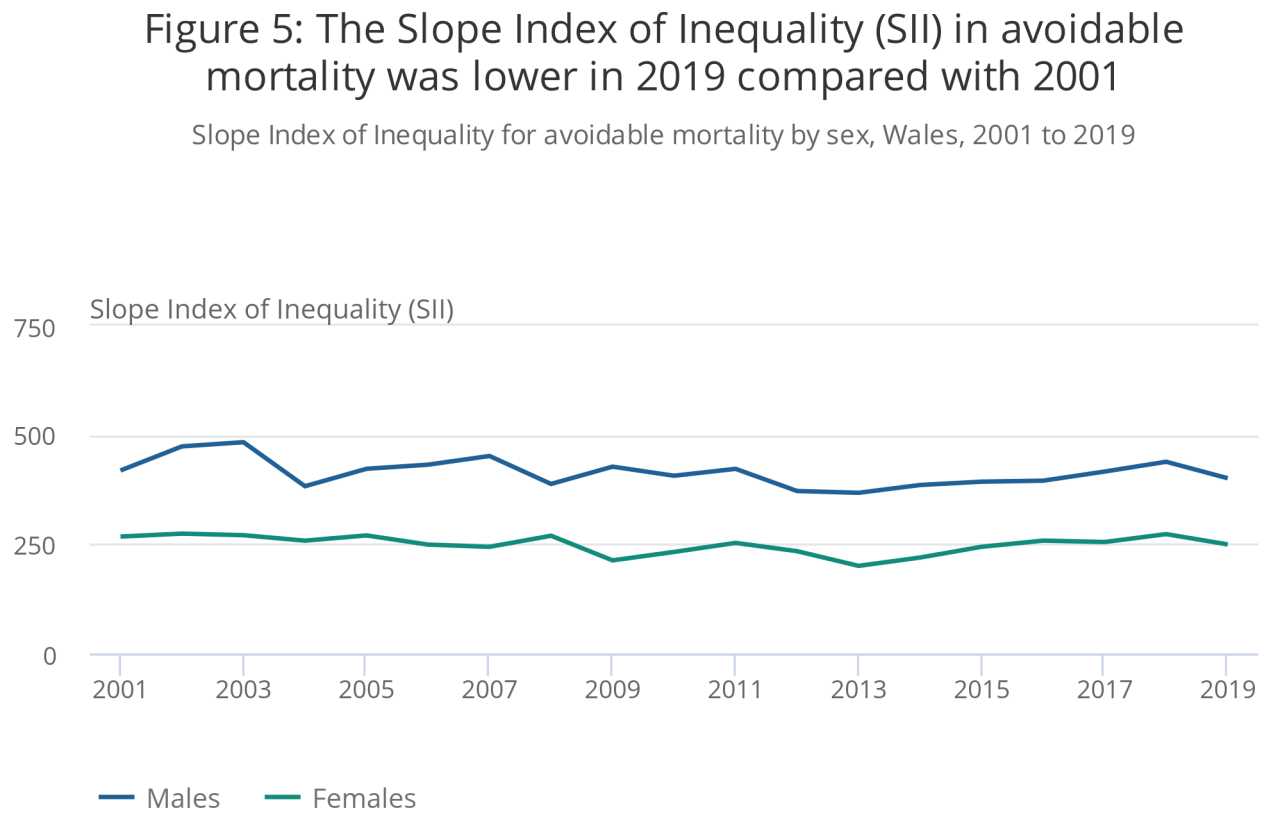
Between 2001 and 2019, the inequality in the avoidable mortality rate non-significantly decreased from 418.5 to 400.8 deaths per 100,000 males and 267.3 to 249.3 deaths per 100,000 females (Figure 5). For females, reductions were greater between 2001 and 2010 compared with 2011 to 2019 with decreases of 13.2% and 1.4% respectively. In contrast, reductions were larger between 2011 and 2019 for males (5.1%) compared with 2001 and 2010 (2.9%). However, these observations were all non-significant.

Specifically, these findings show that in 2019, there were 400.8 additional deaths per 100,000 males living in the most deprived areas of Wales compared with the least deprived areas and 249.3 additional deaths per 100,000 females living in the most deprived areas compared with the least. The SII in 2019 was non-significantly higher than 2013, which was the lowest point in the data time series for males and females.

Overall, while there has been health improvement in avoidable mortality across all levels of deprivation since 2001, these non-significant findings, particularly the increases since 2013, highlight the scale of absolute gaps between the most and least deprived areas of Wales remains entrenched.

**Figure 5: The Slope Index of Inequality (SII) in avoidable mortality was lower in 2019 compared with 2001**

**Slope Index of Inequality for avoidable mortality by sex, Wales, 2001 to 2019**




**Source: Office for National Statistics – Deaths registered in Wales**

**Notes:**

1. Figures are for deaths registered in each calendar year.
2. Figures for Wales exclude deaths of non-residents.
3. The Slope Index of Inequality (SII) is reported as a positive value to demonstrate increasing mortality rates with increasing deprivation. However, because the relative rank ranges from 0 (most deprived) to 100 (least deprived) the actual SII is negative.

# 6 . Socioeconomic inequalities in avoidable mortality in Wales data

Socioeconomic inequalities in avoidable mortality: Wales analysis
Dataset | Released 11 March 2021
Annual age-standardised mortality rates by deprivation decile, sex and cause as well as absolute (Slope Index of Inequality) measures of inequality in Wales.

# 7 . Glossary

## Preventable mortality

Preventable mortality refers to causes of death that can be mainly avoided through effective public health and primary prevention interventions (that is, before the onset of diseases or injuries, to reduce incidence).

## Treatable mortality

Treatable mortality refers to causes of death that can be mainly avoided through timely and effective health care interventions, including secondary prevention and treatment (that is, after the onset of disease, to reduce case-fatality).

## Avoidable mortality

Avoidable mortality refers to deaths that are preventable or treatable.

## Age-standardised mortality rates

Age-standardised mortality rates are used to allow comparisons between populations that may contain different proportions of people of different ages.

## 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 figures indicate the difference is unlikely to have arisen from random fluctuation.

## Slope Index of Inequality (SII)

The SII models the absolute inequality (the difference between the hypothetical most and least deprived populations) in avoidable mortality using weighted linear regression, which takes account of the inequality across all adjacent deciles of relative deprivation, rather than focusing only on the differencing of the two extremes.

# 8 . Measuring the data

This bulletin looks at the socioeconomic inequalities in avoidable mortality in Wales from 2001 to 2019. Figures are calculated using death registration data for Wales held by the Office for National Statistics (ONS).

## Defining avoidable mortality

With advances in medical technology and wider public health interventions, deaths from conditions previously not avoidable may have since become avoidable. This means the avoidable mortality definition requires review, and if appropriate, revisions.

In 2017, an Organisation for Economic Co-operation and Development (OECD) working group was set up to review the definitions of avoidable mortality used internationally with a remit to create a harmonised definition. The group proposed a new definition of avoidable mortality (PDF, 689KB) and in 2019, the ONS ran a public consultation to review this definition. As a result of the consultation, it was agreed the ONS would implement the new avoidable mortality definition (DOC, 421KB) to ensure our statistics are internationally comparable. The new definition has been implemented from data year 2001 onwards.

More quality and methodology information on strengths, limitations, appropriate uses, and how the data were created is available in the Socioeconomic inequalities in avoidable mortality QMI.

### Socioeconomic deprivation

Socioeconomic deprivation is measured using the Welsh Index of Multiple Deprivation (WIMD), which provides an overall relative measure of deprivation for each Lower layer Super Output Area (LSOA). An LSOA is a small area with an average population of 1,500 people. The overall deprivation scores are ranked for all LSOAs within a country and can be divided into 10 groups (deciles) where decile 1 represents the most deprived LSOAs and decile 10 represents the least deprived LSOAs. The IMD is a score based on the area as a whole and not everyone within an LSOA necessarily experiences the same level or type of deprivation.

Different versions of the WIMD were used for this data time series:

- WIMD 2005 was used for data years 2001 to 2004
- WIMD 2008 was used for data years 2005 to 2007
- WIMD 2011 was used for data years 2008 to 2010
- WIMD 2014 was used for data years 2011 to 2014
- WIMD 2019 was used for data years 2015 to 2019

### Early access for quality assurance purposes

We provide early access for quality assurance to a small number of people working in other government bodies. This is for general comment on the plausibility of our findings. However, the ONS itself independently produces these statistics, including determining the focus, content, commentary, illustration and interpretation of these measures presented in bulletins.

## 9 . Strengths and limitations

The strengths of the socioeconomic inequalities in avoidable mortality bulletin include:

- information is supplied when a death is registered, which gives complete population coverage and ensures the estimates are of high precision and representative of the underlying population at risk
- coding for cause of death is carried out according to the World Health Organization (WHO) International Classification of Diseases: ICD-10 and internationally agreed rules
- the implementation of the new avoidable mortality definition (DOC, 421KB) means our statistics are internationally comparable

The limitations of the socioeconomic inequalities in avoidable mortality bulletin include:

- in a very small number of cause of death breakdowns, the number of deaths is either too small to report an age-standardised rate or too small to report a rate with reliability; it is our practice not to calculate rates based on fewer than 10 deaths and rates based on 10 to 19 deaths are marked with a "u" to warn users that their reliability is low
- cause of death data do not account for coding changes that occurred in 2011 and 2014

# 10 . Related links

Avoidable mortality in the UK: 2019
Bulletin | Released 26 February 2021
Deaths from causes considered avoidable given timely and effective healthcare or public health interventions.

Changing trends in mortality by national indices of deprivation, England and Wales: 2001 to 2018
Article | Released 10 March 2020
Analysis of the recent changes in the trends of mortality rates in England and Wales by deprivation (Experimental statistics).

Deaths registered in England and Wales: 2019
Bulletin | Released 1 July 2020
Registered deaths by age, sex, selected underlying causes of death and the leading causes of death. Contains death rates and death registrations by area of residence and single year of age.

Health state life expectancies by national deprivation deciles, England: 2016 to 2018
Bulletin | Released 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
Bulletin | Released 27 March 2020
Life expectancy and years expected to live in "Good" health using national indices of deprivation to measure socioeconomic inequalities in Wales.