

Statistical bulletin

Socioeconomic inequalities in avoidable mortality in England: 2019

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



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1 . Other pages in this release

[Socioeconomic inequalities in avoidable mortality in Wales: 2019](#)

2 . Main points

- The proportion of total deaths in 2019 that were avoidable in England continued to be substantially larger in the most deprived areas compared with the least deprived areas.
- Avoidable deaths accounted for nearly two-fifths (39.2%) of all male deaths in the most deprived areas of England compared with less than one-fifth (17.5%) in the least deprived areas in 2019; for females it was 27.0% and 12.1% respectively.
- Overall, while avoidable mortality rates are statistically significantly lower than they were in 2001 across all levels of area deprivation, since 2011 the speed of improvement has reduced and the rate for females living in the most deprived areas has increased.
- The largest reduction in the avoidable mortality gap between the most and least deprived areas of England between 2001 and 2019 was observed in diseases of the circulatory system for males and females.
- In contrast, the greatest increase in the inequality gap was observed in alcohol-related and drug-related disorders for males and diseases of the respiratory system for females.
- The Slope Index of Inequality (SII) indicated there were 380.7 additional deaths per 100,000 males living in the most deprived areas of England compared with the least deprived areas and 235.1 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 England (decile 1) was 535.7 deaths per 100,000 males, a statistically significant higher rate than the 150.3 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 342.8 deaths per 100,000 females in the most deprived areas compared with 97.4 deaths per 100,000 females in the least deprived areas. Mortality rates for males remained statistically significantly higher than females across all deprivation deciles.

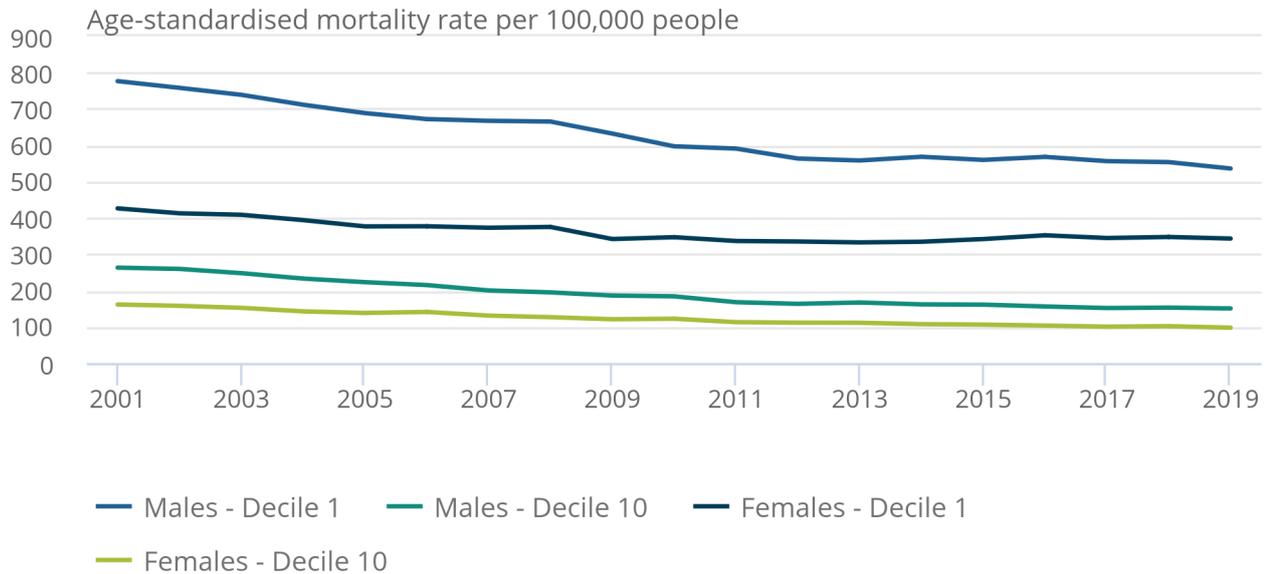
There have been statistically significant decreases in avoidable mortality rates between 2001 and 2019 for males and females living in the most and least deprived areas of England, with the greatest absolute declines observed in the most deprived areas (Figure 1). However, during the second decade much smaller decreases occurred, and for females living in the most deprived areas, rates increased by 2.0% since 2011. When taking account of the substantial declines during the first decade, the absolute gap in avoidable mortality between the most and least deprived areas is 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 England continued to reduce in 2019

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

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



Source: Office for National Statistics – Deaths registered in England

Notes:

1. Figures are for deaths registered in each calendar year.
2. Figures for England 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 Index of Multiple Deprivation (IMD), which is the official measure of relative deprivation. IMD 2004 was used for data years 2001 to 2003, IMD 2007 was used for years 2004 to 2006, IMD 2010 was used for years 2007 to 2010, IMD 2015 was used for years 2011 to 2015 and IMD 2019 was used for years 2016 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, diseases of the respiratory system, and alcohol-related and drug-related deaths as these four groups account for over 80.0% of all avoidable deaths in 2019 so have the greatest influence on the trend. However, the data for all broad cause groups are available in the [accompanying datasets](#).

Neoplasms

Between 2001 and 2019, avoidable mortality rates for neoplasms statistically significantly decreased for males and females living in both the most and least deprived areas of England (Figure 2). Most recently, between 2018 and 2019, non-significant changes were observed.

Interestingly, improvements in mortality rates were greater in the second decade for both sexes living in the most deprived areas and females living in the least deprived areas compared with the first decade. This suggests that avoidable deaths due to neoplasms were not as affected by the stalling in mortality improvement that is observed in [other causes of death](#).

The largest absolute decreases since 2001 for males were observed in the most deprived areas with a decline of 52.3 deaths per 100,000 males; for females, those living in the least deprived areas accounted for the largest decrease amounting to 21.0 deaths per 100,000 females. These overall changes led to a narrowing in the absolute gap in 2019 between the most and least deprived areas for males and a widening in the gap for females.

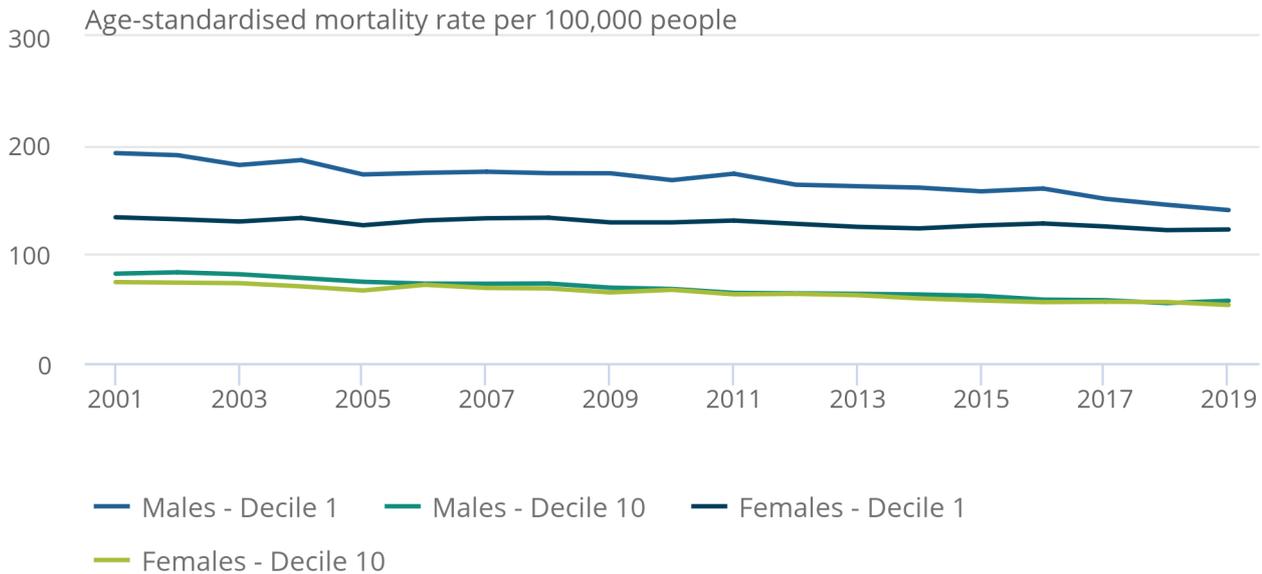
The higher rates observed in the most deprived areas compared with the least deprived areas could be linked to [discrepancies in participation in cancer screening \(PDF, 719KB\)](#) as reported by Cancer Research UK.

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

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

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

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



Source: Office for National Statistics – Deaths registered in England

Notes:

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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 England (Figure 3).

The majority of this reduction occurred in the first decade where mortality rates generally decreased year-on-year, with an overall statistically significant decline between 2001 and 2010. In contrast, since 2011, a pronounced slowdown in the rate of improvement is evident, although declines remained statistically significant between 2011 and 2019 for males living in the most deprived areas and males and females living in the least deprived areas. Most recently, between 2018 and 2019, non-significant decreases were observed.

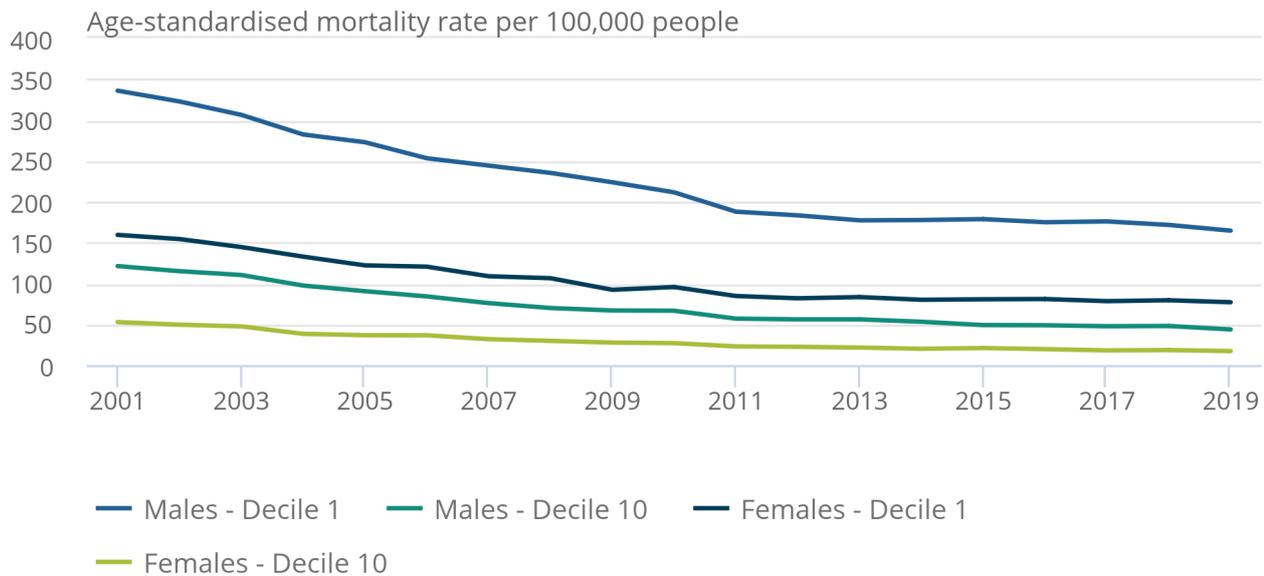
The largest absolute decreases since 2001 were observed in the most deprived areas with a decline of 171.3 deaths per 100,000 males and 82.4 deaths per 100,000 females. These overall declines led to a narrowing in the absolute gap between the most and least deprived areas in 2019 compared with 2001.

Figure 3: Avoidable mortality rates for diseases of the circulatory system continued to decrease for males and females living in the most and least deprived areas of England

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

Figure 3: Avoidable mortality rates for diseases of the circulatory system continued to decrease for males and females living in the most and least deprived areas of England

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



Source: Office for National Statistics – Deaths registered in England

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 England, with rates in the former compared to the latter 7.1 times higher for males and 7.7 times higher for females in 2019 (Figure 4).

Between 2001 and 2019, avoidable mortality rates for diseases of the respiratory system non-significantly decreased by 7.3% for males living in the most deprived areas. This contrasted with males living in the least deprived areas whose rates statistically significantly decreased by 34.8%. Most recently, between 2018 and 2019, mortality rates for males living in both area groupings non-significantly decreased. Despite the differences in the scale of these relative decreases, the absolute gap between males living in the most and least deprived areas of England was slightly narrower in 2019 than 2001.

For females, mortality rates between 2001 and 2019 statistically significantly increased for those living in the most deprived areas by 13.3%. This worsening was driven by increases since 2011. This contrasts with females living in the least deprived areas whose rate statistically significantly decreased by 32.1%. Most recently, between 2018 and 2019, mortality rates non-significantly decreased for females living in both the most and least deprived areas; however, the absolute gap remained wider in 2019 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 for females

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

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 for females

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



Source: Office for National Statistics – Deaths registered in England

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.

Alcohol-related and drug-related

Between 2001 and 2019, avoidable mortality rates for deaths caused by alcohol-related and drug-related disorders statistically significantly increased for males and females living in the most deprived areas of England and males living in the least deprived areas (Figure 5).

The majority of this worsening occurred in the second decade, with non-significant changes between 2001 and 2010 followed by statistically significant increases for those living in the most deprived areas between 2011 and 2019. Most recently, between 2018 and 2019, non-significant increases were observed.

The largest absolute increases since 2001 were observed in the most deprived areas leading to a widening in the absolute gap between the most and least deprived areas in 2019 compared with 2001.

The higher rates observed in the most deprived areas compared with the least deprived areas are in line with those reported in our [alcohol-specific deaths analysis](#) and [deaths related to drug poisoning analysis](#) with statistically significantly higher rates of deaths in the most deprived quintiles compared with the least deprived quintiles in 2019.

Figure 5: Avoidable mortality rates for alcohol-related and drug-related disorders statistically significantly increased in the most deprived areas between 2001 and 2019

Age-standardised avoidable mortality rates for alcohol-related and drug-related disorders by sex and selected deciles, England, 2001 to 2019

Figure 5: Avoidable mortality rates for alcohol-related and drug-related disorders statistically significantly increased in the most deprived areas between 2001 and 2019

Age-standardised avoidable mortality rates for alcohol-related and drug-related disorders by sex and selected deciles, England, 2001 to 2019



Source: Office for National Statistics – Deaths registered in England

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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.

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 statistically significantly decreased from 522.6 to 380.7 deaths per 100,000 males and 268.7 to 235.1 deaths per 100,000 females (Figure 6). These reductions were greater between 2001 and 2010, with statistically significant decreases of 19.7% in males and 15.6% in females. In comparison, between 2011 and 2019 the narrowing in the inequality was smaller, with a statistically significant decrease of 6.6% for males; for females, a non-significant increase of 5.2% was observed.

Specifically, these findings show that in 2019, there were 380.7 additional deaths per 100,000 males living in the most deprived areas of England compared with the least deprived areas and 235.1 additional deaths per 100,000 females living in the most deprived areas compared with the least.

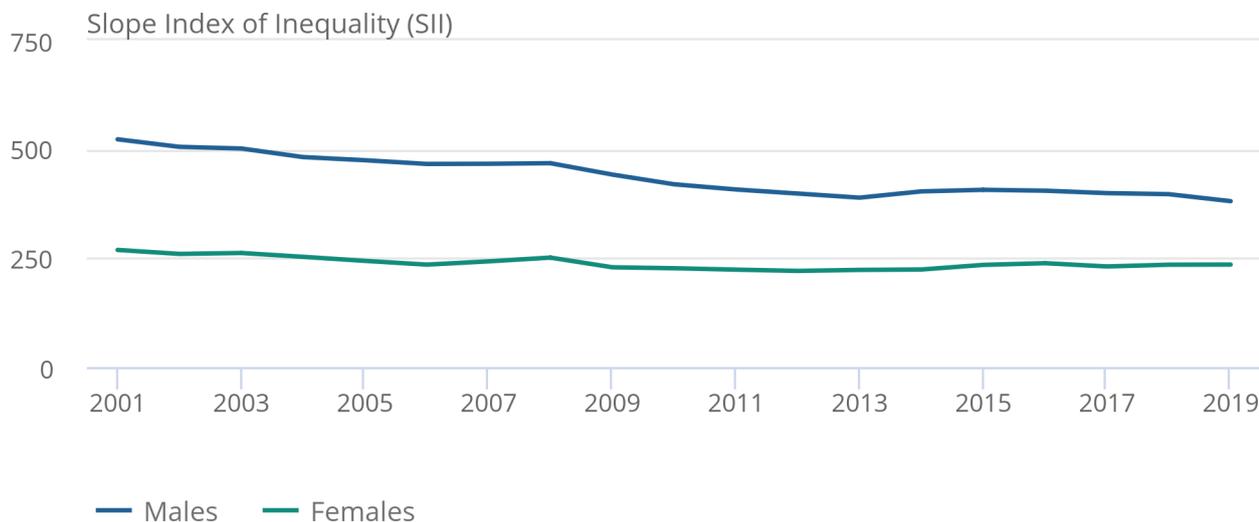
Overall, these findings highlight that since 2001, the inequality in avoidable mortality has reduced for males and females and was largely driven by decreases in risk of death caused by diseases of the circulatory system. However, even though the narrowing of the inequality gap in England continues for males, the rate is much slower in recent years. In contrast, for females, the gap has increased in recent years and is statistically significantly larger than the lowest point in 2012.

Figure 6: The Slope Index of Inequality (SII) in avoidable mortality was statistically significantly lower in 2019 compared with 2001

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

Figure 6: The Slope Index of Inequality (SII) in avoidable mortality was statistically significantly lower in 2019 compared with 2001

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



Source: Office for National Statistics – Deaths registered in England

Notes:

1. Figures are for deaths registered in each calendar year.
2. Figures for England 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 England data

[Socioeconomic inequalities in avoidable mortality: England 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 England.

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 England from 2001 to 2019. Figures are calculated using [death registration data](#) for England 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](#).

Our definition of avoidable mortality is different to the measure of [avoidable deaths in hospital](#), which NHS trusts in England are required to publish figures on. We use a defined set of underlying causes of death that have been approved through consultation with users and expert guidance. It includes conditions where it is reasonable to expect deaths to be avoided through good quality healthcare, even after the condition has developed (treatable mortality), as well as those where it is possible to prevent the condition from occurring in the first place (incidence reduction) through wider public health interventions, such as those targeted at reducing the incidence of smoking (preventable mortality). The avoidable deaths in hospital measure is based on a record review of a sample of deaths deemed to be the result of problems in care. Avoidable deaths in hospital data are not intended to be comparable and are not currently collated centrally.

Socioeconomic deprivation

Socioeconomic deprivation is measured using [England's Index of Multiple Deprivation \(IMD\)](#), 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 IMD were used for this data time series:

- IMD 2004 was used for data years 2001 to 2003
- IMD 2007 was used for data years 2004 to 2006
- IMD 2010 was used for data years 2007 to 2010
- IMD 2015 was used for data years 2011 to 2015
- IMD 2019 was used for data years 2016 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.