

Avoidable Mortality

2019

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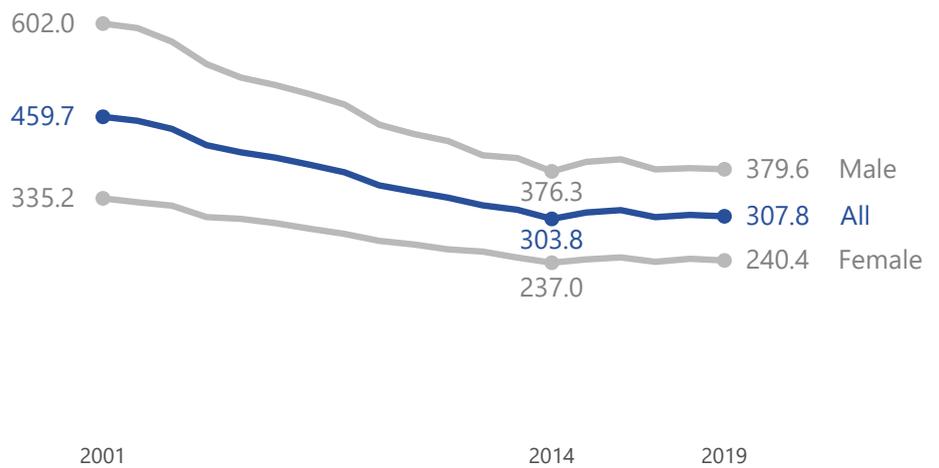
This statistical report details information on the number of deaths that were registered in Scotland in 2019 which are classified as avoidable.

It also includes breakdowns by sex, age, cause of death and deprivation.

Avoidable mortality rate virtually unchanged since 2014

The age-standardised avoidable mortality* rate has decreased by 33% since 2001 but there has been little change since 2014 (+1%). In 2019, 27% of all deaths were considered avoidable.

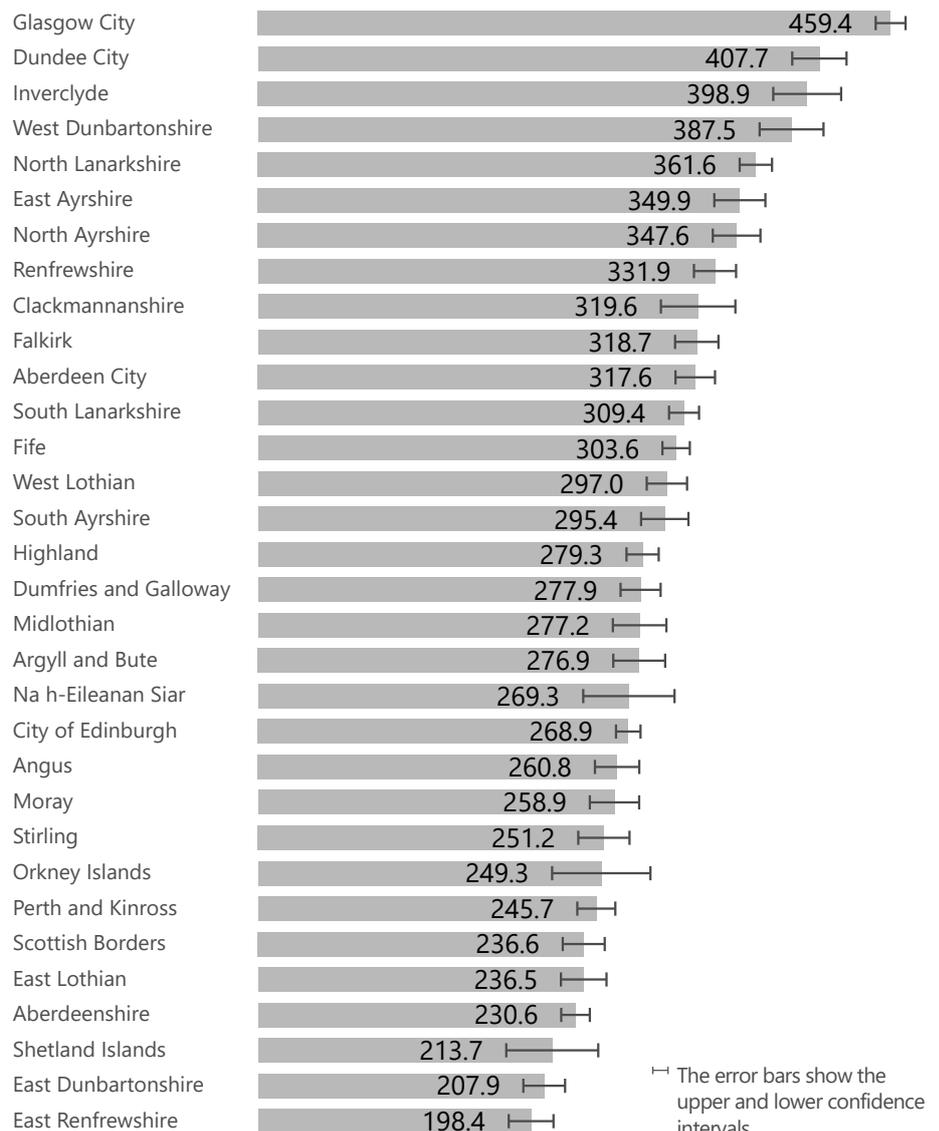
Avoidable mortality rates per 100,000 by sex, 2001-2019



Rates of avoidable mortality vary across Scotland

After adjusting for age, the highest rates of avoidable mortality* were recorded in Glasgow City, Dundee City and Inverclyde whilst the lowest rates were in East Renfrewshire, East Dunbartonshire and Shetland. Glasgow City's rate was more than twice the rate of East Renfrewshire.

Avoidable mortality rates per 100,000 by council area, 2017-2019



* Avoidable mortality is a measure of deaths from causes for which all or most deaths are considered avoidable through timely and effective healthcare and public health interventions.

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1. Key Findings

- In 2019 there were 58,108 registered deaths in Scotland, of which 15,519 (27%) were considered avoidable.
- This remains more or less consistent with the percentages recorded as avoidable for the previous 7 years.
- The avoidable mortality rate has decreased (by 33%) since 2001 but there has been little change since 2014 (+1%).
- After adjusting for age, avoidably mortality rates among males (380 per 100,000) were 58% higher than those among females (240 per 100,000).
- Cancer and circulatory diseases were the most common causes of avoidable mortality in 2019, accounting for 34% and 25% of all avoidable deaths respectively.
- Greater Glasgow and Clyde, Lanarkshire and Ayrshire and Arran had the highest rates of avoidable mortality in 2017-2019 with the lowest rates seen in Shetland and Borders Health Board areas.
- At local authority level, the highest rates were recorded in Glasgow City, Dundee City and Inverclyde whilst the lowest rates were in East Renfrewshire, East Dunbartonshire and Shetland.
- After adjusting for age, avoidable mortality rates in the most deprived areas were 4.5 times more than those in the least deprived areas.

2. Introduction

What is Avoidable Mortality?

Avoidable mortality is a measure of deaths from causes for which all or most deaths are considered avoidable through timely and effective healthcare and public health interventions.

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

NRS has updated its definition of avoidable mortality to use the new [OECD international definition of avoidable mortality](#) to ensure our statistics are comparable internationally and with other parts of the UK. The new definition has been applied to the full time series back to 2001.

This publication contains age-standardised death rates as well as numbers of deaths from avoidable, preventable and treatable causes of death.

Why use age-standardised mortality rates?

Age-standardised mortality rates are a better measure of mortality than numbers of deaths, as they account for the population size and age structure and provide more reliable comparisons between groups or over time. As the probability of death tends to increase with age, changes in the age-distribution of the population could have an effect on any apparent trend shown by numbers of deaths, or crude death rates (dividing the number of deaths by the total population).

Similarly, if two groups' populations have different age-distributions, using age-standardised rates will remove the effect of the differences between the groups and show which one has the higher mortality.

Age-standardised rates are therefore more reliable for comparing mortality over time and between different countries, different areas within a country, deprivation quintiles, and different sexes.

More information on the calculation of age-standardised mortality rates is available on our [website](#).

3. Avoidable mortality in Scotland

Avoidable mortality can be split into two categories. Firstly, those classified as preventable - deaths which could be mainly avoided through effective public health and primary prevention interventions before the onset of disease. Secondly those classified as treatable – deaths which could be mainly avoided through timely and effective healthcare interventions including secondary prevention and treatment after the onset of disease.

See [Table A](#) for a breakdown of specific disease classification by preventable or treatable.

Table 1 shows that of the deaths registered in 2019:

- 10,604 (18% of all registered deaths) were considered preventable.
- 4,916 (8% of all registered deaths) were considered treatable.
- 15,519 (27% of all registered deaths) in total were considered avoidable¹.

¹ Figures for preventable and treatable deaths may not sum to the total for avoidable deaths due to rounding.

Table 1 also shows the age-standardised mortality rates in 2019:

- 210.7 preventable deaths per 100,000 people
- 97.1 treatable deaths per 100,000 people
- 307.8 avoidable deaths per 100,000 people.

Looking at the trend in the avoidable mortality rate over time, from Figure 1, rates decreased between 2001-2014 (a reduction of 34% for all persons), after which the rates appear to plateau having remained fairly consistent for the past 6 years for both males and females. Figure 1 also shows that avoidable mortality rates were consistently higher among males from 2001 – 2019.

Figure 2 further outlines the difference between sexes. Although in both males and females the number of preventable deaths has decreased since 2001, the number of male preventable deaths remains considerably higher than female preventable deaths. Comparatively, the difference between male and female treatable deaths is small, although male treatable deaths have remained slightly higher than females from 2001-2019 consistently.

Figure 1: Avoidable mortality rates in Scotland: 2001-2019

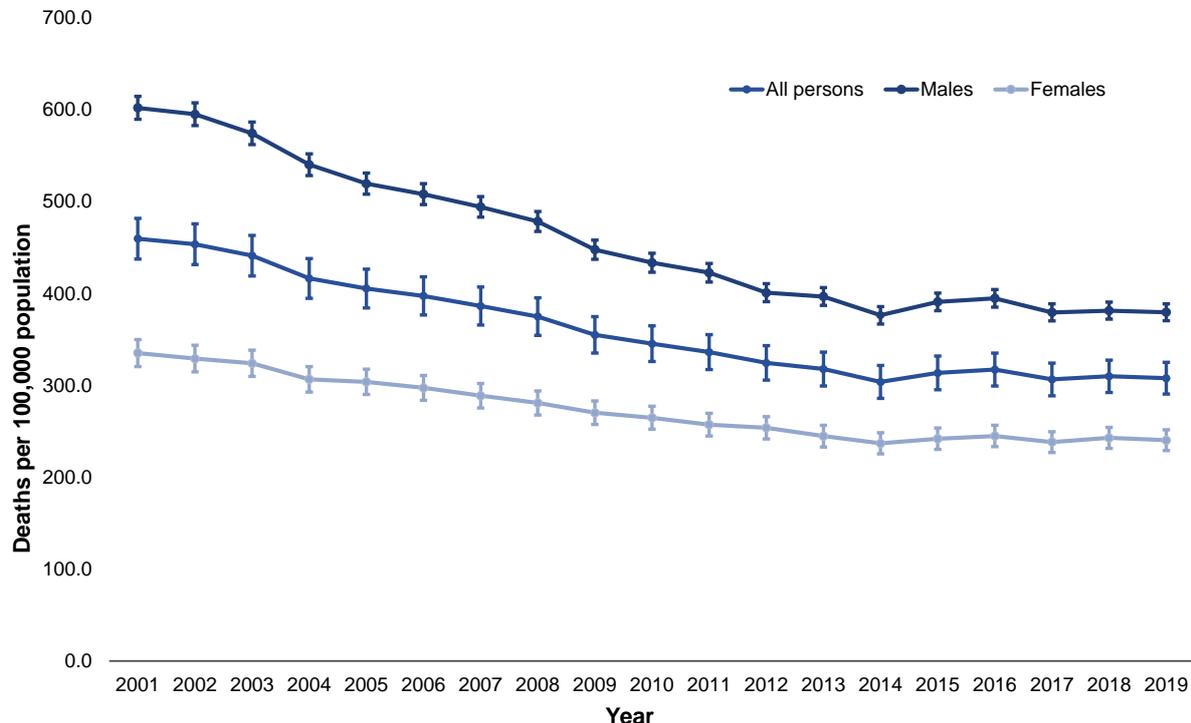
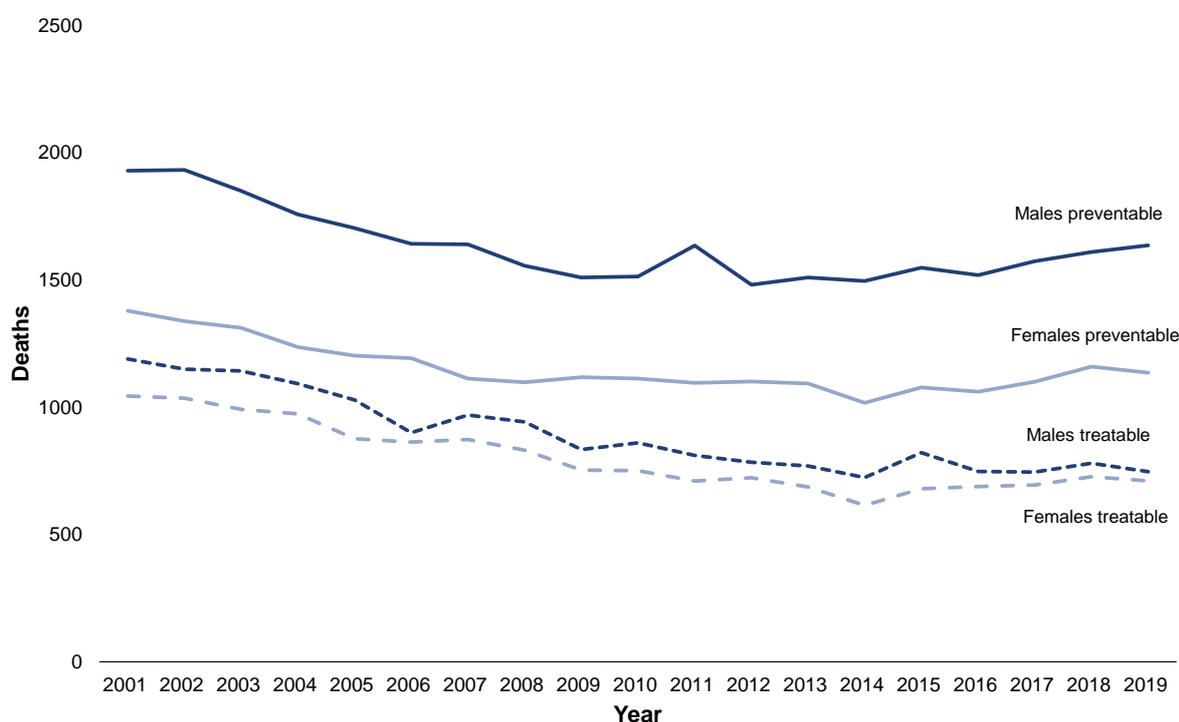


Figure 2: Preventable and treatable deaths by sex: 2001-2019



4. Avoidable mortality by cause

Table 2 shows the underlying cause of death classified as avoidable, preventable and treatable and registered in Scotland in 2019, in terms of the World Health Organisation’s International Statistical Classification of Diseases and Related Health Problems, tenth revision (ICD-10) in total and by sex.

The leading causes of avoidable deaths in 2019 for all persons were:

- Neoplasms (avoidable mortality rate of 102.4 per 100,000 population)
- Circulatory system diseases (avoidable mortality rate of 76.5 per 100,000 population)
- Alcohol and drug related disorders (avoidable mortality rate of 48.1 per 100,000 population)

Not all causes of death are avoidable

The proportion of deaths that are classified as avoidable varies greatly between ICD-10 chapters. For example, almost all deaths due to external causes are counted as avoidable, whereas under one tenth of deaths due to mental disorders hold this classification. See **Table A** for details.

For males the leading cause of avoidable and preventable deaths were neoplasms, whilst the leading cause of treatable deaths were circulatory system diseases.

In comparison, for females the leading cause of all avoidable, preventable and treatable deaths were neoplasms.

Figure 3 shows the distribution of preventable and treatable deaths across the main causes of avoidable deaths in 2019.

- Neoplasms had the highest rate of preventable deaths
- Circulatory system diseases had the highest rate of treatable deaths
- Alcohol and drug related disorders and injuries only had preventable deaths.

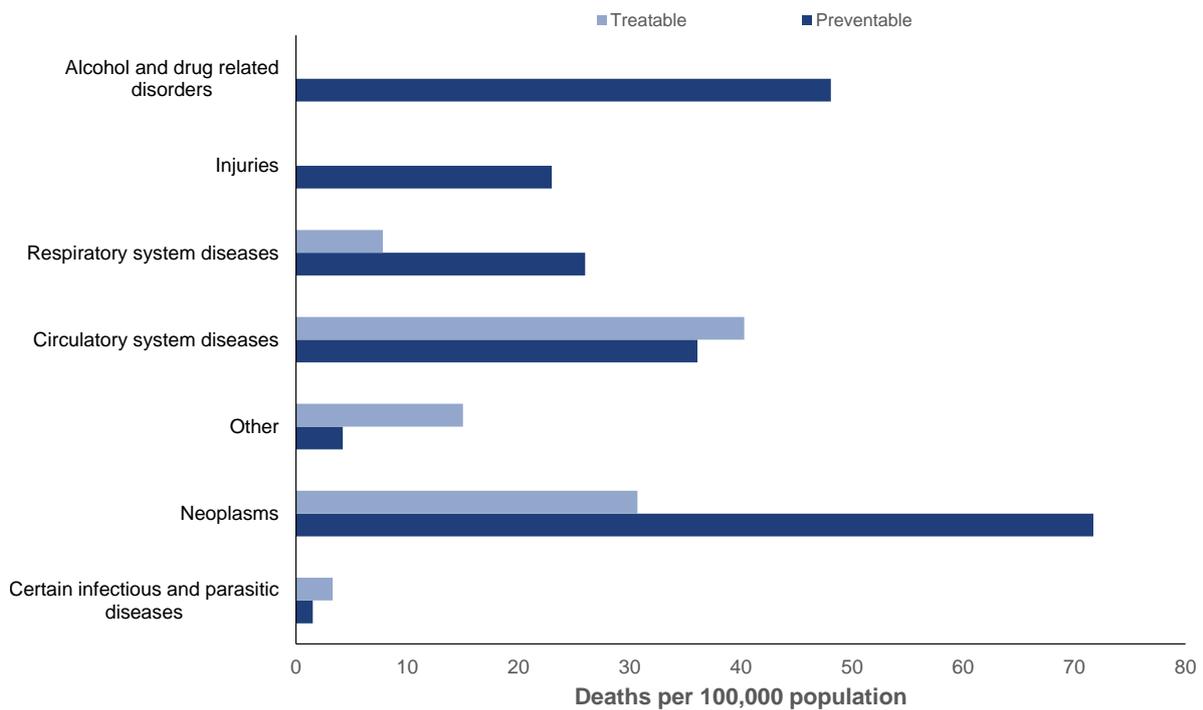
Under the new avoidable mortality definition (see table A), the majority of diseases of the circulatory system in 2019 were equally proportioned between preventable and treatable mortality.

For diseases of the respiratory system and neoplasms, the majority of avoidable deaths were considered to be preventable.

Whilst avoidable deaths caused by certain infectious and parasitic diseases and other diseases (see table A for breakdown of 'other') were mostly considered to be treatable.

Avoidable deaths caused by alcohol and drug related disorders and injuries were all considered only preventable and not treatable.

Figure 3: Avoidable mortality rates in Scotland by cause, all persons: 2019



5. Avoidable mortality by age

Figure 4 shows the distribution of avoidable deaths across age categories in 2019, split by preventable and treatable deaths.

Avoidable mortality in under 1s is largely driven by treatable deaths, whereas for all age categories above 14 years, avoidable mortality is dominated by preventable deaths.

Both preventable and treatable deaths increase as age increases highlighting the majority of avoidable deaths occur in the older age categories.

Importantly, the difference between the preventable and treatable mortality figures also increases as the age categories increase, thus further highlighting preventable deaths as the dominant form of avoidable deaths driving the rate of avoidable mortality overall.

Figure 4: Preventable and treatable deaths by age group, all persons: 2019

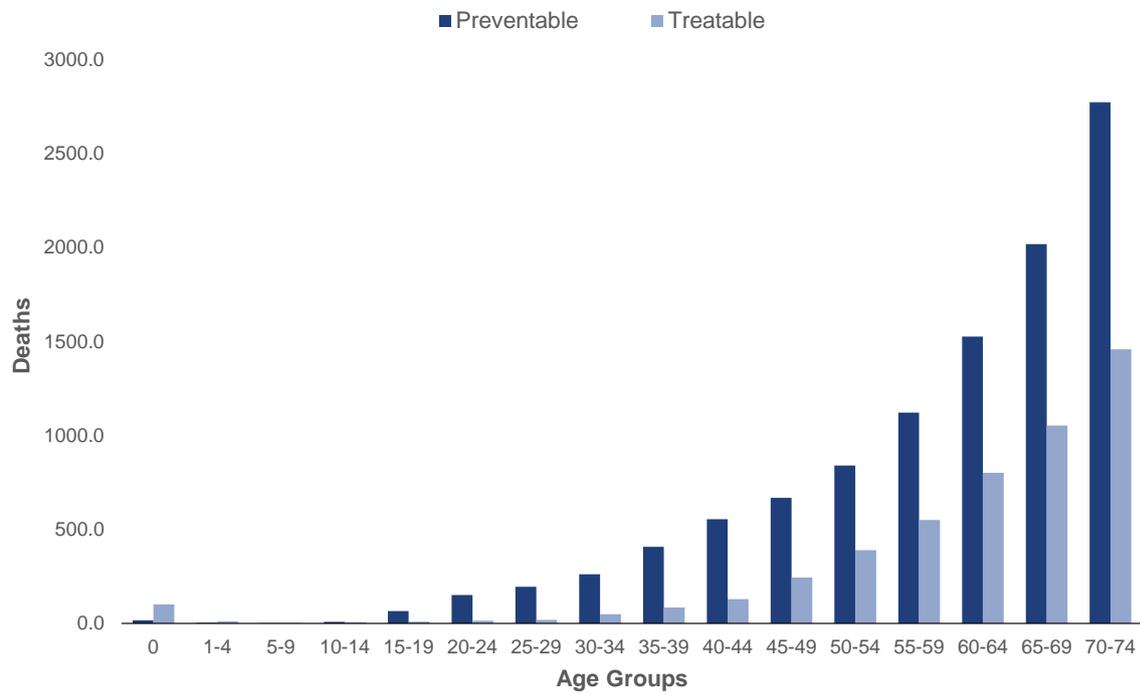


Figure 5: Avoidable deaths, all persons aged 25+: 2001-2019

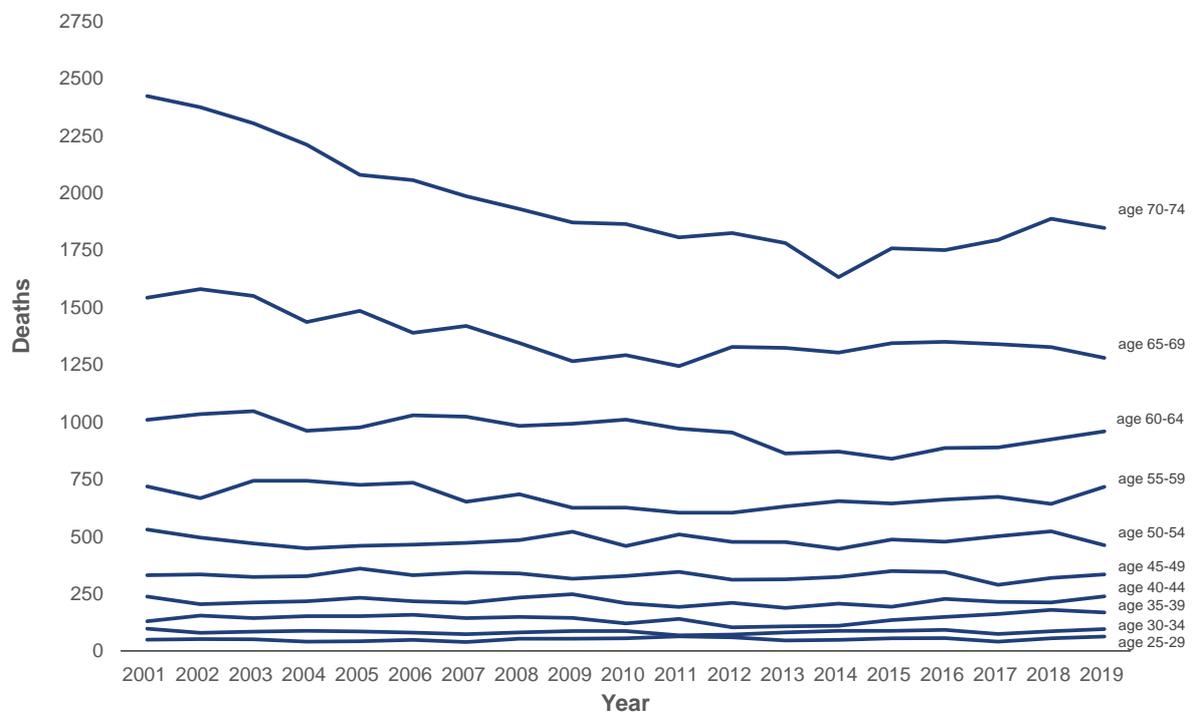


Figure 5 shows how the number of deaths have changed over time across these age groups.

- The only age category to experience a notable reduction in avoidable deaths since 2001 is the 70-74 group (a reduction of 24%).
- The number of avoidable deaths for all other ages have remained relatively stable since 2001.

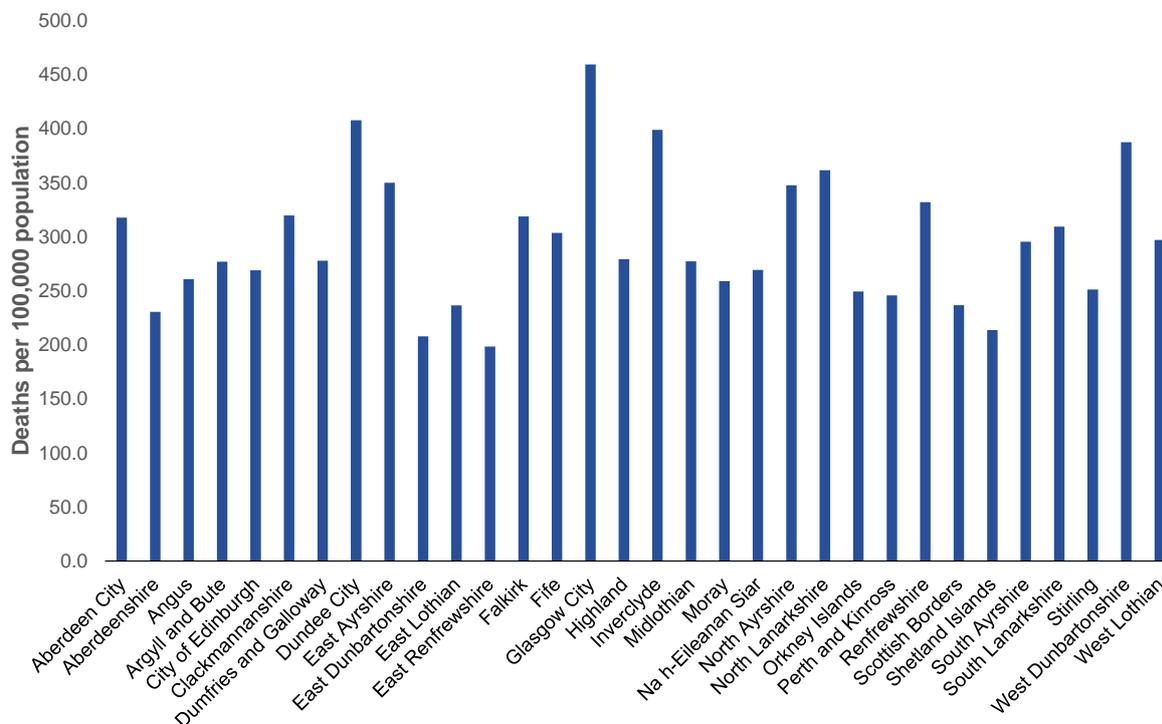
Avoidable mortality in children and young people (under 25s)

From **Figure 4** it is clear that the under 25s show a different pattern in terms of their breakdown by preventable and treatable deaths.

- 386 avoidable deaths were recorded in under 25s in 2019 (accounting for 2% of all avoidable deaths)
 - Of these deaths, the majority were recorded in 20-24 and under 1s age categories accounting for 165 and 117 deaths respectively.
 - In the under 1s the majority of these deaths were treatable (86% of all avoidable deaths in this age group)
 - In the 20-24 age group the majority were preventable (92% of all avoidable deaths in this age group)
- See **Table 3** in the supplementary data for more detailed outlines of the figure across age categories.

6. Avoidable mortality by council area

Figure 6: Avoidable mortality rates by council, all persons: 2017-2019 average



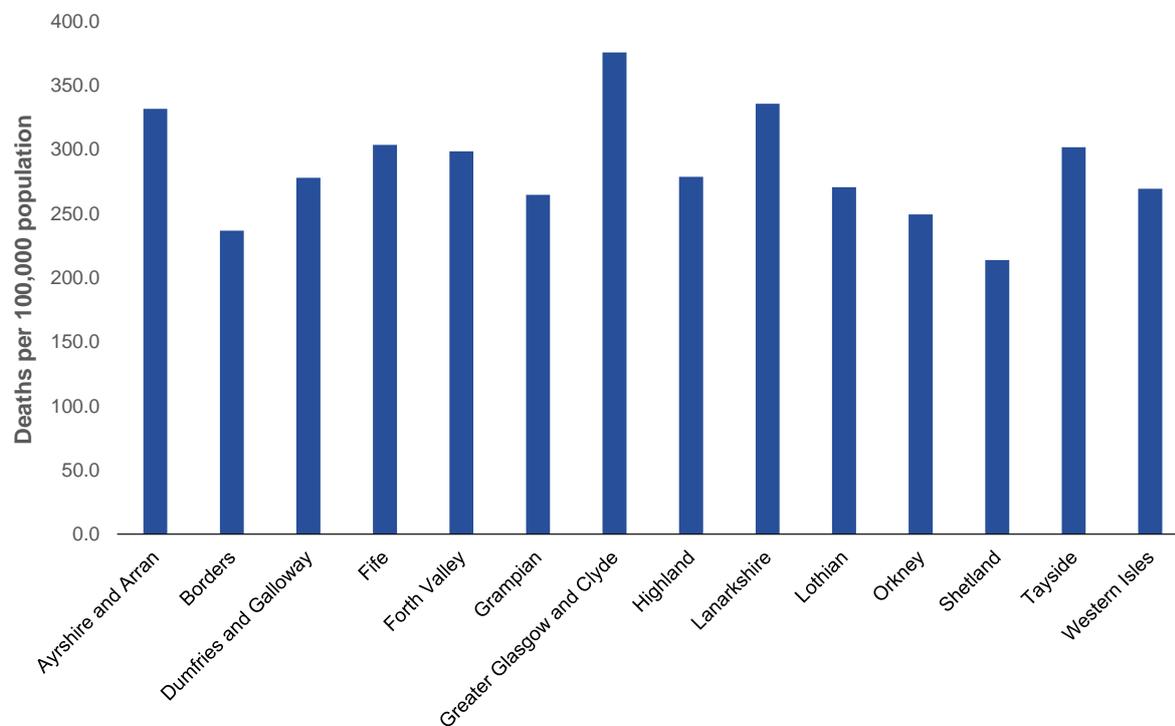
Rates varied across council areas:

- Glasgow City, Dundee City and Inverclyde had the highest avoidable mortality rates, averaged across 2017-2019 (459.4, 407.7 and 398.9 deaths per 100,000 respectively).
- East Renfrewshire, East Dunbartonshire and Shetland Islands had the lowest avoidable mortality rates (198.4, 207.9 and 213.7 deaths per 100,000 respectively).

Glasgow City's avoidable mortality rate was more than twice the rate of East Renfrewshire.

7. Avoidable mortality by Health Board

Figure 7: Avoidable mortality rates by health board, all persons: 2017-2019 average



Avoidable mortality rates varied less significantly across the health boards:

- Greater Glasgow and Clyde had the highest avoidable mortality rate of all the health boards in Scotland (375.6 deaths per 100,000).
- Shetland had the lowest (213.7 deaths per 100,000).

The avoidable mortality rate in Greater Glasgow and Clyde was over 1.7 times the rate in Shetland.

8. Avoidable Mortality by deprivation

While the avoidable mortality rates vary between geographical areas such as council areas and health boards, the difference between mortality rates is far greater when we breakdown Scotland by deprivation.

Figure 8 shows the change in avoidable mortality rates in each SIMD (Scottish index of multiple deprivation) deciles.

SIMD

The Scottish index multiple deprivation is a measure of how deprived an area is. A score is given to all of Scotland's datazones based on multiple indicators of deprivation.

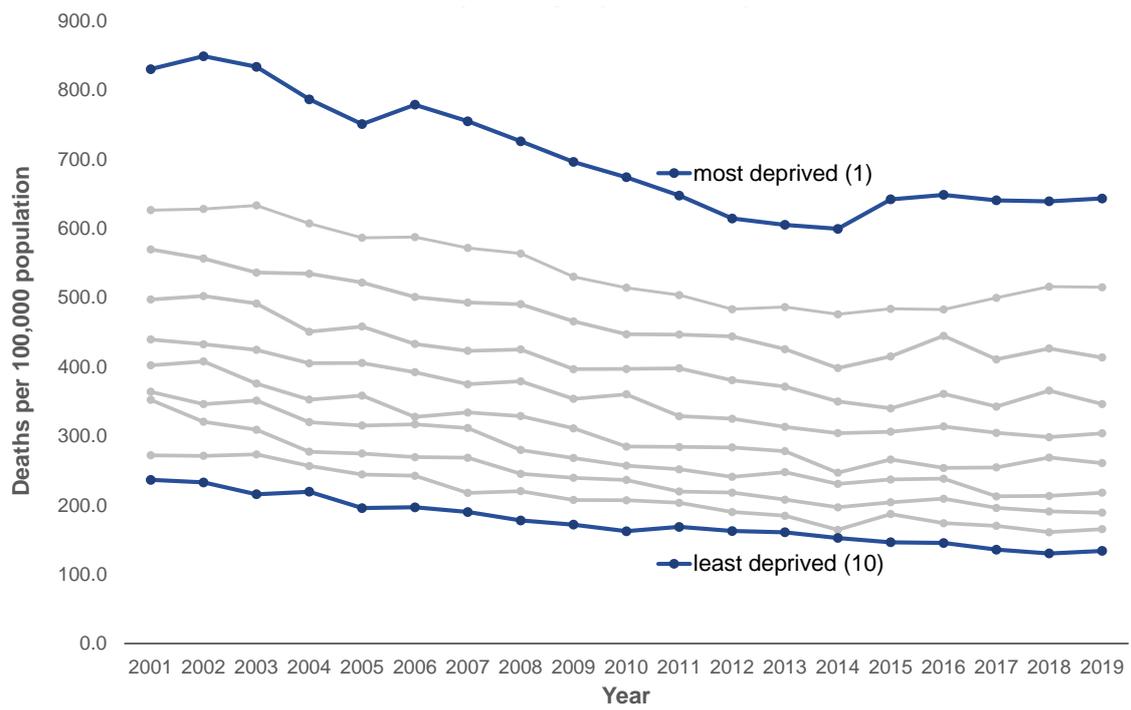
The datazones are then ranked 1 to 6,976 based on their score. Subsequently, the rankings are split into 10 equally sized groups forming SIMD deciles and five groups for SIMD quintiles.

In 2019, the avoidable mortality rate of those in decile 1 (the 10% most deprived areas) was 643.2 per 100,000 compared with 133.8 per 100,000 for those in decile 10 (the 10% least deprived areas). It follows that those in the most deprived decile were 4.8 times as likely to die from an avoidable death in 2019 compared to those in the least deprived decile.

Since 2001, all deciles have experienced a decrease in avoidable mortality rates with rates in the most deprived decile reduced by 23% and those in the least deprived decile reduced by 43%. The gap between the most and least deprived deciles has therefore increased – from a magnitude of 3.5 in 2001 to 4.8 in 2019.

Importantly, the gap between deciles 1 and 2 is far bigger than the gaps between any other deciles, highlighting the inequalities in decile 1 specifically.

Figure 8: Avoidable mortality rates by deprivation, all persons: 2001-2019.



9. Methodology

NRS has updated its definition of avoidable mortality to use the new OECD international definition of avoidable mortality to ensure our statistics are comparable internationally and with other parts of the UK. The new definition has been applied to the full time series back to 2001.

Deaths are classified as preventable or treatable according to their cause of death and the age at death. The following table indicates which types of death are included.

Table A – OECD Definition of Avoidable Mortality

Condition group and cause	ICD-10 codes	Age	Treatable	Preventable
Infectious diseases				
Intestinal diseases	A00-A09	0-74		•
Diphtheria, Tetanus, Poliomyelitis	A35, A36, A80	0-74		•
Whooping cough	A37	0-74		•
Meningococcal infection	A39	0-74		•
Sepsis due to streptococcus pneumonia and sepsis due to haemophilus influenzae	A40.3, A41.3	0-74		•
Haemophilus influenza infections	A49.2	0-74		•
Sexually transmitted infections (except HIV/AIDS)	A50-A60, A63, A64	0-74		•
Varicella	B01	0-74		•
Measles	B05	0-74		•
Rubella	B06	0-74		•
Viral Hepatitis	B15-B19	0-74		•
HIV/AIDS	B20-B24	0-74		•

Malaria	B50-B54	0-74		•
Haemophilus and pneumococcal meningitis	G00.0, G00.1	0-74		•
Tuberculosis	A15-A19, B90, J65	0-74	• (50%)	• (50%)
Scarlet fever	A38	0-74	•	
Sepsis	A40 (excl. A40.3), A41 (excl. A41.3)	0-74	•	
Cellulitis	A46, L03	0-74	•	
Legionnaires disease	A48.1	0-74	•	
Streptococcal and enterococci infection	A49.1	0-74	•	
Other meningitis	G00.2, G00.3, G00.8, G00.9	0-74	•	
Meningitis due to other and unspecified causes	G03	0-74	•	

Neoplasms

Lip, oral cavity and pharynx cancer	C00-C14	0-74		•
Oesophageal cancer	C15	0-74		•
Stomach cancer	C16	0-74		•
Liver cancer	C22	0-74		•
Lung cancer	C33-C34	0-74		•
Mesothelioma	C45	0-74		•
Skin (melanoma) cancer	C43	0-74		•
Bladder cancer	C67	0-74		•

Cervical cancer	C53	0-74	• (50%)	• (50%)
Colorectal cancer	C18-C21	0-74	•	
Breast cancer (female only)	C50	0-74	•	
Uterus cancer	C54, C55	0-74	•	
Testicular cancer	C62	0-74	•	
Thyroid cancer	C73	0-74	•	
Hodgkin's disease	C81	0-74	•	
Lymphoid leukaemia	C91.0, C91.1	0-74	•	
Benign neoplasm	D10-D36	0-74	•	

Endocrine and metabolic diseases

Nutritional deficiency anaemia	D50-D53	0-74		•
Diabetes mellitus	E10-E14	0-74	• (50%)	• (50%)
Thyroid disorders	E00-E07	0-74	•	
Adrenal disorders	E24-E25 (except E24.4), E27	0-74	•	

Diseases of the nervous system

Epilepsy	G40, G41	0-74	•	
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Diseases of the circulatory system

Aortic aneurysm	I71	0-74	• (50%)	• (50%)
Hypertensive diseases	I10-I13, I15	0-74	• (50%)	• (50%)
Ischaemic heart diseases	I20-I25	0-74	• (50%)	• (50%)
Cerebrovascular diseases	I60-I69	0-74	• (50%)	• (50%)
Other atherosclerosis	I70, I73.9	0-74	• (50%)	• (50%)

Rheumatic and other heart diseases	I00-I09	0-74	•
Venous thromboembolism	I26, I80	0-74	•

Diseases of the respiratory system

Influenza	J09-J11	0-74	•
Pneumonia due to streptococcus pneumonia or haemophilus influenza	J13-J14	0-74	•
Chronic lower respiratory diseases	J40-J44	0-74	•
Lung diseases due to external agents	J60-J64, J66-J70, J82, J92	0-74	•
Upper respiratory infections	J00-J06, J30-J39	0-74	•
Pneumonia, not elsewhere classified or organism unspecified	J12, J15, J16-J18	0-74	•
Acute lower respiratory infections	J20-J22	0-74	•
Asthma and bronchiectasis	J45-J47	0-74	•
Adult respiratory distress syndrome	J80	0-74	•
Pulmonary oedema	J81	0-74	•
Abscess of lung and mediastinum pyothorax	J85, J86	0-74	•
Other pleural disorders	J90, J93, J94	0-74	•

Diseases of the digestive system

Gastric and duodenal ulcer	K25-K28	0-74	•
Appendicitis	K35-K38	0-74	•

Abdominal hernia	K40-K46	0-74	•
Cholelithiasis and cholecystitis	K80-K81	0-74	•
Other diseases of gallbladder or biliary tract	K82-K83	0-74	•
Acute pancreatitis	K85.0, K85.1, K85.3, K85.8, K85.9	0-74	•
Other diseases of pancreas	K86.1, K86.2, K86.3, K86.8, K86.9	0-74	•

Diseases of the genitourinary system

Nephritis and nephrosis	N00-N07	0-74	•
Obstructive uropathy	N13, N20-N21, N35	0-74	•
Renal failure	N17-N19	0-74	•
Renal colic	N23	0-74	•
Disorders resulting from renal tubular dysfunction	N25	0-74	•
Unspecified contracted kidney, small kidney of unknown cause	N26-N27	0-74	•
Inflammatory diseases of genitourinary system	N34.1, N70- N73, N75.0, N75.1, N76.4, N76.6	0-74	•
Prostatic hyperplasia	N40	0-74	•

Pregnancy, childbirth and the perinatal period

Tetanus neonatorum	A33	0-74	•
Obstetrical tetanus	A34	0-74	•

Pregnancy, childbirth and the puerperium	O00-O99	0-74	•
Certain conditions originating in the perinatal period	P00-P96	0-74	•
Congenital malformations			
Certain congenital malformations (neural tube defects)	Q00, Q01, Q05	0-74	•
Congenital malformations of the circulatory system (heart defects)	Q20-Q28	0-74	•
Adverse effects of medical and surgical care			
Drugs, medicaments and biological substances causing adverse effects in therapeutic use	Y40-Y59	0-74	•
Misadventures to patients during surgical and medical care	Y60-Y69, Y83-Y84	0-74	•
Medical devices associated with adverse incidents in diagnostic and therapeutic use	Y70–Y82	0-74	•
Injuries			
Transport Accidents	V01-V99	0-74	•
Accidental Injuries	W00-X39, X46-X59	0-74	•
Intentional self-harm	X66-X84	0-74	•
Event of undetermined intent	Y16-Y34	0-74	•
Assault	X86-Y09, U50.9	0-74	•
Alcohol-related and drug-related deaths			

Alcohol-specific disorders and poisonings	E24.4, F10, G31.2, G62.1, G72.1, I42.6, K29.2, K70, K85.2, K86.0, Q86.0, R78.0, X45, X65, Y15	0-74	•
Other alcohol-related disorders	K73, K74.0-K74.2, K74.6-K74.9	0-74	•
Drug disorders and poisonings	F11-F16, F18-F19, X40-X44, X85, Y10-Y14	0-74	•
Intentional self-poisoning by drugs	X60-X64	0-74	•

10. Strengths and Limitations

Strengths

1. Information is supplied when a death is registered, giving complete coverage of the population and ensures highly accurate estimates that are representative of the population.
2. Coding for cause of death is carried out according to the World Health Organization (WHO) ICD-10 and agreed rule.
3. The use of age-standardised mortality rates means our statistics are comparable between local health boards, councils and at national level.
4. The use of the OECD definition also makes the statistics in this report comparable internationally.

Limitations

1. Data are insufficiently robust to provide local authority estimates for smaller areas for single years (hence why they are aggregated over a 3 year period). This limits the timeliness of the data.
2. In a small number of cause of death categories, the number of deaths was too small to report a reliable rate. For this reason, the categories were combined in and thus limits the precision accuracy of our cause of death reporting.

11. Future developments

The next scheduled publication for further avoidable mortality statistics in Scotland is June 2021.

12. Related Statistics

- Prior to 2019, avoidable mortality statistics (using a previous definition) were published in a summary format on the [NRS website](#).
- The [ONS](#) publish avoidable mortality statistics on the UK and its constituent countries. These are also based on the OECD definition of avoidable mortality.

13. Notes on statistical publications

National Statistics

The United Kingdom Statistics Authority (UKSA) has designated these statistics as National Statistics, in line with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics (available on the [UKSA](#) website).

National Statistics status means that official statistics meet the highest standards of trustworthiness, quality and public value.

All official statistics should comply with all aspects of the Code of Practice for Official Statistics. They are awarded National Statistics status following an assessment by the Authority's regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

It is National Records of Scotland's responsibility to maintain compliance with the standards expected of National Statistics. If we become concerned about whether these statistics are still meeting the appropriate standards, we will discuss any concerns with the Authority promptly. National Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.

Information on background and source data

Further details on data source(s), timeframe of data and timeliness, continuity of data, accuracy, etc. can be found in the metadata that is published alongside this publication on the NRS website.

National Records of Scotland

We, the National Records of Scotland, are a non-ministerial department of the devolved Scottish Administration. Our aim is to provide relevant and reliable information, analysis and advice that meets the needs of government, business and the people of Scotland. We do this as follows:

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Recording the present – At our network of local offices, we register births, marriages, civil partnerships, deaths, divorces and adoptions in Scotland.

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Enquiries and suggestions

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