

# Deaths involving coronavirus (COVID-19) in Scotland



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This statistical report includes provisional statistics on the number of deaths associated with coronavirus (COVID-19) and the total number of deaths registered in Scotland, for week 40 of 2022 and additional monthly analysis on deaths occurring up to 30 September 2022.

## Key Findings

### Deaths involving COVID-19, weekly registrations ([go to section](#))

- As at the 9<sup>th</sup> of October 2022, there have been a total of 15,817 deaths registered in Scotland where the novel coronavirus (COVID-19) was mentioned on the death certificate. In the latest week there were 36 deaths, nine fewer than the previous week.
- Of deaths involving COVID-19 in the latest week:
  - 20 were female, 16 were male.
  - 25 were aged 75 or older, 7 were aged 65 to 74 and 4 were under 65.
  - There were 6 deaths in South Lanarkshire, and 4 deaths in both Glasgow City and City of Edinburgh. In total 15 council areas (out of 32) had at least one death involving COVID-19 last week.
  - 26 were in hospitals, 6 were in care homes, and 4 at home or a non-institutional setting.

### Deaths from all causes, weekly registrations ([go to section](#))

- The total number of deaths registered in Scotland in week 40 of 2022 was 1,275. This was 165 deaths more than the five year average for week 40 (15% above average).
- In week 40 there were 63 excess deaths at home or in non-institutional settings (20% above average), 87 more deaths in hospitals (16% above average), and 13 more deaths in care homes (5% above average) compared to the five-year average.
- There were 165 more deaths across all locations for the latest week. Respiratory deaths were 46 above average, circulatory deaths were 45 above average and dementia and Alzheimer's deaths were 29 above average. Deaths from cancer were 17 below average. There were 68 excess deaths from other causes. The number of deaths where COVID-19 was the underlying cause was 17.

### Monthly mortality analysis, deaths occurring up to 30 September 2022 ([go to section](#))

- The age standardised death rate for deaths involving COVID-19 was lower in September 2022 (35 per 100,000) compared to August 2022 (46 per 100,000). The difference between the last two months was statistically significant. Throughout the pandemic, the highest rate was 585 deaths per 100,000 people in April 2020.
- After adjusting for age, people living in the most deprived areas were 2.4 times as likely to die with COVID-19 as those in the least deprived areas. The size of this gap slowly widened over the period of the pandemic but has narrowed since January when the gap was 2.5.
- Of the 15,794 deaths involving COVID-19 between March 2020 and September 2022, 93% (14,750) had at least one pre-existing condition. Just under one quarter of people whose death involved COVID-19 had dementia or Alzheimer's disease. This was the most common main pre-existing condition.
- There have been 9 deaths in Scotland in which the underlying cause of death was due to the adverse effects of vaccination against COVID-19 and four further deaths where an adverse effect was mentioned on the death certificate. By 30<sup>th</sup> September 2022

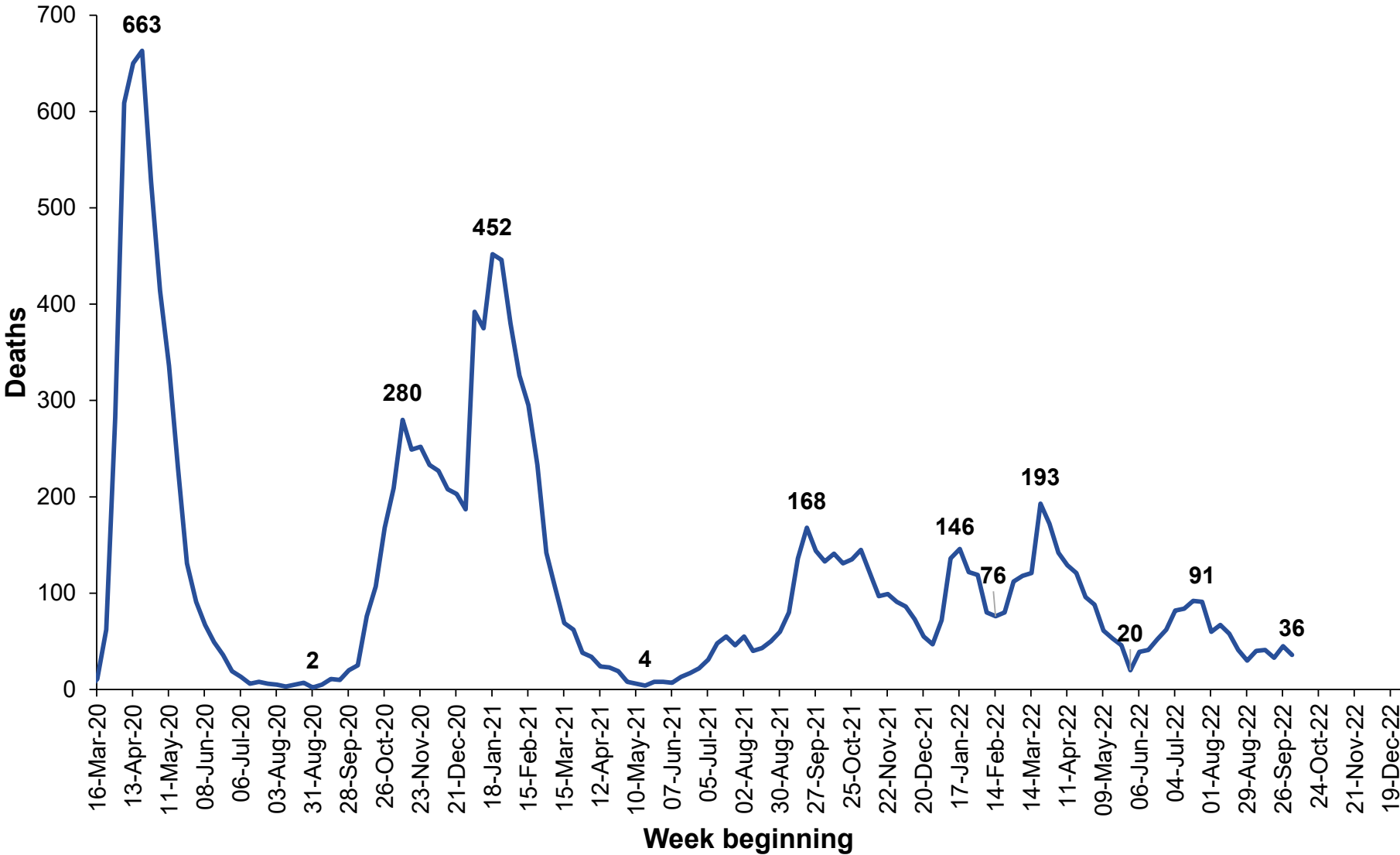
[statistics from Public Health Scotland](#) state that 4.4 million people had been given at least one vaccine dose.

### **Five year average for calculation of 2022 excess deaths**

2022 deaths are being compared against a five year average of the years 2016 2017, 2018, 2019 and 2021. This approach is also being used by the Office for National Statistics (ONS).

The reasons for this choice are laid out in a paper on the [NRS website](#).

Figure 1: Weekly deaths involving COVID-19 in Scotland, week 12 2020 to week 40 2022



## Date of occurrence vs date of registration

Most of the figures throughout the weekly report are based on the date a death was registered rather than the date the death occurred. There is on average a 3 day gap between a death occurring and being registered. Please find a more detailed explanation in the [methodology](#) document.

### Why focus on date of registration rather than the actual date of death?

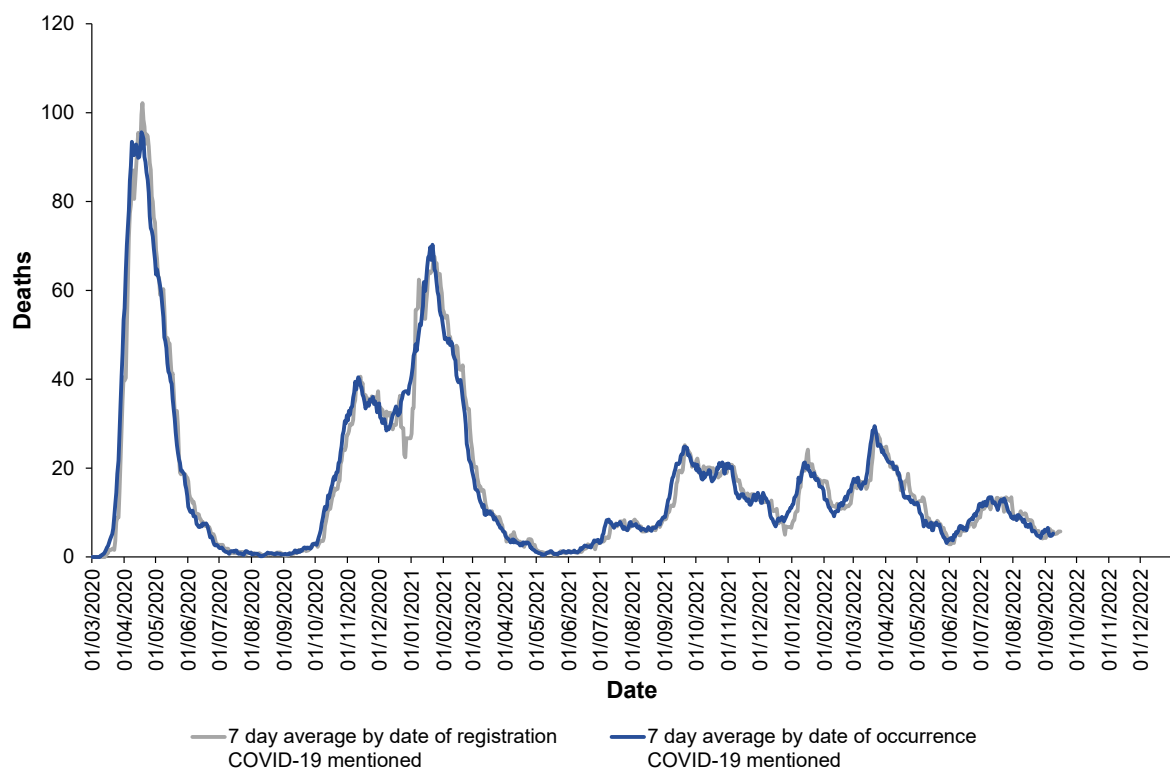
The death count based on **date of registration** is more timely but is incomplete and is subject to fluctuations due to public holidays.

The death count based on **date of death** is more complete and gives a more accurate trend on the progress of the virus, but less timely (a one week delay compared to date of registration figures).

Differences between the two measures can be seen at times of year when there are public holidays, most noticeably at Christmas and Easter. Daily deaths have generally fell since mid-July.

This report includes all deaths which were registered by 9<sup>th</sup> October. There will, however, be deaths which occurred before this date but were not yet registered. In order to include a more complete analysis based on date of occurrence, we need to wait an additional week to allow the registration process to fully complete. The trend based on date of occurrence therefore only includes deaths which occurred by 2<sup>nd</sup> October as the majority of these are likely to have been registered by now.

**Figure 2: Deaths involving COVID-19 by date of registration and date of death**



## Monthly mortality analysis (deaths occurring up to 30 September 2022)

This section provides an in-depth analysis of deaths which **occurred** in Scotland between March 2020 and September 2022. This is a different basis from the rest of this report which (unless specified) is based on the date deaths were **registered**.

### Age-standardised mortality rates

When adjusting for size and age structure of the population, for all deaths involving COVID-19 between March 2020 and September 2022 the mortality rate was 114 deaths per 100,000 population. Rates for males were significantly higher than for females (141 compared with 94 per 100,000).

#### Why use age-standardised mortality rates?

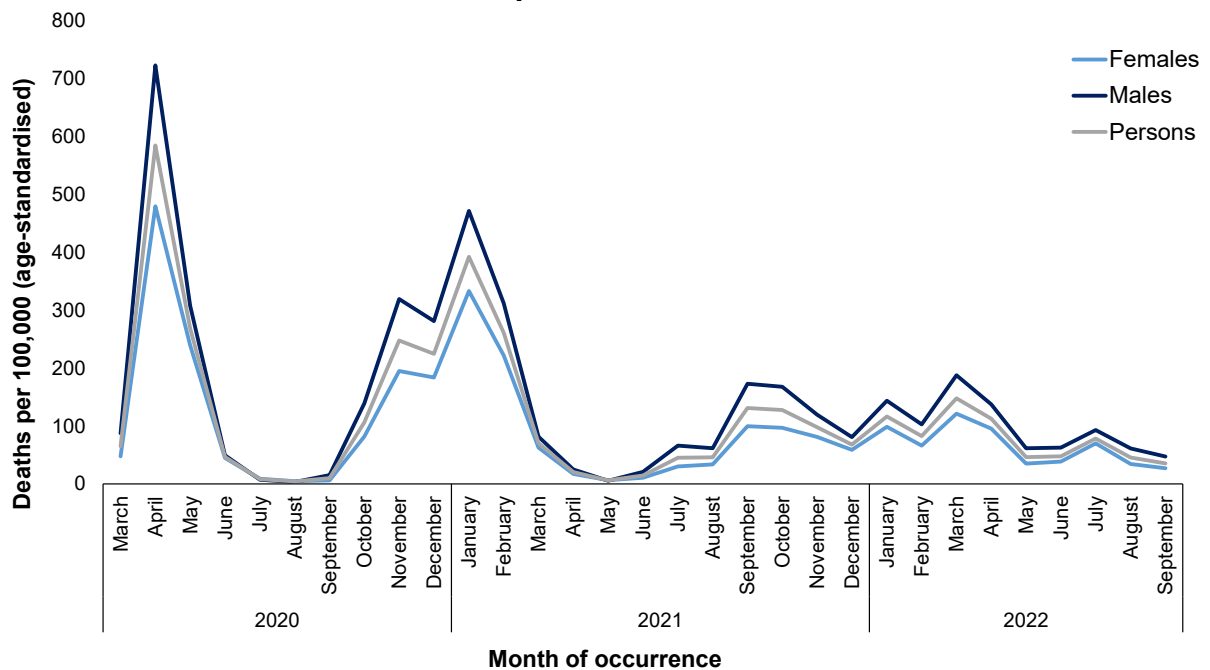
Age-standardised mortality rates are a better measure of mortality than numbers of deaths, as they account for the population size and age structure and provide more reliable comparisons between groups or over time. As the probability of death tends to increase with age, changes in the age-distribution 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).

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

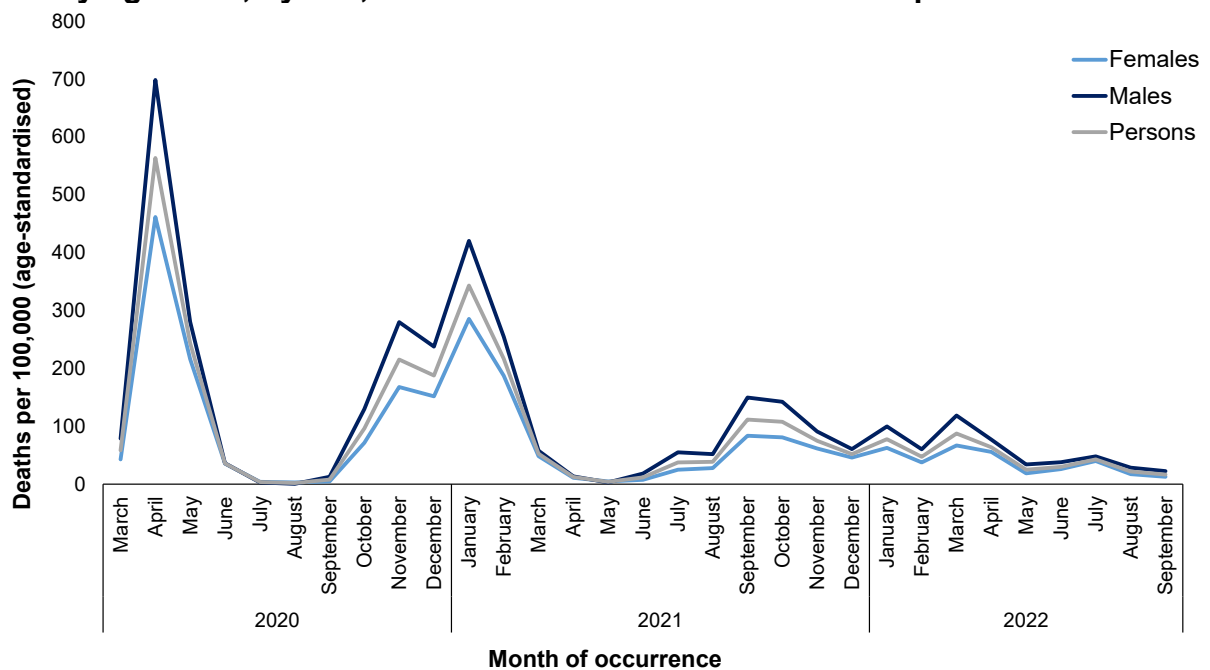
The proportion of deaths involving COVID-19 where it was the underlying cause has fallen over the course of the pandemic. It was 96% at the height of the first wave in April 2020, and 46% in the most recent month (September 2022). Over the whole pandemic (March 2020 to September 2022), 81% of deaths involving COVID-19 had COVID-19 as the underlying cause.

The age standardised death rate for deaths involving COVID-19 fell from 46 to 35 per 100,000 between August 2022 and September 2022. The difference between the last two months was statistically significant.

**Figure 3a: Age standardised rates for deaths involving COVID-19 by sex, between 1<sup>st</sup> March 2020 and 30<sup>th</sup> September 2022**



**Figure 3b: Age standardised rates for deaths where COVID-19 was the underlying cause, by sex, between 1<sup>st</sup> March 2020 and 30<sup>th</sup> September 2022**



The age-standardised mortality rate from all causes was 1,176 per 100,000 population in the period from 1<sup>st</sup> March 2020 to 30<sup>th</sup> September 2022.

## Leading causes of death

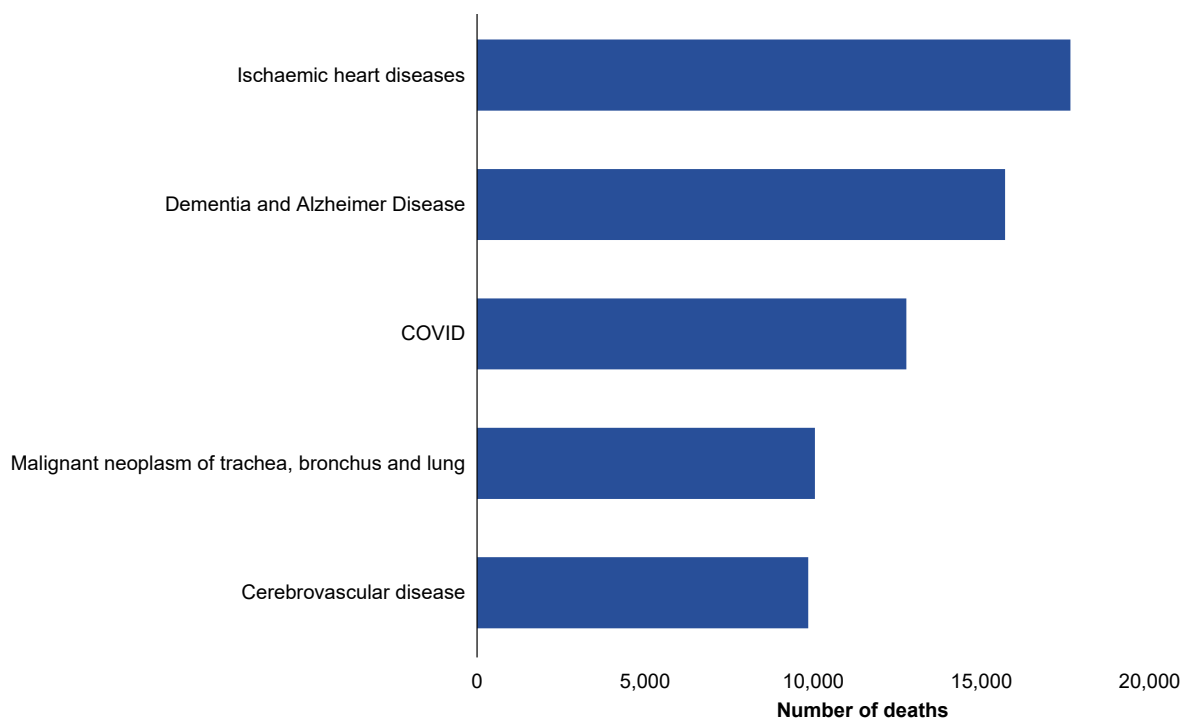
Over the period between 1<sup>st</sup> March 2020 and 30<sup>th</sup> September 2022, the leading cause of death was ischaemic heart disease (17,645 deaths, 11% of all deaths) followed by dementia and Alzheimer's disease (15,701, 10%) and COVID-19 (12,769 deaths, 8% of all deaths).

The most common cause of death in September 2022 was ischaemic heart disease, which accounted for 11% of all deaths last month.

COVID-19 has not been in the top-5 leading causes since April 2022.

The leading cause of death analysis is based on a list of causes developed by the World Health Organisation (WHO). There are around 60 categories in total and cancers are grouped separately according to the type of cancer. For example, lung, breast and prostate cancer are all counted as separate causes. The full list of leading causes is available on the ONS website.

**Figure 4: Leading causes of death - 1<sup>st</sup> March 2020 to 30<sup>th</sup> September 2022**

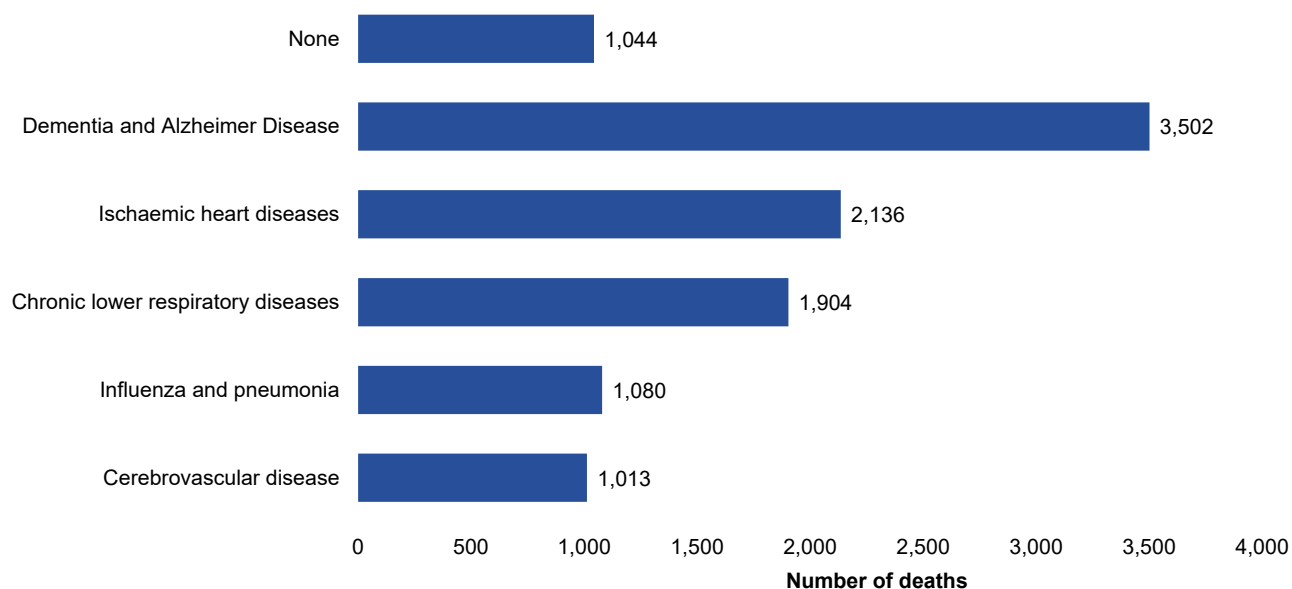




## Pre-existing conditions of people who died with COVID-19

Of the 15,794 deaths involving COVID-19 between March 2020 and September 2022, 93% (14,750) had at least one pre-existing condition.

**Figure 5: Main pre-existing condition in deaths involving COVID-19, between 1<sup>st</sup> March 2020 and 30<sup>th</sup> September 2022**



The most common main pre-existing condition among those who died with COVID-19 was dementia and Alzheimer’s disease (22%), followed by ischaemic heart disease (14%), chronic lower respiratory diseases (12%), influenza and pneumonia (7%) and cerebrovascular disease (6%).

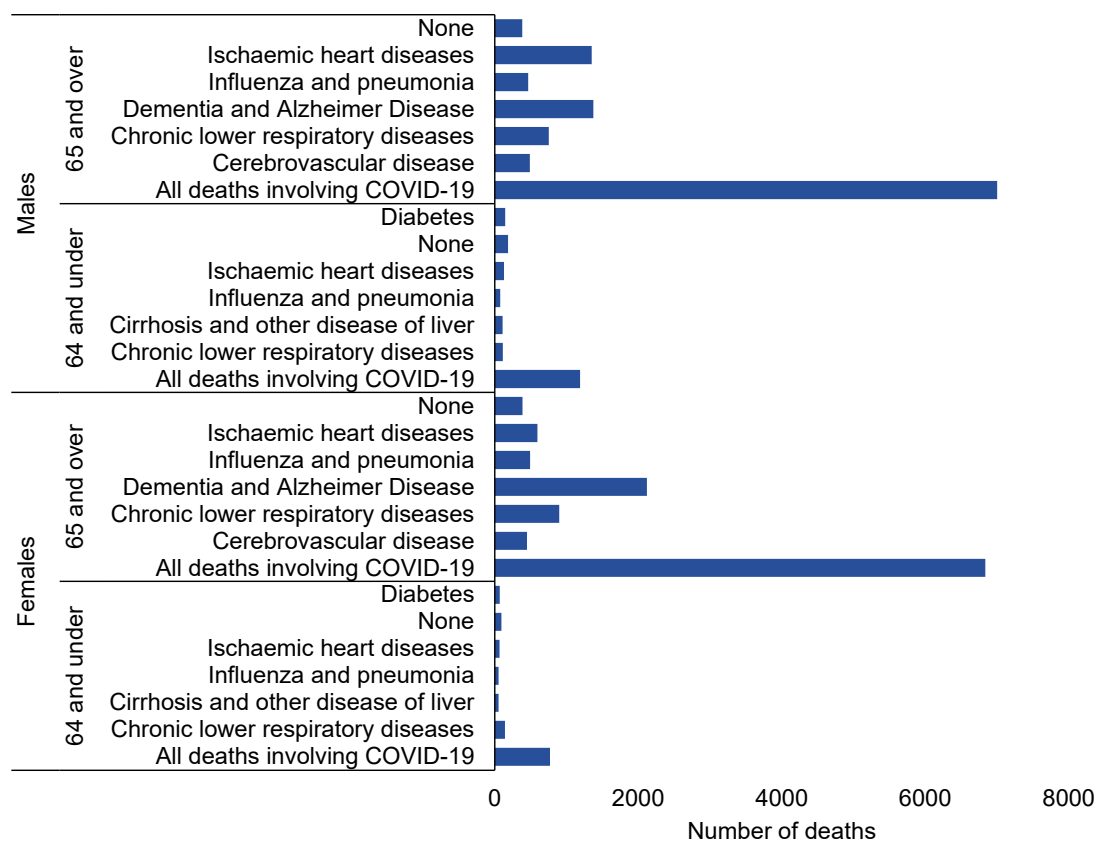
**Pre-existing conditions** are defined as a health condition mentioned on the death certificate which either came before COVID-19 or was an independent contributory factor in the death. Where only COVID-19 was recorded on the death certificate, or only COVID-19 and subsequent conditions caused by COVID-19 were recorded, these deaths are referred to as having no pre-existing conditions.

We have used methodology developed by ONS to determine the main pre-existing condition. This is defined as the one pre-existing condition that is, on average, most likely to be the underlying cause of death for a person of that age and sex had they not died from COVID-19. For more detail on how pre-existing conditions and main pre-existing conditions are derived, refer to the [methodology paper](#).

Pre-existing conditions differed by age and sex. For females and males over 65 the most common main pre-existing condition was dementia and Alzheimer’s disease (31% of all female COVID-19 deaths and 20% of all male COVID-19 deaths in that age group). For females under 65, the most common main pre-existing condition was

chronic lower respiratory diseases (19%) and for males under 65 it was diabetes (12%).

**Figure 6: Main pre-existing medical condition by age and sex, in deaths involving COVID-19 between 1<sup>st</sup> March 2020 and 30<sup>th</sup> September 2022**



### Mortality by deprivation

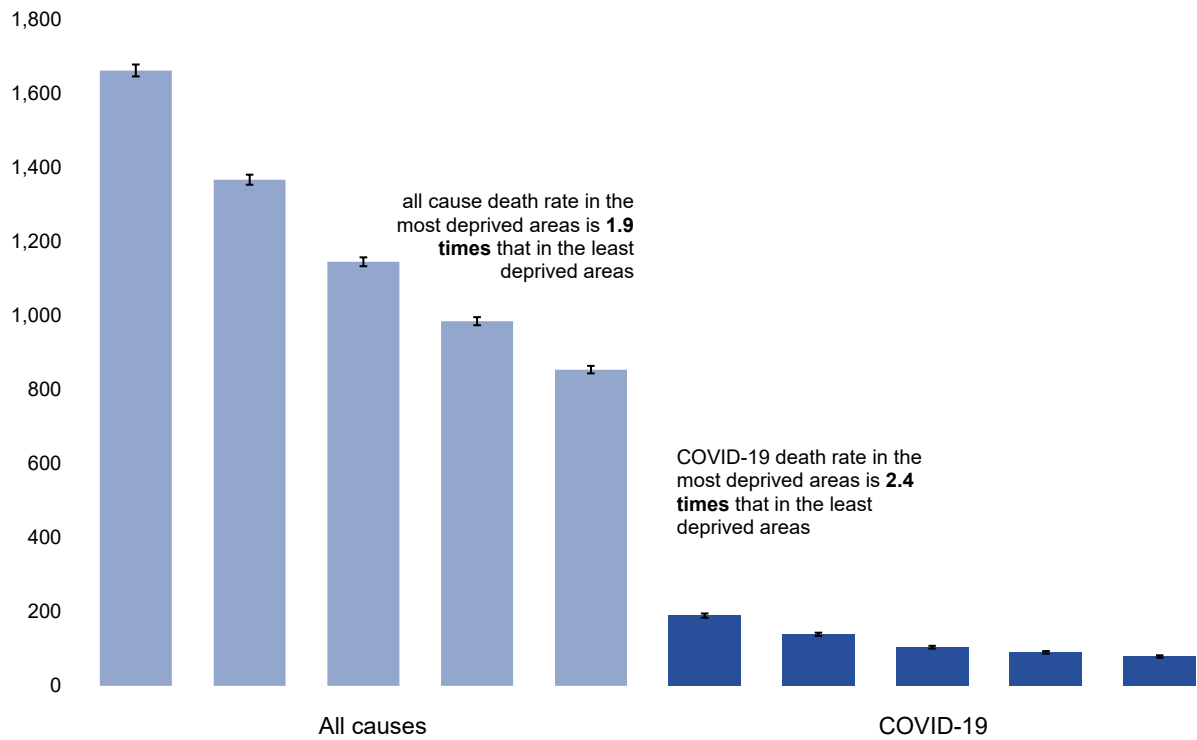
Age-standardised death rates from all causes are generally higher in the most deprived areas than in the least deprived areas. The rate in the most deprived quintile was 1.9 times the rate in the least deprived quintile between March 2020 and September 2022.

The deprivation gap is greater when looking at deaths involving COVID-19. The rate in the most deprived quintile (190 per 100,000 population) was 2.4 times the rate in the least deprived quintile (79 per 100,000 population).

The size of this gap generally widened across the period of the pandemic but has narrowed since January when the gap was 2.5.

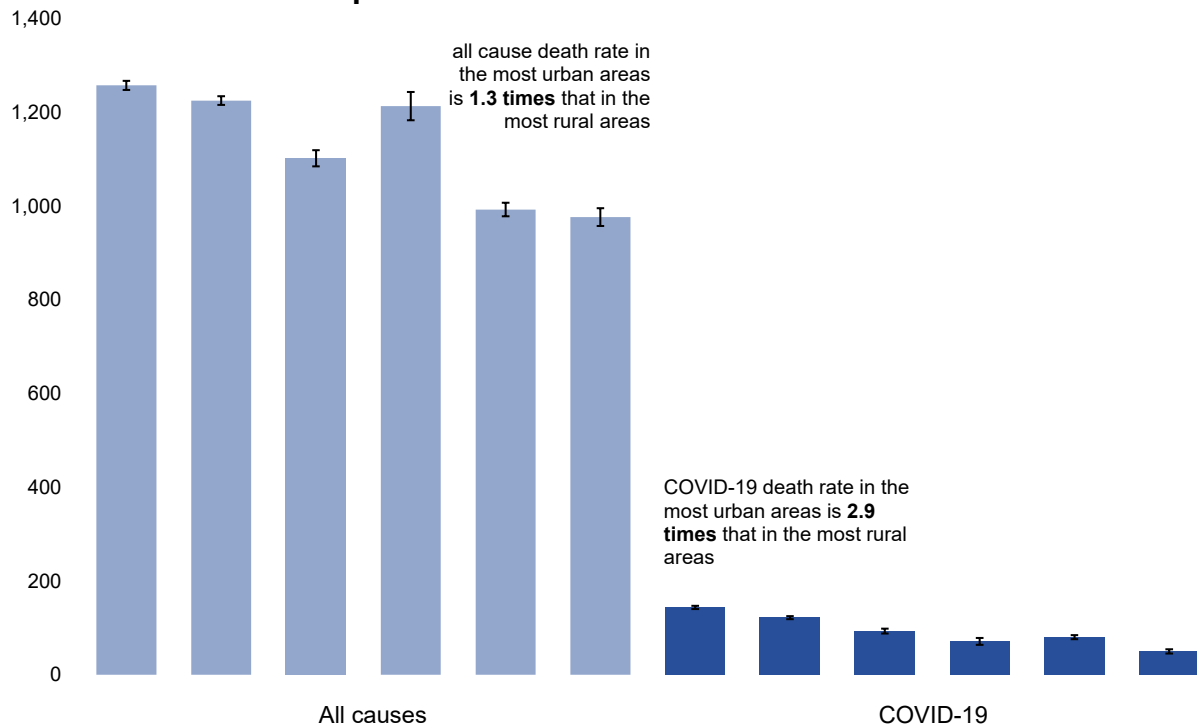
**Deprivation quintiles** are based on the Scottish Index of Multiple Deprivation (SIMD). This is an area based measure of deprivation. Quintiles are allocated according to the deceased's usual place of residence.

**Figure 7: Age-standardised death rates by SIMD quintile between 1<sup>st</sup> March 2020 and 30<sup>th</sup> September 2022**



**Mortality by urban rural classification**

**Figure 8: Age-standardised death rates by urban rural classification between 1<sup>st</sup> March 2020 and 30<sup>th</sup> September 2022**

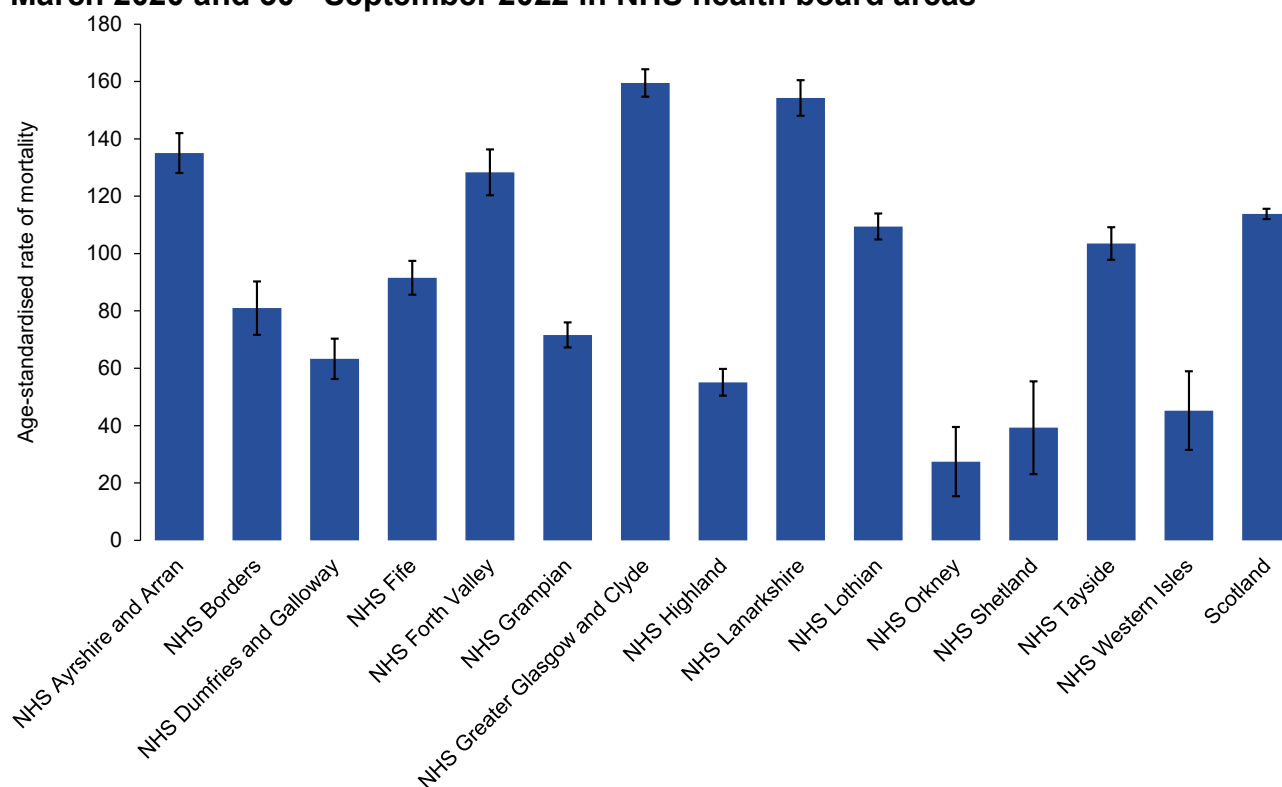


The age-standardised rate for deaths involving COVID-19 in large urban areas (144 deaths per 100,000 population) was 2.9 times the rate in remote rural locations (50 per 100,000 population). The gap was substantially smaller when considering the rate of deaths from all causes (the rate in large urban areas was 1.3 times that in remote rural areas).

### Age-standardised death rates by health board and council area

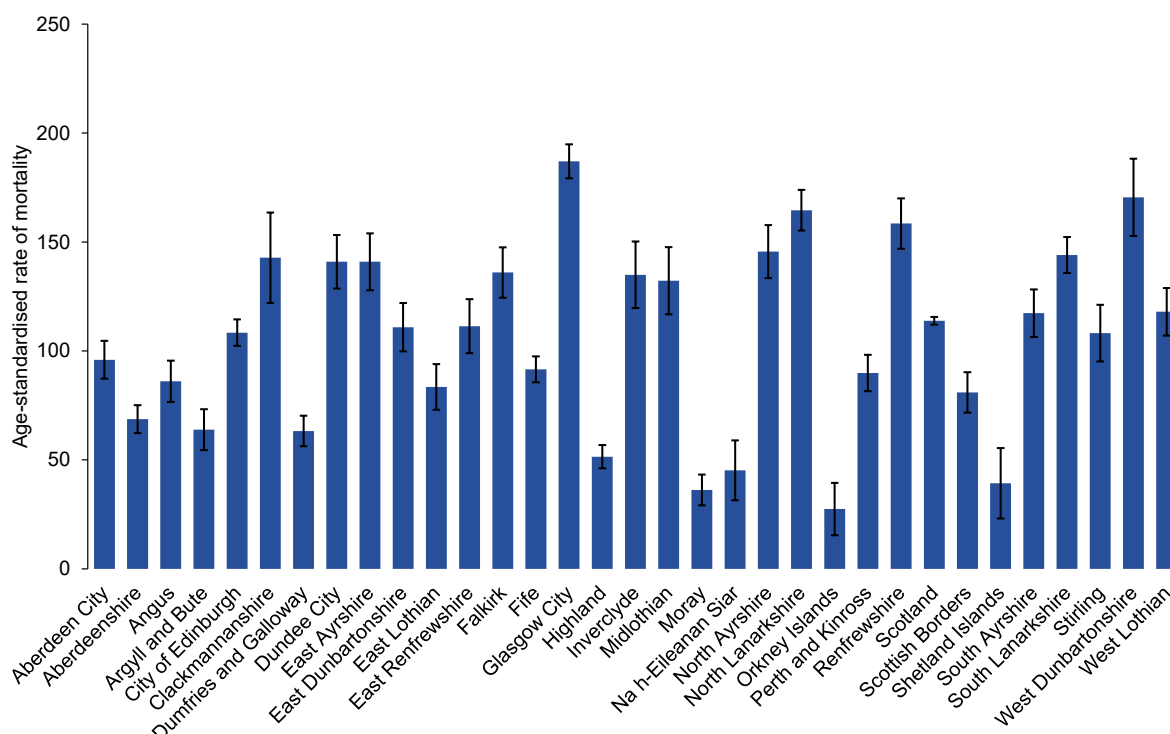
Figure 9 shows that Greater Glasgow and Clyde had the highest rate of all health boards (159 per 100,000 population), followed by Lanarkshire (154) and Ayrshire and Arran (135).

**Figure 9: Age-standardised rates for deaths involving COVID-19 between 1<sup>st</sup> March 2020 and 30<sup>th</sup> September 2022 in NHS health board areas**



Glasgow City had the highest age-standardised death rate of all council areas (187 per 100,000 population), followed by West Dunbartonshire (170), North Lanarkshire (165) and Renfrewshire (159). Orkney Islands (27 per 100,000 population), Moray (36), Shetland (39), and Na h-Eileanan Siar (45) had the lowest rates (Figure 10).

**Figure 10: Age-standardised rates for deaths involving COVID-19 between 1<sup>st</sup> March 2020 and 30<sup>th</sup> September 2022 in Council areas**



### COVID-19 deaths by occupation

Analysis by major occupation group (of deaths involving COVID-19 of people aged 20-64 years old) showed that the highest rate of death occurred among process, plant and machine operatives (207 deaths and an age-standardised death rate of 47 per 100,000 population) followed by elementary occupations (186 deaths, 31 per 100,000 population). For context, there were 1,207 COVID-19 deaths in this age group across all occupations, with a death rate of 21 per 100,000 population. People in professional occupations had the lowest death rate (87 deaths, 7 per 100,000 population). ([Table M7](#))

Compared to the average COVID-19 death rate for all occupations, health care workers had a lower death rate (11 per 100,000 population) whilst social care workers had a higher rate (29 per 100,000 population).

It is important to note that these are the occupations as stated on the death certificate. It does not mean that the individuals contracted the virus while at work, merely that this was their occupation at the time of their death.

### COVID-19 deaths at a small area level

A breakdown of deaths involving COVID by intermediate zone is available in table M8. Intermediate zones are a statistical geography that sit between datazones and local

authorities. There are 1,279 intermediate zones covering the whole of Scotland and their populations ranges between 2,500 and 6,000.

### **Deaths involving COVID-19 by ICD-10 code**

[Table M9](#) shows all deaths with ICD-10 codes related to COVID-19 following the release of additional ICD-10 codes by the World Health Organisation (WHO).

In the period from March 2020 to September 2022, there were 46 deaths where post COVID-19 conditions (including long COVID) were mentioned on the death certificate.

Between December 2020 and the end of September 2022 [statistics from Public Health Scotland](#) state that 4.4 million people had been given at least one COVID-19 vaccine dose. Over this period there have been 9 deaths where the underlying cause of death was reported as being due to adverse effects of COVID-19 vaccines, with none occurring in the last month. In addition, there have been four deaths (none last month) where adverse effects of COVID-19 vaccination was mentioned on the death certificate but not as the underlying cause.

## Why are the NRS number of deaths different from the Scottish Government deaths figures?

Put simply - they are two different measures that each have a valuable role in helping to monitor the number of deaths in Scotland involving COVID-19.

### Scottish Government deaths figures

These are provided by Health Protection Scotland (HPS) and count:

- all people who have had a positive test for COVID-19 and died within 28 days of their first positive test.

These are important because they are available earlier, and give a quicker indication of what is happening day by day and are broadly comparable with the figures released daily for the UK by the Department for Health and Social Care.

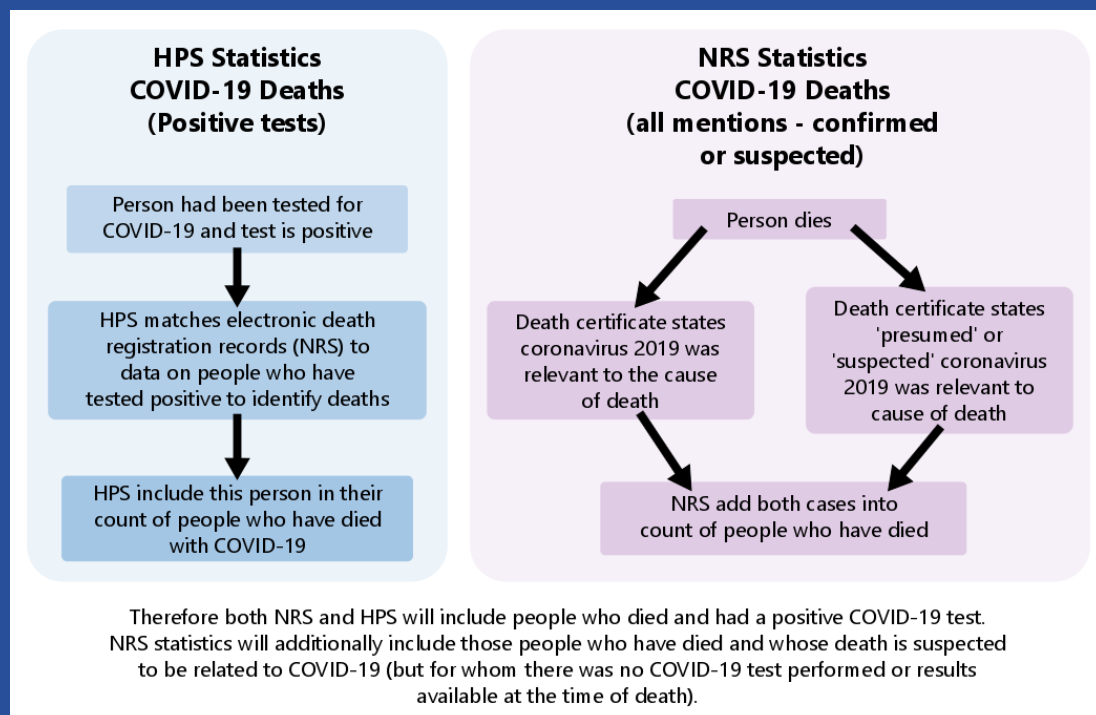
### NRS weekly death totals

The figures in this publication count:

- all deaths where COVID-19 was mentioned on the death certificate by the doctor who certified the death. This includes cases where the doctor noted that there was suspected or probable coronavirus infection involved in the death.

As a result these weekly totals may be higher than the daily figures - because the daily updates only include those who tested positive for the virus.

Using the complete death certificate allows NRS to analyse a lot of information, such as location of death and what other health conditions contributed to the death.



## How do NRS compile these statistics?

- Weekly figures are based on the date of registration. In Scotland deaths must be registered within 8 days but in practice, the average time between death and registration is around 3 days.
- Figures are allocated to weeks based on the ISO8601 standard. Weeks begin on a Monday and end on a Sunday. Often weeks at the beginning and end of a year will overlap the preceding and following years (e.g. week 1 of 2020 began on Monday 30 December 2019) so the weekly figures may not sum to any annual totals which are subsequently produced.
- Deaths involving COVID-19 are defined as those where COVID-19 is mentioned on the death certificate, either as the underlying cause of death or as a contributory cause. Cause of death is coded according to the International Statistical Classification of Diseases and Related Health Conditions 10<sup>th</sup> Revision (ICD-10). The relevant codes included in this publication are U07.1, U07.2, U09.9 and U10.9.
- Figures include deaths where 'suspected' or 'probable' COVID-19 appears on the death certificate.
- From the week beginning 22 March 2021, new ICD-10 codes issued by the World Health Organisation (WHO) were also used to code deaths involving COVID-19. U09.9 is used for 'post-COVID' conditions, when death occurred after acute or ongoing COVID-19. U10.9 is used in the rare cases where 'Kawasaki-like' syndrome is caused by COVID-19. Data back to March 2020 has been recoded to ensure consistency of the time series.
- Data for 2022 are provisional and subject to change in future weekly publications. 2022 data will be finalised in summer 2023. Reasons why the data might be revised later include late registration data being received once the week's figure have been produced or more information being provided by a certifying doctor or The Crown Office and Procurator Fiscal Service (COPFS) on the cause of death.
- Certain user enquiries for ad-hoc analysis related to COVID-19 deaths have been published on our [website](#).
- The weekly publication includes breakdowns by sex, age, health board, local authority and location of death. It also includes an analysis of excess deaths by location and broad cause of death. We also publish a comprehensive and detailed analysis of mortality on a monthly basis (this publication).



## Index of available analysis on registered deaths involving COVID-19

<b>Breakdown</b>	<b>Frequency</b>	<b>When Added</b>	<b>Latest Period Covered</b>	<b>Date Last updated</b>
<a href="#">Age group</a>	Weekly	8 <sup>th</sup> April 2020	Week 40	13 October 2022
<a href="#">Sex</a>	Weekly	8 <sup>th</sup> April 2020	Week 40	13 October 2022
<a href="#">Location</a>	Weekly	15 <sup>th</sup> April 2020	Week 40	13 October 2022
<a href="#">Health Board</a>	Weekly	8 <sup>th</sup> April 2020	Week 40	13 October 2022
<a href="#">Local Authority</a>	Weekly	22 <sup>nd</sup> April 2020	Week 40	13 October 2022
<a href="#">Excess deaths by cause</a>	Weekly	22 <sup>nd</sup> April 2020	Week 40	13 October 2022
<a href="#">Excess deaths by cause and location</a>	Weekly	17 <sup>th</sup> June 2020	Week 40	13 October 2022
<a href="#">Age-standardised mortality rates – Scotland</a>	Monthly	13 <sup>th</sup> May 2020	September 2022	13 October 2022
<a href="#">Age-standardised mortality rates – sub-Scotland</a>	Monthly	17 <sup>th</sup> June 2020	March 2020 – September 2022	13 October 2022
<a href="#">Leading causes of death</a>	Monthly	13 <sup>th</sup> May 2020	September 2022	13 October 2022
<a href="#">Pre-existing conditions</a>	Monthly	13 <sup>th</sup> May 2020	September 2022	13 October 2022
<a href="#">Deprivation</a>	Monthly	13 <sup>th</sup> May 2020	March 2020 – September 2022	13 October 2022
<a href="#">Urban Rural</a>	Monthly	13 <sup>th</sup> May 2020	March 2020 – September 2022	13 October 2022
<a href="#">Daily occurrences by location of death</a>	Monthly	13 <sup>th</sup> May 2020	September 2022	13 October 2022
<a href="#">Occupation</a>	Monthly	17 <sup>th</sup> June 2020	March 2020 – September 2022	13 October 2022
<a href="#">Intermediate Zone</a>	Monthly	17 <sup>th</sup> June 2020	March 2020 – September 2022	13 October 2022
<a href="#">Deaths by ICD-10 codes</a>	Monthly	16 <sup>th</sup> June 2021	March 2020 – September 2022	13 October 2022
<a href="#">Ethnic Group</a>	Occasional	8 <sup>th</sup> July 2020	March 2020 – September 2021	17 <sup>th</sup> November 2021
<a href="#">Disability</a>	One-off	24 <sup>th</sup> March 2021	March 2020 – Jan 2021	24 <sup>th</sup> March 2021

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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.

Informing the future – We are responsible for the Census of Population in Scotland which we use, with other sources of information, to produce statistics on the population and households.

You can get other detailed statistics that we have produced from the Statistics section of our website. Scottish Census statistics are available on the Scotland’s Census website.

We also provide information about future publications on our website. If you would like us to tell you about future statistical publications, you can register your interest on the Scottish Government ScotStat website.

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### Enquiries and suggestions

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For all other enquiries, please contact [statisticscustomerservices@nrscotland.gov.uk](mailto:statisticscustomerservices@nrscotland.gov.uk)