Deaths involving coronavirus (COVID-19) in Scotland

Published on 16 February 2023

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 6 of 2023 and additional monthly analysis on deaths occurring up to 31 January 2023.

Key Findings

Deaths involving COVID-19, weekly registrations *(go to section)*

- As at the 12th of February 2023, there have been a total of 16,780 deaths registered in Scotland where the novel coronavirus (COVID-19) was mentioned on the death certificate. In the latest week there were 35 deaths, 5 more than the previous week.
- Of deaths involving COVID-19 in the latest week:
  - 17 were female, 18 were male.
  - 25 were aged 75 or older, 5 were aged 65 to 74 and 5 were under 65.
  - There were 8 deaths in Glasgow City and 3 in Fife. In total 20 council areas (out of 32) had at least one death involving COVID-19 last week.
  - 31 were in hospitals, 3 were in care homes, and 1 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 6 of 2023 was 1,315. This was 43 deaths more than the five year average for week 6 (3% above average).
- In week 6 there were 75 excess deaths at home or in non-institutional settings (20% above average), 50 fewer deaths in hospitals (8% below average), and 17 excess deaths in care homes (6% above average) compared to the five-year average.
- There were 43 more deaths across all locations for the latest week. Dementia and Alzheimer disease deaths were 14 above average, circulatory deaths were 11 above average and respiratory deaths were 8 above average. Deaths from cancer were 8 below average. There were 60 excess deaths from other causes. The number of deaths where COVID-19 was the underlying cause was 23.
- Deaths involving influenza have fallen for four consecutive weeks. There were 15 deaths where flu was mentioned in week 6, which is 5 fewer than the previous week.

Monthly mortality analysis, deaths occurring up to 31st January 2023 *(go to section)*

- The age standardised death rate for deaths involving COVID-19 in January 2023 was 59 per 100,000. This is almost unchanged from the rate in December 2022 (60 per 100,000). 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 2.3 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 2022 when the gap was 2.5.
- Of the 16,746 deaths involving COVID-19 between March 2020 and January 2023, 93% (15,656) had at least one pre-existing condition. Just over one fifth 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. There has been no change since last month's figures. The latest available statistics show that 4.56 million people in Scotland have received at least one vaccine dose.

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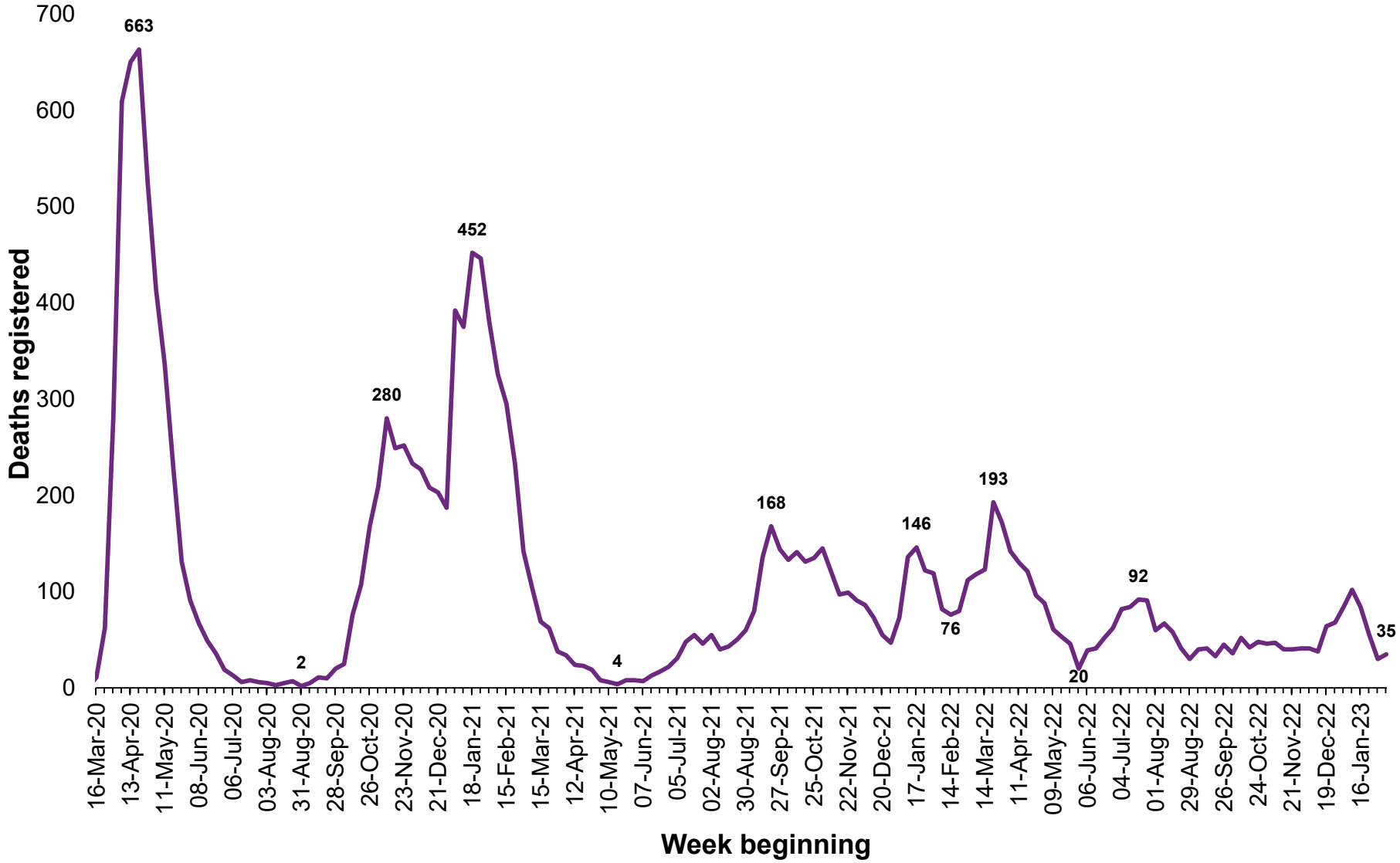
Figure 1: Weekly deaths involving COVID-19 in Scotland, week 12 2020 to week 6 2023



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 fallen since mid-July.

This report includes all deaths which were registered by 12th February. 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 5th February as the majority of these are likely to have been registered by now.

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

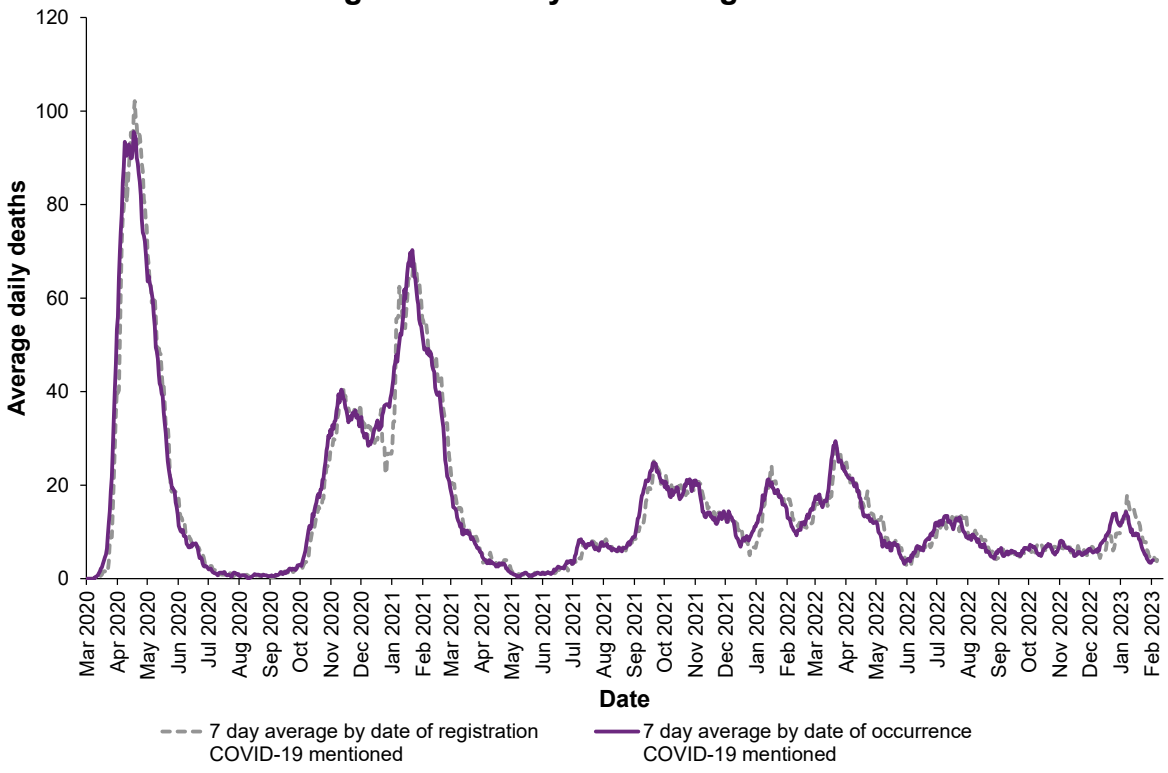
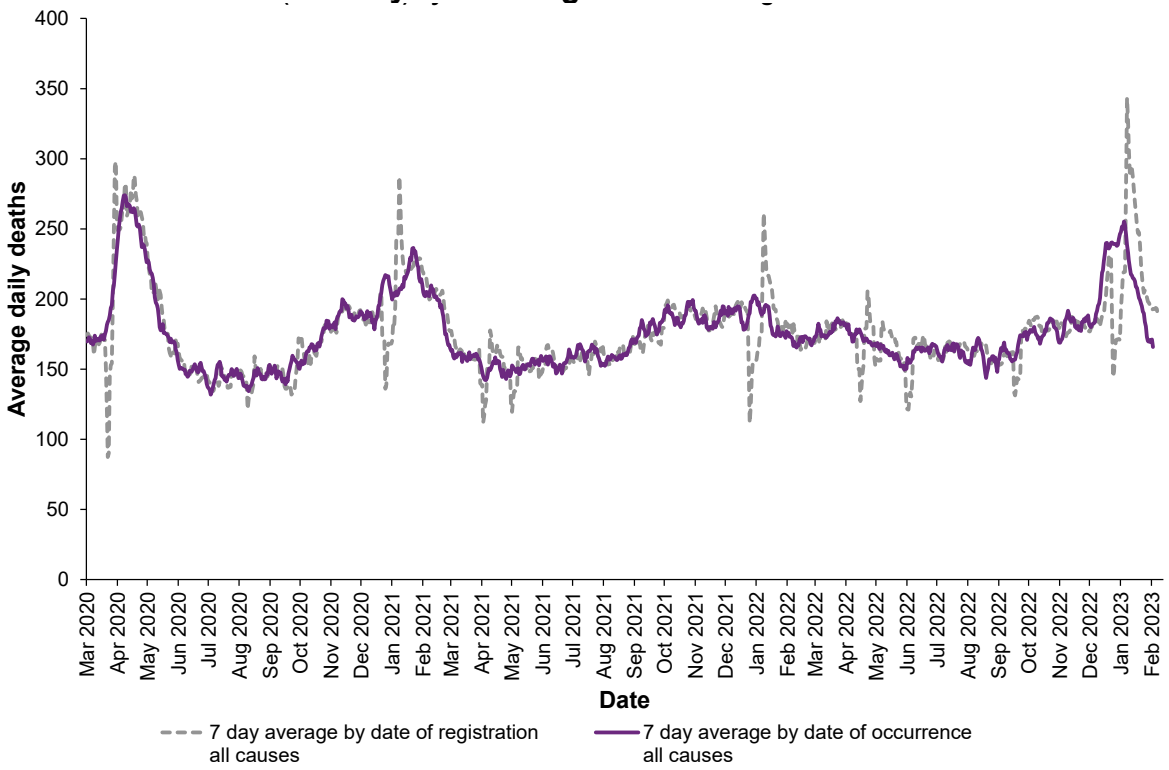


Figure 2b: All cause deaths by date of registration and date of death



The average number of deaths occurring per day rose in late December and early January, but has fallen consistently through the rest of January and into early February 2023.

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Monthly mortality analysis (deaths occurring up to 31 January 2023)

This section provides an in-depth analysis of deaths which **occurred** in Scotland between March 2020 and January 2023. 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 January 2023 the mortality rate was 106 deaths per 100,000 population. Rates for males were significantly higher than for females (132 compared with 88 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 71% in the most recent month (January 2023). Over the whole pandemic (March 2020 to January 2023), 80% of deaths involving COVID-19 had COVID-19 as the underlying cause.

The age standardised death rate for deaths involving COVID-19 in January 2023 (59 per 100,000) was virtually unchanged from the rate in December 2022 (60 per 100,000). Throughout the pandemic, the highest rate was 585 deaths per 100,000 people in April 2020.

Figure 3a: Age standardised rates for deaths involving COVID-19 by sex, between 1st March 2020 and 31st January 2023

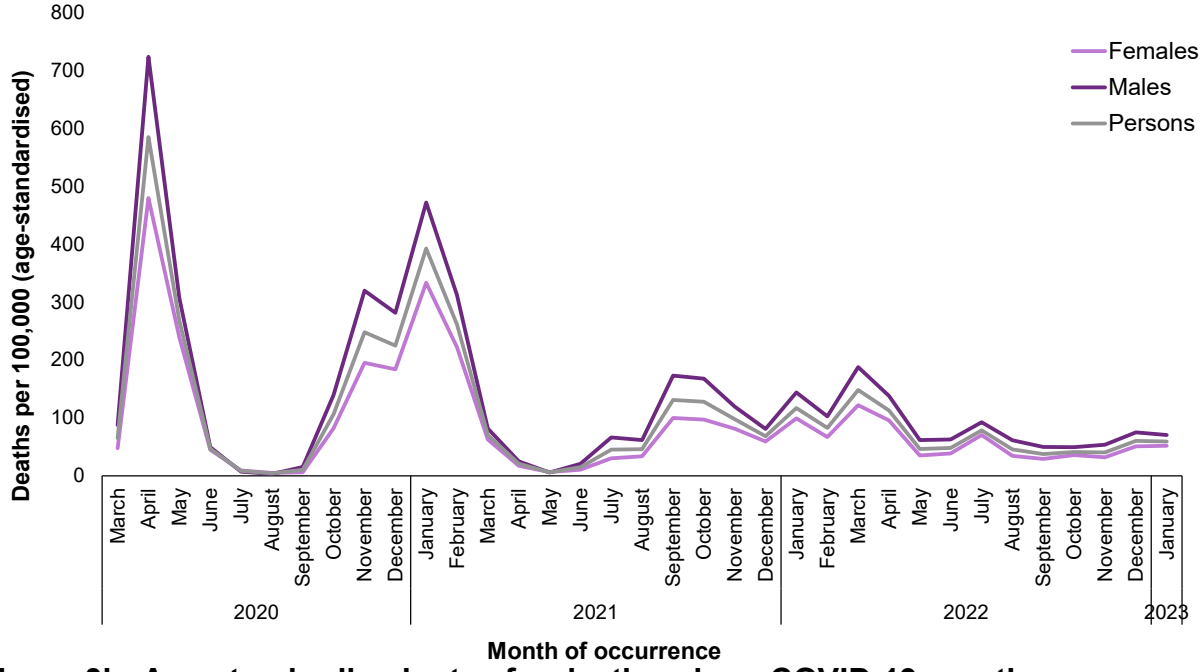
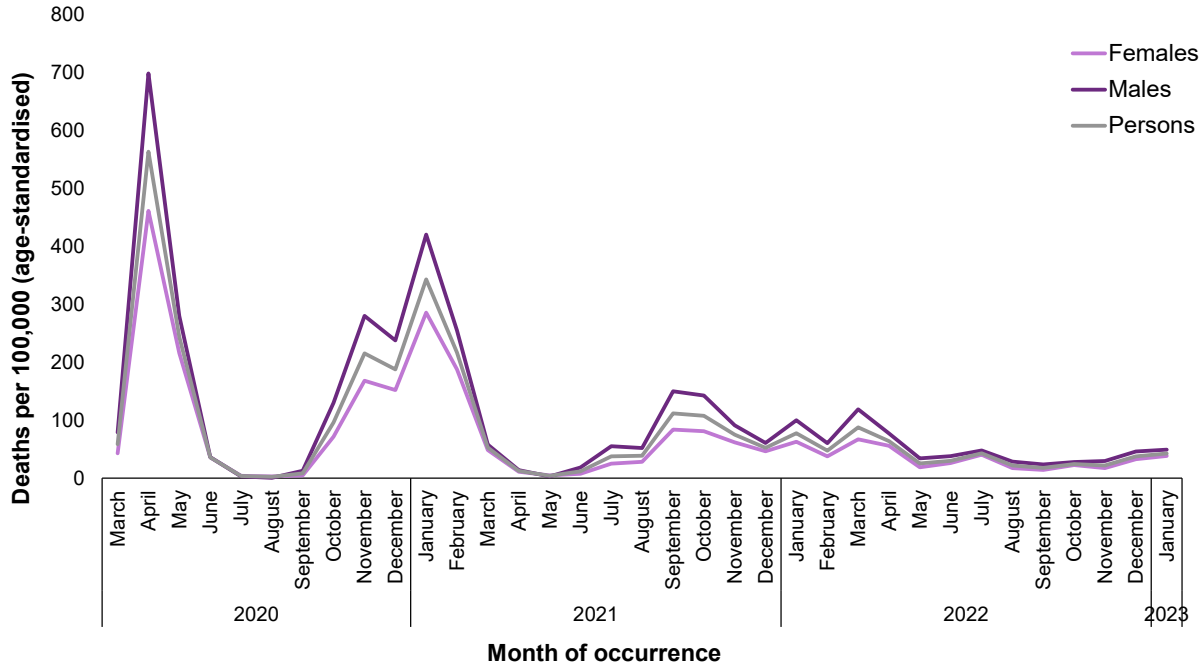


Figure 3b: Age standardised rates for deaths where COVID-19 was the underlying cause, by sex, between 1st March 2020 and 31st January 2023



The age-standardised mortality rate from all causes was 1,190 per 100,000 population in the period from 1st March 2020 to 31st January 2023.

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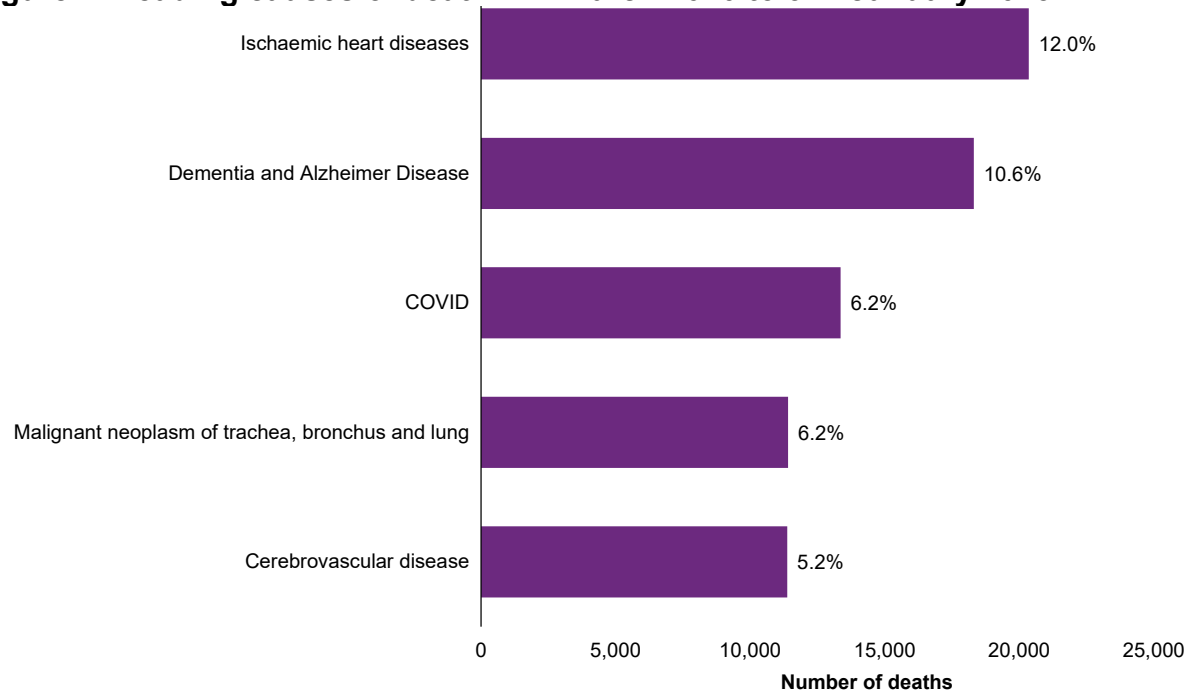
Leading causes of death

Over the period between 1st March 2020 and 31st January 2023, the leading cause of death was ischaemic heart disease (20,355 deaths, 11% of all deaths) followed by dementia and Alzheimer's disease (18,313, 10%) and COVID-19 (13,362 deaths, 7% of all deaths).

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.

The most common cause of death in January 2023 was Dementia and Alzheimer's disease, which accounted for 12% of all deaths last month. Influenza and pneumonia was in the top five most common causes of death for the first time since the start of the pandemic (3rd most common cause of death, 6% of all deaths last month). COVID-19 has not been in the top-5 leading causes since April 2022.

Figure 4: Leading causes of death - 1st March 2020 to 31st January 2023



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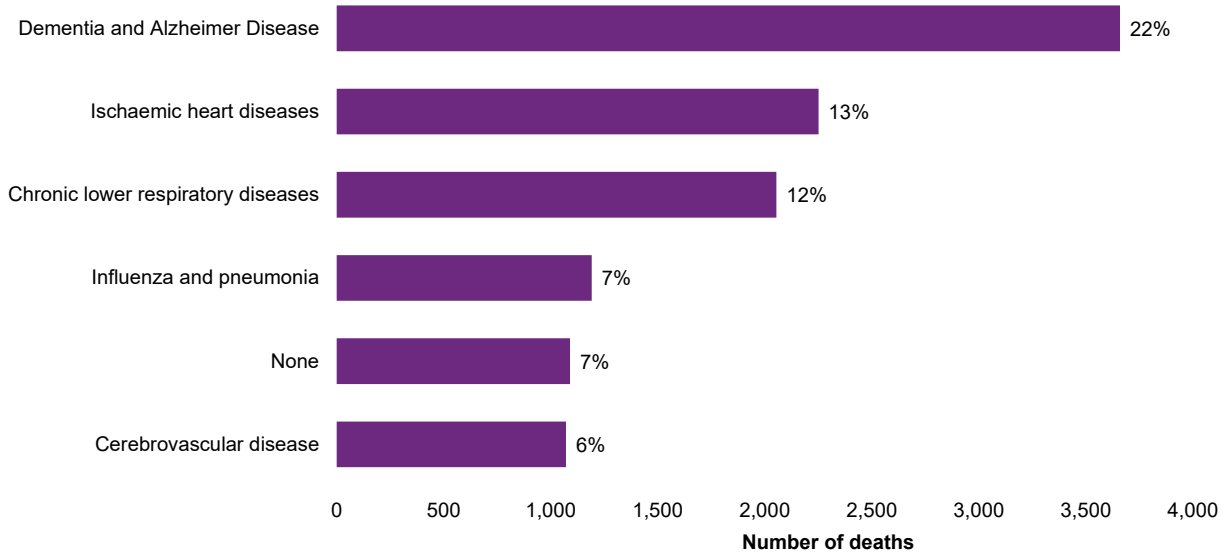
Pre-existing conditions of people who died with COVID-19

Of the 16,476 deaths involving COVID-19 between March 2020 and January 2023, 93% (15,656) had at least one pre-existing condition.

Figure 5: Main pre-existing condition in deaths involving COVID-19, between 1st March 2020 and 31st January 2023



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 (13%) and chronic lower respiratory diseases (12%).

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 (30% of all female COVID-19 deaths and 19% 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 (18%) and for males under 65 it was diabetes (12%).

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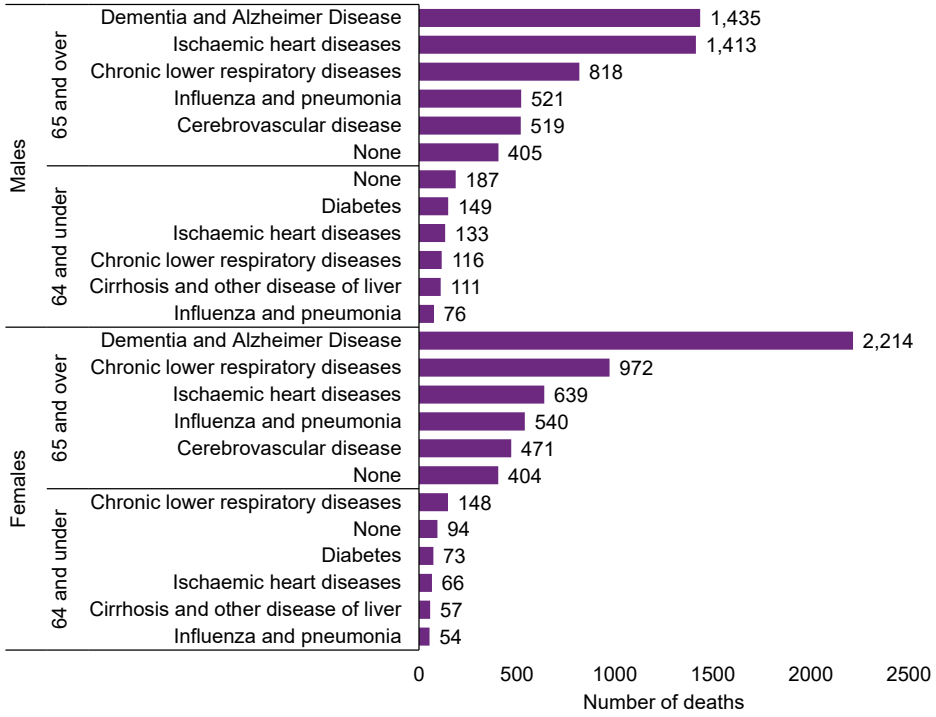
Figure 6: Main pre-existing medical condition by age and sex, in deaths involving COVID-19 between 1st March 2020 and 31st January 2023



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 January 2023.

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.

The deprivation gap is greater when looking at deaths involving COVID-19. The rate in the most deprived quintile (171 per 100,000 population) was 2.3 times the rate in the least deprived quintile (73 per 100,000 population). The size of this gap generally widened across the period of the pandemic but has narrowed since January 2022 when the gap was 2.5.

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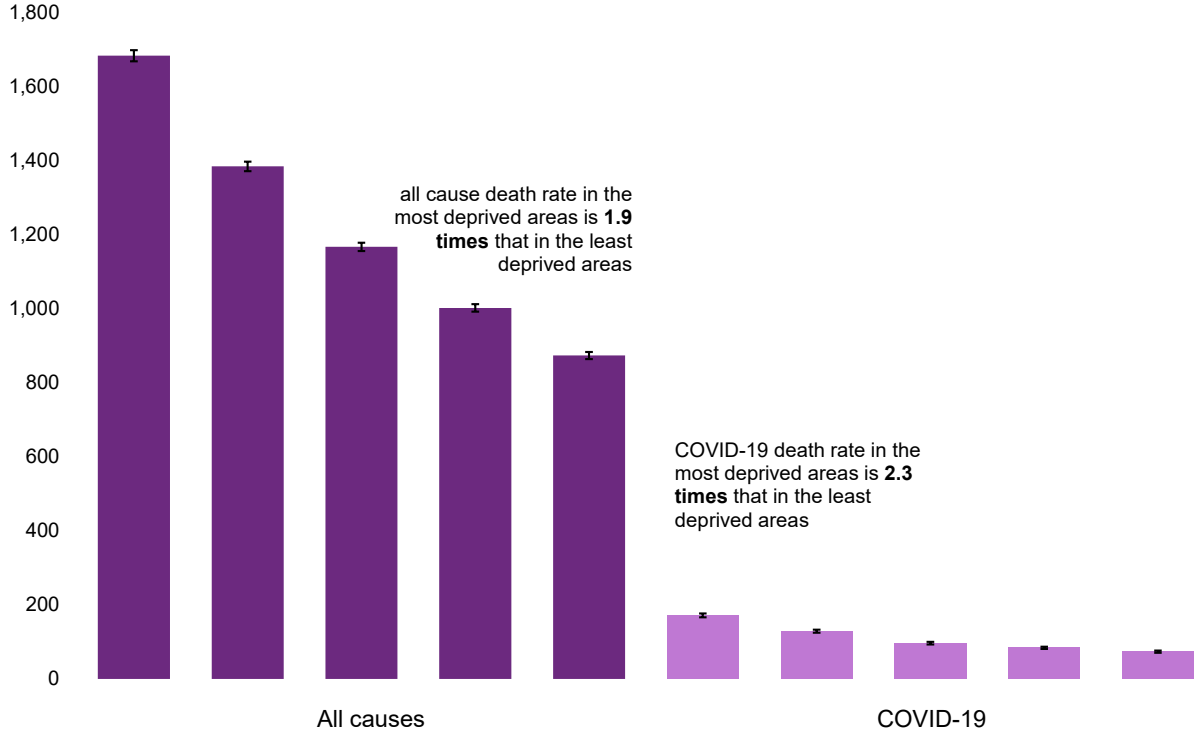
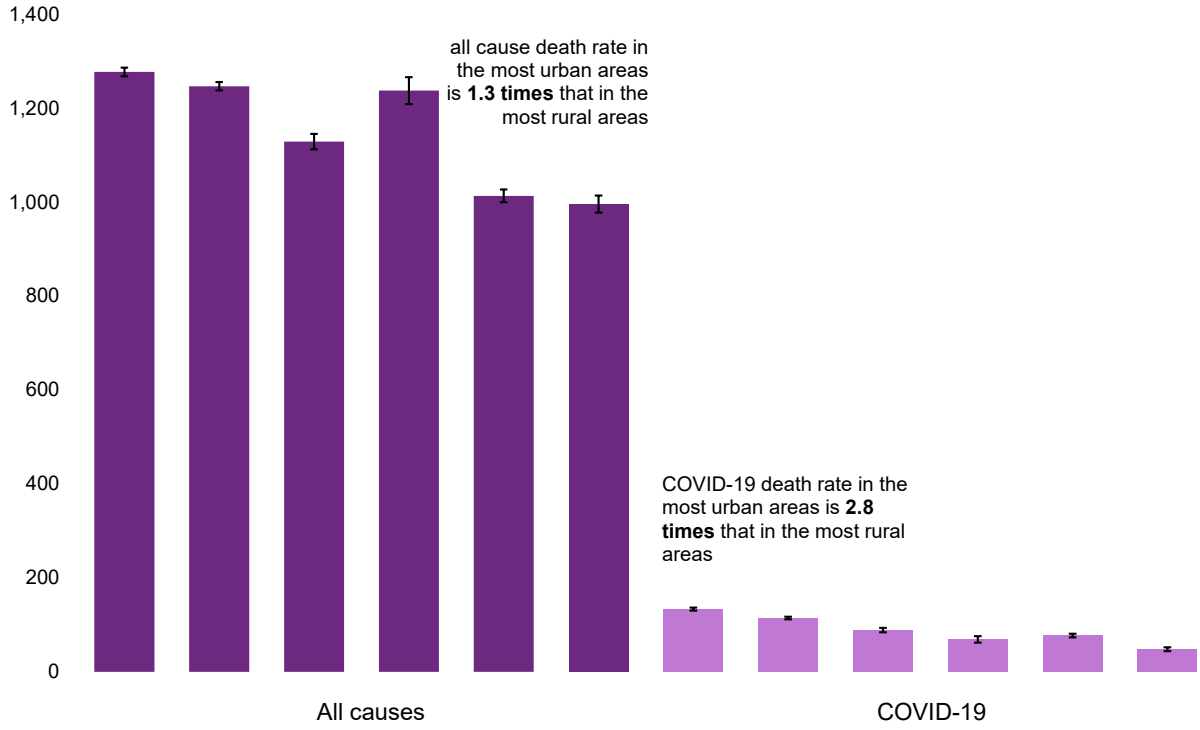
Figure 7: Age-standardised death rates by SIMD quintile between 1st March 2020 and 31st January 2023



Mortality by urban rural classification

Figure 8: Age-standardised death rates by urban rural classification between 1st March 2020 and 31st January 2023



The age-standardised rate for deaths involving COVID-19 in large urban areas (133 deaths per 100,000 population) was 2.8 times the rate in remote rural locations (48 per 100,000 population). The gap was substantially smaller when considering the rate of

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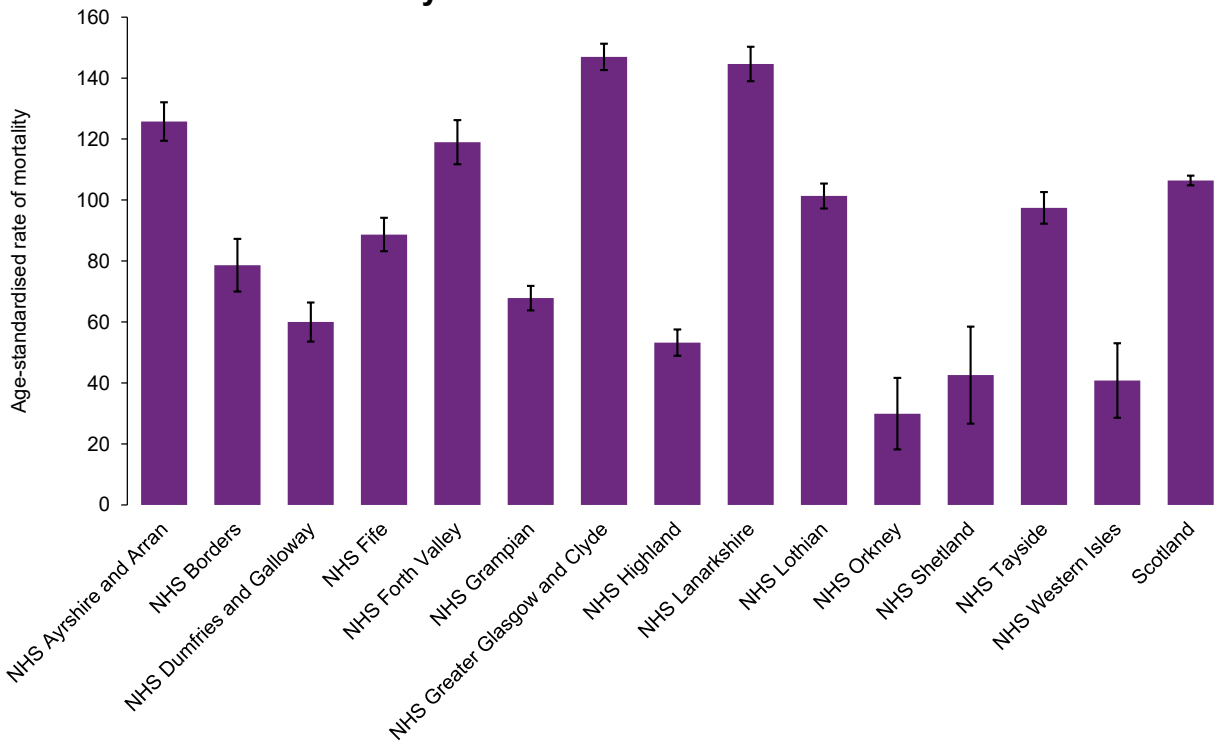
deaths from all causes (the rate in large urban areas was 1.3 times that in remote rural areas).

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 (147 per 100,000 population), followed by Lanarkshire (145) and Ayrshire and Arran (126).

Figure 9: Age-standardised rates for deaths involving COVID-19 between 1st March 2020 and 31st January 2023 in NHS health board areas



Glasgow City had the highest age-standardised death rate of all council areas (173 per 100,000 population), followed by West Dunbartonshire (156), North Lanarkshire (154) and Renfrewshire (144). Orkney Islands (30 per 100,000 population), Moray (34), Na h-Eileanan Siar (41) and Shetland (43) had the lowest rates (Figure 10).

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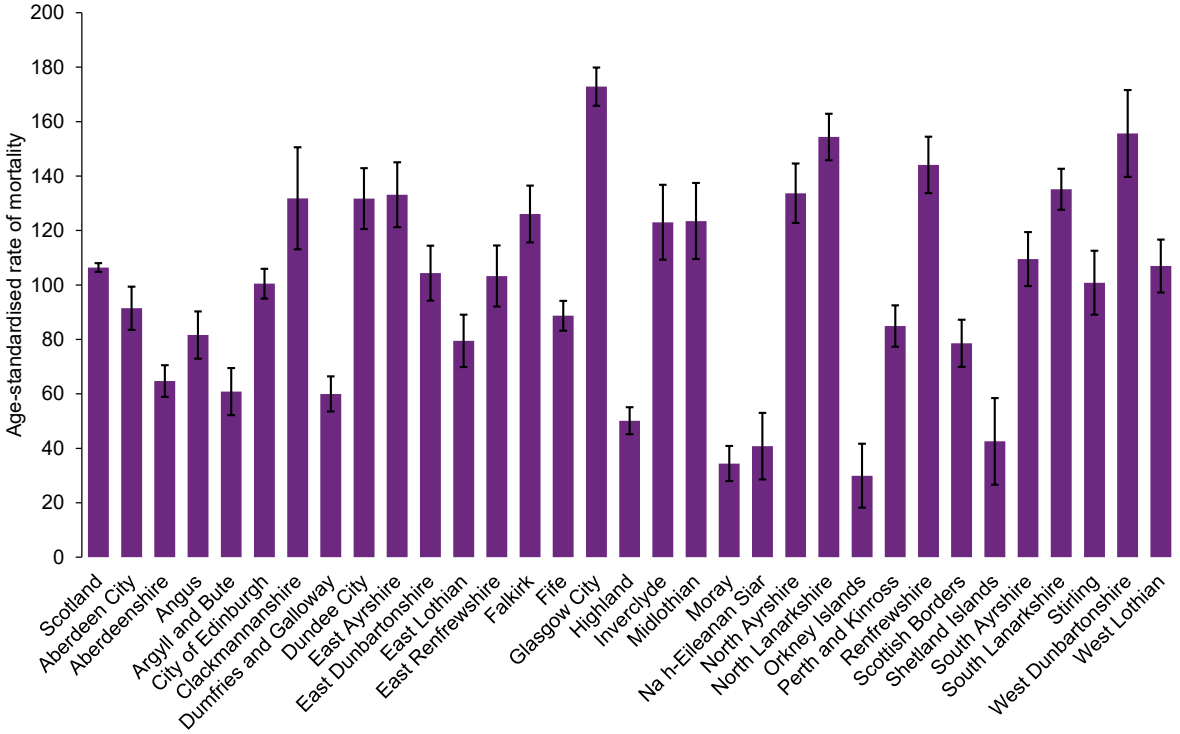
Figure 10: Age-standardised rates for deaths involving COVID-19 between 1st March 2020 and 31st January 2023 in Council areas



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 (213 deaths and an age-standardised death rate of 46 per 100,000 population) followed by skilled trades occupations (220 deaths, 34 per 100,000 population). For context, there were 1,248 COVID-19 deaths in this age group across all occupations, with a death rate of 20 per 100,000 population. People in professional occupations had the lowest death rate (91 deaths, 6 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 (9 per 100,000 population) whilst social care workers had a higher rate (25 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.

The population by occupation denominator for these rates was updated to the 2020 calendar year for the October 2022 statistics. Previously, 2019 populations were used for this work. There may be some minor revisions to previous statistics as a result.

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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 January 2023, there were 50 deaths where post COVID-19 conditions (including long COVID) were mentioned on the death certificate.

The latest available statistics show that 4.56 million people have had 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.

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 10th 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

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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).

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Index of available analysis on registered deaths involving COVID-19

Breakdown	Frequency	When Added	Latest Period Covered	Date Last updated
Age group	Weekly	8th April 2020	Week 6	16th February 2023
Sex	Weekly	8th April 2020	Week 6	16th February 2023
Location	Weekly	15th April 2020	Week 6	16th February 2023
Health Board	Weekly	8th April 2020	Week 6	16th February 2023
Local Authority	Weekly	22nd April 2020	Week 6	16th February 2023
Excess deaths by cause	Weekly	22nd April 2020	Week 6	16th February 2023
Excess deaths by cause and location	Weekly	17th June 2020	Week 6	16th February 2023
Age-standardised mortality rates – Scotland	Monthly	13th May 2020	January 2023	16th February 2023
Age-standardised mortality rates – sub-Scotland	Monthly	17th June 2020	March 2020 – January 2023	16th February 2023
Leading causes of death	Monthly	13th May 2020	January 2023	16th February 2023
Pre-existing conditions	Monthly	13th May 2020	January 2023	16th February 2023
Deprivation	Monthly	13th May 2020	March 2020 – January 2023	16th February 2023
Urban Rural	Monthly	13th May 2020	March 2020 – January 2023	16th February 2023
Daily occurrences by location of death	Monthly	13th May 2020	January 2023	16th February 2023
Occupation	Monthly	17th June 2020	March 2020 – January 2023	16th February 2023
Intermediate Zone	Monthly	17th June 2020	March 2020 – January 2023	16th February 2023
Deaths by ICD-10 codes	Monthly	16th June 2021	March 2020 – January 2023	16th February 2023
Ethnic Group	Occasional	8th July 2020	March 2020 – September 2021	17th November 2021
Disability	One-off	24th March 2021	March 2020 – Jan 2021	24th 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.

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