

Excess Mortality and COVID-19 Related Deaths in Northern Ireland

March to June 2020

Key Points

- There were 885 excess deaths from 1st March to 30th June 2020, 17.4% above expected levels (average deaths for the same period over the last five years). In the same period, there were 837 COVID-19 related deaths.
- The number of excess deaths for females (474) is higher than that for males (411).
- The vast majority of excess deaths (78.4%) and COVID 19 related deaths (79.8%) are accounted for by those aged 75 and over.
- The number of deaths in hospitals was slightly lower than expected levels, despite 434 COVID-19 related deaths occurring in hospitals. In contrast, the majority of excess deaths (556 or 62.8%) occurred at home, while 44 COVID-19 related deaths occurred at home.
- Belfast LGD has the largest number of excess deaths (218), accounting for a quarter (24.6%) of the total number of excess deaths. However, Antrim & Newtownabbey LGD had the highest excess deaths as a proportion above expected levels (28.4%), while Mid Ulster LGD had the lowest (7.0%).
- Excess deaths are highest in the least deprived areas, with just over a 20% increase in deaths compared to expected levels. Excess deaths are lowest in rural areas at 14.3% above expected levels.

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1. Introduction

The Northern Ireland Statistics & Research Agency (NISRA) publishes official statistics on the number of deaths registered in Northern Ireland¹. Due to the coronavirus (COVID-19) pandemic, the NISRA weekly deaths release² has been supplemented with the number of deaths relating to COVID-19, that is, where COVID-19 or suspected COVID-19 was mentioned anywhere on the death certificate, including in combination with other health conditions.

Additional analysis has been published recently, which provides a further breakdown of COVID-19 related deaths by age, sex and geographical areas³.

This bulletin reports on excess mortality based on deaths occurring during the first four months (March to June) of the pandemic in Northern Ireland, an approach that does not rely on the availability or quality, of population estimates or cause of death information. It is for this reason that 'excess mortality' is often used as a standard indicator when comparing deaths between countries⁴.

This report is an Official Statistics publication and statistics are produced to high professional standards set out in the Code of Practice for Official Statistics⁵.

The statistics are:

- produced to meet identified user needs;
- well explained and readily accessible;
- produced according to sound methods; and
- managed impartially and objectively in the public interest and are produced free from any political interference.

The content of this bulletin will be kept under review and more detail may be presented in future.

¹ Deaths registration statistics at: <https://www.nisra.gov.uk/statistics/births-deaths-and-marriages/deaths>

² Weekly deaths statistics at: <https://www.nisra.gov.uk/publications/weekly-deaths>

³ COVID-19 Deaths Bulletin 1 March - 31 May 2020, available at <https://www.nisra.gov.uk/publications/monthly-deaths>

⁴ For example, see <https://www.health.org.uk/news-and-comment/charts-and-infographics/understanding-excess-mortality-the-fairest-way-to-make-international-comparisons>

⁵ <https://www.statisticsauthority.gov.uk/code-of-practice/>

2. COVID-19 in Northern Ireland

It is widely reported that the COVID-19 pandemic started in late 2019 in the Wuhan province of China. From there, it spilled over into other countries in South-East Asia and reached Europe by the end of January 2020. The first UK cases were confirmed in England on 31st January⁶, and the first case in the Republic of Ireland on 29th February⁷.

In Northern Ireland, the first confirmed case was reported on 28th February⁸. Cases continued to rise in early March and the first COVID-19 related death occurred on 18th March 2020. Based on deaths registered up to 15th July, there have been 837 COVID-19 related deaths in Northern Ireland up to 30th June with at least one COVID-19 related death each day from late March to the end of June 2020.

COVID-19 related deaths

Deaths due to COVID-19 included in this bulletin reflect where COVID-19 or 'suspected' or 'probable' COVID-19 was mentioned anywhere on the death certificate, including in combination with other health conditions. The selection of the underlying or main cause of death (coding) has not been completed yet. Evidence from England and Wales⁹ suggest that for 92.8% of cases when COVID-19 was mentioned, it was found to be the underlying cause of death.

3. Excess Mortality

Excess mortality is considered to be a good measure of the impact of the COVID-19 pandemic, as it does not rely on the availability or interpretation of the (primary and secondary) causes of death. It captures deaths from all causes, which may be related to a range of factors associated with the pandemic, for example, changes in the availability or uptake of health care services including screening and diagnosing, or the impact of 'lock-down' on people's mental health. Some of these effects may take months or years to be fully understood.

Excess mortality is the difference between actual deaths from all causes in a period minus the expected number of deaths or 'normal deaths'. It is therefore a mathematical concept; it is not possible to identify if an individual death was an excess death. In contrast, individual COVID-19 related deaths can be identified, yet cannot be automatically classed as excess deaths.

⁶ <https://www.gov.uk/government/news/cmo-confirms-cases-of-coronavirus-in-england>

⁷ Health Protection Surveillance Centre:

<https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/casesinireland/>

⁸ Public Health Agency COVID-19 surveillance reports, see

<https://www.publichealth.hscni.net/publications/covid-19-surveillance-reports>

⁹ Based on 50,335 deaths in England and Wales from 1st March to 30th June 2020, see

<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deaths-involvingcovid19englandandwales/deathsoccurringinjune2020>

Excess mortality can be expressed as a number or as a proportion of the expected number of deaths, which in this analysis is defined as the average number of deaths for the same period over the last five years. The raw number of excess deaths allows for any potential under- or over-counting of COVID-19 deaths and is therefore useful when comparing the effect of the pandemic in different populations. Excess deaths are distinctly different from Excess Winter Mortality, which is a measure of seasonality (see below for further detail).

Excess Winter Mortality

Excess Winter Mortality (EWM)¹⁰ is the difference between the actual number of winter deaths in the four month period December to March and the expected number of deaths. The latter is the average of the number of deaths in the two periods which precede winter (August to November) and follow winter (April to July). The latest Excess Winter Mortality figures for Northern Ireland relate to the winter of 2017/2018.

A period with excess mortality can be followed by another period where the number of deaths are below expected levels. A period of high mortality rate could have reduced the size of the most susceptible population, say the very elderly or those with underlying health problems, leading to fewer deaths compared to previous years in the following period.

The analysis in this report is based on deaths that occurred (based on date of death) from 1st March to 30th June, comparing deaths in 2020 to the average of March to June deaths occurring in the previous five years. To allow for delays in the death registration process, the report takes account of registrations up to 15th July 2020 and also builds this 11 working day period into the 2015-2019 average to enable a more valid comparison. Further information on the methodology is presented in Annex A.

4. Excess deaths – March to June 2020

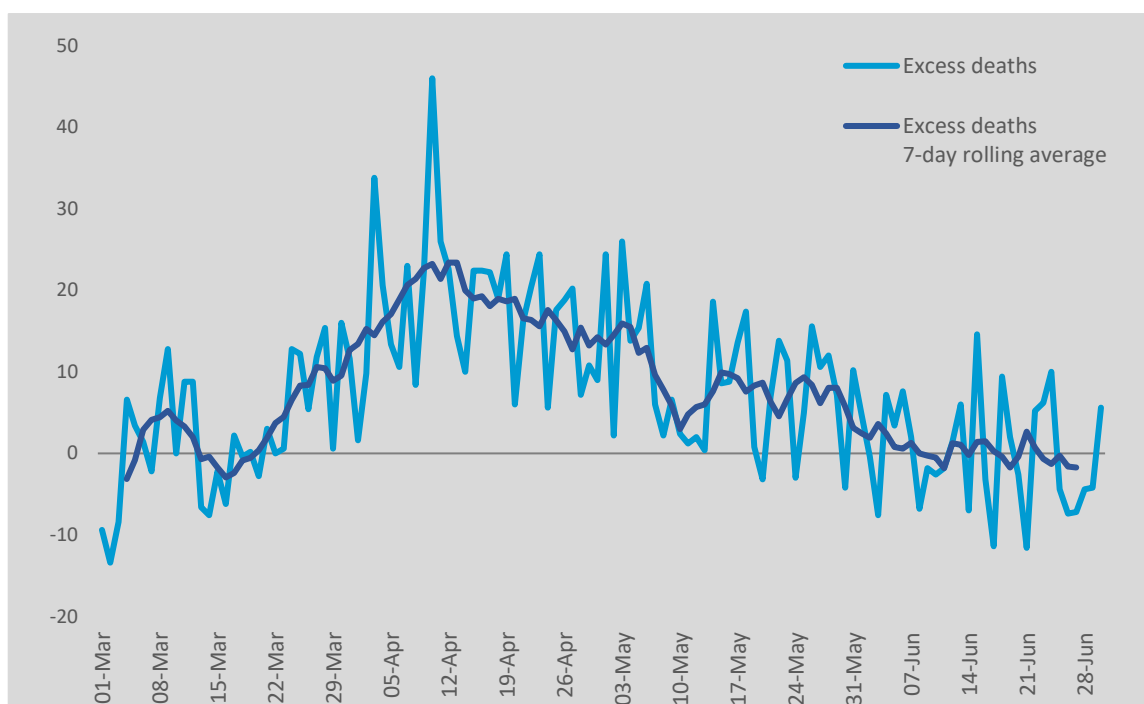
Excess deaths have been reported on a registration date basis in the weekly death reports¹¹, and can be derived from monthly death registrations¹². From March to June 2020, 6,064 deaths were registered, which was 908 more (+17.6%) than the average over the previous five years of 5,156 deaths in corresponding months. By considering deaths which occurred in this four month period, including those registered up to 15th July, 5,660 deaths occurred during this time. This figure is lower than the number of registrations (6,064) in that period due to a level of registration delay. After accounting for this registration lag period (see Annex A), excess deaths are estimated to be 885 deaths or 17.4% higher than in previous years. The daily excess deaths occurring are quite variable in Northern Ireland (see Figure 1).

¹⁰ <https://www.nisra.gov.uk/statistics/cause-death/excess-winter-mortality>

¹¹ Weekly deaths - <https://www.nisra.gov.uk/publications/weekly-deaths>

¹² Monthly deaths registrations - <https://www.nisra.gov.uk/publications/monthly-deaths>

Figure 1: Daily excess deaths and 7-day rolling average, 1st March to 30th June 2020



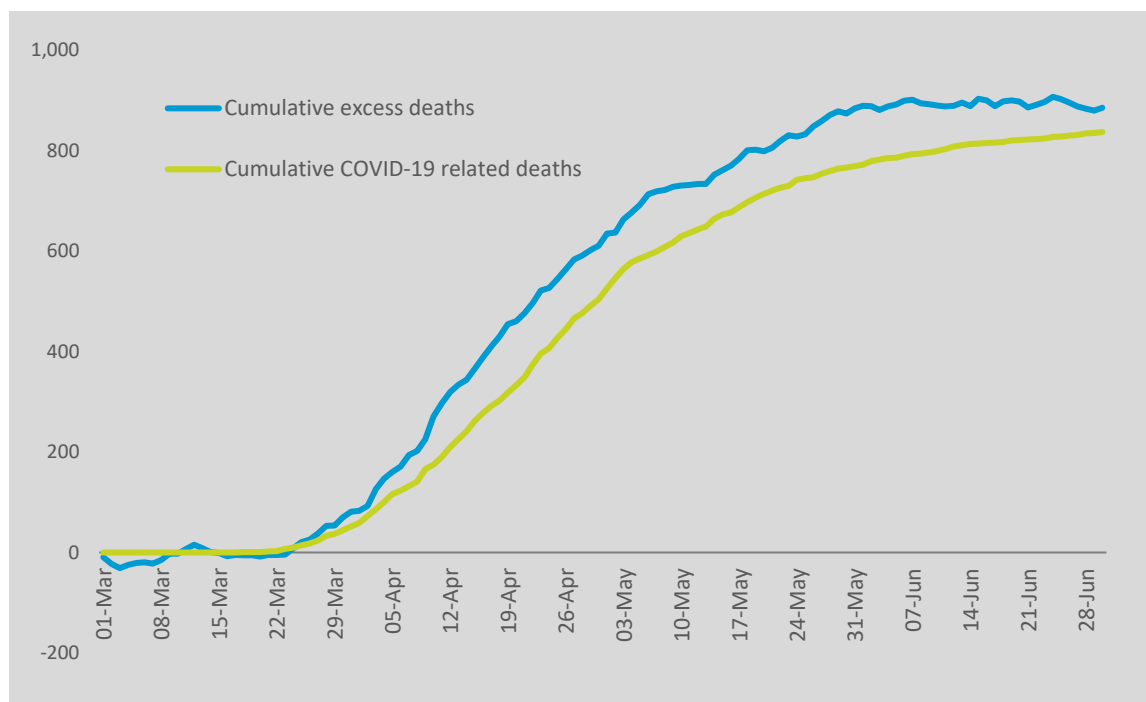
In the first three weeks of March 2020, the number of deaths occurring was broadly similar to previous years. From then on, daily excess deaths remained above zero until the middle of May. Whilst daily excess deaths were negative on three separate occasions¹³ in the latter part of May, on average there remained a positive excess death pattern during that month. During June, daily excess deaths have been in line with expectations, with observed deaths in 2020 at similar levels to the average over the previous five years.

An alternative presentation of excess deaths is as cumulative totals. Starting from the excess deaths on 1st March 2020, excess deaths of subsequent days are added. Figure 2 shows the cumulative excess deaths occurring from 1st March to 30th June 2020, based on registrations up to 15th July.

Figure 2 also presents the cumulative number of COVID-19 related deaths. Both series follow a similar pattern: flat in the first three weeks of March and increasing towards the end of March, then a steady/ steep increase throughout April, followed by a slower increase during May. In June, cumulative COVID-19 related deaths increased even more slowly, whilst excess deaths remained at roughly the same level.

¹³ This occurred on 20th, 24th and 30th of May 2020. Where excess deaths are negative, this indicates that the number of deaths in 2020 were lower than the five-year average of 2015-19.

Figure 2: Cumulative number of excess deaths and COVID-19 related deaths, 1st March to 30th June 2020



The cumulative number of excess deaths has continued to exceed the cumulative number of COVID-19 related deaths since the end of March. The gap between the two series rapidly increased in the first two weeks of April to a maximum of 136 deaths by 19th April. By the middle of May, this gap had fallen to around 100 deaths, whilst June saw a further narrowing of the gap.

Over the four month period March to June, there were 885 excess deaths. By 30th June, 837 deaths included a mention of COVID-19 on the death certificate. The difference between those two figures is 48 deaths or 5.4% of excess deaths. These could be due to multiple reasons¹⁴, such as changes in access to health services, indirect effects of lock-down and isolation (mental health, domestic abuse), changes in the death registration process¹⁵ or indeed further COVID-19 deaths.

¹⁴ The Office for National Statistics provides further background on reasons for non-COVID-19 excess deaths in <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/analysisofdeathregistrationsnotinvolvingcoronavirusCOVID19englandandwales28december2019to1may2020/technicalannex#possible-explanations-for-non-COVID-19-excess-deaths>

¹⁵ More detail on the changes in death registration process in Northern Ireland is available in the weekly report, see <https://www.nisra.gov.uk/publications/weekly-deaths>

5. Excess deaths by Age and Sex

Excess deaths can be calculated for sub-populations, such as particular age groups. Figure 3 shows both excess deaths and COVID-19 related deaths by age group.

Figure 3: Excess deaths and COVID-19 related deaths, by age group, 1st March to 30th June 2020

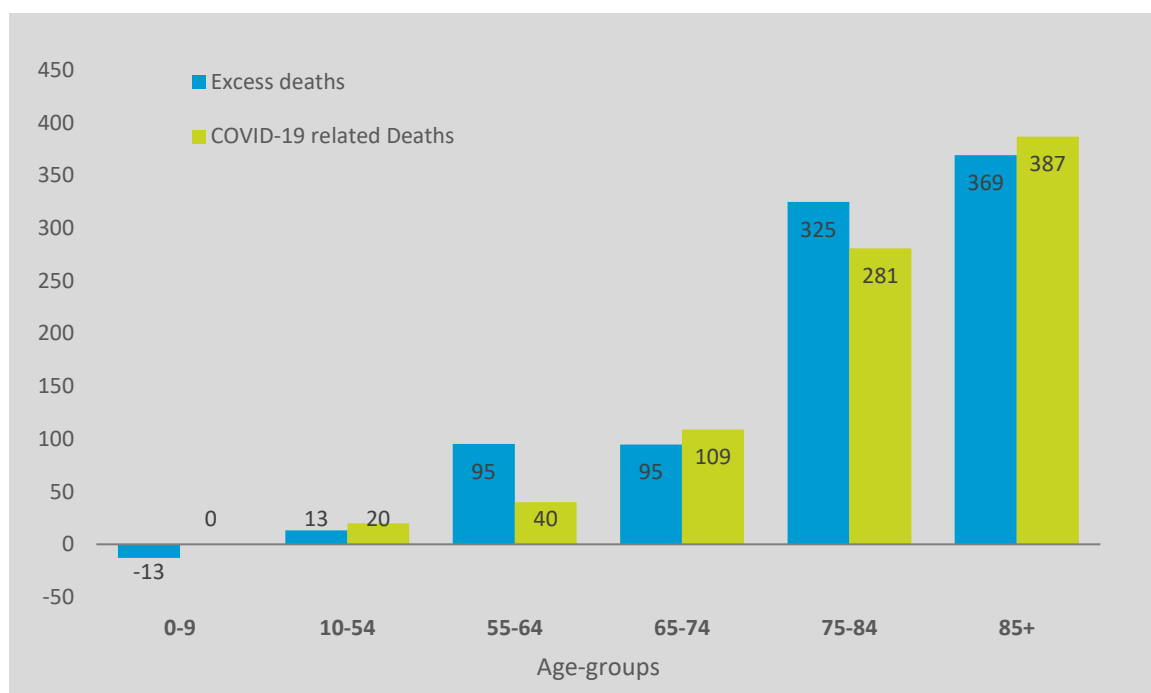
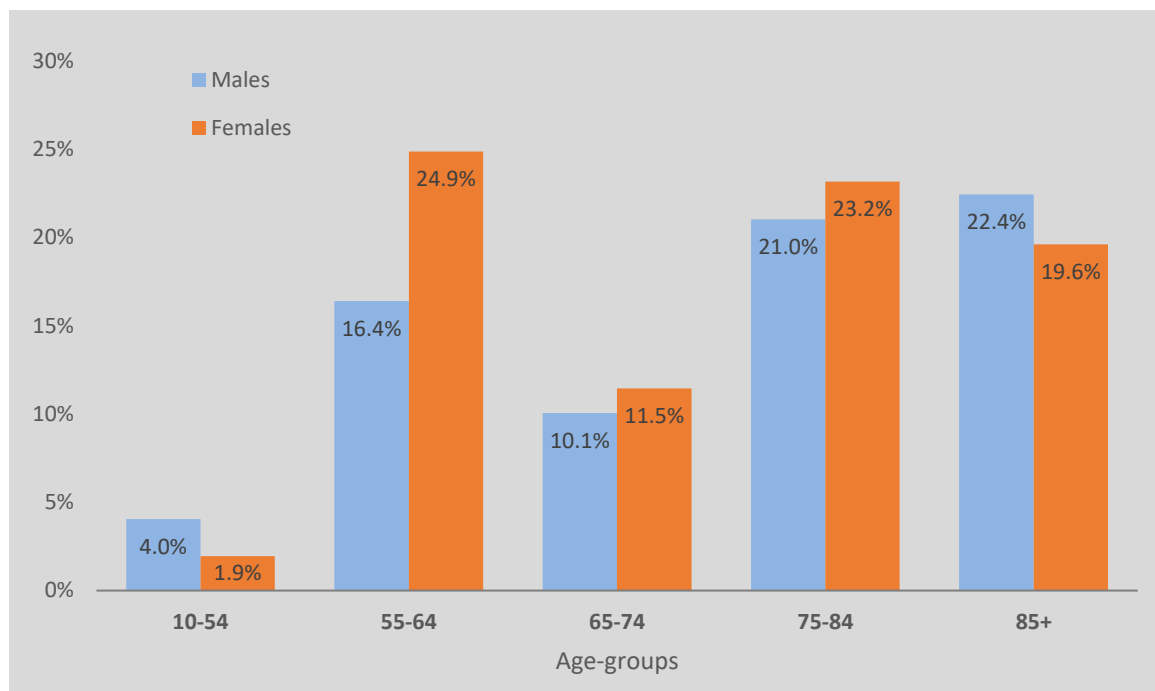


Figure 3 shows that both excess deaths and COVID-19 related deaths increase by age. The vast majority of excess deaths (78.4%; 694 out of 885) and COVID-19 related deaths (79.8%; 668 out of 837) are accounted for by those aged 75 and over. Excess deaths for those aged under 10 years are negative, indicating that the number of deaths in the four months from March to June 2020 was lower than the five-year average of previous years. However, the expected number of deaths in this age group are low, and are predominately infant deaths, which could have a longer registration delay. Deaths of those aged 10 to 54 could also be affected by the registration delay, as a relatively high proportion are due to external causes (suicide, drug-related deaths), which are commonly referred to coroners.

The number of excess deaths for females (474) is higher than that for males (411), and the number of COVID-19 related deaths is only slightly higher (421 compared to 416). The male total excess deaths figure is lower than the number of male COVID-19 related deaths. This difference is relatively small and within the annual variation in the number of deaths. Figure 4 below shows excess deaths by sex and age group as a proportion of the average number of deaths in the previous five years.

Figure 4: Excess deaths as proportion of average deaths 2015-19, by sex and age group, 1st March to 30th June

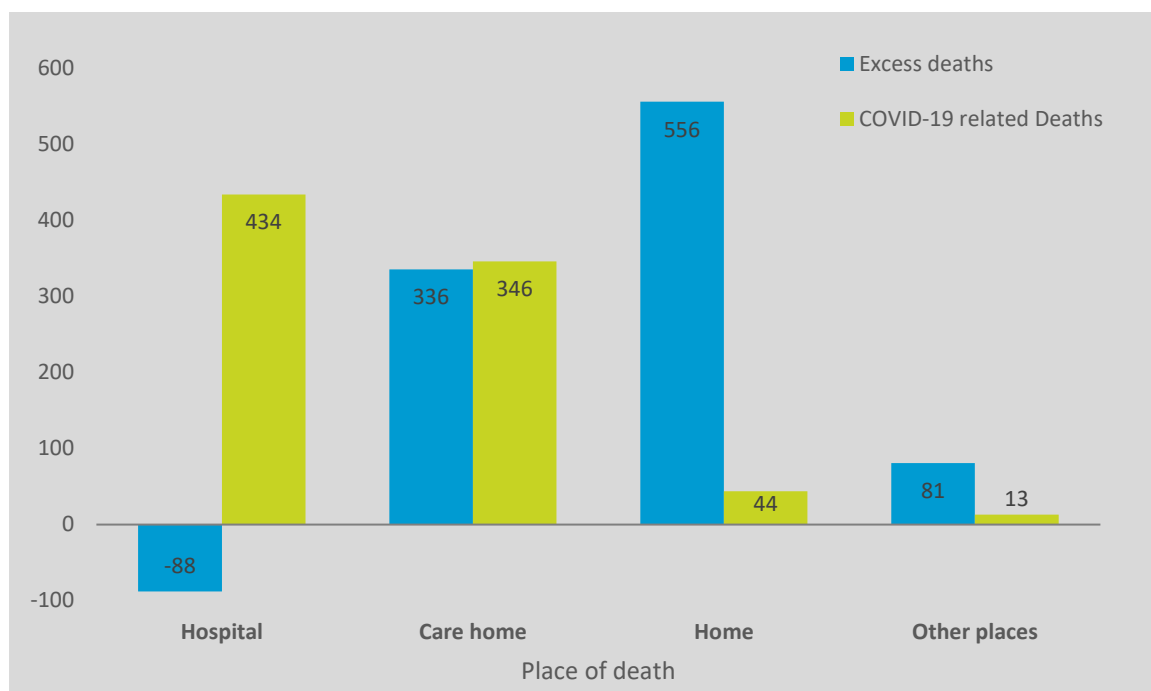


Over all ages, excess deaths are 17.4% above expected levels and is higher for older age groups. Figure 4 also shows that the proportions of deaths over the 5-year average for both males and females aged 55 to 64 (older working age), are higher than the equivalent proportions for those aged 65 to 74 (younger pensionable age). Excess deaths for the age group 55-64 years (95) was more than double that of COVID-19 related deaths (40) suggesting that direct effects of the pandemic could account for less than half of the impact on excess mortality in this age group. For females aged 55 to 64, this proportion is also higher than for females aged 75 and over. Further analysis will be needed once cause of death information becomes available.

6. Excess deaths by place of death

Just over half (51.9%) of the 837 COVID-19 related deaths from March to June 2020 occurred in hospital, compared to 41.3% in care homes and 5.3% at home. The other remaining settings are hospices, non-medical communal establishments and non-domestic settings. Excess deaths and COVID-19 related deaths for these places of death are shown in Figure 5.

Figure 5: Excess deaths and COVID-19 related deaths, by place of death, 1st March to 30th June



One striking finding is the negative excess deaths in hospitals, with the total number of hospital deaths from March to June 2020 lower than the five-year average, despite the 434 COVID-19 related deaths. It appears that the latter may have displaced a sizeable number of non-COVID-19 related deaths that could have been expected to occur in hospitals. Care homes had similar levels of excess deaths (336) and COVID 19 related deaths (346). In contrast, excess deaths at home (556) is more than twelve-fold the number of COVID-19 related deaths at home (44) and account for 62.8% of excess deaths over the period. There could be a number of reasons for this, for example, hospitals retaining capacity for COVID-19 patients, but also hospital restrictions on visitors could have led to patients deciding to receive (palliative) care at home, supported by their families. The accompanying Excel file provides further detail.

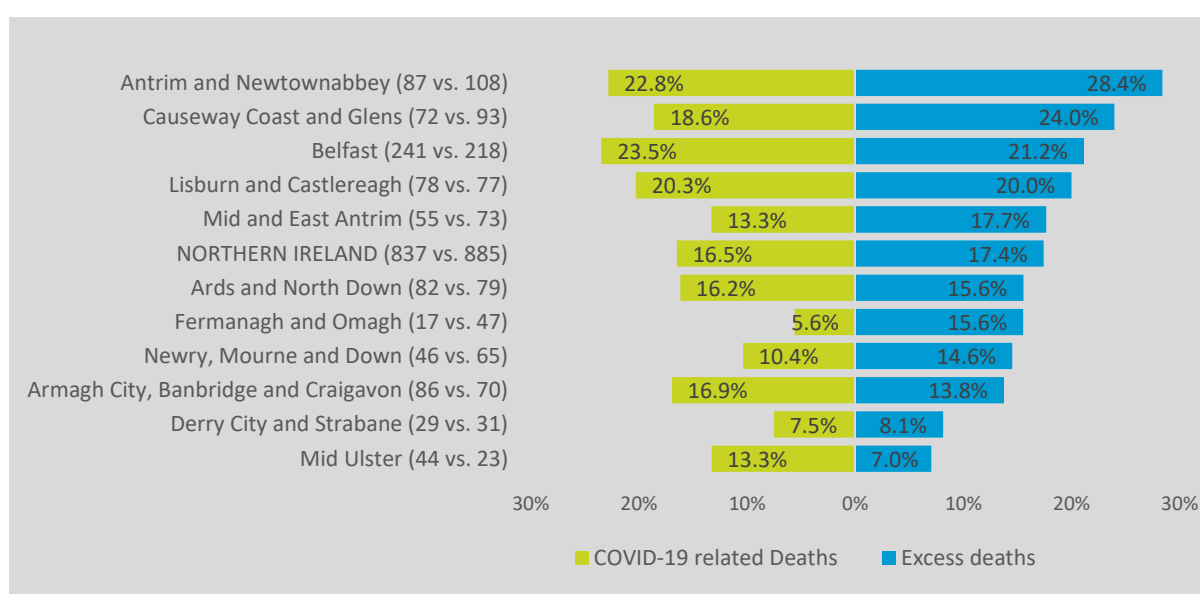
Between March and June 2020, COVID-19 related deaths that occurred in care homes (346) were slightly higher than the 336 excess deaths in care homes. Given the average number of care home deaths in the previous five years (1,046), total deaths in care homes were 32.1% higher from March to June 2020. The Department of Health reported 174 acute respiratory outbreaks in care homes by the 30th June¹⁶.

¹⁶ COVID-19 Care Home Outbreaks, from the DoH COVID-19 - Daily Dashboard Updates, accessed on 23rd July 2020 at: <https://www.health-ni.gov.uk/articles/COVID-19-daily-dashboard-updates>

7. Excess deaths by Local Government District

NISRA publishes weekly numbers of deaths by Local Government District (LGD) based on the date of registration, providing counts for all deaths and COVID-19 related deaths. Deaths are attributed to Districts based on the usual address of residence¹⁷. In this report, for each District, excess deaths are calculated on an occurrence basis, and compared to the number of COVID-19 related deaths. Figure 6 presents both figures as a proportion of the average number of deaths in the previous five years.

Figure 6: Excess deaths and COVID-19 related deaths as proportion of average deaths 2015-19, by Local Government District, 1st March to 30th June 2020



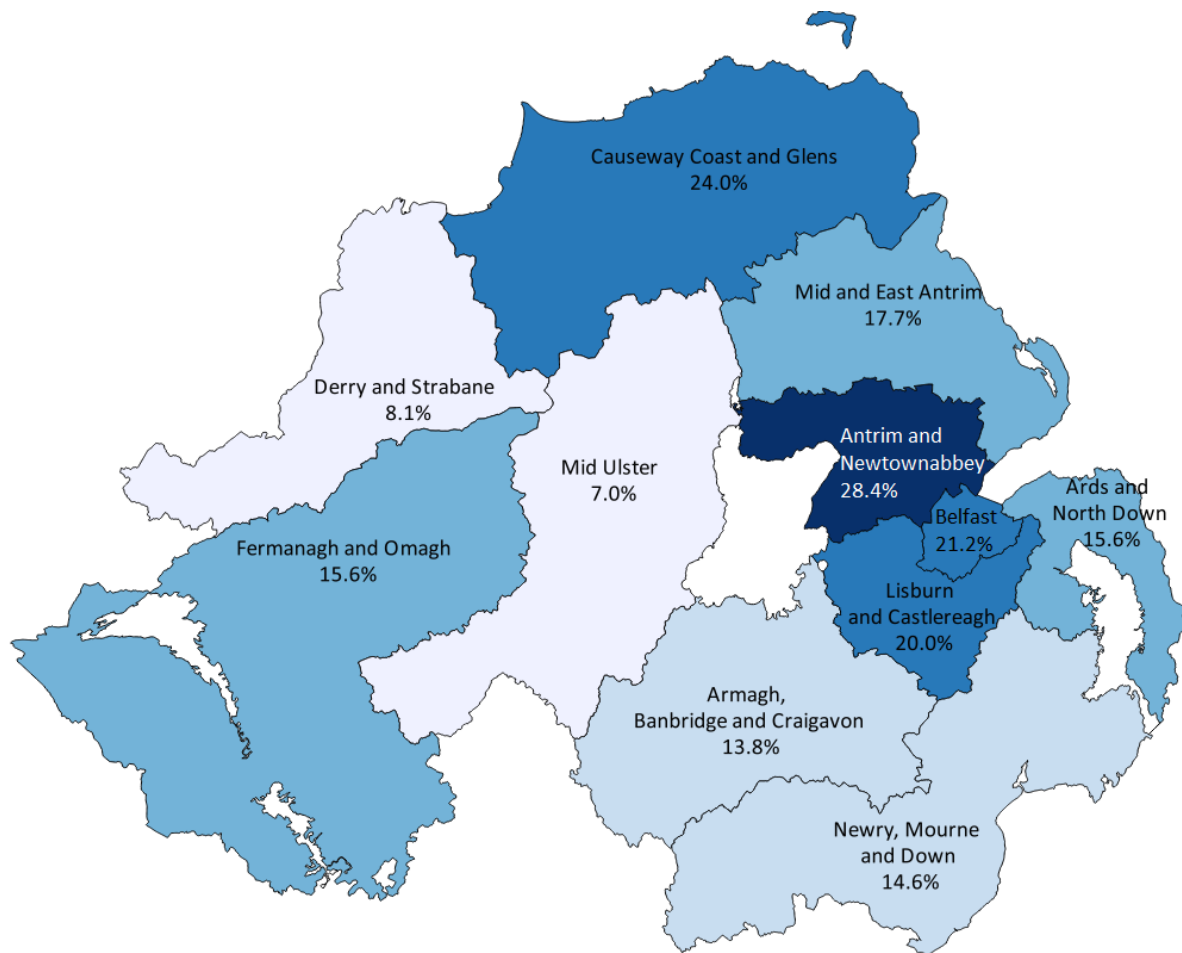
Belfast LGD has the largest number of excess deaths (218), accounting for a quarter (24.6%) of the total number of excess deaths in Northern Ireland. However, when expressed as a proportion of average number of deaths in the previous five years in the same area, Antrim & Newtownabbey LGD had the highest excess deaths as a proportion of average deaths in 2015-19 (28.4%), followed by Causeway Coast & Glens LGD (24.0%) and Belfast LGD (21.2%). Mid Ulster LGD had the smallest excess deaths number as a proportion of historic deaths (7.0%).

There are five Local Government Districts where the number (and therefore, proportions compared to the 5-year average) of COVID-19 related deaths is greater than excess deaths: Ards & North Down, Armagh City, Banbridge & Craigavon, Belfast, Lisburn & Castlereagh, and Mid Ulster LGDs. Fermanagh & Omagh LGD had the smallest number of COVID-19 related deaths (17), yet excess deaths were more than double (47) that figure.

¹⁷ For a small number of deaths where the address is missing or outside Northern Ireland, the place of death is used to allocate to a geographical area.

Figure 7 shows a map of excess deaths relative to average deaths in 2015-19 by Local Government Districts. Further information is available in the accompanying Excel file.

Figure 7: Excess deaths as proportion of average deaths 2015-19, by Local Government District, 1st March to 30th June 2020

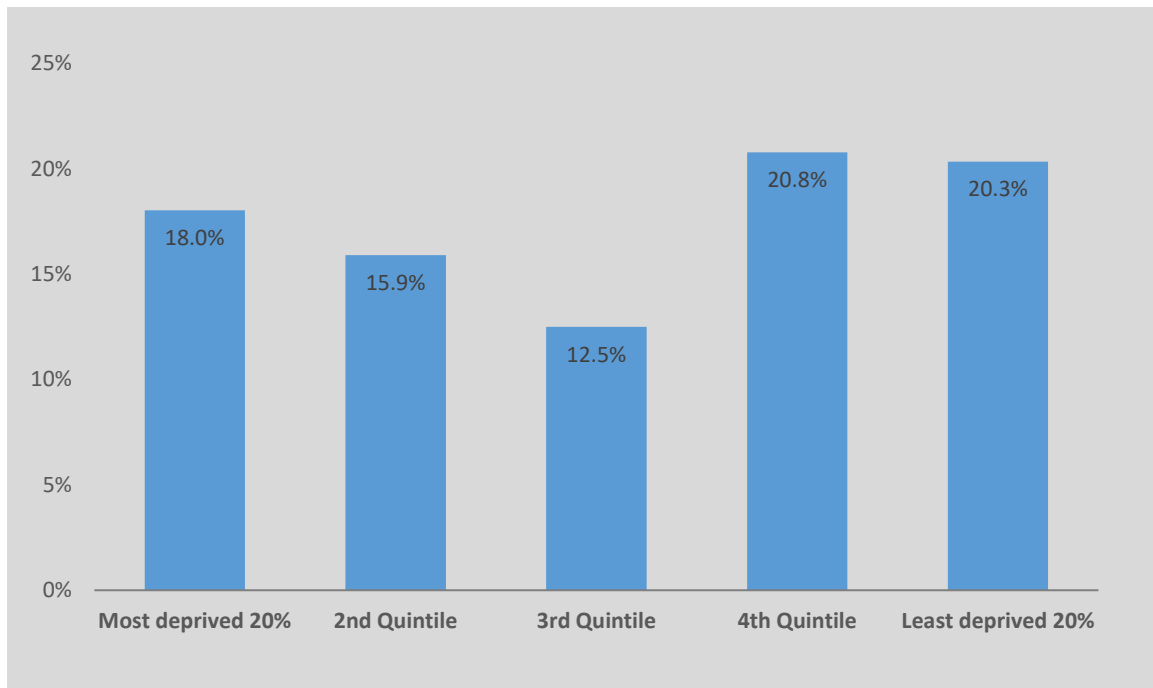


8. Excess deaths – Deprivation and Rurality

Excess deaths can also be calculated for areas smaller than Local Government Districts, however the variability in the number of deaths between years affects the reliability of these figures. This effect can be countered by grouping together small areas with similar characteristics such as Super Output Areas (SOAs), which have an average population of 2,100 people.

Figure 8 shows the excess deaths as a proportion of the average number of deaths in the previous five years, for SOAs grouped into deprivation quintiles according to the Northern Ireland Multiple Deprivation Measure 2017 (See below for further detail).

Figure 8: Excess deaths as a proportion of average deaths 2015-19, by Deprivation Quintiles, 1st March to 30th June 2020



There is not a clear pattern in these figures. Excess deaths are highest in the two least deprived quintiles, with just over a 20% increase in deaths compared to the average of previous years. Excess deaths are lowest in the third quintile. Overall, the variation in excess deaths between deprivation quintiles is smaller than that observed by Local Government District. This is also observed when comparing urban and rural areas¹⁸ (Figure 9).

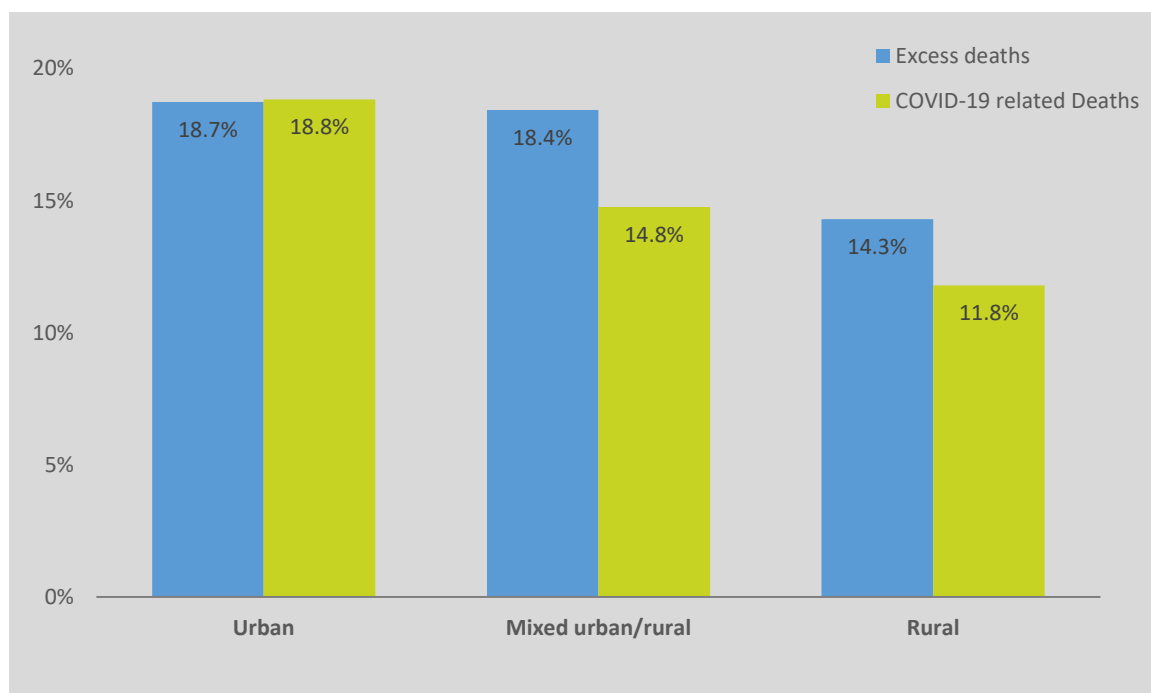
Northern Ireland Multiple Deprivation Measures

The Multiple Deprivation Measure (NIMDM 2017)¹⁹ is a measure of area disadvantage, combining seven separate domains of deprivation. It was used to assign deaths to one of five groups (or quintiles), ranging from most deprived to least deprived, based on their usual address of residence. If the usual address of the deceased was not provided or the deceased was resident outside of Northern Ireland, the place of death address was used.

¹⁸ Review of the Statistical Classification and Delineation of Settlements, available at: <https://www.nisra.gov.uk/publications/settlement-2015-documentation>

¹⁹ Full details on NIMDM 2017 available at: <https://www.nisra.gov.uk/statistics/deprivation/northern-ireland-multiple-deprivation-measure-2017-nimdm2017>

Figure 9: Excess deaths and COVID-19 related deaths as a proportion of average deaths 2015-19, for urban and rural, 1st March to 30th June 2020

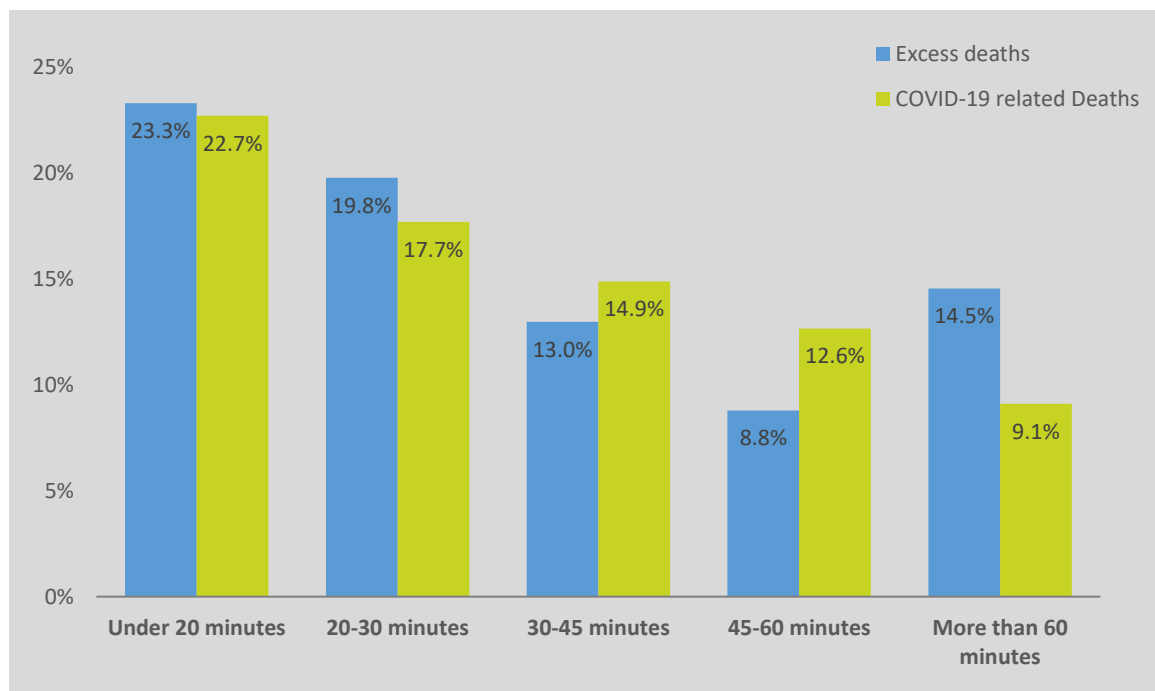


Excess deaths as a proportion of the five-year average number of deaths are similar in urban (18.7%) and mixed urban/rural (18.4%) areas. The latter are generally areas that are on the outskirts of larger settlements. Excess deaths are lower in rural areas at 14.3% above average numbers. Compared to total excess deaths, COVID-19 related deaths as a proportion of average deaths fell more steadily with increased rurality.

From earlier graphs it is clear that the pattern of excess deaths is closely linked to that of COVID-19 related deaths, both in terms of the change over time (Figures 1 and 2) and geographic distribution (Figures 6 and 7). COVID-19 is an infectious disease and is primarily spread between people during close contact. Given the large number of COVID-19 related deaths occurring in Belfast, and relatively few in the more rural west of the country, Figure 10 shows excess deaths and COVID-19 related deaths as proportion of average deaths in the previous five years, based on the drive-time to Belfast²⁰.

²⁰ The lookup table provides for each Super Output Area (SOA) the drive time to the centre of Belfast. For further detail, see <https://www.nisra.gov.uk/publications/settlement-2015-documentation>

Figure 10: Excess deaths and COVID-19 related deaths as a proportion of average deaths 2015-19, by Drive time to Belfast, 1st March to 30th June 2020



COVID-19 related deaths were associated with proximity of area of main residence to Belfast (Figure 10) with decreasing proportions of COVID-19 related deaths with increasing travel times to Belfast. COVID-19 related deaths in areas within 20 minute drive-time (Greater Belfast) represented 22.7% of the average number of deaths in those areas in the previous five years, compared to 9.1% in areas with a drive-time greater than 60 minutes to Belfast. Excess deaths broadly following the same pattern, ranging from 23.3% within 20 minutes drive-time to 8.8% for a drive-time between 45 and 60 minutes. COVID-19 related deaths were greater than excess deaths for drive-time between 30 and 60 minutes.

There is an upsurge in excess deaths for drive-time greater than one hour, which at 14.5% is much larger than COVID-19 related deaths (9.1%). This could also be seen in Fermanagh & Omagh and Causeway Coast & Glens LGDs (see Figure 7), both of which are more than an hour's drive from Belfast. Further analysis will be needed once cause of death information becomes available to understand this upsurge.

9. Excess deaths – Cause of death

All deaths will be coded in accordance with the International Statistical Classification of Diseases, Injuries and Causes of Death, (ICD) (Tenth Revision). Classification of the underlying cause of death is done by reference to the death certificate and additional information from the certifying doctor. At the time of writing (July 2020), the coding of deaths registered in the first half of 2020 has not been completed. Quarter 1 and Quarter 2 cause of death information is due to be published by mid-September, however, the Office for National Statistics has reported that for 92.8% of death certificates in England and Wales where COVID-19 was mentioned, it was found to be the underlying cause of death²¹.

Excess deaths will be calculated for specific causes of deaths once that information becomes available. This will help understand the reasons for the difference between excess deaths and COVID-19 related deaths, when broken down by age groups or geographical areas.

10. Strengths and Limitations

Death statistics form a high quality data source, given the legal requirement of timely registration of all deaths that occurred in Northern Ireland, which is administered by a District Registrar, electronically recorded and managed by the General Register Office and quality assured by statisticians in NISRA²².

The excess deaths calculation does not require population estimates; the underlying assumption is that the population is stable in both size and age distribution. Neither does it require information on the cause of death. An earlier paper²³ that reported age-standardized mortality rates of all causes and COVID-19 related deaths used detailed population estimates in its analysis. It is recommended that these papers are read together to gain greater understanding of the impact of the COVID-19 pandemic in Northern Ireland.

²¹ Based on 50,335 deaths in England and Wales from 1st March to 30th June 2020, see <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deaths-involvingcovid19englandandwales/deathsoccurringinjune2020>

²² See Quality and Methodology Information (QMI) for Northern Ireland death statistics, available at: <https://www.nisra.gov.uk/publications/vital-statistics-documentation>

²³ COVID-19 Deaths Bulletin 1 March - 31 May 2020, available at <https://www.nisra.gov.uk/publications/monthly-deaths>

The Northern Ireland population in 2020 is not the same as in the previous five years, with annual increases of around 0.5% and an aging population²⁴. The excess deaths methodology captures this effect by looking at annual increases in the number of deaths, which reflects both the age and size of the population. The average annual increase in the number of deaths from March to June was 40 deaths between 2011 and 2019. Compared to the 885 excess deaths in these four months in 2020, the underlying trend in deaths due to population change would have had a relatively small impact.

There is also a variation in the number of deaths between years due to, for example, seasonal weather. In the years 2015 to 2019, for which the five year average of 5,077 deaths was used as a baseline, the number of deaths ranged from 5,005 to 5,168 (see accompanying tables). Again, the 885 excess deaths in 2020 is much greater than the magnitude of such annual variation.

The biggest unknown in this analysis is the number of deaths which occurred from March to June, but which have not yet been registered. In the previous five years, deaths registered up to 15th July of each year and occurring between March and June, were around 300 lower than eventually registered. As discussed in the previous section, given the typical causes of death for late registrations, this as yet unknown number may be greater in 2020 as a result of lockdown measures.

²⁴ NISRA produces official population statistics for Northern Ireland, see <https://www.nisra.gov.uk/statistics/population>

Background Notes

The information used to produce statistics on deaths occurring in Northern Ireland is based on registrations recorded on the Northern Ireland General Register Office's Registration System (NIROS). Daily extracts of registration records from NIROS are processed by the NISRA Vital Statistics Unit.

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 and U07.2.

Super Output Areas (SOA)

Northern Ireland is split into 890 spatial areas known as Super Output Areas (SOAs), with an average population of around 2,100 people. The number of SOAs in each of the 11 Local Government Districts (LGDs) varies, ranging from 49 in Fermanagh & Omagh LGD to 174 in Belfast LGD. Further detail can be found from the NISRA website:

<https://www.nisra.gov.uk/support/geography/northern-ireland-super-output-areas>

Multiple Deprivation Measure (NIMDM, 2017)

The Northern Ireland Multiple Deprivation Measure 2017 (NIMDM 2017) is a measure of multiple deprivation at the Super Output Area (SOA) level. It is comprised of seven distinct domains of deprivation which can be recognised and measured separately. The overall MDM is conceptualised as a weighted area level aggregation of these specific domains of deprivation. Further detail can be found from the NISRA website:

<https://www.nisra.gov.uk/statistics/deprivation/northern-ireland-multiple-deprivation-measure-2017-nimdm2017>

Urban-Rural Classification

The Review of the Statistical Classification and Delineation of Settlements (March 2015) defined the boundaries of towns and villages. It also provided a default definition for urban areas (settlements with a population of 5,000 and over) and rural areas (smaller settlements and open countryside, as well as banded drive-times. Further detail can be found from the NISRA website:

<https://www.nisra.gov.uk/support/geography/urban-rural-classification>

Administrative Data Research Northern Ireland (ADR NI)

Administrative Data Research Northern Ireland (ADR NI) is a partnership between the Administrative Data Research Centre Northern Ireland (ADRC NI, comprising Queen's University Belfast and Ulster University), and the Northern Ireland Statistics and Research Agency (NISRA). Together they support the acquisition, linking and analysis of administrative data sets, developing cutting-edge research to improve knowledge, policymaking and public service delivery.

<https://www.nisra.gov.uk/support/research-support/administrative-data-research-northern-ireland-adr-ni>

Links to Relevant Publications

Weekly death registrations in Northern Ireland, 2020

<https://www.nisra.gov.uk/publications/weekly-deaths>

Monthly death registrations in Northern Ireland, 2020

<https://www.nisra.gov.uk/publications/monthly-deaths>

Weekly Data on Deaths Registered in Scotland

<https://www.nrscotland.gov.uk/covid19stats>

Analysis of death registrations not involving coronavirus (COVID-19), England and Wales: 28 December 2019 to 1 May 2020

<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/analysisofdeathregistrationsnotinvolvingcoronavirusCOVID19englandandwales28december2019to1may2020/technicalannex>

Vital statistics (Central Statistics Office, Ireland)

<https://www.cso.ie/en/statistics/birthsdeathsandmarriages/>

COVID-19 Health Surveillance Monitor (Ireland)

<https://www.gov.ie/en/service/0039bc-view-the-covid-19-coronavirus-dashboard-showing-the-latest-stats-and/>

List of Tables

Data accompanying this bulletin are available from the NISRA website in Excel format. The spreadsheet includes the following tables.

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Annex A – Excess deaths methodology

‘Excess deaths’ is the difference between the observed number of deaths and the expected number of deaths. The first key question for determining excess deaths is to define the expected number of deaths. There are broadly three different methods:

1. Number of deaths based on population estimates and projected mortality rates. For example, the 2018-based population projections for Northern Ireland²⁵ projected 16,184 deaths between mid-2019 and mid-2020. As these projections are created on an annual basis, roughly a third of this number could be expected to occur in March-June 2020;
2. Advanced modelling methods can be used to account for seasonality in deaths and corrects for delays in the collection and processing of death data. A well-known example is the EuroMOMO project²⁶, which provides weekly excess deaths for a number of European countries, including Northern Ireland.
3. The number of deaths during a similar period in previous years. NISRA’s weekly deaths statistics report uses the average number of deaths in the previous 5 years. This approach does not require population estimates, although it implicitly assumes that the population has been relatively stable and no other events in that period, such as extreme weather or major disease outbreaks, had a measured impact on the number of deaths.

WHO definition of Excess Death/Mortality:

“Mortality above what would be expected based on the non-crisis mortality rate in the population of interest. Excess mortality is thus mortality that is attributable to the crisis conditions. It can be expressed as a rate (the difference between observed and non-crisis mortality rates), or as a total number of excess deaths (ODI/HPN paper 52, 2005, Checchi and Roberts). <https://www.who.int/hac/about/definitions/en/>

Most NISRA publications on deaths are based on the date of registration. All statistics remain provisional until the publication of the Registrar General Annual report. The advantage of this is that death statistics can be finalised and are not affected by late registrations. Weekly death statistics are also reported on a registration basis. The majority of deaths are registered within five days, but it could be considerably longer if a case is referred to the coroner.

²⁵ See <https://www.nisra.gov.uk/publications/2018-based-population-projections-northern-ireland>

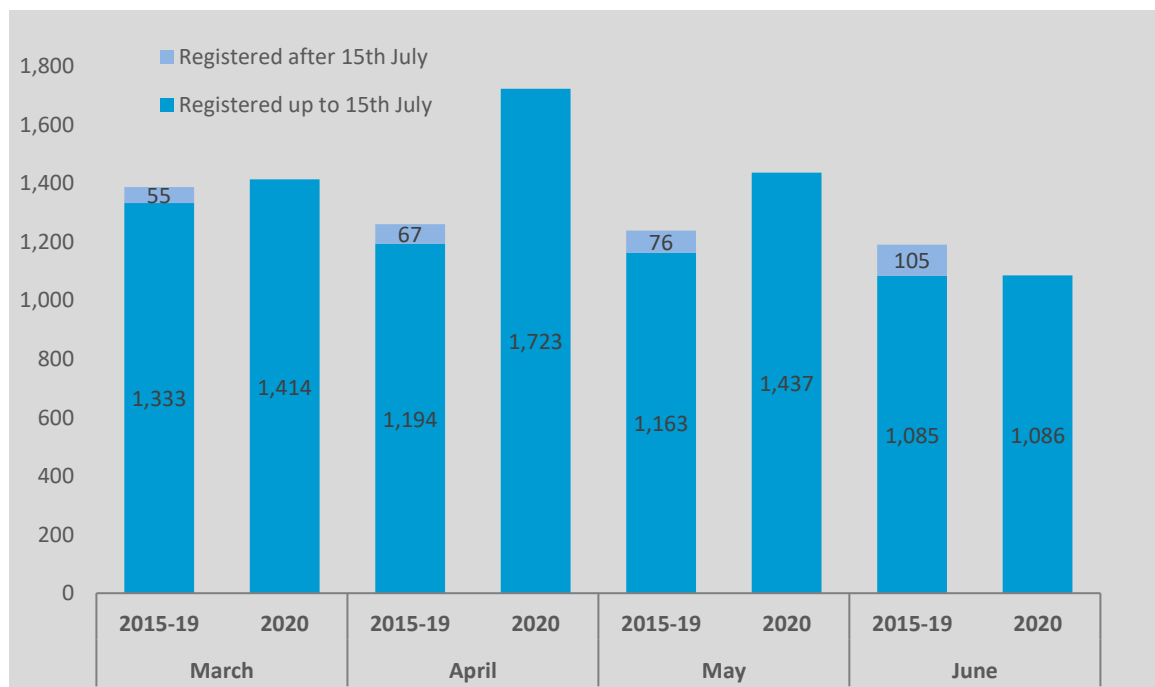
²⁶ See https://webgate.ec.europa.eu/chafea_pdb/assets/files/pdb/2007201/2007201_d04_en_ps.pdf

During the COVID-19 pandemic, a number of changes have been made to the usual process of certifying and registering a death which have been enabled by the Coronavirus Act 2020, which came into effect on 25th March. This could lead to fewer cases being referred to coroners, and informants registering deaths by phone rather than in person. There is some evidence that these changes are leading to a shorter lag between the date of death and the date of registration.

The analysis in this report is based on deaths that occurred from 1st March to 30th June, comparing deaths in 2020 to the average of the previous 5 years. It is recognised that there could be deaths that occurred in this period, but that have not yet been registered. This is most likely in the more recent months.

This analysis includes deaths registered up to 15th July, therefore allowing for 11 working days after the end of June to register deaths. Deaths that occurred in the same period of the previous years have had more time to be registered and the analysis adjusts for this. Figure A has broken down the average number of deaths in 2015-19 into those that were registered by the 11th working day in July, and those that have been registered since. It shows that the number of deaths were 4.1%, 5.6%, 6.5% and 9.7% higher in March, April, May and June respectively.

Figure A: Deaths by month, 2020 and average 2015-19, by registration cut-of date, 1st March to 30th June



Based on these figures, there are three possible approaches in deriving excess deaths in these four months:

1. Deaths which occurred in March to June 2020 and registered by 15th July 2020 (5,660), compared to the average number of deaths occurring over the same months of 2015-19 and which have been registered to date (thus including late registrations) (5,077). This results in 583 excess deaths, or 11.5% above the 5-year average;
2. Deaths which occurred in March to June 2020 and registered by 15th July 2020 (5,660), compared to the average number of deaths occurring over the same months of 2015-19, including death registrations up to 11 working days after 30th June each year (4,775). This results in 885 excess deaths, or 18.5% above that 5-year average; or
3. Adjusting the number of deaths occurring between March and June 2020 to account for late registrations, and compare to the average number of deaths in 2015-19 which have been registered to date.

The first approach is most likely to result in an underestimate of excess deaths, as the number of deaths in March to June 2020 that have yet to be registered will be greater than late registrations in the same period of the previous five years. The second approach could provide an overestimate if the changes²⁷ in the certification and registration of deaths have reduced the lag between occurrence and registration.

Finally, the third approach would rely on assumptions being made on the method of adjustment. This adjustment could be done by applying the observed difference from the five year average, either in levels (302 deaths) or as a proportion (6.3%). This would still not capture a possible reduction in the registration lag, and may require different adjustments for different populations. For example, drug-related deaths or suicides will commonly go through the coroner and could have a long registration lag: such deaths are typically seen in young males and urban deprived areas²⁸.

To put the possible measures of excess death into context, excess deaths based on deaths registered from March to June was 908²⁹, and the number of COVID-19 related deaths that occurred in this period was 837. These figures align more with the second approach, suggesting that the impact of late registration is sizable. It was decided to use the second approach to estimate the number of excess deaths, but to present this excess as a proportion of historical deaths registered to date, i.e. the 885 excess deaths are 17.4% higher than the five-year average of 5,077 deaths. This methodology is demonstrated in Table A on the next page.

²⁷ These changes include registration by telephone rather than in person, and fewer cases referred to the coroner (when the deceases has not been seen by their GP in the last 28 days, and died of natural causes). Further detail on these changes are in the background notes (page 2) of the weekly deaths report, available at <https://www.nisra.gov.uk/publications/weekly-deaths>

²⁸ <https://www.nisra.gov.uk/publications/drug-related-deaths-northern-ireland-socio-demographic-analyses>

²⁹ This figure is taken from the monthly death statistics as published on <https://www.nisra.gov.uk/publications/monthly-deaths>

Table A: Deaths by month and year of death, 2015-2020, 1 March to 30 June¹

Month	2015	2016	2017	2018	2019	Average 2015-19 (A)	Average 2015-19 at cut-off² (B)	2020³ (C)	Excess Deaths (C - B)	Excess deaths as proportion of average 2015-19 (C - B) / A
March	1,395	1,337	1,370	1,490	1,346	1,387.6	1,332.8	1,414	81.2	5.9%
April	1,274	1,227	1,205	1,249	1,347	1,260.4	1,193.8	1,723	529.2	42.0%
May	1,233	1,234	1,280	1,166	1,282	1,239.0	1,163.4	1,437	273.6	22.1%
June	1,241	1,207	1,164	1,147	1,193	1,190.4	1,085.0	1,086	1.0	0.1%
March-June	5,143	5,005	5,019	5,052	5,168	5,077.4	4,775.0	5,660	885.0	17.4%

Source: NISRA

Notes:

¹ Based on the date a death 'occurred' rather than when a death was registered.

² Based on death registrations up to and including 15 July for each year.

³ Based on death registrations up to and including 15 July 2020.