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COVID-19 PANDEMIC REPORT ON CORONER'S INQUIRIES INTO DEATHS IN THE COMMUNITY, HOSPITAL AND NURSING HOME AND RESIDENTIAL CARE: EPIDEMIOLOGY AND TOTAL AND EXCESS MORTALITY IN THE DISTRICT OF KILDARE FOR THE YEAR MARCH 2020 THROUGH FEBRUARY 2021.

Second Report: April 2021

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Executive Summary:

COVID-19 PANDEMIC: REPORT OF CORONER'S INQUIRIES INTO EPIDEMIOLOGY AND TOTAL AND EXCESS MORTALITY IN THE COMMUNITY, HOSPITAL AND NURSING HOME AND RESIDENTIAL CARE IN THE DISTRICT OF KILDARE FOR THE YEAR MARCH 2020 TO FEBRUARY 2021.

All Covid-19 deaths, all nursing home and residential home deaths and deaths due to an adverse drug reaction must by law in Ireland be reported to the Coroner, the independent Judicial Officer of the State, in the District in which they occur. From 11th March 2020, when the first Covid-19 death occurred in Ireland, to 28th February 2021 there were 4,443 Covid-19 deaths nationally of which 230 (5%) were reported in Kildare with 163 (71%) of these deaths occurring in nursing and residential homes. The clinical epidemiology and documented excess mortality of the reported deaths are chronicled and analysed in this second report for **three distinct periods** of March to June 2020 (Period 1); July to December 2020 (Period 2); and January to February 2021 (Period 3) which also correspond with three "lockdown" periods, and for the **consolidated "Covid-19 year"** period from March 2020 to February 2021 ("the year"). These periods and annual figures are compared with the previous 5-year mortality figures noting that between 1st March 2015 and 28th February 2021 some 2,837 deaths were reported to the Coroner for the District of Kildare.

The calculated **excess number of deaths notified for March 2020 to February 2021** compared with 2015-2020 (5-yearly average of 567) was 300 (53%) of the 867 total deaths reported with a 169 (54%) excess in the 480 deaths in nursing and residential homes (5-yearly average of 311). Covid-19 deaths accounted for 77% of the total excess deaths and for 96% of the nursing and residential home excess deaths respectively. Following subtraction of the 66 non-natural cause deaths and 230 Covid-19 deaths from the total excess there remained an unexplained excess of 56 deaths due to natural causes in March 2020 to February 2021 compared with 2015-2021. Thus, the number of unattributed excess deaths actually fell marginally between July 2020 and February 2021 taking into account the figure of 62 in the first report for March to June 2020. Underlying medical conditions were recorded in all but two of those **deaths related to Covid-19** and the average age of the deceased was 82.2 years with median age of 83 years and 58% were female (134) and 42% male (126).

The numbers and percentages of **Kildare Covid-19 cases out of the national cases** were: 139 of 1,728 or 8% in Period 1; 26 of 575 or 5% in Period 2; 65 of 2,140 or 3% in Period 3; and 230 of 4,443 or 5% for the Covid-19 year. The excess total death percentage was 117%, 16%, 46% and 53% in the three periods and year respectively. In the nursing and residential home setting the corresponding numbers and percentages of Kildare cases out of the national cases were 113 of 985 or 11% (Period1); 9 of 175 or 4% (Period 2); 41of 668 or 6% (Period 3); and 163 of 1,828 or 9% for the Covid-19 year. The excess death percentages were 142%, 4% , 35% and 54% in the three periods and year respectively.

Information analysed for this study allows **Covid-19 public health policy and strategy** to learn from mortality events and about the continuing challenges of the infection. The report is also set in the wider context of the Coroner Service and its role during the pandemic. The comments and observations are made on **clinical epidemiology, co-morbidities, *post mortem* practices, bereavement, vaccination and the public health imperative for a centralized national mortality database and reformed death notification and certification systems for infectious disease surveillance**. The tragic deaths in County Kildare of 230 individuals are best remembered and honoured by **actions** arising from that learning process to minimize the worst outcomes of any future similar infectious pandemic or if Covid-19 becomes a recurrent seasonal infection and some are recommended on foot of the findings and questions raised in this report.

A legislative explanatory note is included at the end of the reference section.

Summary of Conclusions and Recommended Actions (Section 5 of the Report):

1. The high Covid-19 death toll and excess mortality findings in Kildare in the past year

- the enormous toll of confirmed deaths on strict clinical criteria from Covid-19 in County Kildare is confirmed in the study of deaths in the past year

- a consistent excess mortality from Covid-19 is seen in March 2020 through February 2021

2. The higher death toll in nursing and residential homes during the Covid-19 pandemic and the need for a new paradigm for care of the elderly and vulnerable

- a new paradigm for these nursing and residential home settings is now needed

- palliative care; end-of-life pathways and decisions; PPE use by healthcare workers; and decision-making in these settings must be reviewed

3. The less understood effects on longer term health of the population including post-Covid-19 conditions, suicides, delayed healthcare interventions and vaccination side-effects

- post Covid-19 conditions effects on morbidity and mortality to be recognised

- effects on non-Covid healthcare assessment, diagnoses and treatments to be ascertained

- deaths due to suicide during the Covid-19 year to be analysed

- safety and risk benefit of vaccination and surveillance and oversight of possible deaths by the Coroner Service continues

4. The effects on bereaved families through imposed changes in bereavement and funeral arrangements and suspension of inquest hearings and the need to mitigate these effects

- restricted visits to the dying, viewing of the body of the deceased by family members, *post mortem* examination procedures, removal of the body and restricted funeral rites need to be reviewed on the prevailing medical evidence

- a phased resumption of Coroners' inquest hearings is needed

5. The established excess mortality requires ongoing collaborative research and study

- increase in deaths recorded by the Coroner Service Annual Returns for 2020 requires analysis

- ongoing examination by expert public health epidemiologists of the data is essential

6. The need for an improved and prompt death notification and certification system

- a more streamlined and more efficient death notification and certification process is needed for surveillance of infectious diseases causing death

7. Remembering the bereaved and their loved ones dying before their time

- to recognise each figure represents a unique and loved individual who died before their time

- to honour and remember them we must institute any necessary improvements and reforms in our system

1. Introduction:

The purpose of this second Coroner's report is to use the knowledge and experience gained over the past year of the Covid-19 Pandemic to enlarge on the first report; establish the number of deaths from Covid-19 in County Kildare in the past year; and to review the number of excess deaths from Covid-19 and other causes. It also considers the wider context of the effects of the pandemic on nursing and residential home residents and their families. It examines a number of wider and emerging issues including *post mortem* practices, bereavement and Covid-19 vaccination. The loss of 230 lives in County Kildare to Covid-19 during the past year covered in this report demands that those people and their families be remembered and that the evidence gathered from their deaths informs our understanding of Covid-19 and any necessary reform of systems in the context of those deaths. Thus, recommendations are made in this second report for some appropriate actions and changes needed to address any future similar infectious or seasonal outbreaks in this country.

All Covid-19 deaths, all nursing home and residential home deaths and deaths due to an adverse reaction to any drug must by law in Ireland be reported to the Coroner, the independent Judicial Officer of the State, in the District in which they occur.[1,2] Covid-19 deaths are deaths due to natural causes caused by a notifiable infectious disease and this is critical to the understanding of how the deaths are investigated and certified. Investigation of the circumstances surrounding reportable deaths is also a function of the Coroner's inquiry.

The first report from the Kildare Coroner's District covering March to June in 2020 was issued in August 2020. This second report continues that study to chronicle and analyse the total number of deaths notified to the Coroner during the 12 month period March 2020 through February 2021 (referred to as "the year" or "Covid-19 year" in this report). It compares the numbers of deaths to the same periods in 2015-2020 to establish the epidemiology of Covid-19 deaths in Kildare and to calculate the excess total mortality, the excess deaths due to Covid-19 and the excess non-Covid-19 natural deaths during the past year and further divided into three distinct periods: March to June 2020; July to December 2020; and January to February 2021. The number of Covid-19 deaths reported in the Covid-19 year was 230 of which 163 occurred in nursing and residential homes.

The Coroners met in national emergency session on 15th March 2020 and also with the Department of Justice and, liaising with the Department of Health, made contingency plans for the possibility of an estimated increase of 30,000 deaths from Covid-19 in the year in the scenario of an uncontrolled spread of the infection through the community thus doubling the annual death toll to a total in the region of 60,000. This was based on figures of infection, transmissibility and death particularly from the Northern Italy experience at that time. This catastrophic death toll did not materialise as a direct result of public health measures implemented since March 2020 although a very significant death toll of 4,443 did occur in the year.

In many countries, the number of Covid-19 deaths in nursing home and long-term residential care facilities has accounted for a large proportion of the total deaths due to the infection. The first and second reports therefore continue to review care home deaths in some detail to assess that phenomenon further.

In the five year period March 2015 – February 2020, the Kildare District Coroner's Office in Ireland, serving a population of 223,000, enquired into 2,837 deaths in the County, directed 762 *post mortem* examinations and completed 304 public hearing inquests.[3] In the year March 2020 - February 2021 the figures were 867, 163 and 41 respectively. This last figure of 41 was smaller than the average because of the Covid-19 Restrictions with the consequence that inquest hearings throughout Ireland have been suspended for 8 of the last 12 months. This has had a significant impact on bereaved families mourning the death of their loved one and has also had practical repercussions on their ability to deal with legal issues relating to the estate of their family member. The backlog of inquests hearings in the Kildare District and nationally is substantial and will take many months to clear.

2. Methods:

The numbers of notified deaths registered for the preceding five years in the Coroner's records March 2015 to February 2020 (2,837 deaths) have been compared with the 867 deaths in the year 1st March 2020 to 28th February 2021 and analysed for those months in the corresponding times in the six years to 2021. The certification of Covid-19 as a cause of death under the Civil Registration Act 2004 again followed the clinical case definition criteria as set down by the World Health Organisation / European Centre for Disease Prevention and Control / Health Protection Surveillance Centre (HPSC) in the categories of clinical, radiological and laboratory criteria.[4] The case classification is divided into: *Possible case* - any person meeting the clinical criteria; *Probable case* - any person meeting the clinical criteria with an epidemiological link or any person meeting the diagnostic criteria; and *Confirmed case* - any person meeting the laboratory criteria. Calculated excess deaths are presented as numbers, percentages and P-scores ([x minus the expected value of x for the population], divided by the expected value for the population).[5,6] The excess deaths were analysed under several categories: total excess, excess from nursing and residential homes and excess natural deaths following exclusion of the non-natural causes and Covid-19 deaths.

3. Results and Analyses:

3.1 Total numbers of deaths notified to the Coroner in March 2020 to February 2021

The total and average numbers of deaths reported to the Coroner annually and monthly in the 6 year period March 2015 to February 2021 were 3,704 (total) and 617 (year average) and are set out in **Figure 1** with 2015-2020 compared with the Covid-19 year 2020-2021. Total, average and excess deaths for these years of 2015 - 2021 are shown in **Table 1**.

The figures for the Covid-19 year are also presented in three distinct epidemiological periods for this report: April-June 2020 (Period 1); July-December 2020 (Period 2) and January-February 2021 (Period 3) and this also includes the months of the three "lockdowns" or high level Covid-19 public health restrictions in April-June 2020; October-December 2020; and January-February 2021 (continuing). The number of notified deaths increased dramatically in April 2020 (188) and the next highest total monthly mortalities were in November 2020 (81)

and in January (81) and February (82) of 2021. The 230 deaths in the year arising as a result of Covid-19 in the year were in three distinct patterns and are shown by weeks in **Figure 2**.

3.2 Total and excess mortality figures from all notifications

The phenomenon of excess mortality is an important concept for public health and infectious disease epidemiology within the total mortality figure. It is defined as the number of deaths from all causes relative to what would normally have been expected for a given period.[5,6] Of deaths reported to the Coroner, the excess total death percentage was 117% in Period 1,16% in Period 2 and 46% in Period 3 with an overall 53% for the year, as illustrated in **Figures 4 and 5** and in **Table 3**. The numbers and percentages of Kildare cases of the national cases were: 139 of 1,728 or 8% (Period1); 26 of 575 or 5% (Period 2); 65of 2,140 or 3% (Period 3); and 230 of 4,443 or 5% for the Covid-19 year. The average previous 5-year number of deaths reported was 567 but in 2020 – 2021 it was 867 (153%). This gave a mortality excess of 300 (53%). When the 230 Covid-19 deaths are subtracted the residual non-Covid-19 excess number of deaths is 70 (12%).

3.3 Total and excess mortality figures from nursing and residential home notifications

The total and average numbers of notified deaths from nursing and residential homes were markedly increased in March 2020 to February 2021 compared to 2015 – 2020. The excess notified deaths in care homes were 142% (Period 1), 4% (Period 2) and 35% (Period 3) with overall 54% excess for the year compared to 2015 – 2020. These numbers are shown in **Figure 3 and Tables 2 and 4**. The numbers and percentages of Kildare cases of the national cases were: 113 of 985 or 11% (Period1); 9 of 175 or 4% (Period 2); 41of 668 or 6% (Period 3); and 163 of 1,828 or 9% for the Covid-19 year. The average previous 5-year number of deaths in nursing and residential homes was 311 but in 2020 – 2021 it was 480 (154%). This gave a mortality excess of 169 (54%). When the 163 Covid-19 deaths are subtracted the residual non-Covid-19 excess number of deaths is 6 (2%).

3.4 Excess mortality due to all causes and natural causes other than Covid-19 infection

The number of deaths and excess deaths notified due to natural causes for March 2020 to February 2021 were calculated taking into consideration the total figures together with the numbers of autopsies directed which indicated whether deaths in those cases were due to non-natural or natural causes. The non-natural cause deaths and Covid-19 deaths were subtracted for each of the months to give the figures for natural non-Covid-19 deaths with excess of 39% (Period 1), 4% (Period 2) and 85% (Period 3) compared to 2015-2021. There remained an unexplained residual excess of 56 deaths out of those remaining due to non-Covid-19 natural causes (overall 11% residual excess compared to the 2015-2020 such deaths). However, when account is taken of autopsy results indicating non-natural deaths the excess in 2020 – 2021 this non-Covid-19 natural deaths excess of 56 (571 deaths compared to the previous 5-year average of 515) actually fell marginally between July 2020 and February 2021 taking into account the figure of 62 already seen in March to June 2020. These numbers are set out in **Table 5.** The corresponding figures are presented in **Tables 2 and 4** for the nursing and residential homes deaths. It is also noted that the non-Covid-19 excess death numbers (the "residual excess") actually fell in December 2020 (by 15) and in January and

February 2021 (by 10 and 5 deaths respectively) when compared with the same months in the previous 5 years although still within the lower range of those months seen over the 5 years. This may in part be attributed to excess deaths in the influenza epidemic in December 2017 to January 2018 and again in the smaller outbreak in February 2019 raising the averages for those periods. This is seen in **Figure 4 and Tables 3.2 , 3.3, 5.2 and 5.3** in particular.

3.5 Demographics and underlying medical conditions in persons dying from Covid-19 infection

The Coroner's District for Kildare recorded a 53% increase in total notified deaths reported in the year March 2020 to February 2021 compared with the preceding five years (867 versus 567), with a corresponding 50% increase in the nursing and residential homes category notified deaths contained within those figures (480 versus 311), over the same period.

Of the total of 230 Covid-19 deaths notified in the year to 28th February 2021: 163 were residents of nursing and residential homes (113 in Period 1; 9 in Period 2; and 41 in Period 3); 60 occurred in the General Hospital (patients admitted from the community being 25 in Period 1; 15 in Period 2; and 20 in Period 3) with a mixture of both community and in-hospital acquired Covid-19 infection; and 4 in the General Community (1 in Period 1; 1 in Period 2; and 2 in Period 3). Of the 230 Covid-19 deaths notified, 191 (83%) were diagnosed by a positive SARS-CoV2 swab (most also with a confirmed clinical history) and the remaining 39 (17%) were confirmed on clinical case history in the absence of a positive swab result (including a small number definitively diagnosed clinically even with a negative swab result having been reported), particularly in Period 1. The average age of the deceased was 82.2 years (range 47 to 104) with median of 83 years. Of the deceased, 134 (58%) were female and 96 (42%) were male which contrasts with the gender profile of a greater male mortality (53%) in the national mortality figures reflecting the larger female population in nursing and residential homes. The excess of 6 non-Covid-19 natural deaths notified from nursing homes in March 2020 to February 2021 is shown in **Table 4**. The detailed breakdown for the three periods during the year are shown in **Tables 4.1, 4.2 and 4.3**.

Nursing Homes and Residential Facilities accounted for 163 or 71% of Covid-19 deaths in the year. Five nursing or residential homes (NH) accounted for 106 (46%) of the 230 Covid-19 notified deaths in Kildare in March 2020 to February 2021 and thus for 65% of 163 the nursing and residential home Covid-19 deaths: NH 1 for 36 deaths, NH for 21 and NH 3 for 18 (in Period 1) and then NH 4 for 16 and NH 5 for 15 deaths (in Period 3), each comprising a sizeable percentage of their resident population. The next four nursing or residential homes with highest mortality (more than 5 but less than 10 deaths) accounted for 35 deaths, and thus 87% of all nursing and residential home deaths were concentrated in 9 residential care homes. One of these was a congregated setting but not a registered facility with the health service or health regulatory bodies for the purposes of listing for the Covid-19 vaccination roll-out.

The associated or underlying medical conditions reported in the 230 persons who died directly from Covid-19 or whose death had Covid-19 as a contributory cause were taken from the original reports to the Coroner detailing clinical conditions. Of the 230 cases notified, 228 (99%) had underlying conditions: 132 (57%) cardiovascular (including hypertension); 120 (52%) dementia; 58 (25%) respiratory; 36 (16%) oncological; 30 (13%) neurological; 25 (11%) diabetes; and 23 (10%) renal.

The HPSC data to 12th December 2020 for underlying medical conditions in cases of death with confirmed Covid-19 in Ireland showed the following conditions: chronic heart disease (41.3%); chronic neurological disease (32.3%); hypertension (19.4%); chronic respiratory disease (18.2%); cancer/malignancy (15.9%); and diabetes (15.5%).[7]

4. Discussion:

4.1 Diagnosis of Covid-19 infection, post mortem examinations and bereavement

The criteria for the diagnosis of Covid-19 (confirmed, probable or possible case criteria) as a direct or contributory cause of death for the purpose of death registration is critical in comparing national and international epidemiological studies of Covid-19. In a natural cause death such as pneumonia be it bacterial, viral or specifically SARS-CoV-2 viral pneumonia (Covid-19 pneumonia), the Coroner must be satisfied that the death is due to natural causes and that the attending doctor is in a position to sign with confidence the Death Notification Form (DNF) including the medical cause of death. If the Coroner is so satisfied and there are no other circumstances requiring investigation, then that doctor completes the DNF under the Civil Registration Act 2004 and the Coroner completes a certificate under section 41(2) of that Act confirming the inquiry into the death has been completed.[8] As with many clinical diagnoses, a single criterion or test does not determine the diagnosis of Covid-19. Based on this combined coronial and clinical examination of deaths related to Covid-19 there should be confidence in the accuracy to an acceptable causation standard of such diagnoses as the direct or contributory cause of death in accordance with the World Health Organisation Guidelines for Certification and Classification (Coding) of Covid-19 as Cause of Death as updated and published on 20th April 2020.[9]

The final diagnosis of Covid-19 remains an assessment of clinical probability based on the case criteria and all the clinical information. It then becomes the confirmed certified cause of death under the Civil Registration Act requirements. Less than 5 cases with positive Covid-19 swab results in the Kildare Coroner's District proceeded to *post mortem* examination under Coroner's direction. These *post mortem* examinations were carried out at the Whitehall Mortuary Facility in Dublin under the agreed health and safety protocol as only the Whitehall facility and the mortuary facility at Cork University Hospital are currently designated by the Faculty of Pathology as suitable to meet the necessary biosafety standards for *post mortem* examinations of cases positive for the SARS-CoV-2 virus (a grade 3 biological hazard in which category are also included other infectious organisms such as *Mycobacterium tuberculosis, Hepatitis B virus* and the *H2N2 virus*).[10] The requirement for inward airflow and HEPA filtration for extract air for each scenario is determined by risk assessment.[11] This low number of *post mortem* examinations in Covid-19 cases has recognised implications for forensic and clinical pathology research and for families making timely funeral arrangements but is balanced by both medical and societal practical advantages in less risk of exposure of pathology staff to infection and timely interment and cremation but requires ongoing review.[12,13] In one study, a comprehensive review of the international medical literature to December 2020 found 84 *post mortem* examinations with full results for study.[14] *Post mortem* CT scanning, where available, is an important adjunct to accurate clinical diagnosis and *post mortem* examination in the limited number of cases where this was performed.[15] The question has been posed by many observers as to ascertaining if the deceased died of Covid or with

Covid and this is addressed by the foregoing clinical and investigative decision pathways. More recently the question of *post mortem* examination in cases where deaths have occurred in the period following Covid-19 vaccination has arisen and what should be the criteria on which a decision to direct such examination be made. Pharmacovigilance and surveillance will remain an important task within the coronial investigation in these cases including consideration of directing a *post mortem* examination.[16] Deaths due to or as a consequence of an adverse reaction to a drug (including a medication or vaccination) are reportable to the Coroner under paragraph 13 (b) of Schedule 2 of the Coroners Acts 1962-2020.

The dearth of medical literature on survival, infectivity and transmission of the SARS-CoV-2 virus in the body after death remains surprising and has resulted in understandably cautious approaches to *post mortem* practice as well as viewing of the body, closed coffins and funeral rites.[17] The very different circumstances in which residents of nursing homes and hospital patients died of Covid-19 were perhaps amongst the most dramatic and traumatic changes brought by the pandemic. The dying and the bereaved were deprived of all the normal family and societal rituals and of many of the supports usually afforded. The longer term effects of these restricted imperfect grieving parameters have yet to be experienced, understood and addressed and will lead to a significant number of yet-to-be completed grieving in bereaved families affected by deaths related to Covid-19.

The classical symptoms of Covid-19 of cough, fever and shortness of breath were not always the manifestations of the infection in the older population in whom lethargy, withdrawal, sudden general deterioration and gastrointestinal symptoms became recognised as clinical presentations as the pandemic developed. In addition, loss of smell, loss of taste and distortion of taste were also only later recognised as classical symptoms.[4] In later times, more general symptoms such as sore throat and sinusitis were recognized. These less classical symptoms and later recognised symptoms may have led to underdiagnosis of Covid-19 in the older population particularly in the initial phase of Period 1.

4.2 Reporting of deaths to the Coroner and death certification

In Ireland, a total of 219,592 confirmed cases of Covid-19 were recorded to 28th February 2021. The first confirmed case was on 29th February 2020 and the first confirmed nursing home case was notified on the 16th March 2020. A total of 4,443 deaths nationally due to the infection were notified from the first death on 11th March 2020 to 28th February 2021 of which 230 (5% of all Covid-19 national deaths) occurred in the County of Kildare, 163 (72%) of them in nursing and residential homes, higher than the 41% of all deaths from Covid-19 in nursing and residential homes nationally. The Kildare figure is 9% of the national total of the estimated 1,828 nursing and residential care home deaths.

In accordance with Coroner's procedure in Ireland when a death is notified to the Coroner in whose geographic district the death occurs, the Coroner inquires into each death by speaking with the healthcare staff in the nursing or residential home (nurse and/or doctor), in the hospital (the attending doctor[s]) or community (the General Practitioner) where the death occurred to ascertain the facts, the circumstances of the death, the clinical and epidemiological details and the medical cause of death. The Coroner's inquiry includes a question to the responsible healthcarer regarding communication with the family of the deceased about the cause of death and its circumstances. The Coroner's Certificate is

forwarded directly to the Registrar of Deaths in the Civil Registration Service and the DNF is presented to the Registrar by the family in due course for the purposes of death registration and their application for the Death Certificate.

The family of a deceased person has up to three months to register the Death with the Civil Registration Service in Ireland, a longer period than in other European Union jurisdictions and the United Kingdom which leads to a longer lag period for the collation of clinical death statistics. A consultation paper has been issued by the General Register Office on the revision of the timing and method by which deaths are notified and registered in Ireland with the aim of addressing the issue.[18] This may address some of the reasons for delayed death notification and registration but is only part of the issue to be addressed and if the changes are implemented it will require a significant change in practice by the general population who do not routinely deal with such procedures except at times of bereavement. Daily figures for deaths due to Covid-19 released by the HPSC and Department of Health, particularly in January and February 2021, frequently included deaths which had occurred weeks or months previously. The reasons for this delayed reporting and confirmation of deaths are not clear but points to a necessary review of the entire process to achieve an integrated, prompt and responsive reporting and confirmation system across the spectrum of services including HSE, HPSC, NPHET, Department of Health, the the General Register Office (GRO), the Central Statistics Office (CSO) and the Coroners Service. It may be that there are wider system improvements required across the entirety of this process to improve infectious diseases surveillance as well as public health epidemiology more generally.

All deaths due to a notifiable disease must be reported to the Coroner and all deaths occurring in a nursing home or residential must also be reported. These are different requirements to other similar common law jurisdictions with a coronial system, such as England & Wales, where no such specified requirements exist under statute.[19] The Coroners Service of Ireland in April 2020 published a *Guidance in relation to the Coroners Service and Deaths due to Covid-19 infection* to assist healthcarers with a number of scenarios when a death was being investigated and how a diagnosis of Covid-19 death was confirmed for the purpose of death registration and this needs ongoing review for any necessary updating as do the modified requirements for death pronouncement also issued in April 2020.[20]

4.3 Total increase in death notifications generally and in the nursing and residential homes setting

County Kildare accounts for 4.5% (223,000) of Ireland's national population (4.9 million); had a range from 3% to a peak of 11% of the total of 4,443 national Covid-19 deaths at different times during the Covid-19 pandemic year with the year average of 5%. There are 24 nursing homes (4% of the national 581 homes) caring for 1,701 residents (5.5% of the national nursing home population of 31,250) and an additional number of Long Term Care Facilities in Kildare reporting deaths to the Coroner. There was a range from 5% to a peak of 16% of the total of 1,828 national nursing home Covid-19 deaths during the year studied with a 9% overall average for the year.

4.4 Excess mortality in death notifications generally and in the nursing and residential homes setting

Excess mortality figures must be interpreted with caution in a wider epidemiological context. Thus the observed excess mortality seen in the deaths reported to the Kildare Coroner for January 2018 coincided, particularly amongst those aged 65 years and older, with high levels of influenza circulation. From mid-December 2017, a marked increase in all-cause excess mortality was observed for a period of 13 weeks, particularly amongst those aged 65 years and older. The timing of this excess mortality coincided with high levels of influenza circulation with 255 deaths reported during the 13-week period from mid-December 2017.[21] A smaller excess mortality was seen in February 2019 coinciding with another smaller influenza outbreak. These excess deaths are apparent in **Figure 1** and highlight the need for careful interpretation of excess mortality in a wider temporal context. The overall and subcategorised excess mortality is illustrated in **Figure 5**.

The excess mortality observed in March through October 2020 in this study coincided with the Covid-19 pandemic and after the seasonal peak in pneumonia and influenza deaths had passed. There have been no reported deaths from influenza in the seasonal months of November 2020 through February 2021. This is of significant note with a lower mortality from influenza no doubt due in part at least to the Covid-19 restrictions and their effect on socialisation and transmission of the influenza viruses. The number of excess deaths in Kildare in the Covid-19 year of this study was high compared with the previous 5-year figures with total figures at more than double the expected number in March to June 2020 (217%), at one and a half times the number in January to February 2021 (146%) and one and a half times the number for the Covid-19 year (153%). The increase in deaths in nursing and residential home settings was even starker. It was two and a half times higher than the previous 5-year average in March to June 2020 (242%), about a third higher in January to February 2021(135%) and one and a half times higher for the year (154%). However, the fall in total non-Covid-19 excess death numbers in December 2020 and in January and February 2021 when compared with the same months in the previous 5 years, perhaps due to excess deaths from influenza in December 2017, January 2018 and February 2019, is a notable feature in this study and seen in **Figure 1, 3 and 4 and Tables 3.2, 3.3, 5.2 and 5.3.** Similar patterns in the nursing home death figures are seen in **Tables 4.2 and 4.3**.

The incidence of dementia (Alzheimer's, vascular and mixed) as an underlying condition in those dying from Covid-19 in nursing homes, when separated out from the more general category of chronic neurological disease, was higher than reported in the Covid-19 deaths in general. This reflects the clinical demographics of the nursing homes residential population. The presence of dementia has clinical and social behaviour implications in the setting of managing a Covid-19 outbreak in nursing homes. This will remain a critical consideration in future planning of infection control measures in these settings. Studies of early or premature mortality of those with underlying medical conditions are also required to address the question of life-years lost by this population.

The 139 Covid-19 deaths accounted for 68% of the total of 204 excess deaths in the March to June 2020 numbers as set out in the first report. This again raises the question as to whether undocumented deaths due to Covid-19 occurred in the nursing homes but were not recognised as being due directly or indirectly to the infection as a consequence of non-classical presentation in the older population and the less intense testing for SARS-CoV-2 in the nursing and residential home setting at that time and were thus under-reported.

The trends in total deaths and Covid-19 deaths in Kildare notified in March 2020 to February 2021 compared to the previous 5 years is in line with the national and international patterns for the pandemic but remain in excess of the total numbers of deaths notified for the same periods in 2015-2019. The excess mortality seen over the Covid-19 year collectively due to natural causes but not attributed to Covid-19 may have been due to a number of reasons already outlined in the first report: an underdiagnosis of Covid-19 related deaths (non-respiratory symptoms not recognised, atypical presentations etc.); other Covid-19 linked morbidities and mortalities (such as acute myocardial infarction, increased coagulopathy with effects on major organs, acute renal injury etc.); non-Covid-19 morbidities and mortalities; a combination of these factors requiring further examination; or other reasons requiring further examination, including patient underuse of or reduction in general medical services. However, the absence of any excess mortality not accounted for by Covid-19 infection since July 2020 is a significant feature and may change at a later time due to delayed diagnoses of other life-shortening illnesses and other causes, including patient underuse of or reduction in general medical services. Examination of these potential causes still requires further study following this continued and prolonged acute phase of the pandemic.

The issue of figures for suicide incidents during Covid-19 in 2020 has been raised as a public concern in Dáil Éireann. This question will require more time to analyse as investigations into such possible cause deaths are ongoing and the suspension of inquest hearings for 8 of the 12 months of the Covid-19 year means that final verdicts cannot be delivered within the usual timeline. Early international studies do not confirm any rise in Covid-19 related suicide in the year. A review of cases in the District of Kildare where incidents occurred in the Covid-19 year under review and in which investigation was completed at inquest and verdicts of suicide returned and also of those cases where suicide must be considered from the preliminary investigation does indicate some upward change in the incidence to date when compared with the previous 5-year average figure. Although the provisional 2020 figure is higher than each of the previous five years 2016-2019, the absolute numbers are small and the yearly average over the 6 years has not increased significantly. The meaning for mental health care of this preliminary and provisional indication for 2020 must be stated with great caution due to the small sample size and pending the ultimate outcome of all such outstanding formal and public investigations into these tragic deaths in Kildare and nationally.

The longer term morbidity and mortality due to slow recovery from Covid-19, post Covid-19 condition and Long Covid and to other health conditions, particularly in cancerous conditions for example, will take a number of years to determine and will need to be the subject of epidemiological examination in the medium to long term.[22]

One new source of information on mortality reports requires further attention. The Coroners Annual Returns 2020 published very recently on the Department of Justice website recorded a total of 23,465 death case investigations completed in calendar 2020.[23] This contrasts with a total of 17,822 for 2019. Increased figures were recorded across Coroners Districts nationwide but with the most significant increase in the Dublin District (3,513 or 166%). The national increase in deaths recorded through the Coroner Service of 5,643 (132%) for 2020 over 2019 requires more detailed analysis. The category of deaths reported (with no *post mortem* examination directed and thus due to natural causes not requiring further inquiry) increased by 5,412 thus accounting for the substantial bulk of the increased figures for calendar 2020. Completed cases in which *post mortem* examinations were directed increased by 578. Inquest cases heard decreased by 347 reflecting the suspension of hearings for 6

months of 2020. There were 2,303 deaths ascribed to Covid-19 nationwide between March and December 2020. The excess mortality in all deaths recorded in the State for 2020 compared with 2019 and previous years therefore requires further study and analysis but this cannot be done at this time. This needs to be addressed when the GRO and CSO figures are collated in the coming months and they need to be reconciled with the total and excess deaths mandatorily recorded through the Coroner Service during these years.

4.5 Limitations of this report

As stated in the first report, the numbers of deaths (including Covid-19 deaths) reported in this analysis relate to one Coroner's District and are therefore regional although they form a sizable proportion of the national figures. The numbers of deaths reported and thus excess figures for the District of Kildare need to be interpreted carefully. To address these limitations and the year-on-year variations, the figures were again examined under a number of headings in the totality and overall trend for the three distinct periods and the full Covid-19 year compared with the corresponding total, periodic and monthly numbers from the previous five years 2015-2020. They were again found to be consistent with the epidemiological pattern, findings and conclusions of increased mortality and excess mortality.

4.6 Learning from the analysis of Covid-19 deaths and excess mortality

Parts of the learning suggested in the first report deserve restating in this second report. The Covid-19 pandemic is established as by far the largest global pandemic in a century with ongoing, enormous and deep health, mortality, social and economic consequences. Human society is still learning about this infection and the causative virus SARS-CoV-2. Figures of deaths from Covid-19 are by definition a sad and late metric in the analysis of the course of the pandemic. Further anonymised medical and epidemiological information and evidence from which the figures in the study were drawn remain to be studied from the many tragic individual cases recorded by the Kildare Coroner's office and Coroners' offices nationally through continuing forensic medicine and public health public medicine research. These data and similar data nationally and internationally need also to be subject to ongoing examination by expert public health epidemiologists with statistical analysis of the more detailed clinical information reports from which mortality figures are derived with clear future challenges still remaining from potential recurrent surges in Covid-19 infection or should it become a recurrent seasonal infection.[24]

The challenges from Covid-19 still facing society generally and nursing and residential homes more specifically for the foreseeable future will require new plans which are evidence-based and this evidence flows from examining multi-sourced epidemiological data on mortality and morbidity particularly for nursing and residential homes. The Expert Panel on Nursing Homes established in Ireland by the Department of Health to examine the national and international responses to the COVID-19 crisis and the emerging best practice and to make recommendations to the Minister for Health to ensure that all protective Covid-19 response measures are planned for nursing and residential homes published its report in August 2021.[25] Its recommendations must now be implemented.

The medical caution in the first report must also be repeated regarding later complications from the infection causing later morbidity and mortality in persons who have apparently recovered from the Covid-19 infection but who develop post-viral pathology in major organs such as the lungs, heart and kidneys and also neurological sequelae which will be another source of delayed morbidity and excess mortality requiring future examination.

The necessity for a deeper clinical study of mortality reinforces the need to have a better, centralised national Coroner Service database to provide prompt and accurate epidemiological analysis and certification of deaths reported is restated.[25]

There are 581 registered nursing homes in Ireland, providing care to 31,250 people nationally. Covid-19 deaths in nursing and residential homes have accounted for 41% (1,828) of all such deaths (4,443) in Ireland to 28th February 2021. This pattern has also been seen internationally. As stated in the first report, the Coroner's reports from Kildare and nationally on mortality and excess mortality may contribute to giving guidance in assessing the needed resourcing for the nursing and residential home setting. Coroners' data remain a source of near real-time reporting whilst the data are awaited from other sources such as the General Register Office of Ireland (GRO) and the Central Statistics Office of Ireland (CSO) to be collated over subsequent weeks and months. The Covid-19 epidemiology is also regularly updated on the HPSC website. International comparisons of Covid-19 mortality and with particular reference to care home facilities continue to be difficult due to the varying requirements for methods of reporting Covid-19 deaths in different countries. [27, 28] Excess deaths in the period of the Covid-19 pandemic will only become clearer in time but will require careful analysis and interpretation.

Ireland has been cited as having one of the higher Covid-19 nursing home death rates internationally. Recognition of the need of measures such as Personal Protective Equipment supply; healthcare staffing levels; testing and prompt result turnaround times; early recognition of a diverse pattern of typical and atypical symptoms of the infection; and contact tracing and follow-up for a vulnerable section of society regardless of the classification of the care homes as public, private, HIQA registered or otherwise (including retired religious community residential care centres) must be based on healthcare needs of the resident population and not the categorisation of the facility. An overdue discussion of a new paradigm for residential care services and structures has only now begun in earnest.[25]

Interpretation of excess mortality must also take account of seasonal and yearly fluctuations due to e.g. influenza epidemics as seen in January 2018 and February 2019 which influence mortality data significantly, including interpretation of excess mortality figures. In the December 2017 to February 2018 period some 255 deaths were attributed to influenza. No such deaths have occurred in the same period 2020-2021. Reference to **Figures 1, 3 and 4 and Tables 3.2, 3.3, 5.2 and 5.3** has been made earlier in this report in the context of a relative decrease in non-Covid-19 "residual excess" deaths for these months with similar patterns in nursing and residential home deaths in **Tables 4.2 and 4.3**. Deaths from influenza are notifiable to the Coroner but may not have been given the coronial or mortality excess attention they required in previous years. This gap has been highlighted by the current pandemic.

Vaccination of high priority groups (nursing and residential home residents and staff and of healthcare workers) commencing in late December 2020 has already contributed hugely to a real decline in Covid-19 morbidity, hospitalisation and mortality in these groups. Positivity

rates for infections in the care home setting have diminished dramatically. Vaccine surveillance and vigilance is paramount for both clinical vaccinology and for morbidity and mortality assessments. The Coroner Service in the District of Kildare and nationally introduced such enhanced monitoring in January 2021 by way of review of the Covid-19 vaccination history and of co-morbidities in death notifications particularly from nursing and residential care home settings. No evidence of deaths directly due to vaccination has yet emerged and the recent Health Products Regulatory Authority report of 25th March 2021 has confirmed this to date. It is cited here in full on possible death monitoring due to vaccinations because of its current importance in assessing mortality in recently vaccinated people:

"The HPRA has received 31 reports describing patients who passed away in the days or weeks following vaccination with authorised COVID-19 vaccines. The majority of these have been reported in association with mRNA vaccines.

The reports mainly describe fatalities which are regularly seen due to natural causes or progression of underlying disease. In all cases, the patients concerned had underlying conditions and/or concurrent illness, with a small number having tested positive for COVID-19. All reports are being carefully reviewed. However, it can be expected that fatalities due to progression of underlying disease or natural causes will continue to occur, including following vaccination. This does not mean that the vaccine caused the deaths.

The most recent public update from EMA's safety committee on this matter was on 25 February and included assessment of worldwide data for both COVID-19 Vaccine Moderna and Comirnaty. The assessment of the available data did not identify a safety concern. In most cases, progression of (multiple) pre-existing diseases was considered a plausible explanation. A further update on ongoing safety monitoring of worldwide data can be expected when EMA next publish safety updates, which are due monthly for each COVID 19 vaccine." [29]

The EMA did subsequently issue an information update on the 7th April 2021 in relation to Astra Zeneca's Covid-19 vaccine and stated that there was a possible link to very rare causes of unusual blood clots with low platelets.[30] It did not give specific advice regarding its continued use or any restrictions on its use. Further advisories from the HPRA and the National Immunisation Advisory Committee are likely but have not yet been issued. Any death caused wholly or partly by an adverse reaction to any drug must be reported to the Coroner. Thus, deaths occurring following a Covid-19 vaccination with a temporal relationship; or where the cause of death cannot be ascertained by the attending doctor; or if the death is sudden and unexpected; these deaths must be reported to the Coroner. A careful and full clinical history must be taken and considered and a decision made as to any requirement for a *post mortem* examination. Neither the Royal College of Pathologists in the UK nor the Faculty of Pathologists at the Royal College of Physicians of Ireland has yet issued guidelines for *post mortem* examination in such cases although the RCPath(UK) had issued Guidelines on autopsy practice for suspected acute anaphylaxis (includes anaphylactic shock and anaphylactic asthma) in 2018.[31] The National Association of Medical Examiners (NAME) in the United States has published a protocol including a suggested triaging of these cases of temporal post-vaccination deaths.[16] Careful assessment of all potential or clinically probable post-Covid vaccination deaths must be made particularly as the number of those vaccinated increases dramatically as expected in coming months and in wider and younger age ranges.

5. Conclusions and Recommended Actions:

5.1 The high Covid-19 death toll and excess mortality findings in Kildare in the past year

This report presents the enormous toll of confirmed deaths on strict clinical criteria from Covid-19 in County Kildare. The number of excess deaths in Kildare was high when compared with the previous 5-year figures, both total and nursing and residential home figures at more than double the expected number in March to June 2020 (217%), at one and a half times the number in January to February 2021 (146%) and one and a half times the number for the Covid-19 year (153%). The increase in deaths in nursing and residential home settings was even starker. It was two and a half times higher than the previous 5-year average in March to June 2020 (242%), about a third higher in January to February 2021(135%) and one and a half times higher for the year (154%). Most of the excess deaths were explained by Covid-19 infection. This was a significant change from the first report findings of March to June 2020 and may have been explained in part by the hypothesis that a number of unexplained deaths in the first period were in fact as a consequence of unrecognised Covid-19 infection. This **consistent excess mortality from Covid-19 in March 2020 through February 2021** was confirmed from a number of different analytical perspectives with comparisons with the previous 5 years thus divided, as with so much of recent human life experiences, into "pre-Covid" and "post-Covid" eras. The total number of Covid-19 deaths in Kildare as a percentage of the national total had been higher in the March to June 2020 period being 8% but by the end of the year was only marginally above the proportionate population percentage at 5%. It is noted however that the non-Covid-19 excess death numbers (the "residual excess") actually fell in December 2020 and in January and February 2021 when compared with the same months in the previous 5 years.

5.2 The higher death toll in nursing and residential homes during the Covid-19 pandemic and the need for a new paradigm for care of the elderly and vulnerable

The Covid-19 deaths in nursing and residential homes however only reduced from a peak of 11% of the national total in the first period to a still higher than average 9% for the full Covid-19 year, thus out of proportion with the 5% of the national nursing home population residing in Kildare.

Lessons have been learned about nursing and residential homes and their residents' vulnerability to infectious disease in particular. **A new paradigm for these nursing and residential home settings is now needed.**

The positive impact of vaccination against Covid-19 vaccination on nursing and residential home mortality is already evident.[32]

The challenges from Covid-19 still facing society generally and nursing and residential homes more specifically for the foreseeable future will require new plans which are evidence-based and this evidence flows from examining multi-sourced epidemiological data on mortality and morbidity.[27, 28] The Expert Panel on Nursing Homes established in Ireland by the Department of Health on 5th June 2020 to examine the national and international responses to the COVID-19 crisis and the emerging best practice and to make recommendations to the Minister for Health to ensure that all protective Covid-19 response

measures are planned for nursing and residential homes has published its report.[25] Its recommendations must now be implemented.

Palliative care; end-of-life pathways and decisions; PPE use by healthcare workers; and decision-making must also be reviewed in the context of the Ethical Guidance documents from the National Public Health Emergency Team (NPHET) COVID-19 Subgroup - Pandemic Ethics Advisory Group, particularly in infectious disease outbreaks in nursing and residential homes where families may have restricted visits to their loved ones.[33]

All residents of nursing and residential homes being in such long-term care facilities must be treated equally regardless of the registered or other status of the facility with the health service or health regulatory bodies. They fall into the vulnerable category and that is the only criterion to be applied for preventative and therapeutic healthcare in an infectious pandemic.

5.3 The less understood effects on longer term health of the population including post Covid-19 conditions, suicides, delayed healthcare interventions and vaccination side-effects

The longer-term effects of slowly resolving SARS-CoV-2 infection or of **post Covid-19 conditions** on morbidity and mortality remain unknown. [22]

The longer-term effects of the Covid-19 pandemic on **non-Covid healthcare assessment, diagnoses and treatments** and on excess mortality will not be known for some years to be measured in medium-term epidemiology of 3 to 5 years and longer-term of 5 to 10 years.

There is no indication from preliminary analysis that the Covid-19 pandemic has resulted in any significant increase of **deaths due to suicide** but some preliminary provisional trends from Kildare need to be monitored and to be examined nationally.

The **safety and risk benefit of vaccination** is being closely monitored at national and international level. [29, 34, 35] There has been no evidence of vaccine related mortality to date in Ireland but pharmacovigilance and reporting of possible cases to the Coroner must be part of the medical surveillance in the months ahead as new information comes to light.[16, 30]

Emerging and growing morbidity and mortality data from vaccination, suicides, late Covid-19 and delayed healthcare interventions are all awaiting epidemiological scrutiny in the coming months and years. The World Health Organisation in January 2021 issued emergency-use international classification of diseases (ICD) codes for the Covid-19 pandemic and consequential deaths from a number of causes.[36] The death investigation service provided by Coroners plays an integral part in the detailed examination and oversight of Covid-19 morbidity and mortality.

5.4 The effects on bereaved families through imposed changes in bereavement and funeral arrangements and suspension of inquest hearings and the need to mitigate these effects

In addition to the loss of loved ones, families have had to suffer unprecedented changes in arrangements in the **restricted visits to the dying, viewing of the body of the deceased by family members, *post mortem* examination procedures, removal of the body and**

restricted funeral rites. The medical evidence for the continuation of these restrictions and arrangements needs further and updated examination.[10, 11, 17, 25]

Suspension of inquests for 8 months during the Covid-19 year has had significant effects on bereaved families in both their capacity to grieve and have closure and on practical aspects of the legal and probate requirements in dealing with the affairs of a deceased family member. The Court Service and Department of Justice must assist the Coroner Service to **a phased resumption of inquest hearings** at the earliest possible time in line with Public Health advices, measures and requirements.[37]

5.5 The established excess mortality requires ongoing collaborative research and study

This report confirms a consistent excess mortality from Covid-19 in March 2020 through February 2021 from a number of different analytical perspectives with comparisons with the previous 5 years thus divided, as with so much of recent human life experiences, into "pre-Covid" and "post-Covid" eras. The Covid-19 pandemic is established as by far the largest global pandemic in a century with ongoing, enormous and deep health, mortality, social and economic consequences. Human society is still learning about this infection and the causative virus SARS-CoV-2. Figures of deaths from Covid-19 remain by definition a sad and late metric in the analysis of the course of the pandemic. Further anonymised medical and epidemiological information and evidence from which the figures in this study were drawn remain to be studied from the many tragic individual cases recorded by the Kildare Coroner's office and Coroners' offices nationally through continuing forensic medicine and public health public medicine research. The **increase in deaths recorded by the Coroner Service Annual Returns for 2020** requires careful analysis when the full CSO figures are available.[22] These data and similar data nationally and internationally need also to be subject to **ongoing examination by expert public health epidemiologists** with statistical analysis of the more detailed clinical information reports from which mortality figures are derived with clear future challenges still remaining from potential recurrent surges in Covid-19 infection or if it becomes a recurrent seasonal infection.[24]

5.6 The need for an improved and prompt death notification and certification system

The necessity for a deeper clinical and epidemiological study of mortality is even clearer than in the first report from the Coroner's District of Kildare not least by delays in confirming Covid-19 death notifications by weeks or months. It reinforces the need to have a better, centralised national Coroner Service database to provide prompt and accurate epidemiological analysis and certification of deaths reported and a reformed, **more streamlined and more efficient death notification and certification process**.[18, 26] Near-real time central death investigation databases enhance national and international morbidity and mortality accuracy and comparisons in the Covid-19 pandemic and future similar or recurring seasonal dynamic and evolving occurrences.[5, 6, 27, 28, 36]

5.7 Remembering the bereaved and their loved ones dying before their time

It remains central, important and proper to say that each figure or number in these reports is much more than a number and refers to **unique and loved individuals who died before their time** in extraordinary and tragic circumstances often without the usual family and social comforts of our society afforded to those who are ill and approaching the end of their life and in their funeral rites. Each individual's life and death story was heard and respected with the dignity due to them in the individual consultations undertaken by the Coroner with the healthcarers involved in their care as part of the inquiry into their premature deaths.

In order to make some sense of the losses endured and to remember and honour and to give dignity and meaning to the lives of those who have died from Covid-19 and to those who are suffering from the infection, it is our duty to consider and use the information gathered from the tragic deaths over the past year and **institute any necessary improvements and reforms in our systems**. The aim must be to create a better system and minimise the worst effects of any such future similar or recurring seasonal infectious disease outbreak. Our responses must be comprehensive, innovative, daring and imaginative using all the tools of medicine and science (including the social and behavioural sciences) at our disposal. Laws and regulations should be informed by this evidence-based knowledge and follow, not lead, in these circumstances.

This report is issued pursuant to the statutory role and functions of the Coroner in receiving and investigating deaths notified to the Coroner in both the individual and public good and interest to assist further in informing appropriate healthcare and operational assessments and measures to be taken in the continuing Covid-19 pandemic emergency. It is to be read in conjunction with and as a continuation and development of the first report issued in August 2020.

All data and information in this report have been anonymised. Figures have been rounded for averages where necessary. Mortality figures from the Kildare Coroner's District and as released by the Department of Health (as advised by the Health Protection Surveillance Centre), particularly for the latest period of January to February 2021, remain dynamic and may be subject to further updating.

The help and support given to the Coroner in making challenging clinical and coronial assessments and decisions over many long hours during the past year by colleague doctors and nurses in hospitals, general practice and nursing and residential homes is acknowledged with gratitude in what have been truly extraordinary and tragic times with better and brighter times ahead.

Professor Denis A. Cusack,
Senior Coroner for the District of Kildare /
Cróinéir Sinsearach, Ceantar Chill Dara.

9th April 2021.

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Legislative Explanatory Reference:

The Coroner is the independent Judicial Officer of the State responsible for the forensic and medico-legal investigation of certain categories of death in Ireland. The functions and role of the Coroner are set out in the ***Coroners Acts 1962-2020****. Novel Coronavirus (2019 nCov or SARS-CoV-2) infection is a notifiable Disease under the* ***Infectious Diseases (Amendment) Regulations 2020*** *and deaths due wholly or partly to a notifiable disease must be reported to the Coroner under* ***Schedule 2, paragraph 13(a) of the Act****. Under* ***paragraph 23(b) of that Schedule*** *deaths occurring in any public or private institution for the care of elderly or infirm persons with a physical or mental disability, including a nursing home, must also be reported. In addition, deaths due wholly or partly to an adverse reaction to any drug must be reported to the Coroner under* ***Schedule 2, paragraph 13(b) of the Act****. Further, deaths must be reported where the death occurred in such circumstances as may, in the public interest, require investigation under the* ***Coroners Acts 1962-2020 section 16 (1) (a) (v)*** *and also under some of the other categories in that section in conjunction with a Covid-19 question.*

This Second Report from the Kildare Coroner's District is issued pursuant to the statutory role and functions of the Coroner in receiving and investigating deaths notified to the Coroner and chronicles and analyses the deaths notified to the Coroner during the period March 2020 through February 2021. It is to be read in conjunction with the First Report published in August 2020 thus completing the study for the first year of the Covid-19 Pandemic Emergency from the time of the first Covid-19 death in Ireland reported to the Coroner Service in March 2020.

Figures and Tables (pages 27 – 45)*

Figures (pages 27-31):

Tables (pages 32-45):

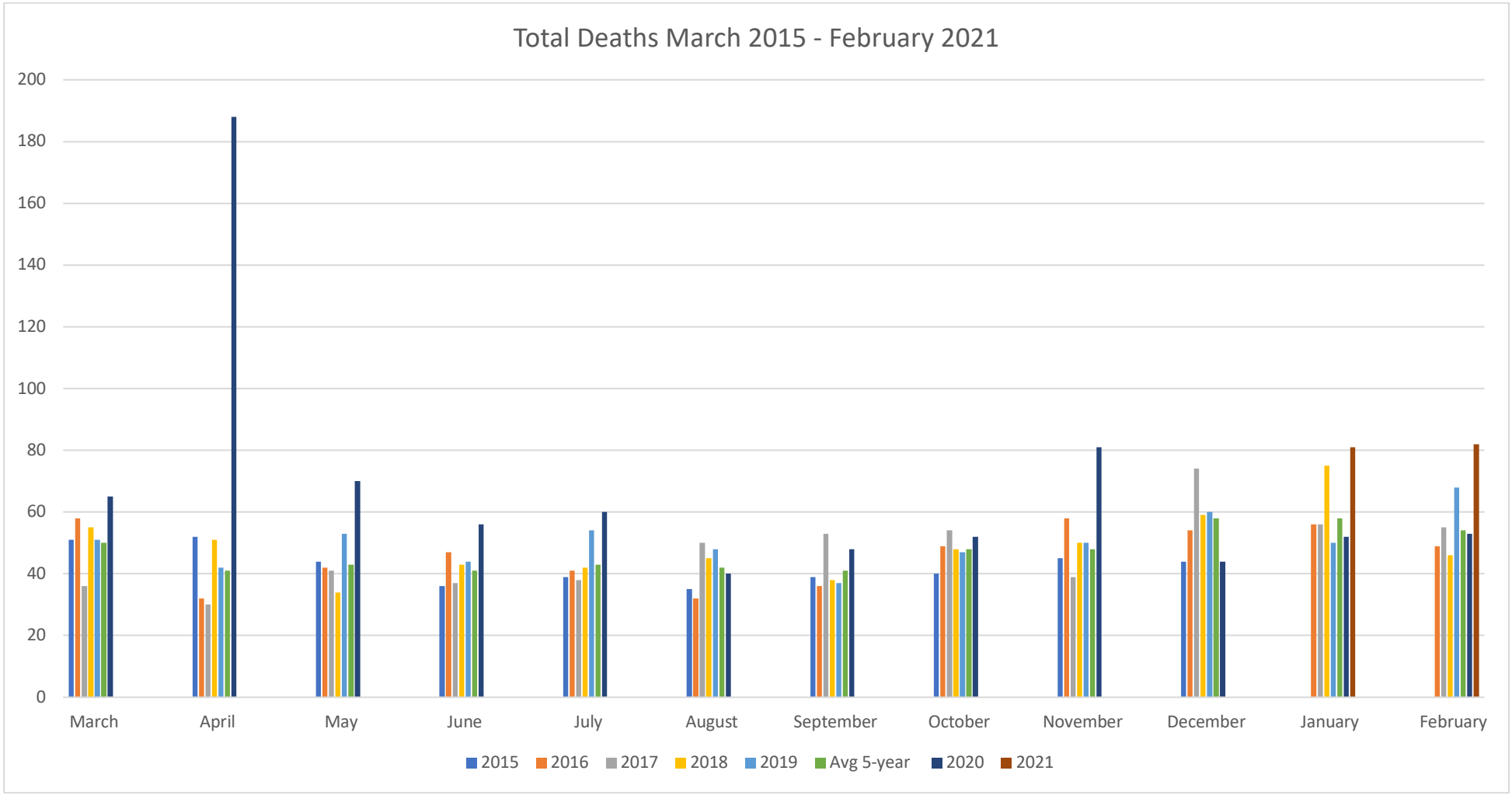

Figure 1. *Total and average numbers of all notified deaths monthly March 2015 – February 2021.*

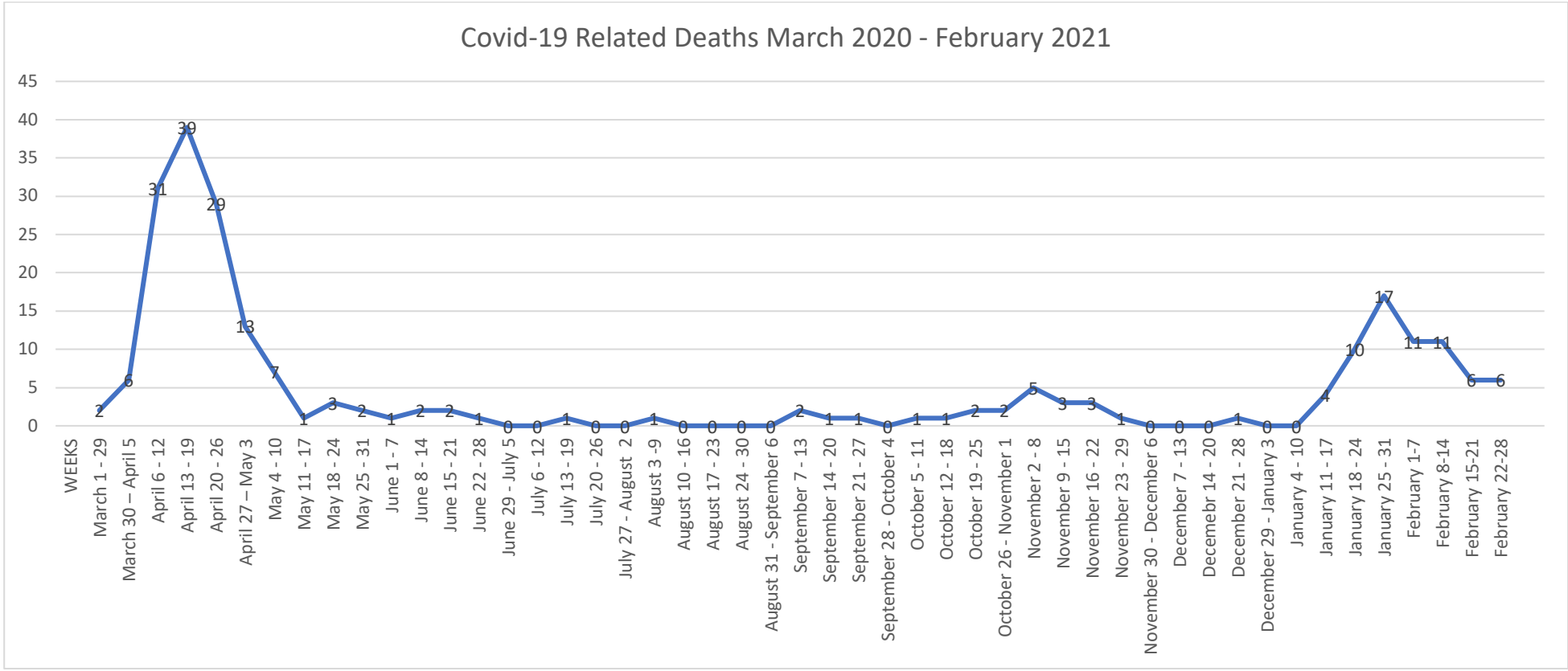

Figure 2. *Notified Covid-19 deaths by weeks March 2020 – February 2021.*

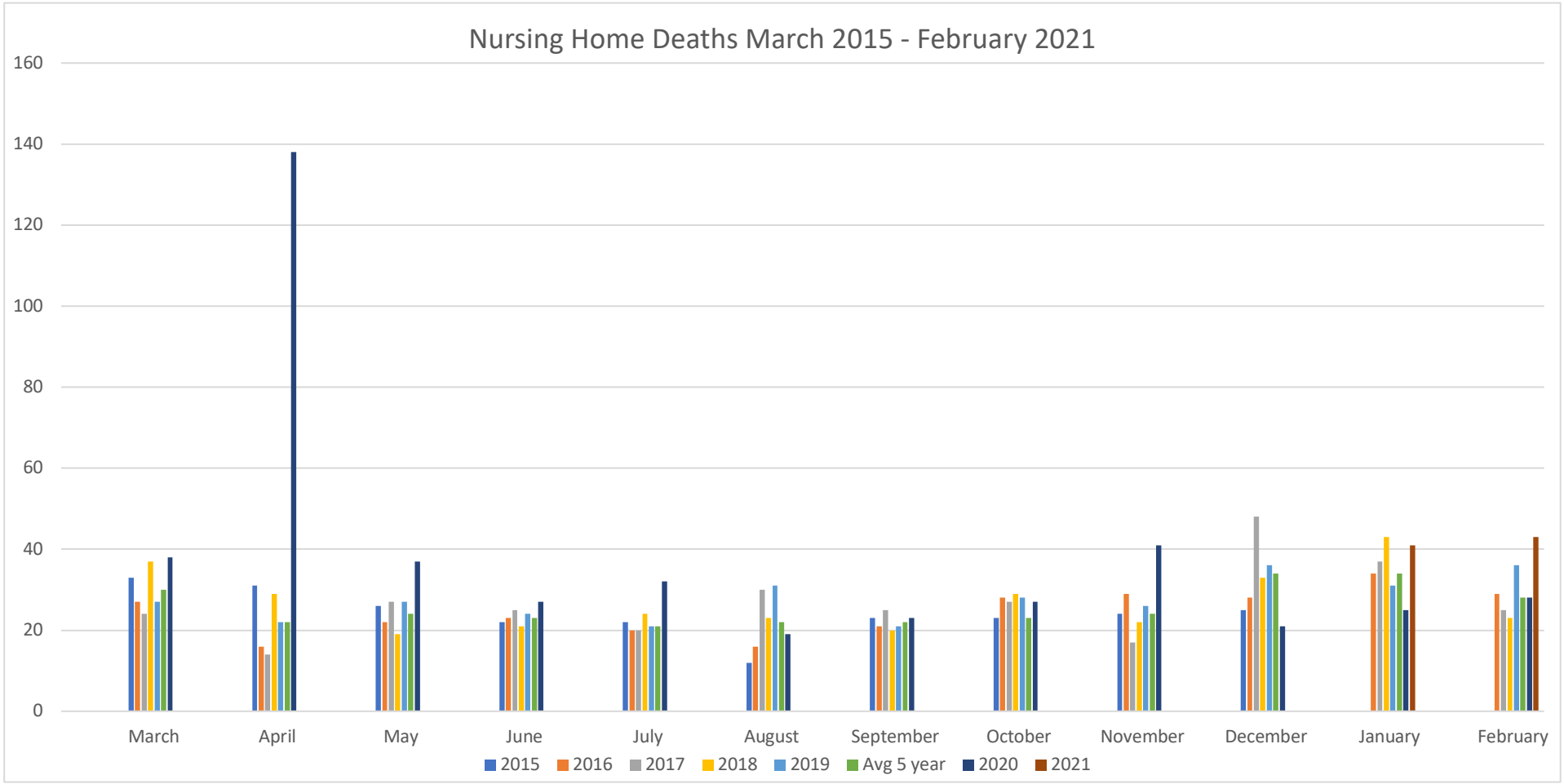

Figure 3. *Total and average numbers of notified deaths monthly from nursing and residential homes March 2015 – February 2021.*

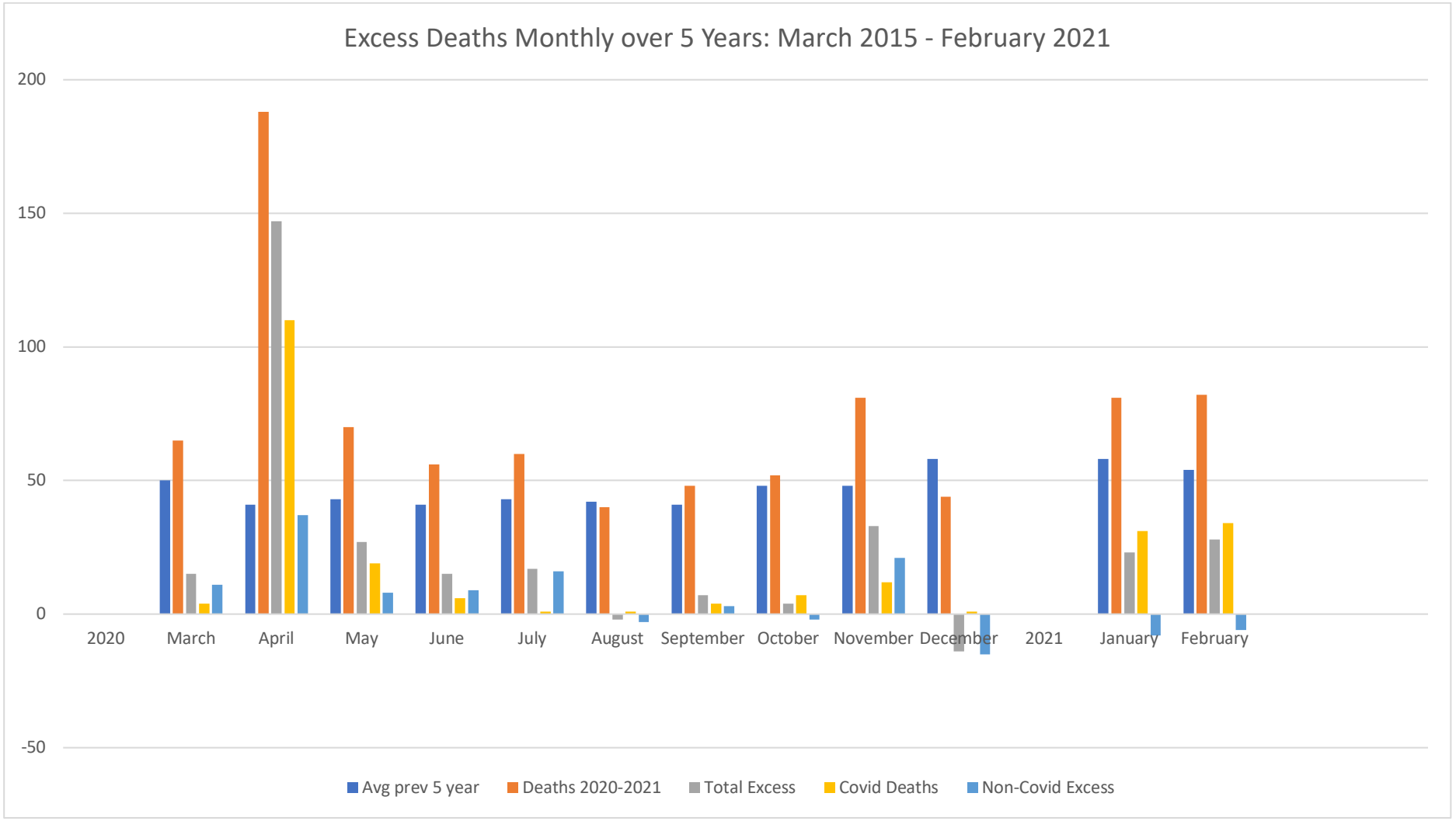

Figure 4. *Total and average numbers of notified deaths monthly with total excess and residual (non-Covid 19) excess mortality March 2015 – February 2021.*

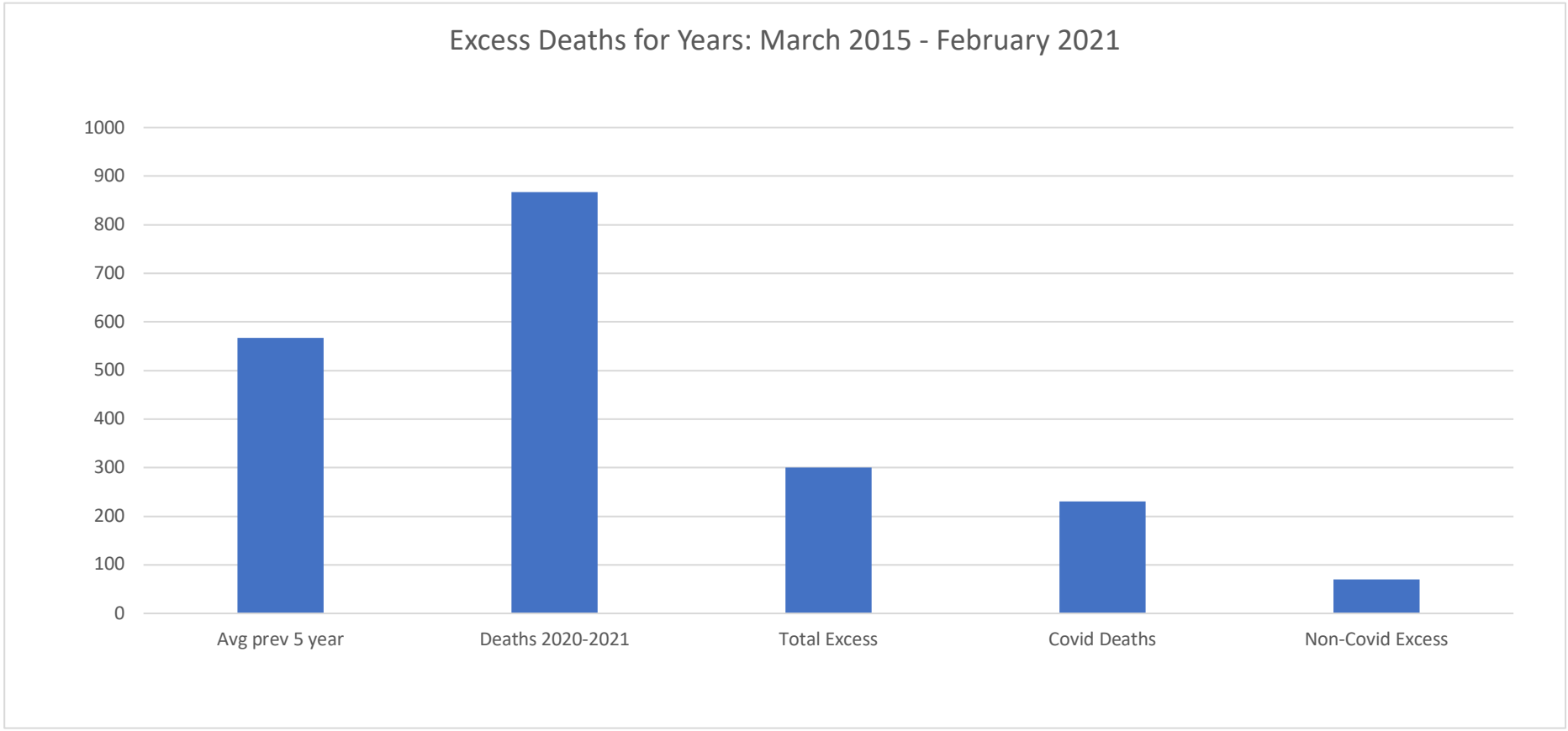

Figure 5. *Total and average numbers of notified deaths yearly with total excess and residual (non-Covid 19) excess mortality March 2015 – February 2021.*

Table 1. *Total and average numbers of all notified deaths March 2015 to February 2021 with mortality excess and residual (all non-Covid-19) mortality excess figures (A) and autopsy and residual (non-Covid-19 but natural) mortality excess figures (B).*

MARCH 2015 to FEBRUARY 2021 DEATH TOTALS – ALL DEATHS NOTIFIED

A.

Average previous 5-year deaths	567
2020 – 2021 deaths	867 (153%)
Mortality Excess	300 (53%) P-score = 0.53
Less 230 Covid-19 deaths:	
residual excess all non-Covid-19 deaths	70 (12%) P-score = 0.12

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B.	*(5-year avg.)*	(2020-2021)
Total deaths	*567*	867
Autopsies	*149*	163
Non-natural deaths	*53*	66
Covid-19 Deaths	*0*	230
Other Natural (not Covid-19)	*515*	571 (111%)
res. excess non-Covid-19 natural deaths		56 (11%) P-score = 0.11

Table 2. *Total and average numbers of notified nursing home and residential care deaths March 2015 to February 2021 with mortality excess and residual (non-Covid-19) mortality excess.*

MARCH 2015 to FEBRUARY 2021 DEATH TOTALS – NURSING HOME/RESIDENTIAL CARE

Average previous 5-year	311
2020 - 2021	480 (154%)
Mortality Excess	169 (54%) P-score = 0.54
Less 163 Covid-19 deaths:	
residual excess	6 (2%) P-score = 0.02

Table 3. *All deaths notified with non-Covid-19 natural death excess March 2015 - February 2021 (with periods 1, 2 and 3 breakdown).*

ALL DEATHS

PERIOD 1: MARCH to JUNE 2020

Average previous 5-year	175
2020	379 (217%)
Mortality Excess	204 (117%) P-score = 1.17
Less 139 Covid-19 deaths:	
residual excess	65 (37%) P-score = 0.37
Kildare / National deaths: 139 / 1,728	8%

PERIOD 2: JULY to DECEMBER 2020

Average previous 5-year	280
2020	325 (116%)
Mortality Excess	45 (16%) P-score = 0.16
Less 25 Covid-19 deaths:	
residual excess	19 (7%) P-score = 0.07
Kildare/ National deaths: 26 / 575	5%

PERIOD 3: JANUARY to FEBRUARY 2021

Average previous 5-year	112
2021	163 (146%)
Mortality Excess	51 (46%) P-score = 0.46
Less 65 Covid-19 deaths:	
residual excess	None (-14)
Kildare / National deaths: 65 / 2,140	3%

ONE YEAR PERIOD: MARCH 2020 to FEBRUARY 2021

Average previous 5-year	567
2020-2021	867 (153%)
Mortality Excess	300 (53%) P-score = 0.53
Less 230 Covid-19 deaths:	
residual excess	70 (12%) P-score = 0.12
Kildare / National deaths: 230 / 4,443	5%

Table 3.1. *All deaths notified March to June 2015 – 2020 with monthly mortality excess and residual (non-Covid-19) mortality excess.*

ALL DEATHS	
MARCH	
Average 2015-2019	50
2020	65 (130%)
Mortality Excess	15 (30%) P-score = 0.30
Less 4 Covid-19 deaths:	
residual excess	11 (22%) P-score = 0.22
APRIL	
Average 2015-2019	41
2020	188 (459%)
Mortality Excess	147 (359%) P-score = 3.59
Less 110 Covid-19 deaths:	
residual excess	37 (90%) P-score = 0.90
MAY	
Average 2015-2019	43
2020	70 (163%)
Mortality Excess	27 (63%) P-score = 0.63
Less 19 Covid-19 deaths:	
residual excess	8 (19%) P-score = 0.19
JUNE	
Average 2015-2019	41
2020	56 (137%)
Mortality Excess	15 (37%) P-score = 0.37
Less 6 Covid-19 deaths:	
residual excess	9 (22%) P-score = 0.22
MARCH to JUNE TOTALS	
Average 2015-2019	175
2020	379 (217%)
Mortality Excess	204 (117%) P-score = 1.17
Less 139 Covid-19 deaths:	
residual excess	65 (37%) P-score = 0.37

Table 3.2. *All deaths notified July to December 2015 – 2020 with monthly mortality excess and residual (non-Covid-19) mortality excess.*

ALL DEATHS	
JULY	
Average 2015-2019	43
2020	60 (150%)
Mortality Excess	17 (40%) P-score = 0.40
Less 1 Covid-19 death:	
residual excess	10 (23%) P-score = 0.23
AUGUST	
Average 2015-2019	42
2020	40 (95%)
Mortality Excess	None (-2)
Less 1 Covid-19 death:	
residual excess	None (-3)
SEPTEMBER	
Average 2015-2019	41
2020	48 (117%)
Mortality Excess	7 (17%) P-score = 0.17
Less 4 Covid-19 deaths:	
residual excess	3 (7%) P-score = 0.07
OCTOBER	
Average 2015-2019	48
2020	52 (108%)
Mortality Excess	4 (8%) P-score = 0.08
Less 7 Covid-19 deaths:	
residual excess	None (-3)
NOVEMBER	
Average 2015-2019	48
2020	81 (169%)
Mortality Excess	33 (69%) P-score = 0.69
Less 12 Covid-19 deaths:	
residual excess	21 (44%) P-score = 0.44
DECEMBER	
Average 2015-2019	58
2020	44 (76%)
Mortality Excess	None (-14)
Less 1 Covid-19 death:	
residual excess	None (-13)
JULY to DECEMBER TOTALS	
Average 2015-2019	280
2020	325 (116%)
Mortality Excess	45 (16%) P-score = 0.16
Less 26 Covid-19 deaths:	
residual excess	19 (7%) P-score = 0.07

Table 3.3. *All deaths notified January and February 2016 – 2021 with monthly mortality excess and residual (non-Covid-19) mortality excess.*

ALL DEATHS	
JANUARY	
Average 2016-2020	58
2021	81(140%)
Mortality Excess	23 (40%) P-score = 0.40
Less 31 Covid-19 deaths:	
residual excess	None (-8)
FEBRUARY	
Average 2016-2020	54
2021	82(152%)
Mortality Excess	28 (52%) P-score = 0.52
Less 34 Covid-19 deaths:	
residual excess	None (-6)
JANUARY to FEBRUARY 2021 TOTALS	
Average 2016-2020	112
2021	163 (146%)
Mortality Excess	51 (46%) P-score = 0.46
Less 65 Covid-19 deaths:	
residual excess	None (-14)

Table 4. *Nursing home and residential care deaths notified with non-Covid-19 natural death mortality excess March 2015 - February 2021 (with periods 1, 2 and 3 breakdown).*

NURSING HOME / RESIDENTIAL CARE DEATHS

PERIOD 1: MARCH to JUNE 2020

Average 2015-2019	99
2020	240 (242%)
Mortality Excess	141 (142%) P-score = 1.42
Less 113 Covid-19 deaths:	
residual excess	28 (28%) P-score = 0.28
Kildare / National deaths: 113 / 985	11%

PERIOD 2: JULY to DECEMBER 2020

Average 2015-2019	150
2020	156 (104%)
Mortality excess	6 (4%) P-score = 0.04
Less 9 Covid-19 deaths:	
residual excess	None (-3)
Kildare / National deaths: 9 / 175	5%

PERIOD 3: JANUARY to FEBRUARY 2021

Average 2016-2020	62
2021	84 (135%)
Mortality Excess	22 (35%) P-score = 0.35
Less 41 Covid-19 deaths:	
residual excess	None (-19)
Kildare / National deaths: 41 / 668	6%

ONE YEAR PERIOD: MARCH 2020 to FEBRUARY 2021

Average 5 year	311
2020- 2021	480 (154%)
Mortality Excess	169 (54%) P-score = 0.54
Less 163 Covid-19 deaths:	
residual excess	6 (2%) P-score = 0.02
Kildare / National deaths: 163 / 1,828	9%

Table 4.1. *Nursing home and residential care deaths notified March to June 2015 – 2020 with monthly mortality excess and residual (non-Covid-19) mortality excess.*

NURSING HOME / RESIDENTIAL CARE DEATHS	
MARCH	
Average 2015-2019	30
2020	38 (127%)
Mortality Excess	8 (27%) P-score = 0.27
Less 3 Covid-19 deaths:	
residual excess	5 (17%) P-score = 0.17
APRIL	
Average 2015-2019	22
2020	138 (627%)
Mortality Excess	116 (527%) P-score = 5.27
Less 90 Covid-19 deaths:	
residual excess	26 (118%) P-score = 1.18
MAY	
Average 2015-2019	24
2020	37 (154%)
Mortality Excess	13 (54%) P-score = 0.54
Less 15 Covid-19 deaths:	
residual excess	None (-2)
JUNE	
Average 2015-2019	23
2020	27 (117%)
Mortality Excess	4 (17%) P-score = 0.17
Less 5 Covid-19 deaths:	
residual excess	None (-1)
MARCH to JUNE TOTALS	
Average 2015-2019	99
2020	240 (242%)
Mortality Excess	141 (142%) P-score = 1.42
Less 113 Covid-19 deaths:	
residual excess	28 (28%) P-score = 0.28

Table 4.2. *Nursing home and residential care deaths notified July to December 2015 – 2020 with monthly mortality excess and residual (non-Covid-19) mortality excess.*

NURSING HOME / RESIDENTIAL CARE DEATHS	
JULY	
Average 2015-2019	21
2020	25 (119%)
Mortality Excess	4 (19%) P-score = 0.19
Less 1 Covid-19 death:	
residual excess	3 (14%) P-score = 0.14
AUGUST	
Average 2015-2019	22
2020	19 (86%)
Mortality Excess	None (-3)
Less 1 Covid-19 death:	
residual excess	None (-4)
SEPTEMBER	
Average 2015-2019	22
2020	23 (105%)
Mortality Excess	1 (5%) P-score = 0.05
Less 4 Covid-19 deaths:	
residual excess	None (-3)
OCTOBER	
Average 2015-2019	27
2020	27 (100%)
Mortality Excess	None
Less 0 Covid-19 deaths:	
residual excess	None
NOVEMBER	
Average 2015-2019	24
2020	41 (171%)
Mortality Excess	17 (71%) P-score = 0.71
Less 2 Covid-19 deaths:	
residual excess	15 (62%) P-score = 0.62
DECEMBER	
Average 2015-2019	34
2020	21 (62%)
Mortality Excess	None (-13)
Less 1 Covid-19 death:	
residual excess	None (-14)
JULY to DECEMBER TOTALS	
Average 2015-2019	150
2020	156 (104%)
Mortality excess	6 (4%) P-score = 0.04
Less 9 Covid-19 deaths:	
residual excess	None (-3)

Table 4.3. *Nursing home and residential care deaths notified January to February 2016 – 2021 with monthly mortality excess and residual (non-Covid-19) mortality excess.*

NURSING HOME / RESIDENTIAL CARE DEATHS	
JANUARY	
Average 2016-2020	34
2021	41 (121%)
Mortality Excess	7 (21%) P-score = 0.21
Less 21 Covid-19 deaths:	
residual excess	None (-14)
FEBRUARY	
Average 2016-2020	28
2021	43 (154%)
Mortality Excess	15 (54%) P-score = 0.54
Less 20 Covid-19 deaths:	
residual excess	None (-5)
JANUARY to FEBRUARY TOTALS	
Average 2016-2020	62
2021	84 (135%)
Mortality Excess	22 (35%) P-score = 0.35
Less 41 Covid-19 deaths:	
residual excess	None (-19)

Table 5. *All deaths notified, post mortem examinations directed and natural death residual (non-Covid-19) mortality excess March '15-February '21 with periods 1, 2 and 3 breakdown.*

ALL DEATHS	2015	2016	2017	2018	2019	2020	*Avg. prev. 5-year*	2020 / 2021 with res. mort. excess
MARCH to JUNE								
Total deaths	183	179	143	183	190		*176*	379
Autopsies	42	56	32	51	48		*46*	49
Non-natural	15	17	4	22	21		*16*	18
Covid-19	0	0	0	0	0		*0*	139
Other Natural (not Covid-19)	168	162	139	161	169		*160*	222 (139%) Res. excess 62 (39%) P-score = 0.39
JULY to DECEMBER								
Total deaths	242	270	308	282	296		*280*	325
Autopsies	66	81	78	51	75		*74*	83
Non-natural	21	36	19	22	24		*26*	36
Covid-19	0	0	0	0	0		*0*	24
Other Natural (not Covid-19)	221	234	289	256	272		*254*	265 (104%) Res. excess 11 (4%) P-score = 0.04
JANUARY to FEBRUARY								
Total deaths	94	105	111	126	118	105	*112*	163
Autopsies	26	24	28	33	34	25	*29*	31
Non-natural	10	8	16	12	11	9	*11*	12
Covid-19	0	0	0	0	0	0	*0*	65
Other Natural (not Covid-19)	84	97	95	110	107	96	*101*	86 (85%) No res. excess (-15)
MARCH 2015 to FEBRUARY 2021								
Total deaths							*567*	867 (153%)
Autopsies							*149*	163
Non-natural deaths							*53*	66
Covid-19 Deaths							*0*	230
Other Natural (not Covid-19)							*515*	571 (111%) Res. excess 56 (11%) P-score = 0.11

Table. 5.1. *All deaths notified, natural death (non-Covid-19) res. excess March-June 15-20.*

ALL DEATHS	2015	2016	2017	2018	2019	Avg. 5-year	2020 with residual excess
MARCH							
Total deaths	51	58	36	55	51	50	65
Autopsies	10	18	5	11	12	11	10
Non-natural	4	7	1	5	6	5	4
Covid-19	0	0	0	0	0	0	4
Other Natural (non- Covid-19)	47	51	35	50	45	45	57 (127%) Residual excess 12 (27%) P-score = 0.27
APRIL							
Total deaths	52	32	30	51	42	41	188
Autopsies	16	9	10	12	12	12	12
Non-natural	4	3	1	5	6	4	4
Covid-19	0	0	0	0	0	0	110
Other Natural (non-Covid-19) (100%)	48	29	29	46	37	37	74 (200%) Residual excess 37 P-score = 1.00
MAY							
Total deaths	44	42	40	34	53	43	70
Autopsies	9	11	9	13	12	11	11
Non-natural	5	3	1	5	5	4	5
Covid-19	0	0	0	0	0	0	19
Other Natural (not Covid-19)	39	39	39	29	48	39	46 (118%) Residual excess 7 (18%) P-score = 0.18
JUNE							
Total deaths	36	47	37	43	44	41	56
Autopsies	7	18	8	15	12	12	16
Non-natural	2	4	1	7	4	3	5
Covid-19	0	0	0	0	0	0	6
Other Natural (not Covid-19)	34	43	37	36	40	38	45 (118%) Residual excess 7 (18%) P-score = 0.18
MARCH to JUNE							
Total deaths	183	179	143	183	190	176	379
Autopsies	42	56	32	51	48	46	49
Non-natural deaths	15	17	4	22	21	16	18
Covid-19 deaths	0	0	0	0	0	0	139
Other Natural (not Covid-19)	168	162	139	161	169	160	222 (139%) Res. excess 62 (39%) P-score = 0.39

Table 5.2. *All deaths notified with natural death (non-Covid-19) residual excess July-December 2015-2020.*

ALL DEATHS	2015	2016	2017	2018	2019	Avg. 5-year	2020 with residual excess
JULY							
Total deaths	39	41	38	42	54	43	60
Autopsies	8	15	15	11	17	13	16
Non-natural	3	7	3	6	6	5	10
Covid-19	0	0	0	0	0	0	1
Other Natural (non- Covid-19)	36	36	35	36	48	38	49 (129%) Res. excess 10 (29%) P-score = 0.29
AUGUST							
Total deaths	35	32	50	45	48	42	40
Autopsies	15	7	10	12	6	10	12
Non-natural	5	2	4	4	1	3	8
Covid-19	0	0	0	0	0	0	1
Other Natural (non-Covid-19)	30	30	46	41	47	39	31 (79%) No res. excess
SEPTEMBER							
Total deaths	39	36	53	38	37	41	48
Autopsies	11	8	16	10	7	10	13
Non-natural	2	5	5	5	4	4	5
Covid-19	0	0	0	0	0	0	4
Other Natural (not Covid-19)	37	31	48	33	33	36	39 (108%) Res. excess 3 (8%) P-score = 0.08

Table 5.2. *contd.*

ALL DEATHS	2015	2016	2017	2018	2019	Avg. 5-year	2020 with residual excess
OCTOBER							
Total deaths	40	49	54	48	47	48	52
Autopsies	7	15	15	11	10	12	12
Non-natural	5	10	4	3	3	5	4
Covid-19	0	0	0	0	0	0	6
Other Natural (not Covid-19)	35	39	50	45	44	43	42 (98%) No res. excess
NOVEMBER							
Total deaths	45	58	39	50	50	48	81
Autopsies	13	19	7	14	16	14	18
Non-natural	2	5	2	7	2	4	5
Covid-19	0	0	0	0	0	0	12
Other Natural (not Covid-19)	43	53	37	43	48	44	64 (145%) Res. excess 20 (45%) P-score = 0.48
DECEMBER							
Total deaths	44	54	74	59	60	58	44
Autopsies	12	17	15	11	19	15	12
Non-natural	4	7	1	1	8	4	4
Covid-19	0	0	0	0	0	0	1
Other Natural (not Covid-19)	40	47	73	58	52	54	39 (72%) No res. excess
JULY to DECEMBER							
Total deaths	242	270	308	282	296	280	325
Autopsies	66	81	78	51	75	74	83
Non-natural deaths	21	36	19	22	24	26	36
Covid-19 deaths	0	0	0	0	0	0	24
Other Natural (not Covid-19)	221	234	289	256	272	254	265 (104%) Res. excess 11 (4%) P-score = 0.04

Table 5.3. *All deaths notified with natural death (non-Covid-19) residual excess January-February 2015-2021.*

ALL DEATHS	2015	2016	2017	2018	2019	2020	*Avg. 5-year*	2021 with residual excess
JANUARY								
Total deaths	48	56	56	75	50	52	*58*	81
Autopsies	11	10	8	19	12	12	*12*	19
Non-natural	5	2	3	8	3	4	*4*	6
Covid-19	0	0	0	0	0	0	*0*	31
Other Natural (not Covid-19)	43	54	53	68	47	48	*54*	44 (81%) No res. excess
FEBRUARY								
Total deaths	46	49	55	46	68	53	*54*	82
Autopsies	15	14	20	14	22	13	*17*	12
Non-natural	5	6	13	4	8	5	*7*	6
Covid-19	0	0	0	0	0	0	0	34
Other Natural (not Covid-19)	41	43	42	42	60	48	*47*	42 (89%) No res. excess
JANUARY to FEBRUARY								
Total deaths	94	105	111	126	118	105	*112*	163
Autopsies	26	24	28	33	34	25	*29*	31
Non-natural deaths	10	8	16	12	11	9	*11*	12
Covid-19 deaths	0	0	0	0	0	0	*0*	65
Other Natural (not Covid-19)	84	97	95	110	107	96	*101*	86 (85%) No res. excess

Figures in the data Figures and Tables have been rounded for averages where necessary.