



# Mortality associated with COVID-19 outbreaks in care homes: early international evidence

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## Itccovid.org

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Corrections and comments are welcome at [info@itccovid.org](mailto:info@itccovid.org). This document was last updated on 26 April 2020 and may be subject to revision.

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## 1. Key findings

- Official data on the numbers of deaths among care home residents linked to COVID-19 is not available in many countries but an increasing number of countries are publishing data
- Due to differences in testing availabilities and policies, and to different approaches to recording deaths, international comparisons are difficult
- There are three main approaches to measuring deaths in relation to COVID-19: **deaths of people who test positive** (before or after their death), **deaths of people suspected to have COVID-19** (based on symptoms), and **excess deaths** (comparing total number of deaths with those in the same weeks in previous years)
- Official data from 10 countries suggests that the share of care home residents whose deaths are linked to COVID-19 may be **lower in countries where there have been fewer deaths** in total
- In the countries for which we have official data (Australia, Belgium, Canada, France, Hungary, Ireland, Israel, Norway, Portugal, Singapore and some regions of Spain), the **% of COVID-related deaths in care homes ranges from 19% to 72%**
- Data for Germany suggests that 34% of deaths would have happened in communal establishments which, as well as care homes, also include prisons and other group living settings.
- An official estimate of the number of deaths in care homes in the United Kingdom is expected on the 28<sup>th</sup> April.

## 2. Measuring the impact of COVID-19 on care home residents and staff: imperfect and limited data, but essential for resource allocation decisions

There is growing international evidence that people living in care homes are particularly vulnerable to severe COVID-19 infections and that they are experiencing high rates of mortality as a result. There are also numerous examples from those countries of care homes becoming unviable as not enough staff is available due to sickness and self-isolation measures. This document uses “care homes” for all non-acute residential and nursing facilities that house people with some form of long-term care needs. It is important to note that what is considered a care home is different in most countries and as a result this means that the data summarised in this report is not strictly comparable.

The impact of COVID-19 on residents and staff has become apparent in two ways: distressing news reports of care homes becoming overwhelmed due to large number of deaths in a short

amount of time and too many staff members being either sick or self-isolating, and, increasingly, estimates of deaths of care home residents both from official and non-official sources.

Very few countries appear to be testing people in care homes (staff and residents) systematically. However, this is changing as a result of a growing awareness of the scale of the infections and deaths in care homes. For example, in Ontario, Canada, where the population in care homes now represent over 70% of deaths (1) from probable cases of COVID-19 have led to a recent order by the provincial government for increased testing, beginning with care homes that are currently experiencing an outbreak(2). This population-level testing is critical for determining the true impact of COVID-19, including secondary infection rate and secondary clinical attack rate among care home staff and residents, asymptomatic fraction of infection, and case fatality ratio of COVID-19 infection.

Another difficulty in comparing data on deaths is that in some countries the data only records the place of death, while others also report deaths in hospital of care home residents. There may also be differences in the extent to which care home residents are transferred to hospital or not.

The authors of this report are fully aware of the limitations of existing data and do not consider that the data presented here are directly comparable, however, it is important to share these data as, if the levels of infections and deaths of care residents and staff are not measured in a timely (even if imperfect) manner, there is a danger that opportunities to alert policymakers to the scale of the impact of COVID-19 in care homes will be missed and this may result in allocations of scarce resources (including testing, personal protection equipment, medical personnel and medicines) that leave out the settings that are experiencing some of the biggest challenges in relation to COVID-19.

This document, which will be updated and improved as new information and data become available, summarises information from three types of sources: epidemiological studies, official estimates and news reports.

### **3. Methods to estimate deaths linked to COVID-19**

There seem to be four main approaches to recording deaths linked to COVID-19. It is important to understand the differences in the data that is obtained through these different approaches, and to also consider the role of each of these approaches in terms of generating the information that is needed to develop strategies to reduce the impact of COVID-19.

### **a. Numbers of deaths of people who have tested positive for COVID-19**

If it was possible to test everyone suspected of having COVID-19 either while still alive or post-mortem, this method would offer the most accurate count of the numbers of people who have died while being infected with COVID-19. These data are very important in order to learn more about the epidemiology of the disease and how it affects people with different characteristics and underlying health conditions in terms of case fatality, long-term sequels, etc.

This approach has a number of limitations in terms of offering an estimate of the impact of the disease in the population or among a certain population group. The first limitation is that very few countries have the capacity to test all people with symptoms(3). The second is that, particularly among care home residents who have underlying health conditions, the infection may present with atypical symptoms (such as delirium) that may be attributed to other potential conditions (for example urinary tract infections) and, as a result, it is possible that some people may not be tested because their symptoms are not identified as potential COVID-19. It is also important to note that in many countries, at least initially, care homes were not prioritised for testing, which means that relying on the numbers of people who died with a positive test for COVID-19 would leave out most of the deaths that happened in care homes. Another limitation of this approach is that it does not include deaths that are indirectly linked to COVID-19, for example, due to people not using health care services for other conditions, or due to difficulties linked to social isolation measures.

### **b. Number of deaths of people suspected of having COVID-19**

Another approach to try to measure deaths linked to COVID-19 is to count suspected cases, as is currently done in Belgium, Canada and Ireland. This approach has the risk of mis-attribution of deaths. In the short-term this approach has the advantage of providing timely information that is not subject to biases introduced by testing priorities. In the case of estimating the number of deaths in care homes, particularly where initial testing priorities were entirely focused on hospital, a system that records suspected cases can provide important timely information on the potential scale of deaths linked to COVID-19 in care homes and private households that can support decisions to, for example, increase testing in care homes or of staff that provide care in private homes as we have observed in Ontario, Canada.

### **c. Number of excess deaths during the COVID-19 pandemic compared to previous years**

Comparing the deaths during the COVID-19 pandemic to deaths that have happened in previous years in the same weeks or months (“excess mortality”) is the best way to estimate the mortality impact of COVID-19. This approach has the advantage of being able to also include deaths that are indirectly linked to COVID-19. These data on mortality will typically be collected by national statistical offices through the registration of deaths and it is important to note that in most countries there is a lag between the date in which a death occurs, and the

date in which it is registered, and that disaggregation by place of death (for example between hospital, care homes and private homes) is not always made available in a timely manner.

#### **4. International data on mortality associated with COVID-19 among care home residents**

This section aims to collect the latest information available from a number of countries and will be updated regularly as new information becomes available.

It is very important to note that the data reported here are not comparable. Data from official sources have been used where possible, and, when not available, information from news reports has been collected. There are a number of caveats that should be noted:

- We only have information for a few countries so far (please email [a.comas@lse.ac.uk](mailto:a.comas@lse.ac.uk) if you can contribute)
- The systems for recording deaths linked to COVID-19 in care homes (and the definition of what is a care home) vary between different countries and even regions.

##### **Australia**

The Department of Health of the Australian Government first published deaths linked to COVID-19 in care homes on the 15<sup>th</sup> of April, as well as deaths among users of home care services. On April 25, Australia has had a total of 80 deaths, of these 15 were care home residents and 2 were people who used publicly subsidized home care. Care home residents represented 19% of total deaths(4)(5). These figures are based on people who have tested positive for COVID-19.

##### **Belgium**

Belgium first reported official estimates of the number of deaths in care homes on the 11<sup>th</sup> April. The data is collected by Sciensano, a public research institution, which publishes very detailed epidemiological daily reports on COVID-19 (6). They include data on the number of deaths in care homes (“maisons de repos”). As of April 15, reports have also included the number of tests done within care homes. For deaths outside hospital, Belgium reports both “confirmed” cases (through a test or, since the 1<sup>st</sup> April, a chest scan), and “suspected” cases where the patient had not been tested but a doctor confirmed that their symptoms were consistent with COVID-19.

On April 26 there had been 7,094 deaths linked to COVID-19 in Belgium, of these, 3,782 happened in care homes (53%) and 89 happened in the community or other settings. The report also includes suspected cases and, of the total deaths, 90% of all care home deaths were suspected cases, only 10% had been confirmed. In the last 24 hours to the 26<sup>th</sup> April, 58% of all deaths in Belgium happened in care homes. The reported % of deaths in care homes has increased since the first date these data were published, from 42% on the 11<sup>th</sup> April to 53% on the 26<sup>th</sup>.

The report also contains data on the numbers of care home staff and residents that have been tested since the 10<sup>th</sup> of April. As of April 26, a total of 63,684 tests were done, 34,966 to staff (6% were positive, and of these, 71% were asymptomatic) and 28,718 to residents (14% were positive and of these, 72% were asymptomatic).

## Canada

On March 5, the first outbreak in a Canadian long-term care home was reported in the province of British Columbia (BC), where a staff member at the Lynn Valley Care Centre in Vancouver had tested positive for COVID-19(7). On March 8, a resident at the home became the first Canadian to die from COVID-19. Since early March, BC's Provincial Health Officer, Dr. Bonnie Henry, has provided regular updates to the public on the number of cases and deaths in care homes through press conferences. Similarly, many other provincial medical officers of health and premiers have provided frequent updates on the spread of COVID-19 in Canadian care homes. However, it was not until recently that reports about care homes have been presented systematically as part of the province's epidemiological reports, such as the ones produced by the BC Centre for Disease Control(8) starting on March 23 and Public Health Ontario on March 31(9). Quebec is the latest province to disclose the number of cases and deaths of residents in long-term care homes, as of April 13(10). Other Canadian provinces and territories have had either no cases or [too few cases in long-term care homes](#) to provide meaningful estimates (11).

In British Columbia, counts published by the BC Centre for Disease Control(8) on April 24 illustrate a total of 98 deaths as a result of COVID-19, of which 62 (63%) were residents in long-term care homes, assisted and independent living establishments. On that day, there were a total of 1,853 confirmed cases of COVID-19 in the province, of which 222 (12%) were residents in these establishments.

In Alberta, the most recent estimates provided by Alberta Health on April 25(12) reported a total of 73 deaths in the province as a result of COVID-19, of which 48 (66%) were residents in long-term care homes. On that day, there were a total of 4,233 confirmed cases of COVID-19 in the province, of which 415 (10%) were staff and residents in long-term care homes(13).

In Ontario, the most recently published numbers on April 25 are based on data exclusively originating from long-term care homes, which offer services to all individuals requiring care 24-hours per day. These estimates report a total of 835 deaths as a result of COVID-19, of which 454 (54%) were residents in long-term care homes(9). Please note that there may be significant under-reporting due to lags in data extracted from the Public Health Ontario Daily Epidemiologic Summary (iPHIS); the Ministry of Long-Term Care reported 654 deaths in long-term care homes on April 25th. On that day, there was a total 14,432 cases of COVID-19 in the province, with 2,185 (15%) cases among long-term care residents and 1,013 (7%) in long-term care staff from homes with confirmed outbreaks. The number of cases reported by the Ministry of Long-Term Care were 2,520 (residents) and 1,161 (staff), respectively.

Quebec is the province with the highest cases and the most deaths related to COVID-19 in Canada. According to the most up-to-date estimates from both governmental and media releases on April 25, a total of 1,515 deaths as a result of COVID-19 occurred in the province, of which 1,186 (78%) were residents in long-term care homes. In Quebec, numbers reported from long-term care homes included individuals residing both in independent and assisted living establishments. On that day, a total of 24,107 cases of COVID-19 were confirmed in the province, of which 5,267 (21.8%) were people living in long-term care homes(14–16).

The great majority of COVID-19 cases and deaths in Canada are in British Columbia, Alberta, Ontario and Quebec. The province of Nova Scotia has recently experienced a surge in the number of COVID-19 cases in its long-term care homes. As of April 25, there are 197 cases among residents in long-term care homes out of a total of 873 confirmed cases of COVID-19 in the province(17). Out of the 24 recorded deaths in the province, 18 (75%) are of residents in long-term care homes. Including the one reported death from a long-term care home resident in Manitoba(18), a total of 1,769 Canadians living in long-term care homes have died thus far as a result of COVID-19. Compared to the 2,465 deaths reported as of 25th of April by the Public Health Agency of Canada(19) this corresponds to 72% of all COVID-19 deaths in the country.

## France

France first published official death estimates for people in care homes on the 31<sup>st</sup> of March, then again on the 7<sup>th</sup> April and, from the 12<sup>th</sup> of April the figures are available daily. The % of all deaths among care home residents has ranged from 39.2% to 51%).

The most recent numbers published by the Ministry of Health on the April 25 declared a total of 22,614 deaths as a result of COVID-19, of which 11,531 (51%) were residents in care homes<sup>1</sup>. Of these, 8,564 died in care homes and were mostly “probably cases” (where a doctor confirmed that the symptoms were associated with COVID-19) and 2,967 died in hospital (and were confirmed through testing) (20). There had been 124,114 cases of confirmed COVID-19 infections, of these, 66,500 were care home residents.

## Germany<sup>2</sup>

Germany’s Robert Koch-Institute published the first official number of infections and deaths in different care settings on 22 April. People in care and nursing homes are covered under §36 of the Protection Against Infection Law (IfSG). §36 also includes people living in facilities for people with disabilities or other care needs, homeless shelters, community facilities for asylum-seekers, repatriates and refugees as well as mass accommodation and prisons.

Since 22 April, the RKI has provided daily updates. In Germany, medical doctors and other health and care professionals must inform the local health authorities about each suspected case of COVID-19. The health authorities transmit the information within one working day to the relevant highest health authority within their federal state. They then provide the Robert

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<sup>1</sup> établissements sociaux et médico-sociaux (ESMS)

<sup>2</sup> With thanks to Klara Lorenz-Dant

Koch-Institute with the relevant data. There can be a delay in reporting, which is why the data presented here may not entirely represent the number of cases of COVID-19 and COVID-19 related deaths for the specific dates. Data that is being transmitted later is being added to the relevant dates as it comes in and feeds into the total case count. Data recorded here includes only confirmed cases following laboratory diagnostic independent of clinical assessment.

On 25 April 2020, 10,481 people living in communal settings and 6,573 people working in these settings (as defined by §36 IfSG) had been infected with COVID-19. Out of the 10,396 cases for whom there is complete information, 1,891 residents had died. Also, 22 member of staff working in communal settings had died. The total deaths in Germany on the 25 April were 5,500, so deaths in communal settings would represent 34% of all deaths (21).

It is important to emphasize that these data from Germany includes communal settings such as homeless shelters, accommodation for refugees and prisons, which may house a younger population, so it is not directly comparable with the data on care homes presented for the other countries in this report. However, these data suggest that in Germany care residents represent a smaller share of all deaths compared to other countries with similar number of deaths in total.

### **Hungary<sup>3</sup>**

On the 18<sup>th</sup> of April, the Surgeon General of Hungary reported a total of 172 deaths related to COVID-19, with 33 of those being residents in LTC homes (19%)(22). COVID-19 deaths are defined as people who have tested positive and died. As less then 3% of the population aged 65 or more lives in care homes in Hungary, it is expected that the share of deaths in care homes in Hungary is lower than in other countries.

### **Ireland<sup>4</sup>**

Ireland has a centralised system to collect epidemiological information in relation to cases of COVID-19 infections (18). All deaths, in all care settings and dwellings, related to COVID-19 that are notified to the Health Prevention Surveillance Centre are included in the official count of deaths. The number of notified deaths in care homes has now been published in governmental daily updates reports (19).

As at the 22<sup>nd</sup> April, Ireland had registered 18,184 confirmed cases of COVID-19 and 829 laboratory-confirmed deaths, 3,277 cases were community residential care home residents (including nursing homes) and of these, 452 (55%) died. Additionally, there have also been 185 probable deaths linked to COVID-19 (that is where a laboratory test has not been done but a doctor believes a death is associated with COVID-19). Of these probable deaths, 124 occurred in community residential care homes. Adding confirmed and probable deaths would result in an estimated 57% of all COVID-19 related deaths being among care home residents.

The new data releases also include figures on the numbers of residential care home residents who died in hospital: of the 452 confirmed deaths, 376 (83%) happened in hospital settings.

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<sup>3</sup> With thanks to Robert Gal

<sup>4</sup> With thanks to Maria Pierce

As of the same date, Ireland had identified a total of 336 clusters of COVID-19 in community residential settings. The % of deaths in nursing homes on the previous dates we have data for were: 54% as announced on 10<sup>th</sup> April, 46% on the 13<sup>th</sup> and 45% on the 22<sup>nd</sup>.

## Israel<sup>5</sup>

The Israeli Ministry of Health has been publishing daily updates on trends in cases and deaths related to COVID-19. On April 26, a total of 15,398 cases of COVID-19 were confirmed in the country, with 200 deaths. Of these 200 confirmed deaths, 65 were care home residents (33%)(23).

## Italy

The most recent official source is a preliminary report of the National Institute of Health (24) published on the 6<sup>th</sup> of April based on a survey sent to 2,166 of the 4,629 care homes for older people in Italy. At the time it was published, 577 homes, with 44,457 residents, responded (26% of those invited to take part in the survey, and just over 10% of all care homes in Italy). Between the 1<sup>st</sup> February and the 6<sup>th</sup> of April, there were 3,859 deaths in the homes that responded, about 8.6% of residents, with regional differences, for example 13.1% in Lombardy and 7.0% in Veneto. It is estimated that 37.4% of these deaths were associated with COVID-19 (3.2% of the total number of residents). There is more information about how COVID-19 has impacted people using and providing long-term care in Italy in the [country report](#) published in LTCcovid.org (25).

## Norway<sup>6</sup>

On the 15<sup>th</sup> of April The Norwegian Institute of Public Health published data on the number of deaths linked to COVID-19 that have occurred in institutions/care homes. This has since been included in their daily report (26,27) published every day at 1pm. The most recent report from the 25<sup>th</sup> of April states that they have been notified of 193 COVID-19 deaths. Of these, 75 deaths (39%) occurred in hospitals, 122 (63%) in health institutions (care homes and other institutions) and 3 (1%) in private homes. The Norwegian newspaper VG publishes detailed data on the location of all deaths, including care homes (28).

## Portugal

Although no official reports have been released, the Government of Portugal released to the media the number of deaths in nursing homes. According to data published on April 23, 327 people have died in these nursing homes, a 40% of all deaths in the country(29).

## Singapore<sup>7</sup>

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<sup>5</sup> With thanks to Shuli Brammli

<sup>6</sup> With thanks to Norwegian newspaper VG

<sup>7</sup> With thanks to Wong Chek Hooi and Wan Chen K Graham

The Ministry of Health centrally collects and publishes epidemiological information about COVID-19 on a daily basis(30). As of April 16, 2020, there are 4,427 confirmed cases of COVID-19 infection and 10 deaths (0.23%). There were 15 confirmed cases who were nursing home residents (0.34%), living in 3 different nursing homes, and 2 deaths. The deaths among nursing home residents represented 20% of the total number of deaths among people with confirmed COVID-19 infections.

## Spain

On April 3rd, the Spanish Health Ministry required that every regional Government provides them with their data on deaths in nursing homes in a homogenous way. This was done in order to have a national estimate. The data that each community is required to send to the Ministry every Tuesday and Friday are as follows:

- Total sum of deaths in the nursing home from the 8th of March, 2020 to the present date.
- Total sum of confirmed COVID-19 deaths in the nursing home from the 8th of March, 2020 to the present date.
- Total sum of deaths with symptoms that are compatible with COVID-19 (not confirmed) in the nursing home from the 8th of March, 2020 to the present date.

These data have not been made public as of the 26th of April. However, the following Autonomous Communities are making their official data on nursing home mortality public:

- [Basque Country](#) has registered a total of 499 deaths, which amounts to 40% of all the COVID-19 deaths registered in the region.
- [Asturias](#) has registered a total of 146 deaths, which represent 58% of all COVID-19 deaths that have been registered in the region.
- [Madrid](#) has registered, as of the 22nd of April, a total of 5,613 deaths, 70% of all COVID-19 deaths that have been registered in the region.
- According to the [Government of Catalonia](#), there have been 2,272 COVID-19 deaths in nursing homes, which adds up to a 23% of total deaths from COVID-19. These data have been made public by the Government of Catalonia and have been provided by funeral services. This includes both residents that have been diagnosed with COVID-19 (819) and those who presented symptoms (1,923). These mortality data are much higher than the official data gathered by the Spanish Government in that community.
- [Castilla y León](#) has registered a total of 2,226 deaths in nursing homes. The data in this region also includes adult disabled persons and differentiates between the 1,158 deaths of those diagnosed with COVID-19 and the 1,068 deaths of those with compatible symptoms. The 1,158 confirmed cases represent the 70% of all registered deaths from COVID-19 in the region.
- The [Cantabrian Government](#) has notified of a total of 105 COVID-19 deaths as of the 23rd of April, which represent 57% of the total COVID-19 deaths in the region. Out of these, 92 are confirmed COVID-19 cases and 13 are cases with compatible symptoms.

## United Kingdom

The NHS publishes daily statistics on COVID-19 related deaths(31). These data include information on deaths of patients who have died in hospitals in England and had tested positive for COVID-19 at time of death. As of the 25<sup>th</sup> April, 18,420 deaths had been recorded. These figures do not include deaths outside hospital, such as those in care homes. They are broken down by NHS Trust, region, age of the patient, and recently by ethnicity.

### *England and Wales*

The Office for National Statistics (ONS) provides weekly updates of deaths registered weekly in England and Wales. The nature of these figures differs from the NHS figures in that they include all deaths where “COVID-19” was mentioned on death certificates. Up to the 10<sup>th</sup> April, there were 10,350 deaths registered in England and Wales involving COVID-19 (6,348 men and 4,002 women). The ONS figures are slower to prepare because they have to be certified by a doctor, registered and processed. Because of the time taken for deaths to be certified and registered, ONS weekly figures are usually published approximately 11 days in arrears. But once ready, they provide a more comprehensive estimate than estimates from other sources. A bespoke analysis of average weekly deaths by place of death in England and Wales occurring between 2015 and 2019(32) suggests that deaths in care homes for week 15 of 2020, between 3 and 10 April, were more than double compared with the five-year average.

The Care Quality Commission (CQC), the health and social care regulator in England, has started to collect information on COVID-19 related deaths in the care home sector. CQC's data is based on notifications directly from providers. This process takes about four days on average, and the data will support the ONS' weekly data analysis from 28 April. Local authorities in England also collect some information on COVID-19 related deaths, but the nature of this data is highly variable and not publicly available.

### *Northern Ireland*<sup>8</sup>

The Northern Ireland Statistics and Research Authority publishes weekly death registrations. By the 17<sup>th</sup> of April there had been 276 deaths that mentioned COVID-19 in the death certificate. Of these, 93 (34%) happened in care homes (33).

### *Scotland*<sup>9</sup>

The care Inspectorate revealed that around 529 care homes (49% of the total) in Scotland had recorded cases of COVID-19 (34). And, whereas the daily data on deaths refer only to symptomatic cases recorded in hospitals, National Records of Scotland (NRS) publishes a weekly analysis of death registrations which mention COVID-19 in the death certificate. This measure captures COVID -related deaths in care homes and other settings as well as those in hospital. Data for the period up to the 19<sup>th</sup> April show that of the 1,616 deaths registered in Scotland by that date, 537 (33%) were in care homes (35).

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<sup>8</sup> With thanks to Corrina Grimes

<sup>9</sup> With thanks to David Bell

## 5. Comparison table and graphs

This table summarises the most recent data from official sources gathered in this document so far, but needs to be interpreted with the limitations and caveats described above. For most countries (except Belgium), these data covers care home residents, irrespective to where they died. For Belgium it covers place of death. More details are provided above in the descriptions of the data for each country.

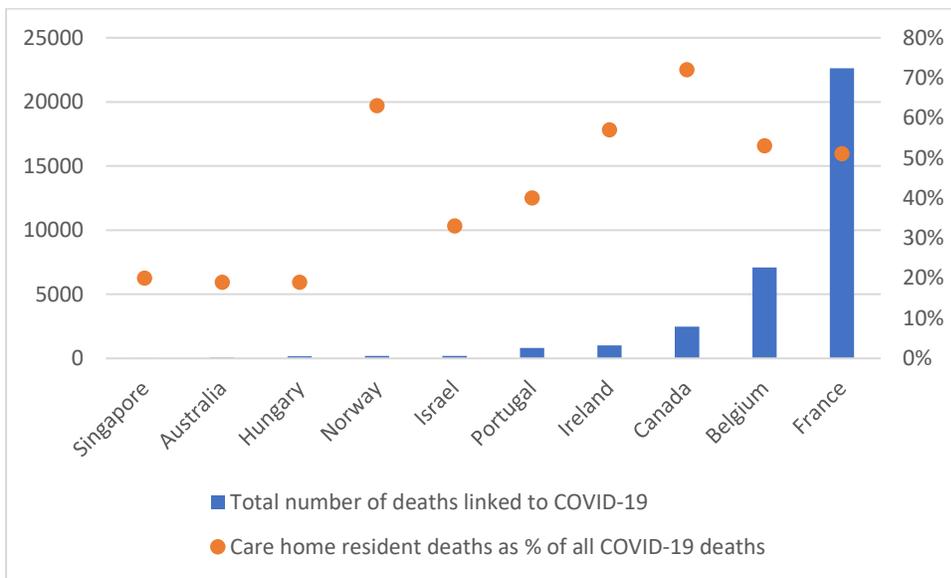
Country	Date	Approach to measuring deaths	Total number deaths linked to COVID-19	Number of deaths of care home residents linked to COVID-19	Number of deaths in care homes	care home resident deaths <sup>10</sup> as % of total COVID-19 deaths
<b>Australia</b>	25/04/2020	Confirmed	80	15	<i>To check</i>	19%
<i>Belgium</i>	<i>26/04/2020</i>	<i>Confirmed</i>	<i>3685</i>	<i>373</i>		<i>10%</i>
<i>Belgium</i>	<i>26/04/2020</i>	<i>Probable</i>	<i>3,409</i>		<i>3,409</i>	<i>100%</i>
<b>Belgium</b> <sup>11</sup>	26/04/2020	Confirmed + Probable	7,094		3,782	53%
<b>Canada</b>	25/04/2020	Confirmed + Probable	2,465	1,769		72%
<b>France</b>	25/04/2020	Confirmed + Probable	22,614	11,531	8,564	51%
<b>Hungary</b>	18/04/2020	Confirmed	172	33		19%
<i>Ireland</i>	<i>24/04/2020</i>	<i>Confirmed</i>	<i>829</i>	<i>452</i>		<i>55%</i>
<i>Ireland</i>	<i>24/04/2020</i>	<i>Probable</i> <sup>12</sup>	<i>185</i>	<i>124</i>		
<b>Ireland</b>	24/04/2020	Confirmed + Probable	1,014	576	76	57%
<b>Israel</b>	26/04/2020	Confirmed	200	65		33%
<b>Norway</b>	25/04/2020	Confirmed	193	122		63%
<b>Portugal</b>	23/04/2020		820	327		40%
<b>Singapore</b>	16/04/2020	Tested	10	2		20%
<b>Spain (6 regions)</b>	Aprox. 22 or 23/04/2020	Probable				23% to 70% (range)

<sup>10</sup> Except for Belgium where we only have place of death

<sup>11</sup> Data for care home residents in Belgium is only for place of death, some care home residents may have died in hospital

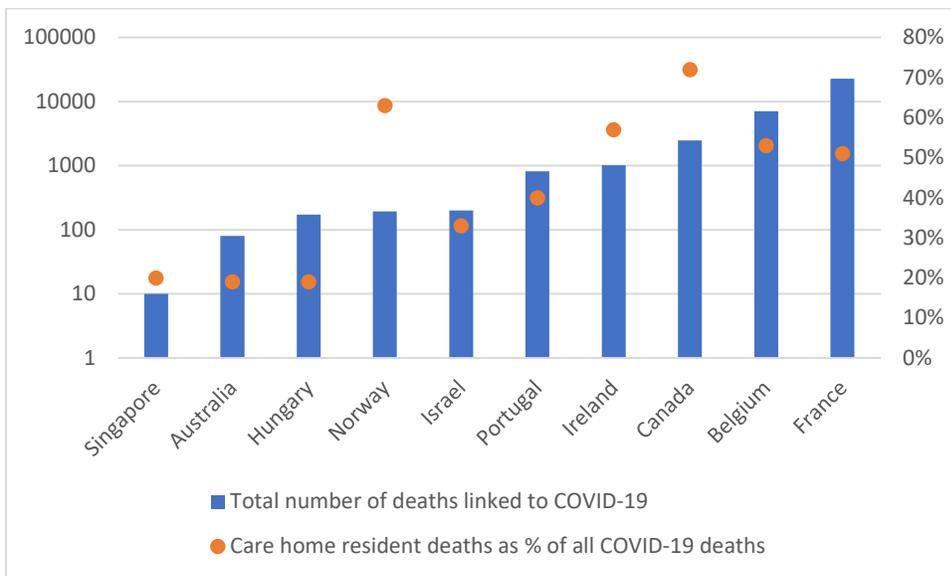
<sup>12</sup> A laboratory test has not been done but a doctor believes a death is associated with COVID-19

In these graphs we have presented the same data from official sources, comparing the total numbers of deaths linked to COVID-19 and the share of COVID-19 related deaths among care home residents. When data from more countries becomes available we may be able to analyse the relationship between the total numbers of death in a country and the share of those deaths among care home residents.



Source: based on figures collected in this report

The same data is presented here using a logarithmic scale, to make the countries with smaller numbers more visible:



Source: based on figures collected in this report

## 6. References

1. The 2019 Novel Coronavirus (COVID-19) | Ontario.ca [Internet]. [cited 2020 Apr 26]. Available from: <https://www.ontario.ca/page/2019-novel-coronavirus#section-1>
2. Newsroom : Ontario Takes Immediate Steps to Further Protect Long-Term Care Residents and Staff During COVID-19 Outbreak [Internet]. [cited 2020 Apr 26]. Available from: <https://news.ontario.ca/opo/en/2020/04/ontario-takes-immediate-steps-to-further-protect-long-term-care-residents-and-staff-during-covid-19.html>
3. Testing for COVID-19: A way to lift confinement restrictions - OECD [Internet]. [cited 2020 Apr 26]. Available from: [https://read.oecd-ilibrary.org/view/?ref=129\\_129658-l62d7lr66u&title=Testing-for-COVID-19-A-way-to-lift-confinement-restrictions](https://read.oecd-ilibrary.org/view/?ref=129_129658-l62d7lr66u&title=Testing-for-COVID-19-A-way-to-lift-confinement-restrictions)
4. Department of Health. Coronavirus (Covid-19 at a glance) [Internet]. 2020 [cited 2020 Apr 16]. Available from: [https://www.health.gov.au/sites/default/files/documents/2020/04/coronavirus-covid-19-at-a-glance-coronavirus-covid-19-at-a-glance-infographic\\_13.pdf](https://www.health.gov.au/sites/default/files/documents/2020/04/coronavirus-covid-19-at-a-glance-coronavirus-covid-19-at-a-glance-infographic_13.pdf)
5. Coronavirus (COVID-19) at a glance | Australian Government Department of Health [Internet]. [cited 2020 Apr 25]. Available from: <https://www.health.gov.au/resources/publications/coronavirus-covid-19-at-a-glance>
6. Sciensano. COVID-19 - Bulletin épidémiologique hebdomadaire du 16 Avril 2020 [Internet]. 2020 [cited 2020 Apr 16]. Available from: [https://epidemiology.wiv-isp.be/ID/Pages/2019-nCoV\\_epidemiological\\_situation.aspx?lcid=1036](https://epidemiology.wiv-isp.be/ID/Pages/2019-nCoV_epidemiological_situation.aspx?lcid=1036)
7. How the coronavirus took North Vancouver's Lynn Valley Care Centre - The Globe and Mail [Internet]. [cited 2020 Apr 17]. Available from: <https://www.theglobeandmail.com/canada/article-how-the-coronavirus-took-north-vancouvers-lynn-valley-care-centre/>
8. BC COVID-19 Data [Internet]. [cited 2020 Apr 17]. Available from: <http://www.bccdc.ca/health-info/diseases-conditions/covid-19/data>
9. The 2019 Novel Coronavirus (COVID-19) | Ontario.ca [Internet]. [cited 2020 Apr 17]. Available from: <https://www.ontario.ca/page/2019-novel-coronavirus#section-0>
10. Tableau milieu de vie COVID1 [Internet]. [cited 2020 Apr 16]. Available from: [https://cdn-contenu.quebec.ca/cdn-contenu/sante/documents/Problemes\\_de\\_sante/covid-19/Tableau-milieus-de-vie-COVID-19.pdf?1586905858](https://cdn-contenu.quebec.ca/cdn-contenu/sante/documents/Problemes_de_sante/covid-19/Tableau-milieus-de-vie-COVID-19.pdf?1586905858)
11. Hsu AT, Lane N. Impact of COVID-19 on residents of Canada's long-term care homes — ongoing challenges and policy response [Internet]. 2020 [cited 2020 Apr 16]. Available from: <https://ltccovid.org/2020/04/15/impact-of-covid-19-on-residents-of-canadas-long-term-care-homes-ongoing-challenges-and-policy-response/>
12. Update 43: COVID-19 pandemic in Alberta (April 25 at 3:30 p.m.) | alberta.ca [Internet]. [cited 2020 Apr 26]. Available from: <https://www.alberta.ca/release.cfm?xID=7017100E340EA-BF4B-6DEF-5FFB088E665AC172>
13. Coronavirus: Alberta announces 216 more cases, 1 new death | Globalnews.ca [Internet]. [cited 2020 Apr 26]. Available from: <https://globalnews.ca/news/6868511/coronavirus-covid-19-alberta-april-25/>

14. COVID-19: 69 nouveaux décès au Québec [Internet]. [cited 2020 Apr 26]. Available from: <https://www.lapresse.ca/covid-19/202004/26/01-5270972-covid-19-69-nouveaux-deces-au-quebec.php>
15. Données COVID-19 au Québec | INSPQ [Internet]. [cited 2020 Apr 16]. Available from: <https://www.inspq.qc.ca/covid-19/donnees>
16. Situation du coronavirus (COVID-19) au Québec | Gouvernement du Québec [Internet]. [cited 2020 Apr 26]. Available from: <https://www.quebec.ca/sante/problemes-de-sante/a-z/coronavirus-2019/situation-coronavirus-quebec/#c47900>
17. Nova Scotia Reports Two More Deaths, Eight New Cases of COVID-19 - Government of Nova Scotia, Canada [Internet]. [cited 2020 Apr 26]. Available from: <https://novascotia.ca/news/release/?id=20200426001>
18. (No Title) [Internet]. [cited 2020 Apr 17]. Available from: [https://cdn.reveraliving.com/-/media/files/covid-19/media-statement--poseidon-care-centre---apr-11.pdf?rev=79c008e0e17b4732a5548f5c6dc7adec&hash=274EF9166218D649DEF0A405A02B277F&\\_ga=2.107193858.1409983635.1587083763-1666256991.1586912221](https://cdn.reveraliving.com/-/media/files/covid-19/media-statement--poseidon-care-centre---apr-11.pdf?rev=79c008e0e17b4732a5548f5c6dc7adec&hash=274EF9166218D649DEF0A405A02B277F&_ga=2.107193858.1409983635.1587083763-1666256991.1586912221)
19. Coronavirus disease (COVID-19): Outbreak update - Canada.ca [Internet]. [cited 2020 Apr 17]. Available from: <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html?topic=tilelink>
20. Sante Publique France. Infection au nouveau Coronavirus (SARS-CoV-2), COVID-19, France et Monde [Internet]. [cited 2020 Apr 12]. Available from: <https://www.santepubliquefrance.fr/maladies-et-traumatismes/maladies-et-infections-respiratoires/infection-a-coronavirus/articles/infection-au-nouveau-coronavirus-sars-cov-2-covid-19-france-et-monde#block-242818>
21. Robert Koch Institute. RKI - Coronavirus SARS-CoV-2 - Aktueller Lage-/Situationsbericht des RKI zu COVID-19 [Internet]. [cited 2020 Apr 25]. Available from: [https://www.rki.de/DE/Content/InfAZ/N/Neuartiges\\_Coronavirus/Situationsberichte/Gesamt.html](https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/Gesamt.html)
22. Nem robbant be a koronavírus-járvány Magyarországon [Internet]. [cited 2020 Apr 26]. Available from: <https://www.origo.hu/itthon/20200418-a-legfrissebbek-a-magyarorszag-i-koronavirus-helyzetrol-szo.html>
23. משרד הבריאות - נגיף הקורונה [Internet]. [cited 2020 Apr 26]. Available from: <https://govextra.gov.il/ministry-of-health/corona/corona-virus/>
24. Ancidoni A, Bacigalupo I, Bellomo G, Canevelli M, Grazia Carella M, Confaloni A, et al. Survey nazionale sul contagio COVID-19 nelle strutture residenziali e socio-sanitarie SECONDO REPORT [Internet]. 2020 [cited 2020 Apr 12]. Available from: <https://www.epicentro.iss.it/>
25. Berloto S, Notarnicola E, Perobelli E, Rotolo A. Report on COVID-19 and Long-Term Care in Italy: lessons learned from an absent crisis management [Internet]. LTCcovid.org, International Long-Term Care Policy Network. 2020 [cited 2020 Apr 12]. Available from: <https://ltccovid.org/2020/04/10/report-on-covid-19-and-long-term-care-in-italy-lessons-learned-from-an-absent-crisis-management/>
26. Dags- og ukerapporter om covid-19 - FHI [Internet]. [cited 2020 Apr 17]. Available from: <https://www.fhi.no/sv/smittsomme-sykdommer/corona/dags--og-ukerapporter/dags--og-ukerapporter-om-koronavirus/>

27. Daily reports about coronavirus disease (COVID-19) - NIPH [Internet]. [cited 2020 Apr 17]. Available from: <https://www.fhi.no/en/id/infectious-diseases/coronavirus/daily-reports/daily-reports-COVID19/>
28. Corona-viruset: Slik spres viruset i Norge og verden. Kart og statistikk. [Internet]. [cited 2020 Apr 17]. Available from: <https://www.vg.no/spesial/2020/corona/#norge-dode>
29. Covid-19: Quarenta por cento dos mortos eram idosos residentes em lares | Coronavírus | PÚBLICO [Internet]. [cited 2020 Apr 26]. Available from: <https://www.publico.pt/2020/04/23/sociedade/noticia/covid19-mortes-residentes-lares-idosos-representam-40-obitos-portugal-1913649>
30. Ministry of Health Singapore. Updates on COVID-19 (Coronavirus Disease 2019) Local Situation Report [Internet]. [cited 2020 Apr 17]. Available from: <https://www.moh.gov.sg/covid-19/situation-report>
31. Statistics » COVID-19 Daily Deaths [Internet]. [cited 2020 Apr 26]. Available from: <https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-daily-deaths/>
32. Five year average weekly deaths by place of death, England and Wales, deaths occurring between 2015 and 2019 - Office for National Statistics [Internet]. [cited 2020 Apr 26]. Available from: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/adhocs/11622fiveyearaverageweeklydeathsbyplaceofdeathenglandandwalesdeathsoccurringbetween2015and2019>
33. Key Points-Analyses based on date of registration ☐ The provisional number of deaths registered\* in Northern Ireland in the week ending 17 th April 2020 [Internet]. [cited 2020 Apr 26]. Available from: <https://www.nisra.gov.uk/publications/registrar-general-annual-report-2018-deaths>
34. Coronavirus (COVID-19): Daily data for Scotland - gov.scot [Internet]. [cited 2020 Apr 16]. Available from: <https://www.gov.scot/publications/coronavirus-covid-19-daily-data-for-scotland/>
35. Records of Scotland N. Deaths involving coronavirus (COVID-19) in Scotland [Internet]. 2020 [cited 2020 Apr 16]. Available from: [www.nrscotland.gov.uk](http://www.nrscotland.gov.uk)

## 7. References

1. The 2019 Novel Coronavirus (COVID-19) | Ontario.ca [Internet]. [cited 2020 Apr 26]. Available from: <https://www.ontario.ca/page/2019-novel-coronavirus#section-1>
2. Newsroom : Ontario Takes Immediate Steps to Further Protect Long-Term Care Residents and Staff During COVID-19 Outbreak [Internet]. [cited 2020 Apr 26]. Available from: <https://news.ontario.ca/opo/en/2020/04/ontario-takes-immediate-steps-to-further-protect-long-term-care-residents-and-staff-during-covid-19.html>
3. Testing for COVID-19: A way to lift confinement restrictions - OECD [Internet]. [cited 2020 Apr 26]. Available from: [https://read.oecd-ilibrary.org/view/?ref=129\\_129658-l62d7lr66u&title=Testing-for-COVID-19-A-way-to-lift-confinement-restrictions](https://read.oecd-ilibrary.org/view/?ref=129_129658-l62d7lr66u&title=Testing-for-COVID-19-A-way-to-lift-confinement-restrictions)
4. Department of Health. Coronavirus (Covid-19 at a glance) [Internet]. 2020 [cited 2020 Apr 16]. Available from: [https://www.health.gov.au/sites/default/files/documents/2020/04/coronavirus-covid-19-at-a-glance-coronavirus-covid-19-at-a-glance-infographic\\_13.pdf](https://www.health.gov.au/sites/default/files/documents/2020/04/coronavirus-covid-19-at-a-glance-coronavirus-covid-19-at-a-glance-infographic_13.pdf)
5. Coronavirus (COVID-19) at a glance | Australian Government Department of Health [Internet]. [cited 2020 Apr 25]. Available from: <https://www.health.gov.au/resources/publications/coronavirus-covid-19-at-a-glance>
6. Sciensano. COVID-19 - Bulletin épidémiologique hebdomadaire du 16 Avril 2020 [Internet]. 2020 [cited 2020 Apr 16]. Available from: [https://epidemiology.wiv-isp.be/ID/Pages/2019-nCoV\\_epidemiological\\_situation.aspx?lcid=1036](https://epidemiology.wiv-isp.be/ID/Pages/2019-nCoV_epidemiological_situation.aspx?lcid=1036)
7. How the coronavirus took North Vancouver's Lynn Valley Care Centre - The Globe and Mail [Internet]. [cited 2020 Apr 17]. Available from: <https://www.theglobeandmail.com/canada/article-how-the-coronavirus-took-north-vancouvers-lynn-valley-care-centre/>
8. BC COVID-19 Data [Internet]. [cited 2020 Apr 17]. Available from: <http://www.bccdc.ca/health-info/diseases-conditions/covid-19/data>
9. The 2019 Novel Coronavirus (COVID-19) | Ontario.ca [Internet]. [cited 2020 Apr 17]. Available from: <https://www.ontario.ca/page/2019-novel-coronavirus#section-0>
10. Tableau milieu de vie COVID19 [Internet]. [cited 2020 Apr 16]. Available from: [https://cdn-contenu.quebec.ca/cdn-contenu/sante/documents/Problemes\\_de\\_sante/covid-19/Tableau-milieus-de-vie-COVID-19.pdf?1586905858](https://cdn-contenu.quebec.ca/cdn-contenu/sante/documents/Problemes_de_sante/covid-19/Tableau-milieus-de-vie-COVID-19.pdf?1586905858)
11. Hsu AT, Lane N. Impact of COVID-19 on residents of Canada's long-term care homes — ongoing challenges and policy response [Internet]. 2020 [cited 2020 Apr 16]. Available from: <https://ltccovid.org/2020/04/15/impact-of-covid-19-on-residents-of-canadas-long-term-care-homes-ongoing-challenges-and-policy-response/>
12. Update 43: COVID-19 pandemic in Alberta (April 25 at 3:30 p.m.) | alberta.ca [Internet]. [cited 2020 Apr 26]. Available from:

<https://www.alberta.ca/release.cfm?xID=7017100E340EA-BF4B-6DEF-5FFB088E665AC172>

13. Coronavirus: Alberta announces 216 more cases, 1 new death | Globalnews.ca [Internet]. [cited 2020 Apr 26]. Available from: <https://globalnews.ca/news/6868511/coronavirus-covid-19-alberta-april-25/>
14. COVID-19: 69 nouveaux décès au Québec [Internet]. [cited 2020 Apr 26]. Available from: <https://www.lapresse.ca/covid-19/202004/26/01-5270972-covid-19-69-nouveaux-deces-au-quebec.php>
15. Données COVID-19 au Québec | INSPQ [Internet]. [cited 2020 Apr 16]. Available from: <https://www.inspq.qc.ca/covid-19/donnees>
16. Situation du coronavirus (COVID-19) au Québec | Gouvernement du Québec [Internet]. [cited 2020 Apr 26]. Available from: <https://www.quebec.ca/sante/problemes-de-sante/a-z/coronavirus-2019/situation-coronavirus-quebec/#c47900>
17. Nova Scotia Reports Two More Deaths, Eight New Cases of COVID-19 - Government of Nova Scotia, Canada [Internet]. [cited 2020 Apr 26]. Available from: <https://novascotia.ca/news/release/?id=20200426001>
18. (No Title) [Internet]. [cited 2020 Apr 17]. Available from: [https://cdn.reveraliving.com/-/media/files/covid-19/media-statement--poseidon-care-centre---apr-11.pdf?rev=79c008e0e17b4732a5548f5c6dc7adec&hash=274EF9166218D649DEF0A405A02B277F&\\_ga=2.107193858.1409983635.1587083763-1666256991.1586912221](https://cdn.reveraliving.com/-/media/files/covid-19/media-statement--poseidon-care-centre---apr-11.pdf?rev=79c008e0e17b4732a5548f5c6dc7adec&hash=274EF9166218D649DEF0A405A02B277F&_ga=2.107193858.1409983635.1587083763-1666256991.1586912221)
19. Coronavirus disease (COVID-19): Outbreak update - Canada.ca [Internet]. [cited 2020 Apr 17]. Available from: <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html?topic=tilelink>
20. Sante Publique France. Infection au nouveau Coronavirus (SARS-CoV-2), COVID-19, France et Monde [Internet]. [cited 2020 Apr 12]. Available from: <https://www.santepubliquefrance.fr/maladies-et-traumatismes/maladies-et-infections-respiratoires/infection-a-coronavirus/articles/infection-au-nouveau-coronavirus-sars-cov-2-covid-19-france-et-monde#block-242818>
21. Robert Koch Institute. RKI - Coronavirus SARS-CoV-2 - Aktueller Lage-/Situationsbericht des RKI zu COVID-19 [Internet]. [cited 2020 Apr 25]. Available from: [https://www.rki.de/DE/Content/InfAZ/N/Neuartiges\\_Coronavirus/Situationsberichte/Gesamt.html](https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/Gesamt.html)
22. Nem robbant be a koronavírus-járvány Magyarországon [Internet]. [cited 2020 Apr 26]. Available from: <https://www.origo.hu/itthon/20200418-a-legfrissebbek-a-magyarorszagi-koronavirus-helyzetrol-szo.html>
23. משרד הבריאות - נגיף הקורונה [Internet]. [cited 2020 Apr 26]. Available from: <https://govextra.gov.il/ministry-of-health/corona/corona-virus/>
24. Ancidoni A, Bacigalupo I, Bellomo G, Canevelli M, Grazia Carella M, Confaloni A, et al. Survey nazionale sul contagio COVID-19 nelle strutture residenziali e socio-sanitarie

- SECONDO REPORT [Internet]. 2020 [cited 2020 Apr 12]. Available from: <https://www.epicentro.iss.it/>
25. Berloto S, Notarnicola E, Perobelli E, Rotolo A. Report on COVID-19 and Long-Term Care in Italy: lessons learned from an absent crisis management [Internet]. LTCcovid.org, International Long-Term Care Policy Network. 2020 [cited 2020 Apr 12]. Available from: <https://ltccovid.org/2020/04/10/report-on-covid-19-and-long-term-care-in-italy-lessons-learned-from-an-absent-crisis-management/>
  26. Dags- og ukerapporter om covid-19 - FHI [Internet]. [cited 2020 Apr 17]. Available from: <https://www.fhi.no/sv/smittsomme-sykdommer/corona/dags--og-ukerapporter/dags--og-ukerapporter-om-koronavirus/>
  27. Daily reports about coronavirus disease (COVID-19) - NIPH [Internet]. [cited 2020 Apr 17]. Available from: <https://www.fhi.no/en/id/infectious-diseases/coronavirus/daily-reports/daily-reports-COVID19/>
  28. Corona-viruset: Slik spres viruset i Norge og verden. Kart og statistikk. [Internet]. [cited 2020 Apr 17]. Available from: <https://www.vg.no/spesial/2020/corona/#norge-dode>
  29. Covid-19: Quarenta por cento dos mortos eram idosos residentes em lares | Coronavírus | PÚBLICO [Internet]. [cited 2020 Apr 26]. Available from: <https://www.publico.pt/2020/04/23/sociedade/noticia/covid19-mortes-residentes-lares-idosos-representam-40-obitos-portugal-1913649>
  30. Ministry of Health Singapore. Updates on COVID-19 (Coronavirus Disease 2019) Local Situation Report [Internet]. [cited 2020 Apr 17]. Available from: <https://www.moh.gov.sg/covid-19/situation-report>
  31. Statistics » COVID-19 Daily Deaths [Internet]. [cited 2020 Apr 26]. Available from: <https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-daily-deaths/>
  32. Five year average weekly deaths by place of death, England and Wales, deaths occurring between 2015 and 2019 - Office for National Statistics [Internet]. [cited 2020 Apr 26]. Available from: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/adhocs/11622fiveyearaverageweeklydeathsbyplaceofdeathenglandandwalesdeathsoccurringbetween2015and2019>
  33. Key Points-Analyses based on date of registration ☒ The provisional number of deaths registered\* in Northern Ireland in the week ending 17 th April 2020 [Internet]. [cited 2020 Apr 26]. Available from: <https://www.nisra.gov.uk/publications/registrar-general-annual-report-2018-deaths>
  34. Coronavirus (COVID-19): Daily data for Scotland - gov.scot [Internet]. [cited 2020 Apr 16]. Available from: <https://www.gov.scot/publications/coronavirus-covid-19-daily-data-for-scotland/>
  35. Records of Scotland N. Deaths involving coronavirus (COVID-19) in Scotland [Internet]. 2020 [cited 2020 Apr 16]. Available from: [www.nrscotland.gov.uk](http://www.nrscotland.gov.uk)

