

Disclaimer: We kindly ask to acknowledge that due to the diverse and heterogeneous nature of the questions and the dynamic pandemic situation some of the information might be incomplete or only correct for the time being. Thus, please consider the date and date of last update with the below information. All available information was provided by a country representative from the PHIRI network during or in connection to the respective meeting.

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Table 1: Country responses: Covid-19 Mortality

Country	Topic: COVID-19 Mortality <ul style="list-style-type: none"> How long does the entire process take to obtain ICD-10 coding of causes of death from death certificates? Do you already have access to information (complete or partial) on COVID-19 as cause of death from death certificates? Have the death certificates now been integrated in the COVID-19 mortality statistics? Are death certificates completed by the physician in electronic or paper format? If completed electronically, what location of death do they cover (ex. hospital only?) and what is the coverage in relation to all deaths? Are there any COVID-19 mortality reports you can share, or reports of excess mortality during the COVID-19 crisis? 	Access to information on Covid-19 as cause of death from death certificates?	Death certificates integrated in Covid-19 mortality statistics
Austria	<ul style="list-style-type: none"> Death certificates are recorded and coded by Statistics Austria. For 90% of deaths this happens within 10 days. There are two parallel mortality statistics, using different data: <ul style="list-style-type: none"> In the statistics based on the central surveillance system, a COVID-19 death is defined as a laboratory-confirmed case of COVID-19 resulting in death, where the status "recovered" has NOT been present between the status "disease" and the status "death", so causality is not considered. https://covid19-dashboard.ages.at/dashboard_Tod.html Statistics Austria provides stratified COVID-19 death statistics using data from death certificates, counting deaths where COVID-19 was reported as the underlying cause of death. Data for 2021 is available at the following website. In 8,7% of all deaths of 2021, COVID-19 was the underlying cause of death. http://www.statistik.at/wcm/idc/idcplg?IdcService=GET_PDF_FILE&RevisionSelectionMethod=LatestReleased&dDocName=127709 In April, over 3.000 COVID-19 deaths that occurred between the start of the pandemic and the end of 2021 were retrospectively added to the mortality statistics in the central surveillance system (data from Statistics Austria). https://orf.at/stories/3260942/ 40% electronic, 60% on paper (as of March 2020). Electronic records mostly come from hospitals. Deaths outside hospitals are mostly recorded on paper. Coding options for location of death are as follows: <ul style="list-style-type: none"> in hospital/clinic in nursing facility (other than hospitals/clinics) at home during transportation (in ambulance or similar) other (e.g., in case of an accident on site) Additional mortality reports: <ul style="list-style-type: none"> There is a continuous monitoring of overall and excess mortality in Austria stratified by regions. https://wien1x1.at/mortality-provinces/ In addition, there is an age-stratified analysis of all-cause-mortality rates comparing (COVID-19-) vaccinated vs. unvaccinated individuals between September and December 2021 (in German). https://www.statistik.at/web_de/statistiken/menschen_und_gesellschaft/gesundheit/covid19/127483.html 	Yes	Yes



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Belgium	<ul style="list-style-type: none"> • 2-3 years • Yes, partially and depending on the region. • Paper format • Yes, see <ul style="list-style-type: none"> - https://covid-19.sciensano.be/fr/covid-19-situation-epidemiologique - https://covid-19.sciensano.be/nl/covid-19-epidemiologische-situatie <p>There is a thematic report about COVID-19 mortality</p> <ul style="list-style-type: none"> - https://covid-19.sciensano.be/sites/default/files/Covid19/COVID-19_THEMATIC%20REPORT_SURVEILLANCE%20OF%20COVID-19%20MORTALITY%20IN%20BELGIUM_2.pdf <p>Article about the COVID-19 deaths surveillance:</p> <ul style="list-style-type: none"> - https://doi.org/10.2807/1560-7917.ES.2021.26.48.2001402 Do you have reports of excess mortality during the COVID-19 crisis to share? Yes see webpage of Be-MOMO epistat. https://epistat.sciensano.be/momo/ 	Yes, partly	Yes
Bulgaria	The diagnosis for Covid-19 on death certificates was introduced according to the new abbreviation. Previously, the term undiagnosed infectious disease was used on death certificates. Access to death certificates via a portal that is updated daily. Death certificates are filled out by doctors in hospitals; if someone is registered as a Covid case at home or not and dies, they are also included in the mortality report.	Yes	N/A
Croatia	Two parallel systems in place. Covid-19 mortality is monitored daily by hospital survey system Regarding death certificates information is collected 3-6 months after death and is published in September for the year prior. It is not part of the report sent to ECDC and other international organizations. Death certificate data is sent by Statistical Institute to Eurostat at the end of the year. Death certificates are completed by physicians in paper form. Covid-19 access mortality data is being sent by the Statistical Institute on a monthly basis to Eurostat and is available on their website.	N/A	N/A
Czech Republic	Deaths are registered within 2 data sources - Infectious diseases surveillance systém and causes of death (COD) statistics By joining the 2 data sources we can additionally identify cases which <ul style="list-style-type: none"> - died within 30 days, COVID death was not reported within surveillance systém - COVID is reported on the death certificate but not reported in the surveillance systém Underlying COD is selected by IRIS, however, not very good quality of input data in Czechia (lack of education of certifying physicians) In 2020 – we did a validation study using the expert panel – some 4000 cases were validated manually with use of hospital medical documentation, information on DC was adapted in some cases Statistics on deaths in surveillance systém – were not changed, evidence of COD is not the primary purpose of the system	N/A	N/A
Estonia	<ul style="list-style-type: none"> • Most of cases are coded and preliminary data published in 1-2 month after death SD15: Preliminary data of causes of death by sex, county and month. PxWeb (https://www.tai.ee) • Access to aggregated data from Causes of Death Registry is easy, but Health Board needs for epidemiologic purposes death data on daily basis and mostly uses not validated data from e-health. E-health data are periodically checked with Causes of Death Registry. • Electronic medical death certificate was introduced in Estonia on 1st July 2019 to all health care providers and forensic experts. • Estonian Causes of Death Registry participates to Euro-MOMO https://www.euromomo.eu/ and C-Mor https://www.unic.ac.cy/coronavirus/mortality/#tab-latestfindings excess mortality monitoring networks. Results from CORIVA-project-article https://www.thelancet.com/journals/lanepi/article/PIIS2666-7762(22)00087-4/fulltext 	Yes	N/A
Finland	For COVID-19 related death certificates, there is information in English at https://thl.fi/en/web/infectious-diseases-and-vaccinations/what-s-new/coronavirus-covid-19-latest-updates/situation-update-on-coronavirus/statistics-on-deaths-related-to-covid-19	N/A	N/A



Ireland	<ul style="list-style-type: none"> • The CSO publishes quarterly mortality statistics based on death registrations around 6 months in arrears. Link to latest release: https://www.cso.ie/en/releasesandpublications/ep/p-vs/vitalstatisticsthirdquarter2021/ Figures published in the Vital Statistics quarterly releases are based on the narrative of cause of death that is reported, in electronic format, on the death certificate once the death is registered with the General Registration Office (GRO) and subsequently forwarded to the CSO for processing. All deaths that are registered are assigned an Underlying Cause of Death in line with the World Health Organization (WHO) International Statistical Classification of Diseases and Related Health Problems (ICD-10). This UCOD is assigned using the WHO selection rules and is dependent on the hierarchy of diseases or conditions and their placement on the medical death certificate. • CSO publishes mortality statistics based on the narrative of cause of death that is reported, in electronic format, on the death certificate once the death is registered with the General Registration Office (GRO). The CSO publishes information on causes of death related to COVID-19. It is important to note that there will be a number of deaths where COVID-19 will not be assigned as the Underlying Cause of Death (UCOD) and therefore, the COVID-19 deaths in CSO mortality statistics, will vary from those put into the public domain by the Department of Health/HPSC. • Mortality registration is still largely paper-based cause-of-death certification and reporting, and has no link back to the certifying doctor, among others, which would be desirable. • A number of analyses of excess mortality have indicated that Ireland appears to have experienced lower excess mortality during the COVID-19 pandemic than many other countries in Europe and globally. <ul style="list-style-type: none"> - An April 2022 analysis by HIQA (Descriptive analysis of COVID-19 epidemiological indicators and associated contextual factors in European countries) estimated that there were 2,019 excess deaths in Ireland between 2 March 2020 and 28 November 2021. The excess deaths occurred during a seven-week period from late March to mid-May 2020 and an eight-week period from early January to late February 2021. The two distinct peaks in excess mortality experienced by Ireland broadly corresponded with the peaks observed for recorded COVID-19 deaths. Throughout the study period, there was substantial variability in the magnitude and duration of peaks in excess mortality across European countries. Between mid- and late-2021, the excess mortality in Ireland was observed to be amongst the lowest in Europe. The analysis of excess mortality contained in the report was based on the data and approaches of EuroMOMO (a European mortality monitoring activity), which provides a long-standing and robust approach to the measurement of excess mortality. https://www.hiqa.ie/sites/default/files/2022-04/COVID-19-Epidemiological-analysis_0.pdf - A study published in the Lancet in March 2022 (Estimating excess mortality due to the COVID-19 pandemic: a systematic analysis of COVID-19-related mortality, 2020–21) indicated that rates varied substantially in western Europe, with estimated rates in some countries almost as high as those for countries in other global regions. Ireland was among several European countries (including Iceland, Norway, and Cyprus) which had some of the lowest rates in the world, at less than 50 excess deaths per 100,000 population. Based on the Lancet publication, which does include a number of methodological caveats, Ireland had the third lowest estimated excess mortality rate amongst western European countries for the relevant study period (1 January 2020 to 31 December 2021). https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)02796-3/fulltext - https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/surveillance/weeklyreporton-covid-19deathsreportedinireland/?msclid=5d65858ecf7211ec8a9f327c05c0831c - https://www.hiqa.ie/reports-and-publications/health-technology-assessment/analysis-excess-all-cause-mortality-ireland - https://www.hiqa.ie/reports-and-publications/health-technology-assessment/descriptive-analysis-covid-19-epidemiological (includes section on reported deaths and excess mortality) 	Yes	Yes
Italy	<ul style="list-style-type: none"> • Normally, official individual certified codes of deaths are available for the entire population after about 2 years; this is the time needed for the entire process of centralised coding according to ICD-10, checking and correction, as well as informatisation of individual causes of death in a unique electronic database 	Yes	No



	<ul style="list-style-type: none"> • Since we are involved in the informatised COVID-19 national surveillance system for preparing periodic reports on COVID-19 deaths and their clinical characteristics, we have access to COVID-19 deaths and their causes of death, that are daily updated. We receive also some scanned certificates of death together with clinical charts that we review for preparing the report; they are not coded according to ICD-10 yet. Death certificates are not integrated in the COVID-19 mortality statistics yet. • Normally, death certificates are completed by the physician in a paper format. Then they are delivered to the National Institute of Statistics (ISTAT), where the causes of death are coded according to the ICD-10, checked, corrected and informatised in a unique database including main cause of death only and demographic information. The coverage includes all deaths occurring in the national territory; therefore they include deaths of the overall resident population and the deaths of abroad citizens occurring in the national territory; • In the COVID-19 national surveillance system, we have the role of preparing periodic reports on COVID-19 deaths and their clinical characteristics; at the beginning of the pandemic we provided the updated report three/four times a week and the frequency of report delivery decreased continuously; the last delivered report on COVID-19 deaths and their clinical characteristics is available at the following link in English language: https://www.epicentro.iss.it/en/coronavirus/bollettino/Report-COVID-2019_10_january_2022.pdf. Four reports of excess mortality were elaborated in collaboration between the Istituto Superiore di Sanità-ISS and the National Institute of Statistics-ISTAT during the COVID-19 crisis; the last one is available at the following link: https://www.epicentro.iss.it/coronavirus/pdf/Rapp_Istat_Iss_gennaio-novembre-2020.pdf (in Italian language). 		
Malta	<ul style="list-style-type: none"> • We usually report at T+12months. Typically ICD-10 coding is done within a few weeks of death, but for COVID-19, it is done within the first 24 hours of death, due to the daily reporting. • Yes, as usual • In paper still, but electronic system being deployed. • We rely on the international visualisation tools and rely on ECDC, WHO, EUROSTAT tools but COVID-19 mortality data for Malta is available here: https://github.com/COVID19-Malta/COVID19-Data 	Yes	Yes
Poland	<ul style="list-style-type: none"> • Codes of causes of death are issued in accordance with the International Statistics Poland Classification of Diseases and Health Problems - X Revision (ICD-10). In our country about 3,000 codes of causes of death are used. In the death certificate completed by the doctor stating the cause of death, it is crucial to correctly fill in appropriate fields according to the definitions: <ol style="list-style-type: none"> 1. Immediate cause of death – a disease or condition immediately leading to death 2. Secondary cause of death - a condition that gives rise to an immediate cause of death 3. Initial cause of death - a disease or other circumstances (e.g. an accident, external injury) that started the disease-related chain of events leading directly to death 4. Other significant circumstances contributing to the death but not related to the disease nor the condition causing it, including risk factors – all other diseases or conditions not included in the previously mentioned course of events, which however according to the physician certifying death contributed to death. It is recommended to use the two proposed codes for determination of the initial cause of death due to COVID 19 (ICD-10 Version: 2019): <ol style="list-style-type: none"> 1. U07.1 COVID-19 - when the SARS-CoV-2 virus is identified on the basis of a laboratory test (molecular testing by RT-PCR), cases confirmed according to the definition of infectious disease cases for epidemiological surveillance. 2. U07.2 COVID-19 - when the virus is unidentified and COVID-19 has been diagnosed on the basis of clinical symptoms or epidemiological criteria, and the laboratory test result is inconclusive or unavailable. • The National Institute of Public Health PZH - National Research Institute prepared a Report for the period: December 27, 2020 - March 31, 2022 on the analysis of the risk of death due to all causes and due to COVID-19 of vaccinated and unvaccinated people, 	Yes	Yes, partly



	which contain data on deaths. These, however, are deaths, for which there is no confirmed cause-and-effect relationship. The report of the National Institute of Public Health PZH-NIB is available: https://www.pzh.gov.pl/raport-analiza-ryzyka-zgonu-z-powodu-ogolu-przyczyn-oraz-z-powodu-covid-19-osob-zaszczepionych-i-niezaszczepionych/		
Portugal	Link to the Portuguese Mortality website: https://evm.min-saude.pt/	N/A	N/A
Serbia	<ul style="list-style-type: none"> • It takes ref. year + 6months to have official data on cause of deat statistics. • Preliminary data are available at the Statistical Office of Republic of Serbia. These data are not integrated in the COVID-19 mortality statistics. • Certificates are completed by the physician using mix mode. Digitalisation of death certificate is on-gong starting from 2022. • Yes, see <ul style="list-style-type: none"> - http://www.doiserbia.nb.rs/img/doi/0038-982X/2021/0038-982X2101061M.pdf - https://www.cambridge.org/core/journals/disaster-medicine-and-public-health-preparedness/article/abs/covid19-death-in-novi-pazar-serbian-bergamo/18813B1DEE2F44A835C5A68D67FE78FA - http://www.doiserbia.nb.rs/img/doi/0038-982X/2021/0038-982X2101061M.pdf - https://scindeks-clanci.ceon.rs/data/pdf/1820-4244/2021/1820-42442118039M.pdf - http://iriss.idn.org.rs/685/1/GPenev_Demografija_2021_18.pdf - https://elifesciences.org/articles/69336 	N/A	No
Slovakia	<ul style="list-style-type: none"> • It depends on the speed (or capacity) of coroners. Death certificates are available in real time after autopsy (or post-mortem examination) • Yes and yes • The physician can complete it both ways. However the electronic format is under developemnent (not integrated in national ehealth) so the DC is finally printed anyway. The electronic processing of DCs is a pilot not related to location. Despite it seems reasonably to select hospital deaths, the relation to all deaths is meaningless. We are typically reporting autopsy rate of hospital deaths vs. all deaths without resolution of CoD. • Yes. 	Yes	Yes
Slovenia	<ul style="list-style-type: none"> • National Institute of Public Health (NIJZ) collects death certificates from coroners on paper. Causes of death are coded immediately and then digitalized, but due to process of harmonisation of demographic data at Statistical Office, the final data are prepared by 30 June or T + 6 months after reference period. • Yes, NIJZ have access on information on COVID-19 at death certificates. It is necessary to expose that in the procedure of coding the underlying causes of death (CoD), many other data sources besides death certificates are used, e.g. hospital discharge data, Covid-19 monitoring system, etc. After finding some discrepancies, the coroner is contacted again to clarify these discrepancies. At the moment, Slovenia still publishes two “different” COVID-19 mortalities: <ul style="list-style-type: none"> - Weekly numbers based on 28-days window, not checked by death certificates (include all deaths of patients with positive SARS-CoV-2 test in 28 days before death, with no information on underlying CoD) (https://www.nijz.si/sites/www.nijz.si/files/uploaded/tedenski_prikaz_umrli_20220502.xlsx) - Yearly statistics on mortality, based on death certificates (links below) • Death certificates are completed on paper, but Slovenia is now in the procedure of full digitalization of process of death certificates which will be completed by 30 June 2023. • Excess mortality is published weekly, using the methodology of EuroMOMO (https://www.nijz.si/sites/www.nijz.si/files/uploaded/gumb_4-smrti_v_povezavi_s_covid-19_202200502.pdf in Slovenian language). Slovenian data are also available at EuroMOMO webpage https://www.euromomo.eu/ 	Yes	Yes



	<ul style="list-style-type: none"> - Data on causes of death for 2020 are published at NIJZ health data portal (Slovenian language only) - Covid-19 related deaths, by sex and age: https://podatki.nijz.si/Selection.aspx?px_path=NIJZ%20podatkovni%20portal_1%20Zdravstveno%20stanje%20prebivalstva_02%20Umrli_4%20Umrli%20po%20vzroku%20smrti&px_tableid=10204008.px&px_language=sl&px_db=NIJZ%20podatkovni%20portal&rxid=51456931-c2b3-457c-bc0f-bd6238d249c3 - Covid-19 related deaths, by sex, age groups and regions (NUTS3): https://podatki.nijz.si/Selection.aspx?px_path=NIJZ%20podatkovni%20portal_1%20Zdravstveno%20stanje%20prebivalstva_02%20Umrli_4%20Umrli%20po%20vzroku%20smrti&px_tableid=10204009.px&px_language=sl&px_db=NIJZ%20podatkovni%20portal&rxid=51456931-c2b3-457c-bc0f-bd6238d249c3 - Covid-19 related deaths, by sex, place of death and status of deceased (resident of LTC): https://podatki.nijz.si/Selection.aspx?px_path=NIJZ%20podatkovni%20portal_1%20Zdravstveno%20stanje%20prebivalstva_02%20Umrli_4%20Umrli%20po%20vzroku%20smrti&px_tableid=10204010.px&px_language=sl&px_db=NIJZ%20podatkovni%20portal&rxid=51456931-c2b3-457c-bc0f-bd6238d249c3 		
Spain	<ul style="list-style-type: none"> • COVID-19 Mortality has been and is one of the most controversial issues during the COVID-19 pandemic. The increase in the number of deaths, the affectation of the workforce of the Civil Registry Offices, have produced delays in sending demographic information of deaths. Also the coding and COVID-19 death extraction (carried out by the Ministry of Health in Spain) have affected the entire process. The last official data currently available on COVID-19 deaths is from 2020 (published in November 2021). • Yes. For the issuance of the corresponding death certificates, in cases of probable Covid-19 infection in the community environment without analytical confirmation, once the medical history of the deceased has been consulted, if possible, with special attention to the symptoms described in the infection, it will proceed to certify as follows: <ul style="list-style-type: none"> - Initial or Fundamental Cause of Death: unconfirmed COVID-19 or suspected coronavirus infection. - Immediate Cause: the ultimate cause that is considered correct, serve as examples "multiple organ failure", "respiratory distress" or "acute respiratory failure". - Intermediate causes may be reflected if they exist or are known: "pneumonia" "sepsis" or "coagulopathy". - In the "other processes" section, the pathologies or comorbidities that entail a greater risk of developing serious illness should be collected: "cardiovascular diseases", "arterial hypertension" or "diabetes". In cases of COVID 19 confirmed by laboratory tests, the fundamental cause must include it as follows: COVID-19 confirmed. For the rest of the certification, proceed as in the previous section. The elaboration of the mortality statistics is complex. Several administrations intervene: central scope (Justice and Statistics) and regional scope (Statistics and Health), and not always at the same level, depending on the regional law of statistics. In addition, participate the current Collegiate Medical Organization, holder of the death certificates. • Paper format. Currently in Spain we use the form published in 2009, edited by the General Council of Physicians (CGCOM) and the National Institute of Statistics (INE). • The information on COVID-19 mortality in Spain (also hospitalization and ICU admission) is included in the National Epidemiological Surveillance Network (RENAVE) Reports (last published on 3rd May, 2022). https://www.isciii.es/QueHacemos/Servicios/VigilanciaSaludPublicaRENAVE/EnfermedadesTransmisibles/Paginas/InformesCOVID-19.aspx • The Information on daily mortality from all causes is obtained from the General Registry of Civil and Notary Registries of the Ministry of Justice by the National Centre of Epidemiology (CNE) which distributes the corresponding information among all the Spanish regions. The Monitoring System of daily Mortality (MoMo) in Spain includes deaths for all causes from civilians computerized registries. It estimates all causes excess mortality which has been daily updated in https://momo.isciii.es/panel_momo/ 	Yes	N/A



	<p>Weekly MOMO reports (last published on 5th May,2022) have been published in https://www.isciii.es/QueHacemos/Servicios/VigilanciaSaludPublicaRENAVE/EnfermedadesTransmisibles/Paginas/Informes_MoMo_2022.aspx</p> <p>Further information:</p> <ul style="list-style-type: none"> - Barbería E, Grijalba M, Amador Martínez J, Marcos RA, García V. Defunciones por COVID-19 en España y estadísticas de mortalidad. Gaceta Sanitaria 2021;35(3):304-304. https://dx.doi.org/10.1016/j.gaceta.2020.09.003 - Cirera L, Segura A, Hernández I. Defunciones por COVID-19: no están todas las que son y no son todas las que están. Gaceta Sanitaria 2022;35:590-593. https://dx.doi.org/10.1016/j.gaceta.2020.06.006 - Teijeira-Alvarez R, León-Sanz MP, Castro-Herranz S, Floristán-Floristán Y, Salazar-Lozano MI, Moreno-Iribas MC. La certificación de la defunción de casos de COVID-19 en España. Revista Española de Medicina Legal 2020;46(3):101-108 https://doi.org/10.1016/j.rem.l.2020.05.006 - León-Gómez, I.; Mazagatos, C.; Delgado-Sanz, C.; Frías, L.; Vega-Piris, L.; Rojas Benedicto, A.; Larrauri, A. The Impact of COVID-19 on Mortality in Spain: Monitoring Excess Mortality (MoMo) and the Surveillance of Confirmed COVID-19 Deaths. Viruses 2021, 13, 2423. https://doi.org/10.3390/v13122423 		
<p>United Kingdom</p>	<ul style="list-style-type: none"> • About 80% are registered within a week. Deaths investigated by coroners take longer. See https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/impactofregistrationdelaysonmortalitystatisticsinenglandandwales/2020 • Yes and yes. • The system is semi-electronic and covers all deaths. Medical certificates of the cause of death (MCCD) are completed by doctors and usually emailed to registrars of birth and deaths in local authorities and send to the Office of National Statistics – see https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2022/03/C1566-information-for-medical-practitioners-after-the-coronavirus-act-2020-expires-march-2022.pdf • Yes, see <ul style="list-style-type: none"> - https://coronavirus.data.gov.uk/details/deaths - https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/excessdeathsinenglandandwales/march2020todecember2021 	<p>Yes</p>	<p>Yes</p>



Figure 1: Countries with access to information on Covid-19 as cause of death from death certificates

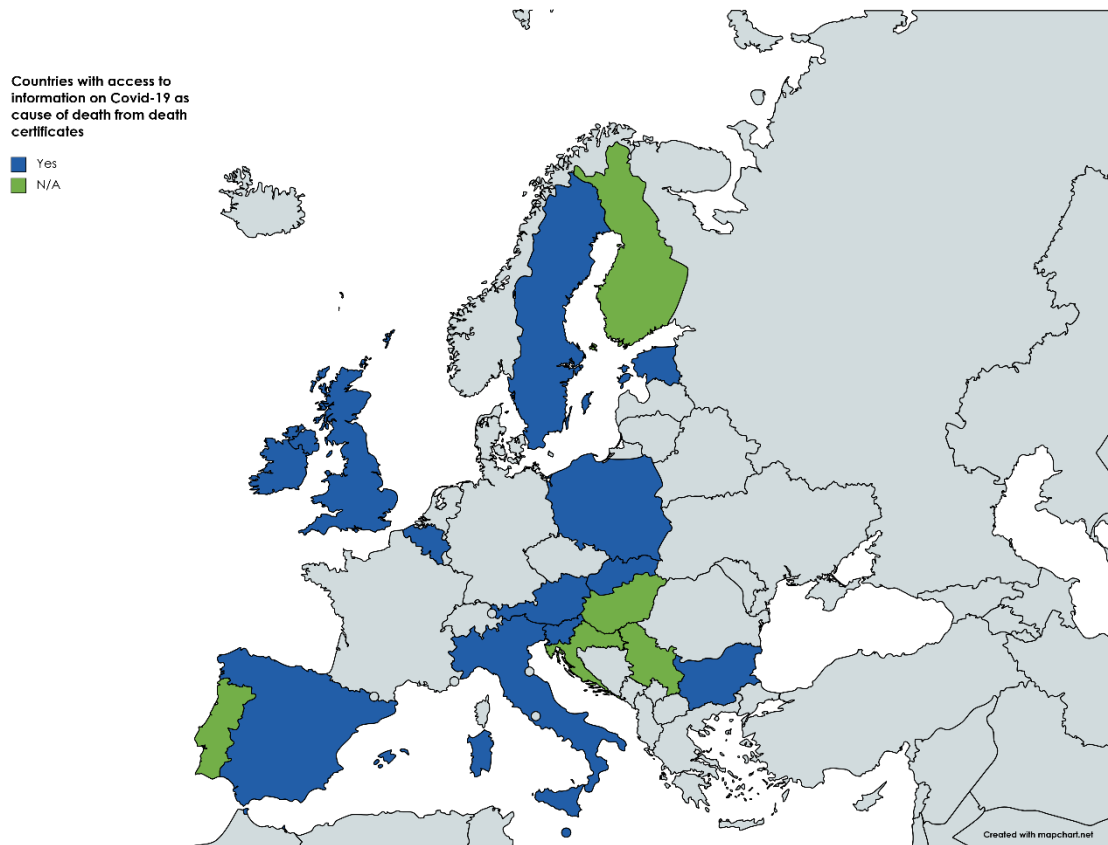
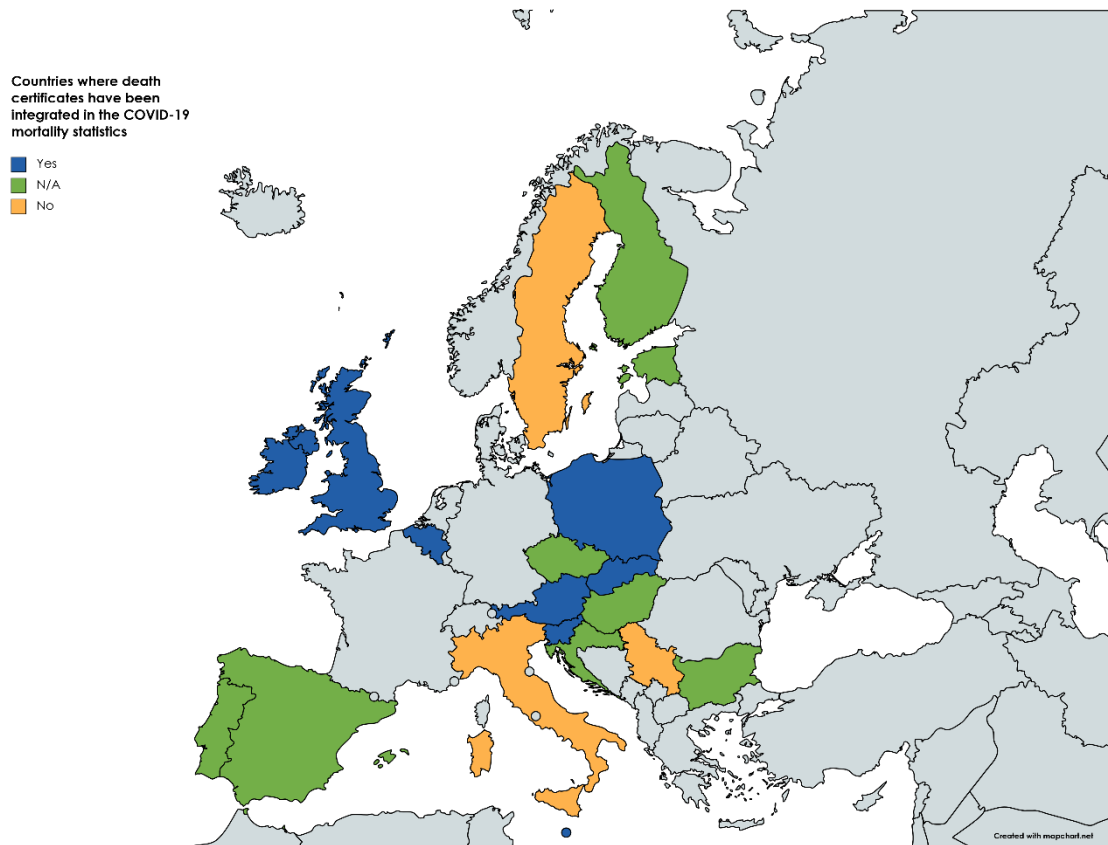


Figure 2: Countries where death certificates have been integrated in the Covid-19 mortality statistics



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