INSTITUTO NACIONAL DE ESTADISTICA

Estimate of weekly deaths

Methodology

Madrid, May 2025

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1 Objective

Weekly and monthly death estimates are intended to provide quick estimates of the number of deaths that occur each week and each month from the entries recorded in the computerized Civil Registries, as well as their comparison with historical death data. This allows the data to be interpreted with a necessary historical perspective, given the variability of deaths over time. Three types of data will thus coexist in the project:

- Definitive data (deaths to 2023).
- Estimated data (completing the series up to the present).

2 Background

Death Statistics forms part of the group of Vital Statistics, which has a long tradition in Spain. This is an annual operation, although provisional data has also been published on a semi-annual basis for several years.

The publication schedule is conditioned by the circuit through which the primary data is produced. Death Statistics are based on the joint Medical Death Certificate/Statistical Death Bulletin (CMD / BED). One part is completed by the doctor certifying the death, and another by family members or the funeral home. This document is delivered to the corresponding Civil Registry, which also fills in certain registration data.

Civil registries produce monthly lots, and at the beginning of month m+1 send the INE all the CMD/BED received for deaths that occurred in month m to the corresponding provincial INE delegation. These paper certificates or bulletins are scanned in the INE delegations throughout month m+1, so that at the end of month m+1 or the beginning of the month m + 2, the scanned information for deaths in month m will be available. .

In practice, not all civil registries send month m deaths at the beginning of month m+1. Rather, it is generally necessary to wait two more months for the receipt of overdue bulletins to be completed. In some cases, it may even be necessary to make a complaint.

Deaths with judicial intervention must also be considered. These also generally arrive with more delay than the rest.

In short, in the best of cases it is necessary to wait for the first of month m+4 to have solid information regarding month m, and this information will always be provisional. Definitive consolidated death data for year t is not available until November of year t+1. The last definitive data published is thus that of 2020.

Under normal circumstances, it would be necessary to wait until the beginning of July to have a clear picture of the increase in deaths caused by the COVID-19 outbreak in Spain, which occurred in March 2020.

Eurostat began to request that countries voluntarily send estimates or results on the total number of deaths, taking the week as the observation unit to make them more comparable. The INE joined the initiative and in June 2020 began to send this data to Eurostat, along with publishing this new statistic under the category of experimental

statistics and under the name *"Estimation of the number of weekly deaths during the COVID-19 outbreak".*

In February 2024, the published tables were extended, and monthly death tables were added to the weekly death series. In this way, the comparison with the "Monthly Estimates of Births" is facilitated and allows us to obtain a quicker estimate of the vegetative growth. Moreover, since then, a highly provisional estimate of the number of deaths occurring each year t is obtained only two months after the end of that year. That is, in February of year t+1, an estimate of the number of deaths in year t will already be available. This estimate is provisional and will be adjusted monthly until the publication of definitive data in November of year t+1.

Having quick, up-to-date deaths figures was a prior aspiration of the INE and users, which was always postponed because it was subject to limitations in the availability of the original data. Deaths are not usually news but when they are (heat waves, flu or other seasonal phenomena) death statistics were not able to offer figures until much later.

Almost two years after the start of the Estimation of the number of weekly deaths (EDeS) experimental statistics, we can verify that the method devised and the sources on which it is based allow the project to continue beyond the covid-19 pandemic, thereby satisfying said demand.

The original source of the data is not the medical death certificates on which the mortality statistics are based, but rather the registrations in the civil registries. For several years, the Ministry of Justice has promoted the progressive computerization of civil registries through specific applications such as INFOREG, used for recording various registry entries, including deaths. Although INFOREG has not been implemented uniformly across the entire territory, its use has provided broad and stable coverage over the years. In this context, the EDeS statistics have incorporated a method to estimate the total number of deaths based on the available computerized records.

Since October 2021, INFOREG has been gradually replaced by a new application, DICIREG, whose full deployment is expected by the end of this year. This transition has contributed to a significant increase in the level of computerization of civil registries. Once DICIREG is fully implemented throughout the country, all deaths will be electronically recorded and, therefore, EDeS will no longer need to apply estimation procedures: the statistics will be entirely based on the count from the DICIREG administrative register.

Digitized civil registries offers the great advantage of being always up-to-date: on any given day, you can see the deaths recorded the day before. While delays may at times occur, they generally do not exceed a week, meaning that with the data recorded today, the number of deaths taking place a week ago can be determined with great precision in municipalities that have computerized civil registries.

3 Type of Operation

It is a mixed operation, fundamentally based on administrative records (deaths registered by the Civil Registries) but with an added component of estimating the total number of deaths to correct for a lack of coverage and delays in recording.

The weekly information is offered in the form of tables with retrospective series since 1975 and the monthly one since 2009.

4 Content

4.1 POPULATION UNDER STUDY

The deaths that occurred in Spain in the period analysed.

4.2 GEOGRAPHICAL SCOPE

The data are estimated at the national level of the Autonomous Community, province and islands; that is, following the European territorial classification NUTS-3.

A very important element to consider is that the estimated data include all deaths that occurred in Spain. Until May 2024, the estimated data were published by province of registration. However, from that date onward, they are published by place of residence, as is the case with the definitive data, which facilitates comparability between both series.

In cases where information on the deceased's place of residence is not available in INFOREG/DICIREG, the province of residence is imputed based on the place of death registration, which is inherent to the computerized registration system itself. It is important to note that the under-registration coefficient is applied to the province of registration, not to the province of residence.

4.3 REFERENCE PERIOD

Weekly data are provided since 2000 and monthly data from 2009 to the present.

The time period in the weekly tables shall take the form AAAASMXX, while that in the monthly tables shall be indicated as AAAAMYY where::

- YYYYY is the year, e.g. 2024.
- XX is the week number according to the ISO8601 standard (ranging from 01 to 52/53 depending on the year). The first week of a year is the calendar week (Monday to Sunday) that contains the first Thursday of the year.
- YY is the number of the month according to the ISO8601 standard (ranging from 01 to 12).

4.4 CLASSIFICATION VARIABLES

In addition to the classification by provinces and islands, the estimated data is also broken down by:

- Sex.
- Five-year age groups (0-4 5-9, …, 90 and over).

5 Characteristics of the Project

5.1 OBSERVATION UNITS TO WHICH THE PRIMARY DATA REFER

The observation unit is the death entry registered in the Civil Registry, which contains the registration data used for the statistics: sex and age of the deceased person.

5.2 DATA COLLECTION METHODOLOGY

The General Office of Legal Security and Public Faith sends files of deaths recorded in INFOREG/DICIREG to the INE on a daily basis. For the estimation, the files received up to Monday of the week prior to publication are used.

5.3 ESTIMATION METHOD

The weekly deaths recorded in INFOREG/DICIREG for each week in each geographical area (CCAA, provinces, islands) are calculated as follows:

$$\widehat{D}_i^t = D_i^t * f_i^m * r_{ix}$$

Where $\widehat{D}_i^t$ is the estimated number of deaths for geographic entity i (Autonomous Community, province, island) and week t,

D_i^t is the number of deaths registered in INFOREG/DICIREG for week t in geographic entity i.

f_i^m are the under coverage correction coefficients for the original INFOREG/DICIREG data. It is an expansion factor that relates recorded deaths that finally occurred in geographical area i (Autonomous Community, province, island) and month m.

r_{ix} is a coefficient that corrects the delay in recording data in INFOREG/DICIREG for the geographical area “i”, and the age in weeks “x” of the deaths with respect to the date of publication. This coefficient is used in very isolated cases, for the most recent two weeks published. This is updated and corrected with each new publication of results.

On the other hand, the monthly deaths in each geographical area (Autonomous Communities, provinces, islands) are calculated as follows:

$$\widehat{D}_i^m = D_i^m * f_i^m$$

Where $\widehat{D}_i^m$ is the estimated number of deaths for geographical entity i (Autonomous Community, province, island) and month m,

D_i^m is the number of deaths registered in INFOREG/DICIREG for week m in geographical entity i.

f_i^m are the undercoverage correction coefficients of the original INFOREG/DICIREG data and month m.

5.3.1 METHODOLOGICAL ADJUSTMENT IN THE MONTHLY ESTIMATION OF DEATHS FOR 2024

In February 2025, the results of the monthly estimation of deaths for the month of December were published, providing a first, clearly provisional estimate of the total number of deaths that occurred in 2024. This estimate was prepared following the usual procedure, using the coefficients available at that time based on historical information from previous years, which represented the best possible approximation with the existing data. However, throughout 2024, approximately 2,000 civil registries were computerized due to the progressive implementation of the DICIREG application, which has brought about a very significant change in the computerization process. At the beginning of 2024, the approximate percentage of deaths registered in computerized civil registries represented 93% of the total, whereas it currently stands at 98XX%. Nevertheless, due to the progressive rollout of the DICIREG application and the resulting ongoing computerization of civil registries during 2024, the need to review and adapt the under-registration coefficients has become evident, as the coverage conditions are changing significantly compared to previous years.

In May 2025, these coefficients were updated. This methodological review was necessary to adapt the estimation procedure to the new context of progressive computerization resulting from the implementation of DICIREG, which became notably more intense throughout 2024. This transformation has substantially changed the conditions under which the traditional under-coverage coefficients were applied, making a methodological update essential to reflect the new reality.

The update carried out in May 2025 is based on three key elements:

• The incorporation of modifications resulting from corrections or updates to the information in the records provided by DICIREG.
• The application of under-coverage adjustment coefficients, traditionally applied on an annual basis, now applied monthly to more accurately reflect the progressive advancement of computerization in each province.
• The availability of more consolidated data for 2024 from non-computerized civil registries, whose reporting had been delayed due to the implementation of DICIREG.

Although this update has been carried out, the mortality data for 2024 should still be considered highly provisional until the definitive data are published in November 2025.

6 Dissemination plan and periodicity

6.1 PLAN FOR TABLES

The following tables are published:

- Estimates of the number of deaths per week:
    - Weekly and accumulated deaths. National and by Autonomous Community. 1975-2025.
    - Weekly and accumulated deaths. National and by province. 1975-2025.
    - Weekly and accumulated deaths. Islands. 1975-2025.
    - Weekly and accumulated deaths by sex and age. National and by Autonomous Community. 1975-2025.
    - Weekly and accumulated deaths by sex and age. National and by province. 1975-2025.
- Estimates of the number of deaths per month:
    - Monthly and cumulative deaths. National and Autonomous Communities. 2000-2025.
    - Monthly and accumulated deaths. National and provinces. 2000-2025.
    - Monthly and accumulated deaths. Islands. 2000-2025.
    - Monthly and accumulated deaths by sex and age. National and Autonomous Communities. 2000-2025.
    - Monthly and accumulated deaths by sex and age. National and provinces. 2000-2025.

6.2 OPERATION CALENDAR AND UPDATING OF PROVISIONAL DATA

The EDS statistics are published monthly around the 15th. On that date, a working day of week s, the weekly deaths series will be updated until week s-3 (calendar week, Monday to Sunday). For the monthly deaths' series, data for month m will be published for month m-2.

As provisional data based on CMD/BED documents become available, estimates will be replaced by these provisional data.

7 Cost and burden

Being a statistic based on an administrative record; they do not have an additional burden on the informants.

The estimate of the budget appropriation necessary to finance the Weekly and Monthly Death Statistics foreseen in the 2025 Annual Programme is 45.63 thousand euros.