

Census of Population of Ireland 2011

1 Km² Grid dataset

User Guide



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1 Census 2011

A Census of Population was taken on the night of Sunday, 10 April 2011, in accordance with the Statistics Act 1993 and the Statistics (Census of Population) Order 2010 (S.I. No. 207 of 2010)¹.

1.1 Coverage of the Census

The 2011 census enumerated the *de facto* population i.e. the population recorded for each area represents the total of all persons present within its boundaries on the night of Sunday, 10 April 2011, together with all persons who arrived in that area on the morning of Monday, 11 April 2011, not having been enumerated elsewhere. Persons on board ships in port are included with the population of adjacent areas.

The date of the census was chosen to coincide with a period when passenger movements were at a minimum and, consequently, the figures closely approximate to those for the normally resident population. Members of the Defence Forces who, on Census Night, were serving abroad with the United Nations were excluded from the enumeration.

1.2 Conduct of the Census

A temporary field force consisting of 6 Census Liaison Officers, 44 Regional Supervisors, 438 Field Supervisors and some 4,854 part-time Enumerators carried out the census enumeration. During the four weeks before Census Day the enumerators entered details in respect of 2 million private residences and communal establishments in their enumerator record books. They simultaneously delivered blank census questionnaires to 1.65 million of these dwellings that were expected to be occupied on Census Night. Approximately 290,000 residences were vacant at the time of the census, while in the remaining cases the household was either enumerated elsewhere or temporarily absent from the State. The collection of completed questionnaires took place between Monday 11 April and Friday 13 May, 2011.

The Central Statistics Office (CSO) wishes to record its appreciation of the public-spirited co-operation received from households and the work carried out by the census field force.

1.3 Production of Results

Each enumerator first prepared and returned to the CSO a summary of the population of his/her enumeration area. These summaries formed the basis for the preliminary 2011 census results published in June 2011. The completed questionnaires for individual households were subsequently transported to the CSO for processing. The population summaries, dwelling listings and enumeration maps for individual enumeration areas were checked for consistency and used to determine the boundaries of census towns and suburbs/environs of towns with legal boundaries. The capture and processing of the responses to questions on the questionnaires proceeded concurrently.

¹ The Statistics (Census of Population) Order 2010 was made by An Taoiseach in pursuance of powers conferred on him by section 25 (1) of the Statistics Act 1993 (No. 21 of 1993).

1.4 The 1 Km² Grid dataset

The data contained within the 1 Km² grid cells are based upon the usually resident population of the Republic of Ireland, and are available to researchers for the purposes of research in the area of spatial statistics etc.

CSO Ireland must be acknowledged as the source of data.

1.5 Further information

For further information on the data content contact:

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Swords Business Campus
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Swords,
Co. Dublin

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LoCall 1890 236 787
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E-mail: census@csso.ie
Web: www.cso.ie

2 Background to grid based statistics

Census 2011 was the first time where each household and dwelling was linked to geographical coordinates following the decision to use the GeoDirectory (the national address database maintained by An Post and Ordnance Survey Ireland) to underpin fieldwork operations. This linkage had the benefit of offering flexibility in the production of Census 2011 outputs for both existing and new boundaries, with the provision that they are available in a digital format.

In conjunction with this linkage, there have been developments at European level promoting the use of grids as a means of disseminating statistical data .e.g. the GEOSTAT initiative. There are also references to the use of grids as a statistical unit in the data specifications on “statistical units” and “population distribution/demography” under the INSPIRE Directive. Other European countries have also been publishing grid based data, subject to individual licensing arrangements in order to protect the confidentiality of the information based upon their own national legislation regarding the capture, collection and publication of official statistics.

Following consultation with users of census data in Ireland, it was agreed to publicly release Census 2011 data aggregated within 1 Km² grid cells. The counts in some grids have been suppressed to prevent disclosure.

2.1 Generation of the grid shapefile

The Irish Transverse Mercator (or ITM, EPSG Code 2157) projection was chosen for the creation of the 1 Km² grid vector shapefile, with the false origin of ITM used as the starting point of the grid.

The creation of a 1 Km² grid required to map the Irish population distribution was aided by the sourcing of a coded script on the ESRI website called ‘Fishnet’ (For more information see <http://arcscripts.esri.com/details.asp?dbid=12807>). This application enables the user to set the coordinate reference system in which the grid is to be created, and also provides the option to establish the size of each grid cell (in metres) as well as the total number of grids to be created.

The next step was to identify any grid cells that cover the land surface area for the Republic of Ireland only, in order to ensure that a more accurate distribution of population density is calculated for grids which straddle the Irish coast. To perform this task, a shapefile for the Republic of Ireland including all the Islands was imported as a layer into a Geographical Information System (GIS). By using the ‘clip’ tool within the ESRI Arc Toolbox (Analysis Tools-> Extract-> Clip) between the shapefile for the Republic of Ireland and the grid produced by Fishnet, the final grid shapefile for the dissemination of Census 2011 data was generated.

The coordinates of approximately 2 million occupied and unoccupied dwellings associated with the 2011 Census were imported into a GIS along with the grid shapefile, and each coordinate value was allocated a grid cell location using the ‘spatial join’ function. The resulting file was then merged with the main 2011 Census of Population (COP20111) dataset, thereby attaching a grid cell code to each person on the COP2011 file.

NOTE: The grid dataset is also available in the ETRS89 Lambert Azimuthal Equal-Area projection coordinate reference system (EPSG Code 3035). This is based on a grid supplied by EUROSTAT, the European statistics agency.

2.2 Usual resident population counts

The production of the population count within the grid dataset has been based upon the *usual resident* population only, as opposed to the *de facto* population. The reason for choosing the usual resident population was to follow the dissemination strategies of other European countries which have also released grid based data. This means that 4,574,888 persons enumerated on April 10th 2011 who were usually resident in the State were considered to be in scope for the grid dataset.

In 2011 Census a question asked the person where they usually lived (see figure 1)

There were 4,525,281 usual residents who were enumerated in the State on Census night. The majority of these ticked the first option, indicating that they were enumerated at their place of usual residence.

However around 122,000 persons recorded that they lived elsewhere in Ireland and entered an address on the second option of the question. As part of Census 2011 processing these addresses were captured and geocoded against the GeoDirectory.

Of the 122,000 records, some 4,000 persons either left the address blank or entered an incomplete address. In these instances, the records were randomly assigned addresses and coordinates from the GeoDirectory within the derived county of usual residence (i.e. the county where they were enumerated)

In addition to the above, persons absent from the State on Census night but usually reside in the State were included. The geographical location of these persons was based on the position of the household where they were marked as absent on the census form.

As a result the total persons included in the grid dataset is 4,574,888. This figure excludes persons enumerated in the State on April 10th 2011 but who don't normally reside here.

7 Where do you usually live?

1 ☐ HERE at this address

2 ☐ Elsewhere in IRELAND (including Northern Ireland), write in your FULL ADDRESS

3 ☐ Elsewhere ABROAD, write in the COUNTRY

Figure 1 Question relating to place of usual residence on the Census 2011 form

2.3 Protection of statistical confidentiality

As the size of the 1 Km² grid cells are generally smaller than the size of the administrative units used to disseminate census data (particularly in rural areas), certain grids could have a small number of residents. This could give rise to the possible disclosure of information which could enable the identification of individual persons or households.

The CSO is governed by the 1993 Statistics Act which guarantees the confidentiality of any statistical information released by the office. In addition the CSO is required to implement the European Statistics Code of Practice 2011, where Principle 5 states the following:

The privacy of data providers (households, enterprises, administrations and other respondents), the confidentiality of the information they provide and its use only for statistical purposes must be absolutely guaranteed.

The CSO also operate its own code of practice on statistical confidentiality which is available on the CSO website (see <http://www.cso.ie/en/aboutus/statisticalinquiries/statisticalconfidentiality/>).

In order to protect against the disclosure of grid based data which could identify an individual person or household, certain rules were adopted in order to preserve confidentiality. This policy was adopted following an examination of practices by other National Statistical Institutes which have already released grid data.

For grid cells which have less than three households, the total population variable has been altered and contains a value of '4' or '5'. In the case of the age or sex variables which breached our rules of confidentiality, the data in those cells have been suppressed and therefore contain a value of '-1' in the dataset. Following the implementation of these rules, 19.4% of all cells in the dataset have been affected.

3 1 Km² Grid dataset Structure and Content

The data has been stored in vector format (COP2011_Grid_ITM_IE_1Km.shp), and as a comma-separated values file (COP2011_Grid_ITM_IE_1Km.csv).

Table 1 gives details of the variables in the dataset and how they are classified.

Variable	Type	Length	Label/Notes	Values
OBJECTID	Num	8	The unique identifier of each object in the dataset.	1,2 etc
ITM1KM	Char	11	The identifier of each grid cell as recommended by the INSPIRE Directive. It states the size of each grid cell, along with the rounded Northings and Eastings of the specified coordinate reference system (ITM)	1KmN597E432
CENT_EAST	Num	8	The Eastings of the centre of the grid cell in ITM	432500
CENT_NORTH	Num	8	The Northings of the centre of the grid cell in ITM	597500
AREA	Num	8	The area of the grid cell (in metres squared)	1000000
TOT_P	Num	8	The total usual resident population	0,4,5 etc.
TOT_F	Num	8	Total female usual resident population	0,1,2,3 etc
TOT_M	Num	8	Total male usual resident population	0,1,2,3 etc
T_00_14	Num	8	The total usual resident population aged 0 to 14 years of age	0,1,2,3 etc
T_15_64	Num	8	The total usual resident population aged 15 to 64 years of age	0,1,2,3 etc
T_65_	Num	8	The total usual resident population aged over 65 years of age	0,1,2,3 etc
F_00_14	Num	8	Females aged 0 to 14 years of age	0,1,2,3 etc
F_15_64	Num	8	Females aged 15 to 64 years of age	0,1,2,3 etc
F_65_	Num	8	Females aged over 65 years of age	0,1,2,3 etc
M_00_14	Num	8	Males aged 0 to 14 years of age	0,1,2,3 etc
M_15_64	Num	8	Males aged 15 to 64 years of age	0,1,2,3 etc
M_65_	Num	8	Males aged over 65 years of age	0,1,2,3 etc
CREATEDATE	Char	10	Date of creation of dataset	11-11-2013