

ABOUT MORTALITY DATA FOR ITALY

by Dana A. Gleit

Updated and revised by Mila Andreeva, Tim Riffe, Gabriel Borges,

Felipe Menares, and Denys Dukhovnov.

Last Updated by Denys Dukhovnov on March 14, 2024

GENERAL

The official statistical office in Italy is the [Istituto Nazionale di Statistica](#) (ISTAT), formerly known as the *Istituto Centrale di Statistica*. The Kingdom of Italy was created in 1861, and Italy was unified in 1870. Separate provinces have estimated their population based on vital, civil or parish registrations since 1824. The first general census of population was conducted in 1861. Decennial censuses were taken from 1861 to 1881, 1901 to 1931, and 1951 to the present. The census of 1891 was omitted due to financial difficulties; an out-of-pattern census was taken in 1936; and the 1941 census was canceled due to World War II. The 1936 census was not considered very compatible with the 1931 census (Goyer and Draaijer, 1992: p. 277).

The HMD series starts in 1871, when the Italian government instituted the Registrar's Office in each city, consolidating the death counts information for the whole country.

Source of Data

The data for the [Human Mortality Database](#) (HMD) come from official vital statistics, census counts and population estimates published by ISTAT.

Specific Episodes in Italian Demographic History

Demographic change in Italy follows closely the population history of any European country in the last two centuries, with behavioral changes that led to fertility decline, the end of mortality crises and a fall in underlying mortality which, together, led to an incredible increase in life expectancy, increasing internal and international mobility and a sharp rise in urbanization. The demographic transition in Italy was smooth and fertility and mortality evolved in parallel, with a decline starting at the end of the 19th century (Livi-Bacci, 1977), leading to gradual changes in the population structure. In the early 1990s, Italy, along with Spain, was the first country to reach lowest-low levels of fertility (Kohler, Billari, & Ortega, 2002).

More recently, migration dynamics have become the main factor driving population changes in Europe, particularly in Italy, where positive net migration flows have prevented declines in population numbers. The proportion of the foreign-born population has increased dramatically since the beginning of the 2000s, from 2.4% in 2002 to above 9% since 2014 (9.3% in 2022) (Table 1).

Table 1 – Population on 1st January by citizenship and proportion of foreign residents

Year	Italian	Foreign	Total	Proportion of foreign residents (%)
2002	55,653,478	1,345,402	56,998,880	2.4
2003	55,709,901	1,490,266	57,200,167	2.6
2004	55,722,842	1,902,112	57,624,954	3.3
2005	55,784,072	2,280,630	58,064,702	3.9
2006	55,803,878	2,512,602	58,316,480	4.3
2007	55,830,119	2,710,107	58,540,226	4.6
2008	55,869,130	3,165,350	59,034,480	5.4
2009	55,879,065	3,570,192	59,449,257	6.0
2010	55,864,985	3,842,300	59,707,285	6.4
2011	55,850,960	4,100,999	59,951,959	6.8
2012	55,812,164	4,355,862	60,168,026	7.2
2013	55,828,674	4,681,544	60,510,218	7.7
2014	55,860,583	4,922,085	60,782,668	8.1
2015	55,781,175	5,014,437	60,795,612	8.2
2016	55,639,398	5,026,153	60,665,551	8.3
2017	55,542,417	5,047,028	60,589,445	8.3
2018	55,339,533	5,144,444	60,483,973	8.5
2019	54,820,515	4,996,158	59,816,673	8.4
2020	54,601,851	5,039,637	59,641,488	8.5
2021	53,678,823	5,171,894	58,850,717	8.8
2022	53,999,417	5,030,716	59,030,133	9.3

ISTAT: last data extracted on 14 March 2024 from <http://dati.istat.it>

TERRITORIAL COVERAGE

Territorial changes for Italy are shown in the Table 2. Italy is divided into 20 regions, which are subdivided into 101 provinces, 8 metropolitan cities, and Aosta, whose provincial functions are carried out by the regional government of Valle d'Aosta.

Table 2. Territorial changes for Italy from 1861

Dates	Territory	Area Code†
1861-1866	The Kingdom of Italy was established under Victor Emmanuel II in 1861. The capital was Florence and the kingdom was divided into 14 regions and 59 provinces.	30
1867-1871 (see Note)	The Veneto region was added in 1867. <i>Note:</i> The province of Roma (a.k.a. the Lazio region) was also added in 1870 and included in the 1871 census. Nonetheless, Roma was not included in vital statistics data (deaths, births) until 1872. Therefore, the 1871 census counts were adjusted to exclude Roma (see Appendix II for details).	40
1872-1923	The province of Roma (which includes Rome and the papal states) was added and Rome became the capital.	50
1924-1946 (see Note)	With the Paris peace settlement of World War I (1919), the Venezia Tridentina region (now called “Trentino-Alto Adige”), which includes the province of Trento (from which Bolzano was split off in 1927), was added to the Italian territory and the province of Trieste was added to the Venezia Giulia region. In 1920, the provinces of Pola (Istria) and Zara were added to the Venezia Giulia e Zara region (currently called “Friuli-Venezia Giulia”). Finally in 1924, the province of Fiume (Carnaro) was added to the Venezia Giulia e Zara region. <i>Note:</i> All of these territories were included in the 1921 census, but they were not included in the vital statistics data until 1924. Therefore, the 1921 census counts were adjusted to exclude these territories (see Appendix II for details).	60
1947-1953 (see Note)	The provinces of Pola, Zara, Fiume, and Trieste became no longer part of Italian territory in 1947. <i>Note:</i> All four provinces were excluded from vital statistics (deaths, births) as of January 1 st 1947. The province of Trieste, however, was included in the 1951 census, although the other three provinces were not. Therefore, the 1951 census counts were adjusted to exclude Trieste (see Appendix II for details).	70
1954-1980	The province of Trieste was ceded back to Italy and was once again included in Italian vital statistics.	80
1981-present	In 1981, the vital statistics (births, deaths) collection system changed from covering the <i>presente (de facto)</i> population to covering the <i>residente (de jure)</i> population. Thus, from this point on census counts are used for the <i>residente</i> population (rather than the <i>presente</i> population) to produce population estimates. Although this change is not really a territorial change, it is treated as such in order to make the appropriate adjustments in the formulas used to calculate population estimates and death rates.	90

† The area code is used in the raw data files (Input Database) to denote the geographic area covered by the data.

DEATH COUNT DATA

Coverage and Completeness

The usually resident population (*de jure*) is the legal population in Italy, although the censuses have traditionally been *de facto* (Goyer and Draaijer, 1992: p. 277). For the purpose of calculating death rates, Italian demographers use the resident population (“*popolazione residente*” in Italian) as the denominator. However, until 1980, mortality data were based on the *de facto* population (“*popolazione presente*”). So, the numerator was based on the *presente* population while the denominator was based on the *residente* population (for an example of the notes associated with these data see

ISTAT, 1962). After 1980, both the numerator (deaths) and the denominator (population) are based on the *residente* population. Deaths of Italian residents that occur abroad are included, but the ages at death are unknown. These deaths are distributed by age proportionately based on the age distribution of deaths in Italy (see ISTAT, 1988).

For the Human Mortality Database, we use data based on the *presente* population for years prior to 1981. Population estimates are calculated based on census counts of the *presente* population in order to be consistent with the vital statistics (i.e., deaths, births). From 1981 to the present, data based on the *residente* population are used; population estimates are derived from census counts for the *residente* population in order to match vital statistics. The transition from the *presente* to the *residente* population coverage is treated as a territorial change in order to make the appropriate adjustments to the formulas for calculating population estimates and death rates (see prior section on “Territorial Coverage”).

We have no information regarding the completeness of death registration. It is known, however, that the death counts recorded in vital statistics exclude large numbers of military deaths during the two World Wars (approximately 650,000 male deaths during World War I and 290,000 during World War II). Therefore, the death counts have been adjusted to include military deaths during the two wars (see Appendix II). Because these death counts are not available by age and calendar year, they have been redistributed using special methods (for details, see Jdanov et al., 2008).

Specific Details

Prior to 1906, deaths counts are available only by five-year age groups (i.e., 0-4, 5-9, ..., 65-74, 75+), with the exception of 1883-84, when they are available for single years of age. The data for 1883-84 demonstrate clear patterns of age heaping. In 1893 and 1894, data are available only for the total number of deaths by sex (not by age group); the age distribution has been estimated (see Appendix II for details).

POPULATION DATA

Coverage and Completeness

The census counts used in the Human Mortality Database are based on the *de facto* (*presente*) population prior to 1981, for the *de jure* (*residente*) population from the census in 1981 and from official intercensal population estimates based on the 1981, 1991, 2001, 2011 and 2018 censuses for all years starting in 1982. We have no information regarding the completeness of census counts.

For 1912-20 and 1937-51, the pre- and post-war census counts and deaths data for the total population (including the military) are used to derive annual (January 1st) population estimates. The intercensal survival method used to obtain these estimates is the same as that described in the HMD [Methods Protocol](#) except that no migration is assumed (except for the mobilization and demobilization of military troops during 1915-18 and 1940-45 - for more details, see Jdanov et al., 2008).

Specific Details

As noted in the section on territorial coverage, the province of Trieste was included in the 1951 Census, although it was excluded from vital statistics data (i.e., deaths, births) during the period of 1947-1954. Therefore, we adjusted the census counts for 1951 to exclude the territory of Trieste in order to be consistent with vital statistics. Province-level census counts in 1951 are available only by age group (0-5, 6-9, 10-13, 14-17, 18-20, 21-24, 25-34, 35-44, 45-54, 55-59, 60-64, 65+). These census counts were used to calculate the population of Trieste as a proportion of the total population within each age group. For each single year of age within a given age group, these proportions were used to adjust the census numbers:

Adjusted Count = Census Count - (Census Count x Proportion Trieste)

The adjusted counts were then double-checked to ensure that within each age group, the adjusted count matched the census counts for the total minus the province of Trieste.

Similarly, the 1921 census included the Venezia Tridentina region (i.e., Trento province) and the Venezia Giulia region (i.e., Fiume, Pola, Trieste, and Zara), even though these territories were not included in vital statistics until 1924. Therefore, the 1921 census counts were adjusted to exclude these territories. Data by region were available for the same age groups as for the country as a whole. So, the adjusted counts are simply the country total minus the counts for these regions within each age group.

Finally, the 1871 census count included the province of Roma (Lazio region), but again this area was not covered by vital statistics until 1872. Therefore, using the same method described for the 1921 census, the 1871 census counts were adjusted to exclude this territory.

Census data prior to 1900 exhibit patterns of age heaping.

BIRTH COUNT DATA

Coverage and Completeness

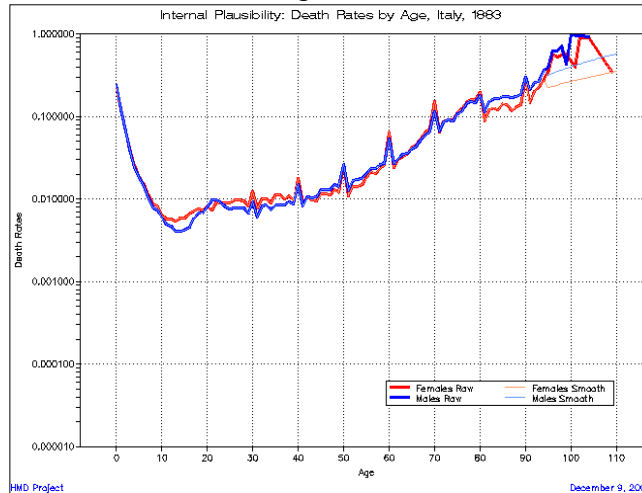
As noted earlier, Italian birth statistics covered the *de facto* population ("*popolazione presente*") until 1980. After 1980, births are based on the *residente* (de jure) population. We have no information regarding the completeness of birth registration.

DATA QUALITY ISSUES

The data prior to 1906 should be used with extra caution due to problems of quality. For most of these early years, the original death counts were available only by five-year age groups with an open age interval at age 75+ years. Thus, life tables by single years of age are based on estimates. Users are advised to use the life tables by five-year (or 10-year) age groups, which are based mostly on the original data rather than estimates.

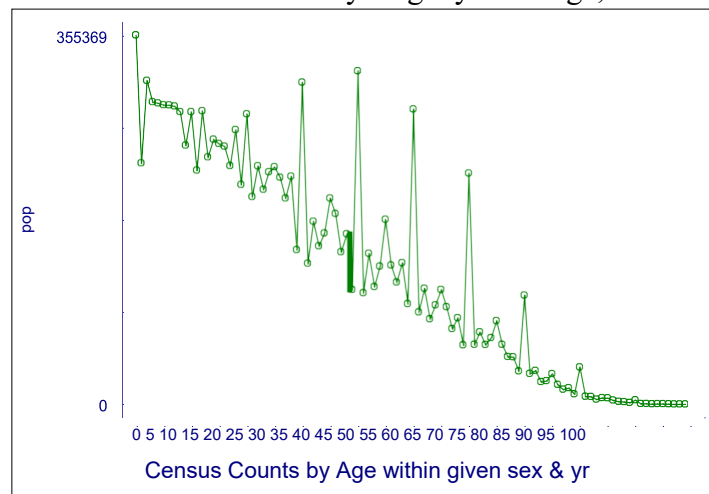
Moreover, in 1883-84 (the only years prior to 1906 for which deaths by single year of age are available), the death counts show strong patterns of age heaping at ages ending in “0” (Figure 1 below for 1883).

Figure 1.



The 1861, 1871, and 1881 census counts also show patterns of age heaping (Figure 2).

Figure 2. 1871 Census counts by single year of age, Females, Italy



Figures of death rates by year within a given age show a discontinuity in 1937 around ages 18 to 20. These patterns appear to be the result of birth discontinuities for the 1917 to 1919 birth cohorts (these cohorts tend to be smaller due to World War I and the 1918 influenza epidemic). For most ages, the 1937 death counts are available only by five-year age groups (0, 1, 2, 3, 4, 5-9, ... 85-89, 90+). Thus, deaths by single year of age and birth cohort must be estimated for 1937. To the extent that the methods for splitting death counts into single years of age do not adequately account for cohort size, death counts may have been overestimated for cohorts that were smaller (thus inflating the death rates).

As of May 2021, following the 2018 population census, resident population estimates for 2002-2020 were produced/re-adjusted on its basis.

REVISION NOTES

Changes with the September 2015 revision:

Population: the September 2015 revision included new intercensal population estimates for the periods 1982-1991 and 1992-2001 and updated the intercensal population estimates for the years 2002-2011.

Changes with the December 2017 revision:

Life tables: All life tables have been recalculated using a modified methods protocol. The revised protocol (Version 6) includes two changes: 1) a more precise way to calculate a_0 , the mean age at death for children dying during the first year of life and 2) the use of birth-by-month data (where and when available) to more accurately estimate population exposures. These changes have been implemented simultaneously for ALL HMD series/countries. For more details about these changes, see the revised Methods Protocol (at <http://v6.mortality.org/Public/Docs/MethodsProtocol.pdf>), particularly section 7.1 on Period life tables and section 6 and Appendix E, on death rates. The life tables calculated under the prior methods (Version 5) remain available at v5.mortality.org but will not be further updated.

Changes with the March 2017 revision:

Death counts: the July 2017 update corrects the death count information for the year 2008 as previous updates had mistakenly used the total death counts rather than deaths among the resident population. This change has a negligible impact on life expectancy estimates.

Population: The population estimates series by five-year age groups published by ISTAT in 2015 (ISTAT, 2015) were redistributed proportionally based on the single-year age group population estimates for the years 2002-2013.

Changes with the February 2020 revision:

Birth counts by month: the 2020 update corrects the monthly birth count information for the years 2001-2009 as previous updates had mistakenly used the birth counts for the de facto population rather than for the resident population.

Changes with the May 2021 revision:

Population: 2002-2019 population estimates by age and sex have been revised with new figures for the previous two intercensal periods (2002-2011 and 2011-2018), following the inter/postcensal re-adjustment after the 2018 population census.

ACKNOWLEDGEMENTS

The authors would like to thank Graziella Caselli and Elisabetta Barbi at the University of Rome for their assistance in obtaining and describing the Italian data. They are also enormously grateful to Silvia Bruzzone at ISTAT for her help in documenting territorial changes in Italy and for providing recent vital statistics data for Italy. The authors also thank Claudia Iaccario, Martina Lo Conte, Luisa Frova and Silvia Simeoni at ISTAT for providing birth and death data. They thank Elana Broch and Michiko Nakayma at the Donald E. Stokes Library for Public and International Affairs and Population Research at Princeton University for their help in locating Italian vital statistics data. Finally, Barbara Chiang, Delicia Nahman, and Sibö Zhao deserve thanks for all of their help with scanning documents and data entry.

REFERENCES

- Bonifazi, C. and Heins, F., 2000. *Long-term trends of internal migration in Italy*. Population, Space and Place, 6(2), pp.111-131.
- Livi-Bacci (1977), M. *A history of Italian fertility during the last two centuries*. Princeton University Press.
- Goyer, D.S. and Draaijer, G.E. (1992). "Italy." Pp. 277-287 in: *The Handbook of National Population Censuses: Europe*. New York, United States: Greenwood Press.
- ISTAT. (1962). "Avvertenze". Pp. 9-10 in: *Annuario di Statistiche Demografiche, 1960*. Vol. X. Rome: ISTAT.
- ISTAT. (1988). "Avvertenze". Pp. 9-11 in: *Statistiche Demografiche, 1982-83*. Vol. 32, tomo 2. Rome: ISTAT.
- ISTAT, 2015. Resident population at NUTS-2 level: new series of estimates for the January 1st 2002-2014 period. Retrieved from <http://www.istat.it/en/files/2015/01/ricostruzione-serie-popolazione->

English.pdf?title=New+series+of+estimates+on+resident+population++-+14+Jan+2015+-+Full+text.pdf

Jdanov, D.A., Glej, D.A., and Jasilionis, D. (2008). A modeling approach for estimating total mortality for Italy during the First and Second World Wars. Center for the Economics and Demography of Aging (CEDA) Papers: Paper 2008-0001CL. Retrieved September 25th 2008
(<http://repositories.cdlib.org/iber/ceda/papers/2008-0001CL/>).

Kohler, H. P., Billari, F. C., & Ortega, J. A. (2002). *The emergence of lowest-low fertility in Europe during the 1990s*. Population and development review, 28(4), 641-680.

Thompson, W.C. with M.H. Mullin. (1999). "The Italian Republic (Italy)." Pp. 388-423 in: *Western Europe 1999, 18th Edition*. Harpers Ferry, West Virginia, United States: Stryker-Post Publications.

APPENDIX I:

DESCRIPTION OF DATA USED FOR LEXIS DATABASE

DEATHS

Period	Type of Data	Age Grouping	Comments	Ref Code†	Area Code‡
1863-1882	Annual number of deaths to <i>presente (de facto)</i> population, by sex and 5-year age groups	0,1-4, 5-9, ... 65-74, 75+, unk		29, 46	30 (<1867), 40 (1867-71), 50 (≥1872)
1883	Annual number of deaths to <i>presente (de facto)</i> population, by sex and age	0, 1, 2...max, unk		32	50
1884	Annual number of deaths to <i>presente (de facto)</i> population, by sex and age to 100+	0, 1, 2...99, 100+, unk		32	50
1885-1892	Annual number of deaths to <i>presente (de facto)</i> population, by sex and 5-year age groups	0,1-4, 5-9, ... 65-74, 75+, unk		29, 46	50
1893-1894	Annual number of deaths to <i>presente (de facto)</i> population, by sex and 5-year age groups	0,1-4, 5-9, ... 65-74, 75+	Distribution by age was estimated (see Appendix 2 for details).	29, 46	50
1895-1898	Annual number of deaths to <i>presente (de facto)</i> population, by sex and 5-year age groups	0,1-4, 5-9, ... 65-74, 75+, unk		29, 46	50
1899-1900	Annual number of deaths to <i>presente (de facto)</i> population, by sex and 5-year age groups to 90+.	0,1-4, 5-9, ... 85-89, 90+, unk		31, 46	50
1901-1902	Annual number of deaths to <i>presente (de facto)</i> population, by sex and 5-year age groups	0,1-4, 5-9, ... 65-74, 75+, unk		29, 46	50
1903-1904	Annual number of deaths to <i>presente (de facto)</i> population, by sex and 5-year age groups to 90+.	0,1-4, 5-9, ... 85-89, 90+, unk		31, 46	50

Period	Type of Data	Age Grouping	Comments	Ref Code†	Area Code‡
1905	Annual number of deaths to <i>presente (de facto)</i> population, by sex and 5-year age groups to 100+.	0,1-4, 5-9, ... 95-99, 100+, unk		31, 46	50
1906-1914	Annual number of deaths to <i>presente (de facto)</i> population, by sex and 1-year age groups to age 14 and 5-year age groups to 100+.	0, 1, 2,...14, 15-19, 20-24,... 95-99, 100+, unk	There were a lot of deaths of unknown age in 1908 and early 1909 due to an earthquake on Dec 28 th , 1908.	31	50
1915-1920	Annual number of deaths by age, and birth cohort (lexis triangle)	0,1,...max	Deaths have been adjusted to account for military-reported deaths (see Appendix 2). There were also a lot of deaths of unknown age in 1915 due to an earthquake on Jan 13 th , 1915.	65	50
1921-1925	Annual number of deaths to <i>presente (de facto)</i> population, by sex and 1-year age groups to age 14, age groups 15-19, 20, 21-24, and 5-year age groups to 100+.	0, 1, 2,...14, 15-19, 20, 21-24, 25-29,... 95-99, 100+, unk		31	50 (<1924), 60 (≥1924)
1926-1928	Annual number of deaths to <i>presente (de facto)</i> population, by sex and age (1x1)	0, 1, 2...99, 100+, unk		30	60
1929-1936	Annual number of deaths to <i>presente (de facto)</i> population, by sex, age, and birth cohort (lexis triangle)	0, 1, 2...max, unk	Death counts are reported by age and triangle, but there are some deaths where age is known, but the birth cohort is unknown. In the Input DB, these deaths of unknown triangle are shown in the record where LEXIS="RR". Thus, the total number of deaths at completed age x for a given sex is sum of the three records for deaths in LEXIS elements "TL", "TU", and "RR".	12	60

Period	Type of Data	Age Grouping	Comments	Ref Code†	Area Code‡
1937	Annual number of deaths to <i>presente (de facto)</i> population, by sex and 5-year age groups	0, 1, 2, 3, 4, 5-9, ... 85-89, 90+, unk		45	60
1938	Annual number of deaths to <i>presente (de facto)</i> population, by sex, 5-year age groups, and birth cohort(s).	0, 1-4, 5-9, ... 105-109, unk	For each 5-year age group we have data for the lower triangle (TL) at the minimum age in the age group (e.g., age 5, birth cohort 1933), period-cohort (VV) data (e.g., aged 5-9, cohorts 1929-32), and the upper triangle (TU) at the maximum age in the age group (e.g., age 9, birth cohort 1928). In addition, there are a few deaths where age is known, but the birth cohort is unknown. In the Input DB, these deaths are shown in the record where LEXIS="RR". Thus, the total number of deaths in a given age group is sum of four LEXIS elements: "TL", "VV", "TU", and "RR".	13	60
1939	Annual number of deaths to <i>presente (de facto)</i> population, by sex, 5-year age groups (above age 9), and birth cohort(s).	0, 1, ... 9, 10-14, 15-19, ... 105-109, unk	See comments for 1938 data.	13	60
1940-1945	Annual number of deaths by age, and birth cohort (lexis triangle)	0,1,...max	Deaths have been adjusted to account for military-reported deaths (see Appendix 2).	65	60
1946-1949	Annual number of deaths to <i>presente (de facto)</i> population, by sex, age, and birth cohort (lexis triangle) to age 100+	0, 1, 2...99, 100+, unk	See comments for 1929-36 data.	11, 10	60 (1946) 70 (≥1947)
1950	Annual number of deaths to <i>presente (de facto)</i> population, by sex, age, and birth cohort (lexis triangle)	0, 1, 2...max, unk	See comments for 1929-36 data.	10	70

Period	Type of Data	Age Grouping	Comments	Ref Code†	Area Code‡
1951-1954	Annual number of deaths to <i>presente (de facto)</i> population, by sex and age	0, 1, 2...max, unk	The data also include deaths of unknown age (AGE="UNK").	16	70 (<1954) 80 (1954)
1955-1980	Annual number of deaths to <i>presente (de facto)</i> population, by sex, age, and birth cohort (lexis triangle)	0, 1, 2...max, unk	See comments for 1929-36 data. There are no deaths of unknown age after 1956.	16	80
1981-2003	Annual number of deaths to <i>residente (de jure)</i> population, by sex, age, and birth cohort (lexis triangle)	0, 1, 2...max		14, 15, 20, 21, 43, 47, 48, 49, 53	90
2004	Annual number of deaths to <i>residente (de jure)</i> population, by sex, age, and birth cohort (lexis triangle)	0, 1, 2...max, unk		59	90
2005-2017	Annual number of deaths to <i>residente (de jure)</i> population, by sex, age, and birth cohort (lexis triangle)	0, 1, 2...110+, unk		63, 67, 39, 76, 77, 87, 88, 89, 94, 98	90
2018-2021	Annual number of deaths to <i>residente (de jure)</i> population, by sex, age, and birth cohort (lexis triangle)	0, 1, 2...max, unk		102, 106, 110, 114	90

max = maximum age attained; unk = Deaths of unknown age; n/a = not applicable

† The reference code is used in the raw data files (Input Database) to link data with sources.

‡ The area code is used in the raw data files (Input Database) to denote the geographic area covered by the data.

POPULATION

Period	Type of Data	Age Grouping	Comments	Ref Code	Area Code
1871	Dec 31 st Census counts of <i>presente (de facto)</i> population, by sex and age	0, 1, 2, ...99, 100+, unk	These counts have been adjusted (see Appendix 2 for details).	38	40
1881	Dec 31 st Census counts of <i>presente (de facto)</i> population, by sex and age group	0, 1, 2, ...9, 10-11, 12-14, 15-19, 20-24,...95-99, 100+, unk		37	50
1901	Feb 10 th Census counts of <i>presente (de facto)</i> population, by sex and birth cohort	Birth Cohorts (not age): 1901, 1900, ... 1886, 1885-1883, 1882-1880, 1879-1876, 1875-1871, 1870-1866, ... 1805-1801, 1800 and earlier	Data also includes population of unknown birth cohort	36	50
1911	June 10 th Census counts of <i>presente (de facto)</i> population, by sex and age group	0, 1, 2, ...20, 21-24, 25-29, ...95-99, 100+,unk		35	50

Period	Type of Data	Age Grouping	Comments	Ref Code	Area Code
1912-1921	Annual population estimates as of January 1 st , by sex and age	0, 1, 2, ...max		65	50
1921	December 1 st Census counts of <i>presente (de facto)</i> population, by sex and age group	0, 1, 2, ...20, 21-24, 25-29, ...95-99, 100+,unk	These counts have been adjusted (see Appendix 2 for details).	34	50
1931, 1936	April 21 st Census counts of <i>presente (de facto)</i> population, by sex and age	0, 1, 2, ...99, 100+, unk		33, 25	60
1937-1951	Annual population estimates as of January 1 st , by sex and age	0, 1, 2, ...max		65	60 (<1947) 70 (>1947)
1951	November 4, 1951 Census counts of <i>presente (de facto)</i> population, by sex and age	0, 1, 2, ...79, 80-84, ...95-99, 100+	These counts have been adjusted (see Appendix 2 for details).	05	70
1961, 1971	October 15, 1961, and October 24, 1971 Census counts of <i>presente (de facto)</i> population, by sex and age	0, 1, 2, ...79, 80-84, ...95-99, 100+		04, 03	80
1981	October 25 th Census counts of <i>residente (de jure)</i> population, by sex and age	0, 1, 2, ...79, 80-84, ...95-99, 100+		02	90
1982-1991	Intercensal population estimates – Population at Jan 1st by age and sex	0, 1, 2, ...84, 85+		82	90
1992-2001	Intercensal population estimates – Population at Jan 1st by age and sex	0, 1, 2, ...99, 100+		83	90
2002-2022	Intercensal population estimates – Population at Jan 1st by age and sex	0, 1, 2, ...99, 100+		105, 108, 109, 113	90

unk = population of unknown age

BIRTHS

Type of data: Annual total number of live births by sex.

Period covered: 1862-1980 (*de facto* population); 1981-2021 (*de jure* population)

Refcode(s): 06-09, 19, 22, 50, 52, 60, 62, 66, 70, 78, 90, 95, 99, 103, 107, 111, 115.

BIRTHS BY MONTH

Type of data: Annual live birth counts by month.

Period covered: 1900 to 2021

RefCodes: 80, 81, 91, 92, 93, 96, 100, 104, 107, 112, 116.

APPENDIX II:

ADJUSTMENTS TO THE ORIGINAL RAW DATA

As noted earlier, for some years it was necessary to adjust the original raw data. Below is a description of how the adjusted numbers were derived from the original data.

DEATH COUNTS

- **1893-94:** Data are available only for the total number of deaths by sex (not by age group). The age distribution of deaths across the period from 1890 to 1900 was relatively stable, although the proportion of deaths under age five shows a slight decrease over time (e.g., among males, 48.2% in 1890 as compared with 42.6% by 1899), while the proportion of deaths at age 75 and older shows a slight increase (e.g., among males, 9.8% in 1890 as compared with 12.5% by 1899). Therefore, the distribution of deaths across age (for each sex) was estimated as follows:
 - 1) the proportion of deaths was calculated for each age group (0,1-4, 5-9, ... 65-74, 75+, unknown age) in 1892 and 1895;
 - 2) the mean proportion across 1892 and 1895 was computed for each age group;
 - 3) the mean proportion was multiplied by the total number of deaths in 1893 and in 1894 to estimate the number of deaths in each age group.
- **1915-1920:** Death counts during World War I have been adjusted to include military deaths (see NoteCode=30, 32; see also Jdanov et al., 2008). The original data used to derive the adjusted counts are shown in the table below.
- **1940-1945:** Death counts during World War II have been adjusted to include military deaths (see NoteCode=34, 37; see also Jdanov et al., 2008). The original data used to derive the adjusted counts are shown in the table below.

Original Death Data used to Derive Adjusted Numbers

The table below shows the format of the original data upon which the adjusted death counts are based. Although these data are included in the raw data files, the adjusted figures described in Appendix I were used for the HMD calculations instead of them.

Period	Type of Data	Age Grouping	Comments	Ref Code	Area Code
1915	Civilian-reported deaths to <i>presente (de facto)</i> population, by calendar year, sex and 1-year age groups to age 14 and 5-year age groups to 100+.	0, 1, 2,...14, 15-19, 20-24,... 95-99, 100+, unk	Deaths include only those reported by the civil authority, not military-reported deaths. There were a lot of deaths of unknown age in 1915 due to an earthquake on Jan 13 th , 1915.	31	50
1916-1920	Civilian-reported deaths to <i>presente (de facto)</i> population, by calendary year, sex and 1-year age groups to age 14, age	0, 1, 2,...14, 15-19, 20, 21-24,25-29,... 95-99, 100+, unk	Includes only those deaths reported by the civil authority, not military-reported deaths.	31	50 (<1924), 60 (>1924)

Period	Type of Data	Age Grouping	Comments	Ref Code	Area Code
	groups 15-19, 20, 21-24, and 5-year age groups to 100+.				
1915-1920	Total military-reported deaths during WWI (all male)	n/a		54	50
1915-1920	Annual number of military-reported deaths (all male)	n/a	Distribution by calendar year was estimated (see NoteCode=30).	56	50
1915-1918	Deaths to men on active military duty by calendar year	n/a	Initial estimates at the end of the war (see NoteCode=25).	54	150*
1915-1920	Additional deaths to men on active military duty	n/a	Deaths added with revised post-war count (see NoteCode=26). Data are not given by calendar year.	54	150*
1915-1918	Deaths to prisoners of war (all male)	n/a	See NoteCode=27. Data are not given by calendar year.	54	151*
1915-1918	Deaths to military men not on active duty	n/a	See NoteCode=28. Data are not given by calendar year.	54	152*
1918-1920	Post-armistice deaths of prisoners & military invalids (all male)	n/a	See NoteCode=29. Data are not given by calendar year.	54	153*
1915-1918	Sample of military deaths in the province of Bologna by age	18, 19...40, 41+	See NoteCode=31. Data are not given by calendar year.	54	154
1915-1920	Military-reported deaths during WWI by age group (all male)	18, 19...40, 41+	Deaths are not disaggregated by calendar year. Distribution by age group was estimated (see NoteCode=32).	57	50
1940	Civilian-reported deaths to <i>presente (de facto)</i> population, by calendar year, sex, 5-year age groups (above age 9), and birth cohort(s).	0, 1, ... 9, 10-14, 15-19, ... 105-109, unk	See comments for 1938 data. Includes deaths reported by the civil authority only, not military-reported deaths.	13	60
1941-1942	Civilian-reported deaths to <i>presente (de facto)</i> population, by calendar year, sex, age, and birth cohort (lexis triangle)	0, 1, 2...max, unk	See comments for 1929-36 data. Includes deaths reported by the civil authority only, not military-reported deaths.	13	60
1943-1945	Civilian-reported deaths to <i>presente (de facto)</i> population, by calendar year, sex, age, and birth cohort (lexis triangle) to age 100+	0, 1, 2...99, 100+, unk	See comments for 1929-36 data. Includes deaths reported by the civil authority only, not military-reported deaths.	11, 10	60 (<1947) 70 (≥1947)

Period	Type of Data	Age Grouping	Comments	Ref Code	Area Code
1940-1945	Deaths to military men by calendar year	n/a	Includes some deaths where the year of death is unknown (see NoteCode=33).	55	60
1940-1945	Annual number of military-reported deaths by sex	n/a	Year of death was estimated for 6,960 males (see NoteCode=33).	55, 56	60
1940-1945	Confirmed military deaths during entire war, pre-Armistice, and post-Armistice periods, by sex and age group	15-19, 20-24... 60-64, 65+, unk	See NoteCode=35, 38, & 39. Excludes missing in action. Data are not given by calendar year.	55	161**
1940-1945	Total number of persons missing in action during WWII	n/a	See NoteCode=36. Data are not given by sex or by calendar year.	55	162**
1940-1945	Military-reported deaths during WWII by sex and age group	15-19, 20-24... 60-64,65+	Deaths are not disaggregated by calendar year. Distribution by sex and age group have been estimated (see NoteCode=37).	58	60

n/a = Not applicable; unk = unknown age

* Covers the same territory as AreaCode=50.

** Covers the same territory as AreaCode=60.

POPULATION SIZE

- **1871 Census:** This census included the province of Roma in the national counts. The counts (by age and sex) for Roma (Area=100) were subtracted from the total Census counts (Area=50) to derive population size in the same territory covered by vital statistics in 1871 (Area=40).
- **1921 Census:** This census included the regions of Venezia Tridentina (province Trento) and Venezia Giulia (provinces Trieste, Pola, Fuime, and Zara). The census counts (by age and sex) for the Venezia Tridentina region (Area=101) and the Venezia Giulia region (Area=102) were subtracted from the total Census counts (Area=60) to derive population size in the territory covered by vital statistics in 1921 (Area=50).
- **1951 Census:** This census included the province of Trieste. The census counts (by age and sex) for Trieste (Area=103) were subtracted from the total Census counts (Area=65) to derive population size in the territory covered by vital statistics in 1951 (Area=70).

Original Census Data used to Derive Adjusted Numbers

The table below shows the format of the original census counts upon which the adjusted numbers are based. Although these data are included in the raw data files, the adjusted figures described in Appendix I were used for the HMD calculations instead of them.

Period	Type of Data	Age Grouping	Comments	Ref Code	Area Code
1871	Dec 31 st national Census counts of <i>presente (de facto)</i> population, by sex and age	0, 1, 2, ...99, 100+, unk	Includes the province of Roma (Lazio Region)	38	50
1871	Dec 31 st Census counts of <i>presente (de facto)</i> population, Roma province, by sex and age	0, 1, 2, ...99, 100+	Covers the province of Roma (Lazio Region)	38	100
1921	December 1 st national Census counts of <i>presente (de facto)</i> population, by sex and age group	0, 1, 2, ...20, 21-24, 25-29, ...95-99, 100+	Includes the regions of Venezia Tridentina and Venezia Giulia.	34	60
1921	December 1 st Census counts of <i>presente (de facto)</i> population, Venezia Tridentina region, by sex and age group	0, 1, 2, ...20, 21-24, 25-29, ...95-99, 100+	Covers the region of Venezia Tridentina (Trento province).	34	101
1921	December 1 st Census counts of <i>presente (de facto)</i> population, Venezia Giulia region, by sex and age group	0, 1, 2, ...20, 21-24, 25-29, ...95-99, 100+	Covers the region of Venezia Giulia including the provinces of Trieste, Pola (Istria), Zara, and Fiume (Carnaro).	34	102
1951	November 4 th national Census counts of <i>presente (de facto)</i> population, by sex and age	0, 1, 2, ...79, 80-84, ...95-99, 100+	Includes the province of Trieste.	05	65
1951	November 4 th Census counts of <i>presente (de facto)</i> population, Trieste province, by sex and age	0, 1, 2, ...79, 80-84, ...95-99, 100+	Covers the province of Trieste.	05	103

- **2002-2013 population series:** the population estimates series by five-year age groups published by ISTAT in 2015 (ISTAT, 2015) were redistributed proportionally based on the single-year age groups population estimates for the years 2002-2013.