

ABOUT MORTALITY DATA FOR SCOTLAND

By Domantas Jasilionis

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We are still working on the *Background and Documentation* file for Scotland. For a description of the original data used to estimate the mortality surface for Scotland, see Appendix 1.

DATA QUALITY ISSUES

For the period around the two world wars, population estimates and death counts provided by the National Records of Scotland (NRS) (the former General Register Office) cover the civilian population only. During World War I and World War II, the male population exhibits a sudden decline because the military is not included. There is a corresponding increase in the male population during the first post-war years due to demobilization.

Population estimates for the period around World War I are available by five-year age groups only. Unfortunately, the standard HMD method for splitting such data into single years of age does not work well due to the irregular implicit migration pattern. The following special procedure has been applied. First, the standard HMD method was applied to split the 1911 and 1921 census data into single years of age data. Next, a modified spline method was used to split population estimates data for the periods 1911-1921, 1921-1931, and 1931-1938. The same method has been used for England & Wales. For a detailed description of the method, see the *Background & Documentation* file for the Civilian Population of England & Wales (Appendix 2).

Population estimates for the period 1855-1860 are pre-censal population estimates calculated according to the HMD methodology (assuming zero net-migration). In addition, life expectancies at ages 65 and 80 seem to be unreasonably high (if compared to Sweden) at least until the mid-1870s (Appendix 2, Figure 1).

The population estimates for 2001-2010 are inter-censal estimates based on the 2011 census data. These estimates replaced previously published post-censal population estimates based on the 2001 census and adjustments for unregistered immigration. The population estimates for 2011-2016 are post-censal estimates based on the 2011 census data. In 2016, the NRS revised previously published official population estimates for 2012-2014 “because of an issue with an input data set used in the calculation of the mid-year estimates, as well as minor unrelated processing errors”. The errors mainly affected the age range 17 to 25 years. The largest underestimate in the total population of Scotland for mid-2014 was 1.28 per cent at age 21 and the largest overestimate was 2.28 per cent at age 18 (NRS, 2017).

By contrast with England & Wales and Northern Ireland, the mid-2021 population estimates for Scotland are post-censal population estimates based on the 2011 census. This difference is due to the postponement of the Scottish census to 2022 because of the coronavirus (COVID-19) pandemic (ONS, 2022).

The ONS has not as yet published a revised series of population estimates for the period 2012 to 2020 using the final results of the 2021 census. For now, population estimates for January 1st 2022 (needed for estimating population exposures and associated mortality rates for 2021) have been derived using the HMD post-censal estimation method assuming zero net-migration.

The compulsory registration of births began on July 1st, 1837. However, according to the U.K. Office for National Statistics (ONS) birth registration was incomplete until 1874. Therefore, the quality of the data for 1855-1875 is assumed to be lower than in later years and should be used with caution.

For Scotland, official birth and death figures for a given year are those registered during that year, a small number of which will have occurred in previous years due to late registration. The monthly number of registrations for 2020 does not reflect the actual number of births in many months. During the second half of March 2020 most registration offices closed due to the Covid-19 pandemic and most birth registrations were postponed. Therefore, monthly births for 2020 were excluded from the calculations. Given the weak seasonality of births in Scotland, we do not expect this to have any major impact on our final mortality estimates.

Revision NOTES

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://www.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 they have not been, and will not be, updated.

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REFERENCES

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Office for National Statistics (ONS) (2022). Population estimates for the UK, England, Wales, Scotland and Northern Ireland: mid-2021. Retrieved 19 September 2023 (<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annualmidyearpopulationestimates/mid2021>)

APPENDIX 1:

Description of the original data used for HMD calculations

DEATHS

Period	Type of Data	Age grouping	RefCode
1855-1962	Annual number of deaths to the <i>de facto</i> population, by sex and age groups (<i>nx1</i> rectangles)	0, 1, 2, 3, 4, 5-9, ..., 100+, unknown	2
1963-2021	Annual number of deaths to the <i>de facto</i> population, by sex and age groups (<i>1x1</i> rectangles)	0, 1, 2, ..., maximum age attained, unknown	3, 4, 5, 6, 7, 8, 18, 21, 25, 28, 35, 39, 43, 48, 52

POPULATION

Period	Type of Data	Age grouping	Comments	RefCode
1861, 1871, 1881, 1891, 1901	Census counts	0, 1, 2, 3, 4, 5-9, ..., 105+, unknown	<i>de facto</i> population	9, 10, 11,
1911, 1921	Census counts	0, 1, 2, 3, 4, 5-9, ..., 95-99, 100+, unknown	<i>de facto</i> population	12
1931	Census counts	0, 1, 2, 3, ..., 100+, unknown	<i>de facto</i> population	13
1912-1938	Annual mid-year population estimates (of permanent residents)	0-4, 5-9,, 85+, unknown	The data for 1912-20 exclude the military population	14
1939-1970	Annual mid-year population estimates (of permanent residents)	0,1,2,3,.....,85+, unknown	The data for 1939-50 exclude the military population	15
1971-2001	Annual mid-year population estimates (of permanent residents)	0,1,2,3,.....,90+, unknown	The data are revised according to the 2001 census results	15
2002-2010	Annual mid-year population estimates (of permanent residents)	0,1,2,3,.....,90+, unknown	Inter-censal estimates based on the 2011 census	26
2011	Annual mid-year population estimates (of permanent residents)	0,1,2,3,.....,90+, unknown	Post-censal estimates based on the 2011 census	27

POPULATION

Period	Type of Data	Age grouping	Comments	RefCode
2012-2014	Annual mid-year population estimates (of permanent residents)	0,1,2,3,.....,90+, unknown	Corrected post-censal estimates based on the 2011 census	32
2015-2021	Annual mid-year population estimates (of permanent residents)	0,1,2,3,.....,90+, unknown	Post-censal estimates based on the 2011 census	31, 36, 40, 44, 49, 53

BIRTHS

Period	Type of Data	RefCode
1855-2021	Annual live birth counts, by sex	1, 17, 20, 24, 29, 33, 37, 41, 45, 46, 50

BIRTHS BY MONTH

Type of data: Annual live birth counts by month

Period covered: 1954-2019, 2021.

RefCode(s): 23, 30, 34, 38, 42, 47, 51.

APPENDIX 2:

Figure 1. Female life expectancy at ages 65 and 80 in Scotland and Sweden, 1855-2021.

