

A NOTE CONCERNING THE CALCULATION OF THE SINGULATE MEAN AGE AT MARRAIGE

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Introduction

In the absence of a system of registration in which marriages are recorded, or in a system in which the recording of age at marriage is deficient, for example in the case of many developing countries, demographers will often attempt to estimate the mean age at marriage from other sources.

If a census or census-type survey exists for the area under investigation, recording accurately the ages and marital condition of the population, then since it records a retrospective statement of the populations age-specific marital behaviour, this can be used to provide an indirect measure of the mean age at marriage. The Singulate Mean Age at Marriage, or SMAM as it is often known, is one of the most widely used of such measures. The index was originally developed by John Hajnal in 1953 to investigate aspects of the post second world war 'marriage boom' across Europe, America and Australasia,¹ and subsequently used to examine historical variations in the marriage patterns of Europe, concluding that the continent was divided into two by a line running from Leningrad in the north to Trieste in the south, the western half of the continent being characterised by relative late marriage and high proportions remaining unmarried, compared with a marriage regime in the eastern half dominated by early marriage and the virtual absence of people never marrying.² In essence, the SMAM measurement compares the age-specific proportions of those who are single – or to use the demographic term, never-married – with those who are married or widowed – ever-married – calculating the mean age at which the transition between the two states was made.

Calculating SMAMs

Using data for the Registration County of Essex from the published returns of the 1851 census, the following example illustrates how SMAMs are calculated. In the standard calculation two key assumptions are made. Firstly, nobody will marry under the age of fifteen; secondly, those still never-married at age fifty will remain so for the rest of their lives. With these assumptions in mind, one should preferably separate the population by sex and then extract or calculate from the census data the proportions never-married in the seven quinquennial age groups 15-54, as listed below. It is these that will form the basis of the calculation of the SMAM and with the figures to hand the calculation can now be made.

Essex Registration County 1851, Females

Age	Population	% never-married
15-19	15,497	97.5
20-24	14,694	64.8
25-29	13,205	35.8
30-34	11,705	21.3
35-39	9,970	15.3
40-44	8,812	12.6
45-49	7,412	11.3
50-54	6,746	10.0

The first stage is to calculate the mean number of years of 'singleness' lived per hundred persons for the population in question (i.e. percentage). For those aged under fifteen, since it is assumed that no one of this age will marry, the calculation is straight-forward, being 15 years of 100 per cent:

$$15 \times 100 = 1,500$$

To calculate the years of singleness for those aged 15-49 one simply aggregates the quinquennial means of the six age groups and multiplies the result by five to gain the figure in single years:

$$(97.5+64.8+35.8+21.3+15.3+12.6+11.3) \times 5 = \text{total years of singleness 15-49}$$

$$258.6 \times 5 = 1,293$$

Therefore the total number of years of singleness experienced per hundred persons of the population up until age fifty is:

$$1,500 + 1,293 = 2,793$$

However, since some individuals in the population will remain unmarried throughout their lives, one needs to adjust this figure to take account of this situation. On the assumption that those who are still unmarried by the age of fifty will remain so, the proportion of the population who remain permanently celibate or never-married can be measured from an estimation of the proportion never-married at age fifty by averaging the proportions never-married for the two quinquennial age-groups 45-54:

$$(11.3+10.0) / 2 = 10.65$$

Therefore the estimated number of years of singleness experienced by those never-married by age fifty is:

$$10.65 \times 50 = 532.5$$

Consequently, for those in the population marrying, the total number of years of singleness experienced per hundred of the whole population is:

$$2,793 - 532.5 = 2,260.5$$

However, the actual proportion of the population who married by age fifty is:

$$100 - 10.65 = 89.35$$

This relates to 89.35 females per hundred in the 1851 population of Essex experiencing a total of 2,260.5 years of singleness before they married, giving a Singulate Mean Age at Marriage of:

$$2,260.5 / 89.35 = 25.299$$

Words of warning

Although an extremely useful measure, it must be realised that SMAMs are not the same as a straight-forward mean age of marriage. Firstly, SMAMs calculate ages at marriage by looking across the whole range of experiences of individuals aged between fifteen and fifty at a single point in time, with people of differing ages marrying at various different points in time, compared with true mean marriage ages which may be period and/or cohort specific measures. This may be important if the marriage patterns of an area are changing rapidly, with the result that those currently in their forties experienced a very different situation from those currently in their late teens and early twenties. Secondly, since unlike true mean marriage ages SMAMs are calculated retrospectively from census data, they are influenced by variations in both age and marital specific mortality and migration rates. For example, in the case of migration, if an area experiences a large-scale influx of young unmarried persons, say domestic servants, this will artificially inflate the proportions never-married and therefore also the SMAM. Equally, a relative out-migration of married couples would have the same effect. Clearly, one has to be aware of such effects especially when calculating SMAMs for local regional populations, the age structures of which can be significantly influenced by short-term shifts in age-specific mortality or migration levels.

Despite these reservations SMAM provides a useful index which in the absence of data yielding the ages of individuals at marriage can be used to compare the marriage patterns of populations over time or for different geographical regions. Although the standard model imposes assumptions concerning marriage under the age of fifteen and over fifty, if appropriate, these can be over-ridden simply by expanding the number of core quinquennial age groups under observation. Equally, if data are not available for the standard quinquennial age groups, but in say groups 15-19, 20-24, 25-29, 30-39, 40-49 etc., the basic equation can be adjusted accordingly to take account of the variation. Consequently, SMAM is a standard yet flexible index of marital behaviour that can be calculated easily from a variety of census-type information and applied in a comparative context.

NOTES

1. J. Hajnal, 'Age at Marriage and Proportions Marrying', *Population Studies*, 1953, 7(2), pp.111-36.
2. J. Hajnal, 'European Marriage Patterns in Perspective', in D.V. Glass and D.E.C. Eversley (eds), *Population in History: essays in historical demography*, London, 1965, pp.101-43; 'Two kinds of pre-industrial household formation system', in R. Wall, P. Laslett and J. Robin (eds), *Family Forms in Historic Europe*, Cambridge, 1983, pp.65-104. For the use of SMAMs within an historical regional context see P.R.A. Hinde, 'Household structure, marriage and the institution of service in nineteenth-century rural England', *Local Population Studies*, 1985, 35, pp.43-51.

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