

The demography and household patterns of the widowed in northern Europe 1600-1900

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Introduction

Our understanding of the demography of populations in the past has advanced considerably over the course of the past half century as a result of the development and refinement of new methodologies such as family reconstitution and back projection. The demography of widowhood in historical populations, however, has not yet been studied in detail because of the absence of systems of vital registers that would enable widows and widowers to be tracked from when they were widowed through to remarriage or death. Most studies of widowhood in the past are thus largely concerned with measurement of the interval between widowhood and remarriage for those widowed whose second or subsequent marriages took place in the same parish where they had resided in their first marriage. The more interesting aspects of widowhood such as the proportion of widows and widowers who eventually remarry, and the mean duration of widowhood for men and women widowed at different ages are rarely if ever measured. Indeed even the interval between widowhood and remarriage for the registering population is difficult to interpret as the death of a spouse is likely to increase the likelihood of migration out of the parish (and thus departure from observation) of the survivor and thus bias downwards the interval between widowhood and remarriage. Alternatively, if a significant proportion of the widowed remained only until they had an opportunity to remarry and settle in another parish, the interval to remarriage suggested by the registration data will be too long.

In order to develop the study of the past demography of widowhood, our recourse has been to use micro-simulation to produce estimates for populations in the past of the characteristics of widowhood that cannot be measured directly from the empirical data that are available, or can be achieved only with great difficulty and some uncertainty as to the reliability of the results. In the micro-simulation, reliable information on the demography of past societies, for example the distribution of ages at first marriage, age specific mortality rates, and frequency of lifetime celibacy, has been used to suggest the likely incidence of widowhood at different ages, the mean age of widows and widowers, and the duration of widowhood. The particular micro-simulation programme that has been used in this case is CAMSIM, constructed by Jim Oeppen of the Cambridge Group and is Jim Oeppen who wrote the programmes which generated the details on widowhood that we summarise and interpret below. In the context of the present paper the micro-simulation has been used only to simulate the pattern of widowhood in the English past. One reason for this is that in the case of England there is exceptionally little empirical data on the history of widowhood in comparison for example with the data available for other parts of Europe, notably Scandinavia with the first English national census to detail the age and marital status of the population being carried out in 1851. Another reason for applying the micro-simulation to the experience of widowhood in the English past in the first instance is that the demography which underpins it is based essentially on completed analyses of 28 family reconstitutions (Wrigley et al 1997). In

theory, however, the micro-simulation could be applied to any historical population for which reliable data of its demographic past are available.

Methodology

Before proceeding to consider what the micro-simulation suggests about the experience of widowhood, it is necessary to compare what the simulation suggests about the pattern of widowhood with some empirical data on widowhood in the English past. Many comparisons that we might wish to make, for instance of the mean duration of widowhood, are simply not possible because of the absence of appropriate empirical data. One comparison that can be made, however, concerns the ratio between the numbers of widows and the number of married couples as this can be derived both from the micro-simulation and from surviving local censuses (often referred to as listings). This may seem an unusual comparison to offer, as opposed say to the proportion of widowed in the total population or of widows of all females and is presented in this form as inspection of the listings suggests that there is less ambiguity about the identification of widows and married couples than of widowers, bachelors and spinsters. The results of the comparison are set out in Table 2.1 and are broadly similar in the micro-simulation and in the listings. The ratios of widows to married couples in three of the four half centuries beginning in 1650 are very close, indeed remarkably close given that they are produced using different methodologies, use different data (vital registration in one case and census type data in the other) and cover different populations. The trend over time indicated by both the micro-simulation and the listings for there to be fewer widows relative to married couples. Only in the period 1700-1749 is the similarity broken, for reasons that are unclear, with the micro-simulation indicating a peak in the ratio of widows to couples while the listings record a sharp fall in the ratio¹. We may risk, therefore, venturing further by examining what micro-simulation suggests about other aspects of the demography of widowhood in the past, aspects which at least in the English case cannot be tested against empirical data. We begin with a consideration of the average duration of widowhood.

The demography of widowhood

Table 2:2 suggests that there was little variation between the latter half of the seventeenth century and the early nineteenth century in the average length of widowhood. For women it lasted approximately 18 years and for men between 15 and 16 years. Women on average were widows a longer time than men spent as widowers but the differences were not great. In three of the sub periods, the difference was less than two years and at its greatest (between 1700 and 1749) it only reached 3.62 years. The 'additional' time women spent as widows represented between 9 and 19 percent of their life as widows indicative of the extra burden widowhood imposed on women apart from any deterioration in their standard of living.

¹ Some assumptions used in the micro-simulation might have influenced our estimates of the demography of the widowed. This issue is discussed in Appendix 1 with a brief report of the tests so far carried out to assess the impact of varying some of these assumptions.

The stability over the period 1650-1837 in the duration of widowhood is interesting because other aspects of the demography of England are known to have been changing and changing markedly at this time. In the latter half of the seventeenth century there was demographic stagnation; in the latter half of the eighteenth century and in the early nineteenth century, rapid growth (see growth rates in Table 2:4) as a consequence of a decline in the age of first marriage for women, some increase in marital fertility and lower mortality during both childhood and adulthood (Wrigley et al. 1997). Variations from period to period in age and sex specific mortality rates and in the ages of men and women at first marriage would seem to be self cancelling as regards their potential to increase or decrease the duration of widowhood. In the present case the impact of remarriage can be ignored as in the micro-simulation the remarriage rate has been held constant, see Appendix 1.

With Table 2:3 we turn to consider the length of life lived, on average, after a woman or a man was widowed for the first time. Here there is evidence of somewhat greater variation from one period to another than was found in the case of actual widowhood (compare Table 2:2). There was also much less of a difference between men and women in the number of years they lived after they were first widowed than there was for actual widowhood. Indeed the micro-simulation suggests that only in two periods (and in one of those to no great extent) did the average life expectancy of women when first widowed exceed that of men when widowed for the first time. This was an unexpected finding as the family reconstitutions show that in the English past women generally outlived men. The invisibility of generally higher male mortality in this set of results would appear to indicate that its impact is masked by the effect of the deaths of some women in early adulthood (the major killers being complications in childbirth and tuberculosis). The result was to lower the age at which men became widowers for the first time.

The micro-simulation has also been used to estimate the mean age of widows and widowers (see Table 2:4). There is again a marked absence of variation over time with the mean age of widows rising by just over a year between the latter part of the seventeenth century and the first half of the eighteenth and then stabilising. The mean age of widowers rose somewhat later and more gradually (by 0.7 of a year). In no period was there a gap of more than a year between the mean age of widows and widowers. Before 1700 widowers were on average a little older than widows; after 1700 widowers were a little younger on average.

It is to be expected that the average male will be younger than the average female because of the impact of higher male mortality. It does not necessarily follow, however, that the average widower will be younger than the average widow as other factors intervene such as the timing of widowhood both for men and for women and the chances of remarriage (higher for men than for women in reality and in the micro-simulation). Women's greater life expectancy would tend to increase the age at which men were widowed. However, higher male mortality also worked to remove older widowers from the population and therefore lower the mean age of widowers in the population. Before 1700 the former effect appears the stronger; after 1700 it is the latter.

Table 4:5 sets out the percentage of widows and widowers in various age groups. To avoid burdening the Table with too many numbers, results are presented for a selection of age groups (30-9, 50-9 and 30+) and not for the full spectrum of ages. For women the major change in the frequency of widowhood took place after 1750. Between 1700-1749 and 1750-1799 the percentage of widows of widows in all three age groups fell sharply and continued to fall after 1800. For men the change was less marked, and was not evident all for men aged 30-9 until after 1800.

In all three age groups a higher percentage of women were widows than men were widowers. Table 4:6 complements Table 4:5 and shows that the difference was larger within the age group 50-9 than among those over 60 and that it was also usually larger at 50-9 than between 30 and 39. The greatest disparity in the incidence of widowhood between men and women thus occurred when they were in their fifties. This seems to accord with what might be anticipated given higher male mortality. More difficult to comprehend, however, is the somewhat erratic variation over time in the frequency of widowhood among men and women aged 30-9. After 1750 men aged 30-9 were almost as likely to be widowers as women were to be widows. In the immediately preceding half century and also in the first half of the seventeenth century the risk of women in thirties experiencing widowhood were almost a third higher than that of men being widowers.

A further aspect to consider is the ratio between the numbers of widows and widowers in different age groups (see Table 2:7). Just as is the proportion of the female population at a particular age who were widows or of the male population who were widowers, the numbers of widows relative to the number of widowers in different age groups is an important feature in the social structure. Both the proportion widowed in the male and female populations and the relative numbers of widows and widowers at different ages will help frame perceptions of the male and female life course, defining what is normal and to be expected. The relative numbers and the proportion widowed when associated with deteriorating standards of living for the individuals concerned if not outright poverty, also have considerable significance for the communities of which they were members, indicating the extent of financial assistance that might have to be provided by others or at least reduced ability to contribute their share of community taxes.

In assessing the significance of these ratios of widows to widowers in Table 2:7 it is important to keep in mind the assumptions about remarriage rates that were used to produce the simulated population. These were that widowers were twice as likely to remarry than were widows, that there was no remarriage after the age of 45 and that rates of remarriage did not change over time (see Appendix 1). The effect of the second of these assumptions is that any variations in the ratios of widows to widowers after 45 will be determined by variations in mortality by age and sex derived from the family reconstitutions. On this basis the micro- simulation indicates that after the age of 50 the numbers of widows usually exceed the number of widowers. The second half of the seventeenth century, however, provides the exception indicating more widows than widowers both in late middle age and in old age. In the immediately succeeding period the situation then changes to one where there was a marked surplus of widows. Such a

dramatic change is the product of equally sharp fluctuations between 1650 and 1749 in the difference between mortality rates for males and females.

Within the age group 30-9 widowers generally predominated even though it has been assumed in the micro-simulation that widowers would remarry at twice the rate of widows. The explanation lies with higher male mortality coupled with a higher age at first marriage for men (the latter reducing the numbers of married men of this age who were married and at risk of becoming widowers). Exceptionally, however both in the first half of the seventeenth century and in the first half of the eighteenth century, the micro-simulations suggest that there were more than a quarter more widows than widowers. Fluctuations over time in the relative level of male to female mortality we again consider to be the key factor.

Tables 2:8 and 2:9 have been designed on the same principles as Tables 2:5 and 2:6 but focused on the percentage of men and women who had ever been widowed by the time they reached a given age. For the purposes of this calculation whether a widow or widower remarried or not becomes irrelevant. The proportions ever widowed are determined by the numbers who marry, ages at marriage and levels of mortality. The micro simulation suggests again that for women the major change in the proportions that had been widowed at least once occurred during the eighteenth century. Between the first and second half of his century the percentage of women aged 30-9 who had experienced widowhood fell by 2 percent, for women in their fifties by 6 percent and for women over 60 by 7 percent (see Table 2:8). For all three age groups the decline continued after 1800. For men there are signs of an earlier decline in the percentages ever experiencing widowhood between the second half of the seventeenth century and the first half of the eighteenth after an initial rise in the rate of widowhood during the seventeenth century. Apart from men in the 1700-1749 birth cohort aged between 30 and 39, men shared with women the decline in the incidence of widowhood after 1750.

The ratios between the percentages of men and women ever widowed at different ages are set out in Table 2:9. After the age of 50 the differences are generally slight. However, the situation of the population aged 30-9 differed markedly. In three of the periods the micro-simulation suggests that more than a fifth fewer women than men had experience of widowhood. In the first half of the seventeenth century and then again in the first half of the eighteenth century the incidence of widowhood was much more evenly shared between the sexes with just five percent fewer women having been widowed, offering further evidence of the impact on the frequency of widowhood of variations in ages at marriage and rates of mortality of younger males and females.

We may conclude this perspective on some aspects of the demography of widowhood in England between 1600 and 1837 with the observation that when the demographic characteristics of widows and widowers are examined in detail, there is evidence of change. We can see this for example in variations in the percentages of men and women in different age groups who had been widowed (Table 2:5), in the relative numbers of widows and widowers (Table 2:7) and in the proportions of men and women who had ever experienced life as a widower or widow. All this change, however, occurred in a

context in which some of the key characteristics of widowhood did not change with time. These invariant attributes included both the average age of widows and widowers (Table 2:4) and the average number of years lived in widowhood.

Widows and their households in England 1650-1891

Three broad aspects of the residence patterns of the widowed will now be considered: the proportion of households headed by widows, the proportion of widows who headed a household and the frequency with which the widow co-resided with children, other relatives or non-relatives, derived from analyses of local censuses (listings) and, for the late nineteenth century, enumerators' schedules from the census of 1891. Before the mid nineteenth century the evidence is admittedly fragmentary. The ideal strategy of selecting at random a set of populations and following the evolution of residence patterns of the widowed from the seventeenth through to the nineteenth century is simply not possible as most of the populations enumerated between 1650 and 1837 were enumerated on just one occasion. Each sub period examined within this period involves the analysis of a different set of populations. This makes it difficult to interpret any trend as there is always the possibility that what may appear a trend may in fact represent long lasting differences between different local populations. To counter this argument we have proceeded in two ways. First for each sub period we have calculated the average percentage of households where a widow or other woman was reported as the head. The average has been measured by the median in order to minimise distortions arising from the possibility of excessively high or excessively low percentages in particular populations or the impact of settlements with larger numbers of households. The median percentages of households with a female head, proportion of households headed by widows and headship rates for widows (Tables 2:10, 2:11 and 2:12) therefore represent as best we can given the relative rarity of local censuses for this period the experience of the 'average' community. The second approach has been to select different sub-sets of the local censuses to provide different perspectives on the role of widows as household heads. These analyses, presented in Tables 2:10-12, are mutually consistent indicating that the data on these households can be considered reliable.

We begin the analysis by reporting the extent of the variation between the late seventeenth and early nineteenth centuries in the percentage of households headed by a woman. Table 2:10 indicates that fewer households in the eighteenth century had a female head than had been the case in the second half of the seventeenth century. The decline is not marked (from 16 to 14 percent) but by the early nineteenth century the percentage of households where a woman was the head had fallen again to 12 percent. However the trend had been reversed by 1881 when the census registered higher percentages of households with a female head than in the seventeenth century in every region of the country, and substantially higher proportions in some regions (in Wales, the south-west and in the islands over 16 percent of households were headed by women). The average for England and Wales was 14.8 percent of households with a female head in

1881 (analysis of the machine readable version of the 1881 census carried out by Matthew Wollard of the Data Archive of the University of Essex)².

We have chosen to report first the proportion of female households rather than the proportion of households headed by widows as many more censuses record whether a household had a female head than identify her marital status. The vast majority of these female heads, however, will have been widows as is clear from comparison with the proportions of households headed by widows when this information is available. This analysis is presented in Table 2:11 and indicates a similar trend between the late seventeenth and early nineteenth centuries in the proportion of households headed by a widow to that in the proportion of households with any female head³. According to Table 2:11 the percentage of households where the head was a widow declined from 15.5 percent in the late seventeenth and early eighteenth centuries to 10.5 percent in the latter eighteenth century and 9 percent early in the nineteenth century. If those women heading households whose marital status was unspecified are counted as widowed, the trend is similar and the difference in the percentages modest (0.5 in two of the periods, 1 percentage point in another; it was largest at 2 percent in the first half of the eighteenth century). The ratio between the numbers of widows and numbers of married couples who headed households (column 3 of Table 2:11), which we would argue provides the best measure of the relative frequency with which widows head households as it is less subject to measurement error due to the failure to record marital status, also moves in the same direction. From a situation in the late seventeenth century where for every five households headed by a married couple one was headed by a widow, the situation had changed by the early nineteenth century to one where couple headed households outnumbered those headed by widows almost eight to one. However, as we saw in the case of the percentage of households headed by women, by 1881 the trend had reversed with 11.7 percent of households reporting that a widow was the head compared with 9 percent in the early nineteenth century.

² To produce this comparison households in 1881 headed by a married woman in the absence of her husband have been excluded on the grounds that such absences would not have been captured in the earlier local censuses which recorded the *de jure* (or usually resident) population whereas the national censuses enumerated the population actually resident on a particular night and thus noted occasions when the husbands were absent, temporarily or otherwise. It is possible, however, that some local censuses may have classed deserted wives with the widows or simply omitted any reference to their marital status. If this were the case then households headed in 1881 by a married woman should not be excluded from the totals of female headed households. The effect of their inclusion would be to emphasise the rise in the proportion of households with a female head by 1881, from 12 percent for the period 1800-1837 (table 2:10) to 17.5 percent in 1881.

³ Comparison of Tables 2:10 and 2:11 shows that for the period 1700-1749 the proportion of households headed by widows recorded in the smaller data set (Table 2:11) exceeds the proportion of households headed by women in the larger data set (Table 2:10) of which it constitutes a sub-set. In this particular case we consider the discrepancy occurs because of the impact of variations between populations in the proportions of households that were headed by widows and by other women and the extent of this variation will be explored in a fuller version of this paper through documentation of aspects of variation between populations in the proportions of households that were female headed (range and inter-quartile range in each period). Variation between populations may also explain why after 1750 three percent of households are headed by spinsters even if all women whose marital status is unknown are considered to be widows (Table 2:11). Another possibility, however is that increasing numbers of unmarried women were finding it possible to head households.

The period 1650-1837 also witnessed a steady decline in the headship rate for widows (Table 2:12). From a situation in the second half of the seventeenth century when almost three quarters of all widows headed the household in which they were resident, the proportion fell to one in the early nineteenth century where only just over half of all widows were enumerated as household heads.

Between the second half of the seventeenth centuries and the early nineteenth century the trend was or fewer households to have a widow as head and for fewer widows to head households. This emphasis on change may seem surprising to those familiar with Peter Laslett's claim that the mean size of English households in the pre-industrial period was 4.75 persons. Yet in fact we have known for some considerable time that the composition of English households did change over time, increasing in size and to some extent, complexity (more containing kin outside the nuclear family) in the latter half of the eighteenth century than had been the case earlier, changes occasioned in all probability by falling ages at first marriage, some increase in marital fertility and a fall in mortality at this time (Wall 1983). It is not too surprising therefore than when we focus on the residence patterns of a particular sub section of the population, in this case he widowed, more evidence of change in residence patterns becomes visible. The more important issue, however, is how the changes in the rate at which head households should be explained.

There are four possibilities that need consideration. The first can be called a compositional effect: the expansion over the course of time in sections of society in which widows had always been less likely to head households. The second is the impact of demographic change. Following declines in mortality in early adulthood during the eighteenth century one might expect the widowhood to occur progressively later in life, thereby ageing the widowed population which in turn left more widows in a situation where they were at greater risk of being absorbed into the households of others, in particular into those of their children. Thirdly there is the possibility of structural changes in the economy which affected the ability of numbers of women to maintain their own households. Such economic factors would include contracting opportunities in the labour market (as argued by Snell) but could also involve changes in inheritance practices which saw them receiving a smaller share of household assets after the decease of their husbands. The final possibility is a cultural change (either with or without changes in living standards) which made it less acceptable for widows to head households.

It is not easy given the current state of knowledge to identify with certainty what is the key determinant of changes in the frequency with which widows headed households, not least because the local censuses rarely reveal much detail about widows' standard of living. What we can attempt, however, is to indicate which of the various hypotheses about the causes of change in the resident widows' patterns seem more plausible. We may begin with the issue of the ageing of the widowed population as some evidence on this point was presented above. Tables 2:5 and 2:8 above do indicate a fall after 1750 in the percentage of younger widows and in women who had been widowed but subsequently remarried. However the population of widows appears not to have aged at

least as judged by their mean age which remained steady throughout the eighteenth century and into the nineteenth (Table 2:4). The impact of demography on changes in the incidence of widow headed households can thus be discounted.

Turning now to consider the possibility of economic and social changes, one of the problems is that it is necessary to explain both why fewer widows came to head households between 1750 and 1837 and why this trend was later reversed. The reversal of trend is particularly difficult to explain as it runs counter to the prevailing interpretation of the Victorian household which emphasises women's dependence on a male breadwinner (Janssens). This does not necessarily mean that the evidence of increasing proportions of households with a female head should be rejected, only that the trend requires further study. On the other hand, the earlier decline in the frequency with which widows headed households does seem to be compatible with our findings that in the eighteenth century widows were receiving a smaller share of the family's property following the death of their husband than had been the case in earlier periods (to be reported in Moring and Wall forthcoming). Whether this was also reflected in a reduction in the social position of the widow is another matter. This remains a theoretical possibility but at this juncture we would be reluctant to consider it as plausible without some firm evidence of its occurrence. At present there is none. Similarly, the impact on the residence patterns of the widowed of changes in the distribution of the population of widows between different sectors of the economy also has to be left unresolved although if further research supports the interpretation we have offered of changes in the circumstances of propertied widows, then this would diminish the significance of any change to the composition of the widowed population.

Widows and their co-residents

The frequency with which widows headed households is just one aspect of their residence patterns. In addition we also need to discover with whom they lived whether they had their own household or lived with others. One possible approach would be to consider the household patterns within the framework of the classification of household types devised by Peter Laslett and Eugene Hammel (Laslett 1972). This much used (but often criticised) scheme to classify households principally on the basis of their kinship structure is, however, ill adapted for our present purposes since it only identifies two categories of residence patterns in the case of the widowed: those who lived alone and those who lived with unmarried children in the absence of other relatives⁴. Accordingly we have experimented with new classification schemes that examine residence patterns from the perspective of the individual widow. The classifications have been developed from schemes favoured by certain sociologists in the 1960s (see for example Shamas et al.) but modified to cover the different residence patterns encountered in the past. Simplified versions of these new classifications are presented in Tables 2:13 and 2:14, first for three English populations enumerated between 1790 and 1821 and then for another set of English populations in 1891.

⁴ Nor are widows and widowers who lived alone distinguished although it would be easy to extend the classification in this way.

The purpose of Table 2:13 is to identify both the frequency with which widows co-resided with their children, distinguishing unmarried from married children, and the proportion of widows who lived alone or with non relatives only. Table 2:13 shows for three populations enumerated between 1790 and 1821 that the proportion of widows whose households contained none of their relatives could exceed a third. More than half of their households contained children. Between 10 and 18 percent of their households contained married children. This may seem surprising to those accustomed to the emphasis by Laslett on the dominance of the nuclear or simple family household in North West Europe and in England in particular. The difference arises primarily from the focus in the present context on the experience of a particular section of the population, widows, who are have more opportunity and in some cases more need to co-reside with married children. Our findings indicate that even in a situation when most households were simple in structure (few related persons present apart that is from a spouse and the unmarried children), around 1 in every 6 widows might have shared a household with a married child. In addition, a small percentage (5 percent in two of the populations but as many as 17 percent in Binfield) shared their households with other relatives in the absence of any resident children. Examination of the censuses reveals that many of these relatives were grandchildren. Others were siblings and there were also a few widows living with a parent or with more distant relative.

Table 2:14 illustrates a further classification of the residence patterns of widows to indicate the frequency with which they co-resided with children, servants and inmates in aggregated populations of 13 English and Welsh communities in 1891. With this larger data set it has been possible to divide the widowed on the basis of age (under 65 but over 40, from those over 65). Details on the co-residents of widowers have also been included for the purposes of comparison⁵. Analysis of the 1891 census signals the significance for widows of the presence of a child. Just over 7 in 10 widows in the age group 40-64 lived with a child as did more than half of all widows aged over 65. Of these older widows almost as many resided with a married child as with an unmarried one. The other major feature of the residence patterns of widows was the frequency of co-residence with non-relatives. More than a third of widows whether aged 40-64 or over 65 resided with a non relative of some sort, either a servant or an inmate or by sharing accommodation with other inmates or servants. Over 10 percent of widows lived in a household that employed a servant, the percentage increasing to 15 percent for widows over 65. Some differences between the residence patterns of widows and widowers are also evident. Widowers were less likely than were widows to co-reside with an unmarried child particularly if they were middle aged, but were more likely to have a servant in the household and to live with non relatives.

⁵ It will be noted that if the percentages in Table 2:14 are totalled they exceed 100. This occurs because each widow and widower, for example, who lived with a child, a servant or an inmate has been counted on each occasion. In addition the percentage of the widowed that lived with non relatives exceeds the sum of the percentages living with servants or inmates because the count of non relatives includes inmates and servants who lived in households with other inmates or servants. They were not considered as co-residing with a servant or an inmate as they did not employ the servant or provide the inmate's accommodation.

The CAMSIM micro-simulation can guide interpretation of these results in so far as they concern the co-residence of widows with children. For example of members of the 1851-1855 birth cohort who married it is estimated that around 85 percent would have at least one surviving child as they approached the age of 50 and about 83 percent when they were in their sixties and seventies (results reported in Zhao 1996:262, 265 and see Wall 2002: 147-8). The proportions of widows reported as sharing a household with a child were considerably lower than this indicating that in 1891 there were considerable numbers of widows with surviving children who did not co-reside with any of them. These children might of course have been living in the vicinity, as argued for example by Ruggles in the case of the United States (Ruggles 2003: 143). As widows aged, fewer lived with children even though they had children with whom in theory they might have lived. Relying on the calculations presented by Zhao and assuming that they would apply to the situation of widows in 1891, it appears that around a fifth of widows in their late forties with surviving children did not live with any of them. This increased to a third of all widows over the age of 65.

In the early part of the nineteenth century it would seem likely that even fewer widows with surviving children lived with them. Comparison of Tables 2:13 and 2:14 indicates lower rates of co-residence between widows and children than in 1891 reflecting we suspect more opportunities for children to live and work outside the parental home in the early nineteenth century rather than widows having significantly fewer surviving children. Confirmation of this hypothesis will be possible in due course through CAMSIM.

Further interpretations of the residence patterns of widows as revealed by Tables 2:13 and 2:14 is perhaps best postponed until we have additional information on the residence pattern of widows in the period before 1837. Ideally we would wish to examine whether there is evidence of the pattern of co-residence changing over time just as we saw in the case of headship. The existence (or not) of a trend may be difficult to verify because of the difficulty of locating sufficient numbers of local censuses that record both the marital status and relationship to the household head of all members of the household. Another critical aspect is the age of the widow and of any co-residents which would serve as a crude indicator of whether the widow was providing or receiving support from other members of the household (or indeed both).

Appendix 1

A number of important assumptions have been built into this application of the CAMSIM programmes. The simulation produces birth cohorts of individuals whose demographic characteristics have been predetermined. These individuals can be considered as a sample of unrelated individuals from a particular cohort in a stable population. In order, however, to compare the attributes of a cohort with empirically based cross-sectional data, the size of successive cohorts needs to be adjusted in accordance with the growth rate in the population indicated by the reconstitutions. The correction has been made in this instance by applying the appropriate stable population growth rate to each age group in each cohort. Assumptions embodied in the simulation are that the mean age at first marriage of each cohort matches that indicated by the reconstitutions with the distribution of marriage ages sampled from the Coale-McNeill marriage model for that mean age at marriage but with an age range of 15-50. It has also been assumed that the marriage ages of husband and wife were correlated ($r = 0.35$). The mortality rates used were those indicated by life-tables for the ever-married population in the reconstitutions. No adjustments were made for any differences in mortality dependent on marital status and the dates of death of husband and wife were assumed to be independent, the likelihood of the survivor dying neither increasing nor decreasing as a consequence of their widowed status. Other assumptions were rates of lifetime celibacy of 10 percent for men, and 12.5 percent for women, rates which remained the same over time, and a probability of remarriage of 25 percent for women and 50 percent for men at intervals indicated by the reconstitutions and subject to a maximum age at remarriage of 45.

The simplifying assumptions that it has been necessary to make to produce the simulations can certainly be challenged. There is evidence from the 1920s and 1930s of associations between the level of mortality and marital status in a number of national populations, both within and beyond Europe. For England there is also evidence to suggest that the frequency of remarriage did change over time as did the incidence of lifetime celibacy. However although this distances the micro-simulation from the historical reality, many of the characteristics of widowhood as set out in this paper such as the ratio of the number of widows to the number of married couples, the mean age of widows and widowers in different time periods and the duration of widowhood are likely primarily to have been determined by general features of the demography, the level of morality and, additionally, age at marriage in the case of the ratio of widows to married couples.

The impact of varying some of the assumptions used in the micro-simulation can be tested. Here we can report on two of these: variations in the probability of women remarrying and the rate of celibacy. In the case of remarriage it has been assumed that no widows remarried, that half remarried and that all remarried. It should be stressed that it is not that we consider that these rates of remarriage capture historical reality. They are introduced here simply to illustrate the effect of different rates of remarriage from that used in the micro-simulation, which we consider the most realistic, and which assumed a 25 percent chance of remarriage for women. Another set of assumptions were made in

conjunction with celibacy where it was assumed in turn that none 5 percent and twenty percent of women never married. The assumptions were applied to the simulated population for the period 1750-1799, holding constant all other aspects of the demography.

The results are presented in Appendix Table 2:1 in relation to the impact of varying assumptions on remarriage and celibacy on duration of widowhood, the average time lived after first widowhood and the mean age of the widows. Appendix Table 2:2 shows the impact on the percentage of widows in the female population at ages 30-9, 50-9 and 60+. According to Appendix Table 2:1, variations in assumptions about the rate of female celibacy would appear to have only a minimal impact on estimates of the mean duration of widowhood, mean expectation of life after a woman was first widowed and the mean age of widows. The same holds for the impact on the mean time elapsed since they were first widowed and the mean age of widows of variations in the rates of remarriage by women. The impact of varying assumptions about remarriage on estimates of the duration of widowhood is more considerable. Duration of widowhood would increase by almost 1.5 years if no widows remarried, or alternatively fall by more than four years if remarriage for widows was universal. Again we should stress that we do not consider either of these possibilities as realistic in the English context.

As regards the impact on estimates of the percentage of women widowed at various ages (Appendix Table 2:2), there is no evidence that modification of the assumptions about female celibacy or remarriage altered the trends over time in the incidence of widowhood as they are outlined above (Table 2:5) based on our preferred assumptions about celibacy and remarriage even though when extreme assumptions are adopted (for instance the assumption of universal remarriage or a fifth of women never marrying), do effect a radical change in the estimates of percentages of women at various ages who were widowed.

Appendix Table 2:1 Impact of variations in assumptions about female celibacy and rates of remarriage on estimates of duration of widowhood, life expectancy after first widowhood and mean age of widows 1750-1799

	%	Duration of Widowhood (years)	Time Lived Since First Widowed (years)	Mean Age
Remarriage by women	25	18.72	20.18	58.1
	0	20.07	20.07	57.1
	50	17.44	20.55	59.1
	100	14.01	20.47	61.9
Female Celibacy	12.5	18.72	20.18	58.1
	0	18.61	20.04	58.5
	5	18.79	20.35	58.5
	20	18.92	20.46	58.5

Appendix Table 2:2 Impact of variations in assumptions about female celibacy and remarriage on estimates of the percentage of widows in the female population at different ages 1750-1799

Remarriage by Women	%	30-9	50-9	60+
	25	7.1	30.2	54.8
	0	8.1	32.9	57.1
	50	6.1	27.4	53.0
	100	3.3	20.5	49.0
Celibacy	12.5	7.1	30.2	54.8
	0	7.5	33.8	62.8
	5	7.5	32.7	60.3
	20	6.4	27.2	49.8