

## SOURCES AND METHODS

This item considers a range of sources and methods commonly used in local population history. These vary in sophistication and complexity, but are intended to be of benefit to the broad *LPS* readership, and are accompanied by worked examples. Each item is written by an experienced population history practitioner, and will usually address both the possibilities and the pitfalls of the respective sources and methods under discussion. The *LPS* Board are happy to enter into correspondence on this item, which should be addressed in the first instance to the *LPS* General Office.

### MEASURING ILLEGITIMATE FERTILITY

Nigel Goose

In the first article in this series Andrew Hinde described the basic method of calculating birth and death rates, which requires knowledge of the number of vital events (births and deaths) occurring in a particular area and a knowledge of the size of the population 'at risk' of producing those events. The main problem for the parish register era (1538–1837) is not in ascertaining the number of events, for these are recorded in parish registers, even though some historians have questioned their general accuracy and nearly all historians accept that their quality varies, and deteriorates seriously over time.<sup>1</sup> The main problem, at least prior to the introduction of the national census in 1801, is in ascertaining the size of the population at risk. For the civil registration era (post 1837), the number of events is recorded far more regularly and accurately, and the size of the population at risk can be easily ascertained at ten-year intervals from the decennial census, but the geographical units employed are unsuitable for local analysis, the data published in the *Annual Reports of the Registrar General of Births, Deaths and Marriages* only extending down to registration sub-districts, representing groups of parishes, not individual parishes themselves. Furthermore, nominal information is unavailable, preventing the use of the civil registration data for the purposes of family reconstitution.<sup>2</sup>

Similarly difficulties arise when attempting to calculate illegitimate fertility, but for the parish register era those difficulties are particularly intractable. Parish registers do not regularly record the proportion of baptisms that relate to illegitimate births, and hence for most parishes there is no evidence at all to call upon, at least not before 1812.<sup>3</sup> To establish levels of illegitimacy before the advent of civil registration, therefore, historians have relied upon the relatively small number of registers that do regularly identify illegitimate births. Peter

Laslett's path-breaking work on illegitimacy relied upon the evidence found in just 98 parish registers, one per cent of the 10,000 or so parishes in England and Wales.<sup>4</sup> Even then the full sample of 98 registers only provided usable information from 1660 to 1809: before 1660 the number in the sample steadily declines, to just 50 in the 1570s, while prior to the 1570s Laslett describes the data as providing only 'somewhat unsatisfactory indications'.<sup>5</sup> These parish registers had all been examined by volunteer researchers whose main concern was to collect information on baptisms, marriages and burials for the purposes of aggregate analysis. On checking a sample of this data, Richard Adair reached the conclusion that as many as one-third of illegitimate births had been missed, and thus he set about personal examination of a much larger sample of 250 registers as the basis for his regional analysis of the subject.<sup>6</sup> This still amounts to a small proportion of the total number of parishes, but did provide Adair with a sample large enough to reveal a sharp contrast before the mid seventeenth century between a Highland Zone of relatively high illegitimacy and a Lowland Zone with much lower rates, a contrast that he explained in terms of divergent courtship regimes, possibly allied to greater economic instability. After that date, the two regions coalesced.<sup>7</sup>

Survival of information on illegitimacy is far from the only problem facing the historian of this topic in the parish register era, for even when seemingly reliable information does survive the methods of measurement available to us are crude. Again we confront the problem of the population 'at risk', and in this case the population at risk is not the whole population of a parish, but the number of single women (never married, divorced or widowed) of child-bearing age. As we have no means of knowing their number, population historians have had to fall back on the calculation of a crude 'illegitimacy ratio', consisting of the ratio of illegitimate baptisms to all baptisms, usually expressed as a percentage. Five or ten-year periods are commonly employed to smooth the undue influence of exceptional years. Hence for the mythical parish of Dimchester, we would count all of the illegitimate baptisms recorded in a particular decade, divide this by the total number of baptisms in the same decade, and multiply by 100 to produce a percentage:

$$\frac{18 \text{ (illegitimate baptisms 1621-30)}}{589 \text{ (total baptisms 1621-30)}} \times 100 = 3.06$$

This reveals that Dimchester roughly conforms to the 'national average' for this decade calculated by Adair from a sample of 250 parish registers.<sup>8</sup>

The illegitimacy ratio is, however, a rather crude measure, for it can be influenced by a range of factors other than the number of illegitimate births. As it does not relate the number of illegitimate births to the population 'at risk', it can be affected by the age, sex and marital composition of the population. A population that contains a much higher than usual proportion of single women aged 15–24, for example, will be much more likely to produce a high illegitimate fertility ratio. Furthermore, unless illegitimate and legitimate births move in parallel, changing levels of marital fertility will also affect the ratio of illegitimate births.<sup>9</sup> Historians have comforted themselves by claiming that

such differences are unlikely to subvert broad, regional differences, or by arguing that where both rates and ratios can be calculated the basic trends are similar.<sup>10</sup> For detailed studies at the local level, however, illegitimate fertility *rates*—which compare the number of illegitimate births to the number of women at risk—are usually preferable to illegitimacy ratios. Of course, one of the criticisms of the illegitimate fertility ratio—that it will be influenced by levels of *marital* fertility—might also be interpreted as a strength, for the ratio will reveal the proportion of total births that are illegitimate (a subject of obvious interest to the social historian), while the rate will not.<sup>11</sup> It might be advisable, therefore, to calculate both rates and ratios where possible. For the parish register era, however, it will never be possible to calculate illegitimate fertility rates, and hence there is no alternative to reliance upon illegitimate fertility ratios.

The civil registration data published in the *Reports of the Registrar General of Births, Deaths and Marriages*, allied to age and marital structure derived from decennial censuses, allows examination of levels of illegitimacy that avoid these drawbacks.<sup>12</sup> Unfortunately, as the *Reports* only record data for Registrar's Districts and sub-districts, they rarely allow examination of individual parishes, and hence cannot provide the depth of insight made possible by detailed, local studies employing nominal record linkage and parish register reconstitution.<sup>13</sup> They do, however, provide not only a clear measure of levels of illegitimacy in relation to the population 'at risk', but also the opportunity to employ a consistent source to compare and contrast local patterns within and between counties without incurring the opportunity cost that time-consuming nominal record linkage techniques entail.

To date illegitimacy rates have only been systematically calculated at county level for the years 1870–2, 1880–2, 1890–2 and 1900–02, and at Registration District level for 1861.<sup>14</sup> The results of more detailed work on the county of Hertfordshire, designed to determine whether or not the straw plait areas of the county exhibited higher levels of illegitimate fertility than the non-straw areas (as contemporaries frequently suggested), is presented in Table 1.<sup>15</sup> The data takes information on legitimate and illegitimate births from the *Annual Reports of the Registrar General*. To produce the illegitimate fertility ratio, expressed in Table 1 as a percentage, all that was necessary was to divide the number of illegitimate births by the total number of births and multiply by 100 (as explained above). A nine-year average, centred upon the census year 1851, was employed to avoid possible distortion produced by the odd exceptional year. Calculation of the marital fertility rate and illegitimate fertility rate required identification of the population at risk: in the former case married women aged 15–44, in the latter single women (whether never married, divorced or widowed) in the same age group. To calculate the marital fertility rate, which is conventionally expressed as so many per thousand, the average number of legitimate births across the years 1847–55 (again a nine-year average) was divided by the number of married women aged 15–44 identified in the 1851 census, and the result multiplied by 1,000. This is the equation for the sub-district of Baldock:

$$\frac{233.8 \text{ (average no. legitimate births 1847-55)}}{952 \text{ (no. married women age 15-44 in 1851)}} \times 1,000 = 246$$

To calculate the illegitimate fertility rate, also conventionally expressed as so many per thousand, the average number of illegitimate births across the years 1847–55 was divided by the number of unmarried women age 15–44 identified in the 1851 census, and the result multiplied by 1,000. The equation for Baldock reads:

$$\frac{15.6 \text{ (average no. illegitimate births 1847-55)}}{938 \text{ (no. unmarried women age 15-44 in 1851)}} \times 1,000 = 16.6$$

Of course, to produce these calculations at sub-district level requires knowledge of the age and marital structure of these districts, and this is not always readily available in the published census reports. Indeed, this information is only regularly available at the level of the Registration District in the reports, and hence the rates that can be readily calculated relate to broad areas rather than to localities.<sup>16</sup> With regard to Hertfordshire, the calculations in Table 1 were made possible by the prior digitisation of the census enumerators' books for the county, the work of numerous hands over many years.<sup>17</sup>

The data in Table 1 can be used to demonstrate the potential unreliability of the illegitimate fertility ratio compared to the illegitimate fertility rate. For although there is indeed a good *general* correspondence between the ratios and the rates shown in this table (the correlation coefficient between the two series is a fairly strong one, standing at 0.81), close scrutiny of the data highlights problems. In Ware, for example, the ratio stood only slightly higher than the county average, but its illegitimacy rate was the second highest of all the sub-districts. By contrast in the St Albans district the ratio was easily the highest in the county, but the illegitimacy rate, while high, was only the sixth highest of the sub-districts. The explanation for these discrepancies lies in the age, sex and marital structure, and the levels of legitimate fertility, in these two districts. In Ware there was a balanced sex ratio (99 males per 100 females), a low ratio of single/widowed to married women aged 15–44 (87 per 100), and a marital fertility rate a little above the county average. In St Albans the sex ratio was heavily skewed towards women (91 males per 100 females), the ratio of single-widowed to married females ages 15–44 was very high indeed (133), and marital fertility was very low. Together these features served to depress the illegitimacy ratio in Ware, and to exaggerate it in St Albans, creating misleading impressions of the tendency of the 'at risk' populations to produce illegitimate offspring. More generally, examination of the conflated figures for straw and non-straw, and rural and urban, districts at the foot of Table 1, suggests that differences are exaggerated by ratios compared to illegitimate fertility rates. Part of the explanation lies in different levels of marital fertility, particularly the higher level in the rural non-straw districts compared with the rural straw districts, but more significant still is the relative proportions of women aged 15–44 who were single/widowed or married, which were consistently substantially higher than average in the straw and urban regions of the county, and lower in the non-straw and rural regions.<sup>18</sup>

**Table 1 Marital and illegitimate fertility rates, and illegitimate fertility ratios, in Hertfordshire 1847–1855**

Registration district	Registration sub-district	Straw district	Urban/rural	Marital fertility rate	Illegitimate fertility rate	Illegitimate fertility ratio (%)
Ware	Hoddesdon	No	R	229	4.5	2.6
	Stanstead	No	R	282	19.9	6.5
	Ware	No	U	278	26.8	7.8
	Standon	No	R	273	16.7	4.7
Bishop's Stortford	Sawbridgeworth	No	R	252	16.5	5.5
	Stansted	No	R	296	18.3	4.7
	Bishop's Stortford	No	U	282	24.4	9.2
	Braughing	No	R	287	23.1	6.5
Royston	Buntingford	No	R	271	20.0	6.1
	Royston	No	R	281	18.1	5.3
	Melbourn	No	R	280	20.4	5.6
Hitchin	Baldock	Yes	R	246	16.6	6.2
	Hitchin	Yes	U	296	27.8	9.6
Hertford	Watton	No	R	295	18.9	5.3
	Hertford	No	U	230	13.1	6.3
Hatfield	Hatfield	Yes	R	274	21.6	7.7
	Welwyn	No	R	305	14.5	5.4
St Albans	Harpenden	Yes	R	272	21.8	8.0
	St Albans	Yes	U	254	24.3	11.4
Watford	Bushey	No	R	311	12.2	4.4
	Watford	No	U	278	24.2	9.3
	Rickmansworth	No	R	282	25.5	8.5
	Abbots Langley	Yes	R	283	14.6	5.2
Hemel Hempstead	Kings Langley	Yes	R	287	17.2	6.7
	Hemel Hemp.	Yes	U	274	19.7	7.4
	Flamstead	Yes	R	305	26.5	8.1
Berkhamsted	Berkhamsted	Yes	U	283	19.0	8.4
	Tring	Yes	U	268	21.1	7.8
Hertfordshire				274	20.3	7.3
Straw industry districts				274	22.2	8.5
Non-straw districts				274	18.5	6.3
Rural straw districts				270	19.7	7.2
Rural non-straw districts				279	17.4	5.5
Urban districts				271	22.6	8.8
Rural districts				276	18.2	6.0

Much more could be said about illegitimate fertility and its measurement. When employing the aggregate techniques described here for the nineteenth century, the location of workhouses might influence the calculation of illegitimate fertility rates and illegitimacy ratios. There is much evidence that

workhouses tended to be used by the mothers of illegitimate offspring as lying-in hospitals, particularly as such mothers were often denied outdoor poor relief, and this might produce a peculiar concentration of illegitimate births in those sub-districts where workhouses were situated.<sup>19</sup> Consider, for example, the baptisms in the five north Hampshire parishes of Basing, Cliddesden, Ellisfield, Farleigh Wallop and Winslade with Kempshott between 1841 and 1891. The total number of baptisms in each parish, and the illegitimacy ratios, are as follows: Basing 1,706, 16.9 per cent; Cliddesden 404, 7.7 per cent; Ellisfield 368, 4.1 per cent; Farleigh Wallop 153, 7.8 per cent; Winslade with Kempshott 196, 4.6 per cent. The illegitimacy ratio in Basing is more than double that of any of the other parishes, because the parish of Basing contained the workhouse for the Basingstoke Union within which all five parishes were situated.<sup>20</sup> When working with registration districts rather than parishes, however, there should be no such distortion as long as each district used its own Union workhouse, while at sub-district level the degree of distortion will usually be less pronounced than at the level of the parish.<sup>21</sup> Another possibility is that pregnant unmarried women may have returned to their parishes of birth to have their child, whose birth would thus be recorded in a parish where the mother was not ordinarily resident. More detailed analysis of illegitimacy is also possible using nominal record linkage, as employed in family reconstitution, but this is a topic that will be incorporated in a general discussion of record linkage techniques in a future article in this series.

#### NOTES

1. The shortcomings of vital registration and estimates of the correction factors that need to be applied at different periods are discussed at length in E.A. Wrigley and R.S. Schofield, *The population history of England 1541-1871: a reconstruction* (London, 1981), 15-154. For a discordant voice see P. Razzell, 'An evaluation of the reliability of Anglican adult burial registration', *Local Population Studies*, 77 (2006), 42-57.
2. Scotland is an exception in this respect.
3. In 1812 printed forms were introduced, and the proportion of illegitimate baptisms can generally be established by identification of the proportion that do not give the name of the father.
4. P. Laslett, K. Oosterveen and R.M. Smith eds, *Bastardy and its comparative history* (London, 1980), 12-15. This sample was first presented in P. Laslett, *Family life and illicit love in earlier generations* (Cambridge, 1977). The original research on this topic by Laslett and Oosterveen relied upon just 24 parishes for the period 1560-1810: P. Laslett and K. Oosterveen, 'Long-term trends in bastardy in England: a study of illegitimacy figures in the parish registers and in the reports of the Registrar General 1561-1960', *Population Studies*, 27 (1973), 260.
5. Laslett et al. *Bastardy*, 12.
6. R. Adair, *Courtship, illegitimacy and marriage in early modern England* (Manchester, 1996), 48-9.
7. Adair, *Courtship*, 224-7.
8. Adair, *Courtship*, Figure 2.1, 49.
9. E. Shorter, J. Knodel and E. Van De Walle, 'The decline of non-marital fertility in Europe', *Population Studies*, 25 (1971), 379-80; Laslett et al., *Bastardy*, 15; Adair, *Courtship*, 25-6.
10. Adair, *Courtship*, 26-7; Laslett et al., *Bastardy*, 15-16.
11. Take two parishes each with 500 women aged 15-44 and of whom 300 are married and 200 unmarried (and therefore 'at risk'). In parish one there are 90 legitimate births per year and 10 illegitimate; in parish two there are 40 legitimate births and again 10 illegitimate. The illegitimate fertility rates of the two parishes are identical at 10/200 = 50 per 1,000. But the ratios are very different: 10 per cent in parish one and 20 per cent in parish two. My thanks to Andrew Hinde for

pointing this out and providing me with this worked example.

12. The data is not consistently recorded for the late 1830s and early 1840s, however.
13. Some examples of studies of this kind include: K. Oosterveen and R.M. Smith, 'Bastardy and the family reconstitution of Colyton, Aldenham, Alcester and Hawkshead', in Laslett et al., *Bastardy*, 94-121; S. Stewart, 'Bastardy and the family reconstitution studies of Banbury and Hartland', in Laslett et al., *Bastardy*, 122-40; D. Levine, *Family formation in an age of nascent capitalism* (New York, 1977), ch. 9; B. Reay, *Microhistories. Demography, society and culture in rural England, 1800-1930* (Cambridge, 1996), 179-212; S. King, 'The bastard prone sub-society again: bastards and their fathers and mothers in Lancashire, Wiltshire, and Somerset, 1800-1840', in A. Levene, T. Nutt and S. Williams eds, *Illegitimacy in Britain, 1700-1920* (Basingstoke, 2005), 66-85
14. Laslett et al., *Bastardy*, 'Introduction'; Woods, *Demography*, Fig. 4.12, insert following p. 96, p. c.
15. This is discussed more fully in N. Goose, 'How saucy did it make the poor? The straw plait and hat trades, illegitimate fertility and the family in nineteenth-century Hertfordshire', *History*, 91 (2006), 530-56.
16. For 1851 marital status by age group is only available at county level in the published census report.
17. Now available on CDRom: N. Goose ed., *The Hertfordshire Census 1851: family history edition* (Hatfield, 2005) – available from the author.
18. The ratio of single/widowed to married women aged 15-44 in Hertfordshire stood at 105:100. For the straw industry districts it was 113, for non-straw 98; for rural straw districts it was 105, for rural non-straw districts 93; for urban districts 115, for rural districts 97.
19. See, for instance, A. Perkyns, 'The admission of children to the Milton Union Workhouse, Kent, 1835-85', in this issue (*Local Population Studies*, 80 (2008), p.67).
20. I am again grateful to Andrew Hinde for supplying this example.
21. For example, in Table 1 above, St Albans sub-district (where the workhouse was situated) quite properly received and recorded illegitimate births in the workhouse from erstwhile inhabitants of the parishes of St Albans, St Peter, St Michael, St Stephens and the out-hamlets that surrounded the town—population 11,160—while also receiving illegitimate births in the workhouse from erstwhile inhabitants of the parishes of Harpenden, Sandridge, Wheathampstead and Redbourn (the sub-district of Harpenden)—population 6,831. That is, almost two-thirds of the population of the district quite properly fell within the jurisdiction of the sub-district where the workhouse was situated.