PARISH REGISTER AGGREGATE ANALYSES:
the *Population history of England* database and introductory guide

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The cover illustration is 'The young family mourning in the churchyard' taken from T. Rowlandson's *The English dance of death.*

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INTRODUCTION

The data published on the accompanying CD-ROM are the monthly frequencies of baptisms, burials and marriages recorded in the registers of 404 English parishes. Aggregated they formed the basis of a reconstruction of English population history from the sixteenth to the nineteenth century that Tony Wrigley and I published nearly twenty years ago under the title *The population history of England, 1541–1871: a reconstruction*.[1] Recently, Tony Wrigley and I, together with Ros Davies and Jim Oeppen of the Cambridge Group, published a second book which took a different method of analysis, family reconstitution, and applied it to a very much smaller set of parishes, only in fact 26 parishes, to derive some detailed demographic characteristics, such as age at marriage, age-specific marital fertility, and the chance of dying when an infant or an adult. Although this book, which is entitled *English population history from family reconstitution, 1580-1837*, fills in some detailed demographic behaviour missing from the Population history of England (henceforward cited simply as *PHE*), it does so in a way which can be said to strengthen the earlier book's conclusions.[2]

When, in fact, we wrote the earlier book, based on the numbers of events, we concentrated on national population trends and their relation to economic circumstances, and only occasionally considered local variations. However, it is evident that the demographic experiences of individual parishes were far from uniform and much work needs to be done in identifying and explaining local differences. Only in this way can those aspects of English demographic and economic history in which there was uniformity of behaviour throughout the country be distinguished from those where the national aggregate reflects an average condition that few communities may actually have experienced, and which may therefore tend to lead to misguided conclusions about the relations between demographic and economic behaviour in the past. For example, the striking absence of evidence that changes in food prices exerted any considerable influence upon either short- or long-term national mortality fluctuations deserves extensive local and regional study to test the possibility that such influences must have been present locally but were masked by aggregation.

The monthly totals of events were tabulated with the assistance of a large number of local historians.[3] Indeed, the volume of the basic data was so great (some three and a half million monthly totals were involved) that their collection far exceeded our own resources. The reconstruction of the population history of England, therefore, owed an immense debt to local historians and, as a mark of our appreciation, we dedicated our book to them. We also resolved that the data should be made generally available so that local historians could use them both to pursue their own interests and to contribute to a fuller appreciation of the national picture. Accordingly we are happy to join with *Local Population Studies* in publishing in as convenient a form as possible the basic monthly totals of events registered in each of the 404 parishes. For each parish we have also provided some derived statistics on seasonality and epidemic mortality, and we have added a few items of standard information on the geographical, social and

economic characteristics of the parishes which we hope will prove helpful in interpreting the results.

This introduction to the data and their uses will first give a brief description of the different items of information and the way in which they have been laid out on the CD-ROM. Then the quality of the data will be discussed, in particular the accuracy of the tabulations and the degree of under-recording of vital events in the Anglican parish registers. Finally, some suggestions will be made on the ways in which the parish information can be used to throw light on such questions as seasonality, crisis mortality, short-run fluctuations and long-term population change. Throughout this introduction reference will often be made to *PHE* for a fuller discussion of particular points, or for a national framework within which local patterns can be compared and appreciated.

1. THE DATA

The CD-ROM is arranged in as convenient way as possible for all potential users of the data. There are three main sub-directories: EXCEL, TEXT and CHARACT. Each of these sub-directories contain a number of directories each representing one county. Within each of these county directories are the parish files. Therefore each parish is represented by three files, one in each of the county sub-directories which in turn are in the three main directories. The basic data are held in two formats; Excel workbook and in formatted text. The 'parish characteristics', are held solely within text files.

For each parish the following data are provided. The titles to the right of the page represent the names of each worksheet within the parish workbook in the EXCEL version.

monthly and annual totals of baptisms	('bap_year')
monthly and annual totals of burials	('bur_year')
monthly and annual totals of marriages	('mar_year')

(These have all been corrected as defined in the section 'Defective data' below.)

monthly and annual totals of baptisms by decade	('bap_10')
monthly and annual totals of burials by decade	('bur_10')
monthly and annual totals of marriages by decade	('mar_10')
monthly seasonality index of baptisms by half-century	('bap_50')
monthly seasonality index of burials by half-century	('bur_50')
monthly seasonality index of marriages by half-century	('mar_50')
original monthly totals of baptisms	('bap_orig')
original monthly totals of burials	('bur_orig')
original monthly totals of marriages	('mar_orig')

(The data are reproduced only for those years in which they were replaced by corrected frequencies.)

periods of epidemic mortality, with information on duration and severity	('crisis')

Additional information about each parish (e.g. population size in 1811, distance to nearest market town, etc.) are found in text files in the CHARACT sub-directory.

It should be noted that the Microsoft Excel files can be read by most Windows 95 compliant spreadsheet packages, such as Quattro and Lotus 1-2-3.

The text files have been created as a by-product of the formatting for EXCEL spreadsheets. They are thus slightly harder to use, as all the headings describing the data have been removed. However, each of the 'tables' represented in the EXCEL spreadsheets is represented in text format, and each of the tables can be found in the same order as listed above. In some cases, where there was no defective data, the tables of original monthly totals are missing, thus while the sequence of tables is always the same, the number of tables in the text files varies.

The notes below give further information on all of the data provided on the CD-ROM.

1.1 Baptisms, burials and marriages

The information on baptisms, burials and marriages can be found in the worksheets 'bap_year', 'bur_year', and 'mar_year'. The information relating to individual years is laid out in a standard format. First the calendar year is identified, then the monthly totals of registered evens are given for January to December, followed by the annual total. The latter may be greater than the sum of the monthly totals if events were dated so imprecisely that they could not be assigned to a particular month.

Periods of registration covered

The years for which registration data are available vary according to parish and series reflecting the accident of survival of register volumes, other interruptions in parish registration, or the availability of transcripts from which the tabulations were made. All parishes, however, have data that run without serious interruption through a minimum 'core' period of 1662 to 1811.[4] On each of the three worksheets, the years before continuous registration begins are indicated by asterisks in the column representing January. The last year for which data are printed is 1839, and if registration data cease to be available before that date, asterisks are again placed on the appropriate lines.

Defective data

If data are lacking, or defective, for some months or years within the period covered by the register, the appropriate lines have been annotated with a hash sign (#) in the column following the annual total. In such cases the data printed in the main body of information are the corrected monthly and annual totals of events. The corresponding original totals for the years affected can be found in the worksheets named 'bap_orig', 'bur_orig' and 'mar_orig', as described below.

The methods by which periods of defective registration were identified, and the corrected monthly totals calculated, are described in detail in *PHE* (pp.20–32, and appendices 12 and 13). It should be remembered that these methods were designed to give reasonable results over a large number of parishes, and often represented a compromise between many conflicting considerations. Consequently, the corrections made in any particular instance may appear less

than ideal, and the reader may be able to improve upon them. For example, the corrected values were calculated by interpolating smoothly across a period of defective registration, and then adjusting the monthly totals involved to take account of fluctuations to be found amongst the whole set of parishes that had complete registration during this period. In this way a parish might acquire a general seasonal pattern of events that it did not experience, or might appear to suffer from a fluctuation in mortality that was widespread, but did not actually affect the parish. The purpose of providing the original monthly totals of events in the three worksheets entitled 'bap_orig', 'bur_orig' and 'mar_orig', is of course, to enable the user to see the magnitude of the changes made and to work with the uncorrected, but defective, data, if that should appear preferable.

Seasonal indices

Two series of seasonal indices are provided on the CD-ROM. The first, comprising the worksheets, 'bap_10', 'bur_10' and 'mar_10' are simply ten-year totals of events by month, for the whole decade. It should be noted that if a complete decade of data can not be found in the basic data it will still be provided here.

In order to bring out the seasonal patterns more clearly the monthly totals are first aggregated into half-centuries, and that has been expressed in relative terms by calculating an index number that has been scaled so that the value 100 would represent an even distribution of events by months, based on a uniform daily rate with no seasonal pattern at all. For each parish, therefore, it is easy to pick out the seasonal pattern simply by observing how far the monthly seasonal index numbers for each half-century diverge from the 'even split' figure of 100. For example, an index number of baptisms for 105 in January and 90 in July would mean that baptisms in January were running at 5 per cent above the average daily rate over the whole half century, while in July they were running at 10 per cent below average. These data are found in the worksheets, 'bap_50', 'bur_50', and 'mar_50'.

1.2 Other information

The three worksheets, 'bap_orig', 'bur_orig' and 'mar_orig' contain the *original* monthly and annual totals of baptisms, burials and marriages for the years annotated with a hash sign in the first three worksheets, indicating that they contain one or more periods of defective registration, as explained above.

Epidemics

This worksheet contains summary information of periods of epidemic mortality detected in the parish: the months when they began, reached a maximum, and ended, followed by the duration of the epidemic in months, and two indicators of its severity. The first (headed 'SR Peak') is the ratio of the number of burials in the *maximum* month of the crisis to the 'normal' number of burials, forecast for that month on the basis of mortality before the epidemic. The second indicator (headed 'SR Total') is a similar ratio calculated for the whole crisis period. The

identification of an 'epidemic' presupposes some rules for deciding that mortality over a period of one or more months was high enough to warrant distinguishing it from normal 'endemic' mortality. Usually some conventional ratio is taken, for example, twice the normal months numbers of burials.[5] The epidemics listed here were identified in a rather different manner. Instead of a fixed ratio, the criterion used was a measure of the probability that the numbers of burials recorded in any month, or sequence of months, were too great to have arisen by chance given the normal, endemic, levels of mortality.[6]

Parish characteristics

The characteristics for each parish are found in a separate file under the CHARACTERISTICS sub-directory. These files are text files and are best viewed in a mono-spaced font. Some of this data were collected so that we could check the representativeness of the parishes in terms of their, size, location, occupational structure and so forth, and the results of this exercise are reported in chapter 2 of *PHE*. Other items of information were collected in connection with other studies, or specifically for the purpose of relating the population history of parishes to their geographical, social or economic characteristics. Where data were lacking under any head, the entry has been left blank.

Table 1 gives the sources from which the data on parish characteristics were taken, and adds some explanatory notes. Several of the items are discussed in chapter 2 of *PHE*, but all need careful evaluation in the light of local circumstances.

Table 1 Parish characteristics

Heading	Source
Position*	*Ordinance Survey Maps*: 1 inch to 1 mile (1946–7 edition)
Altitude	*Ordinance Survey Maps*: 1 inch to 1 mile (1946–7 edition)
Population	1811 figures as revised in 1851 census, *Numbers of inhabitants, vols. I and II*, Parliamentary Papers [hereafter PP] 1852–3, lxxxv–lxxxvi.
Farming type	J. Thirsk, 'The farming regions of England' in J. Thirsk ed., *The agrarian history of England and Wales, 1540–1640*, IV (Cambridge, 1967), 1–112.
Soil type	D. P. Bickmore and M. A. Shaw, *The atlas of Great Britain and Northern Ireland* (Oxford, 1963).
Aggregation	County maps published by A. Bryant (Bucks, Herefordshire, Norfolk, Oxfordshire: 1824–35); R. G. Baker (Cambridgeshire: 1830); A. Dury and J. Andrews (Hertfordshire: 1782); C. [and J.] Greenwood for all other counties 1818–31).
Open/closed	1798 Land Tax returns, or nearest available assessment, in County Record Offices.
Market towns	1640: A. Everett, 'The marketing of agricultural produce', in Thirsk, *Agrarian History* (see 'Farming Type' above), 468–75. 1700: J. Adams, *Index villaris* (London, 1700).
Gentry seats	1700: J. Adams, *Index villaris* (London, 1700).
Poor	1784: PP 1803–4, XIII. 1818: PP 1818, (224) IX 1832: PP 1835, XLVII.
Real property	1832: PP 1835, XLVII.
Taxable value	1832: PP 1835, XLVII. Public Record Office, E 179: assessments for 15 & 16 Henry VIII, as tabulated in J. Sheail, 'The distribution of wealth in England as indicated in the lay subsidy returns of 1524/5' (London, Ph.D. thesis, 1968).
Nonconformity	PRO, HO 71: Returns of the clergy, 1831.
Illegitimacy	PRO, HO 71: Returns of the clergy, 1831.
Schools	1830 [should read 1818]: PP 1819 (224), IX. 1833: PP 1835 (62) XLI–XLII.
Occupations	1831 census, *Enumeration abstract*, PP 1835 xxxvi–xxxvii.
Chapelries	1831 census, *Enumeration abstract*, PP 1835 xxxvi–xxxvii; and *Parish Register abstracts*, PP 1833, xxxviii.

Note: * = National grid co-ordinates of the parish church to the nearest 100 metres, first easting, then northing.

2. THE QUALITY OF THE DATA

Apart from the periods of missing or defective data already mentioned, the accuracy of the monthly totals may have been affected to a greater or lesser degree by two further factors. First, about 60 per cent of all the parish tabulations were based wholly or partly on transcripts which can contain copying mistakes. Second, errors may have been made in the counting and recording. Finally, however accurate the monthly totals may be, there is still the problem that the figures relate to church ceremonies and not to the vital events of birth, death and marriage.

2.1 Precision

Although an attempt was made to control the quality of the transcripts and the tabulations by checking against the original registers, this was not possible in every case. Even where it could be done the number of monthly totals was so large that checking could only reasonably be carried out on a sample basis. Since perfection in such matters is unattainable, tabulations were accepted providing not more than 3 monthly totals in 100 could be shown to be erroneous.[7] Consequently the data printed here undoubtedly contain errors, but the latter are unlikely to be frequent or serious enough to vitiate the use of the tabulations for most purposes of demographic analysis even at the local level.

2.2 Missing vital events

The fact that the tabulated frequencies refer to church ceremonies and not to vital events imposes some limitations on the inferences that can be drawn from them for the study of local populations. It is by no means easy to estimate the numbers of vital events missing from the Anglican registers, and two chapters of *PHE* are devoted to this task (chs 4–5). As can be seen from the various tables in these chapters, and more extensively from column 11 of table A4.1, the proportions of events that are estimated to have escaped the Anglican registers differed between the three series, and varied considerably over time. It should be emphasised that the estimates of missing events in *PHE* are national ones, and represent the average of a wide range of individual parish experiences with regard both to the level of under-registration and to the pattern of its development over time. In parishes with strong nonconformist communities, or which became heavily urbanised, the totals of events tabulated here may be a very poor guide to the numbers of vital events that actually occurred, especially during the later eighteenth and early nineteenth centuries. On the other hand, in some parishes the Anglican registers continued to record the overwhelming majority of vital events throughout the whole period.

2.3 Regional differences

Some idea of the regional differences in the adequacy of Anglican registers at the county level just after the end of the parish register period can be found in the Parliamentary Papers (*Reports of Commissioners*, 1845, vol. XXV). This source compares the numbers of events recorded in the Anglican, and the recently instituted civil, registers in 1839–40. Fortunately the same source also reports events recorded in each Registration District for each year between 1831 and 1840; specifying the names of the parishes concerned. Thus more local estimates of the shortfall of Anglican registration at the end of the 1830s can be made by comparing these figures with the corresponding totals of vital events in each Registration District from mid-1837 that are printed in the Registrar General's *Annual Reports*.

Further information on dissenters and registration deficiencies in each parish at about the same date has been included in the parish characteristics files. The data are taken from the Returns of the Clergy of 1831, which are preserved in the Public Record Office in the class HO 71 and refer to the years 1821–30. While all this information is helpful, a proper evaluation of any deficiencies in the monthly frequencies of Anglican ceremonies tabulated here, obviously requires a detailed investigation of local conditions over a much longer period of time.

2.4 Limitations

The more enduring factors that affected the completeness of parish registration such as nonconformity and late baptism should be distinguished from other, temporary factors, such as torn-out pages, absences of the vicar and so on, that caused registration to be seriously defective for limited periods of time. Corrections have been made to the monthly totals in the manner described above in an attempt to offset the latter type of deficiency, but the more enduring background, that is, under-registration of the former type, remain uncorrected in the totals given on the CD-ROM, and this must always be borne in mind when drawing inferences from the parish data. Above all, the possibility, and in the case of some of the parishes the probability, of very different levels of under-registration having obtained in the sixteenth and the early nineteenth centuries means that special care needs to be taken in drawing conclusions from the parish frequencies about population changes in the long run. Fortunately, however these factors changed relatively slowly, so that the numbers of missing events due to these causes are unlikely to have fluctuated markedly in the short term. Consequently, although one may not be able to specify the proportion of events that are missing from the registers, the fluctuations in the parish totals may still be a reasonable guide to *short-run* variations in the underlying, and imperfectly observed, series of vital events.

In the next section some remarks will be made about the kinds of studies which can be based on the parish data, beginning with seasonal patterns, and other short-run patterns where the problems of inference are less severe, and then proceeding to consider what may be concluded about long-run population change.

3. HOW THE DATA CAN BE USED

3.1 Seasonality

One aspect of population history to which the aggregative tabulations are well suited is the study of the seasonality of events. Once again, however, we need to remember that what we are studying is the seasonality of the ecclesiastical ceremonies associated with vital events, not the seasonality of the vital events themselves. The discrepancy is not serious in the case of deaths and burials, for the necessity of disposing of the corpse led to almost all burials occurring within three days of death. In the case of baptisms, however, there was an immense variation in customs governing the age at which children were baptised, both as between parishes and in the same parish over time. Similarly, widely differing customs with regard to timing of betrothal, cohabitation, and the wedding ceremony that solemnised the marriage, make the registers, which record the wedding, an uncertain guide to the seasonality of other aspects of marriage such as the formation of unions or the setting up of households.

Nonetheless, the seasonal patterns of ecclesiastical events have much to reveal about life in the past, and the ways in which the seasonal patterns of events in a single parish follow, or diverge from, national patterns, can often throw interesting light on local customs, and local circumstances. Some illuminating examples of local seasonality studies can be found in *Local Population Studies*.[8] The national seasonal patterns as revealed by the aggregate experience of all 404 parishes are described and discussed in *PHE*, pp. 286–305.

Calculating index numbers

The monthly index numbers included in the worksheets 'bap_50', 'bur_50' and 'mar_50' are for 50-year periods, and it may well prove instructive to calculate similar index numbers for shorter periods. In doing this it is convenient first to work out a daily rate for the whole period under consideration by dividing the total number of events by the total number of days. The problem of leap years can be handled without too much inaccuracy by assuming 365.25 days in a year, 1,826 days in a quinquennium, and 3,652 days in a decade. Next one calculates the expected numbers of events, assuming an even daily rate, for each of the three groups of months of different lengths: i.e. 31 days for January, March, May, July, August, October and December; 30 days for April, June, September and November, and 28.25 days for February. The index number for any month can then be obtained by dividing the total number of events recorded in that month by the appropriate expected number, and multiplying the result by 100.

In interpreting seasonal patterns it should always be remembered that chance variation can play a part. Since the numbers of events recorded in individual parishes over short periods of time can sometimes be rather small, a significant

proportion of the seasonal pattern observed may in fact be due to chance. In these circumstances it may be helpful to apply a statistical test to evaluate the probability of a chance occurrence of an observed pattern, or differences between the two observed patterns before embarking upon finding any explanations. One convenient procedure is the Kolmogorov-Smirnov test, which can be used to evaluate either a single distribution against the hypothesis of 'no seasonality', or an observed difference between two seasonal distributions.[9]

3.2 Fluctuations in the series

Measuring fluctuations

To identify the major fluctuations in the series of monthly, or annual, parish totals it is often helpful to begin by graphing the series. In some parishes the totals will stay at roughly the same level, while in others the series may rise quite markedly over time. Since, for many purposes, what is at issue is not the absolute size of a fluctuation in a series, but its magnitude relative to the number of events normally being registered at that time, it is helpful to graph using a logarithmic vertical scale. This has the quality of making equal proportionate fluctuations in the series diverge by the same vertical distance from the prevailing level of the series regardless of how high or low the latter may be. In this way the eye can pick out the major fluctuations quite easily. To calculate the actual size of the fluctuations one first needs to find the 'normal' level at each point in the series, and a convenient way of doing this is to calculate a moving average.[10] The difference between the original figures in the series and the corresponding moving-average is then expressed as a percentage of the latter. That is to say, fluctuations are measured as percentage deviations from the changing background level of the series.

It should be remembered, once again, that chance variation is always present, and is likely to comprise a higher proportion of all fluctuations in small parishes than in large. For small parishes, therefore, it may be sensible to take a longer moving average as a measure of the trend than in larger parishes. This difference in the relative importance of chance variation also makes it difficult to compare the relative frequencies of major fluctuations in the series between parishes of different sizes, or at different dates in a parish with a substantial population growth.

Comparing variability

However, providing population sizes are comparable, it is often instructive to compare the degree of variability in the series at different points in time. Since neither the systematic factors producing under-registration (such as nonconformity) nor population size are likely to have varied markedly in the short-run, fluctuations in the series of baptisms, burials and marriages can be taken to reflect fluctuations in the vital processes of fertility, mortality and nuptiality. An exception, of course, must be made in the case of heavy mortality which could well cause a sharp drop in the population size for a short period and so produce fewer events, even though the vital rates instantly returned to

normal. With this caveat, however, the relative frequency and magnitude of fluctuations in the series can be studied to throw light on the question of how stable, or how variable, the demographic processes were at different periods in the history of a parish. A convenient measure of variability in the series is the mean absolute annual percentage deviation from trend, which can be calculated on a decadal or quarter-century basis. To obtain this, add together the individual annual percentage deviations from trend, treating negative deviations as if they were positive, and divide by the total number of observations.

The results for individual parishes can then be compared amongst themselves, or with the national patterns obtained from the whole set of 404 parishes, or regional patters such as Michael Drake found in his study of parishes in the Agbrigg and Morley wapentakes in south Yorkshire.[12]

3.3 Extreme fluctuations

Once the percentage deviations from trend have been calculated, it is a simple matter to identify those years or months in which the most extreme fluctuations occurred. Comparative data for the whole set of 404 parishes can be found in *PHE*, pp. 320–32, though it should be noted that these annual fluctuations with the year running from July through to the following June. Table 8.8 in *PHE* identifies the 20 years in which fluctuations *above* the trend in each series were most extreme amongst the set of 404 parishes, and the 20 years in which fluctuations below trend were most extreme. It may prove interesting to see how far the timing of extreme fluctuations in individual parishes followed the overall pattern, and how far there was any similarity in the incidence of extreme fluctuations of parishes in the same county or region, a point not investigated in *PHE*.

Effect on other series

Another topic of interest, which is discussed in *PHE* is how far extreme fluctuations in one series were accompanied by sympathetic or contrary movements in other series, either in the same year or in the subsequent year. For example, one might expect in the same year in which there was a surge in burials there would also be fewer than average baptisms. If this is found to occur in some parishes, but not in others, then it may suggest interesting questions about differences in the social and economic context of the communities being studied.

Food prices

Fluctuations in the series of events may not only have been linked amongst themselves but, as we have already noted, they may also have responded to a greater or lesser degree to fluctuations in the economy, above all to fluctuations in the price of food. If such a relationship existed, it might be expected to be most evident when the economic fluctuations were most striking. Table 8.8 in *PHE* also identifies the 20 greatest annual deviations above, and below, trend in the national series of consumables prices mentioned above (see also note 11). Here, too, the responsiveness of local demographic series can be compared with the

national picture, to discover whether individual parishes or groups of parishes reacted more or less violently to short-run changes in national prices. In this case the results may be more indicative of the degree to which a parish was integrated into the national economy (that is whether the national price series had any local relevance) than the sensitivity of local demographic behaviour to fluctuations in food prices. However, if local food prices are available, not only can the question of market integration be addressed directly by comparing the local and national price series, but the nature of the demographic response to food price fluctuations *at the local level* can also be investigated.[12]

Measuring responsiveness

One simple way of investigating the responsiveness of each of the demographic series to extreme fluctuations in other series, including prices, is to take a pair of series at a time and tabulate the numbers of occasions on which the 'responding' series is above or below trend in the years of most extreme fluctuations in the other, 'initiating' series. Since we would expect a series to have an almost equal probability of being above or below trend in any year, a marked deviation from an even split around the trend can be taken as indicating the presence of a systematic effect of extreme fluctuations in one series on the level of the other series.[13] The deviation needs to be marked, especially if only twenty or so extreme years are consider, to be confident that the outcome is not likely to have been due to chance.[14] The results of similar calculations of the responsiveness of the aggregate series for all 404 parishes are presented and discussed in *PHE*, pp. 326–32. It should be noted that this is a very weak test of a relationship between the series: in a year of extreme fluctuation in a initiating series the responding series does not also have to experience an extreme fluctuation, it has only to be on the predicted side of the trend for that year to be considered a 'success'. However, to go further than this, and consider the magnitude of the responses to fluctuations of all sizes (as in chapter 9 of *PHE*) requires both more complicated methods of analysis and access to considerable computing power.

3.4 Crisis mortality

One form of the major annual fluctuation that has been much studied is the massive upward surge in burials, often termed a 'mortality crisis'. While *PHE* contains a considerable amount of information about mortality fluctuations, much more remains to be learned, especially at the local, or regional level. For example, comparisons could be made of the similarities or dissimilarities in patterns of crisis mortality in parishes within the same area, and these could be systematically related to local social and economic characteristics, whether taken from the 'characteristics' file on the CD-ROM or obtained by local research. In addition, it would be useful to have more detailed local studies of the timing of the spread of some of the major national epidemics throughout the country.

Comparative information on major national fluctuations in mortality based in the pooled experience of the whole set of 404 parishes can be found on both an annual and a monthly basis in *PHE*, pp. 332–40. Local mortality crises are discussed in the same work, appendix 10, where information is provided on their distribution over time, the proportion of parishes affected in each year, the range

of the duration of the crises and their seasonality. The geographic spread of some of the major national crises is also described in appendix 10, where there is an examination of how far the susceptibility of individual parishes to crisis mortality was influenced by factors such as geographic location, altitude, remoteness, and the kind of agriculture practised.[15]

Defining a 'crisis'

The 'national' patterns outlines in *PHE* appendix 10, were based on the information about periods of epidemic mortality reproduced in the parish files in the worksheet entitled 'crisis', so the data here enable local and regional experiences to be compared directly with the national picture. However, it should be remembered that the criterion for identifying these epidemic periods was a measure of the improbability that the numbers of burials recorded could have occurred by chance given the normal current levels of mortality, not the more usual criterion of burials exceeding the normal monthly frequency by a fixed ratio. This alternative approach was adopted to avoid the problem that in small parishes even modest random fluctuations can exceed the fixed ratio and generate spurious crises, thereby overstating the frequency of crises in small parishes compared to larger ones.[16] Unfortunately, the approach used in *PHE*, which involves a variable ratio linked to the variability of the burial series, may create problems in the opposite direction. In small parishes, the burial series are highly variable, hence a period of genuine epidemic mortality may be indistinguishable from a random fluctuation, and the susceptibility of small parishes to crisis mortality thereby understated.

This connection, one way or the other, between parish population size and the frequency of crises is part of a wider problem. For in reducing the whole range of variation in mortality to a dichotomy (crisis or non-crisis) some arbitrary cut-off point has to be taken, and the criterion adopted will, to a large extent, determine the results. This will be particularly true of the numbers of crises found, their length and severity. But since crises are but the peaks of more general surges in mortality, the choice of cut-off point has far less influence on other aspects of epidemics such as their seasonal patterns and their distribution through both space and time. Results of this type are, therefore, more 'robust' than measures of the size, frequency or severity of crises. Care, therefore, needs to be taken in interpreting the results of a study of crisis mortality, and comparisons should only be made between patterns of 'crises' or 'epidemics' that have been identified using the same criteria[17].

3.5 Long-run population change

In studying the development of the population of a parish, or group of parishes, over a long period of time we typically ask such questions as what was the rate of growth? How far was this due to migration or natural increase? How far were changes in the latter due to movements in fertility or mortality? Unfortunately, it is by no means an easy matter to answer these questions from the parish totals of events alone, even through graphs of the moving averages of events may seem to offer suggestive clues about the course of local population change.

First and foremost, there is the problem, which has already been raised, that the totals of Anglican ceremonies recorded in the CD-ROM may not be a good guide to the numbers of vital events that actually occurred. If the proportions of vital events missing from the registers themselves changed over time, as may well have been the case, the totals of ceremonies will give a misleading impression of the course of vital events. And if the proportion of missing events differed as between births and deaths, the gap between baptisms and burials will be an unsatisfactory guide to the level of natural increase (births minus deaths). Clearly, before the totals of Anglican ceremonies can be used to draw conclusions about local long-term population change much research needs to be done into the local incidence of under-registration, for example by investigating factors such as late baptism and nonconformity.

Overall patterns

Nonetheless, it may be instructive to compare the patterns traced by the parish totals over time, not only with each other but also with the national patterns based on the full set of 404 parishes, or other more limited sets of aggregative data such as Drake's south Yorkshire parishes (1540–1699) or Krause's 'north' and 'south' groups of parishes, numbering 200 in all in 1659–1794.[18] In drawing comparisons between totals of ecclesiastical events it must always be remembered that the differences observed may owe as much, or more, to local differences in the adequacy of Anglican registration as to differences in demographic behaviour. Annual national totals of baptisms, burials and marriages estimated from the aggregate of the 404 parishes can be found in *PHE*, table A4.1 column 5, on pp. 537-60. The corresponding figures for births, marriages and deaths are given in column 6 of the same table, and are graphed on figure 2.

The course traced on the graph by the annual frequencies of vital events suggests a simple division into three periods, 1539-1639, 1640-1709 and 1710-1873. In the two outer periods all three series increase in number and there is normally a substantial surplus of births over deaths. By contrast in the central period, spanning the later seventeenth century, the frequencies of events show little tendency to grow, while the number of deaths is much closer to, and often exceeds, the number of births. The national totals of Anglican events by and large followed the course of vital events except that the removal of the correction for under-registration means that balance between baptisms and burials was even more unfavourable in the later seventeenth century, and that the upward movement of both series started later (in the 1730s), and was less pronounced (*PHE*, table A4.1, column 11).

Local variation

These patterns represent the sum of the individual experiences of the 404 parishes which were far from uniform. Some information on the range of local variation is given in *PHE* in terms of two summary measures of the patterns of Anglican events over time, and it may be instructive to see where in these distributions individual parishes lie. The first measure is the decade in which the number of baptisms first exceeded the maximum decadal total recorded for the

parish before 1660. The results, presented in table 6.1 (*PHE*, p. 163), show that the scatter of the individual parishes around the aggregate recovery point of the 1730s was very wide. The most common outcome (15 per cent of the parishes) was for baptisms to continue to grow without a pause and exceed the pre-1660 maximum at the earliest opportunity (in the 1660s). On the other hand, there were almost as many parishes, 14 per cent of the total, which by 1800-9 were still not recording as many baptisms as they had produced in their heyday before the mid-seventeenth century. It always needs to be remembered that in some parishes baptisms may have failed to grow because of high levels of under-registration, but in others the numbers of births may have remained low and the population may never have regained its early seventeenth-century level.

Burial surpluses

The 404 parishes also show considerable variation in the changing relationships between baptisms and burials, and the second summary measure comprises the number of decades in which burials exceeded baptisms. In aggregate the 404 parishes recorded a baptism/burial deficit in only two decades the 1680s and 1720s, though in the 1550s, 1650s, 1660s and 1670s the surpluses of baptisms over burials were proportionately very low indeed. Table 6.2 in *PHE* (p.164) shows for each decade the proportions of the parishes in observation that registered more burials than baptisms. In the decades from the 1560s to the 1780s there appears to have been a remarkably steady 'background' proportion of parishes recording burial surpluses. This ran at between three and nine per cent, though the parishes were by no means the same in each decade.

The aggregative balance struck in each decade in a parish will, of course, reflect the relative degree of under-registration of births and deaths as well as the combination of levels of fertility and mortality that obtained. In some cases, therefore, the burial surpluses may be spurious owing to the greater under-registration of births than of deaths, a factor that increased up to the end of the eighteenth century (see table 5.27, col. 4, in *PHE*, pp. 140-1).

The variation between parishes in the numbers of decades in which deficits were recorded is brought out in table 6.3 (*PHE*, p. 166), in which the figures are standardised for the different periods covered by individual registers. Out of a notional three centuries (30 decades) in observation, the median parish experience was one of five decades with more burials registered than baptisms. Yet 34 parishes, or eight per cent of the total set, had no decade of deficit, while more than a quarter of the parishes had less than three decades and the same proportion had more than seven decades of deficit. Prominent amongst parishes with a high proportion of decades in deficit were marshland communities, market towns, and city-centre and London suburban parishes. Although the urban parishes and market towns may have been labouring under the handicap of a greater incidence of nonconformity, which is likely to have depressed the numbers of baptisms being registered more than the number of burials, the sizes of the deficits involved are generally large enough to suggest that there was a genuine difference between the balance struck between fertility and mortality in these urban and marshland communities, and that obtaining in more isolated and better drained rural parishes.[19]

Limitations: under-registration and population size

Evidently little can be said with any confidence about long term population change on the basis of the parish totals without some knowledge of the scale of under-registration and its relative trends in each of the series over time. It is, therefore, well worth while trying to find out as much as possible about local patterns of under-registration. If, despite all efforts, they remain unknown, it is probably better to renounce any ambitions to draw conclusions about long-term change based on parish register totals and confine the analysis to short-term movements in the parish totals, as described above.

In some cases, however, it may be possible to make suitable corrections to the parish totals to correct for under-registration and so derive series that can be treated as providing a reasonable guide to the underlying frequencies of vital events. The following discussion assumes that this is the case and to emphasise the point the series will hereafter be referred to as births and deaths rather than baptisms and burials. However, even if the numbers of vital events can reasonably be estimated, several problems of inference remain. This is because the series reflect both the intensity of demographic activity (the levels of fertility, mortality and nuptiality) and the size and age structure of the population. The problem is that when we consider the numbers of events alone we have no means of distinguishing changes in demographic behaviour (e.g. fertility) from changes in the size and age structure of the population.

Suppose, for example, that a graph of parish totals shows both births and deaths rising over time, the former more steeply than the latter, and more births being registered than deaths, quite a common occurrence in the sixteenth and late-eighteenth centuries. It is tempting to conclude that the population was producing a natural increase (more births than deaths) and so growing in size. This might be the correct inference to draw, but the same pattern could be produced by a rise in both fertility and mortality with no change in the size of the population. In this case the 'surplus' population (of births over deaths) will have emigrated. There is therefore no easy inference from the shape of the graph of events to changes in population size, or to changes in birth and death rates. Nor does the fact that births rose faster than deaths necessarily mean that changes in fertility were more important than changes in mortality over the period. For example, the population may have been growing at exactly the same speed as the number of births recorded, in which case the birth rate would have been constant and the death rate actually declining.

Estimating parish population sizes

Clearly, if we want the parish totals to tell us something about the long term population change, we must find a way of discovering the size of the population that produced the events that we observe. Unfortunately, the size of a parish population is rarely known before the national census enumerations began in 1801. We might be tempted to start with one such figure from say, the 1801 census, and backdate the population size by successively subtracting the surplus

of births over deaths recorded in the parish totals. Unfortunately, birth and death were not the only ways of entering and leaving the parish; many people did so on foot, or on horseback. Since the balance between these movements into, and out of, a parish are almost always unknown, any attempt to backdate parish population sizes in this way is likely to run into serious error.

Ideally, we should like to know the size of a parish population at frequent intervals so that calculations could be made of its rate of growth and vital rates, and changes plotted over time. One way of doing this would be to apply the individual parish the same technique of 'back projection' or 'generalised inverse projection' that was developed to derive national population totals from the national series of events based on the aggregate totals of the 404 parishes. But the technique, which entails estimating the amount of migration from the internal consistency of the series of births and deaths, is complex and requires access to a large and powerful computer.[20] A more practical strategy for most local historians would be to attempt to estimate the size of a parish population at as many dates as possible before the nineteenth century using sources such as chantry certificates (1545 and 1548), Diocesan population returns (1563, 1603), the 'Compton Census' (1676), late seventeenth century Hearth Tax returns, or bishop's visitation returns.[21]

Crude vital rates, growth rates and migration

The numbers of events recorded around those dates can then be related to the population size estimates to calculate crude vital rates, i.e. average numbers of events per annum per thousand population. Despite the imprecision that often surrounds population size estimates of this kind they at least enable rough measurements to be made of the levels of fertility, mortality, and nuptiality at the dates concerned. They can then be compared with the more securely grounded measures of the same quantities, based on nineteenth-century censuses and vital registration, to see whether there were any significant changes in demographic behaviour over time.

If parish population sizes can be estimated for several dates, growth rates can be calculated for the intervening periods and compared with the national rates given in *PHE*, pp. 528-9 col. headed CGR). Comparisons can also be made on a local level, between different periods and parishes.[22] The estimated population growth can also be compared with the size of the natural increase (the surplus of births over deaths) over the same period, the difference being attributable to net migration (the balance between immigration and emigration). Again, the inaccuracy of population size estimates at earlier dates may limit the scope of the conclusions that can be drawn, but the amount of population growth implied by a comparison of two populations counts (e.g. a Hearth Tax return and the 1801 census) is often strikingly different from the amount generated in the intervening period in the parish by natural increase. Typically, small rural parish populations may grow much less, and market towns much more, than their respective totals of natural increase, implying a considerable migration from the former to the latter.

If an exercise of this kind indicates that a parish experience little or no net migration, it might be tempting to go one step further and use the figures of natural increase to interpolate population sizes during the period between the dates at which documentary evidence for population size exists. In this way it would be possible to consider the patterns of population growth in greater details, and also, by relating the totals of events to the interpolated population totals, to track the demographic development of the parish over time. However, although migration may net out to zero over a long period, it may actually have been substantial, first in one direction and then in the other, in intervening years. Thus intermediate population totals can only be estimated if both volume and the *timing* of migration during the intervening period can be specified on the basis of local information, or if it seems reasonable to assume that migration occurred at a uniform rate over time.

Arguing from plausible limits

If it proves impossible to estimate the size of a parish population before the nineteenth century, or if this can only be done at one or more widely scattered dates, it may still be possible to reconstruct something of the population history of the parish by looking at the patterns traced by the series of births and deaths over time. For example, the numbers of births or deaths registered in a parish may have risen so greatly that the possibility of the population having remained the same size can be rules out. National birth rates in pre-industrial England rarely fell outside the range of 27 to 41 per thousand. Consequently any increase in the numbers of births by a factor of more than 1.5 (41/27) is unlikely to have been produced by an increase in fertility and may be taken as presumptive evidence of population growth. Of course, in making this calculation sufficient numbers of events must be taken at each date (say by considering 25, or 50-year periods) to lessen the risk of obtaining an untypical ratio from chance fluctuations.

Also biological factors effectively limit the maximum level that the crude birth rate of a large population can reach in normal circumstances to about 55 per 1000, though this figure can be exceeded in small populations with high proportions of young adults as, for example, in cities with substantial immigration. If, therefore, a parish in more normal circumstances experienced a rise in the number of births to a level which, when related to a population size estimate at an earlier date, implies a birth rate of more than 55 per 1000, it is highly likely that the population had grown in the intervening period.

Again the amount of cumulative natural increase in a parish (i.e. surpluses of births and deaths) can be compared with the trends in the series to draw conclusions about the probable direction of net migration. For example, if there were consistently more births than deaths, yet neither series showed a tendency to rise, than it is unlikely that the parish population grew by the amount of the natural increase, for after some years the implied birth and death rates would become implausibly low. It is much more likely that there was persistent migration out of the parish. Similarly, if a parish consistently recorded more deaths than births yet neither series showed a tendency to fall, as was the case in

some market and county towns, it is probably that the population was replenished by in-migration.

Some deceptive ratios

If population size remains unknown, so that the vital rates cannot be calculated, and if a parish appears to have been affected by migration, then care needs to be taken in drawing inferences about the balance of fertility and mortality in the parish from the apparent level of natural increase, or from the ratio between the numbers of births and deaths. Obviously in a parish subject to in-migration the number of deaths will be swollen by the presence of immigrants, and in a parish subject to out-migration the deaths of the emigrants will be missing.[23] Since in both cases the deaths refer to a different population than do the births we cannot draw conclusions about the size of the balance between the levels of fertility and mortality from a simple comparison of the numbers of births and deaths. Thus it does not necessarily follow that mortality was higher than fertility in town parishes recording more deaths than births, nor that fertility was higher than mortality in country parishes registering more births than deaths. Either *may* have been the case, but it is also possible that the reverse was true and the imbalance caused simply by the presence of a considerable flow of migration into, or out of, the parish.

If the volume of net migration is known, or can be estimated, then the 'surplus' or 'missing' deaths can be subtracted from, or added to, the totals recorded in the register, to obtain a better indication of the balance between fertility and mortality *in the parish*. On the other hand, if the volume between net migration remains unknown, then figures of natural increase, or ratios between births and deaths, should not be used to imply anything about the local demographic regime. In this connection, it is worth remembering that the larger and more varied the collection of parishes being studied, the less significant, proportionally, will be the net migration flows to, or from, the outer world. Consequently the dangers of drawing false inferences from totals or ratios of births and deaths are most severe in the case of individual parishes or towns, and progressively less troublesome at a regional, and national level.[24]

Another ratio that is sometimes calculated, and which also raises difficulties of interpretation, is the number of births per marriage. Although this is intended to be an indicator of fertility, it will be influenced both by the number of illegitimate births in the total of births recorded and by the proportion of marriages which are remarriages. Where mortality was high and remarriages common it will be influenced by mortality as well as fertility and nuptiality. And even where these contaminating influences are absent, or can be allowed for, the ratio will only measure the average number of children per marriage if the population is closed or stationary, and if the three demographic components of fertility, mortality and nuptiality are all constant.[25]

Again, calculating the ratio between the number of marriages and the number of births 25 years earlier provides only a very approximate index of nuptiality.[26] Once more, other factors, such as mortality, remarriage and migration, may intervene to cloud interpretation of results.

Summary

This final section, on deriving long-term population trends, has been an extended one. I have tried to outline some of the complexities of the subject and some pitfalls that lurk to trap the unwary. The range and quality of inferences that may be drawn depend very largely upon the success of local research in discovering the degree of under-registration of vital events in the Anglican registers, and in finding sources on which estimates of parish population sizes can be based so that vital rates can be calculated and due allowance made for the impact of net migration. If little can be discovered about these factors, then only very limited conclusions can be drawn about population totals, and long-term trends and changes in fertility and mortality. In these circumstances it would be wise to leave long-term trends severely alone and to concentrate on studying the short-term aspects of local population experiences, as described in the earlier sections of this introduction.

NOTES

1. E. A. Wrigley and R. S. Schofield with contributions from Ronald Lee and Jim Oeppen (Edward Arnold, 1981); reprinted with a new introduction in 1989 and 1993 by Cambridge University Press.
2. E. A. Wrigley, R..S. Davies, J. E. Oeppen and R. S. Schofield, (Cambridge, 1997).
3. The names of the 230 individuals who contributed are listed in *PHE*, appendix 1.
4. Serious interruption was defined as 20 blank years in any run of 40 years (30 years in the case of marriages). If any series suffered such an interruption, registration for all series was considered effectively to begin after that date. Further details and information on the distributions of dates at which the 404 parish tabulations begin and end. See *PHE*, 57.
5. See, for example, R. Schofield, '"Crisis" mortality', *Local Population Studies*, **9** (1972), 10–21, where results from the analysis of 55 parishes are presented and discussed. (Reprinted in M. Drake ed., *Population studies from parish registers*, (Matlock, 1982)).
6. See *PHE*, 646–8.
7. 203 out of 404 tabulations were tested directly. If the same error rate obtained in the 201 unchecked tabulations then 13 of these might be expected to contain errors in more than 3 per cent of the monthly totals enumerated. For further details of the checking procedures see *PHE*, 16–8, and appendix 11.
8. L. Bradley, 'An enquiry into seasonality in baptisms, marriages and burials. Part one: introduction, methodology and marriages', *Local Population Studies*, **4** (1970), 21–40; ibid, 'An enquiry into seasonality in baptisms, marriages and burials. Part two: baptismal seasonality, *Local Population Studies*, **5** (1970), 18–35; ibid, 'An enquiry into seasonality in baptisms, marriages and burials. Part three: burial seasonality', *Local Population Studies*, **6** (1971), 15–30; W. J. Edwards, 'Marriage seasonality 1761–1810: an assessment of patterns in seventeen Shropshire parishes, *Local Population Studies*, **19** (1977), 23–27. All reprinted in Drake ed., *Population studies from parish registers*. For rural-urban differences, and the extra information that a weekly seasonality study can bring, see A. Dyer, 'Seasons of baptisms: an urban approach', *Local Population Studies*, **27** (1981), 26–34.
9. A. clear discussion of the Kolmogorov-Smirnov test, with worked examples can be found in S. Siegel, *Non-parametric statistics for the behavioural sciences* (McGraw-Hill, 1956), 47–52, 127–36.
10. See L. Bradley, *A glossary for local population studies* (LPS Supplement, 1978), 97–9.
11. M. Drake, 'An elementary exercise in parish register demography', *Economic History Review*, **14** (1962), 126–46.
12. Information is presented in terms of a real wage series, but short-run fluctuations in this series are driven entirely by movements in the price of a basket of consumables (see *PHE*, 312 and appendix 9).
13. For a general discussion of the relationship between the food price series and the demographic response in the past, see J. Walter and R. Schofield eds, *Famine, disease and the social order in early modern society* (Cambridge, 1989).
14. The probability of obtaining by chance an outcome as extreme as the one observed can be estimated by cumulating the terms of the binomial distribution, as for example in *PHE*, 326–7. Worked examples of this calculation can be found in Siegel, *Non-parametric statistics*, 36–42.
15. It should be noted that the parish crisis mortality rates are erroneously described in the original, 1981, printing of *PHE*, 685–91 as 'decadal' rates when they are, in fact rates per century. This error was corrected in subsequent issues
16. This feature was apparent in a preliminary study of 55 parishes based on a fixed ratio of twice the normal number of burials. Schofield, "'Crisis" mortality', 16.
17. If the reader also wishes to identify crises on a fixed-ratio basis to compare with other local data not included in the set of 404 parishes, the best way to calculate the current (normal) number of deaths is to take a centred, and truncated, moving average. This removes the effects of peaks in burial numbers,

caused by the epidemics one is trying to identify, and the troughs that often followed the peaks. See the discussion in *PHE*, 646 and the references cited there.

18. J.T. Krause, 'Some aspects of population change 1690–1790', in E. L. Jones and G. E. Mingey eds, Land, labour and population in the industrial revolution (London, 1967), 187–205. For the south Yorkshire parishes see Drake, 'An elementary exercise'.
19. For a study of differential mortality in wealden, downland and marshland parishes, see C. Brent, 'Devastating epidemics in the countryside in eastern Sussex, 1558–1640', *Local Population Studies*, **14** (1975), 42–8 and M. J. Dobson, *Contours of death and disease in early-modern England* (Cambridge, 1997).
20. Back projection is described in *PHE*, 195–9, with technical details in appendix 15. The procedure of 'generalised inverse projection' is described by Jim Oeppen, 'Back projection and inverse projection: members of a wider class of constrained projection methods', *Population Studies*, **47** (1993), 259–67.
21. For an example of local sources for parish population totals see A. C. Percival, 'Gloucestershire village populations', *Local Population Studies*, **8** (1972), 39–47; D. M. Paliser and L. J. Jones, 'The diocesan population returns of 1563 and 1603', *Local Population Studies*, **30** (1983), 55–8 and K. Schürer and T. Arkell eds, *Surveying the people. The interpretation and use of document sources for the study of population in the later seventeenth century*, (Oxford, 1992).
22. Growth rates are conventionally expressed as a cumulative percentage rate per annum. If P_1 is the size of population at the first date and P_2 is its size at a date y years later, the rate is defined as: $(P_2 / P_1)^{1/y}$ x 100.
23. This point was made forcefully by A. Sharlin, 'Natural increase and decrease in early modern cities: a reconsideration', *Past and Present*, 79 (1978), 126–38. The position is more complicated when both immigration and emigration occur, and at different ages.
24. For a study of regional baptism / burial rates see Drake, 'An elementary exercise'; and national birth / death ratios are discussed in *PHE*, 176–89.
25. If the vital rates are constant, but the population is growing or declining (i.e. if the population is stable), then the mean number of children per marriage can be calculated by taking a weighted average of the totals of marriages in previous years as the denominator in calculating the birth / marriage ratio. See L. Henry, Manuel de démographie historique (Geneva and Paris, 1967), 78.
26. D. Turner, 'The effective family', *Local Population Studies*, **2** (1969), 47–54.

APPENDIX

The following two tables list all the parishes included in the 404. The first is an alphabetical list of parishes giving the full name of the parish and its county. The file name in which the parish data can be found is given in under heading. Note that the Excel workbooks have the suffix 'wb1' and the text files have the suffix 'txt'.

Where the parish name is preceded by an asterisk (e.g. *Wem) the tabulation includes totals taken from the registers of a chapelry, or chapelries, within the parish.

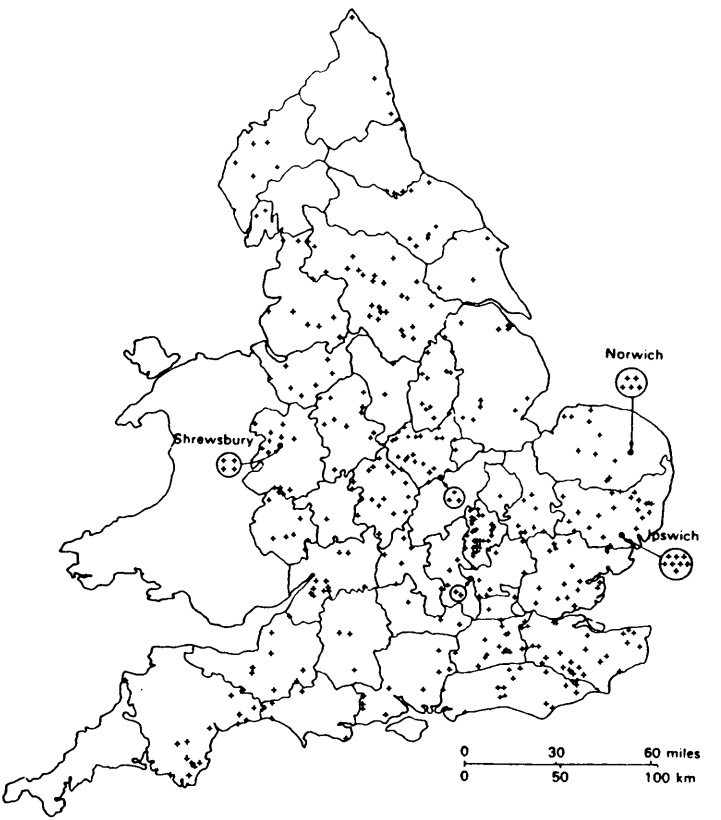

Figure 1 Geographical distribution of the aggregative analysis parishes

Table 2 Alphabetical list of parishes

Parish name	County	File name	Number
Abinger	Surrey	abinger	1
Addingham	Yorkshire West Riding	addngham	2
Adel	Yorkshire West Riding	adel	3
Alberbury	Shropshire	alberbry	4
Albrighton	Shropshire	albrghtn	5
Alcester	Warwickshire	alcester	6
Aldenham	Hertfordshire	aldenham	7
Aldershot	Hampshire	aldersht	8
*Almondbury	Yorkshire West Riding	almndbry	9
Alstonefield	Staffordshire	alstnfld	10
Ampthill	Bedfordshire	ampthill	11
Ardingly	Sussex	ardingly	12
Ardleigh	Essex	ardleigh	13
Arnold	Nottinghamshire	arnold	14
Ashby de la Zouche	Leicestershire	ashby	15
Ashford	Kent	ashford	16
Ashfordby	Leicestershire	ashfrdby	17
Ashton under Lyne	Lancashire	ashton	18
*Audley	Staffordshire	audley	19
Avening	Gloucestershire	avening	20
Aylesbury	Buckinghamshire	aylesbry	21
Aynho	Northamptonshire	aynho	22
Banbury	Oxfordshire	banbury	23
Banham	Norfolk	banham	24
Barley	Hertfordshire	barley	25
Barton under Needwood	Staffordshire	barton	26
*Baschurch	Shropshire	baschrch	27
Beddington	Surrey	beddngtn	28
Benenden	Kent	benenden	29
Berkhampstead St Mary	Hertfordshire	brkstdsm	30
Berkhampstead St Peter	Hertfordshire	brkstdsp	31
Berry Pomeroy	Devonshire	berrypom	32
Berwick upon Tweed	Northumberland	berwick	33
Biddenden	Kent	biddendn	34
Bishops Cannings	Wiltshire	bshpcann	35
Bishops Cleeve	Gloucestershire	bshpclee	36
Bitterley	Shropshire	bitterly	37
Blackawton	Devonshire	blackawt	38
Blunham	Bedfordshire	blunham	39
Blyth	Nottinghamshire	blyth	40
Boldre	Hampshire	boldre	41
Bolney	Sussex	bolney	42
Bolnhurst	Bedfordshire	bolnhst	43
Bolton Percy	Yorkshire West Riding	bolton	44
Bottesford	Leicestershire	bottesfd	45
Bradwell juxta Mare	Essex	bradwell	46
Branscombe	Devonshire	branscbe	47
Brede	Sussex	brede	48
Breedon on the Hill	Leicestershire	breedon	49
Bridekirk	Cumberland	bridekrk	50
Bridgewater	Somersetshire	bridgewt	51
Bridlington	Yorkshire East Riding	bridngtn	52
Brodsworth	Yorkshire West Riding	brodswth	53
Bromfield	Shropshire	bromfld	54
Bromham	Wiltshire	bromham	55
Bromley	Kent	bromley	56

Bromyard	Herefordshire	bromyard	57
Bruton	Somersetshire	bruton	58
Bubwith	Yorkshire East Riding	bubwith	59
Budbrooke	Warwickshire	budbrook	60
Bunbury	Cheshire	bunbury	61
Burnsall	Yorkshire West Riding	burnsall	62
Burslem	Staffordshire	burslem	63
Burton Joyce	Nottinghamshire	burton	64
Cam	Gloucestershire	camglos	65
Campton with Shefford	Bedfordshire	campton	66
Carlton juxta Snaith	Yorkshire West Riding	carlton	67
Carshalton	Surrey	carshltn	68
Castle Donnington	Leicestershire	castldon	69
Cavendish	Suffolk	cavendsh	70
Chalgrave	Bedfordshire	chalgrve	71
Chardstock	Devonshire	chardstk	72
Chester Holy Trinity	Cheshire	chester	73
Chilvers Coton	Warwickshire	chilvers	74
Chinnor	Oxfordshire	chinnor	75
Chipping Norton	Oxfordshire	chipping	76
Chiselhurst	Kent	chiselht	77
Chorley	Lancashire	chorley	78
Clapham	Yorkshire West Riding	clapham	79
Clee	Lincolnshire Lindsey	clee	80
Clophill	Bedfordshire	clophill	81
Cobham	Surrey	cobham	82
Coleorton	Leicestershire	coleortn	83
Colyton	Devonshire	colyton	84
Congresbury	Somersetshire	congrsby	85
Conisborough	Yorkshire West Riding	conisbgh	86
Cowfold	Sussex	cowfold	87
Cranbrook	Kent	cranbrok	88
Cranfield	Bedfordshire	cranfld	89
Cranley	Surrey	cranley	90
Crewkerne	Somersetshire	crewkrne	91
Cropwell Bishop	Nottinghamshire	cropwell	92
Crosthwaite	Cumberland	crosthwt	93
Curdworth	Warwickshire	curdwth	94
Dalston	Cumberland	dalston	95
Darfield	Yorkshire West Riding	darfield	96
Darlington	Durham	darlngtn	97
Darlton	Nottinghamshire	darlton	98
Deane	Lancashire	deane	99
Dedham	Essex	dedham	100
Dengie	Essex	dengie	101
Desford	Leicestershire	desford	102
Dewsbury	Yorkshire West Riding	dewsbury	103
Docking	Norfolk	docking	104
*Dronfield	Derbyshire	dronfld	105
Dunchurch	Warwickshire	dunchrch	106
Dymock	Gloucestershire	dymock	107
Earsdon	Northumberland	earsdon	108
*Easingwold	Yorkshire North Riding	easingwd	109
East Bergholt	Suffolk	eastberg	110
East Grinstead	Sussex	eastgrin	111
Eastington	Gloucestershire	eastngtn	112
Eastry	Kent	eastry	113
Eaton Bishop	Herefordshire	eatnbish	114
Eccleshall	Staffordshire	ecclshll	115
Edgbaston	Warwickshire	edgbastn	116

Edmonton	Middlesex	edmonton	117
*Edwinstowe	Nottinghamshire	edwnstwe	118
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*Ercall Magna	Shropshire	ercalmag	124
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Frant	Sussex	frant	137
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Gainsborough	Lincolnshire Lindsey	gainsbro	141
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Gawsworth	Cheshire	gawswth	143
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Gilling	Yorkshire North Riding	gilling	145
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Milton next Gravesend	Kent	miltnknt	238
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Modbury	Devonshire	modbury	240
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Napton	Warwickshire	napton	243
Newenden	Kent	newenden	244
North Cadbury	Somersetshire	northcad	245
North Elmham	Norfolk	elmham	246
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North Nibley	Gloucestershire	nrthnibl	248
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Pavenham	Bedfordshire	pavenham	268
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Pevensey	Sussex	pevensey	270
Pitminster	Somersetshire	pitmnstr	271
Polesworth	Warwickshire	poleswrt	272
Pontesbury	Shropshire	pontesby	273
Prestwold	Leicestershire	prestwld	274
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Stowe by Chartley	Staffordshire	stowechr	330
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Toddington	Bedfordshire	toddngtn	348
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*Wem	Shropshire	wemsalop	364
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Felmersham	felmerhm	129
Flitwick	flitwick	133
Harlington	harlngtn	164
Kempston	kempston	196
Maulden	maulden	227
Milbrook	milbrook	235
Milton Ernest	miltnern	237
Northill	northill	251
Pavenham	pavenham	268
Pulloxhill	pulloxhl	276
Riseley	riseley	285
Sandy	sandy	296
Souldrop	souldrop	316
Southill	southill	317
Stevington	stevngtn	326
Studham	studham	333
Thurleigh	thurlegh	346
Tingrith	tingrith	347
Toddington	toddngtn	348
Woburn	woburn	385
Wootton	wootbeds	389

Berkshire

Harwell	harwell	168
Sonning	sonning	315
Winkfield	wnkfield	382

Buckinghamshire

Aylesbury	aylesbry	21
Princes Risborough	princes	275
Wing	wing	381

Cambridgeshire

Fowlmere	fowlmere	135
Haddenham	haddenhm	159
Linton	linton	213
Melbourn	melbourn	229
Orwell	orwell	263
Sawston	sawston	297
Waterbeach	waterbch	359
Willingham	willghm	377

Cheshire

Bunbury	bunbury	61
Chester Holy Trinity	chester	73

Frodsham	frodsham	140
Gawsworth	gawswth	143
Nantwich	nantwich	242
Sandbach	sandbach	294
Wilmslow	wilmslow	378

Cumberland

Bridekirk	bridekrk	50
Crosthwaite	crosthwt	93
Dalston	dalston	95
Greystoke	greystke	157
Wigton	wigtoncm	376

Derbyshire

*Dronfield	dronfld	105
*Wirksworth	wirkswth	383

Devonshire

Berry Pomeroy	berrypom	32
Blackawton	blackawt	38
Branscombe	branscbe	47
Chardstock	chardstk	72
Colyton	colyton	84
Hartland	hartland	166
Hemyock	hemyock	173
Islington	islingtn	195
Modbury	modbury	240
Offwell	offwell	261
Paignton	paignton	267
Staverton	stavertn	325
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Symondsbury	symndbry	337
Thorncombe	thorncbe	343

Durham

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Middleton St George	middletn	233
Whitburn	whitburn	368

Essex

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Bradwell juxta Mare	bradwell	46
Dedham	dedham	100
Dengie	dengie	101
Great Baddow	gbaddow	150
Great Burstead	gtburstd	152
Great Sampford	gtsampfd	154
Great Yeldham	gtyeldhm	156
Hadleigh	hadlhess	160

Little Sampford	ltsampfd	215
Maldon All Saints and St Peter	maldon	220
Romford	romford	288
Stanford Rivers	stanford	322
Stow Maries	stowmari	329
Thaxted	thaxted	342
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Wickford	wickford	370

Gloucestershire

Avening	avening	20
Bishops Cleeve	bshpclee	36
Cam	camglos	65
Dymock	dymock	107
Eastington	eastngtn	112
Fairford	fairford	127
Horsley	horsley	179
Minchinhampton	minchham	239
North Nibley	nrthnibl	248
Stroud	stroud	332
Tetbury	tetbury	341
Westbury on Trym	wstbglos	366
Winchcombe	winchcbe	380
Wotton under Edge	wottedge	395

Hampshire

Aldershot	aldersht	8
Boldre	boldre	41
Ellingham	ellinghm	120
Fordingbridge	fordngbg	134
Headley	headley	171
Meonstoke	meonstke	232
Odiham	odiham	260
Ringwood	ringwood	284
Romsey	romsey	289
Selborne	selborne	303

Herefordshire

Bromyard	bromyard	57
Eaton Bishop	eatnbish	114
Ledbury	ledbury	209
Lugwardine	lugwrdne	219
Wigmore	wigmore	374
Yarkhill	yarkhill	402

Hertfordshire

Aldenham	aldenham	7
Barley	barley	25
Berkhampstead St Mary	brkstdsm	30
Berkhampstead St Peter	brkstdsp	31
Hemel Hempstead	hmlhmstd	172
Hitchin	hitchin	176
Hunsdon	hunsdon	181
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Watford	watford	360

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Kent

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Gravesend	gravesnd	149
Herne	herne	174
Hythe	hythe	184
Lenham	lenham	211
Milton next Gravesend	miltnknt	238
Newenden	newenden	244
Reculver	reculver	281
Sandhurst	sandhrst	295
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Sittingbourne	sittbrne	313
Speldhurst	speldhrt	318
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Staplehurst	stplehrt	324
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*Tonbridge	tonbrdge	349
Westerham	westerhm	367
Wickhambreux	wickhamx	371
Wye	wyekent	398
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Chorley	chorley	78
Deane	deane	99
Hawkshead	hawkshd	169
North Meols	nrthmeol	247
Radcliffe	radcliff	279
Rochdale	rochdale	287
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Little Bowden	ltbowden	214
Long Clawson	longclaw	216
Loughborough	loughbgh	217
Market Bosworth	mktbosw	222
Market Harborough	mktharb	223
Medbourn	medbourn	228
Melton Mowbray	melton	230
Prestwold	prestwld	274
Saddington	saddngtn	292
Shepshed	shepshed	306
Wigston Magna	wigston	375
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Lincolnshire Holland

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Leasingham	leasingm	208
Quarrington and Old Sleaford	qrrngton	278
Ropsley	ropsley	290

Lincolnshire Lindsey

Clee	clee	80
Frodingham	frodingm	139
Gainsborough	gainsbro	141
Great Grimsby	gtgrimsb	153
Haxey	haxey	170
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Middlesex

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Norfolk

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Kenninghall	kennghll	198
North Elmham	elmham	246
Norwich St Benedict	nwchsb	253
Norwich St Giles	nwchsg	254
Norwich St James with Pockthorpe	nwchsj	255
Norwich St Margaret	nwchsm	256
Norwich St Saviour	nwchss	257
Sculthorpe	sculthrp	300
Sedgeford	sedgefrd	301
Shipdham	shipdham	307
Swaffham	swaffham	335

Wells	wellsnfk	363
Wymondham	wymondhm	400

Northamptonshire

Aynho	aynho	22

Northumberland

Berwick upon Tweed	berwick	33
Earsdon	earsdon	108
Felton	felton	131
Tynemouth	tynemth	354
Woodhorn	woodhorn	387

Nottinghamshire

Arnold	arnold	14
Blyth	blyth	40
Burton Joyce	burton	64
Cropwell Bishop	cropwell	92
Darlton	darlton	98
*Edwinstowe	edwnstwe	118
Fledborough	fledbrgh	132
Gedling	gedling	144
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Oxfordshire

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Chinnor	chinnor	75
Chipping Norton	chipping	76
Standlake	standlke	321
Wootton	wootoxfd	390

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Albrighton	albrghtn	5
*Baschurch	baschrch	27
Bitterley	bitterly	37
Bromfield	bromfld	54
*Ercall Magna	ercalmag	124
Ludlow St Lawrence	ludlow	218
Onibury	onibury	262
Oswestry	oswestry	265
Pontesbury	pontesby	273
Shrewsbury St Alkmund	shrewsa	308
Shrewsbury St Chad	shrewsc	309
Shrewsbury St Julian	shrewsj	310
Shrewsbury St Mary	shrewsm	311
Stanton Lacy	stantonl	323
*Wem	wemsalop	364
*Westbury	westbury	365

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Congresbury	congrsby	85
Crewkerne	crewkrne	91
Martock	martock	226
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North Petherton	nrthpeth	249
Pitminster	pitmnstr	271
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*Audley	audley	19
Barton under Needwood	barton	26
Burslem	burslem	63
Eccleshall	ecclshll	115
Ellastone	ellastne	119
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*Sedgley	sedgley	302
*Stone	stone	328
Stowe by Chartley	stowechr	330
Tatenhill	tatenhll	339

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Mildenhall	mildenhl	236
Peasenhall	peasenhl	269
Rattlesden	rattlesn	280
Saxmundham	saxmndhm	298
Sibton	sibton	312
Stradbroke	stradbrk	331
Wickhambrook	wickhbrk	372
Woodbridge	woodbrid	386
Wortham	wortham	393
Yoxford	yoxford	404

Surrey

Abinger	abinger	1
Beddington	beddngtn	28
Carshalton	carshltn	68
Cobham	cobham	82
Cranley	cranley	90
Gatton	gatton	142
Limpsfield	limpsfld	212
Nutfield	nutfield	258
Putney	putney	277
Reigate	reigate	282
Walton on the Hill	walton	356
Wimbledon	wimbledn	379
Wotton	wottsrry	394

Sussex

Ardingly	ardingly	12
Bolney	bolney	42
Brede	brede	48
Cowfold	cowfold	87
East Grinstead	eastgrin	111
Felpham	felpham	130
Frant	frant	137
Hailsham	hailsham	162
Harting	harting	165
Hurstpierpoint	hurstpt	182
Northiam	northiam	250
Pevensey	pevensey	270
Salehurst	salehrst	293
Woodmancote	woodmnct	388
Worth	worth	392

Warwickshire

Alcester	alcester	6
Budbrooke	budbrook	60
Chilvers Coton	chilvers	74
Curdworth	curdwth	94
Dunchurch	dunchrch	106
Edgbaston	edgbastn	116
Harbury	harbury	163
Kenilworth	kenilwth	197
Kingsbury	kingsbry	201
*Mancetter	mancettr	221
Monks Kirby	monkskir	241
Napton	napton	243
Polesworth	poleswrt	272
Rowington	rowingtn	291
Tanworth	tanworth	338
Tredington	tredgton	352

Wiltshire

Bishops Cannings	bshpcann	35
Bromham	bromham	55
Wishford Magna	wishford	384
Kings Norton	kingsntn	200
Worcester St Helen	worcestr	391

Yorkshire East Riding

Bridlington	bridngtn	52
Bubwith	bubwith	59
Etton	etton	125
Hunmanby	hunmanby	180

Yorkshire North Riding

*Easingwold	easingwd	109
Gilling	gilling	145
Kirkdale	kirkdale	205
Marske in Cleveland	marske	225
Oswaldkirk	oswldkrk	264
Sessay	sessay	304
Stainton in Cleveland	stainton	320
Yarm	yarm	403

Yorkshire West Riding

Addingham	addngham	2
Adel	adel	3
*Almondbury	almndbry	9
Bolton Percy	bolton	44
Brodsworth	brodswth	53
Burnsall	burnsall	62
Carlton juxta Snaith	carlton	67
Clapham	clapham	79
Conisborough	conisbgh	86
Darfield	darfield	96
Dewsbury	dewsbury	103
Emley	emley	122
Farnham	farnham	128
*Gisburne	gisburne	146
*Guiseley	guiseley	158
Hartshead	hartshed	167
Horbury	horbury	177
Ilkley	ilkley	185
Kippax	kippax	202
Ledsham	ledsham	210
*Otley	otley	266
Skipton	skipton	314
*Thornhill with Flockton	thornhll	344
Thornton in Lonsdale	thornton	345
Waddington	waddngtn	355
*Wath upon Dearne	wath	361

Parish Register Aggregate Analyses. University of Hertfordshire: Local Population Studies, 1998.Google Scholar. Sharp, Paul, and Weisdorf, Jacob.Â Wrigley, E. Anthony, and Schofield, Roger S.. The Population History of England, 1541â€“1871: A Reconstruction. London: Edward Arnold, 1981.Google Scholar. Altmetric attention score. A History of Parish Registers. As we have seen, both Civil Registration and Census Returns run out when you get back to c.1840, and rarely provide information relevant before 1800. At this stage you need to turn to Parish Records - these date back to 1538 when Cromwell, at the Court of Henry VIII, ordered that every wedding, baptism and burial should be recorded.Â There may be gaps in Parish Registers between 1553 and 1558 and the Catholic Mary Tudor was on the throne, and between 1642 and 1660 during the English Civil War and Commonwealth.Â In 1751 England and Wales were still using the old style, Julian calendar, which began each year on March 25th. Most of Europe has changed to the new style, Gregorian calendar, and so England also decided to change. Parish registers were first created in England in 1538 when Henry VIII established the Church of England. By 1597, during Queen Elizabethâ€™s reign, the earliest parish registers were rewritten on vellum, or animal skin, from 1558. This helped protect parish registers and make them available for research today. Many registers before 1558 are lost; they were often written on paper, rather than more durable materials. Early parish registers were often written in chronological order, including baptisms, marriages, and burials in the same volume. As time went by, many parishes recorded these events A parish register in an ecclesiastical parish is a handwritten volume, normally kept in the parish church in which certain details of religious ceremonies marking major events such as baptisms (together with the dates and names of the parents), marriages (with the names of the partners), children, and burials (that had taken place within the parish) are recorded. Along with these vital details, church goods, the parishâ€™s response to briefs, and notes on various happenings in the parish were also Introductory note; Related publications; Preface to the first edition; Introduction; Part I. From Parish Register Data to National Vital Series: 1. The basic data; 2. The representativeness of the date; 3. Inflation to national frequencies; 4. From baptisms and burials to births and deaths: corrections for nonconformity and late baptism; 5. From baptisms and burials to births and deaths: final inflation ratios: offsetting. other causes of non-registration; Part II.Â 'The Population History of England is important, not only to English historians, but to students of population in other countries as well. As a result, the study of the economic history of all European countries before the late nineteenth century will never be quite the same again.'