
Adolescent mortality at Winchester College, 1393–1540: new evidence for medieval mortality and methodological considerations for historical demography¹

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Abstract

This article presents new data on mortality in the late medieval period, and suggests methodologies for analysing incomplete datasets. Using data collated from the records of Winchester College this study follows the lives of 2,692 individuals, and analyses adolescent mortality in the sample group for the period 1393–1540. This study of mortality among 10–18 year olds is the first of its kind to produce data for a sample of adolescents in late medieval England, and thereby contributes significant new data to our understanding of late medieval mortality. These data are placed within the context of that obtained for other medieval population samples, most notably with studies of medieval monastic groups.

Introduction

The late medieval period has been aptly described as ‘the last “dark age” of demography’.² In this era before parish registers, the national census, or civil registration there are relatively few sources that can be systematically tapped to measure rates of fertility, nuptiality, migration, or mortality across the whole English population. This is particularly frustrating given the long-standing interest among historians in charting population changes following the arrival of the Black Death, and the possible interactions between population change and the economic and social history of medieval England.³

1 I would like to express my personal thanks to my doctoral supervisors, Professors Michael Hicks and Tom James, to my PhD examiners, Professors Richard Smith and Anne Curry, and to Robin Bendrey and my family for support, help and encouragement in the completion of my thesis.

2 A. Hinde, *England's population: a history since the Domesday survey* (London, 2003), 53.

3 See for example: J.M.W. Bean, ‘Plague, population and economic decline in England in the later middle ages’, *Economic History Review*, 2nd series, 15 (1962), 423–37; J.L. Bolton, *The medieval English economy 1100–1500* (London, 1980); C. Dyer, *An age of transition? Economy and society in England in the later middle ages* (Oxford, 2005); J. Hatcher, *Plague, population and the English economy 1348–1530* (London, 1977); M.M. Postan, ‘Some economic evidence of declining population in the later middle ages’, *Economic History Review*, 2nd series, 2 (1950), 221–46; W.M. Ormrod and P. Lindley eds, *The Black Death in England* (Donington, 1996); C. Platt, *King Death: The Black Death and its aftermath in late-medieval England* (London, 1996); J. Saltmarsh, ‘Plague and economic decline in England in the later middle ages’, *Cambridge Historical Journal*, 7 (1941), 23–41.

Historians have shown great ingenuity in extracting useable data from surviving medieval documentary evidence to shed light on the population history of this period. Records of *Inquisitiones Post Mortem*, head-tax lists, and testamentary evidence, for example, have been used to examine replacement ratios and investigate possible levels of medieval mortality and life expectancy.⁴ Manorial court rolls and poll tax returns have also been used to chart demographic change in small communities over time.⁵ Such studies have largely focused upon marriage patterns, childbirth and mortality as observed through the payment of customary fines in manorial courts. Mortality in particular has also been more accurately measured through the examination of closed communities, in which all members of a group can be observed over a period of time. Work in this area has previously concentrated on monasteries, charting the lives of the monks and measuring mortality and life expectancy within these communities.⁶

With each type of study there are inherent advantages and disadvantages, which are inevitable given that the sources were not created with the historical demographer in mind. Frequently, trade-offs must be made; all too often reliable data are restricted to certain social groups, usually favouring adult men, who tended to appear more often in medieval documentation.⁷ Similarly, more affluent members of society were more likely to have appeared in records, and were certainly more likely to have made a will or passed on property and possessions. Evidence relating to female life experiences and infant and childhood mortality, however, are rarely documented in surviving records.⁸ While the data obtained for the more visible groups are valuable, questions remain as to how their experiences compared to the broader population. For precisely this reason, the search

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- 4 Such works include M. Ecclestone, 'Mortality of rural landless men before the Black Death: the Glastonbury Head-Tax lists', *Local Population Studies*, 63 (1999), 6–29; P.J.P. Goldberg, 'Mortality and economic change in the diocese of York, 1390–1514', *Northern History*, 24 (1988), 38–55; T.H. Hollingsworth, *Historical demography* (London, 1969); T.H. Hollingsworth, 'A note on the medieval longevity of the secular peerage', *Population Studies*, 29 (1975), 155–9; M.A. Jonker, 'Estimation of life expectancy in the middle ages', *Journal of the Royal Statistical Society Series A (Statistics in society)*, 116 (2003), 105–17; J.T. Rosenthal, 'Mediaeval longevity and the secular peerage, 1350–1500', *Population Studies*, 27 (1973), 287–93; J.C. Russell, *British medieval population* (Albuquerque, 1948); S.L. Thrupp, 'The problem of replacement-rates in late medieval English population', *Economic History Review*, 2nd series, 18 (1965), 101–19.
 - 5 L.R. Poos, *A rural society after the Black Death: Essex 1350–1525* (Cambridge, 1991); M.M. Postan and J. Titow, 'Heriots and prices on Winchester manors', *Economic History Review*, 2nd series, 11 (1959), 392–411; Z. Razi, *Life, marriage and death in a medieval parish: economy, society and demography in Halesowen 1270–1400* (Cambridge, 1980).
 - 6 B.F. Harvey, *Living and dying in England 1100–1540: the monastic experience* (Oxford, 1993); J. Hatcher, 'Mortality in the fifteenth century: some new evidence', *Economic History Review*, 2nd series, 39 (1986), 19–38; J. Hatcher, A. Piper and D. Stone, 'Monastic mortality: Durham Priory 1395–1529', *Economic History Review*, 2nd series, 59 (2006), 667–87.
 - 7 For discussion of this see the textual debate between Z. Razi and L.R. Poos and R.M. Smith regarding manorial court roll evidence. This debate was first published in *Law and History Review* and is reproduced as L.R. Poos, Z. Razi and R.M. Smith, 'The population history of medieval English villages: a debate on the use of manor court records', in Z. Razi and R.M. Smith eds, *Medieval society and the manor court* (Oxford, 1996), 298–368.
 - 8 The absence of data for these groups is highlighted by Hatcher, Piper and Stone, 'Monastic mortality', 681–2.

must continue for records that might help to bring the experiences of previously unobserved groups to light.

It is in this spirit that the research presented here was undertaken as part of my doctoral project following the life histories of scholars attending Winchester College and New College Oxford.⁹ These sister colleges were founded by William of Wykeham, Bishop of Winchester, primarily as chantry foundations. Wykeham's secondary aim was to provide an education for 70 'poor scholars' and thus turn out well qualified young men to swell the ranks of the clergy that had been depleted by plague and war.¹⁰ Boys between the ages of 10 and 18 would first attend the college at Winchester to receive initial training in grammar, before continuing to New College in Oxford to undertake their university education. Wykeham's emphasis on educational provision helped the colleges escape dissolution at the Reformation, and they continue to operate as educational establishments to this day. The unbroken history of both colleges means that a wealth of documentary evidence has survived, still housed in the original medieval muniment towers designed for their safe storage.¹¹

Using records from these institutions, my doctoral research project followed the 2,692 scholars enrolled at Winchester College in the period 1393–1540 to examine mortality rates within the two colleges, and to assess life expectancy among the sample group. This article focuses specifically upon the analyses of mortality data for boys aged 10 to 18 residing at Winchester College, undertaken as part of that research. Primarily it demonstrates new methods that might be used to elicit useful mortality data from seemingly incomplete records. Furthermore, this article aims to contribute to our better understanding of medieval mortality through the presentation and analysis of unique new evidence, specific to the experiences of adolescent males.

Winchester College: environment and evidence

Winchester College is an ideal case study for the analysis of medieval mortality. As with the monastic studies, the individuals in this sample lived within an institutional context. The time spent by scholars at Winchester College can be traced through the documents kept by that institution, and the sample group was united by their common experiences in terms of standards of living and environmental exposure.

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- 9 R.H.A. Oakes, 'Mortality and life expectancy: Winchester College and New College Oxford, c.1393–c.1540' (unpublished Ph.D. thesis, University of Southampton, 2009).
- 10 W.A. Harwood, 'The college as school: the case of Winchester College', in C. Burgess and M. Heale eds, *The late medieval English college and its context* (Woodbridge, 2008); R.L. Storey, 'The foundation and the medieval college 1379–1530', in J. Buxton and P. Williams eds, *New College Oxford 1379–1979* (Oxford, 1979), here at 5.
- 11 J.H. Harvey, 'Winchester College muniments: an introduction and index to the descriptive list by Sheila J. Elliott, B.A.', *Archives* 5:28 (1962), 201–16, here at 202.

As Bishop of Winchester, Wykeham's choice of location for his college was unsurprising. Winchester was on a major trade and communication route to London, and was well connected with the port of Southampton and other important local towns, including Oxford. It had once been a major city and was a former royal capital of England, but its economic and demographic fortunes had been declining since 1200.¹² However, Winchester was still a major provincial centre, being the county-town of Hampshire, seat of the bishop and ranked within the top 20 largest cities in England throughout the study period.¹³ The college was built just outside the city walls, and thus outside the jurisdiction of the mayor and corporation. Acquisition of this land in the suburbs was perhaps made easier by the number of properties that had become vacant following the Black Death and as a result of fears of French invasion.¹⁴

Institutional living had both benefits and inherent drawbacks. Living standards were at least stable, with receipts from college estates successfully supporting the scholars throughout the period.¹⁵ Although life at the college was far less salubrious than at a Benedictine monastery such as Westminster Abbey, the scholars were provided with a commons allowance that amply covered their food, lodgings and clothing.¹⁶ However, the physical environment of the college brought some major disadvantages. The water supply was a particular concern, being obtained from a rather dubious stream contaminated with effluence. In 1483 William Waynfilete, Bishop of Winchester and former headmaster of Winchester College, obtained the right for water to be brought into the college by a conduit from Segryme's well at the bottom of St Giles's Hill.¹⁷

Any form of infectious illness or disease brought into college was undoubtedly exacerbated by institutional living. The scholars lived in close proximity to each other, studying together, eating in hall and sharing dormitories with 12 boys to a room, the youngest of whom were required to share beds. It can thus be imagined that infection or illness would quickly spread among the scholars and may be reflected in the death rates observed at this institution.

12 Harwood, 'The college as school', 232; T.B. James, *Winchester* (London, 1997), 75–85.

13 Winchester ranked 14 in terms of taxpaying population at the 1377 Poll Tax and ranked 15 in terms of lay subsidy paying population in 1524–5, see A. Dyer, 'Appendix: ranking lists of English medieval towns' in D.M. Palliser ed., *The Cambridge Urban History of Britain. Vol. 1 600–1540* (Cambridge, 2000), 747–70.

14 James, *Winchester*, 82; D. Keene, 'Town into gown: the site of the College and other College lands in Winchester before the Reformation' in R. Custance ed., *Winchester College sixth centenary essays* (Oxford, 1982), 61.

15 The statutes demanded that if the college could not support the whole community financially it was to reduce the number of scholars. That it did not need to do so is a testament to its financial success.

16 See Harvey, *Living and dying* for living standards at Westminster Abbey. Comparisons of living standards at Winchester College with those at Westminster Abbey can be found in Oakes, 'Mortality and life expectancy', chapter 3.

17 T.F. Kirby, *Winchester scholars* (London, 1888), xvii; T.F. Kirby, *Annals of Winchester College from its foundation in 1382 to the present time* (London, 1892), 8 and 205–7.

Detailed administrative records were kept by Winchester College and New College Oxford, and these have been used to trace mortality at each institution and life expectancy for the sample group.¹⁸ Each scholar has been followed through surviving college records to pinpoint the dates of their admission to and departure from the two colleges, or the date of their death if this occurred while they were resident at either institution. This article focuses upon deaths that occurred at Winchester College. This focus upon mortality within an institutional setting is closely analogous in nature to previous work on medieval monastic communities undertaken by Hatcher and Harvey, and a similar methodology was employed in this research.¹⁹

In principle, all scholars were expected to continue their education at New College once they had completed their studies at Winchester, and vacancies at both colleges were to be filled within two weeks to maintain the number of scholars at each institution at 70. This strict one-out one-in system was largely adhered to, and replacement of scholars was often instantaneous when it could be predicted. Unlike in monastic communities there was also a strict time limit as to how long scholars were to remain at each institution, linked to the amount of time required for them to complete their studies. The combination of these rules, and the efficient replacement system for scholars, resulted in a much faster turnover of individuals than seen within monastic populations. This makes the sample examined here one of the largest of its kind for the late medieval period, with 2,692 individuals falling under observation.²⁰ Rules regarding the age of scholars attending Winchester College required boys to leave when they were 18. This makes the present sample unique in its focus upon medieval children and adolescents, who represent a previously much under-studied demographic group.

The study period commences at the *primus ingressus*—this marks the first occupation of the newly completed college buildings by the Winchester scholars, and appears to coincide with the first systematic keeping of administrative records at that institution. Weekly hall book accounts were kept until 1519, and listed the names of scholars dining in hall.²¹ From these it is possible to pinpoint with accuracy the arrival and departure of scholars. Notes next to a number of the names also indicate when a scholar died while at the college. Unfortunately, the run of hall books is not complete, but 57 survive for the 124 year period from 1395–1519, and add valuable information to that obtained from other sources.²²

18 Oakes, 'Mortality and life expectancy'.

19 For details of the methodologies employed in those studies see, Harvey, *Living and dying*; Hatcher, 'Mortality'; Hatcher, Piper and Stone, 'Monastic mortality'.

20 This compares to sample sizes ranging between 328 and 415 for the monastic populations. See Harvey, *Living and dying*, 115–7; Hatcher, 'Mortality', 25; Hatcher, Piper and Stone, 'Monastic mortality', 670.

21 Winchester College Hall books, 1395–1519, Winchester College Archive, Winchester (hereafter WCA) 22812–71.

22 A list of the surviving hall books is given in Oakes, 'Appendix A' in 'Mortality and life expectancy', 224–6.

An admission register was also kept, giving the name and place of origin of every scholar enrolled.²³ It seems probable that this volume, known as the *Registrum Primum*, was not begun until 1425, and that entries for years prior to this date were compiled retrospectively.²⁴ However, this does not negate the authority of the volume. It seems likely to have been compiled by Robert Heete, a former scholar who was then employed as a fellow of the college. Notations made in earlier volumes of the hall book accounts suggest that these were referred to in the compilation of the *Registrum Primum* for the years prior to 1425.²⁵ No doubt the compiler was able to refer to a more complete set of hall books than have survived today. Further contemporary notations added alongside many of the names throughout the *Registrum Primum* frequently gave the cause of departure for each scholar, including information about his death if he died while in college. Where dates of death or departure were not recorded they can often be ascertained by reference to other college documents. From c.1470 onwards the age of each scholar was also recorded in the *Registrum Primum*.

A similar admission register was kept at New College, again giving details regarding the name, origin and age of the scholars admitted.²⁶ These details allowed record linkage of individuals between the two institutions. The appearance of a scholar at New College provided another means of accurately pinpointing his departure from Winchester. New College only recruited from among those who had first attended Winchester College, and the statutes required that scholars take up their place at New College within two weeks of it becoming vacant. The arrival of a scholar at New College therefore gives a good approximation for the date of his departure from Winchester.

Another means of ascertaining the presence or disappearance of a scholar is by a record of his taking the oath of loyalty to the college. Every scholar was required to take this oath upon reaching the age of 15, usually at one of two ceremonies held for this purpose during the year. Failure to take the oath resulted in the scholar ceasing to receive his commons allowance, which financed his food, lodgings and clothing. It can thus be assumed that all scholars would take the oath if they were still at the college when they reached the age of 15. The names of those taking the oath, and the dates on which they did so, were recorded in the Register of Oaths, which was commenced in 1414.²⁷ This register provides a means of accurately ascertaining the age of scholars before these details were systematically

23 *Registrum Primum*, 1393–1686, WCA 21490a.

24 The purchase of parchment and the payment of the college notary to compile a register are recorded in the bursars' account roll of 1424–5. This is discussed further in H. Chitty, *The Winchester hall book of 1406–7* (London, 1916), here at 10.

25 Discussions of the evidence for retrospective compilation by Heete can be found in H. Chitty, *A college hall book of 1401–2* (London, 1916) and Chitty, *Hall book of 1406–7*.

26 *Liber Albus*, 1399–1450, New College Archive, Oxford (hereafter NCA) 9654; *Registrum Protocolorum* 1450–1578 (Vols 1–4), NCA 9746–9.

27 Register of Oaths, 1414–1576, WCA, 21850.

recorded in the admissions register. The two registers combined provide the best direct age evidence for a sample group of this kind.²⁸

This brief description of the documentary sources used for this study shows the wealth of information extracted about the individuals in this sample group. Names, ages and places of origin allow nominal linkage between the records of the two colleges. Age details are much more precise than for other medieval population samples, allowing more accurate analysis of life expectancy and age specific mortality. Dates of admission, departure, or death are fundamental to the mortality analyses presented below, and dates for these events are frequently stated in the source materials examined. Where such dates were not directly recorded it is possible to gauge the presence or absence of individuals at regular intervals through reference to hall books and other documents where scholars might be expected to appear. This combination of data is used below to analyse mortality among the scholars of Winchester College.

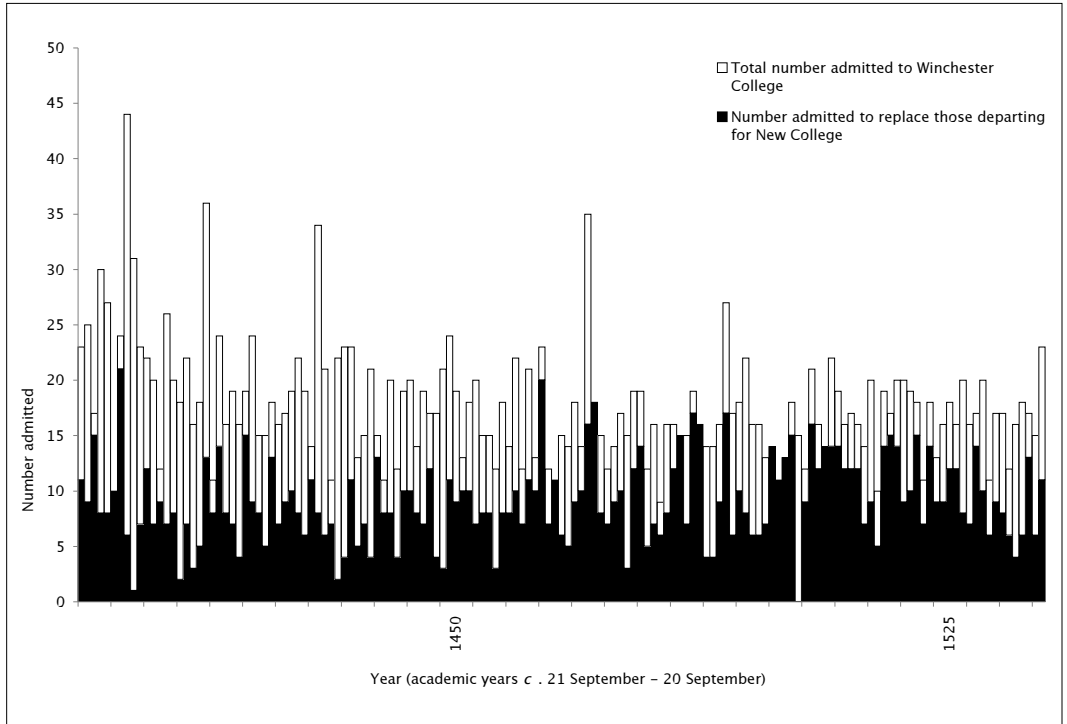
Mortality at Winchester College

In principle mortality should be easily calculated for the Winchester community, as all scholars were intended to progress to New College, and it might thereby be presumed that those that did not had died whilst a scholar at Winchester. If this had been the case, a simple subtraction of the number admitted to New College from the number admitted to Winchester College should produce the number of deaths at Winchester in any given year. The maximum possible levels of mortality in such a scenario can therefore be seen in Figure 1. This graph shows the total number of scholars admitted to Winchester College in each year. The bars have been divided to show how many new recruits were needed to fill vacancies created by those who had progressed to New College, and how many were required to fill vacancies created by other means. In this figure the shaded section of the bars represents the number of scholars recruited to fill the spaces left by those who had gone on to New College. Thus the unshaded sections of the bars represent the maximum possible number of deaths in each year at Winchester College.

If these data represented only deaths at Winchester College it might be said that relatively high background levels of mortality prevailed throughout the study period, that mortality was higher in the earlier years of the study period, that mortality declined after c.1470, and that a number of individual years stand out as having experienced exceptional numbers of deaths. It could also be said that a greater number of apparent mortality crisis years occurred in the earlier half of the study period, with the severity of

28 The age of those entering the monastic communities was not specifically recorded, but age information was inferred using dates of profession. See discussions in Harvey, *Living and dying*, 118–22; Hatcher, 'Mortality', 26–7; Hatcher, Piper and Stone, 'Monastic mortality', 669.

Figure 1 Graph showing the number of scholars admitted to Winchester College, 1394–1540



Sources: Winchester College *Registrum Primum*, Winchester College Archive (hereafter WCA), Winchester, 21490a; New College *Liber Albus*, New College Archive (hereafter NCA), Oxford, 9654; New College *Registrum Protocollorum* (Vols 1–4), NCA 9746–9.

Note: The un-shaded sections of the bars in this graph represent the maximum possible levels of mortality at Winchester College across the period of this study.

such crises being generally higher than for the later part of the period. However, the recruitment and replacement system was not straightforward, and vacancies were created for a number of reasons other than the death of a scholar or his progression to New College.

A range of factors, including levels of mortality at New College, the age of scholars recruited to both institutions, the academic achievements of scholars, and a number of outside influences (most notably in terms of employment opportunities), had an impact on recruitment at both colleges.²⁹ As a result of such factors it frequently occurred that scholars left Winchester College for reasons other than to pursue further study at New College. Some found employment opportunities elsewhere, while others were required to

²⁹ There is not space to fully explore the impact of these variables upon recruitment to Winchester College in this paper, but further discussion of these issues can be found in Oakes, ‘Mortality and life expectancy’.

leave Winchester as they had reached the maximum statutory age limit of 18 without a place becoming available for them at New College.

Calculation of mortality at Winchester is therefore made more difficult by these alternative possible reasons for the departure of scholars, and thus the numbers shown in Figure 1 cannot be taken to represent the actual number of deaths at Winchester College. The graph does, however, provide an indication of the maximum number of deaths that may have occurred in any one year, and of potential trends in the mortality profile at this institution. The following sub-sections of this paper propose methodological refinement of the mortality data through examination of departure evidence, known dated deaths, known deaths for which no date was provided, and the problems surrounding unidentified possible deaths.

Departure information

Causes of departure were frequently given for Winchester scholars, with notations often made in one or other of the college records described above. Table 1 summarises the reasons for student departure over the study period.

The data have been divided into four columns: those who died while at Winchester (and whose death was noted in college records); those who went on to New College, and whose admission there was attested by records at that institution; those who left the college, whether to pursue external employment opportunities or as a result of becoming too old to remain at Winchester; and finally those whose departure cause was unknown, with no departure information found in the Winchester records. This last group of unknowns really belong in one of the other columns within the table, and must represent a death, a departure, or a scholar who progressed to New College. Table 1 records the information by ten-year admission cohorts, rather than by dates of departure. This is due to the difficulties in accurately pinpointing the departure dates for some scholars due to gaps in the series of hall books.

A striking element of the table is the apparent absence of deaths among those enrolled *c.* 1471–1510. This period was one of defective registration in terms of departure information, when it appears that scribes responsible for the college records did not return to the documents to add this information. This also accounts for the small proportion of scholars recorded as having left for other reasons, and for the larger proportion whose cause of departure is unknown. Data regarding the numbers who went on to New College is relatively secure for this period, as it is derived from records held at that institution, and so the unknowns in this table are more likely to represent deaths or departures due to other causes.

Levels of death and departure might be hypothesised for the period 1471–1510 using the data available for the earlier cohorts. Calculation of ratios between the number of deaths

Table 1 Causes of departure for scholars admitted to Winchester College 1393–1540, by 10-year admission cohort

Admission Cohort	Died		To New College		Left		Unknown		Total N
	N	%	N	%	N	%	N	%	
1393–1400 ^a	13	6	99	44	100	44	14	6	226
1401–1410	18	8	78	33	135	57	7	3	238
1411–1420	8	4	90	45	94	47	7	4	199
1421–1430	34	18	77	41	51	27	27	14	189
1431–1440	12	7	75	43	52	30	36	21	175
1441–1450	8	4	86	47	66	36	23	13	183
1451–1460	6	4	84	51	61	37	15	9	166
1461–1470	15	10	101	66	23	15	14	9	153
1471–1480	1	1	96	55	1	1	78	44	176
1481–1490	0	0	96	64	1	1	53	35	150
1491–1500	0	0	100	59	1	1	69	41	170
1501–1510	0	0	119	72	1	1	46	28	166
1511–1520	7	4	105	61	6	3	54	31	172
1521–1530	1	1	94	58	3	2	65	40	163
1531–1540	5	3	78	47	33	20	50	30	166
Overall %	5		51		23		21		100
Total (N)	128		1378		628		558		2692

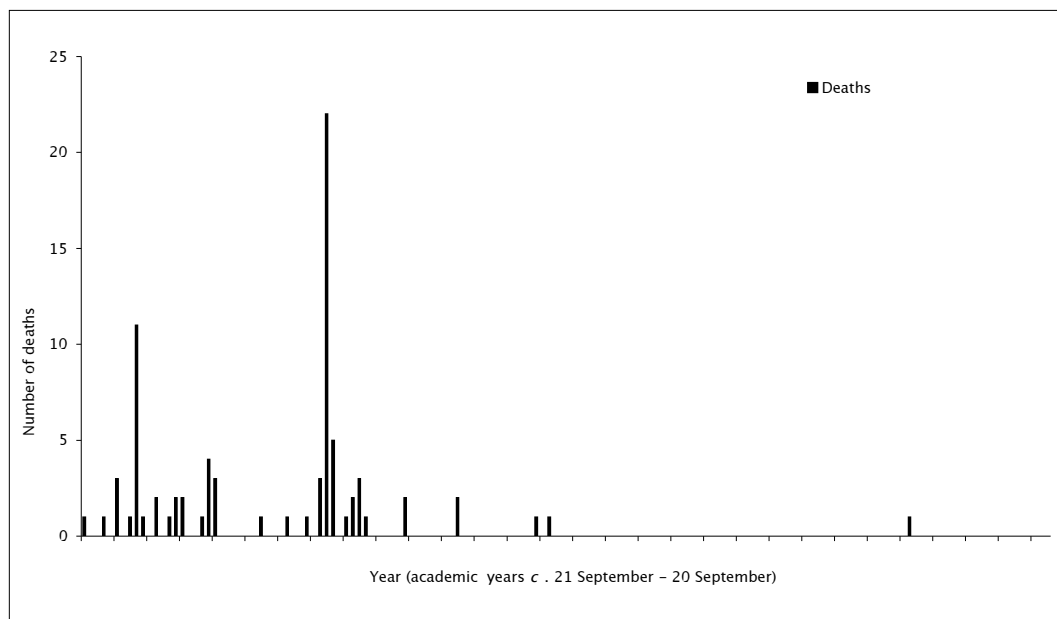
Sources: Winchester College *Registrum Primum*, WCA, 21490a; New College *Liber Albus*, NCA, 9654; New College *Registrum Protocollorum* (Vols 1–4), NCA 9746–9.

Note: ^a This cohort comprises scholars admitted over an eight year period, rather than ten.

and the number of departures and/or New College admissions is straightforward enough.³⁰ However, we can see from the table that the proportion of scholars admitted to New College increased over time. Possible explanations for this increase include changes in the mortality regime at either college, a shortening of the time period for which scholars remained at Oxford, better management of recruitment and age structure at Winchester to ensure more scholars found places, or a host of other variables requiring more analysis than is possible here.³¹ It remains unclear whether the increase in progression to New College was a result of a reduction in the proportion leaving Winchester for other reasons, or due to a reduction in mortality. Consequently any discussion based purely on a hypothesis, employing supposed ratios to infer mortality would be circular and inappropriate. However, more detailed analysis of the data in Table 1 is possible. This is undertaken below to assess patterns of mortality among the known data and to suggest possible interpretations for the period of defective registration.

30 These calculations have been undertaken, but are not reported here. They are to be published as part of a separate article currently in preparation.

31 These are discussed in more detail in Oakes, 'Mortality and life expectancy', chapters 3, 4 and 5.

Figure 2 Graph showing the distribution of known dated deaths at Winchester College, 1394–1540

Sources: Winchester College *Registrum Primum*, WCA 21490a; Winchester College Hall Books, WCA 22812–71.

Known dated deaths

Of the 128 scholars in Table 1 recorded as having died at Winchester College, 80 had an accurate date of death noted in college records. Figure 2 shows the distribution of these deaths by year across the study period.

This figure shows generally low levels of mortality, with one or two deaths occurring in single years. Higher rates of four or five deaths in an individual year are seen only occasionally, such as in 1412 and 1431. However, these slightly elevated levels of mortality occur in close succession to other years in which deaths were observed. Recorded deaths were often clustered in small groups of years, for example 1400–1402, 1406–1408, 1411–1413, 1429–1431 and 1433–1436.³² Extreme peaks of mortality are the most striking feature of this graph. In comparison to the lower levels of mortality, the number of deaths soared to 11 in 1401, a known plague year, and to a staggering 22 in

³² National outbreaks of epidemic plague have been suggested for at least one year in each of these periods, with the exception of 1429–1431. See for example, Bean, 'Plague, population and economic decline', 427–31. The relationship between plague years and mortality at Winchester College and New College Oxford is discussed in greater detail than is possible here in a separate article currently in preparation.

1430.³³ These appear to represent incidents of exceptional mortality, probably reflecting episodes of epidemic disease or contagious illness within the community.³⁴ This is further supported by reference to the hall book accounts for these years, which show the deaths to have occurred in quick succession over a short period of only a few weeks.³⁵

Known undated deaths

A further 48 deaths are confirmed over the study period, although the dates of these events were unspecified. Undated deaths present more of a challenge in terms of their representation, and ‘there is very little statistical theory that helps with missing data problems’.³⁶ Missing data are not an uncommon problem in medieval samples such as this, and many datasets include some gaps. In the Christ Church Canterbury study it was necessary to space 29 deaths at equal time intervals over a period of 16 years. This resulted from bare lists of names with no exact dates of death for the periods 1472–1481 and 1491–1496.³⁷ In the study of Westminster Abbey it was noted that the cause of departure from the sample group was not always known with certainty. In many instances the departure dates of Westminster monks were explicitly recorded, but where this was not the case it could be inferred from other evidence.³⁸ Gaps in the data were more frequent for Durham Priory, and consequently an exact date of death was not known for 137 individuals from the sample group (c.33 per cent). However, it was possible to estimate the dates of these deaths through analysis of the gaps in surviving records, and the periods between the earliest and latest possible dates of death.³⁹

Similarly, it has been possible to identify a range of years in which the deaths of these 48 Winchester scholars must have occurred. This has been undertaken by identification of the last known date on which each scholar was seen alive in the college records (last alive year) and the date by which they were known to have no longer been part of the sample group (dead by year). These gaps were ascertained using the hall book accounts. The age

33 Adam of Usk reported 1401 as a year of exceptional plague. See C. Given-Wilson, ed. and trans., *The chronicle of Adam Usk 1377–1421* (Oxford, 1997), 98.

34 Whilst the 1430 mortality peak cannot be directly attributed to plague, it also came after two years of high grain prices. High grain prices were also experienced in 1401. Other mortality peaks discussed in subsequent sections of this paper also appear to coincide with periods of high prices. (See D.L. Farmer, ‘Prices and wages 1350–1500’, in E. Miller ed., *The agrarian history of England and Wales Vol. III 1348–1500* (Cambridge, 1991), 502–5 for a list of such years). The relationship between college mortality and grain prices is also to be assessed in the article in preparation.

35 Hall Book 1401, WCA, 22815; Hall Book 1430, WCA 22824.

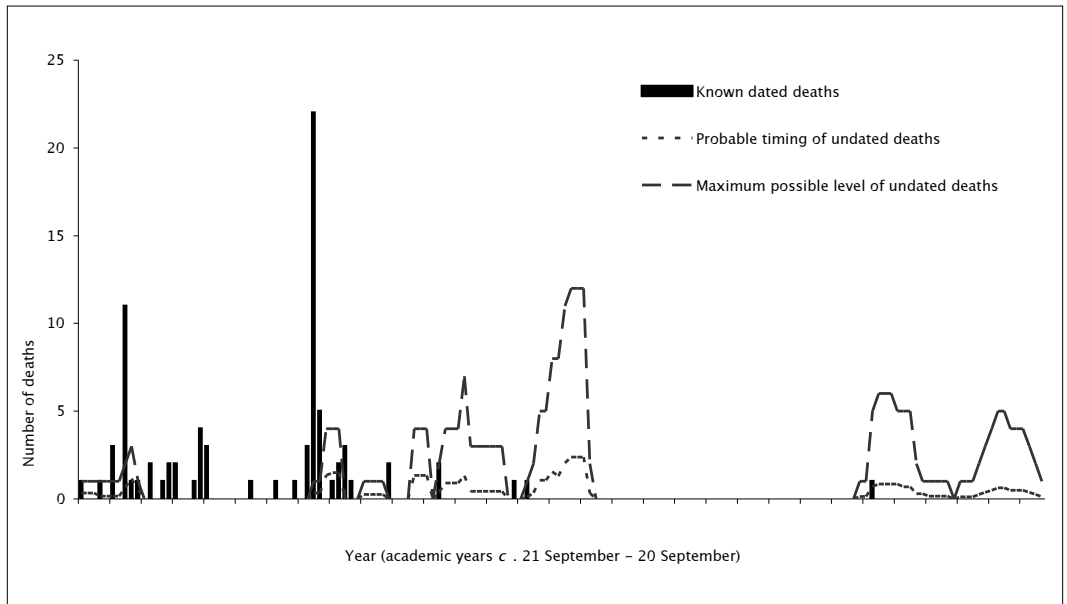
36 R. Floud, *An introduction to quantitative methods for historians*, 2nd edn (London, 1979), 186.

37 Hatcher, ‘Mortality’, 24.

38 Harvey, *Living and dying*, 116–7.

39 Hatcher, Piper and Stone, ‘Monastic mortality’, 671–3.

Figure 3 Graph showing the timing of known deaths at Winchester College with suggested timings for known undated deaths, 1394–1540



Sources: Winchester College *Registrum Primum*, WCA 21490a; Winchester College Hall Books, WCA 22812–71.

of scholars in their last alive year and dead by year has enabled some of these ranges to be narrowed, as it is known from the statutes that they were not permitted to remain in the community beyond the age of 18. Similarly, the range of years can be reduced when a scholar reached the age of 15 during a gap in the hall book data, but did not appear in the Register of Oaths.

How these data are represented and interpreted must to some extent be dictated by the needs of the analysis. In essence we have two key questions relating to mortality at Winchester College: firstly, when were periods of high mortality occurring, and secondly, how severe were the death rates within this institution each year? Figure 3 plots the possible timing of the 48 undated deaths alongside the data for dated deaths. The undated deaths are represented in two ways to indicate the possible answers to these two questions.

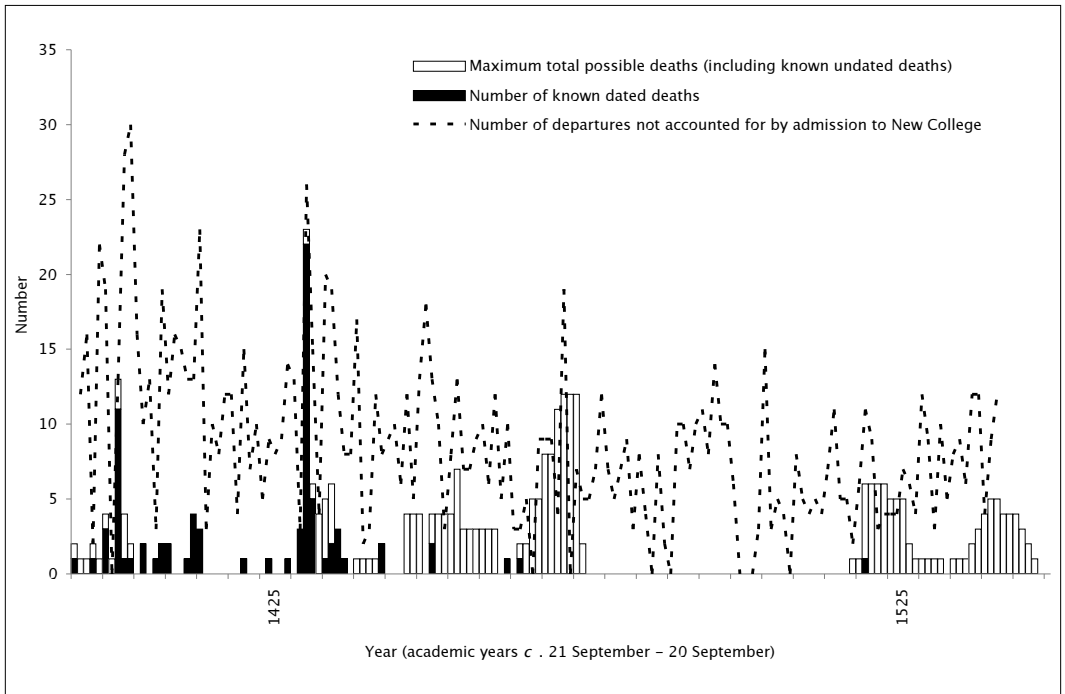
The dotted line on this graph represents the probable number of deaths occurring per year, additional to those shown by the solid bars. The method employed in depicting this data smooths the number of deaths across the gaps between the earliest and latest possible year of their occurrence. Each of the 48 individuals who were known to have died without a specified date of death has been included in each year in which their death may have

occurred. However, each death has been given a value relative to the probability that it occurred in each year. For example, four individuals are known to have died in the three years 1446–1448. It is not known which of these four deaths occurred in which of these three years. For each of the individuals there is a one in three probability that they died in 1446, 1447 or 1448. Therefore, each individual has been given a value of 0.333 [$\frac{1}{3}$] in each of the three years. These have been added together and produce a total of 1.333 [$1\frac{1}{3}$] for each year, which is plotted by the dotted line. In instances where an individual died in one of two possible years they were given a value of 0.5 for each year, in one of four possible years a value of 0.25 and so forth. Those with known dated deaths were given a value of one, and appear on the graph as solid bars. These data go some way towards answering the first of our questions regarding the possible timing of peaks in mortality at Winchester College, with potential further peaks evident in the mid 1430s, late 1440s, mid 1450s and early 1470s. Other relatively small peaks in mortality may have occurred in the late 1510s/early 1520s and late 1530s.

The dashed line in Figure 3 assesses the potential severity of mortality in the different years across the study period using the information relating to the undated deaths. In this series the dashed line represents the potential number of deaths per year, additional to those shown in the solid bars. It has been calculated by placing an individual with an unknown date of death into all of the years in which his death might have occurred. For example, John Welynew was admitted to the college in 1438. It is known that he died whilst a scholar, but gaps in the hall book data have meant that the date of his death was unobserved, but is known to have occurred before September 1441. His death has therefore been included in this data series for the years 1438, 1439, and 1440, and given the value of one in each instance. The same method was applied to all 48 individuals with no known date of death. This has inevitably created double counting. However, this figure is designed to suggest a possible answer to the question regarding the potential severity of mortality crises at Winchester. The data for the undated deaths have been shown as a dashed line to indicate that the actual number of probable deaths could have occurred anywhere between the value given for that year and zero, represented by the X-axis of the graph.

This data series confirms the likely timing of additional peaks in mortality identified by the dotted line. It further suggests the potential extent of mortality within those periods. The years 1471–1473 saw the largest possible peak in mortality, with the deaths of 12 individuals falling across those years, potentially in a single year. The other potential peaks were less severe, but may have been high relative to the mortality seen in other years. In 1454 the number of deaths may have been as high as seven, between 1520 and 1522 the number of deaths possibly rose to six in a single year, and in 1539–1540 five deaths may potentially have occurred in one year. Smaller possible peaks in the number of deaths around 1402, 1432–1434, and 1446–1447 of up to four deaths are also suggested by the data shown by the dashed line in Figure 3.

Figure 4 Graph showing the numbers of known dated and undated deaths at Winchester College with a line showing the total number of departures for each year not resulting from admission to New College Oxford



Sources: Winchester College *Registrum Primum*, WCA 21490a; New College *Liber Albus*, NCA 9654; New College *Registrum Protocollorum* (Vols 1–4), NCA 9746–9.

The potential levels of mortality in these years can be tested by comparing the data from Figure 3 to the admissions data shown in Figure 1. Admissions in each year that did not arise as a result of recruitment to New College have been plotted alongside the suggested levels of possible mortality in Figure 4.

In this graph, the stacked columns show the total possible level of mortality in any one year, with dated deaths shown here by the solid segments of the bars, with the possible additional number of deaths that were plotted by the dashed line in Figure 3 shown here as non-filled bars. The dotted line shows the numbers admitted per year that were not replacing Winchester Scholars progressing to New College. Due to the one-out one-in system of recruitment it should not be possible for the number of deaths in any one year to exceed the level of the dotted line.

Figure 4 suggests the 12 deaths that occurred in the period 1471–1473 may have been clustered predominantly in 1471, when an exceptional peak in the number of admissions cannot be explained by recruitment to New College. The much lower

numbers of non-New College departures in the following two years make it unlikely that the deaths were spread over all three years. This would make 1471 a year of exceptional mortality, similar in scale to that recorded in 1401. Documentary evidence supports the plausibility of this conclusion, with plague epidemics reported by chroniclers for both of these years.⁴⁰ Similarly, it seems likely that the majority of the six deaths recorded over the period 1520–1522 may have occurred in the first of these three years, when there was a rise in admissions not linked to New College recruitment. If the case, and depending on their seasonal timing, these deaths might relate to the one known death in 1519, although this must remain speculation. In this instance, however, the possibility remains that some of these six deaths may have occurred in 1521 or 1522, as the data would still fall below the levels of maximum possible mortality shown by the dotted line in Figure 4 if the deaths were spread more evenly over the three year period.

The above discussion of known deaths, both dated and undated, shows likely possible scenarios for mortality patterns and peaks in the death rate at Winchester College over the late medieval period. However, it seems probable that there were additional unrecorded deaths at Winchester.

Unidentified possible deaths

As seen in Table 1, departure information was not recorded for everyone in the sample, and from among the group of scholars whose departure cause is unknown there may have been some who contributed an unidentified death to these totals. As previously discussed, it is not possible to safely suggest a departure cause for these individuals. However, Figure 4 suggests the absolute maximum levels of mortality that may have occurred, and is particularly useful for the period *c.*1471–*c.*1510.

The dotted line in Figure 4 suggests that mortality at Winchester may have been generally declining in the latter part of the study period, with perhaps some resurgence in the last decades of the fifteenth century, followed by a possible steady increase into the early part of the sixteenth century. Years of potentially severe mortality might also have occurred *c.*1477, 1493, 1495, 1503, 1514, 1519, 1528, 1536 and 1540. As the area under the dotted line represents both deaths and departures for reasons other than New College admission, it cannot be certain that these peaks represent mortality rather than increases in the number of scholars not progressing to Oxford. However, regardless of how the numbers under the line should be split between the two categories, it is clear that mortality at Winchester

40 Bean, 'Plague, population and economic decline in England', 427–31; see also the letter from John Paston II to John Paston III, 15 September 1471, in N. Davis ed., *Paston letters and papers of the fifteenth century: Part I* (Oxford, 1971), 439–41; Given-Wilson, *Chronicle of Adam Usk*, 98.

never again attained the level witnessed in 1430 and may only rarely have come close to the level seen in 1401.

Comparison and contextualisation

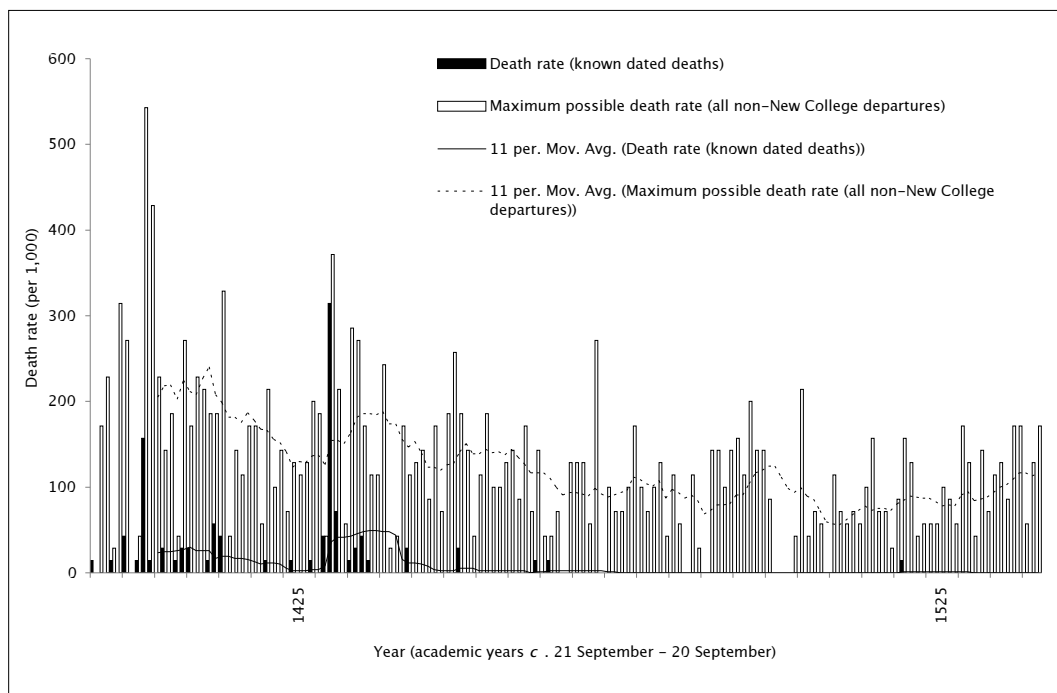
Further contextualisation is required to understand the significance of the mortality data presented for Winchester College. However, raw data of this kind are almost impossible to compare, and rates of mortality expressed as a measure of deaths per 1,000 people are more commonly employed to enable comparisons with other datasets. This is where studies based upon manorial court rolls often run into difficulty, as it is harder to relate the deaths to an accurate figure for the size of the overall population at risk.⁴¹

Such problems are not encountered with the Winchester College data, where the size of the population at risk is known. Rates of death per 1,000 have therefore been calculated for the Winchester College dataset, and a constant overall population of 70 has been assumed. It might be argued that the overall population size should equate to 70 plus the number of scholars admitted in any one year. However, the one-out one-in replacement system meant that over the course of the year no more than 70 person-years were exposed to risk of a death. Each new recruit was exposed to the risk of dying at Winchester College for only the proportion of the year from their admission to year-end. In turn, the person they replaced was only exposed to the risk of dying from year-start to the point of their departure. Sensitivity testing of the data shows that even if all vacancies took a month to be filled, the resulting impact on the person-years lived over the course of the study is negligible. Consequently, an overall population size of 70 has been used for calculating the death rate at Winchester College. Mortality at Winchester College as a rate of deaths per 1,000 is given in Figure 5. For purposes of potential comparison a maximum death rate has also been calculated, based on the number of departures in each year not accounted for by an admission to New College. Again an overall population at risk of 70 has been used, and the raw data are derived from those represented in Figure 4 by the dotted line. As can be seen from Figures 4 and 5, the margin of error between the known death rate and the maximum possible death rate is quite large, especially in the latter years of the study when the number of scholars with an unknown cause of departure increased.⁴² However, both sets of data in Figure 5 suggest an overall downward trend in mortality or possible mortality among the 10 to 18 age group in the later fifteenth century.

41 See discussions in Razi, *Life, marriage and death*; Poos, Razi and Smith, 'Population history'.

42 Reducing this margin of error is the subject of on-going research.

Figure 5 Graph showing the death rate per thousand calculated for known dated deaths and maximum possible deaths (including all departures not attributed to an admission to New College).



Sources: Winchester College *Registrum Primum*, WCA 21490a; New College *Liber Albus*, NCA 9654; New College *Registrum Protocollorum* (vols 1–4), NCA 9746–9.

In this form the data can be compared to those produced by other studies of medieval mortality. Rates of death per 1,000 have only been calculated for a small number of medieval population groups.⁴³ The most appropriate for comparison with the Winchester College data are those derived from studies of the monastic populations at Christ Church Canterbury, Westminster Abbey, and Durham Priory.⁴⁴ Comparison of the Winchester College mortality rates with those for the monastic populations allows some general observations to be put forward.⁴⁵ It can be seen that the Winchester mortality profile most

43 Such studies include a number of the works cited in footnotes 4, 5 and 6 above.

44 These monastic studies provide directly observed death rates for a similar time period, allowing comparisons of annual mortality across the fifteenth century. Studies of rural tenants undertaken using manorial court rolls mostly terminate by 1400 (e.g. Postan and Titow, 'Heriots and prices', or Razi, *Life, marriage and death*), or else do not report annual death rates (e.g. Poos, *Rural society*). This makes them less useful for comparison here.

45 The following discussion makes reference to the mortality data presented in Harvey, *Living and dying*, 122–7; Hatcher, 'Mortality', 25–31; Hatcher, Piper and Stone, 'Monastic mortality', 676–8.

closely resembles that of the Westminster monks. At both institutions mortality seems less frequent but more severe in the earlier part of the fifteenth century, particularly when the Westminster data are represented by years of account.⁴⁶ Years of extreme mortality in this earlier period were also of a similar order of magnitude at Winchester and Westminster, whereas the exceptionally high death rates of over 200 per 1,000 observed at these institutions were never witnessed at Canterbury or Durham.⁴⁷

The scale and timing of severe mortality crises across all four institutions rarely seem to have coincided exactly, perhaps reflecting an increasing regionalisation of plague outbreaks across the fifteenth century. The exception is for the year 1471, in which crisis mortality was experienced at Westminster Abbey and Christ Church Canterbury, and potentially also at Winchester College. As noted above, this was a year of widespread plague, and the correlation of these peaks may reflect the national scale of this outbreak.

Mortality in the later part of the study period was potentially more volatile than it had been in earlier years. This must remain supposition as it is based upon the suggested profile of the maximum mortality data. However, such volatility towards the end of the fifteenth century can also be observed at the three monastic communities. At all four institutions the mortality trend, represented in Figure 5 by the 11 year moving-average lines, indicates a slight upward trend in mortality (or possible mortality) in the early decades of the sixteenth century.

The implications of these trends are difficult to elucidate by simple comparison of annual mortality rates alone. It is the case that crude death rates allow the instability of mortality among different communities to be compared across a period of time, regardless of the size or exact age distribution of those within the population sample under observation.⁴⁸ However, the rates calculated for medieval populations are not true 'crude' rates, as none of the samples include individuals from *all* age groups within the population. The monastic samples encompass only men of eligible age for profession, and thus reflect mortality among males aged 18 and over only.⁴⁹ These monastic groups contain

46 Issues to do with the start date for each twelve month period of observation can have a profound effect on the resulting mortality rates. This cannot be dealt with here in detail, but see R. Schofield, "'Crisis" mortality', *Local Population Studies*, 9 (1972), 11; E.A. Wrigley and R.S. Schofield, *The population history of England 1541–1971: a reconstruction* (London, 1981), 293–6 and 657–9; and E.A. Wrigley et al., *English population history from family reconstitution, 1580–1837* (Cambridge, 1997), 322–47 for further discussion, and Harvey, Figures IV.1a and IV.2a, *Living and dying*, 123 and 126 for an example of this effect.

47 To give an indication of the severity of these death rates, among rural tenants on the manor of Halesowen mean annual crude death rates for adult males over the age of 20 are estimated at around 24.8 per thousand for 1300–1348, falling to around 20.4 per thousand for 1350–1400. During epidemics of plague at Halesowen in 1361 death rates were estimated to be c.135 per thousand, in 1369 to be c.161 per thousand, and in 1375 c.117 per thousand.

48 D.T. Rowland, *Demographic methods and concepts*, (Oxford, 2003), 33.

49 Harvey, *Living and dying*, 118–22; Hatcher, 'Mortality', 26–7; Hatcher, Piper and Stone, 'Monastic mortality', 669.

individuals from older age ranges, amongst whom death rates would likely be higher. The Winchester College sample is the first of its kind to present mortality data for a younger age group, with scholars falling between the ages of 10 and 18.⁵⁰ Mortality might be expected to be lower amongst these age groups. In this sense the data presented here are invaluable, being the first sample to present directly observed evidence for mortality experiences among this age-specific group for the fifteenth century. However, this uniqueness also makes it difficult to compare these data with other studies of medieval mortality. Comparative analysis of life expectancy among the monastic and college based samples would provide a more robust understanding of the mortality regimes among these different age-specific groups, and is the subject of ongoing research.⁵¹

Conclusion

The data presented in this article, like much of that obtained for the late medieval period, are patchy and not without their problems. Undated deaths and periods of defective registration mean that mortality rates observed within this sample undoubtedly underestimate the real figures. Although there are gaps in the dataset, this article has demonstrated that maximum mortality levels can be calculated for this group. It has demonstrated various methods that can be employed to extract further information from incomplete datasets such as these, and how such methods can be targeted towards specific questions.

As is also the case with many studies of medieval population, these data have something valuable and new to offer. For the first time a community of children and adolescents can be directly observed. The information collated for the period up to c.1471 is most secure, and suggests generally low levels of mortality with infrequent yet severe surges in the death rate in particular years. The general lack of correlation between peaks in the death rate across different datasets suggests a possible regionalisation of mortality in the fifteenth century. The sheer scale of the death rates at Winchester College in 1401 and 1430 are exceedingly high when compared to mortality observed at monasteries for the late medieval period. This possibly suggests that epidemic or contagious disease may have had a greater impact among those at Winchester College, either due to their age, or resulting from differences in their standards of living that set them apart from the monastic communities.⁵²

50 Theoretically scholars could be admitted as young as eight years of age. However, scholars were normally about 11 years old on their admission, with only a very few scholars falling below this age. See Oakes, 'Mortality and life expectancy', 163–5.

51 Such analyses have been undertaken and appear in Oakes, 'Mortality and life expectancy'. They demand more discussion than is possible here, and form the basis of another article, currently in preparation.

52 For further discussion see Oakes, Chapter 3, 'Mortality and life expectancy'.

The story does not end here. The mortality data presented in this article may be the first for a sample of individuals directly observed from this age range, but ongoing research hopes to provide further data for this group and allow comparative analyses to be made. Mortality evidence for the Winchester scholars is only one part of the dataset collated for this research. Those who continued their education at New College Oxford have also been followed, and mortality at that institution has been analysed.⁵³ Those data are more complete, and issues of defective registration far less of a problem. The New College scholars are more similar in age to the monastic communities, and many more comparisons can be drawn between those groups. The analyses of these data form the basis of a separate article, where mortality evidence for both colleges is drawn together and compared to other existing medieval datasets.

This article has shown that alternative methods of analysis can make the investigation of samples such as this worthwhile, and can yield useful information from seemingly incomplete datasets. By applying such methods to yet more datasets, particularly for previously understudied population groups, we might increase the number of samples between which comparisons can be made, and thus add to our understanding of medieval population history.

53 Oakes, Chapter 4, 'Mortality and life expectancy'.