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Living la vita apostolica. Life expectancy and mortality of nuns in late-medieval Holland

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Abstract: Data on vital events of medieval women are extremely scarce. We use a dataset based on a necrology of nuns in late-medieval Holland to arrive at estimates for the development of life expectancy and mortality. The first study of its kind for the Low Countries, it shows striking differences in the development of life expectancy and mortality between Holland and England. In the fifteenth century, life expectancy at age 25 in Holland was much higher than in England. Also, mortality among our population of nuns was much lower than among monks in England, and mortality crises were less frequent. Our result support claims by Van Bavel and Van Zanden (2003) about the relatively early recovery of the population of Holland, as well as the mild impact of infectious diseases. The comparison with England suggests that this country's crisis of the late Middle Ages was most likely the result of a high-mortality demographic regime.

Keywords: life expectancy, women, Middle Ages

JEL codes: J11, N33, N13

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I

The fourteenth century plague that killed millions of people has become a popular explanatory variable among economic historians. They use this external shock to explain why some economies experienced stagnation and perhaps even decline, while others managed to flourish. England is perhaps the best example of an initially prominent economy suffering from plague and struggling throughout the remainder of the middle ages. Some of its continental neighbours, Flanders and Holland, are regarded as regions that had to cope with fewer deaths, and could therefore grow during the crisis of the late Middle Ages. The emergence of Antwerp, and later Amsterdam, as economic centers has thus been linked to the absence of a late-medieval crisis in much of the Low Countries. The same goes for the golden age of the province of Holland and the Dutch Republic, in the seventeenth century.[1]

In search for an explanation for economic decline during the late Middle Ages, historians have fiercely debated the population history of medieval England for many decades now. That England had to cope with a declining population in the fourteenth and fifteenth centuries is not disputed.[2] The debate rather centers on the question what caused the contraction of the population of late-medieval England: had the country hit a Malthusian maximum shortly before the Great famine of 1315-1318?[3] Or did the population decline due to external shocks, such as bad weather causing food crises, and infectious diseases killing tens of thousands of people, as most scholars nowadays seem to believe?[4] And if the latter is true: was high mortality the driving factor behind the population history of late-medieval England – the view expressed by Hatcher?[5] Or was this caused by low fertility because people postponed and even refrained from marriage, as Wrigley and Schofield, and Smith, have suggested?[6]

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[1] B. van Bavel, J. Dijkman, E. Kuijpers and J. Zuijderduijn, 'The organisation of markets as a key factor in the rise of Holland, fourteenth-sixteenth centuries. A test case for an institutional approach', *Continuity & Change* 27 (2012) 347-378; B.J.P. van Bavel and J.L. van Zanden, 'The jump-start of the Holland economy during the late-medieval crisis, c. 1350 – c. 1500', *Economic History Review* 57 (2004) 503-532.

[2] J. Hatcher and M. Bailey, *Modeling the Middle Ages: the history and theory of England's economic development* (Oxford 2001) 21-65.

[3] M.M. Postan, *Essays on medieval English agriculture and general problems of the medieval economy* (Cambridge 1973).

[4] See the survey by Pamela Nightingale: P. Nightingale, 'Some new evidence of crises and trends of mortality in late medieval England', *Past & Present* 187 (2005) 33-68, pp. 33-35.

[5] J. Hatcher, 'Understanding the population history of England, 1450-1750', *Past & present* 180 (2003); J. Hatcher, 'Mortality in the fifteenth century: some new evidence', *The Economic History Review* 39 (1986) 19-38, pp. 19.

[6] E.A. Wrigley and R.S. Schofield, *The population history of England, 1541-1871: a reconstruction* (Cambridge 1981); R.M. Smith, 'Hypotheses sur la nuptialitté en Angleterre aux XIIIe-XIVe siecles', *Annales: Économies, Sociétés, Civilisations* 38 (1983) 107-136.

In the Low Countries historians also concerned themselves with late-medieval population development to explain prosperity in the regions Brabant, Flanders and Holland. In this respect Van Werveke claimed that the plague had passed by the Low Countries entirely.[7] Later Jansen came with a hypothesis that rather than all of the Low Countries, it was the county of Holland that was largely unaffected by plague. This allowed for what he called 'Holland's advance': a low-wage economy at a time when labour became much more expensive in other areas, such as Flanders and England.[8] This comparative advantage should have given Holland a crucial edge over its economic competitors, and allowed for a first phase of economic growth during the crisis of the late middle ages.

In the 1980s historians were able to unearth more data on the impact of plague in the Low Countries. Blockmans was in particular responsible for nuancing the views put forward by Van Werveke and Jansen: based on a large variety of sources he argued persuasively that the plague did not pass by the Low Countries and Holland.[9] He thus followed the pioneering work by De Boer, who reported plague in his extensive study of the Rijnland region of Holland.[10] But since Jansen's hypothesis assumed a mild mortality, it had also become necessary to find indicators that allowed for quantifying the impact of plague in Holland and surrounding regions. In a first attempt to do so, Blockmans found wage levels in Holland, in the second half of the fifteenth century, to be much lower than in Flanders, which seemed to support Jansen's hypothesis.[11] However, this finding was questioned by Van Zanden, who found wage levels in Holland and Flanders to be quite similar, and later again by Van Bavel and Van Zanden.[12] These authors found evidence for relatively high-wages in Holland before the plague, and next a gradual convergence to the wage levels observed elsewhere in Europe. Van Bavel and Van Zanden conclude:

> This pattern – the end of Holland as a high-wage region – is consistent with the exceptional
> development of the population. The relatively slight decline in the population after 1347, and

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[7] H. van Werveke, *De Zwarte Dood in de Zuidelijke Nederlanden (1349-1351)* (Brussels 1950); H. van Werveke, 'Nogmaals: de Zwarte Dood in de Nederlanden', *Bijdragen voor de Geschiedenis der Nederlanden* 8 (1954) 251-258.

[8] H.P.H. Jansen, 'Holland's advance', *Acta historiae Neerlandicae* 10 (1978) 1-20.

[9] W.P. Blockmans, 'The social and economic effects of plague in the Low Countries: 1349-1500', *Revue belge de philologie et d'histoire* 58 (1980) 833-863.

[10] D.E.H. de Boer, *Graaf en grafiek.Sociale en economische ontwikkelingen in het middeleeuwse 'Noordholland' tussen + 1345 en + 1415* (Leiden 1978) 29-166, pp. 165-166.

[11] Blockmans, 'The economic expansion of Holland and Zeeland in the fourteenth-sixteenth centuries' in: E. Aerts (ed.) *Studia historica oeconomica* (Louvain 1993) 41-58, pp. 46-49.

[12] J.L. van Zanden, 'A third road to capitalism? Proto-industrialisation and the moderate nature of the late medieval crisis in Flanders and Holland, 1350-1550', in: P.C.M. Hoppenbrouwers and J.L. van Zanden (eds.), *Peasants into farmers? The transformation of rural economy and society in the Low Countries (middle ages-19th century) in the light of the Brenner debate* (Turnhout 2001) 85-101' pp. 92-96; Van Bavel and Van Zanden, 'The jump-start'.

its strong growth during the fifteenth century induced the process of converging (nominal and real) wage levels...[13]

To sum up: today, the economic development of Holland in the late middle ages is explained by 1) mild effects of plague and 2) strong population growth in the fifteenth century. Van Bavel has called the population development of Holland, and also Flanders, 'exceptional in a European perspective, especially since population densities and pressure on the land were high there'.[14]

This paper provides new evidence for the demographic history of Holland. It presents, for the first time, late-medieval data on vital events. These data allow for a better understanding of population growth in Holland, in the fifteenth century, relative to stagnation and decline elsewhere, most notably in England. Evidence of life expectancy and mortality comes from a nunnery: a Third Order convent in the town of Gorinchem, in the Southeast of the county of Holland. We compare this to the demography of populations of monks in London's Westminster abbey, in Durham priory, and in Canterbury's Christ Church. We find support for the idea that mortality levels in Holland were relatively low: in England mortality figures were almost twice as high, and mortality crises occurred almost twice as often as in Holland. With respect to the claim that the effect of the plague in Holland was modest we argue that life expectancy at the beginning of the fifteenth century was low, and the degree of untimely deaths high: most women in the convent of St. Agnes died before they reached the age of 50. As a result, life expectancy at age 25 in the cohort of 1415-1439 was low, at 28,7 years. We suggest this was caused by plague, but also that plague disappeared quicker in Holland than elsewhere. Life expectancy at age 25 rose to 36,8 during the cohort 1435-1459 – much higher than what has been observed in England. This remained so until the cohort 1485-1499, when life expectancy in Gorinchem had declined to match the English levels. Mortality in Gorinchem was also relatively low, at 2,1 per cent per year.

The paper first introduces the reader to medieval demography (II). It then discusses our population: the nuns of the convent of St. Agnes (III) and goes on to explain how the necrology of this convent can be used to calculate life expectancy (IV) and mortality (V). Conclusions follow (VI).

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[13] Van Bavel and Van Zanden, 'The jump-start', 515.

[14] B. van Bavel, *Manors and markets.Economy and society in the Low Countries, 500-1600* (Cambridge 2010) 280. Peter Hoppenbrouwers, in a survey of the economic history of Holland, also mentions a combination of mild effects of plague and early recovery (P.C.M. Hoppenbrouwers, 'Van waterland tot stedenland. De Hollandse economie ca. 975-ca. 1570', in: Th. de Nijs and E. Beukers (eds.) *Geschiedenis van Holland. Deel 1. Tot 1572* (Hilversum 2002) 136.

II

In this paper we focus on mortality and age-specific life expectancy of nuns. In general, demographic data for the late-medieval period are difficult to come by and this is especially true for women. Birth, marriage and death records were only kept after the Council of Trent (1545-1563),[15] so medieval historians often have to suffice with scarce and sometimes indirect sources. With respect to longevity we know something about male members of the elite, who easily reached ages well into their sixties on average.[16] However, these figures are biased in a number of ways. In their paper on the longevity of famous people, De la Croix and Licandro identify a 'notoriety bias' (to become famous or make a career, individuals need to live long enough).[17] The main reason why we know of the age at death of philosophers, scholars and artists is because these were famous people who were honoured with biographies. Such biographical information was primarily gathered of people who had lived long enough to become famous.[18] Another reason why such data are biased, is that royalty, elites and clergy are generally believed to have lived under relatively favourable conditions: they lived in isolation, which reduced risk of disease, were well-housed and well-fed.[19] The latter bias also applies when we make use of data on the longevity of medieval monks. Several studies have uncovered the demography of monastic populations: for medieval England we therefore have basic information concerning several thousands of monks.[20] Considering the (possible) favourable conditions in convents, monastic data tell us something about the longevity and life expectancy of a specific group. Furthermore, since monks and nuns first moved into convents in their teens or later,

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[15] J. Baldo, '*Quonstitudio en extrema vejez*. Old age and life expectancy in late medieval Navarre', *Imago temporis. Medium aevum* 2 (2008) 191-225, pp. 200.

[16] Royalty and popes lived for 60 to 80 years on average (J.P. Griffin, 'Changing life expectancy throughout history', *Journal of the Royal Society of Medicine* 101 (2008) 577. Medieval elites such as Islamic religious scholars reached 69 to 75 years on average (M. Shatzmiller, *Labour in the medieval Islamic world* (Leiden/Boston 1996) 66. Studies of the English nobility arrive at similar figures (T.H. Hollingsworth, 'A Note on Medieval Longevity of the Secular Peerage I350- 1500' *Population Studies* 29 (1975) I55-I59; J.C. Russell, *British Medieval Population* (Albuquerque, 1948) 189-I9I and 200). The same goes for the Castilian nobility, which reached on average 64 years (Baldo, '*Quonstitudio*', 202).

[17] D. de la Croix and O. Licandro, 'The longevity of famous people from Hammurabi to Einstein' (working paper 2012) 11-12.

[18] Shatzmiller, *Labour*, 66. Cf. the selection process, including one individual and leaving another one out, in the course of writing genealogies and family histories of elite families in the Low Countries: L. Geevers, 'The disputed legacy of William of Orange and the creation of the Prince of Orange (1584-1675)', in: L. Geevers and M. Marini (eds.), Dynastic Identity in Early Modern Europe. Rulers, aristocrats and the formation of identities (1520-1700) (t.b.p. 2014).

[19] Living in isolation may have been favourable to health, but as Hatcher et al point out, monks living in close proximity may also have been relatively easily exposed to infectuous disease (J. Hatcher, A.J. Piper and D. Stone, 'Monastic mortality: Durham priory, 1395-1529', *The Economic History Review* 59 (2006) 667-687, pp. 682).

[20] Cf. the survey in: D. Loschky and B.D. Childers, 'Early English mortality', *The Journal of Interdisciplinary History* 24 (1993) 85-97.

after they had survived early childhood, so looking at these people can only tell us something about the demography of juveniles or adults.[21]

Historians have used various methods to arrive at age-specific life expectancies for males. For renaissance Pistoia, David Herlihy used the age distribution of the population to estimate life expectancies. Thus he arrived at life expectancies at age twenty of 25,4, and at age 25 of 23,7 years.[22] Christopher Dyer used the length of tenancies as an indicator of life expectancy. The basic idea is that males first began to lease land in their early twenties, and that discontinuation of the lease provides an indication for age at death. Dyer was able to calculate this for 82 tenants in the fifteenth and sixteenth centuries, arriving at a life expectancy of 23-25 years.[23] This approach was also used by Zvi Razi, in his study on the village of Halesowen. Razi compared tenants' year of first entry in court rolls with the year of death. Since the legal age for holding land was 20 years or older, Razi's approach may serve to arrive at a crude estimate of life expectancy at age twenty, which would have been 30,2 years. The author admits that this approach yields biased results, also because it covers more wealthier than poorer tenants. He suggests that an estimate of 25-28 years would be more realistic.[24]

Little is known of medieval women though: they appear much less frequently in sources that provide demographic data such as taxation records. Yet, qualitative sources can give us an idea of general outlines. The life expectancy of females appears to have been low relative to that of males in the early middle ages, causing men to outnumber women. This changed after the thirteenth century, when female longevity increased, and women began to outnumber men. By then authors began to notice a surplus of females, and Albertus Magnus (c. 1200-1280) explained that although men would normally speaking live longer than women, women could outlive them because they did not work as hard as men. According to Albertus, women profited from menstruation, which allegedly purified the body, and also from not having to put as much effort in sexual intercourse as men. Modern scholars have linked women's relative increase in longevity to such issues as 'the curtailment of violence in medieval life, rising standards of living, the growth of cities'.[25] Vern Bullough and Cameron Campbell

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[21] J. Oeppen, 'Estimating the life-expectancy of the monks of Westminster' in: B. Harvey, *Living and dying in England 1100-1540. The monastic experience* (Oxford 1993) 236-238.

[22] D. Herlihy, 'Deaths, marriages, births, and the Tuscan economy' in: R.D. Lee (ed.), *Population Patterns in the Past* (New York 1977) 139.

[23] C. Dyer, *Lords and peasants in a changing society. The estates of the bishopric of Worcester, 680-1540* (Cambridge 1980) 229.

[24] Z. Razi, *Life, marriage and death in a medieval parish. Economy, society and demography in Halesowen, 1270-1400* (Cambridge 1980) 43. Cf. other indications that medieval life expectancy at c. 20-25 years was c. 30 years: S. Shahar, *Growing old in the middle ages. 'Winter clothes us in shadow and pain'* (London 1997) 32 note 108.

[25] V. Bullough and C. Campbell, 'Female longevity and diet in the middle ages', *Speculum* 55 (1980) 317-325, pp. 319; D. Herlihy, 'Life expectancies for women in medieval society', in: R. Thee Morewedge (ed.) *The role of women in the middle ages* (Albany 1975) 1-22 pp. 9-10, 15.

came with another explanation: the early-medieval diet lacked the nutrient iron, which is especially important for women's health. Due to iron-shortages early-medieval women 'were on the whole severely anemic ' – hence their low longevity. However, in the later middle ages, when more meat became available, iron intake also increased and female longevity could improve.[26] Although one would expect improvements to the medieval diet to have been made in medieval convents, However, Hatcher et al point to 'the possibility that an unbalanced and excessively rich monastic diet may have helped to depress life expectancy, especially when combined with a lack of exercise'.[27]

The only quantitative data supporting the idea that female life expectancy surpassed male's, comes from David Herlihy. Based on the age distribution of Florence and its countryside, in 1427, he estimated life expectancy of females at birth at 29,54 years, and of male at 28,50.[28] Women did particularly well during adulthood: whereas girls were found to die more often than boys, women lived longer than men. Herlihy concludes that '[t]he contemporary opinion that women lived longer than men seems to be justified, at least for the adult ages'.[29] However, early-modern evidence, presented in appendix 1, yields some doubt about whether female life expectancy had indeed for good surpassed male's, as seems to be assumed in some of the literature.[30] In many cases men's life expectancy exceeded that of women, although differences were often quite modest. The advantage today's females have over men did not exist in the early modern period: both sexes could expect to live about equally long lives. The absence of a significant gender-gap in adult life expectancy is important for our study because it allows us to use female data to make claims about general life expectancy and mortality.

III

The convent of St. Agnes was located in the small town of Gorinchem. This small town of c. 3000 inhabitants lay in the southeast of the county of Holland, on a strategic position, at the border with the often hostile county (later duchy)of Guelders, and also close to the duchy of Brabant and the prince bishopric of Utrecht. Initially Gorinchem was part of the independent lordship Arkel, which was ruled by the family that bore the same name. The latter's position deteriorated when they came

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[26] Bullough and Campbell, 'Female longevity', 317-318. Their view is supported by: K.L. Pearson, 'Nutrition and the early-medieval diet', *Speculum* 72 (1997) 1-32, pp. 29-30.
[27] Hatcher, 'Monastic mortality', 682.
[28] Herlihy, 'Life expectancies', 13.
[29] Herlihy, 'Life expectancies', 14-15.
[30] Bullough and Campbell, 'Female longevity', 325.

in conflict with their feudal lords, the counts of Holland, during the wars of Arkel (1401-1412). Ultimately, the lordship Arkel and town of Gorinchem became part of the county of Holland in 1417.

The convent existed from 1412 to 1584. It was founded in 1401 by a woman named Else, widow of Floris Spronck. Initially it was not a proper convent, but merely a congregation of religious women: only in 1412 did these begin to live in an isolated community.[31] Little is known of the history of the convent,[32] except that it branched out to the nearby town of Arkel in 1444, where the nuns founded yet another convent, called Mariënhage.[33] According to Van Maanen, that year 25 nuns left the St. Agnes convent to enter this new Mariënhage convent,[34] which indicates that the convent must have been quite sizeable. There are reports of St. Agnes housing 500 nuns,[35] but these surely are exaggerations: further on we will show that reports of c. 80 nuns, as indicated on a list from 1563, are more plausible.

Just like many other religious institutions in medieval Europe, the St. Agnes convent kept close records of the sisters' date of death. Such records were instrumental for the commemoration of the dead, which was to be done at the anniversary (*jaardag*) of the deceased. Records were usually kept in necrologies or 'books of the death'.[36] Usually, these sources only give the names of the deceased and the *date* of death; the necrology of the St. Agnes convent stands out because it gives the *age* at death.[37] This necrology covers most of the convent's existence (1412-1584), with the exception of 1519-1541 (in the source, the page covering these years has been lost) and 1559-1568 (because inclusion in the register was dependent on women passing away; registration probably stopped altogether when the convent was abolished in 1568). In this study, we will focus primarily on

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[31] Cf. the foundation of this convent the contract edited by C. van Someren, *Beschryvinge der stadt Gorinchem, ende landen van Arkel* etc. (Gorinchem 1755) 34.

[32] The main sources at our disposal are several short chronicles (discussed further on) and the accounts of *zuster en het bagijnenconvent 1581-1582* (NN, *Inventaris van het oud archief van de stad Gorinchem* (The Hague 1936) 57). Cf. this convent R.C.H. Römer, *Geschiedkundig overzigt van de kloosters en abdijen in de voormalige graafschappen van Holland en Zeeland* (Leiden 1854) 572-575; P. van Heel 'De tertiarissen van het Utrechtse kapittel. Eerste deel. Geschiedenis van het kapittel', *Archief voor de geschiedenis van het aartsbisdom Utrecht* 63 (1939) 1-382, pp. 137-139 and the lemma: Gorinchem, Tertiarissen: Agnes at http://www2.let.vu.nl/oz/kloosterlijst/index.php, as well as the lemma: St. Barbara at http://www.meertens.knaw.nl/bedevaart/bol/plaats/1131.

[33] To this end the convent rented a *hofstede* in Arkel (Van Someren, *Beschryvinge der stadt Gorinchem*, 36-39). Cf. this convent R.C.H. Römer, 'Geschiedkundig overzigt van de kloosters en abdijen in de voormalige graafschappen van Holland en Zeeland (Leiden 1854) 448-449 and the lemma: Arkel, regularissen, Mariënhage at http://www2.let.vu.nl/oz/kloosterlijst/index.php.

[34] R.H.C. van Maanen, 'Nonnen en begijnen in Gorinchem 1391-1606', *Ons Voorgeslacht* 58 (2003) 266-267.

[35] V. Becker, 'Het klooster der H. Agnes te Gorkum', *De Katholiek* 34 (1858) 95-126, pp. 106.

[36] See the bibliography on medieval memoria compiled by V. Bonenkampová and K. Ragetli: http://memo.hum.uu.nl/pdf/Bibliography-Memoria.pdf

[37] Similar data have been found for convents in medieval England, but even there these data appear to be scarce (Nightingale, 'Some new evidence', 35-36).

the fifteenth and early sixteenth century, for which our data are most reliable. The first deceased reported is Aecht Adriaensdr. van Cloetinge, who died in 1412 (the official starting year of the convent) at the age of 30, and altogether the source gives the names of 163 women, 159 *dates* of death, and 146 *ages* at death. Additional data are given for year of entry (82), age at entry (81), and year of profession (82) and number of years since profession (136; not all women living in the convent did become nuns).

Why ages at death were recorded in the St. Agnes convent, but not in other religious institutions is difficult to tell. For a necrology to function properly, records of age at death were not necessary; perhaps their inclusion in St. Agnes was the result of the personal preferences of the convent's first scribe, for instance because he (or she?) took an interest in longevity?[38] Successive scribes may have continued this practice. Another explanation is the practice among Franciscan convents to record short biographies of deceased, which could be stored in small hanging cabinets.[39] Such cabinets would depict images on the outside, and contain necrology tables on the inside, consisting of short biographies of the deceased. Perhaps such cabinets were also in use in St. Agnes during the late Middle Ages, and had been copied before they, and the original biographies, were destroyed?[40]

How reliable are the reported ages at death? In this respect there appear to have been two potential problems: if the nuns themselves frequently reported their age to the scribe, they may have been unable to accurately calculate and report their own age. If ages at death were calculated by the scribe, using date of death and date of birth, the accuracy depended on his (or her?) skills.[41] Usually, the women who entered convents to become nuns came from wealthy noble or urban families,[42] so they are likely to have had some basic education, although it remains doubtful whether

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[38] Cipolla reported an interest in longevity among renaissance scholars in several Italian towns, who would pay gravediggers to keep registers of ages at death (C.M. Cipolla, 'The "Bills of Mortality" of Florence', *Population Studies* 32 (1978) 543-548).

[39] Two examples are listed in P. Basta and M. Bastova, *Ard Moriendi. The Loreto crypts. From the history of burying in the capuchin convents* (Prague 2012) 84-85; http://issuu.com/loreto-prague/docs/ars_moriendi_en/51.

[40] In this respect we should also mention *rouleaux des morts* or *rouleaux mortuaires*: rolls that were used to note down deceased clergy members, and which included a few lines commemorating the deceased. In England these are best known as obituary rolls.

[41] Perhaps a steward also responsible for the convent's finances recorded the ages at death. Initially a monk or lay brother would have acted as a steward in a nunnery, but later this would more likely have been a male that had not been ordained (G. de Moor, *Verborgen en geborgen. Het cisterciënzerinnenklooster Leeuwenhorst in de Noordwijkse regio (1261-1574)* (Hilversum 1994) 131).

[42] I. Wormgoor, 'De aantrekkingskracht van kloosters', in: P. de Nijs and H. Kroeze (eds.) *De middeleeuwse kloostergeschiedenis van de Nederlanden* (Zwolle 2008) 115-131, pp. 123-123; J.G.M. Sanders, *Waterland als woestijn. Geschiedenis van het kartuizerklooster 'Het Hollandse Huis' bij Geertruidenberg, 1336-1595* (Hilversum 1990) 136.

arithmetic would have been part of their curriculum. Literature on historical numeracy indicates that people with a lack of calculating skills are likely to round off, causing an over reporting of multiples of five and ten (so-called age heaping).[43] The ages at death reported by scribes of St. Agnes have been processed in figure 1. Age-heaping is strong at ages 50 and 70, which suggests some of our data may have differed slightly from the actual ages at death. Still, this bias appears to be modest (for the rest there is not much evidence for rounding off) and furthermore, such slight deviations of a couple of years cannot have much of an influence on the data we are mostly interested in – life expectancy and mortality of nuns.

Figure 1. Distribution of ages at death
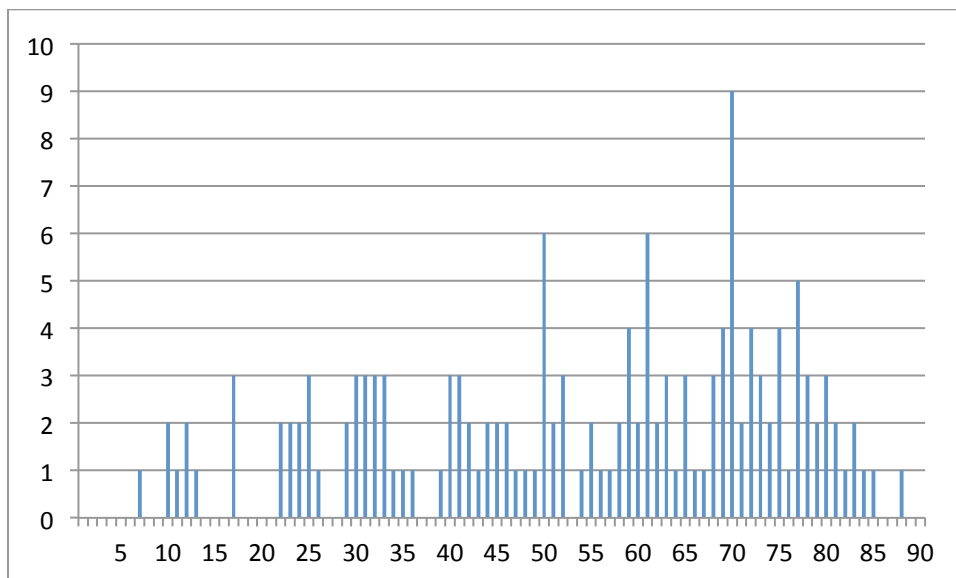
Nr. of observations: 150.

IV

We can use the necrology to arrive at crude estimates of life expectancy for our population of nuns. This can tell us something about the lives of people living under similar circumstances, namely in a somewhat isolated community, without much contact with the population at large[44] and – relevant for women – without much contact with men. In theory one of the reasons life expectancy of nuns was high, was abstinence from sexual contacts, and hence no risk of dying while giving birth, or from sexually transmittable disease.

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[43] T. de Moor and J.L. van Zanden, 'Every woman counts. A gender-analysis of numeracy in the Low Countries during the early-modern period' *Journal of interdisciplinary history* 41 (2010) 179-208.
[44] J. Hatcher, 'Mortality in the fifteenth century: some new evidence', *Economic history review* 39 (1986) 19-38.

We present our data in 25-year overlapping entry cohorts. Each is made up of the nuns that professed during the span of 25 years. Figure 2 gives the age at death for 155 nuns, divided in twelve overlapping cohorts, and divided in the categories untimely and timely death. We define a timely death as occurring during old age – which we have set at over 50 years of age.[45] The figure first shows a gradual shift, from untimely to timely deaths, in the course of the fifteenth century. Particularly in the first 25 years of the existence of the convent did many nuns die at low ages. This pattern disappears over time though, and only returns in the late fifteenth century, when the number of nuns passing away before their fifties increased again. The final cohort, 1505-1529, only consists of one nun who died aged 30.

We will now discuss the development of life expectancy in the convent of St. Agnes. Life expectancy is a statistical indicator. It expresses for members of a given population, and at a given age, how many more years they are statistically likely to live. Demographers use complete life histories of members of a population to calculate life expectancies; historians usually do not have such detailed data, mainly because of people migrating in or out of a population.[46] Although inhabitants of convents were not as mobile as ordinary people, monks and nuns have been known to return to secular life.[47] Hatcher et al calculated that only 3,3% of the monks of Durham priory 'left the community for a variety of reasons'.[48] For nuns leaving was particularly difficult. First, desertion brought a nun in conflict with worldly and clerical authorities. Second, and more importantly, she would have to make a new start in society without a dowry, which had been used to pay for entering the convent, and neither could she expect to inherit from her parents. For deserting nuns prospects on the marriage market were not good; the best they could hope for was returning to the parental household, which was more likely if the parents were sufficiently wealthy.[49] It is unlikely many nuns deserted, and it therefore seems safe to assume we are able to track the vast majority of nuns that

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[45] The question when people in the middle ages were 'old' and could be expected to pass away, is difficult to answer. Shahar, in a review of contemporary sources commenting on old age, arrives at 60 (S. Shahar, 'Who were old in the middle ages?' *Social history of medicine* 6 (1993) 313-341). The data presented in the appendix indicates early-modern adults could expect to reach 60 years of age. Of course, old age began several years before this benchmark of 60: today, people are regarded as 'old' years before they reach average longevity of c. 80, and can be expected to pass away in their seventies. Likewise, we assume people could have been expected to pass away in history in their fifties or later (the 'timely death'), and suffered an 'untimely death' if they passed before their fifties.

[46] These problems, in particular with respect to populations of clergy, are discussed by Oeppen: Oeppen, 'Estimating'.

[47] Cf. an example of nuns leaving convents: S. Corbellini, '"Een zilveren kooi, een nachtegaal en een leeuwerik." Vrouwen in kloosters in Nederland' in: P. de Nijs and H. Kroeze (eds.) *De middeleeuwse kloostergeschiedenis van de Nederlanden* (Zwolle 2008) 133-147, pp. 133-134.

[48] Hatcher, 'Monastic mortality', 670.

[49] A. Rüttgardt, *Klosteraustritte in der frühen Reformation. Studien zu Flugschriften der Jahre 1522 bis 1524* (Gütersloh 2007) 327.

entered the convent. But as is so often the case with medieval demography, we also have to accept a certain margin of error.

Before we proceed to calculate the life expectancy, a few words are due about the age at entry. Our source shows that some women already entered the convent during childhood: in 1442 Agnes Willemsdr. did so at the age of seven. However, this was unusual: most women could decide for themselves about entering a convent.[50] The majority entered when they were teenagers: we know the age of entry of 81 nuns, the average being 16,6.[51] One woman, Jan Jacobsdr., entered at the age of 43: she is listed as a widow, and thus entered the convent after losing her husband. We also know that after entering the convent, it took the women several years to get their profession, and to become proper nuns. On average they professed 4,4 years after entering the convent[52], at an average age of 21,4.[53]

Considering these figures, we have decided to calculate life expectancy at age 25, at an age when almost all women had entered the convent. This also allows for a comparison with the life expectancy of monks in England. We divide our population in 25-year entry cohorts. Following Hatcher et al, we define entry as the year of profession, rather than the year individuals first entered the convent as novices. We know the year of profession of 136 nuns, and have estimated the year of profession of the remaining nuns, setting the average age at profession at 21 years. The first 25-year entry cohort starts in 1395, well before the foundation of the convent in 1412. This cohort, as well as that of 1405-1429, includes nuns that had already professed before 1412, and had apparently moved to St. Agnes from another convent (altogether eight nuns professed before 1412). These cohorts have been included for the sake of completeness; since these nuns spent part of their monastic experience in another convent, they have been excluded from the life expectancy data presented in figure 2. Unsurprisingly, the average longevity of these eight nuns was high, at 66,8 years. For the

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[50] Wormgoor, 'De aantrekkingskracht van kloosters', 119, 124-126.

[51] This is comparable to the average age at entry Van Kan reports for a 15th-century womens' convent in Warmond (F.J.W. van Kan, 'De bevolking van het Elfduizend Maagdenklooster te Warmond in de 15de eeuw' in: J.W. Marsilje et al (ed.), *Uit Leidse bron geleverd. Studies over Leiden en de Leidenaren in het verleden, aangeboden aan drs. B.N. Leverland bij zijn afscheid als adjunct-gemeentearchivaris van het Leids Gemeentearchief* (Leiden 1989) 105-123, pp. 107. It is higher than average ages at entry into the convent of Leeuwenhorst, to the northwest of Leiden, which was c. ten years of age (De Moor, *Verborgen*, 579).

[52] Excluded are those observations where the age of profession antedated the age at entry into our convent.

[53] Based on 136 observations. There are a few less credible records however, for instance Lucie Claesdr., who should have received her profession aged 7, and Liesbeth Jacobsdr. van Ess, at age 9. This seems a bit early: in nearby Gouda girls were allowed to enter the Sion convent at 13, and could do profession at 15. This was a guideline: we know of some twelve year-olds mentioned as nuns in convents in Gouda as well (Taal, *Goudse kloosters*, 127-128). This age of profession is in agreement with Harvey's assumption of an average age at profession for monks in England, at 21 (Harvey, *Living*, 118-122; Hatcher, 'Monastic mortality', 668-669).

sake of clarity we have also included a cohort covering the first 25 years of the convent's existence (1412-1437) – life expectancy and mortality do not differ much from the 1415-1439 cohort.

Table 1 shows that life expectancy at age 25 varied considerably, declining from 42,5 in the first cohort, to 28,7 in the third, and then rising to 36,8 in the 1435-1459 cohort. To put it another way: initially, at age 25 the first inhabitants of St. Agnes could statistically expect to reach age 67,5 and later this declined to 53,7, to rise again to 61,8. After 1445 there was a steady decrease. The development of life expectancy in English monasteries differs in one aspect (figure 3). With the exception of the first and last cohorts, life expectancy observed in St. Agnes was much higher than in England. In the cohort 1415-1439 life expectancy in St. Agnes was at the average observed in Westminster, Durham and Canterbury, but in the 1495-1519 cohort it dropped below English levels. However there is also a similarity: life expectancies in Holland and England gradually declined over the fifteenth century.

Table 1. Life expectancy in Gorinchem, Canterbury, Durham and Westminster per 25-year cohort

	Gorinchem	Canterbury	Durham	Westminster
1395-1419	42,5	29,6	31,4	26,5
1405-1429	32	30,9	32,3	26
1415-1439	28,7	30,3	34,1	25,8
1425-1449	33,8	29,2	32,1	25,2
1435-1459	36,8	26,7	32,6	22,6
1445-1469	36,3	23,8	27,4	21,8
1455-1479	34,1	22,9	24	22,7
1465-1489	28,9	25,8	22,1	19,7
1475-1499	26		20,9	17,2
1485-1509	20,3		20,1	19,7
1495-1519	16,6		22,4	27,7
1505-1529	5		26,5	30,3
First 25 year cohort				
1412-1437	31,4			

Figure 2. Proportion of untimely deaths
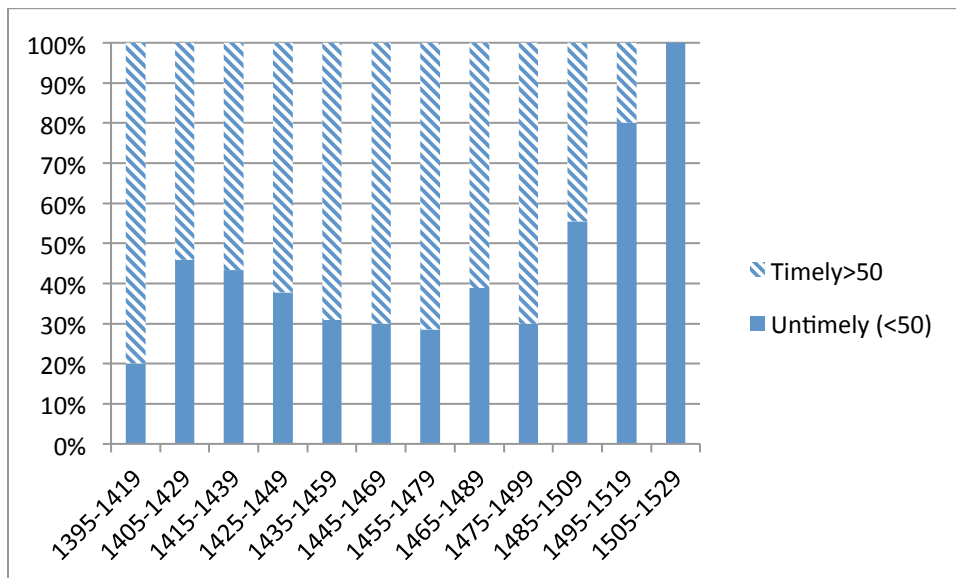
Nr. of observations: 145.

Figure 3. Life expectancy at age 25 in Gorinchem, Canterbury, Durham and Westminster
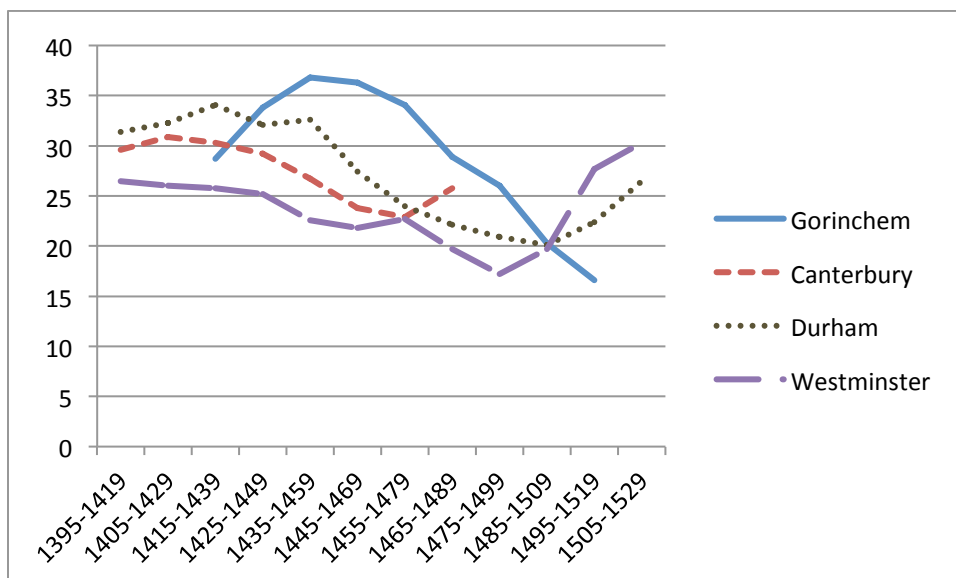
Sources: dataset St. Agnes Gorinchem and Hatcher, 'Monastic mortality', 674.

What caused the low life expectancy in St. Agnes we observed in the 1415-1439 cohort? And what caused the sharp increase in life expectancy in the following cohorts? Why did nuns first die at

a relatively early age, and then at a much higher age? One possible explanation would be recurrent outbreaks of infectious diseases, such as plague, causing untimely deaths.[54] A chronicle of the convent reveals that the first nuns of St. Agnes were concerned of being confronted with many sick, and therefore refrained from ordaining their church to St. John, which apparently was the original idea:

> Since our sisters feared to be bothered by the sick, who were often brought to his church [the church of St. John], they decided not to name their church after him.[55]

The chronicler probably refers to the link between St. John and the Knights Hospitaller (also known as Knights of St. John or Order of St. John), who provided care for the sick among pilgrims. Apparently the nuns feared that naming their church after St. John would also attract scores of needy people. Instead, they named their church after St. Agnes. Apparently infectious diseases, such as plague,[56] were a concern in the first years of the convent's existence. Indeed, the chronicle continues with some more references to sickness: St. Agnes' first rector, Herbert Jansz., was said to have cured 'one of our sisters of a terrible sweat, which no doctor had managed to do'.[57] Considering the symptoms, it seems this sister suffered from an infectious disease other than plague. Another good deed ascribed to the rector Herbert also hints at the presence of infectious diseases in Gorinchem: after this rector had passed away, in 1441, clerics gathered to clothe the body of the deceased. Among them was Willem Dankertsz. 'who had had a fever for a long time, and was gravely ill', but who was miraculously 'cured while taking care of the deceased'.[58] Regardless of the question whether these stories are credible at all, the chronicle clearly depicts Gorinchem in the early fifteenth century as a town frequently visited by infectious disease. Problems related with this are

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[54] There is more evidence of high mortality at the beginning of the fifteenth century, for instance from St. Catherine's hospital in the town of Leiden. Here the average number of deaths between 1394-1485 was 28, peaking at 70 in 1411, and also reaching relatively high figures in 1416 (50), 1417 (46) and 1420 (43) (C. Ligtenberg, *De armezorg te Leiden tot het einde van de 16e eeuw* (The Hague 1908) 42).

[55] 'Mer want onse susteren vrese hadden, moeyenisse te liden vanden besiecten menschen diemen gheernc tot sijnre kerken pleecht te brenghen, Soe en is sinen name niet voer gheset' (Becker, 'Het klooster', 107).

[56] Recent insights have confirmed that the medieval plague was indeed a pestilence (K. Bos et al, 'A draft genome of Yersinia pestis from victims of the Black Death', *Nature* 478 (2011) 506-510). Cf. the argument that medieval plague was not pestilence caused by the *Yersinia pestis* bacteria but onother infectious disease: S.K. Cohn, *The Black Death transformed: disease and culture in early renaissance Europe* (London 2002).

[57] 'Hi ghenas mit sijnre crachtiger bedingen een van onsen susteren van eenre seer vreselicker suucten die gheen meyster ghenesen en conde' (Becker, 'Het klooster', 110).

[58] 'Ende een van hem, gheheiten here Willem danckertsz. , in dier tijt deken die langhe tijt den saghe gehadt had, ende op die tijt seer siec was, werd rechtevoirt genesen inder handelinge'(Becker, 'Het klooster', 111).

furthermore indicated by a number of bylaws, from the first quarter of the fifteenth century, stipulating amongst others that plague victims were not to visit churches and convents.[59]

By that time, plague may have become endemic: no longer incidentally striking large numbers of the population, but ever present and contributing to higher mortality.[60] A look at the distribution of deaths over time (figure 4), reveals there is no evidence for clustering of deaths in a single (plague) year: after 1421 the distribution of deaths of the nuns was pretty even, except for 1474, when 12 nuns died. Why this was the case is unknown: we are not aware of a severe outbreak of plague in 1474.[61] When we return to the low life expectancy in the cohort 1415-1439, apart from plague, warfare may also have played a part. Gorinchem and its surroundings were a warzone during the so-called *Arkelse oorlogen* (1401-1412) between the lords of Arkel and the counts of Holland.[62] During these conflicts, Gorinchem was besieged in 1402, and this also happened when the conflict flared up again in 1417. In this context of warfare food supplies may have been cut off, causing hardship among the nuns.

Another question we must ask ourselves is about the peak in the cohort 1435-1459: a life expectancy at age 25 of 36,8 years, based on 68 observations.[63] This figure is somewhat depressed due to eight women passing before they reached 25 years of age. This longevity is not unheard of: De la Croix and Licandro calculated, for the second half of the sixteenth century, a mean lifetime of famous people of c. 58 to 60.[64] Shatzmiller, in her book on labour in medieval Islamic society, even gives average lifetimes of religious scholars in the range of 69 to 75 years, and members of the English and Castilian nobility usually reached equally high ages.[65]

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[59] H. Bruch, *Middeleeuwsche rechtsbronnen van Gorinchem* (Utrecht 1940) 298-303.

[60] De Boer, *Graaf en grafiek*, 165.

[61] M.A. van Andel, 'Pestepidemiën te Gorinchem', *Nederlands Tijdschrift voor Geneeskunde* 57 (1913) 1844-1862.; L. Noordegraaf and G. Valk, *De gave Gods. De pest in Holland vanaf de late middeleeuwen* (Bergen 1988).

[62] M.J. Waale, *De Arkelse Oorlog, 1401-1412* (Hilversum 1990).

[63] The average age at death was 64,5 (1395-1419), 52,3 (1405-1429), 50,3 (1415-1439), 53,0 (1425-1449), 56,7 (1435-1459), 57,5 (1445-1469), 57,0 (1455-1479), 51,5 (1465-1489), 51 (1475-1499), 45,3 (1485-1509), 41,6 (1495-1519), 30 (1505-1529).

[64] De la Croix and Licandro, 'The longevity', 51 figure A.7.

[65] M. Shatzmiller, *Labour in the medieval Islamic world* (Leiden/Boston 1996) 66; J.C. Russell, *British Medieval Population* (Albuquerque 1948) 189-I9I, 200; J. Baldo, 'Quonstituido en estrema vejez. Old age and life expectancy in late medieval Navarre', *Imago temporis. Medio aevum* 2 (2008) 191-225, pp. 202.

V

Before we proceed with estimates of mortality among the inhabitants of St. Agnes, a few words are due about the size of the convent – which is a requirement for calculating number of deaths per hundred inhabitants. The minimum numbers of inhabitants of St. Agnes are processed in figure 5. For every year, we calculated how many women that had entered the convent before, were still alive; in doing so, we did not make a distinction between novices and nuns. The figure shows a gradual growth, from a minimum of 9 in 1412, to 82 in 1461. By then, the convent had apparently reached a maximum number of inhabitants: the following years the number of inhabitants fluctuates around 80. To understand what happens after 1471, it is worthwhile to remember the gap in our sources from 1519-1541. We do not have records for the women who died in these years, both with respect to their years of entry and exit. This is probably what causes the decline visible in figure 4: after c. 1472 the women that entered the convent would die from 1519-1541, and thus are not recorded in our source.

In reality, after 1472 the convent is likely to have had more inhabitants than indicated in figure 4. How much is difficult to tell: the aforementioned contemporary list from 1563, suggests c. the number remained at c. 80 inhabitants.[66] Convents of this size were not unheard of: in Holland some had 100-200 inhabitants, which would make St. Agnes not an excessively large convent.[67] There are some other, more indirect clues for this: we are informed about the wealth – and hence size – of convents in Holland in the sixteenth century. In 1534, when religious institutions had to contribute to war against the Ottomans, St. Agnes had to pay 214 lb. 14 s. – nine religious institutions in the South of Holland paid more, up to 856 lb. 5 s., and fourteen paid less, which indicates that St. Agnes was at least a middle-sized convent.[68]

To calculate mortality we use the data on the number of deaths per year, as given in our source, and the number of inhabitants. With respect to the latter, we use two scenarios: one assumes the number of inhabitants was as depicted in figure 4, the other sets the number of inhabitants after 1471 at 80. Until c. 1500 the two scenarios do not differ all that much, but in the

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[66] Becker, 'Het klooster', 103. If we are right to assume the number of inhabitants remained at c. 80, St. Agnes would not have experienced the decline in population many other convents experienced during the early reformation.

[67] R.R. Post, *Kerkgeschiedenis van Nederland in de middeleeuwen. Deel II* (Utrecht/Antwerp 1957) 318. Taal estimated the population of convents in nearby Gouda to have been in the range of 20-200 in 1517 (J. Taal, *De Goudse kloosters in de middeleeuwen* (Gouda 1960) 119-120).

[68] Sanders, *Waterland als woestijn*, 109-110. Complaints from a few years later, about the impoverishment of the convent under Joannes van Oisterwijk (1504-1572), are probably exaggerations. This 'impoverishment' probably does not refer to the convent's size and wealth, but rather to the (lack of) observance of religious practice (Van Someren, *Beschryvinge der stadt Gorinchem*, 40-41).

sixteenth century differences increase rapidly. Mortality peaked in the first decade, which is in line with the low life expectancy observed at this time, and there is another peak in 1474, when twelve inhabitants passed away rather mysteriously. As explained above, there were no deaths recorded for 1519-1541, hence for these years mortality drops to zero. For our calculation of crude average death rate we therefore restrict ourselves to the fifteenth century for Gorinchem. Our data indicate the average was c. two deaths per hundred, except for the 1420s and 1430s. The crude average death rate for 1412-1500 was 2,3.[69]

How do these figures compare to data on English monasteries? John Hatcher and Barbara Harvey have calculated fifteenth-century mortality for the monks of Christ Church and Westminster respectively. They found mortality rates of 3 to 4 per cent. Other scholars found similar mortality rates for the secular population elsewhere in England (table 2). In comparison, crude annual death rates for the convent of St. Agnes are considerably lower: 2,3 for the fifteenth century, for which our data are most reliable. This relatively low mortality is also reflected in the frequency of mortality crises: years with more than four deaths per 100 inhabitants.[70] Fifteen years between 1412 and 1500 qualify as mortality crisis years (scenario 1) and eleven when we follow scenario 2.[71] In the fifteenth century mortality crises occurred once every six to eight years. Again, this figure is much lower than that reported by Hatcher for Christ Church, where the monks had to endure a mortality crisis 'more than once every four years'.[72]

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[69] Crude average death rate for 1412-1500 based on 92 observations of year of death. Crude average death rate for 1412-1559 for scenario 1 was 4,4, for scenario 2 1,8 (both based on 146 observations of year of death).
[70] To allow for a comparison between Holland and England, we use the mortality crisis indicator used by Hatcher. Cf. other ways to calculate mortality crises: E. Thoen and I. Devos, 'Pest in de Zuidelijke Nederlanden tijdens de Middeleeuwen en de Moderne Tijd. Een status quaestionis over de ziekte in haar sociaal-economische context', in J. Lemli (ed.) *De pest in de Nederlanden. Medisch-historische beschouwingen 650 jaar na de Zwarte Dood* (Brussels 1998) 45-83.
[71] This is in line with Ladan's calculations of mortality crises in late-medieval Leiden, to the northwest of Gorinchem. Based on the year of death of benefactors of Leiden's St. Pancraskerk, and defining mortality crises as a 20% deviation from the nine-year moving average of mortality, he arrives at sixteen mortality crises between 1412-1500 (R. Ladan, *Gezondheidszorg in Leiden in de late middeleeuwen* (Hilversum 2012) 38).
[72] Hatcher, 'Fifteenth-century mortality', 27.

Table 2. Mortality in Holland and England

	Crude average death rate (per cent)
Holland, clergy	
Gorinchem (15th c.)	2,3
England, clergy	
Canterbury (15th c.)	3,3
Westminster (15th c.)	3 to 4
England, other	
Halesowen (13th-14th c.)	3,6 to 4
Wiltshire (14th c.)	3,7
England (14th-16th c.)	3,3
Worcester (16th c.)	2 to 3

Sources: dataset St. Agnes Gorinchem; Hatcher, 'Mortality', 32; Harvey, *Living and dying*, 124; Razi, *Life and death*, 45; Ecclestone, 'Mortality', 24; Nightingale, 'Mortality', 41; Dyer, *Lords and peasants*, 222.
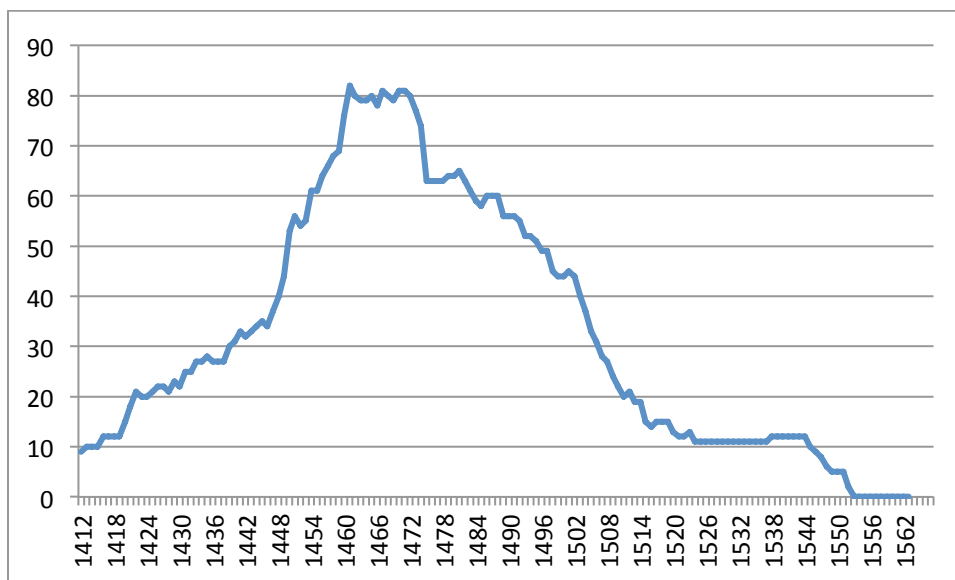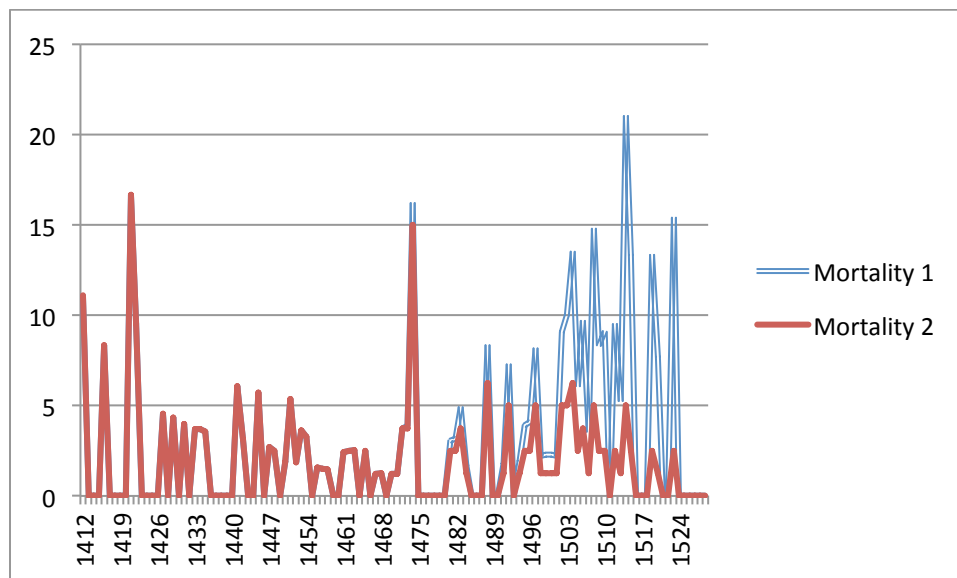
Figure 4. Nr. of nuns

Figure 5. Mortality at St. Agnes convent 1412-1529

Mortality 1: based on the number of inhabitants as depicted in figure 4.
Mortality 2: scenario based on the assumption that after 1472 the number of inhabitants remained at c. 80.

VI

In his 1985 study into the monks of Christ Church, Canterbury, John Hatcher asked whether his results 'lend additional support to those who contend that the slump in late medieval population was primarily due to high mortality?' Our study into the nunnery of St. Agnes in Gorinchem suggests mortality in England was comparatively high, and that England and Holland may have experienced a different demographic regime in the late Middle Ages. Assuming monastic data can be used as a proxy for general demographic developments, Holland was characterized by an earlier decline of mortality, and earlier rise of life expectancy, which contributed to a rapid recovery of the population, beginning in the first half of the fifteenth century. In England mortality continued to be almost twice as high until the beginning of the sixteenth century, and life expectancy was relatively low.

These findings are in line with theories about the relatively great impact of the late-medieval crisis in England, and its relatively modest impact in Holland. Holland's late-medieval population growth thus was at least in part caused by increased longevity. To what degree increased fertility also contributed to this remains unclear for a lack of data on late-medieval birth rates. Mortality appears to have been high at the beginning of the fifteenth century. The exact causes for this are still difficult to pinpoint: contemporary sources indicate that the infectious diseases hit Gorinchem. However, the

nuns coped with fewer mortality crises than monks in England, which seems to suggest outbreaks of plague or other infectious diseases were limited in a comparative perspective.

What can the convent of St. Agnes tell us about nuns and medieval women in general? Apart from the early fifteenth century, the nuns seem to have enjoyed a fair degree of longevity. Its pattern resembles that of famous people, which seems to confirm nuns were privileged, for instance with respect to their diet. In this respect Bullough and Campbell claimed that women, once diets improved, caught up with men. One would expect monasteries would surely have provided such diets, and nuns therefore to have been in a perfect position to achieve a similar longevity as monks. Considering the different demographic regimes in Holland and England this cannot be confirmed using the data presently at hand. A sound comparison would require data on vital events of monks in the Low Countries, which does not seem to be available. What we can be sure of, though, is the privileged position of nuns: the data in appendix 1 for women in the village of Maasland, c. 50 km to the west of Gorinchem, show that ordinary women did not achieve the life expectancies the nuns of St. Agnes reached until the nineteenth century.

Finally, what can our data say about the demographic history of other places in Holland? Our reconstruction of life expectancy and mortality is in agreement with other accounts of the county's population history. These suggest, using indirect indicators, a relatively mild mortality due to plague or other infectious diseases, and a relatively quick recovery of the population to pre-plague levels. Considering Gorinchem's proximity to regions such as Brabant, Zeeland, Utrecht and Guelders, our data also suggests the possibility of a similar trajectory elsewhere in the Low Countries. However, confirmation could only come from similar data from monasteries elsewhere in the Low Countries, which is unlikely to surface. Until then, vital events from St. Agnes' nunnery give us a unique glimpse into medieval demography.

Appendix

Adult male and female life expectancies, seventeenth and eighteenth centuries

Place	Period	Males	Females
E_{20}			
Brabant	1709-1755	36,3	39,1
Brabant	1755-1796	40,2	40,1
Germany	1740-1800	39,1	38,6
Castile	1620-1680	28,2	28,3
E_{25}			
Holland	1730-1759	31,7	29,7
Holland	1760-1789	34,4	32,8
Holland	1790-1819	37	36,5
Germany	1740-1800	35,6	34,7
Castile	1620-1680	25,5	25,4
E_{30}			
Germany	1740-1800	31,8	30,9
England (London)	1650-1699	28	29,3
England (London)	1700-1749	26,2	26,5
England (London)	1750-1799	30,9	32,6
England (villages)	1650-1699	28,4	28,9
England (villages)	1700-1749	30,4	30,2
England (villages)	1750-1799	32,1	32,4
Castile	1620-1680	23,2	23,6

Sources: C. Bruneel, *La mortalité dans les campagnes: le duché de Brabant aux VVIIe et XVIIIe siècles* (Louvain 1977) 409 (Brabant); Soler Serratosa, 'Demografía y sociedad en Castilla la Neuva durante el Antiguo Régimen: la villa de Los Molinos, 1620-1730', *Revista Espanola de Investigaciones Sociologicas* 32 (1985) 141-192 (Castile); D.J. Noordam, *Leven in Maasland. Een hoogontwikkelde plattelandssamenleving in de achttiende en het begin van de negentiende eeuw* (Hilversum 1986) 189 (Holland); J. Landers, *Death and the metropolis. Studies in the demographic history of London, 1670-1830* (Cambridge 1993) 158 (England: London); E.E.A. Wrigley and P. Schofield, *The population history of England 1541-1871: a reconstruction* (Cambridge 1991) (England: villages); A. Imhoff, *Lebenserwartungen in Deutschland vom 17. Bis 19. Jahrhundert* (Weinheim 1990) 462-463 (Germany).