Plague and Epidemic Disease in the Northern Parts of the Low Countries, 1349-1450*

Evidence, Limitations, and Implications

Daniel R. Curtis

TSEG 21 (2): 75–104
DOI: 10.52024/7gr34y91

Abstract

This article reviews what we know about plague and other epidemic diseases in the northern Low Countries before 1450 – the evidence, its limitations, and its implications. I make three observations. First, sources suggest that the Black Death was severe in central inland areas, although we lack conclusive evidence for its impact in the county of Holland. Second, the recurring epidemics occurring in the northern Low Countries were often severe – in certain localities reaching death rates of 20-25 percent. In this respect, Holland was as afflicted as other areas in the Low Countries. Third, while the outbreak of 1439 was a notable exception, most epidemics in the northern Low Countries rarely occurred during or just after grain price spikes, suggesting that food crises were not major drivers of epidemic disease in the period 1349-1450. I support further attempts to obtain empirical evidence for the mortality effects of epidemics in the medieval Low Countries. Ultimately, this information can be the foundation behind insights into other important long-term narratives in social, demographic, and economic history in the region.

* This work was supported by the NWO under grant number 016.Vidi.185.046. Any references with "AO" refers to manuscripts "accessed online", and I thank all provincial, regional, and city archives in the Netherlands for their digitization efforts, especially during the COVID-19 pandemic. Many scans were generously provided without charge. I benefitted greatly from the close reading of Remi van Schaïk, Janna Coomans, and Ton Kappelhof. Van Schaïk's direction towards certain sources in the Duchy of Guelders was highly valuable. Nevertheless, any interpretations, errors, and mistakes are entirely my own.

Building on decades of previous research, recent literature has reassessed the characteristics of plague and other epidemic diseases in many southern parts of the Low Countries. Two aspects stand out. First, it is suggested that the severity of the Black Death of 1349-1351 might have been previously obscured by administrative dysfunction (caused by the outbreak itself) as well as a historiographical over-emphasis on differences in low-resolution urban population figures. Second, when the Black Death is considered in combination with a series of very severe recurring epidemic outbreaks from the second half of the fourteenth century onward, we might even be talking about a 'harsh' late-medieval regime of epidemic disease considered in a relative European perspective. Furthermore, this analysis would appear logical given the high levels of human contact and movement driven by strong commercialization, close economic integration of cities and the countryside, and frequent significant military conflicts in the area.[1]

However, it is clear that much more has been written on plague and other epidemic diseases in medieval Flanders, Hainaut, and Artois, for example, than for the northern parts of the Low Countries.[2] Indeed, perhaps the most influential book on the subject from 1988, *De gave Gods. De pest in Holland vanaf de late Middeleeuwen*, largely ignored the Black Death, and in fact started chronologically from 1450 onward – but with the majority of material from the sixteenth and seventeenth

1 Joris Roosen and Daniel R. Curtis, 'The "light touch" of the Black Death in the southern Netherlands. An urban trick?', *Economic History Review* 72:1 (2019) 32-56; building on a previous literature more extensive than cited here: Wim Blockmans, 'The social and economic effects of plague in the Low Countries, 1349-1500', *Revue Belge de Philologie et d'Histoire* 58:4 (1980) 833-863; Gérard Sivéry, 'La Hainaut et la peste noire', *Mémoires et Publications de la Société des Sciences, des Arts et des Lettres du Hainaut* 79 (1965) 431-447; Erik Thoen and Isabelle Devos, 'Pest in de zuidelijke Nederlanden tijdens de middeleeuwen en de moderne tijden. Een status quaestionis over de ziekte in haar sociaal-economische context', in: *De pest in de Nederlanden. Medisch historische beschouwingen 650 jaar na de Zwarte Dood* (Brussels 1999) 19-43; André Bocquet, *Recherches sur la population rurale de l'Artois et du Boulonnais pendant la période bourguignonne, 1384-1477* (Arras 1969) 141-143.

2 A word on the geographical distinctions used in this article. I include as the 'northern parts of the Low Countries', Holland, the Sticht Utrecht, Frisia, Guelders, Bentheim, Cleves, and all the assorted smaller medieval lordships located in the east. More debatably, I also include a northern part of Brabant which by the seventeenth century came to be known as Brabant of the States. Although politically and economically this area had close southward links in the late Middle Ages, I include it because it is not an area that has been discussed in the more substantial existing literature on medieval plague and epidemics in the southern parts of the Low Countries. For example, see the focus on the 'Roman Païs' of Brabant in Georges Despy, 'La "Grand Peste Noire de 1348" a-t-elle touché le roman pays de Brabant?', in : *Centenaire de séminaire d'histoire médiévale de l'Université Libre à Bruxelles, 1876-1976* (Brussels 1977) 195-217.

centuries.[3] The reason, it seems, was the lack of supporting evidence in the northern parts of the Low Countries to say anything of note and was likely why a recurring scholarly narrative of 'mild' experiences of plague continued to persist for certain areas such as the county of Holland.[4] Interestingly, plague and epidemic disease has not formed a significant part of general Dutch historiographies on medieval economy, society, and culture – at least in a relative sense compared to other parts of Western Europe. Even when referring to Huizinga's classic account of the changing sense of mortality in the late Middle Ages, and the symbolism and the patterns of culture behind it, the Black Death was mostly ignored.[5]

This article organizes and reviews our current state of knowledge on plague and other epidemic diseases in the northern parts of the Low Countries before 1450 – what types of evidence we have, what we can and cannot (yet) say about its presence, and some of the implications of what we now know.[6] Although the value of the piece is bringing fragments of information together into a coherent whole, some new original findings are provided – including a new series of mortality indicators from 's-Hertogenbosch. The first section focuses on the Black Death, while the second section focuses on the recurring epidemics from '*pestis secunda*' (1359/1360) up to the middle of the fifteenth century. The third section focuses on the exceptional nature of the 1439 epidemic outbreak, and how it differs from the other epidemics in the period 1349-1450. As an offshoot of this discussion, an observation is made that most recurring epidemics in the northern parts of the Low Countries up to the middle of the fifteenth century were not connected to food crises. The article ends by making a case for further attempts to reconstruct severity and spread of late-medieval epidemics in the

3 Leo Noordegraaf and Gerrit Valk, *De gave Gods. De pest in Holland vanaf de late Middeleeuwen* (Bergen 1988). A similar late chronology in the recent A.H.M. Kerkhoff, *Per imperatief plakkaat. Overheid en pestbestrijding in de Republiek der zeven Verenigde Nederlanden* (Hilversum 2020). It has already been stated that it is an easier task to identify plague outbreaks in the period after 1450: Ronald Rommes, 'Op het spoor van de dood. De pest in en rond Utrecht', *Jaarboek Oud-Utrecht* (1991) 93-120, 97.

4 Bas van Bavel and Jan Luiten van Zanden, 'The jump-start of the Holland economy during the late-medieval crisis, c. 1350 – c. 1500', *Economic History Review* 57:3 (2004) 503-532, 515; Bas van Bavel, *Manors and markets. Economy and society in the Low Countries, 500-1600* (Oxford 2010) 280.

5 Johan Huizinga, *The waning of the Middle Ages. A study of the forms of life, thought and art in France and the Netherlands in the XIVth and XVth centuries* (London 1924).

6 This article does not discuss the southern parts of the Low Countries in detail, given that more historiographical attention has already been given to medieval epidemics in this geographical area (see footnote 2).

Low Countries – providing new impetus for other important long-term narratives in social, demographic, and economic history in the region.

The Black Death

The impact of the Black Death in the northern parts of the Low Countries remains difficult to interpret – although that is not the same as saying there is definitive evidence for a mild or even an absence of the outbreak. One challenge we face is that many quantitative markers to assess mortality effects start too late, lacking serial indicators used in manorial sources from England, testaments from Italy, or (plentiful) mortmain registers from the southern parts of the Low Countries.[7] Remarkably, the one serial necrology that remains relevant is from the St. Lebuinus church in Deventer, mentioned more than 40 years ago by Wim Blockmans, and almost 100 years ago by archivist K.O. Meinsma.[8] At this institution, 52 deaths were recorded in 1350 (48 of which came in June, July, and August), while in the entire 20 years prior to 1350 only 45 deaths had been recorded, and in the entire 20 years after 1350 only 54 deaths had been recorded.[9] If the ordinary death rate of the ecclesiastical population was similar to that estimated in other medieval confined religious institutions such as the convent of St. Agnes in Gorinchem, Holland (i.e., 2 or 3 percent),[10] then this more than twentyfold increase in the average annual deaths could have conceivably corresponded with a 50 percent death rate for the institution during the Black Death.

Blockmans reinforced these figures with qualitative evidence such as an act passed by the bishop of Utrecht on 12 January 1351, which described a dispute between the Bethlehem monastery and a Zwolle pastor over contested responsibilities for burying the dead during the "ravaging epidemic".[11] More recently, further documents have been

7 Sharon N. Dewitte and Maryanne Kowaleski, 'Black Death bodies', *Fragments: Interdisciplinary Approaches to the Study of Ancient and Medieval Pasts* 6 (2017) 1-37, 19-22; Samuel K. Cohn, 'The Black Death. End of a paradigm', *American Historical Review* 107:3 (2002) 703-738, 719-724, 728-729; Roosen and Curtis, 'The "light touch" of the Black Death'. These indicators, however, are also not straightforward to interpret.

8 K.O. Meinsma, *De Zwarte Dood 1347-1352* (Zutphen 1924) 403-409.

9 Blockmans, 'The social and economic effects of plague', 843-844.

10 Jaco Zuijderduijn, 'Living la vita apostolica. Life expectancy and mortality of nuns in late-medieval Holland', *CGEH Working Paper Series* 44 (2013) 1-23, 20.

11 Blockmans, 'The social and economic effects of plague', 844.

found to corroborate this view. In one statute from 12 December 1351 (see illustration 1), it is noted that through the times of mortality in 1350 (*temporalibus propter mortalitatem*), the isolated monastery of Zwartewater (13 kilometers north of Zwolle) was in a neglected condition, and their possessions and fields by "whose fruits they were sustained" remained "unproductive and uncultivated" (*infructuosi et inculti remanent*).[12] Two further charters have recently been found by Huiting which also mention post-Black Death cultivation issues on the lands of the deanery of St. Pieter at Utrecht. The first, written in May 1352, noted the lack of income from the lands due to high mortality; and the second, written in September 1353, noted substantial deaths of tenants, the lands laying vacant and abandoned, falling susceptible to plunder from roving bands of men.[13] These findings are very important because they suggest not only significant mortality, but that these deaths had significant implications for agricultural production, too – an issue we return to at the end of this article.

The problem is that this documentation is almost the entire scope of our (more reliable) direct evidence for the Black Death in the northern parts of the Low Countries. Scholars have pointed to indicators such as the announcement of environmental regulations as evidence for "preventative measures" against the plague in Arnhem,[14] and yet it is clear that many of the provisions such as cleaning public areas, getting rid of waste, and disposing of dead animals were "general" or "ordinary" aspects of medieval urban environment management and not necessarily radical departures connected to the epidemic disease.[15]

12 Jan Huiting, *Domeinen in beweging. Samenleving, bezit en exploitatie in het West-Utrechtse landschap tot in de Nieuwe Tijd* (PhD thesis in history, University of Groningen 2020) 163.

13 Ibid., 163. The existence of the first charter was already mentioned back in 1978 in Dick E.H. de Boer, *Graaf en grafiek. Sociale en economische ontwikkelingen in het middeleeuwse "Noordholland" tussen 1345 en 1415* (Leiden 1978) 34. Further, we had already long known flagellants (penitents whipping themselves) to be present in the surrounding area at the time, although only from retrospective mentions through chroniclers: J.G. Joosting (ed.), 'Cornelis Block's kroniek van het regulierenklooster te Utrecht', *Bijdragen en Mededelingen van het Historisch Genootschap* 16 (1895) 1-93, 23; H. van Bavel et al. (eds), *De kroniek van het St. Geertruiklooster te 's-Hertogenbosch* (Den Bosch 2001) 21. It was not until the plague of 1400 that we first see flagellants in the northern parts of the Low Countries identified in normative administrative sources such as an ordinance against them roaming in the Neder-Betuwe: Pieter N. van Doorninck (ed.), *Acten betreffende Gelre en Zutphen 1400-1404 uit het staatsarchief te Dusseldorp, Register B No. 25* (Haarlem 1901) 28-29.

14 Gerda B. Leppink and R.C.M. Wientjes, *Het Sint Catharinae Gasthuis in Arnhem in de eerste vier eeuwen van zijn bestaan (1246-1636)* (Hilversum 1999) 220.

15 Janna Coomans, *Community, urban health and environment in the late medieval Low Countries* (Cambridge 2021) 216-251.

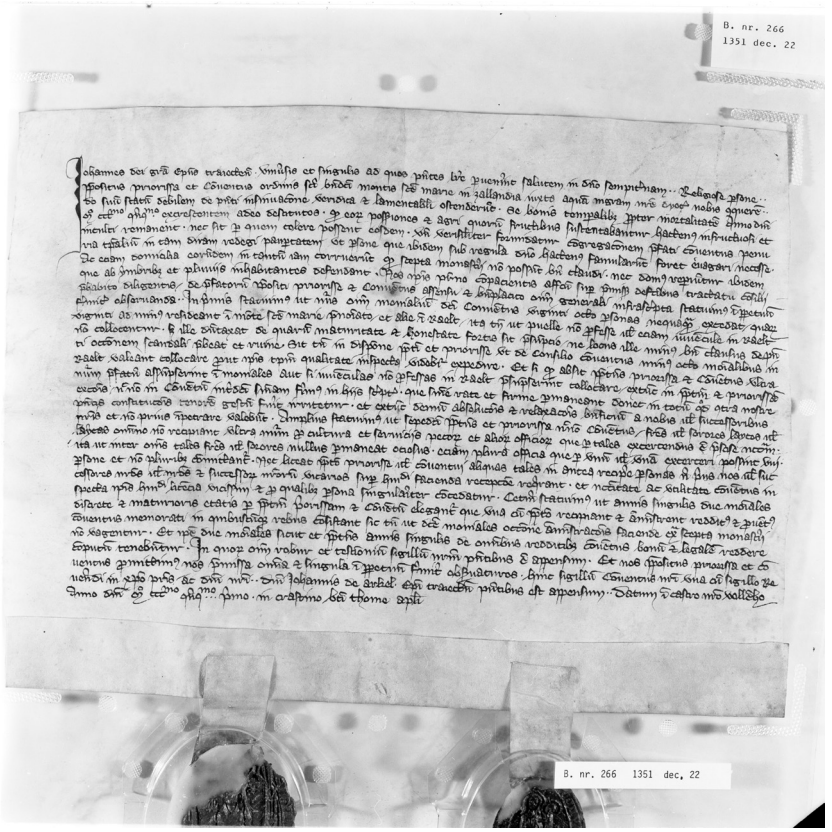

Illustration 1 Statute from Bishop Jan van Arkel to the Mariënberg monastery at Zwartewater, 1351 (source: Het Utrechts Archief (hereafter HUA), Bisschoppen van Utrecht, 218-1, Deed in which Bishop Jan van Arkel gives new statutes to the Mariënberg monastery near Zwartewater in Salland, the goods of which are in a neglected condition due to the plague, and in which the convent promises to adhere to these statutes, 1351 dec. 22, no. 170 (AO))

Many of the important quantitative indicators found by other scholars unfortunately start after the Black Death – including numbers of deceased donors to or members of ecclesiastical institutions, or lists of coffins constructed, church bells tolled, or graves dug.[16] Meanwhile,

16 Deceased donors to the St. Pancras Church Leiden, from 1367, see: De Boer, *Graaf en grafiek*, 80; with the series later continued by Rudolph Ladan, *Gezondheidszorg in Leiden in de late middeleeuwen* (Hilversum 2012) 38; graves and coffins for the St. Catharinagasthuis (hospital) Leiden, from 1392: Christina Ligtenberg, *De armezorg te Leiden tot het einde van de 16e eeuw* (The Hague 1908) 42; with additions by De Boer, *Graaf en grafiek*, 90; graves for the St. Pieters church Leiden, from 1398, see: Erfgoed Leiden en Omstreken (hereafter ELO), Archieven van de kerken van Leiden, 0502, Rekeningen van de kerkmeesters 1398-1404, 1407-1408, 1409-1410, 1412-1414, 1417-1418, 1426-1429, no. 323; bells and graves for the St. Bavo church Haarlem, from 1411, see: Daniel R. Curtis, 'From one mortality

series that start before the Black Death tend to have mixed value. A list of goods owed to the count of Holland from 1343 onward as a type of death duty from "bastards, clerics, foreigners, and those without heirs" contains many gaps, particularly in the early part of the series, and we miss accounts for the years 1348-1350.[17] I have also used accounts for the "Illustrious Brotherhood of Our Blessed Lady" (a religious fraternity founded in 1318 in 's-Hertogenbosch), which provide information on the financial obligations of living and deceased members and have a consistent run of yearly information starting in 1341 – yet the key year of 1350 is skipped in the accounts, and the information on those deceased within a year is not straightforward to interpret before 1381.[18]

The lack of Black Death evidence has encouraged a narrative whereby plague is seen as having a minimal presence in certain parts of the northern Low Countries.[19] According to Van Bavel, for example, "Holland did not suffer great loss of life" during the Black Death.[20] Indirectly, this view seemed to be confirmed by the fact that many towns appeared larger in 1400 than they were at the beginning or middle of the fourteenth century. Edam, for example, was effectively a village of just 200 inhabitants at the time of the Black Death, but in 1400 had trebled to around 600 inhabitants, which then quadrupled in 1450 to around 2,400 inhabitants.[21] Yet, at the same time, we should still be a little cautious with such assertions. First, medieval population figures are

regime to another? Mortality crises in late medieval Haarlem, Holland, in perspective', *Speculum* 96:1 (2021) 127-155; the deceased of the Haarlem beguinage from 1381, see: Noord Hollands Archief (hereafter NHAH), Haarlem, Kloosters te Haarlem, 2123, Fundatieboek. Register van de te houden memories, met aantekeningen over bezittingen, bestuur en geschiedenis van het Begijnhof, periode 1272-1630, no. 419, fos. 9-65v.

17 De Boer, *Graaf en grafiek*, 64-65. The right of a territorial lord to the inheritance of a person born out of wedlock after death was, furthermore, quite limited, since if this person had legitimate offspring themselves, these children inherited from him or her.

18 After 1381, a yearly indicator of members who have died can be estimated through consistent lists of deceased brothers and sisters (and the debts they owed). However, prior to 1381, the information is not systematically displayed, and intermixed with other categories of debt. People with the terms "*ex morte*" or "*obitam*" are clearly dead, but we also have members that are recorded as registering a testament, paying for candles or prayers, registered as unable to pay a debt, or simply just have their names recorded, and yet it is unclear whether these people have definitively died. Brabants Historisch Informatie Centrum (hereafter BHIC), Den Bosch, Illustre lieve vrouwe broederschap in 's-Hertogenbosch, (1291) 1318-2005, 1232, nos. 116-119 (AO).

19 Van Bavel and Van Zanden, 'The jump-start of the Holland economy', 515.

20 Bas van Bavel, 'The medieval origins of capitalism in the Netherlands', *BMGN: Low Countries Historical Review* 125:2-3 (2010) 45-79, 67.

21 C. Boschma-Aarnoudse, *Tot verbeteringe van de neeringe deser Stede. Edam en de Zeevang in de late Middeleeuwen and de 16de eeuw* (Hilversum 2003) 108-109.

low-resolution estimates at best, with temporal gaps that cannot easily accommodate sharp short-term fluctuations based on excess mortality and inward migration. Urbanization rates increased in Holland after the Black Death through inward migration,[22] and hence obscured any direct mortality effects that could be observed in the cities. Second, and relatedly, increases in urban populations after the Black Death could be entirely compatible with simultaneous losses in the countryside. So, the rural areas of the Zeevang or Waterland surrounding Edam experienced contractions of their populations across the same period.[23] Third, as we will come to see in the next section, the recurring plagues and other epidemics in the northern parts of the Low Countries were frequent and severe, and moreover, Holland did not appear to escape any more lightly than other areas.

Recurring epidemic outbreaks

Written distinctions of the different types of diseases causing epidemics mainly appear in documents toward the later parts of the fifteenth century.[24] Thus, in different parts of Guelders, for example, we know through the explicit terms used that dysentery was present in the drought of 1472/1473 (*rode loop/melisoen*) and that in 1497/1498 "*pokken*" broke out – likely because these are diseases with very distinctive describable outward symptoms.[25] Instead, most of the time before 1450, we see general terms used such as "*peste*" and "*pestilentia*". As already widely iterated on the subject of "retrospective diagnosis" through historical documents, we should be cautious not to assume that these terms always definitively refer to plague caused by *Yersinia*

22 Van Bavel, *Manors and markets*, 281.

23 Boschma-Aarnoudse, *Tot verbeteringe van de neeringe deser Stede*, 108-109.

24 We have some references to afflictions such as children's blindness caused by "*pokken*" (potentially smallpox or measles) as early as 1383 from 's-Hertogenbosch, but it is unclear whether this is an epidemic outbreak, see: Hans van den Broek, 'Genezing van blindheid na pokken of mazelen. Nederlandse mirakelverhalen, 14e-18e eeuw', *Nederlands Tijdschrift voor Geneeskunde* 154 (2010) A1853, 2.

25 Remi van Schaïk, *Belasting, bevolking en bezit in Gelre en Zutphen (1350-1550)* (Hilversum 1987) 305-306. For severe prolonged drought, see: Chantal Camenisch et al., 'Extreme heat and drought in 1473 and their impacts in Europe in the context of the early 1470s', *Regional Environmental Change* 20 (2020) 19, 1-15, 3. In 1497/1498, it was likely syphilis rather than smallpox, and we see similar references around the same time in Leiden, Rotterdam, Haarlem, and Middelburg, see: Curtis, 'From one mortality regime to another?' 140; Adriaan Abraham Fokker, *Onderzoek naar den aard van de epidemische en contagieuse ziekten die vroeger in Zeeland geheerscht hebben* (Middelburg 1860) 14-17.

pestis, but at the very least refer to an outbreak of a disease of some description which might or might not be plague.[26] Even more loosely defined are general indicators for exceptional mortality – "*grote sterfte*" or "*magnas mortalitas*", for example. The earliest mention of the famous term "*gave Gods*" (the gift from God) found thus far is applied to a man from Gouda in a Delft chronicle from 1426.[27]

In contrast to the southern parts of the Low Countries, where the *pestis secunda* featured prominently in the written sources,[28] barely any information has been established for this epidemic in the north, notwithstanding references from a papal bull in 1359 regarding the spread of "*pestis*" in Utrecht and the nearby small town of Rhenen,[29] and a spike in the deceased owing goods to the count of Holland in 1360 (36 listed, when the yearly average from 1343 to 1380 was fewer than 6, though with several gaps as previously mentioned).[30] The lack of evidence might, however, be connected to the lack of systematic historiographic focus, as noted recently in other work for elsewhere in Europe.[31]

Further information in recent years, however, has been provided through the combination of bio-archaeological excavation and genetic sequencing. In 1999, excavations at the former site of the St. Maartensgasthuis in the west Brabant town of Bergen op Zoom (20 kilometers south of Holland), led to the discovery of around 800 skeletons in the confines of the hospital cemetery – buried in mass graves but neatly laid out (see: illustration 2).[32] More than ten years

26 Ronald Rommes, 'Plague in northwestern Europe. The Dutch experience, 1350-1670', *Popolazione e Storia* 16:1 (2015) 47-71, 49. We do not know, for example, whether these terms were "general" descriptors for any kind of disease, or whether these terms were more precisely applied for the disease of plague, but still contemporaries could misdiagnose and confuse with another affliction. Buboes are a very significant indicator from written documents, although this standard of evidence is not found often enough in medieval sources. Overall, we have only one potential reference to buboes – during the 1382 outbreak in Leiden, the St. Pancras church "memory books" make a direct reference to visible symptoms such as a "*nigra et venenosa pustula*" (black poisonous blister) that might have been a plague bubo, yet was also a sign of anthrax, see: H.G. Hamaker (ed.), 'Historische aanteekeningen in het Memoriale Fautorum Capituli Sti Pancratii te Leiden, 1367-1408', *Bijdragen voor Vaderlandsche Geschiedenis en Oudheidkunde* 6 (1870) 126-143, 138. We do not get any information on the location of the *pustula* on the body.

27 D.P. Oosterbaan (ed.), 'Kroniek van de Nieuwe Kerk te Delft', *Haarlemsche Bijdragen. Bouwstoffen voor de Geschiedenis van het Bisdom Haarlem* 65 (1958) 2-336, 109.

28 Roosen and Curtis, 'The "light touch" of the Black Death', 43, 45, 49, and the 'supporting documents'.

29 Gisbert Brom (ed.), *Bullarium Trajectense* II (The Hague 1896) no. 1631.

30 De Boer, *Graaf en grafiek*, 64.

31 Philip Slavin, 'Out of the west. Formation of a permanent plague reservoir in south-central Germany (1349-1356) and its implications', *Past and Present* 252:1 (2021) 3-51, 7.

32 Marco Vermunt and Alexander van der Kallen, *Opgravingen in Bergen op Zoom* (Utrecht 2012) 90-99.

later, DNA on the bones of several of these skeletons was analyzed, which furnished *Yersinia pestis* in two of the samples – i.e., definitive proof of the existence of plague. The authors of the initial study found that the Bergen op Zoom genotypes differed from *Yersinia pestis* extracted in Hereford (western England) and Saint-Laurent-de-la-Cabrerisse (southern France),[33] while later work from 2016 showed that the lineage of the Bergen op Zoom sample (referred to as "1B", and thus distinct from "1A") was shared with *Yersinia pestis* taken from the excavated Cistercian abbey of St. Mary Graces in London and from Bolgar, a settlement on the Volga River in Russia.[34]

In the very beginning, it was assumed that this was a mass burial connected to the Black Death. Accordingly, it was originally hypothesized that the Black Death might have spread to Bergen op Zoom in a different chain of transmission – from the north rather than from the south.[35] Indeed, recently, Monica Green has given some further credence to this view – suggesting a possibility of the spread of Black Death through the Hanseatic trading towns, separate to that which came via Sicily and the Mediterranean.[36] This proposition is certainly interesting, since most of the clearer Black Death evidence we have for the northern parts of the Low Countries comes from the central inland towns of Utrecht, Zwolle, and Deventer – the last two mentioned places both "Hansa" towns.[37] Bergen op Zoom, furthermore, had strong commercial connections at the time – linking important cities further south such as Antwerp and Bruges with those to the north through its useful geographical location and frequent trade fairs.[38]

However, while the Bergen op Zoom sample's distinctive genetic lineage has been confirmed, one basic fact that remains inconclusive is the dating of the sample itself. The original study from 2010 made a specific dating of the burial site to 1349 – but this finding was on the basis of vague unreferenced claims to "soil stratigraphy, artifacts and

33 Stephanie Haensch et al., 'Distinct clones of *Yersinia pestis* caused the Black Death', *PLOS Pathogens* 6:10 (2010) e1001134, 1-8.

34 Recently contextualized in: Monica Green, 'Out of the east (or north or south). A response to Philip Slavin', *Past and Present* 256:1 (2022) 283-323, 303-304. The city of Bolgar, intermittent medieval capital of the Volga Bulgaria, was sacked in 1361 during the Golden Hoard series of conflicts: Daniel C. Waugh, 'The "owl of misfortune" or the "phoenix of prosperity"? Re-thinking the impact of the Mongols', *Journal of Eurasian Studies* 8 (2017) 10-21, 19-20.

35 Haensch et al., 'Distinct clones', 5.

36 Green, 'Out of the east', 310-311.

37 As noted in Rommes, 'Plague', 50-51.

38 C.J.F. Slootmans, *Paas- en koudemarkten te Bergen op Zoom, 1365-1565*, I (Tilburg 1985) 6-10.

coins".[39] On subsequent reflection, the burial site seems to be more likely to have been connected to the *pestis secunda* of 1359/1360 rather than the Black Death, even if the archaeological indicators are fragmentary and a fire in 1397 likely destroyed supporting documentation.[40] Probably the strongest argument to be made for the *pestis secunda* dating is simply that the other "1B lineages" of *Yersinia pestis* found so far, in St. Mary Graces (London) and Bolgar, have also been attributed to *pestis secunda*.[41] This connection is interesting when we consider that the format and order of the individual burials within the different mass graves suggests that the 800 people were at least buried in the very same short phase (i.e., one individual outbreak rather than incrementally over time or during a number of outbreaks).[42] Accordingly, from an estimated population of roughly 2,500-3,000 at Bergen op Zoom around the middle of the fourteenth century, roughly a quarter to a third of the population died in this individual outbreak – but likely much more if we consider that not everyone who died was buried at this institution.[43] If we accept the dating of the site as around 1359/1360, then it suggests to us that *pestis secunda* was very severe – at least in the town of Bergen op Zoom.

Helpfully, from the third plague outbreak of 1368/1369 we start to acquire more information – thanks in part because serial mortality indicators can be properly integrated for the first time. Figure 1 below

39 Haensch et al., 'Distinct clones', 5.

40 Arguing for *pestis secunda*: R. Barbieri et al., '*Yersinia pestis*: The natural history of plague', *Clinical Microbiology Reviews* 34:1 (2021) e00044-19, 1-44, 30; Roosen and Curtis, 'The "light touch" of the Black Death', 45; Amine Namouchi et al., 'Integrative approach using *Yersinia pestis* genomes to revisit the historical landscape of plague during the medieval period, *Proceedings of the National Academy of Sciences* 115:50 (2018) e11790-e11797, e11794. Arguing for the "late fourteenth century": Maria A. Spyrou et al., 'Phylogeography of the second plague pandemic revealed through analysis of historical *Yersinia pestis* genomes', *Nature Communications* 10:4470 (2019) 1-13, 3. For the fire of 1397: W.A. van Ham, *Macht en gezag in het Markiezaat. Een politiek-institutionele studie over stad en land van Bergen op Zoom (1477-1583)* (Hilversum 2000) 249.

41 Philip Slavin, 'Reply: Out of the west – and neither east, nor north, nor south', *Past and Present* 256:1 (2022) 325-360, 333.

42 Vermunt and Van der Kallen, *Opgravingen in Bergen op Zoom*, 93. That does not necessarily apply to the 50 skeletons additionally buried within the inside of the hospital structure.

43 Medieval population estimates of Bergen op Zoom provided in Vermunt and Van der Kallen, *Opgravingen in Bergen op Zoom*, 96; Van Ham, *Macht en gezag*, 28. In the late Middle Ages, those who died from plague were frequently buried in great numbers in ordinary church cemeteries; for Eindhoven, see: Nico Arts, 'Begraven op de Brabantse zandgronden. De archeologie van veranderende grafrituelen, circa 1000-1900', in: Peter Bitter, Viera Bonenkampová, and Koen Goudriaan (eds), *Graven spreken. Perspectieven op grafcultuur in de middeleeuwse en vroegmoderne Nederlanden* (Hilversum 2013) 23-36, 31; for Haarlem: Curtis, 'From one mortality regime to another?', 134-135.

Illustration 2 Mass grave dug at the excavation of Bergen op Zoom gasthuis *(© Marco Vermunt)*

shows a simple reconstruction of the quantitative information we have for mortality indicators in different towns in Holland and the northern part of Brabant in the period 1367-1452. Given that many of the series have gaps, start at different times, do not measure the same things, and sometimes require significant assumptions about the sample, the figure is only intended to roughly demonstrate when the main significant epidemic years were – rather than an accurate estimate of mortality impact (hence, simple raw totals on two y-axes of scale).

According to figure 1, after the Black Death in 1350/1351,[44] and *pestis secunda* (1359/1360), the main epidemic years in the northern parts of the Low Countries were likely 1369, 1382/1383,[45] 1400, 1411,[46] 1420/1421, 1426, 1439/1440, and 1449-1451. Generally, then, epidemic disease outbreaks occurred roughly every ten years in the century following the Black Death, although interestingly, formal plague ordinances announced at the city level regulating trade and movement of people during the outbreak only picked up from the middle of the fifteenth century (as opposed to general "environmental regulation ordinances", which were already seen in the fourteenth century).[47] Although highly impressionistic, the sharpest spikes for the different series, when placed against their annual averages, potentially suggest death rates of 20-25 percent – in line with what was suggested for *pestis secunda* at Bergen op Zoom. In a relative perspective, this range would be much higher than the death rates estimated in recent literature for comparable "severe" outbreaks – see, for example, the 15 percent and 10 percent death rates produced for Dijon (eastern France) during the epidemics of 1400 and 1439, respectively,[48] and the 10-15 percent death rates calculated for various recurring epidemics

44 While plague mortality is already occurring in the summer of 1349 in the southern parts of the Low Countries, it appears the Black Death only reached the northern areas in 1350.

45 However, we should consider that the effects of delays in registration for a tax not straightforward to collect among dispersed localities (especially when great in number), and that it was probably detested and resisted by the local populations. Evidence from elsewhere in the northern Low Countries shows outbreaks already occurring two years earlier in 1381 – see, for example, references to "*mortalitatem pestem*" leading to the reduced incomes of churches at Putten and Voorthuizen (Guelders): HUA, Bisschoppen van Utrecht, 281.1, no. 114, fo. 67r (AO); and, the references to "*pestilentia*" already in Haarlem in 1381: De Boer, *Graaf en grafiek*, 83-84.

46 It was noted in 1411 that the St. Catharinagasthuis in Leiden had taken on extra summer personnel on account of the "*starf*" (death): Ladan, *Gezondheidszorg in Leiden*, 234.

47 For Utrecht in 1450: A.J. van der Weyde, 'Bijdrage tot de geschiedenis der pest te Utrecht', *Nederlands Tijdschrift voor Geneeskunde* 71 (1927) 3119-3139, 3119; For Dordrecht in 1450 and 1452; Patrick Naaktgeboren, 'Policing the environment of late medieval Dordrecht', in: Carole Rawcliffe and Claire Weeda (eds), *Policing the urban environment in premodern Europe* (Amsterdam 2019) 149-178, 162-163. For Hasselt in 1450: Jeroen Benders, 'Demografie van de stad Hasselt (Ov.) tot 1535', *Overijsselse Historische Bijdragen* 109 (1994) 5-38, 10. For Gouda in 1448 and subsequent years: Janna Coomans, 'Food offenders: Public health and the marketplace in the late medieval Low Countries', in: Rawcliffe and Weeda (eds), *Policing the urban environment*, 121-148, 139. It should be noted, though, that urban magistrates were already convening in an official capacity to discuss how to deal with plague outbreaks, as seen in the Arnhem financial accounts of 1421: Leppink and Wientjes, *Het Sint Catharinae Gasthuis*, 221.

48 Pierre Galanaud, Anne Galanaud, Patrick Giraudoux, and Henri Labesse, 'Mortality and demographic recovery in early post-black death epidemics. Role of recent emigrants in medieval Dijon', *PloS ONE* 15:1 (2020) e0226420, 4.

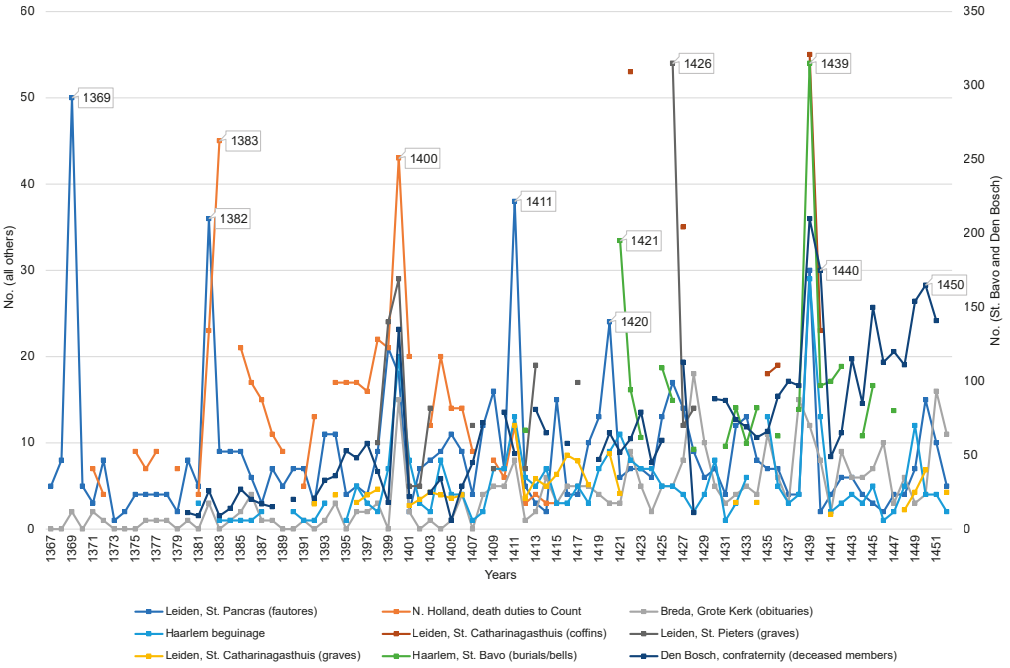

Figure 1 Mortality indicators in various places in Holland and northern parts of Brabant, 1367-1452 Sources: De Boer, Graaf en grafiek, *64, 80, 90; Ladan,* Gezondheidszorg in Leiden, *38, 234-235; Ligtenberg,* De armezorg te Leiden, *42; ELO, Rekening van de gasthuismeesters van het Sint Catharinagasthuis, 334, no. 30 [1420] fo. 7v; no. 31 [1420/1421] fo. 27r; no. 33 [1421] fo. 29r (correcting a minor misinterpretation by Ladan for the years 1420/1421); ELO, Archieven van de kerken van Leiden, 0502, Rekeningen van de kerkmeesters 1398-1404, 1407-1408, 1409-1410, 1412-1414, 1417-1418, 1426-1429, no. 323; Curtis, 'From one mortality regime to another?'; F.A. Gooskens, 'Pestepidemieën in Breda tijdens de middeleeuwen (1382-1535)',* Jaarboek De Oranjeboom *39 (1986) 18-54, 44; BHIC, Den Bosch, Illustre lieve vrouwe broederschap in 's-Hertogenbosch, (1291) 1318-2005, 1232, nos. 116-119 (AO). Raw annual totals provided in Appendix 1.*

in different regions of England before 1450,[49] though perhaps similar to those across different parts of the southern Low Countries,[50] and the 25 percent suggested for Iceland in the plague of 1402-1404,[51] and lower than the exceptionally high mortality rates of more than 40 percent

49 Pamela Nightingale, 'Some new evidence of crises and trends of mortality in late medieval England', *Past and Present* 187 (2005) 33-68, 47-49.

50 Roosen and Curtis, 'The "light touch" of the Black Death', 38-39, 49-50.

51 Chris Callow and Charles Evans, 'The mystery of plague in medieval Iceland', *Journal of Medieval History* 42:2 (2016) 254-284; a drastic downward revision of almost 50 percent first posited in Gunnar Karlson, 'Plague without rats. The case of fifteenth-century Iceland', *Journal of Medieval History* 22:3 (1996) 263-284.

suggested for plague outbreaks in 1430 and 1460 in Mamluk Cairo.[52] Another point of relative interest to observe is that there is seemingly no linear reduction in the severity of these epidemics across the later Middle Ages – quite different to what has been suggested, for example, in Tuscany.[53]

As seen from figure 1, the county of Holland did not fare lightly in its experience with epidemic disease outbreaks. They were frequent and severe, and overall, we can see recent statements in big global plague narratives such as "Holland missed, or was little affected by, seven of nine epidemics [in the fifteenth century]" to be definitively false.[54] The third outbreak of plague was particularly brutal. Thus, the large spike in donors to the St. Pancras church at Leiden in 1369 is also corroborated by an observation from one of the clerics that the "*pestilencia*" or "*epydimia*" killed more than 3,000 people in Leiden and nearby villages.[55] Given that the population of Leiden around the time was only 3,000-4,000,[56] many of the deaths likely corresponded to the villages in the surrounding Rijnland countryside. Those rural people that did not succumb to the disease may have found their way into the city of Leiden itself. In 1372, the number of new male head of household "*poorters*" (incoming registered burghers) spiked to 129, when the average in the period 1364-1415 was 58.[57] Of those migrants to Leiden in the period 1364-1389 where place of origin could be reconstructed, almost 70 percent were from the "northern" Rijnland.[58] Indeed, the impact on the Holland countryside was substantial. The number of names between an inquisition of 1369 and a "*naamlijst*"

52 Stuart Borsch and Tarek Sabraa, 'Plague mortality in late medieval Cairo. Quantifying the plague outbreaks of 833/1430 and 864/1460', *Mamlūk Studies Review* 19 (2016) 115-148, 135.

53 Cohn, 'The Black Death. End of a paradigm', 703-738, 727, 731; Ann G. Carmichael, *Plague and the poor in renaissance Florence* (Cambridge 1986) 63.

54 James Belich, *The world the plague made. The Black Death and the rise of Europe* (Princeton 2022) 303. It is particularly so when we add the numerous epidemic mortality spikes seen after 1450 and shown in the likes of Haarlem and Leiden, see: Curtis, 'From one mortality regime to another?', 137; Ladan, *Gezondheidszorg*, 60.

55 De Boer, *Graaf en grafiek*, 73. Latin terms taken from the original manuscript: ELO, Archieven van de Sint Pancraskerk, Antiquum registrum A, no. 415, fo. 29r. Although the cleric suggests that the disease particularly victimized pregnant women and children, if not for rhetorical effect, then it might have simply been a young population profile rather than a "young person's disease" – if the Black Death or the *pestis secunda* led to many deaths, producing a spike of new marriages and, in turn, births.

56 Van Bavel and Van Zanden, 'The jump-start of the Holland economy', 506-507.

57 Wim Blockmans et al., 'Tussen crisis en welvaart. Sociale veranderingen 1300-1500', in: *Algemene geschiedenis der Nederlanden*, IV (Haarlem 1980) 42-86, 52.

58 De Boer, *Graaf en grafiek*, 147-148.

from 1371 declined at anything between 25 to 45 percent in different Rijnland villages.[59] The same rural impact was also suggested via evidence from a small village, Vlijmen, at the time part of Holland in the Land van Heusden. Here, 89 individuals paid the local recognition fees (*tijns*) to the count of Holland as owners of well-defined pieces of land in the Nuwe Heide and Luisbroek areas in 1365, but by 1375 this figure had declined radically to just 37.[60]

Other parts of the northern Low Countries have yet to furnish significant serial evidence for the impact of epidemics – instead we rely on fragments, though some of which are highly insightful. Some show the level of demographic devastation, even in quite isolated areas. At the Marienwolde monastery in the county of Bentheim, it was noted in June 1401 that 17 out of the 18 resident brothers had died one after another.[61] Still in the east, about 120 km further south in the town of Geldern, 98 mortmain payments were made in the year 1400/1401, which was 4.5 times more than in the previous year and almost 10 times more than in the following year.[62] Some also show differences in timing to the spikes identified in figure 1 – perhaps indicative of the regional or locally distinctive patterns of disease that could occur.[63] Thus, in Guelders we have a reference in 1429 by a priest of the rectory belonging to the St. Remigius church in the village of Steenderen, just east of the IJssel River, to "great pestilence flourishing in the parish".[64] And at nearby Zutphen, we even have a small serial impression of mortality. In 1429/1430 it reached a total of 30 graves dug and 17 coffins bought by the Oude Gasthuis. In 1428/1429, though, it was 0 and 2; 1430/1431 it was 6 and 9; 1431/1432 it was 4 and 5; 1432/1433 it was 0 and 9; 1433/1434 it was 4 and 4; 1434/1435 it was 1 and 3; and 1435/1436 it was 0 and 5 – thus perhaps representing a four- or fivefold increase in deaths and a death rate of around 15-20 percent.[65]

59 Ibid., 98-105. Although discussed in De Boer's work with considerable nuancing of the source's margins of error.

60 Peter Hoppenbrouwers, *Een middeleeuwse samenleving. Het Land van Heusden* (*ca. 1360-ca. 1515*), I (Wageningen 1992) 60.

61 W. Jappe Alberts and A.L. Hulshoff (eds), *Het Frensweger handschrift betreffende de geschiedenis van de moderne devotie* (Groningen 1958) 166-172.

62 Van Schaïk, *Belasting*, 167.

63 Blockmans, 'The social and economic effects of plague', 850.

64 Gelders Archief Arnhem (hereafter GAA), Sint-Remigiuskerk te Steenderen, 0326, Cartularium van eigendomsbewijzen van de pastorie uit 1383-1441, no. 1, fo. 1r (AO).

65 Sjoerd Galema (ed.), *Rekeningen van het Oude Gasthuis 1416/17-1435/36* (Zutphen 1996) 74, 79, 83, 85, 90, 96, 102-103, 109, 116.

Perhaps one of the most attention-grabbing references, however, comes from the notes of one Arnold van Goer, the Guelders land agent, who suggested in the 1449/1450 volume that the forester's wife was so sick from the "*pestilencien*" that no one dare touch one of his books.[66] The reference shows that while disease spread was understood through the framework of miasma theory – foul-smelling poisonous vapors and particles coming from "corrupt" matter such as stagnant pools, waste, rotting carcasses, and soft fruits; from vapors of the earth via clefts and caves; or from misaligned constellations of the planets – "corruptions" connected to poor airs, atmospheres, light, and smells – people also carried concern for physical proximity to certain items and individuals. Hence, the explanatory frameworks of providence, miasma, and contagion cannot be considered separate from one another.

Epidemics, hardship, and food crises

Recent literature has established the outbreak of 1439 to have been the most severe epidemic outbreak to hit the southern Low Countries after the Black Death, and evidence from the north suggests a similar story.[67] This time was potentially the first after the Black Death when a high death rate of 20 to 25 percent of the population could be applied to a wide geographical area, rather than to restricted regions or localities.[68] The epidemic likely involved plague but, given the coexistence of significant harvest failures, may also have simultaneously involved other hardship-related diseases, too.[69] Problems in agricultural

66 GAA, Graven en hertogen van Gelre, graven van Zutphen, 0001, Rekeningen van de overste rentmeester Arnold van Ghoor, 1438-1450, no. 2997, fo. 168v (AO).

67 For Hainaut in the southern parts of the Low Countries: Roosen and Curtis, 'The "light touch" of the Black Death', 43-45, 49; Blockmans, 'The social and economic effects of plague', 861-862; and for Ypres, Flanders: Paul Trio, 'De grote sterfte van 1438-39 in Ieper. Nieuwe inzichten op basis van een rekening van de O.L.V.-broederschap van Parijse scholieren', *Handelingen van het Genootschap voor Geschiedenis* 143:1-2 (2006) 226-245, 244-245. For Haarlem and Leiden in the northern Low Countries: Curtis, 'From one mortality regime to another?', 137; Ladan, *Gezondheidszorg*, 60.

68 Indeed, high death rates for individual localities were possible well into the seventeenth century, and at least a third of the population of Leiden died during the epidemic of 1635: see the large individual locality mortality deviations in Bram van Besouw and Daniel R. Curtis, 'Estimating warfare-related civilian mortality in the early modern period. Evidence from the Low Countries, 1620-99', *Explorations in Economic History* 84 (2022) 101425, 16. High death rates across larger geographical areas, however, was rarer.

69 A similar argument for the presence of a different, "possibly waterborne", disease has been advanced for Dijon in 1439/1440 in Pierre Galanaud, Anne Galanaud, and Patrick Giraudoux,

production were connected to the terribly cold weather conditions during the 1430s (especially winter and spring),[70] where it has already been argued that this decade was one of the coldest of the previous millennium,[71] subsequently exacerbated by ongoing conflicts between the county of Holland and the Hanseatic League, which disrupted imports.[72] Thus, at the St. Catharinagasthuis in Leiden, 1439 was the very first year in the series when wheat prices more than doubled, and this was the same case for wheat at St. Jan in Utrecht (1438), rye at the Dom Chapter in Utrecht (1439), wheat at the Leeuwenhorst Abbey in Noordwijkerhout (1437/1438), and wheat (1438) and rye (1438-1440) at Maastricht.[73] Grain prices were so out of control that most urban authorities tended to focus on fixing bread prices and weights instead.[74]

The severity of the 1439 outbreak is already demonstrated in the serial evidence we have for deaths – invariably, the largest spikes in figure 1 came in this year. In a series of deceased from Utrecht who had taken out annuities in the period 1429-1528, the year 1439 was clearly the highest spike, representing about an eightfold increase on the annual average.[75] It is also supported by other documentary references to the harsh effects. Thus, it was noted in a meeting of Amersfoort magistrates in 1439 that a "*grote pestilentie*" among the people was seen in the city where 20 nuns had died in the St. Agnes convent. In Utrecht, meanwhile, we find a prayer for protection against the plague and hear

'Historical epidemics cartography generated by spatial analysis. Mapping the heterogeneity of three medieval "plagues" in Dijon', *PloS ONE* 10:12 (2015) e0143866, 1-24, 21.

70 Remi van Schaïk, 'Drie vijftiende-eeuwse crises in de Nederlanden. Oorzaken, kenmerken en gevolgen', *Leidschrift Historisch Tijdschrift* 28:2 (2013) 67-84, 70.

71 Chantal Camenisch et al., 'The 1430s. A cold period of extraordinary internal climate variability during the early Spörer Minimum with social and economic impacts in north-western and central Europe', *Climate of the Past* 12:11 (2016) 2107-2126; and with specific reference to the (southern parts of the) Low Countries: Chantal Camenisch et al., 'Endless cold. A seasonal reconstruction of temperature and precipitation in the Burgundian Low Countries during the 15th century based on documentary evidence', *Climate of the Past* 11:8 (2015) 1049-1066, 1058.

72 Ad van der Zee, *De Wendische Oorlog. Holland, Amsterdam en de Hanze in de vijftiende eeuw* (Hilversum 2018) 170.

73 Mainly from: Jessica Dijkman, *Shaping medieval markets. The organisation of commodity markets in Holland, c. 1200-c. 1450* (Leiden 2011) 398-408; but Maastricht from: W. Tijms, *Prijzen van granen en peulvruchten te Arnhem, Breda, Deventer, 's-Hertogenbosch, Kampen, Koevorden, Maastricht en Nijmegen*, II (Groningen 1983) 164-169.

74 Remi van Schaïk, 'Marktbeheersing. Overheidsbemoeienis met de levensmiddelenvoorziening in de Nederlanden (14de-19de eeuw)', in: Clé Lesger and Leo Noordegraaf (eds), *Ondernemers en bestuurders. Economie en politiek in de Noordelijke Nederlanden in de late Middeleeuwen en vroegmoderne tijd* (Amsterdam 1999) 465-489, 483.

75 Huiting, *Domeinen in beweging*, 166.

that only two residents remained at the Regulieren monastery after the "*epidimae morbus*" of 1439.[76] In one interesting case at the small town of Culemborg, financial accounts (*stadsrekeningen*) make reference to two local figures, Brother Elyas (a priest) and Johan die Schoelmeyster (a schoolmaster), who received extra payments during the "*sterften*" (death) for their help and assistance: for the first man it is unclear in exactly what form this aid was, but for the second man it was because so few children had come to school to pay the school fees.[77] At Arnhem, meanwhile, it was noted in their financial accounts that some people had been unable to get back into the city on account of the ongoing "*pestilencie*".[78] Even the most isolated areas did not escape – meetings of the "*Etstoel*" (highest court) in parts of rural Drenthe were disrupted in 1441 on account of the plague.[79]

The important thing to discern from the 1439 episode, however, is that it seems to be quite distinctive in a broader temporal perspective, when compared to the other epidemics occurring in the century after the Black Death. While the substantial and territorially pervasive mortality impact in 1439 occurred at roughly the same time as widespread harvest failures and significant spikes in grain prices in the northern parts of the Low Countries, very few of the other epidemics occurred simultaneous to or just after these price spikes. Interestingly, this situation mirrors what has already been shown for the Dutch Republic in the seventeenth century – again, a significant temporal detachment between grain price spikes and mortality crises.[80] Instead, if we do see these spikes in wheat and rye prices in the period 1349-1450, they tend to come after significant epidemic outbreaks (although

76 For the Amersfoort magistrate's reference: W.F.N. van Rootselaar, *Amersfoort 777-1580*, I (Amersfoort 1878) 515. For the plague prayer at Utrecht: M.H. Hulshof (ed.), 'Gebed en voorschriften tegen pest in een Utrechtsch getijdenboekje uit 1440', *Nederlands Tijdschrift voor Geneeskunde* 83 (1939) 533-535; for the remaining monastery residents: Joosting (ed.), 'Cornelis Block's kroniek', 58.

77 Regionaal Archief Rivierenland (hereafter RAR), Tiel, Archief van het stadsbestuur van Culemborg, 1318-1813, 0826, no. 188, fo. 11r (AO). On epidemic-related restrictions for school children later in the fifteenth century at nearby Utrecht, see: HUA, Stadsbestuur van Utrecht 1122-1577, 701, Buurspraakboek of Luiboek, 1385-1391, 1396-1536, 1542-1555, 1560-1579, no. 16.17 [1490-1499], fo. 75r (AO); this valuable Utrecht finding was made by Claire Weeda, Leiden University (pers. comms. 5 June 2020).

78 GAA, Oud Archief Arnhem, Stadsrekeningen, 1244, 1439/1440, fo. 11r, 44r (AO).

79 Peter Hoppenbrouwers, *Village community and conflict in late medieval Drenthe* (Turnhout 2018) 122.

80 Daniel R. Curtis and Jessica Dijkman, 'The escape from famine in the northern Netherlands. A reconsideration using the 1690s harvest failures and a broader northwest European perspective', *The Seventeenth Century* 34:2 (2019) 229-258.

still never a doubling of the price as in 1439), such as in Utrecht in 1374 (after the epidemic of 1368/1369) and in 1422 (after the epidemic of 1420/1421). From the evidence we have at Utrecht, Leiden, Maastricht, and Noordwijkerhout up to 1450, only a (moderate) grain price spike in 1409 occurs just before or during an epidemic outbreak (1411).[81]

Of course, we would prefer to have more early grain price series available for the northern parts of the Low Countries and, moreover, tighter geographical association between prices and mortality indexes (i.e., two series from the exact same localities). Despite limitations to the evidence, however, there are some implications for these impressionistic observations. If we can assume that grain price spikes can be an indicator of food crisis, either through disruptions in production or distribution, then it seems that food crises were not major drivers of epidemic outbreaks in the northern parts of the Low Countries after the Black Death and before 1450 – notwithstanding 1439. Taking this point one step further, therefore, poverty and pre-existing health deficiencies might not have made people more likely to die from diseases. The actual "seeds" of these epidemics in the first place were not necessarily connected to subsistence-related hardships, however, but instead unrelated or indirect events or processes creating zoonoses, for example, or facilitating the arrival and persistence of potentially significant vectors.[82] Thus, the link between climate change and epidemic activity might not have been in the higher incidence of harvest failure but simply disrupting ecological settings that supported relevant vectors. On a related note, much of the related literature on plague spread now tends to emphasize not the lack of grain, but the presence of it and its potential contamination during storage and transportation.[83]

81 Dijkman, *Shaping medieval markets*, 398-408. However, we do not have any grain prices that go back far enough to coincide with the Black Death and *pestis secunda*, but for parts of the southern Low Countries we do have this information: Daniel R. Curtis et al., 'The Low Countries', in: Guido Alfani and Cormac Ó Gráda (eds), *Famine in European history* (Cambridge 2017) 119-140, 122.

82 An "exogenist" interpretation in line with much earlier literature: David Herlihy, *The Black Death and the transformation of the West* (Cambridge (Mass.)1997) 39. The later third of the fifteenth century was different, as epidemic disease outbreaks were linked temporally to severe food crises: Curtis, 'From one mortality regime to another?', 142, 148, 155; Van Schaïk, 'Drie vijftiende-eeuwse crises'.

83 On plague, climate change, and vector disruption: Philip Slavin, 'The birth of the Black Death. Biology, climate, environment, and the beginnings of the second plague pandemic in early fourteenth-century central Asia', *Environmental History* 28:2 (2023) 300-334; Bruce M.S. Campbell, *The great transition. Climate, disease and society in the late-medieval world* (Cambridge 2016) 8-9. On plague and the presence of grain: Hannah Barker, 'Laying the corpses to rest. Grain, embargoes, and Yersinia pestis in the Black Sea, 1346-48', *Speculum* 96:1 (2021) 97-126; Nükhet Varlik, *Plague and empire in the early*

It seems that a promising avenue of research to follow up in the future is the opposite relationship to what seems intuitively logical on the surface. That is, not how food crises impact on mortality outcomes through malnutrition-related disease, but how excess mortality caused by epidemics potentially affects (and disrupts) production and distribution outcomes. Indeed, mortality and quarantines not only affected agricultural work performed in the fields – as seen with the case of the Black Death in rural areas around Zwolle and Utrecht mentioned above – but also disrupted the circulation of goods, where many cities restricted trade in foods considered to be vectors of transmission.[84] Thus, probably further progress on this subject might take place not in the north, with our limitations on the available source material, but in the southern Low Countries.[85] In the south, it seems that the temporal link between harvest failures (measured in yields via tithe records) and episodes of epidemic disease is somewhat tighter than in the northern parts of the Low Countries for the relevant period 1349-1450 – perhaps a point of deviation from the situation in the north – although this difference might be evidence instead of the complicated and unstraightforward relationship between harvest and price information in the medieval period.[86] Nevertheless, of relevance to the avenue of research I propose above, it is highly significant that recent research on epidemic diseases and food crises for areas of the southern Low Countries has shown that "grain prices only peaked during after these waves of pestilence, but in no case did this happen in the period before the plague" – pointing to the potential mechanisms of a reduced labor force able to gather the harvest, the disruption of trade relations, and general fears and restrictions that accompanied the outbreaks.[87]

modern Mediterranean world. The Ottoman experience, 1347-1600 (Cambridge 2015) 167.

84 On this issue, recently, for the southern Low Countries: Claire Weeda, 'The porous city. Dealing with public health crises in 15th-century Sint-Truiden', in: Claire Weeda, Robert Stein, and Louis Sicking (eds), *Communities, environment and regulation in the premodern world* (Turnhout 2022) 99-120, 107.

85 See the promising ongoing work on this kind of idea for southern areas of the Low Countries: Stef Espeel, *Prices and crises. The grain economy in fourteenth-century Flanders* (PhD thesis in history, University of Antwerp 2021) 214-231.

86 Tim Soens, 'No second lord. Agriculture and climatic variability in the late medieval Low Countries', in: Weeda, Stein, and Sicking (eds), *Communities,* 71-98, 87-88, 90.

87 Espeel, *Prices and crises*, 223.

Moving forward

This paper has attempted to bring together in one place a large amount of the evidence we currently have for plague and other epidemics in the northern parts of the Low Countries in the period before 1450 – i.e., before the period of focus in the (still highly valuable) book *De gave Gods*. It reveals a series of ten identifiable epidemic outbreaks in the period between the Black Death and 1450 – in 1350/1351, 1359/1360, 1369, 1382/1383, 1400/1401, 1411, 1420/1421, 1426, 1439/1440, and 1449-1451 – and thus an outbreak occurring roughly every ten years. From this, it is important to stress that these were not "shocks" – as often incorrectly used in the contemporary economics and economic history lexicon – but expected and anticipated recurring processes enshrined in collective memory and consciousness. Epidemics were simply incorporated into the ordinary rhythms of everyday life. It is in that light that we can understand the reluctance of recent literature to see epidemics as agents of change or as sharp departures from the "norm" – at least in the arenas of public health practice, the functioning of economic institutions, and societal cohesion.[88] The persistent and recurring nature of the spikes, furthermore, makes us reconsider the blurred and complicated lines between "epidemic" and "endemic" in a medieval context – especially if, crudely put, the epidemic status of a disease hinges on its capacity to present a societal "problem".[89]

Although it seems a simple enough task – reconstructing how many people died during epidemic disease outbreaks – for a long time it had appeared, for all parts of the Low Countries, that our progress would be hindered by a lack of source material. Yet, in just a matter of years, we have recently seen new or updated estimates of deviations in mortality and even mortality rates being produced for various contexts – from Hainaut (and the mortmain), to Haarlem (and the *klok en graf* registers and beguinage deaths), to 's-Hertogenbosch (and fraternity deaths). These data support already pre-existing indicators taken from graves

88 The lines of this public health argument point forward in Coomans, *Community, urban health and environment*; Rawcliffe and Weeda (eds), *Policing the urban environment*; and for societal cohesion: Daniel R. Curtis, 'Preserving the ordinary. Social resistance during the second pandemic plagues in the Low Countries', in: Christopher M. Gerrard, Paolo Forlin, and Peter J. Brown (eds), *Waiting for the end of the world? New perspectives on natural disasters in medieval Europe* (London 2020) 280-297.

89 Margaret Pelling, '"Bosom vipers". Endemic versus epidemic disease', *Centaurus. An International Journal of the History of Science and its Cultural Aspects* 62:2 (2020) 294-301; Monica H. Green, 'Emerging diseases, re-emerging histories', *Centaurus. An International Journal of the History of Science and its Cultural Aspects* 62:2 (2020) 234-247.

dug, coffins purchases, and testaments read in other contexts such as Leiden. Material is there, and it is on medievalists now to not only find it but also operationalize it to link up with bigger issues. More than ever before, we are helped today by the outstanding quality and pace of digitalization of original manuscripts, registering of search terms, and indexing of material by archives across the Low Countries – perhaps some of the best examples in Europe. In my view, this situation allows us to escape the traditional practice within medieval history of "reconstructing everything of potential interest within an apparently special archive" with an emphasis on substantial expertise in one localized region.

This process does not seem very enlightening on the surface but is the empirical means by which we can start to engage with much bigger debates and narratives – some of which have only been hinted at in this review piece. Having a more solid empirical base of quantitative information on epidemic mortality in the late-medieval period – where we can relativize across time and space – will allow us to establish more refined understandings of the posited connections between climate change, weather patterns, harvest failures, food crises, and the seeds and spread of diseases. Given the prominence of the Black Death evidence in the Hansa-connected towns of the central parts of the northern part of the Low Countries, we can start to link up with important theories at the heart of global plague history such as the idea of a second "northern" Black Death route of transmission.[90] Epidemic mortality information will also allow us to quantitatively consider the likelihood and impact of new assertions in environmental and public health history such as the more salubrious and hygienic situation within medieval cities of the Low Countries.[91] Indeed, if we see, at the same time, better hygiene than previously thought but greater epidemic mortality than previously thought, then perhaps cleanliness is not as big a driver of deaths than we might have expected (instead perhaps linked more to increased "ordinary" mortality and chronic disease).[92] Integrating indicators for the period before 1450 with the period thereafter, furthermore, will allow us to see to what extent these urban disease environment

90 Green, 'Out of the east', 310-311.

91 Coomans, *Community, urban health and environment*; Rawcliffe and Weeda (eds), *Policing the urban environment*; Roos van Oosten, *De stad, het vuil en de beerput. De opkomst, verbreiding en neergang van de beerput in stedelijke context* (Leiden 2015).

92 Rachel Schats, 'Ziekte en gezondheid in middeleeuws Holland en Zeeland. Een osteoarcheologisch perspectief op het "urban graveyard-effect"', *Stadsgeschiedenis* 13:2 (2018) 114-132, 131-132.

dynamics changed over time. Finally, having more information on epidemic mortality (and other demographic indicators, in general), and coupling this with better and more widespread empirical markers of population in the medieval period,[93] we can start to unravel an apparent mystery of why the Low Countries apparently experienced a very severe regime of repeat epidemic disease outbreaks across the late Middle Ages, yet (supposedly) recovered its population rapidly.

About the author

Daniel R. Curtis is an associate professor at Erasmus University Rotterdam and leads an NWO VIDI project "Positively Shocking! The Redistributive Impact of Mass Mortality through Epidemic Diseases and Violent Conflict in Early Modern Northwest Europe".
E-mail: curtis@eshcc.eur.nl

93 See the results to come out of the project led by Rombert Stapel, (Re)counting the Uncounted. Replication and Contextualisation of Dutch and Belgian Premodern Population Estimates (1350-1800) – Blog | IISG.

Appendix 1 Raw annual totals

Years	Leiden St. Pancras (fautores)[1]	Death duties to Count of Holland (bastards, clerics, foreigners, and those without heirs in N. Holland)[2]	Breda, obituaries of canons and chaplains at Grote Kerk[3]	Leiden St. Catharinagasthuis (graves dug)[4]	Leiden St. Catharinagasthuis (coffins purchased)[5]	Leiden St. Pieters (graves dug)[6]	Haarlem beguinage deaths[7]	Haarlem, St. Bavo church, "bells and graves"[8]	s-Hertogenbosch, Illustrious Brotherhood of Our Blessed Lady confraternity deaths[9]
1367	5		0						
1368	8		0						
1369	50		2						
1370	5		0						
1371	3	7	2						
1372	8	4	1						
1373	1		0						
1374	2		0						
1375	4	9	0						
1376	4	7	1						
1377	4	9	1						
1378	4		1						
1379	2	7	0						
1380	8		1						11
1381	5	4	0				3		9
1382	36	23	3						26
1383	9	45	0				1		9
1384	9		1				1		14
1385	9	21	2				1		27
1386	6	17	4				1		20
1387	3	15	1				2		17

Years	Leiden St. Pancras (fautores)[1]	Death duties to Count of Holland (bastards, clerics, foreigners, and those without heirs in N. Holland)[2]	Breda, obituaries of canons and chaplains at Grote Kerk[3]	Leiden St. Catharinagasthuis (graves dug)[4]	Leiden St. Catharinagasthuis (coffins purchased)[5]	Leiden St. Pieters (graves dug)[6]	Haarlem beguinage deaths[7]	Haarlem, St. Bavo church, "bells and graves"[8]	s-Hertogenbosch, Illustrious Brotherhood of Our Blessed Lady confraternity deaths[9]
1388	7	11	1						15
1389	5	9	0						
1390	7		0				2		20
1391	7	5	1				1		
1392	3	13	0	17			1		21
1393	11		1				3		33
1394	11	17	3	23					36
1395	4	17	0				1		53
1396	5	17	2	18			5		48
1397	4	16	2	23			3		58
1398	9	22	3	27		10	2		39
1399	21	21	0			24	7		18
1400	18	43	15			29	20		135
1401	2	20	2	16		5	8		22
1402	7		0	20		5	3		
1403	8	12	1	25		14	2		25
1404	9	20	0	23			8		34
1405	11	14	1	21			4		6
1406	9	14	4	23			4		29
1407	4	9	0			12	1		45
1408	12		4				2		72
1409	16	8	5			7	7		

Years	Leiden St. Pancras (fautores)[1]	Death duties to Count of Holland (bastards, clerics, foreigners, and those without heirs in N. Holland)[2]	Breda, obituaries of canons and chaplains at Grote Kerk[3]	Leiden St. Catharinagasthuis (graves dug)[4]	Leiden St. Catharinagasthuis (coffins purchased)[5]	Leiden St. Pieters (graves dug)[6]	Haarlem beguinage deaths[7]	Haarlem, St. Bavo church, "bells and graves"[8]	s-Hertogenbosch, Illustrious Brotherhood of Our Blessed Lady confraternity deaths[9]
1410	7	6	5				7		79
1411	38	12	8	70			13		51
1412	5	3	1	21		7	6	67	
1413	3	4	2	34		19	5		81
1414	2	3	6	29			7		65
1415	15	3	3	37			3		
1416	4		5	50			3		58
1417	4		5	46		17	5		
1418	10		5	30			3		
1419	13		4				7		47
1420	24		3	51			9		65
1421	6		3	24			11	195	52
1422	7		9		53		8	94	61
1423	7		5				7	62	79
1424	6		2				7		45
1425	13		5				5	109	60
1426	17		5			54	5	87	
1427	14		8		35	12	4		113
1428	9		18			14	2	54	11
1429	6		10				4		
1430	7		5				8		88
1431	4		3				1	56	87

Years	Leiden St. Pancras (fautores)[1]	Death duties to Count of Holland (bastards, clerics, foreigners, and those without heirs in N. Holland)[2]	Breda, obituaries of canons and chaplains at Grote Kerk[3]	Leiden St. Catharinagasthuis (graves dug)[4]	Leiden St. Catharinagasthuis (coffins purchased)[5]	Leiden St. Pieters (graves dug)[6]	Haarlem beguinage deaths[7]	Haarlem, St. Bavo church, "bells and graves"[8]	s-Hertogenbosch, Illustrious Brotherhood of Our Blessed Lady confraternity deaths[9]
1432	12		4	18			3	82	74
1433	13		5				6	58	69
1434	8		4	18				82	62
1435	7		11		18		13		66
1436	7		6		19		5	63	90
1437	4		3				3		100
1438	4		15				4	81	97
1439	30		12		55		29	315	210
1440	2		8		23		13	97	175
1441	4		2	10			2	100	49
1442	6		9				3	110	65
1443	6		6				4		115
1444	4		6				3	63	85
1445	3		7				5	97	150
1446	2		10				1		113
1447	4		3				2	80	120
1448	4		6	13			5		111
1449	7		3	25			12		154
1450	15		4	40			4		165
1451	10		16				4		141
1452	5		11	25			2		

Sources:

[1] Dick E.H. de Boer, *Graaf en grafiek: Sociale en economische ontwikkelingen in het middeleeuwse "Noordholland" tussen 1345 en 1415* (Leiden 1978) 80; Rudolph Ladan, *Gezondheidszorg in Leiden in de late middeleeuwen* (Hilversum 2012) 38.

[2] De Boer, *Graaf en grafiek*, 64.

[3] F.A. Gooskens, 'Pestepidemieën in Breda tijdens de middeleeuwen (1382–1535)', *Jaarboek De Oranjeboom* 39 (1986) 44.

[4] De Boer, *Graaf en grafiek*, 90; Ladan, *Gezondheidszorg in Leiden in de late middeleeuwen*, 38, 234–235; Christina Ligtenberg, *De armezorg te Leiden tot het einde van de 16e eeuw* (The Hague 1908), 42; Erfgoed Leiden en Omstreken, Rekening van de gasthuismeesters van het Sint Catharinagasthuis, 334, no. 30 [1420] fo. 7v; no. 31 [1420/1] fo. 27r; no. 33 [1421] fo. 29r.

[5] Ladan, *Gezondheidszorg in Leiden in de late middeleeuwen*, 234–235.

[6] Erfgoed Leiden en Omstreken, Archieven van de kerken van Leiden, 0502, Rekeningen van de kerkmeesters 1398–1404, 1407–1408, 1409–1410, 1412–1414, 1417–1418, 1426–1429, no. 323.

[7] Noord Hollands Archief, Haarlem, Kloosters te Haarlem, 2123, "Fundatieboek", no. 419, fos. 9–65v.

[8] Daniel R. Curtis, 'From one mortality regime to another? Mortality crises in late medieval Haarlem, Holland, in perspective', *Speculum* 96:1 (2021) 127–155.

[9] Brabants Historisch Informatie Centrum, Den Bosch, Illustre lieve vrouwe broederschap in 's-Hertogenbosch, (1291) 1318–2005, 1232, nos. 116–19.