

# The Black Death and recurring plague during the late Middle Ages in the County of Hainaut

**Joris Roosen**

## Colofon

The Black Death and recurring plague during the late Middle Ages in the County of Hainaut:  
Differential impact and diverging recovery

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# **The Black Death and recurring plague during the late Middle Ages in the County of Hainaut**

Differential impact and diverging recovery

## **De Zwarte Dood en terugkerende pestgolven tijdens de late middeleeuwen in het Graafschap Henegouwen**

Differentiële impact en uiteenlopend herstel  
(met een samenvatting in het Nederlands)

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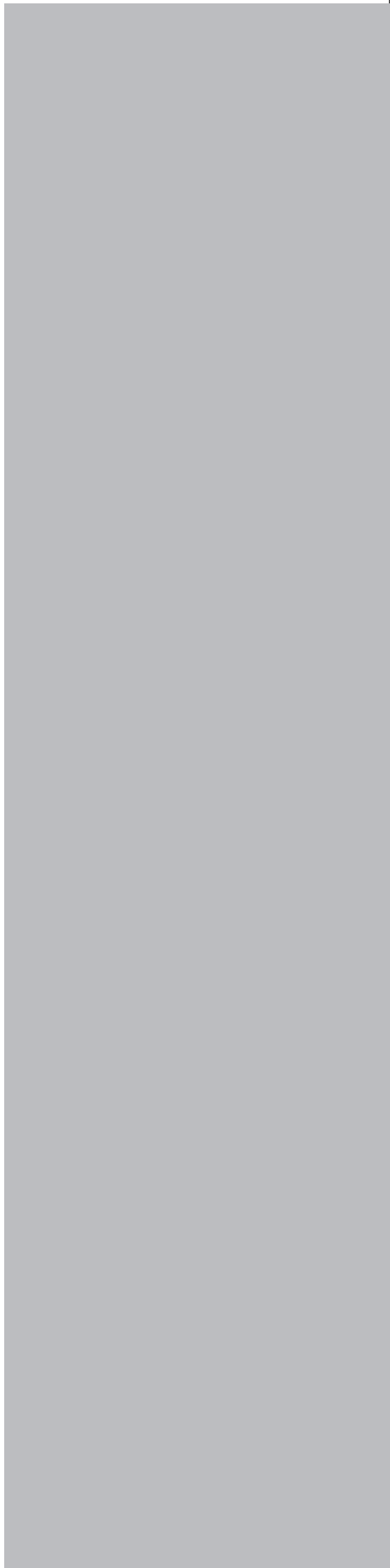
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# General introduction

*That's all history is, after all: scar tissue*

Stephen King, Mr. Mercedes

Few historical relationships have been as intimate, enduring or disruptive as that between humans and infectious disease.<sup>1</sup> Diseases have influenced the course of human history from the earliest times and severe epidemics in particular have been credited by historians for shaping long-term economic, cultural and demographic societal trajectories.<sup>2</sup> No single epidemic stands out more in this regard than the mid-fourteenth century Black Death.<sup>3</sup>

Caused by the bacterium *Yersinia pestis*, the pathogen commonly known as plague,<sup>4</sup> the Black Death is regarded as one of the greatest mortality crises ever to have struck humankind.<sup>5</sup> Seen by many as a pivotal moment in European history, it has grabbed the attention of generations of historians.<sup>6</sup> However, the Black Death itself was only the proverbial tip of the spear, the first outbreak of the ‘*Second Plague Pandemic*’ which established itself as a recurring presence for over five centuries across Eurasia and Africa. Only during the second half of the seventeenth century did plague start to retreat from Western Europe, while in Eastern Europe and Russia the disease remained until the late eighteenth century. Many final outbreaks occurred in port towns of the Middle East and the Mediterranean during the early nineteenth century.<sup>7</sup> It is the repeat occurrence of the disease over many centuries that allows historians to investigate the root causes of vulnerability and resilience of past societies confronted with plague, by reconstructing its long-term socio-economic and demographic outcomes.<sup>8</sup>

Although early scholarship described the whole of post-Black Death Europe as a place fraught with economic depression,<sup>9</sup> societal collapse and violence,<sup>10</sup> current literature no longer accepts any direct association of plague with long-term socio-economic decay and instead focuses more explicitly on regional and chronological divergences.<sup>11</sup> Within the context of the Great Divergence debate, for example, the impact of the Black Death could have either positive or negative long-term economic consequences.<sup>12</sup> For western Europe, the demographic shock is said to have prompted -amongst other things- a process of institutional ‘*creative destruction*’,<sup>13</sup> the decline of lordly power, efficiency gains in agriculture,<sup>14</sup> the rise of real wages and improvements in living standards,<sup>15</sup> all of which contributed to the rise of the European economy. While for the Middle East, which suffered a similar impact of the Black Death,<sup>16</sup> the mid-fourteenth century mortality

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1 Wolfe, Dunavan, & Diamond, ‘Origins’.

2 Diamond, *Guns, germs, and steel*; McNeill, *Plagues and peoples*. Noted in: Devos & Janssens, ‘Reconsidering the burden’.

3 All the chapters of this dissertation follow the convention of referring only to the first plague outbreak of the Second Pandemic (1346-1353) as the “Black Death”. The plague outbreaks from that point onwards will be referred to as recurring/recurrent plagues. This is in line with recent publications e.g. Alfani and Murphy, ‘Plague’, p. 315.

4 Garcia-Vallejo & van Kooyk, ‘A new cellular target’.

5 Benedictow, ‘The Black Death’.

6 Bowsky, *The Black Death*.

7 Dols, ‘The Second Plague Pandemic’, p.162; Shahraki, Carniel and Mostafavi, ‘Plague in Iran’.

8 Curtis, Soens and van Bavel, ‘History and the Social Sciences’.

9 Lopez & Miskimin, ‘The Economic Depression’.

10 Cohn, ‘The Black Death: End of a Paradigm’.

11 Cohn, ‘After the Black Death’, p. 457; Epstein, ‘Cities, regions’; Emigh, *The underdevelopment*; Cohn, ‘Pandemics’; Brenner, ‘Agrarian class’, p. 39; Brenner, ‘The agrarian roots’. For an early publication see: Robbins, ‘A Comparison’.

12 Broadberry, ‘Accounting’; Pamuk, ‘Black Death’; van Bavel and van Zanden, ‘Jump-start’; Voigtländer and Voth, ‘Three horsemen of riches’, pp. 774-811.

13 Epstein, *Freedoms and growth*.

14 Herlihy, *The Black Death*.

15 Clark, *A farewell to alms*, pp. 99-102. See also: Campbell, ‘Nature as historical protagonist’.

16 Ayalon, *Natural disasters*, p. 31.

crisis is said to have ushered in a period of long-term economic stagnation.<sup>17</sup> Similarly, in the context of the Little Divergence debate, plague mortality is claimed to have caused a rise in real wages and increases in human capital formation, both of which contributed to the rise of the North Sea Area during the early modern period.<sup>18</sup> In Eastern Europe, however, plague mortality led to the impoverishment of the peasantry by breathing life into the so-called ‘*second serfdom*’.<sup>19</sup> And for Southern Europe, repeat plague outbreaks of the seventeenth century have been blamed for long-term economic decline.<sup>20</sup> Some scholars have suggested that regions which suffered the highest mortality rates during the Black Death, also experienced the most favourable long-term economic developments.<sup>21</sup> However, according to Campbell, what mattered for defining the long-term positive or negative economic outcomes of the Black Death, was not the severity of the biological shock but the “*socio-ecological context within which the mortality crisis occurred*”.<sup>22</sup> This dissertation explores a similar premise for the long-term demographic consequences of late medieval plague in the Southern Low Countries, and more specifically the County of Hainaut.<sup>23</sup>

Despite a general lack of population data for the late medieval period,<sup>24</sup> it is commonly accepted in the literature that the Black Death and recurring plagues of the Second Pandemic did not have equitable demographic consequences across the whole of Europe. While some European regions experienced comparatively quick and full demographic recoveries, others underwent long term stagnation or even further decline.<sup>25</sup> A comparison can be made between England and Wales where the population did not recover to its pre-plague level until well into the eighteenth century, and the Iberian and Italian Peninsulas where this had already occurred during the sixteenth century. Some of the most expeditious trajectories of demographic recovery, however, were displayed by parts of the Low Countries where the population reached its pre-plague size during some stage of the fifteenth century.<sup>26</sup>

17 van Bavel, Buringh and Dijkman, ‘Mills, cranes and the great divergence’; Borsch, *The Black Death*.

18 The Little Divergence can be defined as the process by which the North Sea Area (the Low Countries and the United Kingdom) was able to develop into the most dynamic and affluent part of Europe, see: De Pleijt and van Zanden, J. L., ‘Accounting’.

19 Though debated: Domar, ‘The causes’.

20 Alfani, and Percoco, ‘Plague and long-term development’.

21 Voigtländer and Voth, ‘Three horsemen of riches’. An evocative question also posed in: Cohn, ‘After the Black Death’, p. 458.

22 Campbell, *The great transition*, p. 15.

23 Although chapters one through four invariably use the terminology ‘Southern Netherlands’, in hindsight this can cause some confusion over the actual geographical area that is central to this dissertation. As these chapters have already been published as separate articles, it was not possible to change the terminology.

24 A problem seen across Europe: Noymer, ‘Contesting the cause’, p. 622. For the Low Countries specifically: van Bavel, ‘People and land’, p. 18.

25 Malanima, *Pre-modern European economy*; Pamuk, ‘Black Death’, p. 293; Epstein, ‘Cities, regions’.

26 Malanima, ‘Economic consequences’; Broadberry, Campbell, Klein, Overton and van Leeuwen, *British economic growth*. Within the Low Countries, adjacent regions could experience sharply diverging population trends: van Bavel, *Manors and markets*, pp. 282-291; Thoen, *Landbouweconomie*, pp.155-164. For more information, see chapter five.

### Research question

Although historians agree that post-Black Death population trends diverged noticeably across Europe, the underlying causes are still debated.<sup>27</sup> Why is it that some societies proved highly vulnerable in the face of plague, while others were resilient, achieving relatively swift and sustained demographic recovery? And more specifically, how can we account for the quick recovery in parts of the Low Countries, while other regions of Europe saw their population levels struggle for many more centuries? The way in which post-plague demographic recovery in the Low Countries has been explained in a previous historiography, is by pointing to the combined effect of a mild late medieval plague regime and societal factors that stimulated population growth from an early stage.<sup>28</sup> However, the notion that plague only caused limited mortality in the Low Countries is based predominantly on historical insights that have advanced little since the 1980s.<sup>29</sup> Using the Southern Low Countries -and the County of Hainaut during the late Middle Ages in particular- as a case study, this dissertation seeks to challenge the notion that rapid demographic recovery was caused primarily by limited plague mortality in this region. Instead, I will argue that more emphasis should be put on endogenous societal factors that promoted population growth.

The main research question of my dissertation -as well as the notion of regional socio-economic divergence after historical calamities- is based on the outline of the research project that funded my doctorate. The full title of this research project is: *COORDINATINGforLIFE. Success and failure of Western European societies in coping with rural hazards and disasters, 1300-1800*.<sup>30</sup> In the original project summary from 2013, the following overarching question is posed, “Societies in past and present are regularly confronted with major hazards, which sometimes have disastrous effects. Some societies are successful in preventing these effects and buffering threats, or they recover quickly, while others prove highly vulnerable. Why is this?”<sup>31</sup>

### Malthusian theory and late medieval demography

Historians have traditionally interpreted late medieval population developments through the lens of a neo-Malthusian framework. Although the work of Postan has been especially influential in this regard,<sup>32</sup> a wide range of scholars working in the 1960s and 1970s have drawn parallels between Thomas Malthus’ eighteenth century writings and the events of the late medieval crisis.<sup>33</sup> The basic Malthusian model assumes that population numbers -when left unimpeded- grow exponentially, while agricultural productivity only achieves linear growth. If population growth is allowed to continue unchecked -so Malthus claimed- it would eventually reach a ‘Malthusian

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27 Bailey, ‘Demographic decline’, pp. 1-19; Epstein, ‘The late medieval crisis’; Allen, ‘The Great Divergence’, pp. 411-447; Chavas and Bromley, ‘Modelling population’; Emigh, *The underdevelopment*.

28 Pamuk, ‘Black Death’, p. 308. Claimed for Holland specifically in: van Bavel and van Zanden, ‘Jump-start’, p. 515; van Zanden, ‘Third road to capitalism?’, p. 90.

29 Recently, a number of important publications have indicated higher death rates during the Black Death in the County of Flanders, see: Vandeburie, ‘De Zwarte Dood’; Vermeersch, ‘De Zwarte Dood’.

30 COORDINATINGforLIFE, grantnumber 339647, finance program FP7-IDEAS-ERC.

31 Similarly, the topic of historical plague outbreaks and the temporal delineation to study the late medieval period, were also defined in the original project outline as a specific work package. The original title was, “*Window of opportunity or death-blow? Long-term responses of rural economy and society to plagues, 1348-1600*”.

32 Postan, ‘Medieval agrarian society’.

33 Abel, *Agrarkrisen und Agrarkonjunktur*; Postan, *The medieval economy*; le Roy Ladurie, ‘L’histoire immobile’.

ceiling', outgrowing the agricultural capacity to feed itself.<sup>34</sup> The subsequent result would spell unequivocal disaster, as so-called 'positive checks' such as famine, disease and warfare would forcefully push population numbers down to within the margins of the agricultural carrying capacity.<sup>35</sup>

When compared to the events of the late medieval crisis, the Malthusian model seems eerily accurate. The general historical narrative holds that after a long period of demographic stagnation, the European population had more than doubled between the tenth- and the late thirteenth century, putting considerable strain on the food supply.<sup>36</sup> By the early fourteenth century, overpopulation resulted in a full-blown Malthusian crisis,<sup>37</sup> as the Great Famine (1315-1322) swept across northern Europe wiping out almost ten per cent of the populace.<sup>38</sup> Although some authors, most notably Postan himself, saw this as the great watershed moment, it paled in comparison to the death rate and geographical spread of the Black Death which killed up to half the European population.<sup>39</sup> The Black Death has even been recast by some historians as the ultimate 'positive check', breaking a Malthusian deadlock that had gripped Europe's late medieval population.<sup>40</sup>

Even though historians in particular have been influenced by Malthusian reasoning in their analysis of the late medieval- and early modern period, the ghost of Malthus lives on to this day. The notion of a cyclical alternation between demographic growth and decline -dictated by a Malthusian trap- resonates with a wide non-academic audience. In fact, the neo-Malthusian model continues to frame current debates on the possible effects of overpopulation.<sup>41</sup>

Since the late 1970s, however, historians have argued that the neo-Malthusian model is not a viable explanation for late medieval population developments.<sup>42</sup> With regard to the role of the Black Death, two main points of contention have appeared in the literature. First, the postulated link between malnutrition and the occurrence of plague is no longer commonly accepted.<sup>43</sup> Plague it seems was not a disease of malnutrition, as past scholarship would have it, although increased migration during famine years could create favourable conditions for plague outbreaks as Guido Alfani recently pointed out.<sup>44</sup> Instead, most historians now consider the disease an exogenous shock to the population, one that was not the result of famine caused by Malthusian

34 Postan, *Essays on medieval agriculture*, esp. pp. 12–16 and 213; Voigtländer and Voth, 'Malthusian dynamism'.

35 Munro, J., 'Postan, population and prices'.

36 Russell, 'Late ancient and medieval population'; Nightingale, 'England and the European Depression'. Although some scholars argued that population growth was not the main cause of the crisis in the fourteenth century. See in particular: Hallam, 'The Postan thesis'.

37 Some scholars point out that population growth may have continued during the first half of the fourteenth century. See the publications by Bruce Campbell: Campbell, 'Population pressure'; Campbell, *English Seigneurial Agriculture*.

38 For a good overview see: Jordan, *The Great Famine*. For the Southern Low Countries: Geens, 'The Great Famine'.

39 Postan, 'Some economic evidence'; Postan and Hatcher, 'Population and class relations'.

40 Herlihy, *The Black Death*, pp. 31-38.

41 Nguyen and Lugo-Ocando, 'Malthusianism and news framing'. Even permeating popular media, see: Mastrodomenico, 'Thanos, the Malthusian Titan'.

42 For a general criticism see: Epstein, 'The late medieval crisis'; Morineau, 'Malthus: there and back'.

43 Livi-Bacci, 'The nutrition-mortality link'. More recently in Alfani and Ó Gráda, eds., *Famine*.

44 Alfani, *Calamities and the economy*, p. 45. Studies for the early modern period also indicate that there was no correlation between high grain prices and plague mortality in the Low Countries. See: Curtis and Dijkman, 'The escape from famine'.

pressures on resources.<sup>45</sup> Second, neo-Malthusian reasoning is hard to square with evidence of considerable variations in population trends across Europe.<sup>46</sup> Those who survived the murderous onslaught of plague generally enjoyed higher wages, rising living standards, improved diets and a relative abundance of land, factors that should have promoted demographic recovery.<sup>47</sup> Yet, while some regions experienced comparatively swift recovery, others saw their population stagnate or decline even further after the Black Death.<sup>48</sup> This demographic divergence manifested itself even between neighbouring regions and could persist for centuries down the line.<sup>49</sup> Relying on a neo-Malthusian framework, it remains inexplicable why demographic recovery took so long to materialize in certain parts of Europe. As a result, historians have had to venture beyond this traditional framework to explain regionally diverging population trends after the Black Death.

### Explaining diverging population trends

There is unresolved debate as to what the actual causes are for the diverging rates of demographic recovery seen across Europe in the wake of the Black Death. Two main variables have been identified in the literature and while some scholars put emphasis on exogenous mortality shocks as a prime mover,<sup>50</sup> others have pointed to the decisive role of endogenous societal factors -mostly those that influenced fertility and nuptiality trends- instead.<sup>51</sup>

#### *Exogenous explanation*

A first line of reasoning argues that plague mortality, seen as an exogenous biological shock, remained the bane of population recovery in Europe until well into the early modern period.<sup>52</sup> According to this explanation, population recovery occurred at different times across different European regions because the severity of the Black Death and repeat plague outbreaks exhibited significant regional variations.<sup>53</sup> The assumption is that less severe plague mortality equated to faster population recovery, while comparatively high mortality levels would result in long-term population decline or at least stagnation. The logic of this reasoning is perhaps best expressed by Emmanuel Le Roy Ladurie who -when describing diverging population trends in late medieval France- wrote, '*the less severe the fall, the less steep the climb back*'.<sup>54</sup>

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45 Herlihy, *The Black Death*, p. 38; Epstein, *Freedom and growth*, p. 54; Livi-Bacci, *A concise history*, p. 45. Also in: van Zanden, 'The skill premium', p. 136; Campbell, 'Population pressure', p. 127.

46 Epstein, 'The late medieval crisis'.

47 For wages see: Allen, 'The Great Divergence'; De Pleijt and van Zanden, J. L., 'Accounting', p. 389. For land-labour ratios see: Thirsk, *Alternative agriculture*, esp. pp. 7-9. See for improved diet: Montanari, *La faim et l'abondance*, pp. 104-109. For the Low Countries specifically: Thoen and Soens, 'Vegetarians'. For rising living standards in general see: Munro, 'Money matters', p. 9.

48 Brenner, 'The agrarian roots', p. 62.

49 van Bavel, 'People and land', p. 10; Campbell, 'Population pressure', p. 128; Epstein, 'Cities, regions', p. 9; Allen, 'The Great Divergence'. The comparison has also been made on a macro-level: Dols, 'The Second Plague Pandemic'.

50 Hatcher, *Plague, population*; Hatcher, 'Mortality'; Benedictow, 'New perspectives'.

51 Wrigley and Schofield, *The population history*; Nightingale, 'Some new evidence'.

52 A long-established view among historians, as noted in: Poos, 'Plague mortality', p. 229.

53 Pamuk, 'Black Death', p. 293; Hatcher, *Plague, population*; Hatcher, 'Mortality', p. 19; Harvey, *living and dying*, p. 145.

54 Le Roy Ladurie, *The French peasantry*, p. 98.

It has been claimed that long-term demographic stagnation in England was the result of severe mortality caused by repeat plague outbreaks.<sup>55</sup> While for the Low Countries, the supposed ‘light touch’ of the Black Death and a mild fourteenth century plague regime are seen by many historians as instrumental for the subsequent rapid population recovery.<sup>56</sup> Historical evidence on the demographic impact of the Black Death, lends some credence to this reasoning, as most historians agree that it could differ noticeably across Europe.<sup>57</sup> The same goes for recurring plague outbreaks which were often confined regionally or even locally and which could display varying levels of severity across regions.<sup>58</sup> There is, however, a counter-argument to be made for interpreting plague mortality as a wholly exogenous biological shock. As the disease established itself in Europe over the course of many centuries, societies took measures to guard themselves against infection.<sup>59</sup> Over time organized institutional responses for disease control -such as quarantine and hygienic measures- were implemented to mitigate the impact of plague.<sup>60</sup> However, it is difficult to estimate their effect on reducing mortality levels over the long-term.<sup>61</sup> Moreover, there are indications that these mitigatory measures were not a sustained success across the board. Many of the final outbreaks of plague in the seventeenth century displayed remarkably high death rates, despite the fact that most of the affected areas had countermeasures in place for over a century.<sup>62</sup> And, although the sudden disappearance of Second Pandemic plague in north-western Europe remains an unsolved puzzle,<sup>63</sup> existing literature points to the combined role of epidemiological and climatological factors alongside coordinated human efforts.<sup>64</sup>

#### *Endogenous explanation*

Where the first explanation emphasizes differential levels of plague mortality, a second line of reasoning instead focuses on endogenous societal factors that influenced the rate of population growth after the Black Death. As early as the 1960s, when the neo-Malthusian model was first brought into vogue, David Herlihy suggested that low fertility rather than severe mortality explained why the European population failed to recover for more than a century after the Black Death.<sup>65</sup> In his analysis of medieval Pistoia, he claimed that, “*the failure of the birth rate to respond to the stimulus of deaths, more even than deaths themselves, seems the root cause of the shocking*

55 Hatcher, *Plague, population*; Hatcher, ‘Mortality’, p. 19; Harvey, *Living and dying*, p. 145. A notion that was disputed early on; see: Bean, ‘Plague, population’.

56 Pounds, ‘Population’, p. 379; Pamuk, ‘Black Death’, p. 308. For a summary of this argument, see chapter three.

57 Benedictow, *The Black Death, 1346-1353*.

58 Blockmans, ‘Social and economic effects’, p. 850; Alfani, ‘Plague in seventeenth-century Europe’.

59 Livi-Bacci, *A concise history*, p. 46.

60 Schiavo, May Leung & Brown, ‘Communicating risk’; Tognotti, ‘Lessons’.

61 Slack, ‘Responses to plague’, p. 450. Although some historians have pointed to the decisive role of human action, in reality the centuries-long persistence and abrupt disappearance of Second Pandemic plague in Europe remain poorly understood. Bos et al., ‘Eighteenth century *Yersinia pestis* genomes’.

62 Curtis, ‘Was plague an exclusively urban phenomenon?’; Alfani, ‘Plague in seventeenth-century Europe’; Cummins, Kelly & Ó Gráda, ‘Living standards and plague’.

63 Drancourt and Raoult, ‘Molecular insights’, pp. 105-109.

64 A point raised in: Alfani and Ó Gráda, ‘Famine and Disease’, p. 139.

65 Herlihy, *medieval and renaissance Pistoia*, p. 117. R.L. Poos has been especially influential in drawing attention to what he called “*the fertility side of the demographic equation*”. Poos, *A rural society*, pp. 113-120; see also: Dyer, *Lords and peasants*, p. 233.

*population plunge of the fourteenth century*”.<sup>66</sup> It has been argued by some authors that the Black Death contributed crucially to the rise of fertility restrictions in Europe.<sup>67</sup> Here we can once again juxtapose the examples of England and the Low Countries. A much cited explanation for the long-term demographic stagnation in England, is that labour shortages after the Black Death resulted in higher remuneration and more labour opportunities, in particular for women.<sup>68</sup> As a higher share of young women was drawn to the labour market, the average age at first marriage rose leading to a decline in birth rates.<sup>69</sup> It should be noted that, although an important factor, higher female labour participation is only one potential explanation for depressed fertility rates. In the literature, a whole range of socio-economic and institutional factors have been identified that could influence fertility -including, inheritance practices, celibacy and birth control- all of which were endogenous to society itself.<sup>70</sup>

Moreover, even though as a concept ‘fertility’ appears in the literature most prominently, pre-modern societies had various endogenous tools at their disposal to influence rates of demographic recovery, this included nuptiality, migration, employment opportunities, property structures and welfare systems.<sup>71</sup> In regions characterized by an unequal distribution of property, a predominance of monogeniture and/or an absence of welfare systems, population recovery after mortality crises often tended to be slow, and demographic stagnation could last until long after the initial crisis had subsided. However, depending on the regional setup of these endogenous factors, the opposite could also be true. For example, in parts of the Low Countries endogenous factors -which ensured that broad population groups had direct access to land and resources through region-specific inheritance systems, property structures and employment opportunities- are said to have promoted population growth after the late medieval crisis.<sup>72</sup>

#### *Combining exogenous and endogenous explanations*

Neither of the two explanations discussed above, exogenous or endogenous, necessarily excludes or negates the other. The most likely scenario is that both should be taken into account, albeit to varying degrees, to explain diverging regional population trends after the Black Death.<sup>73</sup> The graph below provides an abstract overview of the possible constellations in which exogenous and endogenous regional factors could define post-plague demographic recovery rates. It visualizes the range of different theoretical explanations for diverging trends of population recovery that have appeared most prominently in historical demographic literature. The specific arrangement

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66 Herlihy, *medieval and renaissance Pistoia*, p. 117.

67 Voigtländer and Voth, ‘How the West’.

68 De Moor and van Zanden, ‘Girl power’, p. 11.

69 Bailey, ‘Introduction’, p. xx.

70 For labour force see: Herlihy, *medieval and renaissance Pistoia*, p. 117. On delayed marriage, inheritance practices and birth control see: Wrigley and Schofield, *The population history of England*. For female labour involvement see: Goldberg, *Women, work and life*. For counterarguments see: M. Bailey, ‘Demographic decline’, p. 9. On the topic of birth control outside England see: Herlihy and Klapisch-Zuber, *Tuscans and their families*, pp. 439-446.

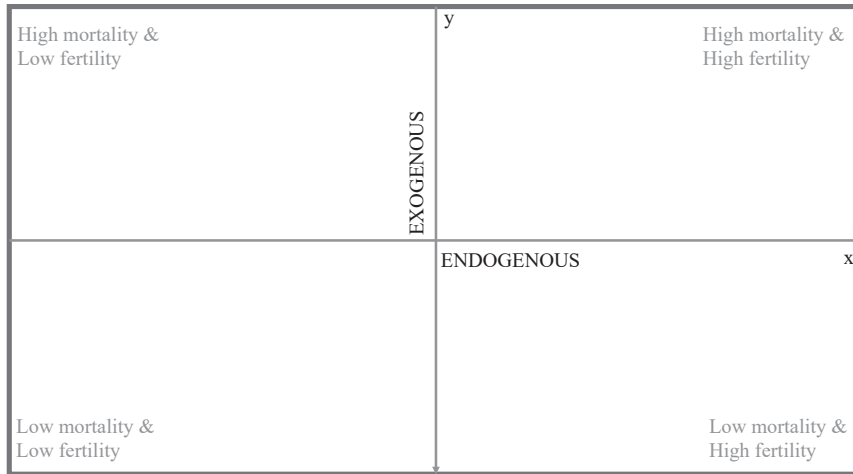
71 See chapter five for more information on these factors.

72 Curtis, ‘The impact of land accumulation’; van Bavel, ‘People and land’.

73 Pointed out for England specifically in: Horrox, *The Black Death*, p. 12; Poos, *A rural society*, pp. 111-130. Summarized in: Bailey, ‘Introduction’, p. xx.



of these factors within a region could be ranged anywhere between the four extremes represented in the graph, which should be seen as archetypical regional models.



The exogenous-endogenous continuum for explaining diverging demographic recovery rates

The position on either axis is not representative of an absolute value (i.e. total number of deaths or births), instead it indicates the relative importance attributed to a specific variable (for a given region) in the existing literature. The relative importance of (plague) mortality is represented on the y-axis, the higher a region is placed on this axis, the more weight is allocated in the literature to high mortality levels to explain demographic stagnation or further decline after the Black Death.<sup>74</sup> Conversely, the lower a region is placed on the y-axis, the lower the late medieval mortality is assumed to have been in a given region. Similarly, on the x-axis, the relative weight of endogenous factors that influenced population trends are represented. The further a region is placed left on this axis, the less successful endogenous factors were -according to historical research- at promoting population growth (in extreme cases even counteracting it), the further it is placed to the right the more successful they were. As indicated above, societies had more tools for repopulation at their disposal than just those that influenced fertility trends, however being the most prominent factor discussed in the literature, fertility serves in this graph as a *'pars pro toto'* for endogenous factors in a broader sense.

While regions that range somewhere on the scale of *'high mortality/high fertility'* and *'low mortality/low fertility'* can be expected to show only moderate levels of repopulation, regions that suffered from the combined effect of *'high mortality/low fertility'* would suffer long-term population stagnation or decline. The most expeditious demographic growth trajectories would theoretically be displayed by regions that combined *'low mortality/high fertility'*. The explanations for the diverging demographic trajectories after the Black Death in England and the Low Countries stand at the most pronounced opposite sides of the spectrum represented

<sup>74</sup> For examples of this literature see chapter five.

in the graph above. Long-term demographic stagnation in England has been explained as the result of a high-mortality regime -due to the impact of repeat plague outbreaks- during the late medieval period, followed by a low-fertility regime during the early modern period.<sup>75</sup> The swift demographic recovery in parts of the Low Countries, on the other hand, has been explained by the combined effect of a mild exogenous plague shock and endogenous societal factors that stimulated population growth at an early stage after the impact of the Black Death.<sup>76</sup>

### Gaps in current research

Testing the exact relationship between exogenous and endogenous factors, to understand how they influenced post-plague demographic recovery, requires long-run data on both mortality trends and population developments for the regions under investigation.<sup>77</sup> For the early modern period these types of data can be found in local parish registers that have been kept from the late sixteenth- and early seventeenth century onwards. While the demographic impact of plague can be reconstructed through the use of burial records,<sup>78</sup> fertility and nuptiality trends can be analysed by using baptismal and marriage records.<sup>79</sup> Where early modernists can rely on relatively abundant sources -to study the mechanisms behind diverging demographic trajectories in the wake of plague outbreaks- the same cannot be said for medievalists.<sup>80</sup> In fact, for most European regions there is an absolute scarcity of late medieval sources that would allow historians to evaluate the overall demographic developments after the Black Death in a conclusive manner.<sup>81</sup> Medieval population studies, by their very nature, are a data-starved endeavour and any quantitative study of this period necessitates numerous assumptions that rely heavily on intra- and extrapolation of scant source material. Every study on late medieval demography has to tackle a scarcity of suitable sources, the use of indirect data, the absence of serial documents and the imperfect nature of contemporary administrations.<sup>82</sup> Adding to this problem is the suspicious absence of sources during specific plague years seen across Europe.<sup>83</sup> Elisabeth Carpentier, for instance, noticed that the documentary sources for Orvieto did not mention the Black Death, nor do they contain any trace of societal, economic or political disruption even though the epidemic was undoubtedly present.<sup>84</sup>

Although direct demographic indicators are often missing, endogenous factors that influenced repopulation -such as fertility and nuptiality- have been explored quite thoroughly

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75 Bailey, 'Introduction', p. xxi.

76 Pounds, 'Population'; van Bavel, *Manors and markets*, pp. 279-280. The absence of plague or its less virulent strikes has also been identified to explain economic development: Jansen, 'Holland's advance'; van Bavel and van Zanden, 'Jump-start', pp. 506-515. These authors claim that the best proof of the remarkable performance of Holland in comparison with other areas can be derived from its demographic record.

77 Noted for the specific relationship between mortality and fertility in late medieval England in: Poos, *A rural society*, p. 111.

78 A prominent example for the Low Countries is: Curtis, 'Was plague an exclusively urban phenomenon?'

79 Alfani, 'Plague in seventeenth-century Europe'.

80 Bailey, 'Introduction', p. xxi.

81 Klapisch-Zuber, 'Plague'. For the Low Countries specifically see: van Bavel, 'People and land', p. 18.

82 Noymer, 'Contesting the cause', p. 622.

83 For more information on this, see chapter three.

84 Carpentier, *Une ville devant la peste*.

in the literature.<sup>85</sup> A prominent example is the debate whether the so-called European Marriage Pattern - characterized by late age at first marriage and a high degree of celibacy among women of reproductive age- was indeed adopted at an accelerated pace in the century following the Black Death.<sup>86</sup> Quantifiable indicators for long-term plague mortality in the late Middle Ages, however, are less readily available. Claiming that demographic recovery was depressed over the long-term, because a certain region suffered more frequent or more severe exogenous plague shocks than neighbouring regions, is therefore difficult to prove empirically. We simply lack sufficient amounts of epidemiological data to allow for comparison over large areas or long periods of time. Especially for the century and a half following the Black Death our (quantitative) knowledge of recurring plague outbreaks is surprisingly limited.<sup>87</sup> As a result, the exact relationship between plague mortality and endogenous processes of demographic recovery -and the exact way this defined diverging population trends- has often been assumed rather than empirically tested for the late Middle Ages.<sup>88</sup>

The Low Countries provide an ideal illustration of the tenuous relationship between commonly accepted explanations for post-plague population recovery and the limited empirical evidence on which they are sometimes based. From the previous section, it is clear that the speedy post-plague demographic recovery displayed by parts of the Low Countries has been associated, in part, with experiencing comparatively mild plague mortality.<sup>89</sup> Very early literature on the subject even went so far as to argue that the Black Death had left large parts of the Low Countries entirely untouched.<sup>90</sup> The lack of direct sources, rather than direct evidence of the absence of plague, led Hans Van Werveke to argue that the county of Flanders had been left largely untouched by the Black Death.<sup>91</sup> Similarly, other early works suggested that the lesser-urbanized frontier society of Holland, further north, also escaped the effects of the plague.<sup>92</sup> However, the early assertions that plague was entirely absent in the fourteenth-century Low Countries are no longer credible. Subsequent regional works over the years were able to show that in particular the Black Death had a greater presence than previously assumed, perhaps no less than in other parts of Europe.<sup>93</sup> Even though the notion that the Low Countries were untouched by the Black Death has been disproven, the majority of the international literature still downplays the severity of the shock,

85 A prominent example being the scholars of the so-called 'Cambridge School': Wrigley & Schofield, *The Population History*; Nightingale, 'Some New Evidence'.

86 De Moor and van Zanden, 'Girl power', p. 2.

87 Alfani and Murphy, 'Plague and lethal epidemics', p. 318.

88 Poos, *A rural society*, p. 111.

89 A notion present in both older and more recent publication: Pounds, 'Population', p. 379; van Bavel, *Manors and markets*, p. 279-80; van Bavel and van Zanden, 'Jump-start', p. 515. The connection between a moderate plague shock and favourable economic and demographic growth also asserted in: van Zanden, 'A third road to capitalism?', p. 90.

90 For more information on this, see chapter three.

91 van Werveke, 'De Zwarte Dood'. He based this assumption on the fact that there was an absence of direct references to the epidemic, the relative stability in revenue from direct taxation (the assize in Ghent) and the rise in absolute numbers of the militia members in Ghent in 1346 and 1357.

92 Jansen, 'Holland's advance'.

93 For the South: Maréchal, 'De Zwarte Dood'; Blockmans, 'Social and economic effects'; Blockmans, Pieters, Prevenier, and van Schaik, 'Tussen crisis en welvaart'. More recently: Vandeburie, 'De Zwarte Dood'; Vermeersch, 'De Zwarte Dood'. For the North: de Boer, *Graaf en grafiek*; Noordeggraaf and Valk, *De Gave Gods*; Ladan, *Gezondheidszorg*, ch. 2; Hoppenbrouwers, *Een middeleeuwse samenleving*, pp. 58-60.

especially in a broader comparative perspective with other parts of Europe.<sup>94</sup> The same has been claimed for the effect of recurring plagues which were deemed less severe than in other densely populated and highly urbanized regions of Europe such as, for instance, Northern Italy.<sup>95</sup> Yet, even though the moderate fall in population after the Black Death is seen as very influential for the demographic developments that followed, it remains unexplained.<sup>96</sup> Despite there being no dearth of hypotheses, a conclusive explanation for the supposedly mild plague-regime in the Low Countries has hitherto not been advanced. In fact, limited plague mortality poses an epidemiological conundrum, especially for the Southern Low Countries which was a densely populated and highly urbanized region, involved in intensive commercial trading during the late Middle Ages. Conditions that, according to most epidemiological literature, should have turned this region into a 'Goldilocks zone' for the occurrence of epidemic disease.<sup>97</sup>

### Contributions

The chapters in this dissertation were written as independent papers. As such, they contain some repetition, especially with regard to their introductions, the analysis of existing literature and the discussion of archival documents that have been used. As there is some overlap in a number of the research questions posed in the chapters, I have endeavoured to order them thematically in this dissertation. The content page provides an indication of this thematic order of chapters. Chapters one, two, three and four have been published in peer reviewed academic journals, while chapter five has not yet been submitted to a journal at the time this dissertation was completed.<sup>98</sup>

### Data critique

In light of the discrepancies in the existing narrative for swift post-plague demographic recovery in the Low Countries, the first two chapters of this dissertation evaluate the available data that points to a mild impact of the Black Death, as well as the way in which historical datasets on plague outbreaks have been used in the literature. While the first chapter does so within the narrower confines of the Southern Low Countries, the second chapters explores the issue of noncritical use of historical plague data in a wider European and interdisciplinary setting.

The first chapter titled, '*Severity and selectivity of the Black Death and recurring plague in the Southern Netherlands (1349-1450)*', focuses on a number of general assumptions regarding the severity and selectivity of late medieval plague in the Southern Low Countries. Although the Black Death is regarded by many historians as a formative event in European history, some of its most basic characteristics remain ill-understood, in part due to the paucity of available archival sources already discussed above. And yet, despite the lack of direct demographic indicators, several assumptions about the Black Death have gained a foothold in the international literature. Key among them - at least regarding the subject of this dissertation - is the notion that the Black Death caused only mild mortality in the Low Countries. Chapter one focuses on one specific

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94 Malanima, 'Economic consequences', p. 314; Christakos et al., *Interdisciplinary public health reasoning*, p. 320.

95 Epstein, 'The late medieval crisis'.

96 Noted in: van Zanden, 'Third road to capitalism?', p. 99.

97 Blockmans, 'Social and economic effects', p. 834.

98 The lay-out and footnote system of all chapters have been standardized for the purpose of this manuscript. Online supplemental materials to published articles have been included in this dissertation as appendices.

dataset -constructed by Christakos and co-authors- of Black Death mortality rates in the Southern Low Countries.<sup>99</sup> By cross-referencing mortality estimates for specific localities with the archival sources and the secondary literature from which they were gleaned, it becomes evident that some references have been taken out of context and imbued with a numerical value (a death rate percentage) never intended by the authors of the consulted literature. Using this type of dataset to compare plague mortality both across time and across regions is therefore unsatisfactory. If historians have any hope of distinguishing between the respective roles of endogenous and exogenous factors in defining post-plague demographic recovery, high resolution data on both variables is required. Guestimates of plague mortality do not suffice if it means allocating greater importance to endogenous factors -that are better documented in existing literature- simply because death rates are largely obscured. Without reliable data on plague severity any regional comparison of demographic recovery remains largely a theoretical exercise. Before historians can understand (and empirically test) the diverging directions of socio-economic and demographic developments seen across European regions after the Black Death, they must understand the changing epidemiological characteristics of plague over time.<sup>100</sup> In order to shed more light on the severity (and selectivity) of the Black Death and recurring plague outbreaks in the Southern Low Countries, chapter one introduces the central database used throughout the various chapters of this dissertation. The '*mortmain database*' was constructed using on the mortmain accounts which are available for the County of Hainaut from 1349 onwards.<sup>101</sup> It constitutes the central empirical contribution of this dissertation and is used in chapters three and four to provide detailed studies on the severity and selectivity of the Black Death and recurring plague in the County of Hainaut. In chapter five this database is used to provide information on plague mortality to allow a regional comparison of demographic trends after the Black Death in Hainaut taking into account endogenous and exogenous factors.

The second chapter titled, '*Dangers of noncritical use of historical plague data*', is similar to the first chapter, in that it reviews how historical data on plague outbreaks has been gathered and used in previous literature. Where chapter one deals primarily with data on plague mortality, chapter two focuses instead on the most frequently used dataset of Second Pandemic plague occurrences. Over forty years ago, in the mid-1970s, French scholar Jean-Noël Biraben undertook the arduous task of compiling references of documented plague outbreaks across most of Europe, for the period starting from the Black Death up until the nineteenth century.<sup>102</sup> Although this dataset has primarily been used by historians, this changed when in 2012 Biraben's dataset was digitized as part of a short correspondence piece in a leading epidemiology journal.<sup>103</sup> Unfortunately, this publication reflected little on the limitations of the four decade old dataset. Before long, a wide assortment of scholars (mostly non-historians) started employing the Biraben dataset to conduct intricate spatio-temporal analyses in which plague outbreaks were correlated with a variety of factors, ranging from vicinity to navigable rivers to climatic fluctuations. In line with the 2012

99 Christakos et al., *Interdisciplinary public health*, p. 320.

100 Alfani and Murphy, 'Plague and lethal epidemics', p. 314.

101 Archives Départementales du Nord, Lille (hereafter ADN), Lille B, 12122-12273; Algemeen Rijksarchief Brussel (hereafter ARB), I, 004, 17867-73. For a description of the access database, see the appendix to the introduction.

102 Biraben, *Les hommes et la peste*, I; idem, *Les hommes et la peste*, II.

103 Büntgen, Ginzler, Esper, Tegel, and McMichael, 'Digitizing historical plague'.

article that introduced the dataset to a large audience of non-historians, these publications did not apply any form of sources criticism. This sets a dangerous precedent in the noncritical use of historical plague data. Chapter two addresses this issue, not only by pointing out gaps in the Biraben dataset, but also by offering a number of solutions for scholars wanting to either continue using this dataset or those interested in constructing new datasets of historical plague incidences. The Low Countries, once again, provide an ideal test case to illustrate some of the gaps in spatial and temporal coverage present in the Biraben dataset as hardly any plague outbreaks appear in the data for much of this area over a period of nearly four centuries. Using a dataset of plague mentions constructed from secondary literature and primary sources for the Low Countries, the inconsistencies in the Biraben dataset become apparent. Moreover, it illustrates the need to construct new datasets to move beyond merely copying the empirical work done by previous generations of historians.

#### *Epidemiological characteristics of plague*

Chapters three and four use the mortmain database and the dataset of plague mentions discussed in the first two chapters to unearth several epidemiological characteristics of late medieval plague outbreaks in the Southern Low Countries, and more specifically in the medieval County of Hainaut. While chapter three discussed the prevailing notion of a light medieval plague regime in the Low Countries, and offers counterevidence, chapter four provides a closer look at gender selective mortality effects during late medieval plague outbreaks. Taken together, these two chapters provide an important insight into the exogenous side of the demographic equation.

Chapter three is titled, *'The 'light touch' of the Black Death in the Southern Netherlands: an urban trick?'*, it reconsiders the persistent view that the Southern Low Countries were visited less severely by late medieval plague than other regions in Europe. As discussed in previous sections, the notion of a mild mortality regime is central to existing explanations for the apparently rapid and full demographic recovery in parts of the Low Countries in the wake of the Black Death. However, after analysis of both the mortmain database and the plague mentions dataset for the period 1349-1450, it appears that the Black Death and recurring plague was likely no less severe in the Southern Low Countries than in other parts of western Europe. Moreover, it seems that plague was able to spread over large areas within the Low Countries, including the countryside. Based on these findings, this chapter hypothesizes that the swift demographic recovery in parts of the Low Countries after the Black Death -in comparison to other European regions- was most likely a function of endogenous processes of recovery rather than the chance 'good fortune' of experiencing weaker exogenous plague shocks. This hypothesis will be put to the test in the final chapter of this dissertation. Aside from a realignment of views on the plague regime of the late-medieval Low Countries, this chapter also demonstrates some broader significance connected to current trends on plague research. As a consequence of the advances in laboratory treatment of plague DNA, together with wider trends towards digitization and the 'big data' phenomenon, more and more medieval historical research (often explicitly on the subject of plague) is being performed not by historians themselves, but by bio-archaeologists, economists, and others from

the scientific community.<sup>104</sup> Yet the desire of these scientists to quantify crucial characteristics of late medieval and early modern plague outbreaks -such as death toll, spread and occurrence- has in some cases led to the misuse of historical data and sources. For this reason, it remains crucial to construct new datasets based on archival research and the meticulous scouring of all existing literature -be it local or international- to continue to build more reliable datasets that can be used by a wide variety of disciplines interested in the history of plague.

Chapter four is titled, *'The sex-selective impact of the Black Death and recurring plagues in the Southern Netherlands, 1349-1450'*. Taking its lead from publications in the field of bioarchaeology, it discusses the issue of the Black Death's potential sex selectivity. Although recent publications in bioarchaeology have established that the Black Death was selective regarding pre-plague health status and age, evidence for potential sex selectivity remains inconclusive. Much of this is due to limited sample sizes. In the field of bioarcheology it is difficult to find sufficient numbers of skeletons from a single excavation site to make strong claims. Historians, for their part, must deal with documentary sources in which women are generally underrepresented. This chapter employs the mortmain database which uniquely allows for sex-disaggregation, as mortmain accounts recorded the deaths of men and women in equal measure. Analysing 25,610 deaths recorded in the county of Hainaut for the period 1349-1450, this chapters concludes that women died in greater number than men during plague years compared to 'normal years'. This effect was seen, not only during the Black Death itself, but for nearly every major plague outbreak in the following century. Late medieval plague outbreaks in this part of the Southern Low Countries were therefore undoubtedly sex-selective. The findings of this chapter also contradict the notion that the Black Death was a 'universal killer',<sup>105</sup> striking indiscriminately with no regard for age, sex, health or socio-economic status.

#### *Differential impact, diverging recovery*

The fifth and final chapter is titled, *'The Black Death: window of opportunity or disaster? Demographic growth, stagnation and decline in the County of Hainaut (1349-1541)'*, it analyses the effects of endogenous societal factors and exogenous plague shocks on diverging regional population trends in the wake of the Black Death. As stated earlier, this type of analysis requires long-run data on both population developments and mortality trends for the regions under investigation. To this end, the County of Hainaut was selected as a case study. On the one hand because the mortmain database (already discussed above) provides mortality data from a single, nearly continuous source for most of this county from the Black Death onwards. On the other hand, because population figures for the entire county are available at regular intervals starting just after the mid-fourteenth century, in 1365. Moreover, data on these two key demographic variables are available on the level of both individual localities and entire administrative districts, removing the need for intra- or extrapolation based on limited data. By focusing on the County of Hainaut, for which the archives offer relatively abundant information, it is thus possible to account for several crucial variables to decipher some of the causal mechanism behind regionally

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104 On this trend see Curtis et al., 'History and the social sciences'.

105 Naphy and Spicer, *Plague*.

diverging population trends. The available data allows for an in-depth analysis of why certain regions in Hainaut failed to show signs of quick demographic recovery in the wake of the Black Death, while at the same time other regions saw their population soar. This is done by testing the hypothesis formulated in the conclusion of chapter three, stating that rapid demographic recovery in parts of the Low Countries was the result of, “*endogenous processes of recovery itself, rather than the chance ‘good fortune’ of experiencing weaker exogenous biological shocks*”.<sup>106</sup> The final chapter concludes that diverging regional population trends after the Black Death in the county of Hainaut were primarily the result of endogenous societal factors and not differentials in exogenous mortality trends in the long-run. Important factors for endogenous growth processes -in late medieval Hainaut- seem to have been region-specific property structures, employment opportunities and inheritance systems.

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<sup>106</sup> See chapter three.







# 1

## Severity and selectivity of the Black Death and recurring plague in the Southern Netherlands (1349-1450)<sup>107</sup>

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<sup>107</sup> Published as: Roosen, J., 'Severity and Selectivity of the Black Death and Recurring Plague in the Southern Netherlands (1349-1450)', *Low Countries Journal of Social and Economic History*, **14** (2018), pp. 25-55. Footnotes and lay-out have been standardized.

## Abstract

The Black Death is the textbook villain when it comes to the study of historical diseases and to the general public it remains a thought-provoking subject. To illustrate, in 2017 over three million viewers accessed the English Wikipedia's Black Death page, compared to present-day Ebola which only had less than one million. Despite the wide drawing power of the Black Death, some of its most basic characteristics are still debated in academic circles. The focus of this paper will be on the severity of the Black Death and recurring plague outbreaks in the Southern Netherlands. More specifically it will reflect on the general assumption that plague evolved from a 'universal killer' to a more selective and less severe disease over time. Due to the scarcity of late medieval sources and a lack of quantifiable indicators, little is known about the causal mechanisms at work during the late Middle Ages. This paper offers a newly compiled database of 25,610 individuals that died between 1349-1450 in the County of Hainaut to test a number of assumptions on the selectivity and severity of late medieval plague outbreaks.

## Introduction

Plague is considered the most deadly infectious disease in history. Caused by the bacterium *Yersinia pestis*, it sparked off three widespread pandemics: the Justinian plague of 541-767, the second pandemic which started with the Black Death in 1347,<sup>108</sup> and the third pandemic which occurred during the middle of the nineteenth century. Although less severe than the two previous pandemics, with mortality mostly affecting India, it spread plague to ports across the globe.<sup>109</sup> Despite being perceived as a historical disease, plague is still present in wild animal reservoirs around the world and human plague-casualties are frequently reported.<sup>110</sup> In recent years, the increasing number of plague resurgences has led the World Health Organization to categorize the disease as a re-emerging global health threat.<sup>111</sup> Scholars have voiced concerns that future climate change may increase plague activity,<sup>112</sup> and some even consider it a potential bioterrorism agent.<sup>113</sup> In order to understand the causal mechanisms behind the spread, occurrence and severity of the disease, research is increasingly oriented towards historical plague in the hope that a long-term analysis will provide insights not attained by studies of contemporary (isolated) outbreaks.<sup>114</sup>

At the same time there is growing consensus that, in order to assess the socio-economic and demographic implications of diseases over time, debates on the nature of epidemics and the changing characteristics of pathogens also need to be taken into consideration.<sup>115</sup> Even though we cannot assume pre-industrial epidemiological experiences mirrored the modern one,<sup>116</sup> especially given the disparities between the second and the third plague pandemics,<sup>117</sup> a greater understanding of the biggest killer-disease ever to afflict mankind is fundamental to predict the dynamics of future large-scale epidemics.

Most research on late medieval plague has primarily focused on the initial outbreak of the disease, constituting a kind of myopia in which interest in the Black Death seems almost perennial while late medieval echo-epidemics have received far less attention.<sup>118</sup> Due to the scarcity of sources we know little about the characteristics of recurring plague outbreaks in the century following the Black Death.<sup>119</sup> As a result, a number of assumptions have gained foothold in the international literature without a solid empirical foundation. To highlight this problem, this article will reflect on the state of current knowledge regarding the severity of the Black Death and the role of selective mortality in later plague outbreaks to explain their reduced mortality

108 Black Death refers to the plague outbreak in 1347-1353, see: Green, 'Editor's introduction', pp. 9-26.

109 Echenberg, *Plague ports*, p. 350.

110 Stenseth et al., 'Plague', pp. 9-13.

111 World Health Organization et al., *Vector-borne diseases*.

112 Stenseth et al., 'Plague dynamics', pp. 13110-5.

113 Ingelsby et al., 'Plague as biological weapon', pp. 2281-90.

114 Büntgen et al., 'Digitizing historical plague', pp. 1586-1588; Schmid et al., 'Climate-driven introduction of the Black Death', pp. 3020-25; Bos et al., 'Eighteenth century *Yersinia pestis* genomes'; Lewnard and Townsend, 'Climatic and evolutionary drivers', pp. 14601-8.

115 Alfani and Murphy, 'Plague and lethal epidemics', pp. 314-43.

116 On this topic see: Curtis and Roosen, 'The sex-selective impact of the Black Death'.

117 Disparities with regard to seasonality, contagiousness, severity, pervasiveness, longevity and intermediate hosts. See: Green, 'Editor's introduction', pp. 9-26.

118 Getz, 'Black Death and the silver lining', pp. 265-89; Blockmans, 'The social and economic effects', pp. 833-63.

119 Alfani and Murphy, 'Plague and lethal epidemics', p. 318.

rates (section 2).<sup>120</sup> As indicated, one of the biggest hurdles is the scarcity and disparate nature of available sources on epidemiological characteristics. In order to understand the impact this has had on our understanding of late medieval plague epidemics, this article introduces data from a single continuous source, the Hainaut mortmain accounts (section 3). Using a database of 25,610 individuals that died in the County of Hainaut between 1349-1450 this article will analyze severity (in the context of acquired immunity), geographic selectivity and gender selectivity during the Black Death and recurring plague waves. The results of this analysis will be contrasted with certain beliefs in current literature (section 4). To conclude, I will discuss the need to question assumptions in the absence of hard data when studying historical plague outbreaks (section 5).

### **Black Death mortality**

The Black Death caused demographic carnage of unprecedented magnitude, to which scholars have allocated a prime role in: regulating the equilibrium between population and resources,<sup>121</sup> determining the path of economic development,<sup>122</sup> the creation of institutions,<sup>123</sup> and both the little- and the great divergence.<sup>124</sup> Ascertaining the overall mortality rate has therefore attracted a fair amount of scholarly attention. Although absolute mortality from the ‘Spanish’ influenza pandemic of 1918-1919 was higher,<sup>125</sup> expressed as a percentage of the population, the Black Death was the biggest killer disease ever to have struck Europe, spreading to the Middle East and Northern Africa as well. Whilst earlier studies – relying on limited data – estimated overall mortality at 20 per cent to 35 per cent, current estimates have been pushed up to around half the European population. In fact, ongoing research is continuing to revise estimates upwards, a trend also seen in studies on early modern plague.<sup>126</sup> The highest mortality estimate for the Black Death is 60 per cent and was advanced by Ole Benedictow in his seminal book, *The Black Death: The Complete History*.<sup>127</sup> Even though it may become the new standard estimate, there are some issues with how it was calculated. First, for the purpose of his argument, Benedictow tended to avoid data that contradicted his story of exceptionally high mortality.<sup>128</sup> Moreover, in calculating an estimate for the whole of Europe, he noted a remarkable similarity of mortality levels in different regions.<sup>129</sup> However, it is well established that the Black Death did not hit all regions with the same severity.<sup>130</sup> Finally, Benedictow’s claim that the data is sufficiently widespread and numerous to allow for a Europe-wide estimate, needs to be nuanced.<sup>131</sup> In truth there is an absolute scarcity of documentary evidence to furnish quantifiable indicators for mortality during the late Middle Ages, making it impossible to specify the exact numerical impact of the Black

120 On reduced plague mortality see: Campbell, *The Great Transition*, pp. 307-8.

121 Klapisch-Zuber, ‘Plague and family life’, pp. 124-54.

122 Acemoglu, Robinson, and Johnson, ‘Disease and development’, pp. 397-405.

123 Epstein, *Freedom and growth*, p. 223.

124 Pamuk, ‘The Black Death’, pp. 289-317.

125 Johnson and Mueller, ‘Updating the accounts’, pp. 105-15.

126 Alfani and Murphy, ‘Plague and lethal epidemics’. For seventeenth century studies see: Alfani, ‘Plague in seventeenth century Europe’; Rommes, ‘Plague in Northwestern Europe’, pp. 47-71.

127 Benedictow, *The Black Death, 1346-1353*, pp. 380-4.

128 Noted in: Noymer, ‘Contesting the cause’, pp. 616-27.

129 Benedictow, *The Black Death, 1346-1353*, p. 433.

130 Mengel, ‘A plague on Bohemia?’, pp. 3-34.

131 Benedictow, ‘The Black Death’, pp. 42-9.

Death in a satisfactory manner. Even if sources are available, estimates remain inexact due to a lack of detailed accounts of deaths occurring during the time of plague.<sup>132</sup> Instead, mortality rates are usually calculated on the basis of anecdotes, chronicles and random samples of general economic data.<sup>133</sup>

Despite the challenges posed by historical sources, plague research has witnessed some remarkable breakthroughs in the past two decades, most importantly with the identification of *Yersinia pestis* as the causal agent of the Black Death.<sup>134</sup> In recent years, aDNA testing and genome sequencing has allowed micro-biologists and bio-archaeologists to study plague on a geographical scale that often dwarfs localized studies of the past.<sup>135</sup> The allure of this wide geographic scope has enticed scholars in the social sciences (often non-historians) to perform studies on a pan-European scale as well. They usually do so not by relying on evidence gathered in the field or in the laboratory, but by using pre-existing historical datasets. When employing this data, some scholars tend to loosen the rigorous standards of evidence and interpretation demanded in the field of history, undermining the reliability of their results.<sup>136</sup> At the core of this problem is the assumption that Black Death mortality estimates are hard data suitable for complex analysis. In what follows, I will illustrate that certain datasets provide a poor starting point for comparing the severity of the Black Death with that of later plague outbreaks. This problem is compounded by the fact that there is currently no systematic overview of mortality rates caused by many of the echo-epidemics. In fact, even datasets tracking plague occurrences geographically over time have proven to be problematic.<sup>137</sup> It is assumed the Black Death acted as a 'universal killer' causing it to be more severe than subsequent plague outbreaks because (among others): it hit an immunologically naïve population, was less selective in who it killed and was more territorially pervasive.<sup>138</sup> Recurring plague outbreaks, on the other hand, are said to have been more selective. However, our understanding of how these epidemiological characteristics evolved and how they influenced severity is limited.<sup>139</sup> The Hainaut mortmain database provides an excellent opportunity to unveil some of the characteristics behind the severity and selectivity of late medieval plague. Before turning to these issues let us turn to the starting point, the mortality estimates for the Black Death in the Southern Netherlands.

One of the most widely used datasets of Black Death mortality rates, building on pre-existing research, was compiled in the book, *Interdisciplinary public health reasoning and epidemic modelling: The case of the Black Death*.<sup>140</sup> Based on their data, George Christakos and co-authors argued that 'unlike Northern Italy, (Black Death) mortality in Belgium was the lowest among

132 Klapisch-Zuber, 'Plague and family life', p. 131.

133 Fallow and Evans, 'The mystery of plague', pp. 254-84.

134 Little, 'Plague historians', pp. 267-90; Green, 'Taking "pandemic" seriously', pp. 27-62.

135 Spyrou et al., 'Historical *Y. pestis* genomes', pp. 874-81. On the broader trend see: Curtis, van Bavel, and Soens, 'History and the Social Sciences', pp. 751-74.

136 Critiqued in: Jones and Nevell, 'Plagued by doubt', pp. 235-40.

137 For a commentary on these datasets see: Roosen and Curtis, 'Dangers of noncritical use', pp. 103-10.

138 Some historians claim recurring plague tended to diminish in severity although the exact mechanisms are uncertain: Russel, *British medieval population*; Fourquin, *Les campagnes de la région parisienne*; Pamuk, 'The Black Death', 289-331. A notion echoed in other sciences as well: Boire et al., 'Lessons learned'.

139 Alfani and Murphy, 'Plague and lethal epidemics', p. 318.

140 Christakos et al., *Interdisciplinary public health*, p. 320.

present-day countries, with about 20 per cent mortality at most'.<sup>141</sup> I will test the reliability of the data on which this claim is based as a way to reflect on the need to adhere to strict standards of interpretation when using historical sources.

First, let us examine the possibility of comparing on a 'country- by-country' level to substantiate the claim that Belgium witnessed the lowest mortality rate of all present-day countries. To calculate the mortality estimate for an entire country, the authors were forced to extrapolate results from localized studies. This methodology has to contend with the fact that mortality rates could differ noticeably from one locality to the next.<sup>142</sup> For example, work with manorial sources for England and fiscal sources for France and Italy has revealed local population losses ranging from 30 per cent to 70 per cent.<sup>143</sup> For countries with a relative abundance of sources, such as England and France, the cross-referencing of multiple local estimates might yield some degree of reliability when extrapolated to a 'country-level' total. However, for countries such as the Czech Republic and Poland, which have far fewer sources, no meaningful estimates can be extrapolated. An overview of the number of locations providing information per country, as used by Christakos et al. is presented in table 1. The second column of the table indicates the number of locations for which the information on Black Death mortality was deemed unreliable and therefore were 'not used'. Unfortunately, the authors do not provide an overview of which locations were excluded, it is thus not possible to check the sources, their reliability or the underlying selection process.

Next, let us consider the claim that Black Death mortality in Belgium was 20 per cent at most. Since this figure was attained by calculating the average for eight separate estimates, the question becomes 'how reliable is each individual estimate'? Table 2 represents the data used by Christakos et al., indicating the location, the start- and end date of the Black Death, the estimated mortality and the corresponding source.

For the cities of Bruges,<sup>144</sup> Brussels, Ghent and Ypres the mortality estimates were based on information from Robert Gottfried's contested book, *The Black Death: Natural and human disaster in Medieval Europe*, which stated that '(in) Ghent, Bruges, Ypres, Brussels, and Antwerp [...] plague mortality was "only" about 20% to 25%, not much more than it had been during the great famines of the 1310s'.<sup>145</sup> These percentages were not calculated by Gottfried himself, instead they were taken from publications by Van Werveke and Blockmans.<sup>146</sup> The comparison with mortality during the Great Famine is problematic as Van Werveke stated that data was only

141 *ibid.*, p. 222. This claim is not unique to this volume and has been expressed by many scholars, including Low Countries experts Blockmans et al., 'Tussen crisis en welvaart', pp. 42-86.

142 Blockmans, 'The social and economic effects', p. 837.

143 For an overview, see the England, Italy and France sections in: Benedictow, *The Black Death, 1346-1353*, pp. 91-95, 96-109, 123-145.

144 For a more recent overview of mortality rates for these cities see for Bruges: Vandeburie, 'De Zwarte Dood te Brugge', pp. 269-308. For Ghent and Ypres: Vermeersch, *De Zwarte Dood in Vlaanderen en Europa*.

145 Gottfried, *The Black Death*, 203. Gottfried was accused of plagiarism in the following review article: Jenks, 'The Black Death', pp. 815-23.

146 van Werveke, 'De Zwarte Dood', p. 28; *idem*, 'La famine', pp. 5-14; Blockmans, 'The social and economic effects'. Van Werveke was the first scholar to deny the presence of the Black Death in large parts of the Low Countries. See: van Werveke, 'Nogmaals de Zwarte Dood', pp. 251-8.



available for Bruges and Ypres. Moreover, neither Van Werveke, nor Blockmans give explicit reference to a mortality rate for any of these cities (Brussels is never even mentioned!), and Blockmans specifically noted that ‘we can bring little precision in the mortality figures’.<sup>147</sup> It is therefore surprising that the mortality rates proposed by Blockmans for Maubeuge and Ath, 24 per cent and 16 per cent respectively, are so exact. These figures were calculated on the basis of the Hainaut mortmain account and refer to an average death rate per month. However, Blockmans exclusively used data from the first extant account which only covers the period from 24 June 1349 to 11 April 1350, while Black Death mortality was present until the end of 1351 in the County of Hainaut. Moreover, the mortmain documents for the Black Death period show several issues causing it to underreport mortality (see following section). For the city of Antwerp, the reference is to a book by Naphy and Spicer in which they argued that, ‘many historians comment on the “mild” plague that struck Antwerp [...] (which) “only” killed one out of every four or five persons’.<sup>148</sup> This claim is highly contentious as there is no reference to literature or archival sources to substantiate it.

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**Table 1.** Number of locations for which information was available.<sup>149</sup>

Country	used	not used	total
Austria	7	1	8
Belgium	8	5	13
Croatia	3	0	3
Czech Republic	1	1	2
Denmark	4	2	6
France	92	27	119
Germany	35	8	43
Gibraltar	1	0	1
Ireland	13	7	20
Italy	43	6	49
Norway	15	1	16
Poland	2	2	4
Portugal	6	8	14
Spain	50	24	74
Sweden	10	1	11
Switzerland	18	2	20
The Netherlands	4	1	5
United Kingdom	47	76	123
<b>Total</b>	<b>359</b>	<b>172</b>	<b>531</b>

147 Blockmans, ‘The social and economic effects’, p. 861.

148 Naphy and Spicer, *The Black Death*, pp. 31-2.

149 Christakos et al., *Interdisciplinary public health*, p. 179.

**Table 2:** Black Death mortality estimates for Belgium<sup>150</sup>

Place	start	end	mortality
Antwerp	n.a.	n.a.	20-25% Naphy and Spicer 2000:38-39
Ath	Summer of 1349 Benedictow 2004:113	n.a.	16% Blockmans 1980:837
Brabant	n.a.	n.a.	Low Despy 1977:209
Bruges	May, 1349 Blockmans 1980:838	December, 1349 Nicholas 1992:266	20-25% Gottfried 1983:57
Brussels	n.a.	n.a.	20-25% Gottfried 1983:57
Flanders	n.a.	n.a.	16-25% Nicholas 1992:266
Ghent	July, 1349 Kowalewsky 1911:261	n.a.	20-25% Gottfried 1983:57
Liège	n.a.	n.a.	Escaped the disease Scott and Duncan 2001:87
Louvain	n.a.	n.a.	Spared Kelly 2001:17
Maubeuge	n.a.	n.a.	24% Blockmans 1980:837
Mons	July, 1349 Biraben 1975:77	n.a.	n.a.
Tournai	July, 1349 Biraben 1975:77	n.a.	n.a.
Ypres	July, 1349 Biraben 1975:77	n.a.	20-25% Gottfried 1983:57

The final area for which the mortality rate was quantified is the County of Flanders for which a mortality rate of 16 to 25 per cent was based on the following quote by David Nicholas, ‘Flanders may have lost one-quarter to one-sixth of its population during the plague of 1349, which is less severe than most other areas’.<sup>151</sup> Nicholas referenced the work by Adriaan Verhulst, who in turn used publications by Sivéry, Blockmans and Van Werveke to attain these estimates.<sup>152</sup> As such, it is merely a summary of the estimates already presented for individual localities.

For the remaining cities of Louvain and Liège the mortality estimates were not quantified, instead Christakos et al. indicated ‘no impact’ by relying on an *argumentum ex silentio*, assuming that an absence of sources mentioning plague equaled an absence of plague activity. For Liège, a book by Scott and Duncan was used, referencing the claim that ‘places such as Milan, Liège and Nuremberg, escaped the disease’, again without reference to literature or archival sources.<sup>153</sup> For Louvain, a book by Maria Kelly was referenced in which we find the unsubstantiated claim that, ‘plague spared some crowded urban centers like Milan, Ghent and Louvain’.<sup>154</sup> All these claims are unconvincing, as Ole Benedictow has persuasively argued that absence of evidence should not be interpreted as evidence of absence, especially when dealing with scanty late medieval

150 Christakos et al., *Interdisciplinary public health*, pp. 242-3.

151 Nicholas, *Medieval Flanders*, pp. 265-6.

152 Verhulst, *Précis d’histoire rurale*, p. 224; Sivéry, ‘Le Hainaut et la Peste noir’, pp. 431-47; Blockmans, ‘The social and economic effects’.

153 Scott and Duncan, *Biology of plagues*, pp. 87-8.

154 Kelly, *A History of the Black Death*, p. 248.

sources.<sup>155</sup> Finally, for the region of Brabant, where the impact was deemed low, an article by Despy was referenced in which the impact of the Black Death is described as mild.<sup>156</sup> This claim is based on a narrative source from the second half of the fifteenth century,<sup>157</sup> however, Despy also mentioned an earlier chronicle from the late fourteenth century which does indicate severe mortality during the Black Death.<sup>158</sup> Although it is beyond the scope of this article, it would be interesting to see how estimates for other countries (in the dataset) hold up to scrutiny. If the case study for Belgium is anything to go by, the basic data on the impact of the Black Death compiled by Christakos et al., is flawed to say the least.<sup>159</sup> However, this has done little to deter scholars from employing the data at face value for complex regression- and spatiotemporal analyses.<sup>160</sup> What this section has shown is that mortality estimates for the Black Death used in recent literature do not provide an adequate basis for comparing severity, both across regions and across time. This makes any general claim on the diminished severity of recurring plague outbreaks difficult to demonstrate empirically.

### The mortmain database

In order to shed new light on the selectivity and severity of the Black Death and recurring plague outbreaks, I present findings from a database of 25,610 individuals found in the mortmain accounts of the County of Hainaut during the period 1349-1450.<sup>161</sup> The term 'mortmain' is reminiscent of the legal term found in regions with English, French and Anglo-Norman juridical authorities, referring to the alienation of land to the dead hand of the church.<sup>162</sup> However, the Hainaut mortmain accounts are more comparable to English heriot taxes since both were paid as a death duty in the form of the best movable possession of the deceased. The main difference is that heriots were levied on tenants payable to a manorial lord, while mortmain was levied on a broad range of people that came from an ancestral lineage of servitude.

155 Benedictow, *The Black Death and later plague epidemics*, pp. 27, 47-9, 398-9.

156 Despy, 'La Grande Peste Noire', pp. 195-217.

157 Gielemans, *Anecdota ex codicibus*.

158 De Rivo, *Historia episcoporum Leodiensium*.

159 Much of the problem has to do with a lack of a standardized methodology to calculate mortality rates, which in turn is due to the disparate nature and scarcity of available sources.

160 For example see: Christakos, Olea, and Yu, 'Recent results', pp. 700-20; Olea and Christakos, 'Duration of urban mortality', pp. 291-303; Gaudart et al., 'Demography and diffusion', pp. 277-305; Welford and Bossak, 'Revisiting the Medieval Black Death', pp. 561-75.

161 Archives Départementales du Nord (hereafter ADN), Lille, pp. 12122-226; National Archives of Belgium, Brussels (hereafter ARB), i, pp. 17867-73.

162 Kittell, 'Death and taxes', pp. 187-211.

**Map 1.** Map of the county of Hainaut in mid-fifteenth century with indication of district-level boundaries

Source: Produced by the author, based on M.A. Arnould, *Les dénombrements de foyers dans le comté de Hainaut (XIVe-XVIe siècle)*, Publications de la Commission Royale d'Histoire, Brussels.

By the fourteenth century only a small minority of the population in Hainaut were still serfs and mortmain no longer functioned as an exclusive sign of servile status.<sup>163</sup> As early as June 1349 (first extant document) the accounts offered a separate rubric that read 'received from serfs, bastards and foreigners', highlighting their separate status from the 'wider' population paying mortmain (see illustration 1).<sup>164</sup> While heriots targeted a specific socio-economic subset of society, mostly (male) tenant heads of households, the reach of the mortmain was wider including all men and women who had reached age of majority (and sporadically emancipated children).<sup>165</sup> The main criteria was that an individual came from an ancestral line of servility, for which the mortmain accounts recognized three distinct lineage groups.<sup>166</sup> These groups were (a) people whose ancestry came from a lineage of serfdom in the broad sense, (b) the so-called 'sainteurs' who initially stood under the patronage of an ecclesiastical institution, and (c) people who originally stood under the patronage of a lay lord, the so-called 'gens d'avouerie'.<sup>167</sup>

163 Verriest, *Le servage*, p. 736.

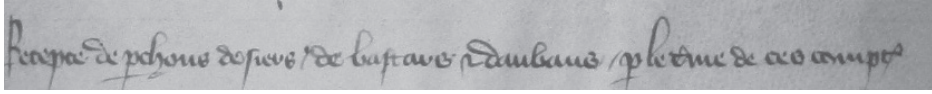
164 ADN, Lille, p. 12122.

165 Previous scholars working on the Hainaut mortmain record assumed it was only for heads of household: Benedictow, *The Black Death, 1346-1353*; Sivéry, 'Le Hainaut et la Peste noire'; Blockmans, 'The social and economic effects', p. 837.

166 Verriest, *Le servage*, pp. 170, 266-72.

167 Boeren, *Etude sur les tributaires d'église*.

**Illustration 1.** Image of separate rubric heading for serfs, foreigners and bastards (source: ADN 12122, fo. 10ro).



The number of people subjected to mortmain payment in Hainaut was substantial. An estimated 10 to 16 per cent of total mortality was recorded in the rural localities that appeared in the mortmain accounts during the first half of the fifteenth century (see appendix). Considering the coverage of probate inventories for Ghent between 1349-1400 has been estimated at 10 per cent, and factoring in the wider geographical reach, the mortmain accounts offer a significant insight in mortality in Hainaut.<sup>168</sup>

More important than the numerical coverage, however, is the fact that mortmain was levied on a wide range of socio-economic groups. Only three groups were specifically exempt from payment due to their socio-economic status, these were: (a) 'les gens d'origine franche' (form of noble status transferred through maternal lineage), (b) 'les seigneurs haut-justiciers', and (c) religious professionals.<sup>169</sup> Despite the exclusion of certain groups with high social status, not all high-ranked individuals were omitted from the accounts, and titles such as 'sire' and 'mayeur de [x]' are found in the documents. The accounts also extended to the poorest in society, labelling them as 'pauvre' or 'mendiant'. The mortmain accounts also recorded a significant proportion of women (43.7 per cent of the entire database). When removing a number of localities that had specific stipulations excluding women, a sex ratio of mortality of 1.07:1 can be derived from the data, indicating slightly more men.<sup>170</sup>

Overall, it would seem that the mortmain accounts are one of the most complete and continuous sources on late-medieval mortality. However, their reliability as a proxy for mortality crisis has been criticized, most notably by Ellen Kittell who examined these documents for the County of Flanders.<sup>171</sup> There are some general source limitations such as delayed or incomplete registration in times of crisis. Yet due to their serial nature, the principal advantage of mortmain accounts is that deaths can be compared in known crisis years with 'normal' years.<sup>172</sup> However, Kittell has pointed out that the count of Flanders was increasingly able to subject more people to mortmain payment in the course of the late fourteenth century, exploiting a population weakened by persistent plagues and upsurges in conflict. It was only after 1380 that people were recorded in a standardized way, the rubric of the document itself began to change, and explicit reference to the precise item seized occurred. This was not the case for Hainaut, both structure and terminology of the documents remained unchanged from the first extant document of 1349 all the way up to 1500. Moreover, there do not seem to be any structural increases in the amount of people recorded not linked to mortality crises identified in the literature. The issue instead was that the number of districts (and therefore localities) included in the account showed fluctuations over time (see

168 Wynant, *Regesten*, p. 530.

169 Verriest, *Le servage*, pp. 312-317.

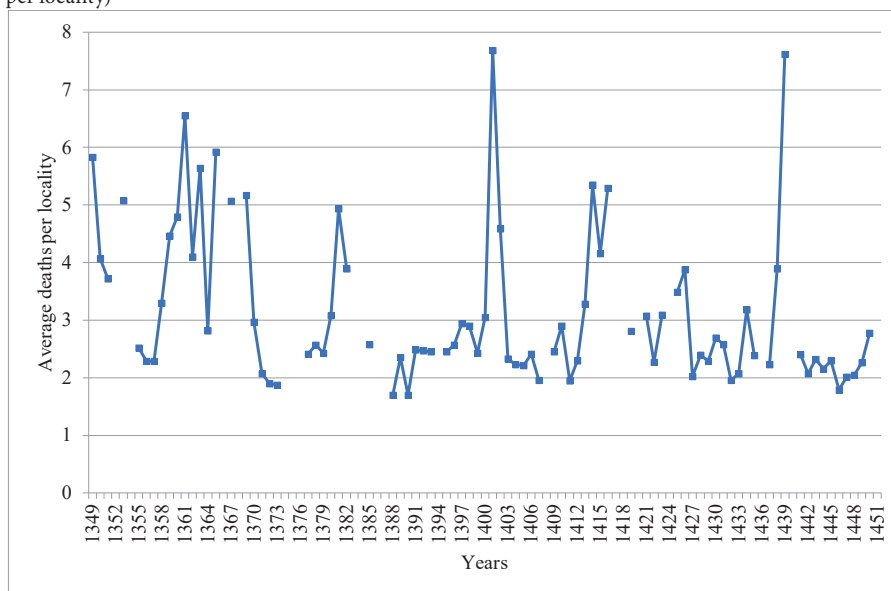
170 Curtis and Roosen, 'The sex-selective impact of the Black Death'.

171 Kittell, 'Death and taxes'.

172 Thoen and Devos, 'Pest in de Zuidelijke Nederlanden', pp. 20-43.

appendix). In order to assess the mortality spikes in the data, it is therefore preferable to show the average mortality per locality instead of absolute mortality, as shown in figure 1 below. Apart from the Black Death, for which raised mortality can be seen in the period 1349-51, figure 1 shows recurring plague outbreaks in the County of Hainaut during the years 1358-1363, 1368-1369, 1380-1382, 1400-1401, 1413-1416, 1425-1426 and 1438-1439.<sup>173</sup>

**Figure 1.** Annual mortality based on individuals owing mortmain, Hainaut, 1349- 1450 (average deaths per locality)



Source: ADN, B 12122-12226; ARB, I, 004, 17867-73.

Unfortunately, the mortmain accounts only show a minimum impression of Black Death mortality for several reasons. (a) The first extant account, starting in June 1349, is in poor physical condition, approximately 20 per cent of the content is missing (see illustration 2), (b) this first document only covers a period of ten months, while most other accounts span twelve months, (c) the accounts during the Black Death period contain second recordings of additional deaths for certain localities, something not seen in any of the other accounts up to 1450 and probably indicative of disruption in local administration which was (d) in all likelihood caught off guard by sudden hyper-mortality.<sup>174</sup> Despite these issues, the mortality peak during the Black Death is clearly visible for the County of Hainaut in figure 1.

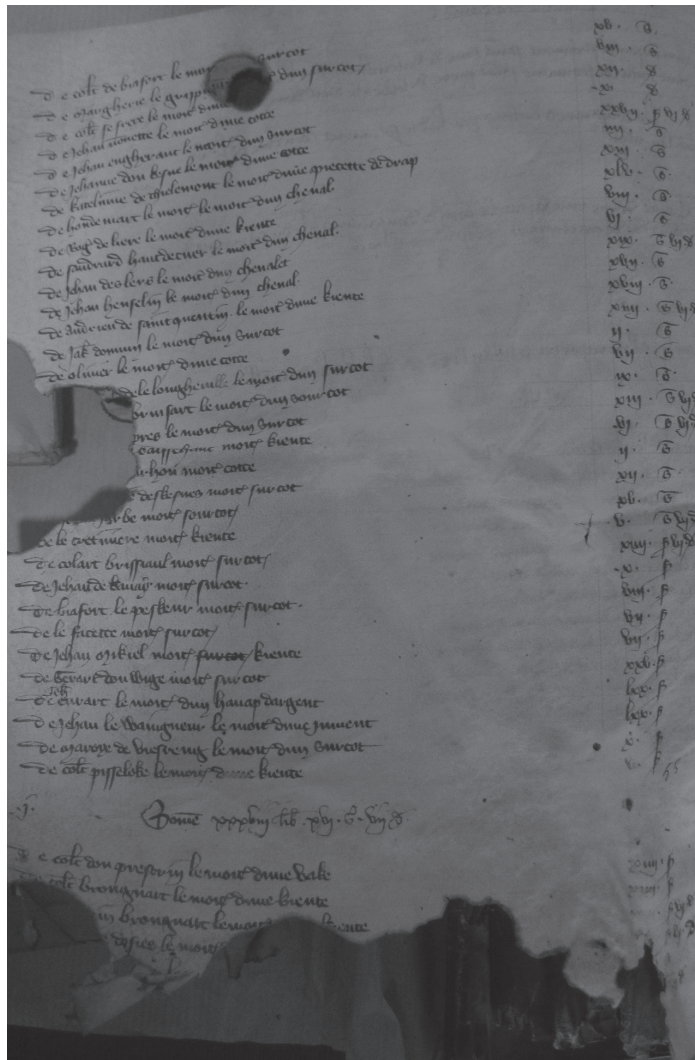
The use of mortmain accounts is not a novel approach to the study of demographic history in the Southern Netherlands. The documents were first used to analyze the impact of recurring

<sup>173</sup> Curtis and Roosen, 'The sex-selective impact of the Black Death'.

<sup>174</sup> First extant document, ADN 12122 began in June 1349 when Black Death mortality took off.

plague outbreaks in a MA thesis written by Wilfried Vangassen in 1952.<sup>175</sup> In 1965 French historian Gérard Sivéry used the mortmain accounts to prove that the Black Death had a more severe impact on the County of Hainaut than previously assumed.<sup>176</sup> The following year, Sivéry used the documents to analyze the severity of the plague outbreak of 1400-1401 in Hainaut, showing significant mortality.<sup>177</sup>

**Illustration 2.** Image of document damage in first extant document (source: ADN 12122, fo. 7vo).



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175 Vangassen, *De pestepidemieën na 1350*.

176 Sivéry, 'Le Hainaut et la Peste noire'.

177 Sivéry, 'La Peste Noire et l'épidémie de 1400-1401'.

Most notably, however, was Wim Blockmans' use of the accounts in his authoritative article on the social and economic effects of late medieval plague in the Low Countries.<sup>178</sup> In this article, Blockmans refuted the claims made by Van Werveke that the Black Death had not reached the central areas of the Low Countries.<sup>179</sup> A notion which, until that time, had been accepted in the international literature.<sup>180</sup> Instead of a miraculous escape from plague, Blockmans introduced the notion that the Black Death had been comparatively mild in the Low Countries, antithetical to its status as a densely populated, commercialized and highly urbanized region.

However, there are several issues with the use of the mortmain accounts in previous scholarship that need to be addressed here. The article by Blockmans seems to rely mostly on the dataset compiled by Vangassen in 1952 which poses several problems. Key among them are the errors that occurred either due to the recording of double entries or the failure to record more than one person in a line. More surprising is the fact that neither Sivéry nor Blockmans incorporated the account of 1350-1351 in their research.<sup>181</sup> A rather sizeable gap in the data considering the Black Death was not a one-year event. Similarly, the article by Sivéry which focused on the 1400-1401 plague outbreak did not incorporate the account from September 1400 to September 1401.<sup>182</sup> Moreover, previous research never analyzed the mortmain accounts as a continuous serial source and ignored its value for analyzing urban and rural plague dynamics, or gender-related mortality effects.

### Selective mortality effects

Based on the data compiled from the mortmain accounts, it is possible to analyze several factors that have been used in the literature to explain the diminished severity of recurring plague waves. A first factor thought to have caused lower severity in recurring plague outbreaks is the notion that humans could build up immunity to plague over time.<sup>183</sup> The assumption is that, because the Black Death affected a 'virgin soil' population, it caused higher mortality than subsequent plague outbreaks.<sup>184</sup> However, the prevalent idea that populations could permanently acquire immunity to plague (or other pathogens) if part of that population survived a previous epidemic has been deemed misleading.<sup>185</sup> The assumption that the Black Death was more severe than plague outbreaks in the following hundred years is constrained by the fact that there is an absolute scarcity of quantitative evidence for much of this period.<sup>186</sup> Based on the Hainaut database it is difficult to provide a conclusive answer because the documents offer only a minimum estimate for Black Death mortality. However, there are indications of higher severity of certain recurring plague outbreaks, despite prolonged contact of local population with the pathogen. For example,

178 Blockmans, 'The social and economic effects'.

179 van Werveke, *De Zwarte Dood*; idem, 'Nogmaals: de Zwarte Dood'.

180 For instance: Biraben, *Les hommes et la peste*; McNeill, *Plagues and peoples*.

181 ARB, p. 17867.

182 Sivéry, 'La Peste Noire et l'épidémie de 1400-1400'; ARB, p. 17870.

183 Ell, 'Immunity as a factor', pp. 866-79; Cohn, 'Epidemiology of the Black Death', pp. 74-100; Carmichael, 'Universal and particular', pp. 17-52.

184 Livi-Bacci, *A concise history*, p. 251.

185 Green, 'Editor's introduction', p. 19. For a full overview of issues of immunity to plague see: Fabian and Lawrenz, 'Heterogeneous immunological landscapes', pp. 229-57.

186 Alfani and Murphy, 'Plague and lethal epidemics'.



judging by the results from figure 1, the outbreak of 1400-1401 seems to be much more severe than the outbreaks of 1368-1369 and 1380-1382.<sup>187</sup>

A second factor used to explain diminished severity is linked to the notion that the population was so immunologically naïve that the Black Death killed indiscriminately.<sup>188</sup> This has been compared to research on recurring plague outbreaks which suggests a higher selectivity with regard to age and pre-plague health status. On the topic of age, bio-archaeological evidence suggests that the Black Death was selective towards adults with mortality risk increasing with age.<sup>189</sup> For subsequent plague outbreaks, however, this selectivity seems to have gone the opposite direction by affecting children to a disproportionate degree.<sup>190</sup> In the case of England or Florence, the second plague outbreak of the early 1360s is often labelled the 'plague of children'. However, according to Ann Carmichael, this may simply be due to a large baby-boom generation which dominated the population at risk a decade after the Black Death.<sup>191</sup>

Concerning pre-plague health status, research has suggested a connection between the Great Bovine pestilence, which resulted in the loss of normal dairy consumption for people born in this period, and the severity of the Black Death.<sup>192</sup> Bio-archaeological research has indicated that stress seen in late thirteenth- and early fourteenth century Northwestern Europe may have created favorable conditions for a severe plague epidemic.<sup>193</sup> However, historical research on pre-industrial famines has not found a clear causal connection between famines and plague.<sup>194</sup> Whatever the possible selective effects of recurring plague might have been with regard to age and health, there is research that suggests that the Black Death also had a selective impact despite causing mortality on a truly massive scale.<sup>195</sup> Unfortunately, the Hainaut database offers no direct information on health status or age. However, the database does provide sex-disaggregated data for those who died so the potential difference in sex-selective mortality effects for the Black Death and recurring plague can be analyzed.<sup>196</sup>

In 2009 Sharon DeWitte published a bio-archaeological study which found no conclusive sign that sex played a role in plague's potential discriminatory effect during the Black Death.<sup>197</sup> In a follow-up article, however, DeWitte offered a more nuanced hypothesis. Either the Black Death killed more men who were vulnerable due to prior physiological stress, or it killed more women who were otherwise healthy.<sup>198</sup> Two main limitations of previous research have limited

187 For the Southern Netherlands, there is a strand of literature pointing to the potentially greater severity of the echo-epidemics of the later fourteenth century: Thoen and Devos, 'Pest in de Zuidelijke Nederlanden'; Derville, 'La population du Nord', pp. 524-7; Helin, 'Les Pays-Bas', pp. 413-24; Delmaire, 'Contribution à l'étude de la peste', pp. 35-50; Sivéry, 'La Peste Noire et l'épidémie de 1400-1401'. However, this does not necessarily entail that the Black Death was therefore mild.

188 DeWitte and Wood, 'Selectivity of Black Death mortality', pp. 1436-41.

189 Castex, 'Identification and interpretation', pp. 23-48; DeWitte, 'Age patterns of mortality', pp. 3394-400.

190 Hatcher, *Plague, population, and the English economy*; Ann Carmichael summarized the disagreement among historians about the age-selectivity plague: Carmichael, *Plague and the poor*, pp. 90-3.

191 Carmichael, 'Plague persistence in Western Europe', 157-92.

192 DeWitte and Slavin, 'Between famine and death', pp. 37-60; Slavin, 'The Great Bovine Pestilence', pp. 1239-66.

193 DeWitte and Hughes-Morey, 'Stature and frailty', pp. 1412-9; DeWitte, 'Setting the stage', pp. 441-51.

194 Alfani and Ó Gráda, eds., *Famines in Europe*.

195 Yaussy, DeWitte, and Redfern, 'Frailty and famine', pp. 272-83.

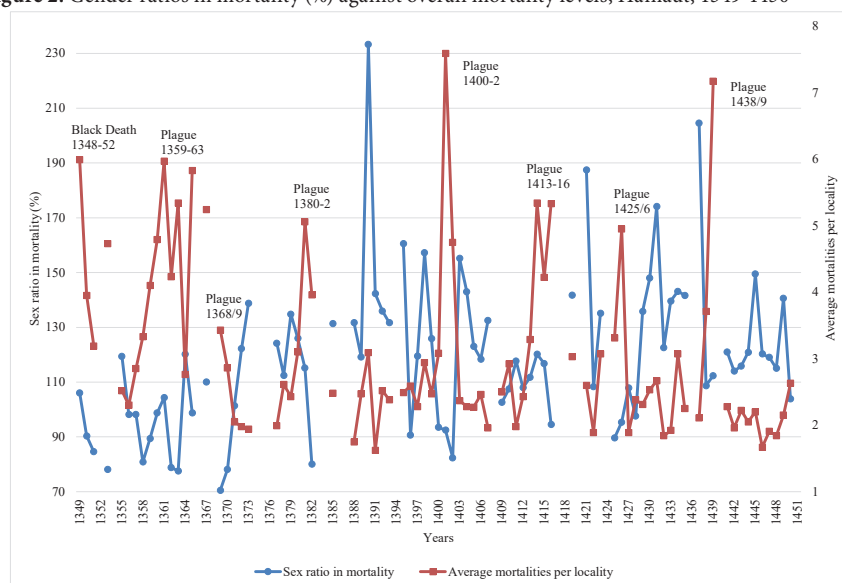
196 Based on results from: Curtis and Roosen, 'The sex-selective impact of the Black Death'.

197 DeWitte, 'Age patterns of mortality during the Black Death'.

198 DeWitte, 'Sex differentials in frailty in medieval England', pp. 285-97.

the progress on this topic. First, sample sizes are usually small because bio-archaeologists are restricted to using a limited amount of skeletons from a limited number of burials sites. Historians on the other hand usually focus on the results from isolated case studies, making it difficult to discern broader patterns. Second there is the problem of ascertaining whether differences in mortality rates between sexes are caused by factors intrinsic to plague or the result of differential exposure.<sup>199</sup> In late medieval and early modern Europe, women started migrating to the cities to a greater degree than men who remained in the countryside to work. Thus higher female mortality may be due to the disease ravaging urban localities.<sup>200</sup> What is needed to attain reliable results is data that can be compared over a long timespans between plague-years and 'normal'-years, as well as data beyond individual burial sites to compare sex ratios in mortality between rural and urban environments. This is where the Hainaut database offers a unique insight as it provides sex disaggregated data over the course of a century for both countryside and city.<sup>201</sup> Figure 2 indicates the main plague periods from 1349-1450, the peaks in mortality they caused and the sex ratios (%). The figure shows that both the Black Death and most of the recurring plagues during the late Middle Ages had a tendency to kill more women than normal. This is represented by the fact that when a major plague occurred, there was an inverse relationship with the sex ratio in mortality.

**Figure 2.** Gender ratios in mortality (%) against overall mortality levels, Hainaut, 1349-1450



Source: ADN, B 12122-12226; ARB, I, 004, 17867-73.

199 Carniel, 'Plague today', pp. 115-22.

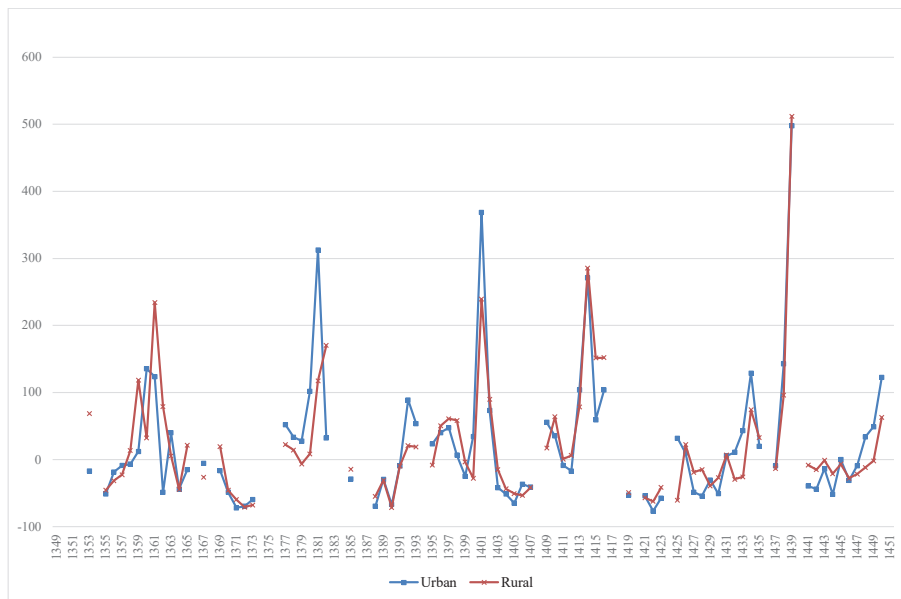
200 Kowaleski, 'Single women', pp. 38-81; Bardsley, 'Missing women', pp. 273-309.

201 Curtis and Roosen, 'The sex-selective impact of the Black Death'.

The notion that the Black Death killed indiscriminately and that this effect changed in later plague outbreaks does not seem to hold for Hainaut, at least with regard to sex-selectivity. A third and final factor is rooted in the assumption that the Black Death was a universal killer, hitting city and countryside in equal measure. Recurring plague, on the other hand, is seen as more selective and therefore less territorially pervasive,<sup>202</sup> with outbreaks often confined locally or regionally.<sup>203</sup> What happened in the period immediately after the Black Death is still largely unknown,<sup>204</sup> although according to Naphy and Spicer, 'the second outbreak and subsequent plagues differed in that it was more confined to urban areas'.<sup>205</sup> This assumption is in line with a strong tendency of historians of European plagues to focus on data-rich environments, remaining unimpressed by patchy and problem-ridden evidence from rural hinterlands.<sup>206</sup>

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**Figure 3.** Average trend in mortmain dead compared to 'previous years' (%), urban and rural Hainaut, 1349-1450



Source: ADN, B 12122-12226; ARB, I, 004, 17867-73.

This has led to the common claim that plague became an almost exclusively urban phenomenon in (Southern) Europe by the fifteenth century.<sup>207</sup> Once again it seems that much of this assumption

202 Alfani, 'Plague in seventeenth century', p. 408.

203 Blockmans, 'The social and economic effects'. Mentioned for the fourteenth and fifteenth century plague by Poos, 'Plague mortality', pp. 227-34.

204 For the early modern period the notion of plague as an exclusively urban phenomenon has been refuted for the Low Countries: Curtis, 'Was plague an exclusively urban phenomenon?', pp. 139-70.

205 Naphy and Spicer, *The Black Death*, pp. 34-5.

206 Carmichael, 'Plague persistence', p. 161.

207 For example in: Alfani, *Calamities*, p. 257.

is based on the scarcity of data to systematically assert the ‘universal’ nature of the Black Death in contrast to later plague outbreaks. Using the Hainaut database to compare plague severity between rural and urban localities, it is possible to test this assumption. However, before turning to the analysis of the data, it must be acknowledged that, within the context of the Low Countries, the County of Hainaut does not provide an ideal test case for comparing rural and urban plague activity. In 1400, 30 per cent of the people lived in an urban environment in Hainaut, compared to 31 per cent in Brabant, between 33-36 per cent in Flanders and 33 per cent in Holland. By 1500, Holland and Brabant had experienced an increase in urbanization rate, to 45 and 35 per cent respectively. In Flanders, however, there was a noticeable decline to 25 per cent, while Hainaut almost managed to attain a status-quo with an urbanization rate of 29 per cent.<sup>208</sup> Hainaut was therefore one of the least urbanized regions in the late medieval Low Countries. However, the Low Countries were one of the most urbanized parts of Europe, second only to northern Italy during the late Middle Ages.<sup>209</sup> Compared to the rest of Europe, Hainaut still provides a relevant case study for studying urban and rural plague dynamics.

Figure 3 separates urban and rural mortmain data. In order to accommodate for different aggregate mortmain figures between city and countryside and changing population levels across time, urban and rural data were separated by using an average increase/decrease in deaths compared to the moving average of previous years. Previous averages are calculated by skipping back a year and calculating the average of the five previous years (excluding highest and lowest figures). The mortmain figure in the year in question is then divided by the average of the previous years, multiplied by 100 with 100 subtracted. For the Black Death, no previous documents were available. However, the urban aggregate mortmain comes very close to that of the rural one (209 to 228) and it is possible that the Black Death had a greater impact on the cities than the countryside. Figure 3 shows that many of the key-medieval plagues had discernible mortality effects on the countryside, with trends similar to the cities.

## Conclusion

Current knowledge regarding the severity and selectivity of late medieval plague is still limited, mostly due to the scarcity and disparate nature of available sources seen throughout Europe. It is clear that certain datasets on Black Death mortality rates ‘which have been widely used for spatiotemporal- and regression analysis’ are unfit (for this purpose). A general revision of all pre-existing datasets by carefully checking mortality estimates against the actual content of available sources is necessary to ensure the continued and reliable contribution of historical data to the field of plague studies. However, this endeavor should go beyond reconstructing mortality rates for the Black Death, in fact, each widespread plague outbreaks that followed is deserving of the same amount of scholarly attention dedicated to the initial fourteenth century outbreak. This article has shown how a comparative study of plague severity, either across regions or across time, still

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208 van Bavel, *Manors and markets*, pp. 281-2.

209 Malanima, ‘The economic consequences’, pp. 311-28.

has to contend with incomplete and flawed data. Based on the Hainaut mortmain database, there are no noticeable changes in the selectivity of plague between 1349 and 1450. As such, certain assumptions on selective mortality effects can be refuted. In short, the narrative on selective mortality effects and diminished severity is not as black-and-white as some scholars argue. One possible explanation is that plague only became a 'selective' disease from the late fifteenth century onwards.<sup>210</sup> The assumed selectivity in mortality effects proposed by certain authors for the late medieval period might have been influenced by results for early modern plagues. However, the findings of this article also have broader implications. In order to understand the diverging directions of socio-economic and demographic development seen after plague outbreaks,<sup>211</sup> it is vital to take into consideration the changing epidemiological characteristics of the disease over time.<sup>212</sup> It is therefore important to move beyond cemented assumptions to allow historical investigation to engage more fully with recent trends in plague ecology. With other sciences such as micro-biology and bioarchaeology becoming fully mature in their study of historical diseases, it is up to historians to ensure their data (reliability) and methods mature at an equal rate. Future research will undoubtedly seek to incorporate the historical data, as the lack of long-term analysis is one of the major gaps in current disaster studies.<sup>213</sup> This offers a great opportunity for the field of history, one we should face by applying rigorous critique and standards of interpretation to historical datasets but also to long-held beliefs and assumptions.

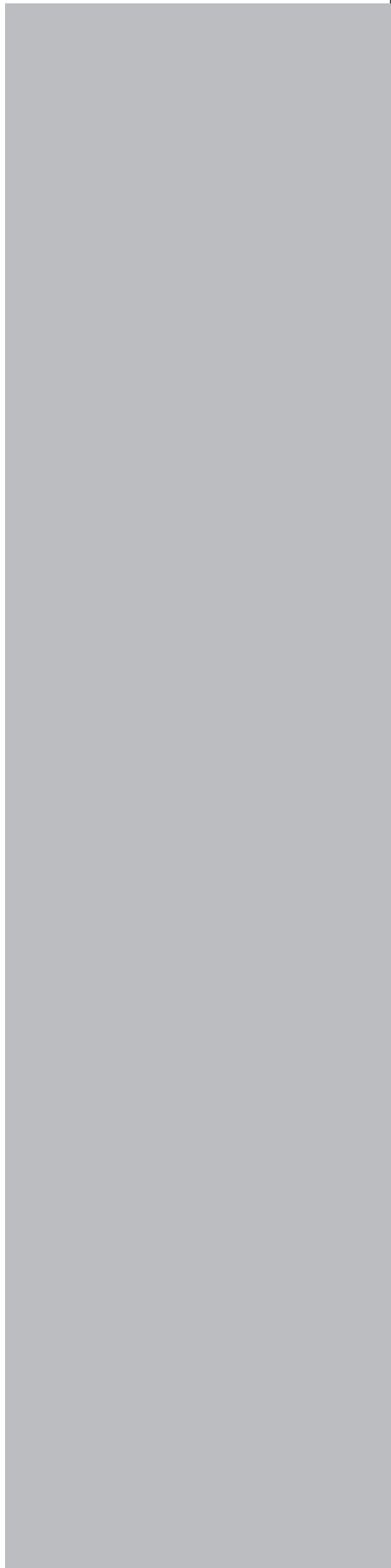
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210 Campbell, *The Great Transition*, p. 351.

211 Brenner, 'Agrarian class structure', pp. 30-75.

212 Alfani and Murphy, 'Plague and lethal epidemics', p. 314.

213 Dell, Jones, and Olken, 'What do we learn from the weather?', pp. 740-98; van Bavel and Curtis, 'Better understanding disasters', pp. 143-69.



# 2

## Dangers of Noncritical Use of Historical Plague Data<sup>214</sup>

*Co-authored with Daniel R. Curtis*

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<sup>214</sup> Published as: Roosen, J. and Curtis, D. R., 'Dangers of noncritical use of historical plague databases', *Emerging Infectious Diseases*, **24** (2018), pp. 103–10. Footnotes and lay-out have been standardized.

## Abstract

Researchers have published several articles using historical data sets on plague epidemics using impressive digital databases that contain thousands of recorded outbreaks across Europe over the past several centuries. Through the digitization of preexisting data sets, scholars have unprecedented access to the historical record of plague occurrences. However, although these databases offer new research opportunities, noncritical use and reproduction of preexisting data sets can also limit our understanding of how infectious diseases evolved. Many scholars have performed investigations using Jean-Noël Biraben's data, which contains information on mentions of plague from various kinds of sources, many of which were not cited. When scholars fail to apply source criticism or do not reflect on the content of the data they use, the reliability of their results becomes highly questionable. Researchers using these databases going forward need to verify and restrict content spatially and temporally, and historians should be encouraged to compile the work.



## Introduction

In an article by Jones and Nevell,<sup>215</sup> the authors argue that improved access to historical data through digitization projects has benefited research in different scientific fields. However, they also point out that digitization has some unintended consequences. A key issue they identified is the loosening of the rigorous standards of evidence and interpretation scientific researchers typically demand within their own disciplines.<sup>216</sup> Although scholars regularly reprimand colleagues for misrepresenting evidence and misusing data to make arguments that their material cannot support, such issues are less frequently addressed when data sets transcend the border from one scientific discipline to the next. This discrepancy poses a problem in an age of greater interdisciplinary research.

Here we focus on the most frequently used record of historical plague outbreaks in Europe. This information was originally compiled 40 years ago by Jean-Noël Biraben as part of his 2-volume work, *Les hommes et la peste en France et dans les pays méditerranéens*, which documents plague outbreaks from the Black Death (1347–1352) to the 19th century.<sup>217</sup> Using a digitized version of this data set,<sup>218</sup> which includes a limited number of outbreaks in northern Africa, authors have boasted impressive collections of documented European plague outbreaks: 6,929 plague outbreaks across Europe during 1347–1900,<sup>219</sup> 7,711 outbreaks across Europe and Asia during 1347–1900,<sup>220</sup> 5,559 outbreaks across Europe and northern Africa during 1347–1760,<sup>221</sup> and 6,656 outbreaks across Europe during 1347–1760.<sup>222</sup> In one of these studies, the Biraben data set was supplemented with additional outbreaks from Russia and Turkey gleaned from secondary literature.<sup>223</sup>

Biraben had the ambition of constructing a pan-European overview of recurring plague outbreaks, and although his work at the time was an extraordinary feat of scholarship, a complete documentation of the occurrence of plague throughout Europe could not be adequately concluded by any single researcher. From a historian's perspective, the most fundamental problem with Biraben's data is the lack of systematic justification for the sources used and only cursory referencing of the original documents. However, this article is not meant to be a criticism of Biraben's 1970s work but of the research published decades later by authors who interpreted Biraben's results at face value. Scholars who have used this data set have not applied adequate source critique expected within the field of history, failing to pose basic questions concerning how the data were collected and what they represent. The 4 aforementioned studies<sup>224</sup> are not the only instances in which the Biraben data set were not used critically; in fact, there are many

215 Jones and Nevell, 'Plagued by doubt'.

216 Ibid.

217 Biraben, *Les hommes et la peste*, I; idem, *Les hommes et la peste*, II.

218 <https://zenodo.org/record/14973>

219 Büntgen, Ginzler, Esper, Tegel, and McMichael, 'Digitizing historical plague'.

220 Schmid et al., 'Climate-driven introduction of the Black Death'.

221 Yue, Lee, and Wu, 'Navigable rivers'.

222 Yue, Lee, and Wu, 'Trade routes and plague transmission'.

223 Schmid et al., 'Climate-driven introduction of the Black Death'.

224 Büntgen, Ginzler, Esper, Tegel, and McMichael, 'Digitizing historical plague'; Schmid et al., 'Climate-driven introduction of the Black Death'; Yue, Lee, and Wu, 'Navigable rivers'; idem, 'Trade routes and plague transmission'.

examples.<sup>225</sup> However, Büntgen et al., Schmid et al., and Yue et al. are the first to use a digitized version of the data set, which not only causes specific problems but also sets a dangerous precedent for future research.<sup>226</sup>

### Noncritical use of historical plague databases

In 2012, Büntgen et al. presented the digitized version of the Biraben data set in a short correspondence piece.<sup>227</sup> This publication reflected little on the limitations of the data. The only concerns Büntgen et al. addressed were the imprecise geographic descriptions that impeded exact localization and the annual resolution of the data that precluded tracking of outbreaks within the same year. However, through digitization and subsequent publication in a top-ranked journal, the 4-decade-old data set was imbued with a false aura of trustworthiness and the impression of being new historical research. Subsequently, others used the resulting database noncritically, in some cases not referencing the original Biraben data at all.<sup>228</sup> The perpetual reuse of these data without structural effort to add new archival evidence has given the impression that our knowledge of historical plague outbreaks is saturated and, moreover, has obscured the fact that large amounts of innovative research on the spatiotemporal spread of plague has been conducted by others since the mid-1970s.

These problems can be demonstrated through the maps that have been produced on the basis of Biraben's data. Büntgen et al. provided a map in the introduction to the database,<sup>229</sup> and a copy (Figure 1) was later included in an article on the supposed link between plague spread and navigable rivers.<sup>230</sup> However, looking at the map, 2 problems surface immediately. First, France is depicted as the major epicenter of plague activity across 4 centuries, something even accepted as a face-value truth by some scholars.<sup>231</sup> However, more than likely, the concentration of plague activity reflected nothing more than the fact that Biraben was French and had exceptional knowledge of the archives in France.<sup>232</sup> Second, there are vast areas where no plague was recorded across the whole of the late-medieval and early modern periods. For example, hardly any recorded plague outbreaks appear in a period of 4 centuries in much of the Low Countries in western Europe.

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225 Christakos, Olea, Serre, Yu, and Wang, *Interdisciplinary public health*; Bossak and Welford, 'Did medieval trade activity'; Signoli, 'Reflections on crisis burials'; Büntgen et al., 'Filling the Eastern European gap'; Voigtländer and Voth, 'Gifts of Mars'; Scott and Duncan, *Biology of plague*.

226 Büntgen, Ginzler, Esper, Tegel, and McMichael, 'Digitizing historical plague'; Schmid et al., 'Climate-driven introduction of the Black Death'; Yue, Lee, and Wu, 'Navigable rivers'; idem, 'Trade routes and plague transmission'.

227 Büntgen, Ginzler, Esper, Tegel, and McMichael, 'Digitizing historical plague'.

228 Yue, Lee, and Wu, *Navigable rivers*.

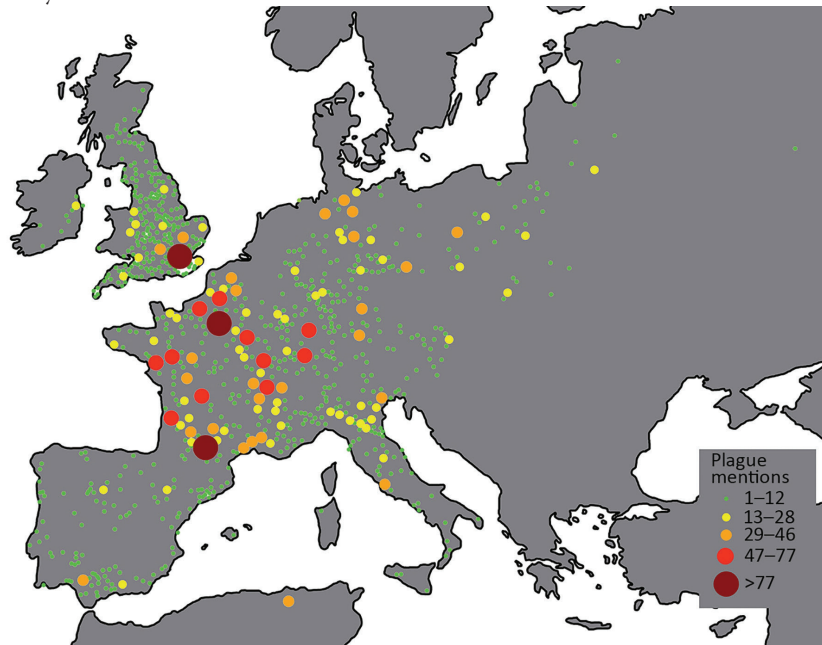
229 Büntgen, Ginzler, Esper, Tegel, and McMichael, 'Digitizing historical plague'.

230 Yue, Lee, and Wu, 'Navigable rivers'.

231 Scott and Duncan, *Biology of plague*.

232 Alfani, 'Plague in seventeenth-century Europe'.

**Figure 1.** Plague outbreaks in Europe, 1347–1760. Map produced on the basis of data from Biraben.<sup>233</sup> Map provided courtesy of Yue et al.<sup>234</sup>

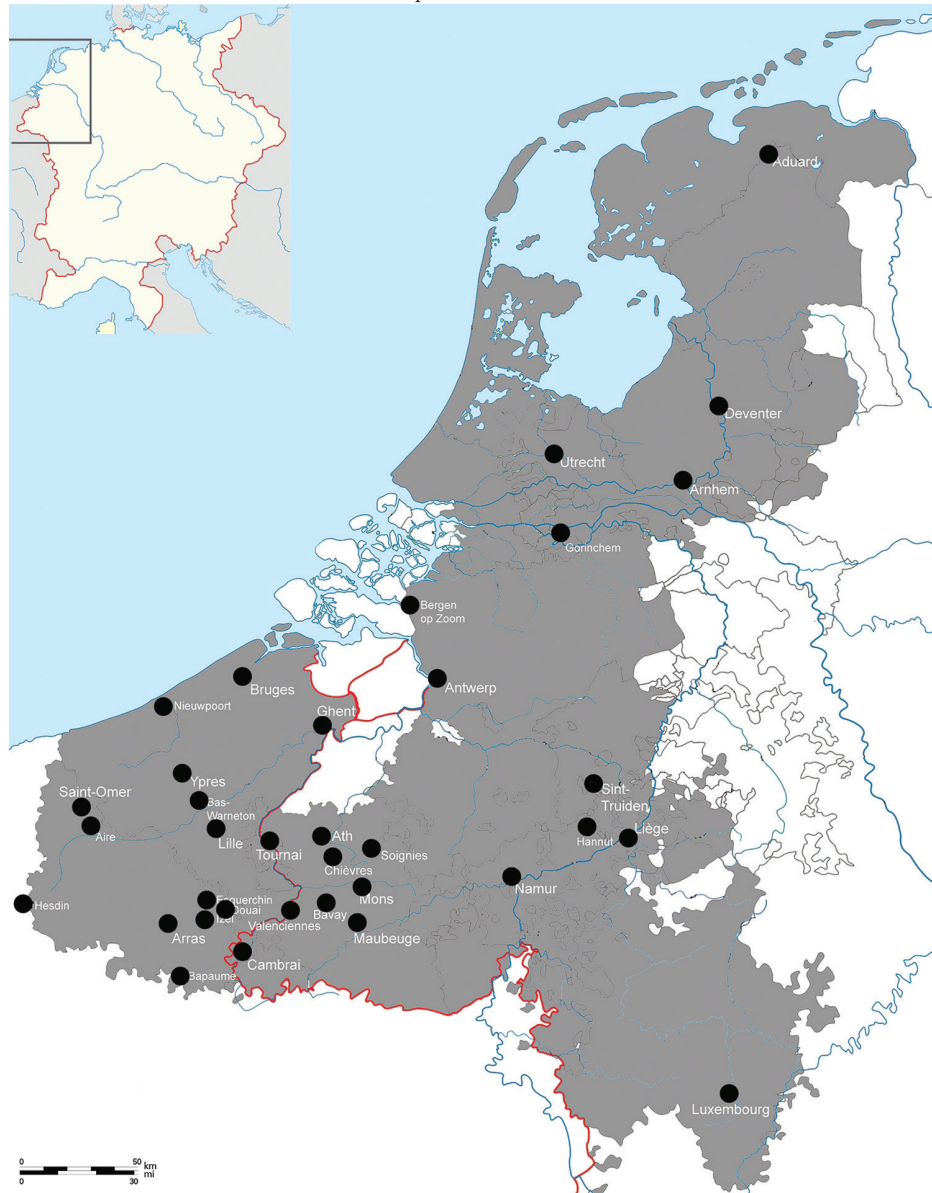


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233 Biraben, *Les hommes et la peste*, I; idem, *Les hommes et la peste*, II.

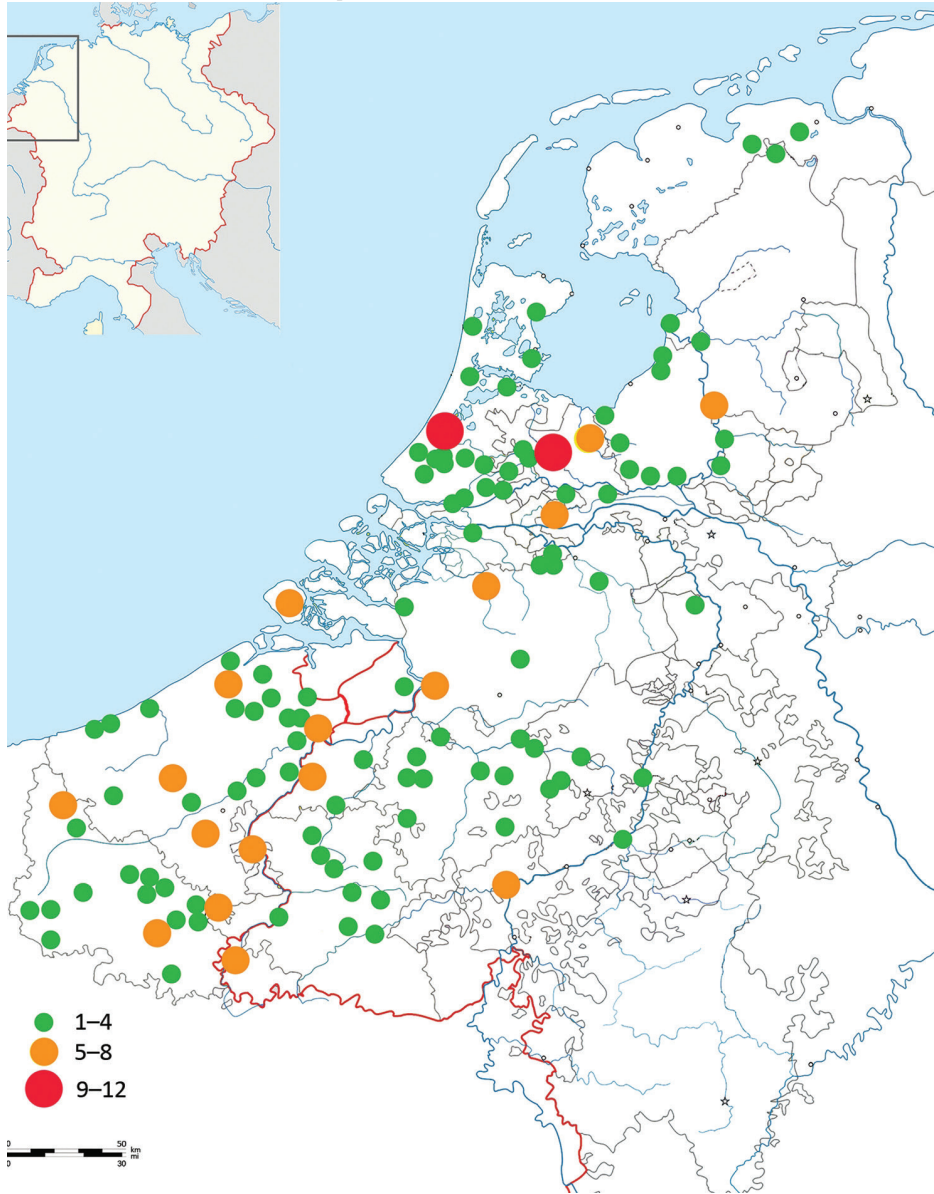
234 Yue, Lee, and Wu, 'Navigable rivers'.

**Figure 2.** Plague mentions during the Black Death outbreak, Low Countries, 1348–1352.<sup>235</sup> Inset shows location of the Low Countries in western Europe.



235 Curtis and Roosen, 'The sex-selective impact of the Black Death'.

**Figure 3.** Plague mentions taken from archival sources, Low Countries, 1348–1500.<sup>236</sup> Inset shows location of the Low Countries in western Europe.



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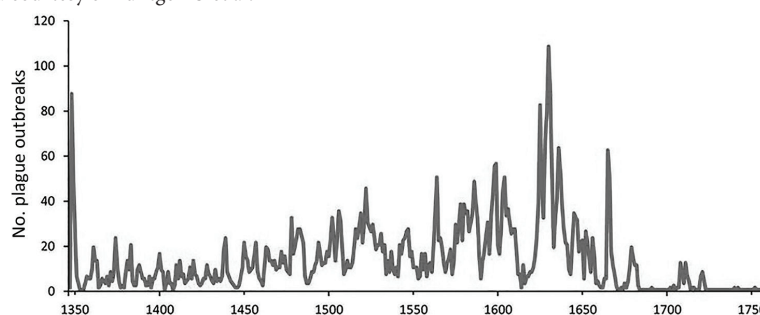
236 Ibid.

If we were to focus exclusively on the initial Black Death outbreak (1347–1352), this evidence would be in agreement with the literature of the mid-1970s. At that time, the consensus was that the Black Death somehow did not reach most parts of the Low Countries.<sup>237</sup> Later this view was refuted, and proof that the Black Death was present in the Low Countries was established.<sup>238</sup> In fact, a newly compiled data set of plague mentions shows that many regions of the Low Countries were hit by the Black Death (Figure 2).<sup>239</sup> When we add data of plague mentions across the entirety of the late Middle Ages (1349–1500), this map becomes filled to an even greater extent (Figure 3),<sup>240</sup> without even adding plague data from the 16th and 17th centuries, when many plagues, such as those in 1624–1625 and 1635–1636, hit almost every recordable locality of the Low Countries, both urban and rural.<sup>241</sup> Biraben's data set, therefore, is not only hindered by being outdated but also by having crucial gaps in spatial coverage, leaving out large parts of the Low Countries, Denmark, Scotland, Ireland, and Central Europe.<sup>242</sup> Even countries well known in the literature for having experienced numerous plagues of exceptional severity across the Middle Ages and during the early modern period, such as Italy,<sup>243</sup> have very few plague markers on the maps produced with Biraben's data.

### Biraben data set

In the examples we mention, 3 transgressions have been attributed to the scholars using the Biraben data set. First, reflection on the data collection process has been improper; second, what the data represent has not been recognized; and third, critique of the original sources has been inadequate. We argued that a critical consideration of any of these 3 elements would have led to the conclusion that the data set could not have been used at face value.

**Figure 4.** Plague outbreaks in Europe, 1347–1900. Graph produced on the basis of data from Biraben.<sup>244</sup> Graph provided courtesy of Büntgen U et al.<sup>245</sup>



237 Biraben, *Les hommes et la peste*, I; Carpentier, 'Autour de la peste noire'; McNeill, *Plagues and peoples*.

238 Blockmans, 'Social and economic effects'.

239 Curtis and Roosen, 'The sex-selective impact of the Black Death'.

240 Ibid.

241 Curtis, 'Was plague an exclusively urban phenomenon?'.

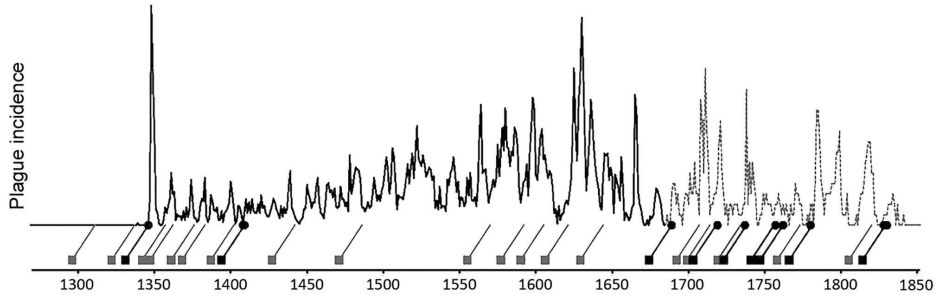
242 Mengel, 'A plague on Bohemia?'.

243 Alfani, 'Plague in seventeenth-century Europe'; Cohn, *The Black Death transformed*.

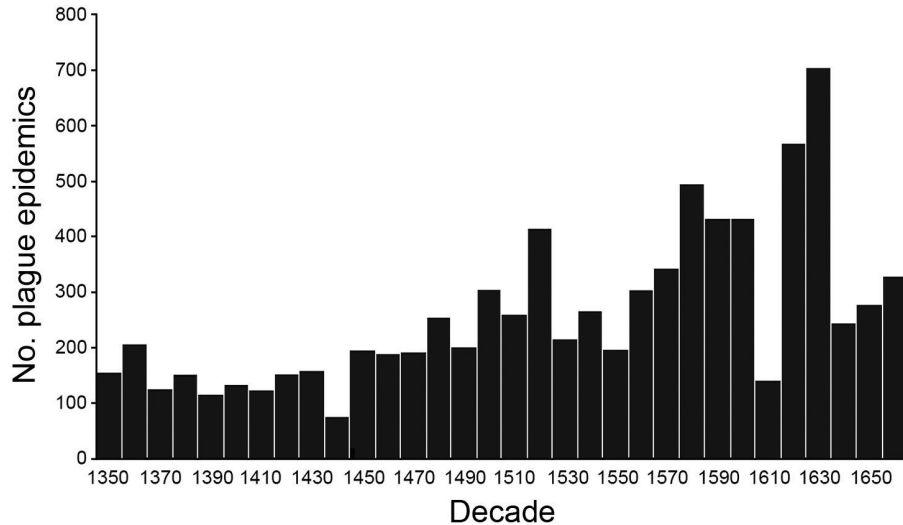
244 Biraben, *Les hommes et la peste*, I; idem, *Les hommes et la peste*, II.

245 Büntgen, Ginzler, Esper, Tegel, and McMichael, 'Digitizing historical plague'.

**Figure 5.** Plague incidences in Europe, 1347–1900. Graph produced on the basis of data from Biraben.<sup>246</sup> Graph provided courtesy of Schmid BV et al.<sup>247</sup>



**Figure 6.** Plague epidemics in Europe, 1350s–1660s. Graph produced on the basis of data from Biraben.<sup>248</sup> Modified graph provided courtesy of Voigtländer N, Voth H-J.<sup>249</sup>



First, we address what the Biraben data represent. Three previously published graphs display the same data set (Figures 4,5,6) and yet, peculiarly, present the data differently. Büntgen et al. described the data as plague outbreaks, Schmid et al. referred to the data as plague incidence, and Voigtländer and Voth regarded the Biraben data as plague epidemics. These 3 terms are not interchangeable. The lack of clarity on what the data set represents has led to the drawing of false conclusions.

<sup>246</sup> Biraben, *Les hommes et la peste*, I; idem, *Les hommes et la peste*, II.

<sup>247</sup> Schmid et al., 'Climate-driven introduction of the Black Death'.

<sup>248</sup> Biraben, *Les hommes et la peste*, I; idem, *Les hommes et la peste*, II.

<sup>249</sup> Voigtländer and Voth, 'Gifts of Mars'.

Which of the 3 graphs uses the correct terminology? In fact, none of them do. The data collected by Biraben represent the availability of sources mentioning plague and not the severity or pervasiveness of the disease in any given year. More narrowly defined, the data set represents those sources Biraben was able to find in the timespan of researching his book while working in Paris. In no way does this data set represent the full coverage of all historical plague activity throughout the whole of Europe.

Furthermore, the Biraben data set has an urban bias. Most of the mentions of plague occurrences (particularly those outside of France) pertained to cities, perhaps because urban documents were more easily accessible. For example, in the database used to create Figure 1, the city of Paris was indicated as having 90 plague outbreaks, yet the middle-sized town of Soissons ≈100 km to the northeast only experienced 3 during the same period (1347–1760). We must view this result skeptically, given that this number would have meant that a new plague outbreak in Paris occurred on average every 3.5 years over a period of 320 years (the last plague in northern France was in the late 1660s). This average rate contradicts a wealth of scholarship that suggests that, after the Black Death, the average interval separating 2 plague occurrences in Northwest Europe was around 11–12 years in the 14th century, decreasing to 15–20 years by the late 15th century,<sup>250</sup> and being anything from 10 to 20 years by the 17th century.<sup>251</sup> Ultimately, by confusing mentions of plague in available sources as a representation of individual incidences or outbreaks of the disease, Biraben's data set has led to a gross overestimation of plague in big cities and a gross underestimation of plague in smaller towns and villages. This confusion is problematic, considering some scholars have linked plague spread to commerce,<sup>252</sup> trade routes,<sup>253</sup> or distance to navigable rivers,<sup>254</sup> all factors highly conducive to the development of cities.<sup>255</sup> Misinterpretation of Biraben's data set also feeds into a narrative describing plague as a fundamentally urban phenomenon when research is beginning to reveal this perception to be a fallacy.<sup>256</sup>

Next, we address the question of how the data were collected. The collection process did not aim to attain a representative sample of all historical plague outbreaks across Europe, which would have been necessary for a data set attempting to offer a long-term pan-European overview. As previously mentioned, the data set has crucial gaps in geographic coverage; it does not provide an unbiased sample for every region in Europe and, within many regions, provides a clear urban bias. However, substantial gaps are evident in temporal coverage as well. For instance, the original data set gives the impression that the 16th and 17th centuries witnessed much higher plague activity than the 14th and 15th centuries. Yue et al. are especially not critical in this regard and suggest that more severe plague outbreaks occurred during the Thirty Years' War (1618–1648) than other periods,<sup>257</sup> an association also suggested in other studies.<sup>258</sup> Despite the fact that long and

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250 Klapisch-Zuber, 'Plague and family life'.

251 Curtis and Roosen, 'The sex-selective impact of the Black Death'; Cummins, Kelly, and Ó Gráda, 'Living standards and plague'.

252 Bossak and Welford, 'Did medieval trade activity'.

253 Yue, Lee, and Wu, 'Trade routes and plague transmission'.

254 Yue, Lee, and Wu, 'Navigable rivers'.

255 Bosker and Buringh, 'City seeds'.

256 Alfani, 'Plague in seventeenth-century Europe'; Curtis, 'Was plague an exclusively urban phenomenon?'.

257 Yue, Lee, and Wu, 'Navigable rivers'.

258 Büntgen et al., 'Filling the Eastern European gap'.



devastating wars occurred similarly throughout the 14th through 16th centuries in many parts of Western Europe, no consideration is given to why the 'Thirty Years' War would set off more severe plagues than, for example, the Hundred Years' War (1337–1453). Furthermore, absence of evidence cannot be interpreted as evidence of absence in the case of late-medieval plague outbreaks.<sup>259</sup> The literature has explicitly pointed out the paucity of quantifiable evidence for the recurring epidemics of the late Middle Ages (1349–1500);<sup>260</sup> however, this paucity is also related to a polarization of the research focus between the initial Black Death outbreak and early modern outbreaks. To interpret both the incomplete recording of sources by Biraben and the less forthcoming nature of late-medieval plague documents as evidence of lower plague activity is unsatisfactory. This interpretation accepted by some researchers is yet another reason why the noncritical use of the data leads us to consternation over the results and interpretations produced.

Last, we address the third and final problem, the absence of source critique. Despite elucidating the basic symptoms one would expect to see with bubonic plague, such as fever, buboes, and vomiting, Biraben never justified how he came to identify certain localities in certain years as experiencing plagues in his own data set, and a structural overview of the original sources he used is missing. Because of his inadequate citation practices, we have little hope of checking the validity of Biraben's assertions, which undermines the reliability and accuracy of the data set that has been reused on a number of occasions by others. A further problem with not knowing the original sources is that equal weight in terms of accuracy and reliability cannot necessarily be attributed to different reference types (e.g., resources allowing for quantification of mortality rates, administrative sources with qualitative direct mentions of plague, and narrative sources with qualitative direct mentions of plague).<sup>261</sup> This problem is magnified further in light of increasing interest in germ theory-based nosology and the retrospective diagnosis of diseases.<sup>262</sup> Medieval historians question the methods used for identifying diseases in the past.<sup>263</sup> Laboratories have confirmed *Yersinia pestis* in burial sites connected to the initial Black Death outbreak of 1347–1352,<sup>264</sup> but few works have explicitly linked *Y. pestis* to burial sites of other specific, recurring, late-medieval plague outbreaks.<sup>265</sup>

Accordingly for other late-medieval plagues, we are often reliant on anecdotal references by contemporaries in the absence of laboratory or even epidemiologic evidence. Using references by contemporaries is problematic, given the terms *peste* or *pestilentia* were often indiscriminate references to all sorts of afflictions.<sup>266</sup> Only starting roughly around the second half of the 15th century do we find more explicit differentiation in the descriptions of diseases in the Low Countries and Italy,<sup>267</sup> and even these descriptions still were by no means systematic. For many

259 Benedictow, *The Black Death*.

260 Alfani and Murphy, 'Plague and lethal epidemics'.

261 Blockmans, 'Social and economic effects'.

262 Jones and Nevell, 'Plagued by doubt'.

263 Arrizabalaga, 'Problematising retrospective diagnosis'; Theilmann and Cate, 'A plague of plagues'.

264 Little, 'Plague historians'.

265 Benedictow, *The Black Death*.

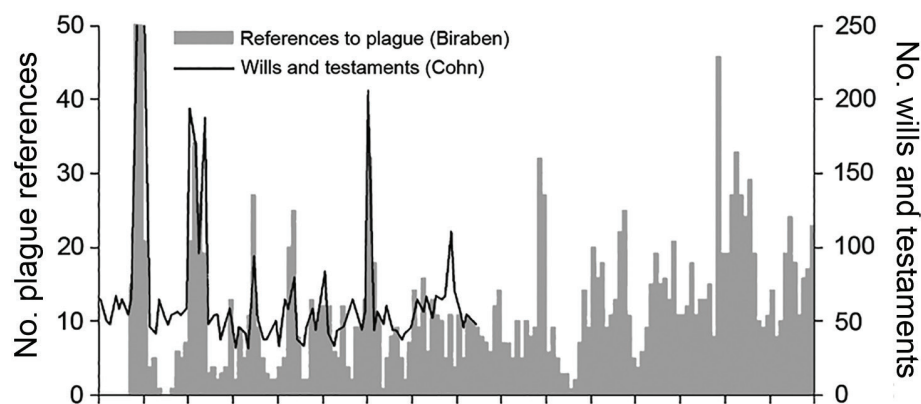
266 Thoen and Devos, 'Pest in de Zuidelijke Nederlanden'.

267 van Schaik, *Belasting, bevolking en bezit*; Carmichael, 'Universal and particular'.

of the putative late-medieval outbreaks after the initial Black Death, most literary sources do not mention key signs or symptoms, such as the combination of buboes, fever, and a rapidity of death. When signs or symptoms are referenced, they are fragmentary and localized and, therefore, difficult to use as evidence for the occurrence of general epidemic outbreaks over large territories. Even in the early modern period, when disease differentiation became much more commonplace in sources,<sup>268</sup> not every death spike could be accounted for, especially during periods such as the Thirty Years' War when a host of other diseases were present alongside plague.<sup>269</sup> We must also bear in mind that even in modern times the diagnosis of plague on the basis of signs and symptoms is problematic for trained medical professionals.<sup>270</sup> The only way to determine the etiologic agent responsible for a disease is by using molecular diagnostic tests. In other words, we are not sure that the mentions of plague identified originally by Biraben were in fact plague at all, especially for the medieval period, and as mentioned, we have no way of checking Biraben's data set without citations to the original manuscripts. This problem is further illuminated by some of the plagues Biraben identified, such as the plague of 1437–1440, which occurred during a period of extreme cold weather<sup>271</sup> and manifested as harvest failures and famine-related diseases;<sup>272</sup> research has suggested that waterborne infections were more likely the cause of this pestilence.<sup>273</sup>

### Moving forward

**Figure 7.** Comparison of Biraben's and Cohn's historical plague data sets. Biraben's data set included references to plague in various types of documents from Italy, Iberia, France, the Low Countries, and the British that were written during 1345–1499.<sup>274</sup> Cohn's data set included information from a select set of documents (wills and testaments of 9 cities) that were drafted during 1340–1424.<sup>275</sup> Graph provided courtesy of Campbell B.<sup>276</sup>



268 Curtis, 'Was plague an exclusively urban phenomenon?'; Cohn, *Cultures of plague*.

269 Curtis and Roosen, 'The sex-selective impact of the Black Death'.

270 Cosgrove, Perl, Song, and Sisson, 'Ability of physicians'.

271 Camenisch, 'Endless cold'; Camenisch et al., 'The 1430s'.

272 Curtis, Dijkman, Lambrecht, and Vanhaute, 'The Low Countries'.

273 Galanaud, Galanaud, and Giraudoux, 'Historical epidemics cartography'.

274 Biraben, *Les hommes et la peste*, I; idem, *Les hommes et la peste*, II.

275 Cohn, *The Black Death transformed*.

276 Campbell, *The great transition*.

We suggest 3 necessary steps to take to rectify some of the mistakes made with the use of digital databases of plague, which were often constructed by using Biraben's data. First, if we are going to pursue the Biraben database, we at least need to check his plague references with other forms of evidence rather than taking him at his word. Historians have done this in previous years with care by using only a select geographic sample of Biraben's evidence and comparing the data to other quantifiable indexes, such as the temporal distribution of will production (Figure 7).<sup>277</sup>

Second, scholars looking to test certain hypotheses, such as the effect of navigable rivers, commercialization, trade routes, or climatic fluctuations, should do so by using a historical plague data set of a much more restricted geographic or temporal scope to limit problems such as the inequalities in availability of source material or scholarly attention. We need to escape the confines of excessively localized and excessively macro scales and, instead, reap the benefits of a more workable historical laboratory at a regional level.<sup>278</sup> This restriction method is similar to how epidemiologists try to control for confounders by limiting their data to a specific group of persons sharing a specific characteristic. A way of implementing this in practice is by moving away from using data sets that consolidate different kinds of references to plague through different kinds of evidence (often without justification) and moving toward using data sets that can show differences in plague characteristics by comparing the same type of source material, a method that offers greater control. For example, by using only data from church burial records from the 16th and 17th centuries over many parts of Europe, a systemic comparison can be performed between urban and rural localities over time and with regard to plague severity, seasonality, pervasiveness, and various kinds of selectivity.<sup>279</sup> Epidemiologic information on plagues is better provided by using this approach than by using a random set of diverse manuscripts that may or may not refer to plague.

Third, it is clear that new databases of plague incidence have to be compiled by historians using data sets besides Biraben's. Given that this task is laborious and time-consuming, incentives are needed for historians to compile this information. One incentive could be the formal inclusion of trained medieval historians in large interdisciplinary scientific teams interested in charting and explaining the spread of plague.

277 Ibidem.

278 Carmichael, 'Plague persistence'.

279 Alfani, 'Plague in seventeenth-century Europe'; Curtis and Roosen, 'The sex-selective impact of the Black Death'.



# 3

## The 'light touch' of the Black Death in the Southern Netherlands: an urban trick?<sup>280</sup>

*Co-authored with Daniel R. Curtis*

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## Abstract

Although the fanciful notion that the Black Death bypassed the Low Countries has long been rejected, nevertheless a persistent view remains that the Low Countries experienced only a 'light touch' of the plague when placed in a broader European perspective, and recovered quickly and fully. However, in this article an array of dispersed sources for the Southern Netherlands together with a new mortmain accounts database for Hainaut show that the Black Death was severe, perhaps no less severe than other parts of western Europe; that serious plagues continued throughout the fourteenth and fifteenth centuries; and that the Black Death and recurring plagues spread over vast territories -including the countryside. The previous conception of a 'light touch' of plague in the Low Countries was created by the over privileging of particular urban sources, and a failure to account for the rapid replenishment of cities via inward migration, which obscured demographic decimation. We suggest that the population of the Low Countries may not have recovered faster than other parts of western Europe but instead experienced a greater degree of post-plague rural-urban migration.

## Introduction

In the 1950s, a fanciful notion was perpetuated that much of the Low Countries, especially the south, was remarkably unscathed by the Black Death of 1347–52.<sup>281</sup> Subsequent works have shown this to be a complete fallacy.<sup>282</sup> Nevertheless, there is still a persistent perception that the Low Countries escaped the full brunt of plague. Skilled work with manorial sources for England and fiscal sources for Italy and France has estimated 30–70 per cent population losses in some localities after the Black Death,<sup>283</sup> with high mortality rates also caused by fifteenth-century epidemics.<sup>284</sup> Yet while broad aggregated 'country-level' data (which must be viewed cautiously) have suggested that places such as Ireland and Scandinavia lost roughly 50 per cent of their population, in the Southern Netherlands losses were apparently less than 15 per cent.<sup>285</sup> In the 1960s, a famous map by Carpentier identified the Low Countries as one of the few places in Europe where plague was basically absent,<sup>286</sup> and remarkably, this map has been reproduced uncritically, even in recent works.<sup>287</sup> International literature makes frequent reference to the 'light touch' of the Black Death in the Low Countries: we learn from Cohn and the co-authored work of Scott and Duncan, for example, that Douai and Liège largely escaped the initial outbreak.<sup>288</sup> Accordingly, Blockmans et al. suggest that 'losses [in the Low Countries] were not as high as the 25 to 40 per cent assumed for England and Italy',<sup>289</sup> while Christakos et al. claim that 'unlike Northern Italy, mortality in Belgium was the lowest among present-day countries, with about 20 per cent mortality at most'.<sup>290</sup>

As even specialists of the medieval Low Countries downplay plague severity, especially when viewed comparatively across Europe, it is unsurprising that similar ideas have filtered through to the general literature. Some take the view that early fourteenth-century famines were more damaging than the Black Death,<sup>291</sup> and those conceding higher plague severity tend to argue that the worst of it occurred in the echo-epidemics of the later fourteenth and even fifteenth centuries.<sup>292</sup>

281 van Werveke, 'De Zwarte Dood'; idem, 'Nogmaals: de Zwarte Dood'. By the 'Black Death' we refer to the first mid-fourteenth-century outbreak of plague, to distinguish it from other plagues of the Second Pandemic; see Alfani and Murphy, 'Plague', p. 315.

282 For the south: Maréchal, 'De Zwarte Dood'; Blockmans, 'Social and economic effects'; Vermeersch, 'De Zwarte Dood'. For the north: de Boer, *Graafen grafiek*; Noordegraaf and Valk, *De Gave Gods*; Ladan, *Gezondheidszorg*, chapter 2; Hoppenbrouwers, *Een middeleeuwse samenleving*, pp. 58–60.

283 For an overview, see the sections on England, Italy, and France in Benedictow, *Black Death, 1346–1353*.

284 Hatcher, 'Mortality'; Hatcher, Piper, and Stone, 'Monastic mortality'; Nightingale, 'Some new evidence'; Alfani, Carbone, del Bo, and Rao, eds., *La popolazione italiana*.

285 Malanima, 'Economic consequences', p. 314.

286 Carpentier, 'Autour de la peste noire', p. 1070.

287 Reproduced, for example, in an introduction in Slack, *Plague*, p. 19. Subsequent reproductions have been criticized in Mengel, 'Plague on Bohemia?'. See also the absence of plagues in the Low Countries in recent reproductions of the Jean-Noël Biraben data: Büntgen, Ginzler, Esper, Tegel, and McMichael, 'Digitizing historical plague', p. 1587; Schmid, Büntgen, Easterday, Ginzler, Walloe, Bramanti, and Stenseth, 'Climate-driven introduction'; Yue, Lee, and Wu, 'Navigable rivers'; idem, 'Trade routes'. Criticized in Roosen and Curtis, 'Dangers'.

288 Cohn, *Black Death*, pp. 179–80; Scott and Duncan, *Biology of plagues*, p. 87.

289 Our translation from Blockmans, Pieters, Prevenier, and van Schaik, 'Tussen crisis en welvaart', p. 57. An estimated death rate of 16–25% for Flanders during the Black Death can be found in Nicholas, *Medieval Flanders*, p. 266.

290 Christakos, Olea, Serre, Yu, and Wang, *Interdisciplinary public health reasoning*, p. 222.

291 Aubry, 'Les mortalités lilloises', p. 336.

292 Thoen and Devos, 'Pest'; Derville, 'La population'; Helin, 'Les Pays-Bas'; Thoen, 'Historical demography'; Sivéry, 'La Peste Noire'; idem, *Structures agraires*, pp. 610–11.

The demographic devastation depicted by Abel for Germany in the wake of the Black Death, including totally deserted villages known as *Wüstungen*, was thought to be basically absent from inland Flanders, Hainaut, and Brabant,<sup>293</sup> though some lost settlements and farms did appear in coastal Flanders.<sup>294</sup> In his authoritative synthesis on medieval economy and society in the Low Countries, van Bavel clearly states that ‘Flanders was not hit hard at all’, and that population levels in 1400 were close to those in 1300.<sup>295</sup> Likewise, Holland ‘did not suffer great loss of life’.<sup>296</sup>

This view of a ‘light touch’ of the Black Death in the Low Countries has been made all the more convincing by the notion that population recovery was apparently so rapid and full. While it is claimed that the population in parts of the Low Countries recovered to its pre-plague levels during the fifteenth century,<sup>297</sup> this did not take place until the sixteenth century in the Italian and Iberian peninsulas and not until the eighteenth century in parts of England.<sup>298</sup> As early as the 1970s, Pounds pointed to an association between low mortality and quick recovery, noting that ‘the Low Countries appear to have been visited less severely by the plague than many other areas, and it is to be presumed that the population recovered more quickly’,<sup>299</sup> a view taken up in recent works, where it was noted that ‘in the Low Countries ... population recovered much faster in part because the impact of the Black Death was more limited’.<sup>300</sup> In the north, the ‘jump-start’ of Holland’s economy is said to have been built upon a comparatively mild outbreak of plague interacting with an already capital-intensive path of production, a frontier economy with low Malthusian pressures on resources, and freedoms for producers to respond to changing exogenous pressures, leading to ‘strong [population] growth during the fifteenth century [which] induced ... convergence of (nominal and real) wage levels’.<sup>301</sup>

The ‘light touch’ story is problematic, however, because we have no convincing explanation for why the Black Death seemingly exhibited such weak effects in the Low Countries. In fact, it represents an ‘epidemiological conundrum’, especially in the heart of the Southern Netherlands, which was unusually densely populated, heavily urbanized, and intensely commercialized, as well as being a battleground during the Hundred Years’ War. Tentative explanations have been offered, such as the early dominance of nuclear household structures, with each household becoming its own ‘cordon sanitaire’,<sup>302</sup> yet such explanations carry little weight given that nuclear households also characterized other parts of north-western Europe that were hit hard by the Black Death. Dhérent argues that the city of Douai, for example, avoided the worst effects of the Black Death

293 Sivéry, ‘La Hainaut’; Thoen, *Landbouweconomie*; Despy, ‘La “Grand Peste Noire”’.

294 Thoen and Soens, ‘Family or the farm’, pp. 197–8.

295 van Bavel, *Manors and markets*, pp. 279–80.

296 van Bavel, ‘Medieval origins’, p. 67.

297 Importantly, it has been noted that there were strong regional divergences; van Bavel, ‘People and land’. For example, the population of inland Flanders is said to have recovered more quickly than coastal Flanders; Thoen and Soens, ‘Family or the farm’.

298 Malanima, *Premodern European economy*; Broadberry, Campbell, Klein, Overton, and van Leeuwen, *British economic growth*.

299 Pounds, ‘Population’, p. 379.

300 Pamuk, ‘Black Death’, p. 308.

301 van Bavel and van Zanden, ‘Jump-start’, p. 515. The connection between a mild plague shock and favourable economic and demographic growth is further asserted in van Zanden, ‘Third road to capitalism?’, p. 90; Hoppenbrouwers, ‘Van waterland tot stedenland’, p. 136.

302 Thoen and Devos, ‘Pest’, p. 115.



by introducing superior quarantining measures and hygiene regulations.<sup>303</sup> Once again we must question the logic here: later outbreaks of plague were apparently severe in Douai, despite little change in the nature and implementation of these regulations. Slicher van Bath links the quality of nutrition seen in the Low Countries with greater capacity to withstand the plague.<sup>304</sup> However, much literature now suggests that malnutrition and plague are not linked causally,<sup>305</sup> and second, if the theory were correct, we would expect the Southern Netherlands to have weaker resistance given that this region experienced some of the worst conditions in the Great Famine of 1315–17 and subsequent subsistence crises.<sup>306</sup>

In light of these discrepancies, this article empirically reviews the notion that the Low Countries were only lightly affected by the Black Death. It focuses explicitly on the difficult case of the Southern Netherlands. In section I, we concentrate on some problems and limitations with the evidence presented in earlier studies, and how this may have fostered a conception of the Southern Netherlands as escaping the worst effects of the Black Death. In section II, we use dispersed archival data and a new database of mortmain accounts to argue that the Black Death took a severe toll on the Low Countries' population; an upward revision of mortality in line with recent research elsewhere in Europe.<sup>307</sup> We also argue that the severe plagues that recurred throughout the fourteenth and fifteenth centuries, rather than being evidence for the weakness of the initial Black Death, simply exacerbated a harsh late medieval mortality regime. In section III, we show that the Black Death and later epidemics afflicted the countryside too, sometimes as severely as the cities. In section IV, we show that the traditional view of a 'light touch' of plague was the result of historians over privileging urban sources that do not account for the rapid replenishment of cities via inward migration—and thus hiding true demographic devastation: the Southern Netherlands in particular was adept at recovering damaged urban agglomerations. In the conclusion we suggest that the relatively rapid and full late medieval population recovery in the Low Countries still needs to be demonstrated empirically, and that, if it did indeed occur, it was not connected to reduced mortality but potentially increased rates of nuptiality and fertility.

### Scarce source material

The lack of source material to quantify the demographic impact of plague in the fourteenth and fifteenth centuries is a problem across Europe.<sup>308</sup> Sources for England and Italy, for example, are more abundant, but still nothing exists that allows for a reconstruction of the epidemiological characteristics of plague over large areas. Scholars tend to extrapolate from localized micro-

303 Dhérent, 'Abondance et crises', p. 366.

304 Slicher van Bath, *Agrarian history*, pp. 89–90.

305 This is asserted passim in most of the essays in Alfani and Ó Gráda, eds., *Famine*. One connection between famine and plague may have been social disruption and breakdown rather than nutritional deficiency; Alfani, *Calamities*, p. 45.

306 Jordan, *The Great Famine*. However, some argue that greater exposure to the Great Famine may have removed the frailest individuals, creating a cohort less likely to die from the Black Death; DeWitte and Slavin, 'Between famine and death', p. 47.

307 Alfani and Murphy, 'Plague', p. 322.

308 Kowaleski, 'Medieval people', p. 577.

studies (some manors in England, for example), or calculate mortality rates from indirect data.<sup>309</sup> For the late medieval Low Countries, demographic sources are not plentiful.<sup>310</sup> However, the situation is better for the south than the north: fiscal inquiries and hearth counts found for fourteenth- and fifteenth-century Flanders, Hainaut, Brabant, and Artois do not survive in similar quantities for the Northern Netherlands, with the Duchy of Guelders a notable exception.<sup>311</sup> That is not to say these sources are perfectly suitable for assessing plague mortality: many hearth counts have large chronological gaps between assessments, few go back before the Black Death, and we have no reliable figure for the numbers of households excluded from registration, on account of poverty for example.

Another problem is the difficulty in discerning whether a decline in hearths should be attributed to mortality or to other demographic variables, such as declining nuptiality and fertility, or migration. A specific problem related to calculating plague mortality is the fact that the hearth assessment was based on whole households. Plague mortality does not always show up clearly in hearth counts because plague epidemics did not always kill every household member. Recent evidence shows that household contagion was a feature of plague (with family members dying in quick succession),<sup>312</sup> though this did not mean that the Black Death always finished off whole households. Therefore, any work that bases plague mortality on these sources probably understates its severity.

These challenges do not only apply to demographic sources: according to Noordegraaf and Valk, direct references to plague in narrative or administrative sources are scarce in the period before 1550, though their work was limited to Holland.<sup>313</sup> One thing that is certain is that sources are less forthcoming during the Black Death in the Low Countries than for other periods in the fourteenth century. This problem manifests itself in two ways, further entrenching the 'light touch' narrative. First, where sources exist, they often obscure or downplay societal, economic, or political disruption. Derville notes that the accounts of the city of Lille in 1349 seemed on the surface to indicate life continuing as normal, but after more scrupulous inspection it became clear that during the epidemic the city gates were opened each night to allow municipal chariots to carry the dead to mass graves in the suburbs.<sup>314</sup> As suggested recently by Rommes, urban governments tried to give an impression that everything was functioning as normal and attempted to maintain trading networks with other cities and the hinterlands—to do otherwise was to risk economic ruin.<sup>315</sup>

309 As noted in Klapisch-Zuber, 'Plague', p. 131. Recent work has tried to limit these problems by using archaeological indicators over larger areas instead; Lewis, 'Disaster recovery'.

310 Thoen, 'Historical demography'.

311 Derville, 'Le nombre des habitants'; idem, 'La population'; Bocquet, *Recherches*; Arnould, *Les dénombremments de foyers*; Cuvelier, *Les dénombremments de foyers*; van Schaik, *Belasting*. Other forms of early censuses (with large chronological gaps) have been used for areas of late medieval North Holland; see de Boer, *Graafen grafiek*; Lesger, *Hoorn*.

312 For the early modern period, see Curtis, 'Was plague an exclusively urban phenomenon?'; Cohn and Alfani, 'Households'; Whittles and Didelot, 'Epidemiological analysis'. For the late middle ages, see Curtis and Roosen, 'Sex-selective impact'.

313 Noordegraaf and Valk, *De Gave Gods*.

314 Derville, 'La population', p. 530.

315 Rommes, 'Plague'.

Second, there is the likelihood that the Black Death actually contributed to the lack of sources. Missing sources are not necessarily an indicator of the absence of the epidemic, but could be caused by the administrative breakdown it instigated.<sup>316</sup> The notion that the Black Death bypassed the town of Douai, for example, has been predicated on the lack of wills produced at that time, in complete contrast to the massive spike in the epidemic of 1400–1, supporting the view that echo-epidemics were more substantial in the Low Countries.<sup>317</sup> However, in reality we are not talking about a low number of wills during the Black Death but almost none at all, which suggests a breakdown in administrative procedure instead. Similarly there were no wills recorded for the early and late 1360s, despite plagues being attested for these periods across the whole of the Low Countries. Another reason may be that during the Black Death outbreak, people were not yet used to the precise symptoms of the disease, and so did not necessarily realize the precariousness of their situation—hence the lack of will writing. Only in later plague outbreaks did people become acquainted with these indicators of impending death.<sup>318</sup> Comparable trends can also be seen in the numbers of probate inventories recorded from 1349 to 1440 in Ghent, for example, where significant spikes are seen for the repeat plague outbreaks but not for the Black Death.<sup>319</sup> Again we have to question the administrative process here: in 1349, the year when hyper-mortality takes off (as demonstrated below), the number of probate inventories is the lowest of all years up to 1440, reaching no more than one-fifth of the value of even the 'normal' years.

### Indicators of plague mortality

The paucity and limitations of the sources may have led to the 'light touch' view of plague in the Low Countries. However, recent archival research has begun to uncover evidence contrary to this established view. In this section we bring together these dispersed pieces into a more coherent whole, alongside our own archival evidence. First we look at the Black Death, before turning our attention to the repeat outbreaks across the fourteenth and fifteenth centuries.

One of the places to which much recent research has been dedicated is the city of Bruges. In 1952, Rogghé offered as evidence for plague a letter of permission from Count Louis II of Flanders to construct two new graveyards outside the city walls on 15 August 1349,<sup>320</sup> and this evidence has been supported recently by the discovery of an additional document which shows that by 18 July 1349, the existing graveyard at St Jacob's Church had already been enlarged.<sup>321</sup> However, as Hans van Werveke pointed out, this is not evidence for plague mortality per se: it could also be evidence for precautionary measures dictated by fear of a potential outbreak. Indeed, in England, the London cemetery of East Smithfield was established in anticipation of plague mortality, not

316 Blockmans, 'Social and economic effects', p. 839; de Boer, *Graafen grafiek*, p. 32; Nicholas, *Town and countryside*, pp. 230–3.

317 Deregnaucourt, 'Autour de la mort', vol. I, p. 60. Evidence used in Cohn, *Black Death*.

318 This links to Cohn's argument that important changes to testamentary recording occurred in the wake of 'pestis secunda' as a traumatic reliving of the previous mortality shock of the initial Black Death; Cohn, 'Renaissance attachment to things'. Benedictow also asserts that wills and testaments are better seen as indicators of attitudes to death rather than mortality outright; Benedictow, *Black Death*, 1346–1353, pp. 268–9.

319 Our database calculated from Wynant, ed., *Regesten*, vol. I, pp. XVIII–XXI; Stadsarchief Gent, Oud Archief, no. 330 (1349–1440). Although probate inventories were recorded from 1330, these are the earliest extant records.

320 Rogghé, 'De Zwarte Dood', p. 836.

321 Vermeersch, 'De Zwarte Dood', p. 14.

in response to actual pressures.<sup>322</sup> In place of this anecdotal information, however, quantifiable evidence has been provided. In 1980, Maréchal exploited the archive of the ‘Potterie’ hospital of St John in Bruges to show that the entire nursing staff perished during the Black Death, while there was a seven-fold increase in the admissions of new members.<sup>323</sup> Given that new admissions took place only when there were vacancies, this is a good proxy for mortality: using this information Vandeburie calculated a mortality rate of 35 per cent at the institution.<sup>324</sup> Maréchal also employed a larger dataset of annuities, from which she calculated a mortality rate of 11 per cent among annuitants in the orphanage books of Bruges by cross-referencing names in the city accounts.<sup>325</sup> This estimate, however, has been shown to be rather low. More recently, Vandeburie compared the number of expired annuities (13) with the total number of annuitants (42) at St John’s hospital to calculate a mortality rate of 31 per cent between May 1349 and May 1350.<sup>326</sup>

Information for other cities is not as plentiful as for Bruges, but taken together the fragments are suggestive of higher mortality than previously supposed. Using the registers of tutelage and orphanage accounts, Blockmans noted that mortality was higher than normal between 1349 and 1352 in Ghent.<sup>327</sup> In the accounts of the St Nicholas Church, employing an overview of parishioners entitled to a dividend from the Table of the Holy Spirit, Vermeersch recently found that the account for October 1348 to October 1349 had 36 names with seven crossed out (indicating death), while in the account of 1346–7 only one of 30 names was crossed out. Similarly in a list of 39 annuitants of the deanery of St Bavo running from June 1349 to June 1350, six were given the sign of a cross.<sup>328</sup> Elsewhere, Ypres was one of the few cities in the older literature actually said to have been hit relatively hard by the plague, and recent evidence of a tripling of the number of issue payments between October 1349 and October 1350 in the city accounts corroborates this.<sup>329</sup> As already mentioned, Douai was a city thought to have escaped the Black Death, though a re-examination of the sources by Alain Derville indicated that in these years a third of the city’s aldermen died, as did six out of nine vicars of the college of Saint-Amé. Derville also uncovered further information for Lille showing that in the hospital of St Saveur, more than two-thirds of its city debtors and more than a third of its debtors in the rural hinterlands disappeared from records in the period 1349–54.<sup>330</sup> The blaming and burning of Jews in the city accounts of Bavay, dating from 5 August 1349, also does not suggest a modest impact.<sup>331</sup> In St-Omer in 1349, 33 money-changers were said to exist within the city, but in 1352 only 13 remained: a loss of 61 per cent. Just 10 kilometres further east, in the small town of Aire-sur-la-Lys, the amount of escheated property of bastards multiplied by nine in 1350.<sup>332</sup>

322 DeWitte, ‘Archaeological evidence’, p. 65.

323 Maréchal, ‘De Zwarte Dood’, p. 379.

324 Vandeburie, ‘De Zwarte Dood’, p. 299.

325 Maréchal, *De sociale en politieke gebondenheid*.

326 Vandeburie, ‘De Zwarte Dood’, p. 278.

327 Blockmans, ‘Social and economic effects’, p. 839.

328 Vermeersch, ‘De Zwarte Dood’, p. 15.

329 Vandeburie, ‘De Zwarte Dood’.

330 Derville, ‘La population’, p. 524–5.

331 Archives Départementales du Nord, Lille (hereafter ADN), Lille B, no. 10817.

332 Derville, ‘La population’, pp. 523–5.

Although fragmentary, this provides a new picture of plague severity in the initial outbreak: frequently the sources point to at least a 30 per cent loss. This was not the end, however, as the effects of this shock were further enhanced by recurrent severe plague outbreaks across the late medieval Southern Netherlands, contributing to a rather harsh late medieval mortality regime. The abbot of St-Bertin abbey in St-Omer reported in September 1361, for example, that the 'plague attacked day after day causing a great pestilence and mortality'. Between 1357 and 1366, the abbey experienced a decline in communicants of nearly half, from 10,200 to 5,350.<sup>333</sup> Churches in other parishes had similar drops: from 2,500 to 1,200 (St-Denis), from 2,600 to 1,300–1,400 (St-Sépulcre), from 1,800 to 1,000 (St-Aldegonde), and from 3,300 to 1,800 (St-Margueritte).<sup>334</sup> Cities such as Lille had severe afflictions during the outbreak of the late 1360s: the steepest spike in mortality among rentiers came during the period 1368–9. Similarly in Ghent, the number of coffins purchased by the Table of the Holy Spirit of St Nicholas Church increased substantially during both plague periods of 1361–2 and 1367–8 to six and 11, respectively, from effectively one per year (and often none at all) in normal times.<sup>335</sup>

Many cities showed signs of exceptionally severe mortality during the plague of 1400–1: a general phenomenon seen everywhere in the Low Countries. The hospital of St-Jean at Arras buried 246 bodies from 1 October 1399 to 30 September 1400, while from 1371–3 they had buried no more than 50 per year. The plague in 1414–15 also raised burials to around 250. In Mons, the accounts from St Jan Baptist's 'great alms' show 438 coffins purchased in 1400–1, compared to an annual non-plague average of roughly 50.<sup>336</sup> The number of new wills reached a peak in 1400 at Douai. In nearby Tournai, 339 wills were found for the year 1400, while a normal year never saw more than 80.<sup>337</sup> The amount of goods that bastards passed to their lords after death and the number of mortmain payments increased substantially in the cities of Sluis, Courtrai, and Bruges in the years 1400–1, as well as in smaller towns such as Geraardsbergen and Aalst. Serious plagues continued intermittently throughout the fifteenth century too. A significant outbreak struck in the late 1430s in the Southern Netherlands (though, as noted later, coupled with famine conditions), where documents that recorded possessions coming into the hands of the duke show that one in three bastards died in Bruges at this time. This plague period also caused exceptionally high mortality in Tournai and Arras: with the number of new wills rising to 328 in 1438 (from an annual average of close to 50) in the first case, and the burial of 802 bodies in 1438–9 in the second case—a significant leap from the 46 pits dug when the situation normalized in the 1440s.<sup>338</sup>

Our newly compiled database of mortmain accounts further validates the above findings. It provides an excellent source of mortality information from the county of Hainaut for the Black Death and subsequent plagues (25,610 individuals in total for the period 1349–1450).<sup>339</sup>

333 Bled, Haignéré, and Dewitte, eds., *Les chartes de Saint Bertin*, vol. II, no. 1710.

334 Derville, 'Le nombre d'habitants', pp. 281–2.

335 Aubry, 'Les mortalités lilloises', p. 333, Stadsarchief Gent, Archief H. Geesttafel van St. Nikolaaskerk, no. 30.

336 Decamps, 'La maladie contagieuse', p. 139, Archives Départementales du Pas-de-Calais, Arras (hereafter ADPdc), Série H-Dépôt: Archives hospitalières déposées (1167–1968), E10 & E13, no. 1.

337 Vandenbroeck, *Extraits analytiques*, vol. I, pp. 47–8.

338 Vangassen, 'De pestepidemieën', pp. 29–32, 61–70, 71–74, ADPdc, Série H-Dépôt: Archives hospitalières déposées (1167–1968), E1, nos. 16–20.

339 Mortmain accounts from ADN, B 12122–12226; Algemeen Rijksarchief Brussel (hereafter ARB), I, 004, 17867–73.

Mortmain— a death fee on possessions, paid to the count by a large subsection of the population— should not be confused with the same legal term used in regions with English, French, or Anglo-Norman juridical authorities, where it instead refers to the alienation of land to the dead hand of the Church.<sup>340</sup> The Hainaut mortmain instead is closer to the English heriot, since both were death duties usually paid in the form of the best live beast or chattel of the deceased. The main difference between the mortmain and the heriot is that heriots were levied on tenants and payable to a manorial lord, while mortmain was levied on a broader range of people who came from an ancestral lineage of servitude, but now enjoyed free status.<sup>341</sup> While heriots targeted a specific socio-economic group and only affected heads of households, mortmain in Hainaut included all men and women who had reached the age of majority, plus some emancipated children in a small number of cases.<sup>342</sup> As table 1 shows, women made up a significant proportion of the total database in the period 1349–1450 (43.7 per cent of the entire database). The average sex ratio was just 1.07:1 when we exclude localities with special local stipulations excluding women.<sup>343</sup> Table 1 also shows that the mortmain sometimes recorded more than one person from the same household: 2.5 per cent of the database were husbands and wives together and 0.7 per cent were siblings. Three groups were exempt: (a) ‘les gens d’origine franche’ (a form of noble status transferred through maternal lineage), (b) ‘les seigneurs haut-justiciers’ (noble judges), and (c) religious professionals.<sup>344</sup> While certain people of high social status were excluded, it did not exclude all high-ranked individuals, as the accounts sporadically record, for example, ‘sire’ and ‘mayor of x’. Mortmain also extended to the poorest in society, even beggars. The wide disparities in the value of the goods impounded as death duty indicate that the source does not represent a narrow subset of society.

**Table 1.** Distribution of mortmain entries, Hainaut, 1349–1450

	Total database		Total without localities with special stipulations	
	%	N	%	N
Male	54.4	13,940	50.8	11,292
Female	43.7	11,200	47.5	10,559
Unknown	1.8	470	1.8	396
Total	n.a.	25,610	n.a.	22,247
Sex ratio		1.16		1.07
Husband-wife entries	2.5	636	n.a.	n.a.
Sibling entries	0.7	195	n.a.	n.a.

Sources: ADN, B 12122–12226; ARB, I, 004, 17867–73.

340 Kittell, ‘Death’, p. 192.

341 Verriest, *Le servage*, pp. 248–50.

342 Benedictow, *Black Death, 1346–1353*, p. 375; Arthur, ‘Black Death’, p. 60. Previous scholars working on the Hainaut mortmain record assumed it was only for heads of household too; Sivéry, ‘La Hainaut’, p. 435; Blockmans, ‘Social and economic effects’, p. 937.

343 We remove the cities of Maubeuge and Bavay where women supporting a child did not pay mortmain; Verriest, *Le servage*, p. 309. Rural localities with a level of female mortmain exclusion were Froidchappelle-Fourbechies, Rousies, Montbliart, Solre-Saint-Géry, Villers, Vaulx, Leval-sous-Beaumont, Acren-Saint-Martin, Rance, Taisnieres, and Vieux-Condé.

344 *Ibid.*, pp. 312–22.

The Hainaut mortmain accounts do, of course, have limitations—for example, delayed or incomplete registration during political upheaval or military activity—yet they allow us to compare deaths in crisis years (that is, plague years) with those in 'normal' years.<sup>345</sup> The source has been used before, notably by Blockmans, but his work was unfortunately based on a dataset from an MA thesis written in the 1950s which contained errors—sometimes recording double entries, and sometimes failing to record more than one person in a line of the document (unsurprising given the erroneous view that the mortmain only recorded heads of household).<sup>346</sup> Sivéry also used mortmain accounts; however, he did not incorporate the accounts for 1350–1, which were kept not in Lille but in the Brussels National Archives.<sup>347</sup> Similarly, in a subsequent article on the 1400–1 plague outbreak, he did not use accounts for September 1400 to September 1401, again kept in Brussels.<sup>348</sup> As a result, these studies understate the severity of plagues, and this current study is the only one to use all available mortmain documents for the Black Death and the plague of 1400–1.

One further methodological issue is that the number of deaths appearing in mortmain accounts was not a direct indicator of death, but could also increase or decrease, depending on the rights of the overlord to take goods after death. For nearby Flanders, for example, Kittell argued that the count of Flanders was able to subject more people to mortmain payment over the second half of the fourteenth century, exploiting a population weakened by persistent plagues and upsurges in conflict.<sup>349</sup> Kittell based her evidence on the changing structure and terminology used in the Flanders mortmain accounts, which were only standardized from the 1370s onwards. This was not the case for Hainaut, however, as the accounts there were standardized from the very first extant records of 1349, with terminology and structure remaining unchanged until after 1500. In Hainaut, subjection to mortmain was passed on through maternal family lineage, and thus the count could not arbitrarily subject more people at random.<sup>350</sup>

A more serious issue is that the number of districts (and thus localities) included in the account fluctuated over time, which was probably caused by expansions and contractions in jurisdictional grip over territory.<sup>351</sup> The map in figure 1 shows the difference between the districts included in 1349 and the larger number included in 1450. Since the number of localities included for the Black Death was relatively low compared to later years, the mortmain provides a minimum impression of plague mortality. The effect of the omitted localities can be demonstrated by comparing trends in figure 2. In figure 2 we can see the total number of people per year paying mortmain (and therefore the number of dead) in Hainaut from 1349 to 1450. Although a mortality spike can be seen in the years 1349–51, the simple total gives the impression that the Black Death was much less substantial than many of the plagues that were to follow. While this could be evidence that

345 Thoen and Devos, 'Pest', p. 28.

346 Blockmans, 'Social and economic effects', pp. 850, 856.

347 Sivéry, 'La Hainaut'. The 1350–1 account is also omitted in Blockmans, 'Social and economic effects'.

348 Sivéry, 'La Peste Noire'.

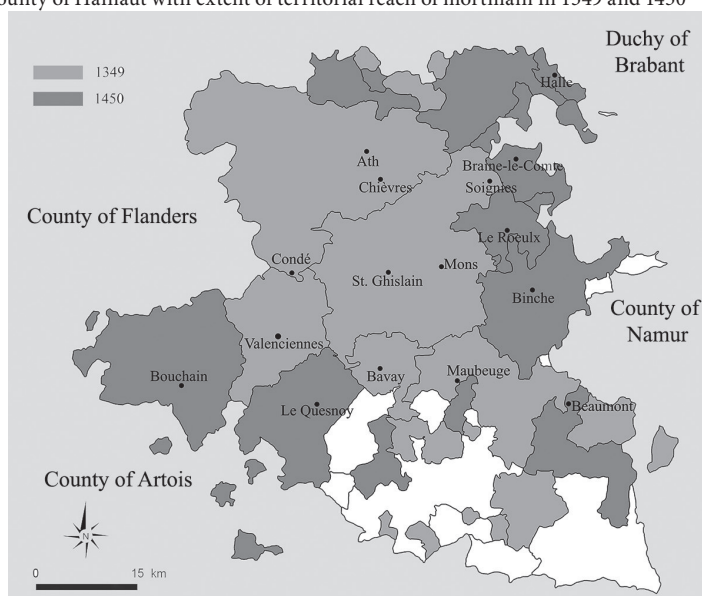
349 Kittell, 'Death', p. 192.

350 Verriest, *Le servage*, pp. 253–66.

351 Certain districts and localities were sometimes leased out by the Count, explaining why they returned to the Count's portfolio some years later. Other lay and ecclesiastical lords also sometimes acquired mortmain rights through alienation and purchase; *ibid.*, p. 289.

the Black Death failed to touch many localities, the more likely reason is that the territorial reach of administering the record was more restricted. Rather than individual localities, whole districts are missing in the earlier records, including Braine-le-Comte, Binche, Halle, Beaumont, and, to a large extent, Valenciennes. One way of dealing with this problem is to include only deaths in localities that are present in the accounts during the Black Death and for the majority of the years to 1450.<sup>352</sup> In the adjusted total in figure 2, the Black Death spike is much closer to the other plague spikes, although it is still lower than in the crises of 1360 and 1401. It must be noted that since the first account starting in June 1349 is in poor physical condition with parts missing or unreadable, approximately 20 per cent of the content is lost. Furthermore, the first account only covers 9.5 months rather than a whole year. Accordingly, figure 2 shows mortmain mortality in 1349 using a multiplier of 1.25 (to cater for the missing 20 per cent of information) and 1.26 (to cater for the missing months). The issue of missing manuscript information does not affect any other year up to 1450, although we have used multipliers for all other years where the account was not equivalent to or exceeded a full year.<sup>353</sup>

**Figure 1.** County of Hainaut with extent of territorial reach of mortmain in 1349 and 1450

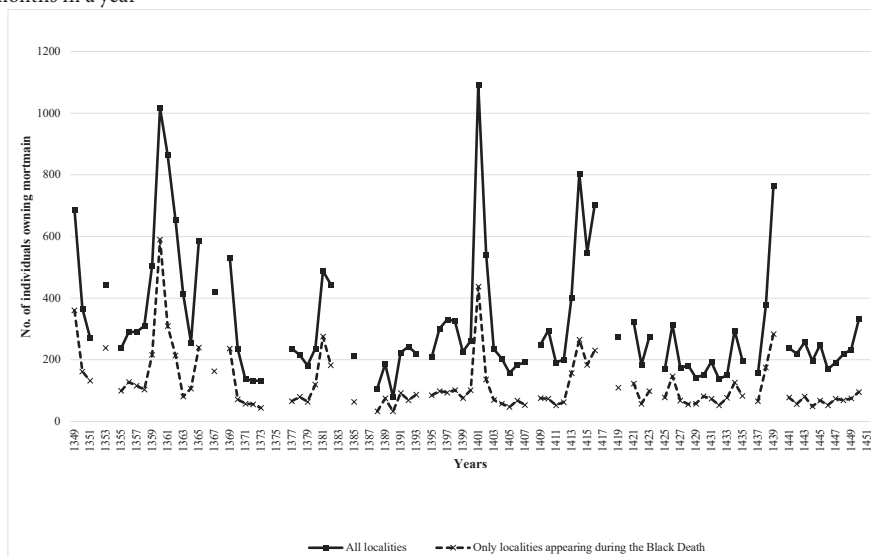


352 This series includes the cities of Ath, Bavay, Maubeuge, Mons, and St-Ghislain, and the villages of Crespin, Cuesmes, Herchies, Horrués, Jemappes, Jurbise, Kieuraing, Lens, Masnuy St Jean and St Pierre, Montignies, Neufville, Quaregon, St-Symphonien, Hon, Hyon, Cambron St-Vincent, and Mainvault. Localities included had to appear during the Black Death and be present for at least 75% of the following years. For rural localities this allows for years when absences simply occur because no mortmain payments were made (many rural localities recorded only one or two names in 'normal' years).

353 Not all accounts extend neatly from 1 Jan. to 31 Dec., but in shortened periods which we combine to make up a year. In the period 1349–99, there were 18 occasions when the combined accounts did not make up an exact year, and in the period 1400–50, there were two occasions. Usually this was only an increase or decrease of a month or less from a full year.



**Figure 2.** Annual mortality based on individuals owing mortmain, Hainaut, 1349–1450, adjusted for missing months in a year



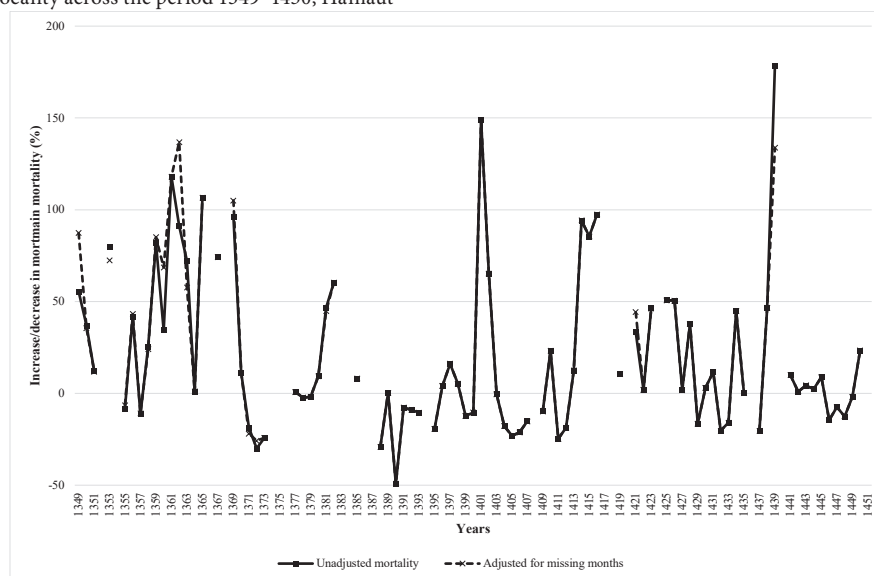
Source: ADN, B 12122-12226; ARB, I, 004, 17867-73.

Sources: ADN, B 12122-12226; ARB, I, 004, 17867-73.

Another approach to plague mortality is to calculate the relative annual percentage change in mortmain against long-term average mortmain figures for the whole period 1349–1450. We calculate for each locality in every year (for which mortmain data are available) the increase or decrease in mortmain deaths as a percentage of that locality's average mortmain deaths for the whole period 1349–1450.<sup>354</sup> An overall average of these local measures is then calculated for every year. Using this methodology, figure 3 reveals a significant Black Death mortality spike, particularly when adjusting for missing months and the physical damage to the manuscript. However, this is still somewhat understated, since larger settlements were hit harder during the Black Death according to the mortmain data (as we show later on in table 2), yet this method weights all localities equally regardless of their size.

<sup>354</sup> We would have preferred to calculate a percentage change from the 'previous years' rate, as used for burial records in Alfani, 'Plague'; followed in Curtis, 'Was plague an exclusively urban phenomenon?'. However, since the dataset only starts in 1349, it is not possible to calculate a 'previous years' figure for the Black Death period.

**Figure 3.** Annual mortality based on increase or decrease (%) from the average number of mortmain per locality across the period 1349–1450, Hainaut



Source: ADN, B 12122-12226; ARB, I, 004, 17867-73.

Sources: ADN, B 12122–12226; ARB, I, 004, 17867–73.

Ultimately, although showing a more severe impact of the Black Death than hitherto believed, even our revised presentation of the Hainaut mortmain data suggests that mortality was lower during the Black Death than later epidemics. However, there are good reasons to believe that the Hainaut figures understate the scale of mortality during the Black Death. Some parts of Europe saw raised mortality as early as 1347–8, but the first mortmain account only survives from June 1349, coinciding with the arrival of the Black Death in the city of Valenciennes.<sup>355</sup> It seems likely that the first extant account, starting on 24 June 1349, was created as a direct consequence of hyper-mortality, and thus misses the initial impact of the Black Death in the region. Counts of deaths in the mortmain during 1348–50 should be considered a lower-bound estimate of mortality.

This is further supported by clear evidence that the administration of mortmain was disrupted during the Black Death. In the accounts for 1350–1 we find a second report of additional deaths for certain localities made by officials other than the original bailiff. This is not encountered in any other document over the following century.<sup>356</sup> In all likelihood, this is due to a change in the local bailiff after the previous incumbent had died or fled—indicative of severe mortality, but also of administrative disruption that may have led to an under-reporting of deaths. In fact, the local administration was probably caught off-guard, since the accounts were probably triggered by the sudden hyper-mortality, disrupting earlier administrative procedures. As plague became a recurring disease, it is likely that the administration found ways to record deaths to a much fuller

355 Sivéry, 'La Hainaut', p. 438.

356 ARB, I, 004, no. 17867.

extent, but the Black Death was a shock without precedent, disrupting the laborious process of selecting and collecting the impounded object, finding a buyer, haggling over its value, auctioning it, and recording the money received.<sup>357</sup> The spike seen in 1353, for example, may simply reflect delayed recording of the mortmain, and therefore be testament to the administrative disruption caused by the Black Death. Disruption is also reflected in the abnormally high ratio of deaths of siblings to deaths of husband–wife couples in 1349. Sibling deaths were typically lower than husband and wife deaths during plague years (from 0.13:1 to 0.6:1, except during 1380–1 when the ratio rises to 1:1 and 1.5:1 respectively), and were never high in non-plague years, yet in 1349 they were 3.67 times more common than husband–wife deaths, much higher than other plague years. Husband and wife deaths were probably under-reported because it was difficult to identify cases in which whole households perished.

Finally, direct comparison between the Black Death and later mortality spikes has to contend with the issue that plague may not have been the sole driver of raised mortality in later years. For example, the mortality spike of 1439 in Hainaut occurred during an extremely cold decade—one of the coldest of the past millennium,<sup>358</sup> leading to a period of famine.<sup>359</sup> Recent research on Dijon has suggested that raised mortality in 1438–40 may in fact have a 'different, possibly waterborne, disease involved' based on the spatial concentration of mortality.<sup>360</sup>

Whatever the size of these effects on our estimate for 1349–51, evidence for extremely severe mortality shocks in 1360 or 1400 cannot be used to infer a 'weak' impact of the Black Death. In fact, what the mortmain records demonstrate is that rather than a 'light touch' of the plague in the Southern Netherlands, the severe outbreak of the Black Death was followed by recurrent serious plagues throughout the fourteenth and fifteenth centuries. The Southern Netherlands faced a harsh late medieval epidemiological regime, not a light one: something that fits much better with our understanding of the region as highly urbanized, densely populated, highly commercialized, and mobile.

The uncertainty over the causes of raised mortality in 1439 leads us to consider a final issue: can we identify a spike in the number of mortmain, or coffins produced, or wills written, as caused by plague? Thoen and Devos argue that due to the paucity of sources, it is not possible to separate late medieval plague from other diseases and causes of mortality.<sup>361</sup> Currently we lack studies identifying the pathogen in late medieval plague outbreaks other than the Black Death (an exception is the identification of *Yersinia pestis* at Bergen-op-Zoom during 'pestis secunda').<sup>362</sup> To address this, we have compared the timing of the major mortality spikes in the Hainaut mortmain database with a database that identifies primary and secondary documentary sources making

357 Kittell, 'Death', p. 191.

358 Camenisch, 'Endless cold'. For the 1430s in a broader European perspective, see Camenisch et al., '1430s'.

359 Derville, *L'agriculture du Nord*, p. 215; Verhulst, 'L'économie rurale', p. 70; Blockmans, 'Privaat en openbaar domein', p. 711.

360 Galanaud, Galanaud, and Giraudoux, 'Historical epidemics'.

361 Thoen and Devos, 'Pest', pp. 20–1.

362 'Pestis secunda' refers to the second plague outbreak of the Second Pandemic that followed the Black Death. Green and Schmid, 'Plague dialogues'; previously (erroneously) identified for the Black Death outbreak: Haensch, Bianucci, Signoli, Rajerison, Schultz, Kacki, Vermunt, Weston, Hurst, Achtman, Carniel, and Bramanti, 'Distinct clones'. On laboratory studies with *Yersinia pestis* findings for the Black Death, see Little, 'Plague historians'; Benedictow, *Black Death and later plague epidemics*, pp. 81–2.

explicit or indirect reference to plague in the Low Countries between 1348 and 1499. A similar enterprise was undertaken by Biraben, but, while particularly thorough for France, his coverage of the Low Countries was unsystematic.<sup>363</sup>

Naturally, caution should be exercised with this kind of data. Many works that refer to plague do not provide unequivocal evidence, but point to a disease of some kind or a mortality crisis that may have been caused by plague. The sources only begin to differentiate explicitly between diseases from the second half of the fifteenth century: good examples are the references to epidemics in the Duchy of Guelders in 1472–3 and 1497–8 as ‘rode loop’ and ‘rood melisoen’ (dysentery) and ‘pokken’ (smallpox) respectively.<sup>364</sup> In Tiel in 1492–3, ‘t rood mimzoen’ (dysentery) is mentioned,<sup>365</sup> and a similar example of ‘louppenden buyck’ (diarrhoea) can be found in 1473;<sup>366</sup> both occurred when many other places in the Low Countries were experiencing plague, indicating that many diseases could also be raging simultaneously. A broader comparative view helps: some sources mention a ‘haestige sieckte’ (rapid sickness), which on its own is vague, if it were not for specific mentions of plague in the same year elsewhere.<sup>367</sup> We categorize references to plague in three ways: quantifiably demonstrable increases in mortality; descriptive mentions of plague in contemporary sources; and descriptive mentions of plague in later sources (for example, chronicles after the epidemic). To be included in our analysis, secondary sources must state where they found the evidence or at least what the evidence represents.<sup>368</sup>

Matching the Hainaut mortality spikes with mentions of plague in medieval Low Countries sources suggests that plague outbreaks occurred in 1349–51, 1358–63, 1368–9, 1380–2, 1400–2, 1413–16, 1425–6, and 1438–9, even if they were potentially coupled with other afflictions, as seen in 1438–9. For 1353, 1364–7, 1390, 1419, 1423, and 1434, there was no documentary evidence of plague, although the disease cannot be ruled out.

### Territorial pervasiveness

In previous literature, most information on plague mortality in the Low Countries has been taken from urban evidence, while the impact of the Black Death in the countryside has been of peripheral interest.<sup>369</sup> This is problematic on three grounds. First, it is widely accepted that the initial Black Death across Europe affected both city and countryside to a severe degree.<sup>370</sup> Second, recent burial register evidence for the early modern period has shown that the countryside of the Low Countries often experienced severe plague epidemics indicated by high rural mortality rates.<sup>371</sup> Third, while previous literature definitively asserted that the Black Death and subsequent plagues of the Second Pandemic were caused by flea bites from infected rats, now there is significant

363 Biraben, *Les hommes*. Noordegraaf and Valk rectified this by creating a database of their own, which, although thorough and citing original sources, began from the year 1450 and was focused on Holland; see Noordegraaf and Valk, *De Gave Gods*, app.

364 van Schaik, *Belasting*, pp. 305–6.

365 Arickx, ‘De armendis’, p. 177.

366 Habets, ed., ‘Chronijk’, p. 43.

367 Other frequent terms include ‘pestilientiaele siecte’ (pestilential sickness), ‘heete siecte’ (hot sickness), and ‘gave gods’ (the gift from God).

368 The exact places and sources in the dataset can be found in the appendix to chapter three.

369 Noordegraaf and Valk, *De Gave Gods*, p. 49.

370 Benedictow, *Black Death*, 1346–1353, p. 298.

371 Curtis, ‘Was plague an exclusively urban phenomenon?’.

unresolved debate about the nature of the precise vectors and modes of transmission involved.<sup>372</sup> Recent literature highlights plague's capacity to kill people in close confinement,<sup>373</sup> and therefore suggests the potential for human-to-human transmission, whether through a vector (human flea or louse) or even directly.<sup>374</sup> Whatever the reality, the reduced emphasis on the rat as sole vector<sup>375</sup> also legitimizes the view that plague was capable of spreading into rural, even isolated, environments—perhaps even originating in rural environments from a prior enzootic phase, and set off by certain climatic or ecological changes.<sup>376</sup> In the Southern Netherlands, the likelihood of plague spreading to (or from) the countryside was high, given that distances between villages and towns were small, rural population density was high, and movement and interaction between urban and rural people was easily facilitated in a commercialized environment that was also subject to frequent military conflict.

Nicholas was one of the first scholars to find an explicit reference to rural plague mortality during the Black Death. The *Acta Capituli Sancti Donatiani* (Chapter Act-Books of St Donatian's Cathedral), from 30 September 1350, referred to exceptionally low tithe revenue.<sup>377</sup> As Vermeersch has shown, further systematic use of the source can demonstrate abnormally high rural mortality. The canons played an important role in appointing parish priests in Bruges and its surrounding rural hinterlands, and the *Acta Capituli* of 1349 contains appointments for rural parishes left vacant. In September 1349, a new parish priest was appointed for numerous villages, including Sint-Kruis, Uitkerke, Loppem, Sint Willibrord, Middelkerke, Blankenberge, Dudzele, and Sint-Jacobskapelle, while in Diksmuide both the parish priest and chaplain of the Beguine chapel died. In October 1349, the parish church of Dudzele was in need of a new priest again, just one month after installing the previous incumbent. At the end of September 1349, the demand for new priests was so high that there were too few to fill the vacancies.<sup>378</sup> The accounts of the *Officie van den Brode en van de Foraniteit* (an institution responsible for providing food and shelter for inhabitants of the chapter) for the years 1348 and 1352 are another indicator for rural mortality in the areas around Bruges. This charitable institution was funded by *cijnsrechten* (a form of tithe) on property in Bruges and its rural hinterlands. Of the 13 tithe holders in 1348 from the villages of Uitkerke, Varsenare, Houthave, Moerkerke, and Zuienkerke, only nine remained in 1352. The complete account including parishes in Bruges shows that 28 out of 80 tithe holders disappeared between the same years.<sup>379</sup>

Two rural villages in Walloon Flanders that unusually have household counts for just before and just after the Black Death experienced contractions of 25 per cent and 18 per cent between 1347 and 1351.<sup>380</sup> Such a decline is corroborated for a few select Hainaut villages that were also

372 On this debate, see Bolton, 'Looking for *Yersinia pestis*'; Green, 'Editor's introduction'.

373 Cohn and Alfani, 'Households'; Whittles and Didelot, 'Epidemiological analysis'; Alfani and Murphy, 'Plague'; Curtis and Roosen, 'Sex-selective impact'.

374 Huffhammer and Walloe, 'Rats'; Cohn, 'Epidemiology'; Walloe, 'Medieval and modern bubonic plague', p. 71; Ayyadurai, Sebbane, Raoult, and Drancourt, 'Body lice'; Welford and Bossak, 'Body lice'. This issue is unresolved.

375 The literature now asserts a broader range of potential mammalian and flea vectors; Carmichael, 'Plague persistence', pp. 159–60.

376 This is in line with a narrative suggested in Campbell, *Great Transition*.

377 Nicholas, 'Economic reorientation'.

378 Vermeersch, 'De Zwarte Dood', p. 17–18.

379 *Ibid.*, pp. 18–19.

380 Calculated from Bocquet, *Recherches*, p. 37.

able to give pre-Black Death hearth figures. The three villages of Pont-sur-Sambre, Forest-en-Cambrésis, and Louvignies-Quesnoy lost 27 per cent, 60 per cent, and 58 per cent of their hearths, respectively, between 1286 and 1365,<sup>381</sup> even if we concede that this gap between dates includes the famine of 1315–17 and the second plague outbreak of 1358–63, and take into account the methodological challenges regarding hearth counts already described above. In other source material, the mortality rate for farmers in the surrounding rural hinterlands of Cambrai, as tenants of the chaplains of Notre Dame Cathedral, was more than a third in the mid-fourteenth century.<sup>382</sup>

Plague outbreaks continued to affect the countryside in intermittent stages throughout the fourteenth and fifteenth centuries too. Previous literature has downplayed the rural spread of the outbreaks in many parts of Europe after the initial outbreak of the Black Death in many parts of Europe. William Naphy and Andrew Spicer state, for example, that ‘the second outbreak and subsequent plagues differed [from the Black Death] in that it was more confined to urban areas’ and ‘subsequent outbreaks tended to be localised in population centers’.<sup>383</sup> The Hainaut mortmain database does not support this view for the Black Death, however, since the urban–rural ratio of mortmain mortality was high during certain years of the Black Death.<sup>384</sup> The figure of 0.92:1 in 1349, for example, was the fifth-highest out of all years from 1349 to 1450, and was much higher than the average urban–rural ratio for all years (0.49:1) calculated in table 2.<sup>385</sup>

For the later plagues, the Hainaut data partially support the view that plague mainly affected towns. For example, the only time in the period 1349–1450 when the urban–rural mortality ratio rose above 1:1 in absolute numbers was during the plagues of 1360, 1380, and 1425, and table 2 shows that the urban–rural ratio in mortmain deaths was generally higher during plagues than in non-plague years (0.54:1 compared to 0.45:1). However, there was not a simple chronological development from more universal to more territorially restricted outbreaks. Table 2 shows that in several plague years, such as 1361–2, 1369, and 1415–16, mortality was relatively more severe in rural areas than in cities, compared to the norm. Indeed, when employing the same methodology already used for figure 3, where mortmain figures are calculated as a percentage increase or decrease in the average for the whole period 1349–1450, table 3 shows that many recurring plagues

381 The count of 1286 from Devillers, ed., *Cartulaire*, the count of 1365 from ADN, B, no. 1586.

382 Derville, ‘La population’, p. 524.

383 Both quotations from Naphy and Spicer, *Plague*, pp. 34–5. For a similar view, see Scott and Duncan, *Biology of plagues*, pp. 102, 113.

384 Hainaut cities in the database were Ath, Soignies, Maubeuge, Bavay, Chimay, Avesnes, Landrecies, Busigny, Caudry, Bouchain, Le Quesnoy, Condé, St Ghislain, Chièvres, Mons, Leuze, Lessines, Le Roeulx, Braine-le-Comte, Enghien, Halle, and Flobecq. Valenciennes did not appear in the mortmain. Cities were distinguished from the countryside by only including so-called ‘bonnes villes’ (the richest localities, usually fortified) not subject to the fiscal hearth count. Hearth counts were only conducted in the countryside, and thus any locality in the mortmain that was also in the hearth count was rural; Arnould, *Les dénombrements de foyers*, pp. 67–8.

385 The urban–rural ratio only surpassed 1:1 three times (in 1360, 1381, and 1425), partially due to greater urban exclusion from mortmain assessment, but also as more people in late medieval Hainaut were still resident in the countryside.

were territorially pervasive.<sup>386</sup> That is to say, high proportions of rural localities during plague periods were displaying increases in mortmain that were 50 per cent higher than their 1349–1450 average.

**Table 2.** Urban–rural mortality ratios in plague years, Hainaut, 1349–1450

Urban-rural mortality summary					
	Urban (n)		Rural (n)		Urban-rural ratio
All years 1349-1450	8,385		17,225		0.49
Plague years	4,238		7,913		0.54
Non-plague years	4,147		9,312		0.45
p-value	≤0.0001				
Urban-rural mortality for individual plague years					
Plague year	Urban-rural ratio	Plague year	Urban-rural ratio	Plague year	Urban-rural ratio
1349	0.92	1363	0.80	1413	0.65
1350	0.52	1369	0.32	1414	0.50
1351	0.72	1380	0.85	1415	0.32
1358	0.51	1381	1.05	1416	0.43
1359	0.36	1382	0.28	1425	1.25
1360	1.10	1400	0.97	1426	0.34
1361	0.41	1401	0.70	1438	0.53
1362	0.16	1402	0.51	1439	0.44

Note: p-value calculated through a Chi-squared test; it is from a comparison of the 'Urban' and 'Rural' categories and between the 'Plague years' and 'Non-plague years' groups, and is highly significant.

Sources: ADN, B 12122–12226; ARB, I, 004, 17867–73.

**Table 3.** Share of localities with raised mortality during plague years in Hainaut, 1349–1450

Plague years	Urban		Rural	
	%	n	%	n
1349-51	50	2	55.7	39
1358-63	70	7	75.5	80
1368-9	62.5	5	54	27
1380-2	55.6	5	45	36
1400-2	90.9	10	72	72
1413-1416	83.3	10	80.7	88
1425-6	50	4	37	20
1438-9	77.8	7	74.7	59

Sources: ADN, B 12122–12226; ARB, I, 004, 17867–73.

386 Each locality's mortmain was compared to the average mortmain rate for the whole period 1349–1450, rather than against the 'previous years' rate calculated for early modern burials in, for example, Alfani, 'Plague'; Curtis, 'Was plague an exclusively urban phenomenon?'; Alfani and Ó Gráda, eds., *Famine*. This was due to the lack of data for calculating a 'previous years' rate for the Black Death, and too many gaps in the series for individual (especially rural) localities considered in isolation—where some localities are excluded entirely on the basis of having too few annual mortmain deaths. By using this method, the estimates for territorial spread may be pushed downwards, since general population movements play a greater role in calculating the 1349–1450 average than when calculating the 'previous years' average.

Other sources also show that later plagues spread into the countryside in the Southern Netherlands. Rural tenant farmers of Notre Dame Cathedral in Cambrai died in significant numbers in the outbreaks of 1360–2 and 1368–9: roughly 33 per cent of those listed in 1360–2 (equivalent to the death rate among the chaplains resident in the city), and 25 per cent of those listed in 1368–9 (exceeding the 10 per cent death rate for the cathedral chaplains).<sup>387</sup> In the rural Land van Waas during the outbreak of 1368–9, domain accounts of the castle of Beveren show the death of 12 servants, when the usual number in the previous and following years was three to six. In the village of Petegem in inland Flanders, there was a clear peak in the receipt of death duties during the 1368–9 outbreak, increasing to 13 between June 1368 and June 1369, from an average of four over the previous and following years.<sup>388</sup> The village of Beuvry in Artois in the plague year of 1368 saw its number of ‘reliefs’ shoot up to 163, a substantial increase from a normal annual average of around eight, and, according to Derville, 40 per cent of the adult population died in 166 days.<sup>389</sup>

### An urban bias

We argue that the Black Death was more severe in the Low Countries, and particularly the Southern Netherlands, than previously accounted for. Serious plagues continued to occur throughout the rest of the late middle ages, establishing a harsh plague regime. These plagues were sometimes territorially pervasive, affecting the countryside.<sup>390</sup> The question then arises as to why we have established a different view from that entrenched within the historiography of the ‘light touch’ of plague in the Low Countries.

Part of the reason for the ‘light touch’ view perpetuating itself over such a long time is connected to the limitations of the sources mentioned in section I. However, the contrast between the historiography and our view also stems from previous overemphasis on cities and particular types of source information. The problem is that mortality crises become less traceable from urban population data since cities had a distinct and different demographic regime to that of the countryside. It is widely accepted now that serious epidemic diseases causing mortality shocks in the late medieval and early modern period decimated cities, but these losses were frequently exhibited over the short term. Urban populations replenished themselves through inward migration from the rural hinterlands.<sup>391</sup> Accordingly, some scholars have used stable or even rising urban population figures as evidence for the weak impact of the plague,<sup>392</sup> yet this may be an index for rapid and full rural–urban migration that hides the mortality effect.<sup>393</sup>

387 Derville, ‘La population’, pp. 525–7.

388 Vangassen, ‘De pestepidemieën’, p. 8, ARB, De Nelis, nos. 51–60.

389 Derville, ‘La population’, p. 526.

390 ‘Territorially pervasive’ is a term first introduced in Alfani, ‘Plague’, p. 408.

391 Alfani, ‘Plague’; Voigtländer and Voth, ‘Three horsemen of riches’.

392 For example, the figures for Leiden given in van Bavel and van Zanden, ‘Jump-start’, pp. 507, 529–30. For Flanders more generally, see van Bavel, *Manors and markets*, p. 280. For Bruges, see Murray, *Bruges*, pp. 86, 106. For fast population recovery, increased urbanization, and weak Black Death logic, see Pamuk, ‘Black Death’, pp. 305, 308; Christakos et al., *Interdisciplinary public health reasoning*, pp. 222–223, 242–243.

393 On this migration process as a component of post-plague urban resilience, see Stabel, ‘Working alone?’, p. 40; Dumolyn, ‘Population’, p. 63.



Although migration is hard to document empirically for the middle ages, there are also some signs that the Black Death helped stimulate rural–urban migration in the Southern Netherlands. One agreement drawn up between the coastal town of Nieuwpoort and Furnes-Ambacht on 3 April 1350 explicitly mentions that recent plague mortality had caused inhabitants to move from the villages of Leke and Klerken to the town.<sup>394</sup> City-dwellers fleeing to the countryside helped expose rural people to the disease,<sup>395</sup> and on numerous occasions in 1350 we see former residents called back to their town of residence by urban governments on pains of punishment.<sup>396</sup> In Bruges, the urban government tried to curtail immigration in the wake of the Black Death by imposing higher entrance fees (*poortersgeld*), especially for 'foreigners' or non-Flemings.<sup>397</sup> This acted as only a moderate deterrent for immigration since migrants did not need to become burghers simply to live in the city.<sup>398</sup> Yet despite understating rural–urban migration, registrations of new burghers do reveal mass mobility in the wake of the Black Death: in Lille the number of new burghers in the years 1350–1 exceeded 200 (the overwhelming majority through purchase rather than birth), and yet only on six other occasions between 1327 and 1370 did the number ever go above 100, and in no other year did it exceed 150.<sup>399</sup> There were a number of conditions within the Southern Netherlands that facilitated post-plague rural–urban migration. By the time of the Black Death, commercial connections between city and countryside were already strong, as market-orientated peasants from inland Flanders, for example, came to the cities to sell their surpluses.<sup>400</sup> Furthermore, there were few institutional impediments to the migration of people towards the cities in the mid-to-late fourteenth century, at least not from the rural side. While in some parts of Europe, manorial or seigniorial lords tried to keep their tenants rooted to their localities (often without success), leading in some places to rather extreme labour legislation,<sup>401</sup> the weaker grip of feudal coercion in the Southern Netherlands by the fourteenth century paved the way for freer movement of rural people.<sup>402</sup> Finally, even with plague mortality in the countryside, there were enough rural inhabitants prior to the Black Death to serve as a reservoir for urban replenishment. The countryside in inland Flanders, for example, was perhaps the most densely populated in the whole of western Europe, perhaps rivalled only by the *Contadi* of the Tuscan towns.<sup>403</sup>

394 Vermeersch, 'De Zwarte Dood', p. 18.

395 Noordegraaf and Valk, *De Gave Gods*, pp. 47–8.

396 Vermeersch, 'De Zwarte Dood', pp. 97–8.

397 *Ibid.*, p. 102.

398 Blockmans et al., 'Tussen crisis en welvaart', p. 52.

399 Desportes, 'Réceptions', p. 556.

400 Thoen, 'Commercial survival economy', p. 120.

401 Cohn, 'After the Black Death'.

402 van Bavel, *Manors and markets*, pp. 211–12.

403 See the comparisons made in van Bavel, 'Markets', pp. 504–5; Curtis, 'Florence'.

## Conclusion

Although the fanciful notion that the urbanized and commercialized areas of the Southern Netherlands managed to avoid the worst excesses of the plague is no longer maintained, the literature has still downplayed its overall severity in the late medieval Low Countries, particularly for the initial Black Death. The perpetuation of the story of the 'light touch' of the plague in the Low Countries has not just gained general acceptance,<sup>404</sup> but has in fact been a component of some of the most important recent explanations for the social and economic efflorescence of parts of the Low Countries in the transition from the late middle ages to the early modern period, and the relative ease with which it recovered its population, even if this is viewed as working in tandem with other endogenous processes.<sup>405</sup> Our re-evaluation of the basic empirical 'fact' of a 'light touch' of plague in the Low Countries, and the Southern Netherlands in particular, has indirect consequences for how we explain the rapid and full recovery of the population. In fact, this overall recovery may have been overstated, with the true picture being obscured by resilient urban settlements taking in migrants from increasingly decimated rural areas: the Low Countries did not necessarily recover its population to a greater degree than elsewhere; it experienced a greater degree of rural–urban migration. Yet even if the rapid and full demographic recovery story is correct, this was most likely connected to the endogenous processes of recovery itself, rather than the chance 'good fortune' of experiencing weaker exogenous biological shocks. Instead of reduced mortality, one explanation may be a high fertility regime: the consequence of high real wages and low ages of marriage in the post-Black Death era.<sup>406</sup>

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404 Benedictow, *Black Death, 1346–1353*; Slack, *Plague*.

405 van Bavel and van Zanden, 'Jump-start'; van Bavel, *Manors and markets*.

406 de Moor and van Zanden, 'Girl power', pp. 16–17; Carmichael, de Pleijt, de Moor, and van Zanden, 'European marriage pattern', p. 201.





# 4

## The sex-selective impact of the Black Death and recurring plagues in the Southern Netherlands, 1349–1450<sup>407</sup>

*Co-authored with Daniel R. Curtis*

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## Abstract

Although recent work has begun to establish that early modern plagues had selective mortality effects, it was generally accepted that the initial outbreak of Black Death in 1347-52 was a “universal killer.” Recent bioarchaeological work, however, has argued that the Black Death was also selective with regard to age and pre-plague health status. The issue of the Black Death’s potential sex selectivity is less clear. Bioarchaeological research hypothesizes that sex-selection in mortality was possible during the initial Black Death outbreak, and we present evidence from historical sources to test this notion. We present a newly compiled database of mortality information taken from mortmain records in Hainaut, Belgium, in the period 1349–1450, which not only is an important new source of information on medieval mortality, but also allows for sex-disaggregation. We find that the Black Death period of 1349–51, as well as recurring plagues in the 100 years up to 1450, often had a sex-selective effect, killing more women than in “non-plague years”. Although much research tends to suggest that men are more susceptible to a variety of diseases caused by bacteria, viruses and parasites, we cannot assume that the same direction of sex-selection in mortality applied to diseases in the distant past such as Second Pandemic plagues. While the exact reasons for the sex-selective effect of late-medieval plague are unclear in the absence of further data, we suggest that simple inequities between the sexes in exposure to the disease may not have been a key driver.

## Introduction

Recent literature has begun to establish that early modern plagues did not kill indiscriminately but had elements of selectivity in their mortality effects.<sup>408</sup> For example, a number of studies over the years have suggested that from the fifteenth century onwards, plague acquired a “social character” with a preference for striking the poor.<sup>409</sup> However, this was not a unilinear process: the last great plagues of the seventeenth century in Italy returned to indiscriminately killing rich and poor alike.<sup>410</sup> Other works have combined to suggest that recurring late-medieval plague outbreaks killed children to a higher degree than adults<sup>411</sup>—although not something that has been met with entire consensus.<sup>412</sup> This stands in contrast to the first plague of the Second Pandemic, the Black Death of 1347–52,<sup>413</sup> which has been presented as a “universal killer”<sup>414</sup>—likely testament to its high mortality rates. In recent years, however, bioarchaeological investigation has suggested that the Black Death may also have been selective in its mortality effects, particularly with regard to age and pre-existing health status.<sup>415</sup>

The notion that plagues of the Second Pandemic selected by sex, however, has had far less confirmatory evidence. A few works have suggested that early modern plague led to more female deaths than male, mainly from those relying on documents.<sup>416</sup> By contrast, early pioneering work in a parish of early modern London suggested that male mortality outweighed female in the outbreaks of 1592–3, 1603 and 1625, citing differences in occupation and hygiene.<sup>417</sup> More commonly, however, both older and more recent studies have generally suggested that the disease did not clearly discriminate by sex.<sup>418</sup> For the Black Death, bioarchaeological research has suggested much the same: the excavation of skeletons from a plague burial site (298 individuals) and a pre-Black Death “normal” burial site (194 individuals) revealed no kind of sex-discrepancy in mortality<sup>419</sup> (though the protocol used is not the same one applied in this article for calculating sex ratios in mortality). In a later publication, these findings were supplemented, however, with new evidence.<sup>420</sup> In the plague burial site, Black Death excess mortality was higher for males

408 Alfani and Murphy, ‘Plague and lethal epidemics’; Whittles and Didelot, ‘Epidemiological analysis’.

409 Carmichael, *Plague and the poor*; Cohn, *Cultures of plague*; Slack, *The impact of plague*.

410 Alfani, ‘Plague in seventeenth-century Europe’; Alfani & Murphy, ‘Plague and lethal epidemics’, pp. 325–6.

411 Galanaud and Galanaud, ‘Femmes et enfants dijonnais’; Höhl, *Die Pest in Hildesheim*, p. 299; Razi, *Life, marriage and death*, p. 134.

412 Carmichael, *Plague and the poor*, pp. 90–3.

413 This article follows the convention of referring to the first plague of the Second Pandemic that occurred in the period 1347–52 as “the Black Death” and all other later medieval plagues from that point onwards as recurring plagues; in line with the recent Alfani and Murphy, ‘Plague and lethal epidemics’.

414 Margerison and Knüsel, ‘Paleodemographic comparison’; Naphy and Spicer, *Plague*.

415 DeWitte, ‘Age patterns of mortality’; DeWitte and Hughes-Morey, ‘Stature and frailty’; DeWitte and Wood, ‘Selectivity of Black Death mortality’.

416 Ell, ‘Three days in October’; Frandsen, *The last plague*, pp. 358, 370; Pérez Moreda, ‘La peste de 1647–57’; Zapnik, *Pest und Krieg*, p. 241. Also including bioarchaeologists that have used documents: Signoli, Séguy, Biraben, and Dutour, ‘Paleodemography and historical demography’.

417 Hollingsworth and Hollingsworth, ‘Plague mortality rates’.

418 Alexander, *Bubonic plague*, pp. 258–9; Alfani and Murphy, ‘Plague and lethal epidemics’; Bradley, ‘The most famous’; Höhl, *Die Pest in Hiedelsheim*, p. 302; Jirková, ‘Plague year 1680’, p. 227; Schofield, ‘An anatomy of an epidemic’; Whittles and Didelot, ‘Epidemiological analysis’, p. 6.

419 DeWitte, ‘The effect of sex’.

420 DeWitte, ‘Sex differentials’.

with osteological stress markers than females. Nevertheless, this could still suggest two different outcomes. On the one hand, the higher amount of burials of men with stress markers could mean that prior physiological stress increased the risk of death during the Black Death for men to a greater extent than women. On the other hand, lower excess mortality of women with stress markers may mean the Black Death was killing more otherwise healthy women than healthy men. More evidence is needed to confirm the most convincing interpretation.

There are a number of reasons why our knowledge in this field remains restricted. First, for the early modern plagues, the sample sizes are often not large enough to make strong claims. Sex ratios in mortality needs more data to reveal general patterns than studies of individual cities can provide, especially given that the differences in the ratios are often small. Second, for the medieval period, the amount of documentary source material to reveal mortality information, let alone sex- disaggregated mortality information, is very limited. Many of the documents that medieval demographers have used relate only to male mortality or male heads of household—especially if they are reliant on fiscal or census sources. Even when such information is available, it tends to be for very restricted localities or time periods. Accordingly, research into the selectivity of plague in the medieval period has been dominated by bioarchaeologists. The pioneering work of Sharon DeWitte and associates has advanced our understanding of many facets of the medieval disease environment immensely. However, the third problem we identify is that some bioarchaeological approaches have potential accuracy issues with determining sex of skeletons. For example, DeWitte notes for the East Smithfield cemetery excavation that they determined sex from dimorphic features of the skull and pelvis, yet other studies “have demonstrated that the accuracy of these individual traits [in skull and pelvis], or combinations thereof, for the purpose of sex determination ranges from 68% to over 96%.”<sup>421</sup> Potential inconsistencies in accuracy could be dangerous when one considers the limited samples only focused on one outbreak of plague in one burial site, and exacerbated when differences in sex ratios in mortality tend to be quite small anyway—although it must be noted that those recent studies using only reliable methods based on pelvic dimorphism (a >95% reliability in sex determination) have not revealed an excess of females in several plague cemeteries.<sup>422</sup> A fourth problem is understanding whether sex differentials in mortality during plagues were the result of inherent vulnerabilities to the disease itself, or instead caused by inequalities in exposure—a challenge in the absence of population figures.<sup>423</sup> For example, in one case in a series of plagues in Milan between 1452 and 1523, a higher mortality rate was noted for women, which was attributed to poor and overcrowded living conditions for female immigrants.<sup>424</sup> That is to say were more women dying here simply because more women lived here? This is a pressing point because most literature nowadays suggests that from the late Middle Ages onwards, urban environments tended to have more women, while rural ones had more men, a process sharpening in the transition to the early modern period.<sup>425</sup> This fourth problem then provides two separate challenges: first, we need to be able to separate rural and

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421 DeWitte, ‘Sex differentials’, p. 289.

422 Castex and Kacki, ‘Demographic patterns’.

423 Carniel, ‘Plague today’.

424 Cohn and Alfani, ‘Nonantola 1630’.

425 Bardsley, ‘Missing women’; Kowaleski, ‘Singlewomen’.



urban trends in sex ratios in mortality, and second we need to find long series of data to place plague mortality sex ratios within a broader context of “normal” sex ratios.

In this article we address all five challenges outlined above—small sample sizes, lack of medieval documentation, limitations to the bio-archaeological investigations, lack of systematic separation between urban and rural environments, and lack of chronological depth—to help us understand to a greater degree the potential sex selectivity of medieval plague. Building upon the pioneering bioarchaeological work of DeWitte, we offer a newly compiled database of documentary sources to follow up on the stimulating hypotheses she posed. Given the absolute scarcity of documentary evidence to furnish quantifiable indicators for mortality across large areas in much of the fourteenth- and fifteenth centuries (before the systematic recording of births, marriages and deaths in the parish registers from the mid-sixteenth century onwards), we are fortunate to have a new dataset of 25,610 individuals from mortmain registers in Hainaut, a region of southern Belgium, across a long time period of 1349–1450.<sup>426</sup> While bioarchaeological investigations have often had to use different cemeteries for pre-Black Death and Black Death data,<sup>427</sup> or compared archaeological data with attritional and catastrophic mortality,<sup>428</sup> this source allows us to look at the same localities over time (though unfortunately not for the pre-plague period). The added value of this dataset is that the mortality information allows for specifically sex-disaggregated data—highly unusual for late-medieval Europe. Furthermore, as we go on to show later in the article, the recording process seemed to offer no intrinsic biases with regard to sex of the dead—that is to say, the source does not appear to have structurally discriminated against the recording of women.

## Material and methods

This section is divided into two. First, we discuss the source, its potential and limitations, and how we employ it for the purposes of revealing more about the potential sex-selective nature of the Black Death and recurring plagues up to 1450. Second, we discuss how we identify the plagues—the Black Death may be obvious, but for the recurring plagues it is not straightforward.

### *Employment of the mortmain database*

Mortmain accounts are similar to heriot taxes found in England in two distinct ways. First, they were paid as a death duty, and second, payment was usually in the form of the best movable possession of the deceased. However, unlike the mortmain, heriots were levied on tenant holdings and not on individuals. Accordingly, heriots indicate the death of the head of a household,<sup>429</sup> usually older and male, not only leading to an overall underestimation of mortality,<sup>430</sup> but also problematic for the purposes of calculating sex-selection in mortality. Previous scholars

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426 We use mortmain accounts from Archives Départementales du Nord, Lille, B, pp. 12122–12226; National Archives of Belgium, Brussels, I, 004, pp. 17867–73.

427 DeWitte, ‘The effect of sex’. Though skeletal series for the same city compared in: Waldron, ‘Are plague pits’.

428 Castex and Kacki, ‘Demographic patterns’; Gowland and Chamberlain, ‘Detecting plague’.

429 Arthur, ‘The Black Death and mortality’, p. 60.

430 Benedictow, *The Black Death, 1346-1353*, p. 375.

confused the Hainaut mortmain records for heriots, which can explain why those that made use of the source in the past failed to record more than the (presumed) head of household in a line.<sup>431</sup> Mortmain was not just paid by tenant heads of households but by a large group of people coming from a lineage of servitude who now enjoyed free status.<sup>432</sup> It is important to note that the mortmain did not just record women “heads of household” who were widowed, but recorded women who had died even when their husband was still alive, and furthermore, when women were widowed their status was specifically mentioned as such, which contrasted with other indications of marital status such as “wife of *x*” (ADN B 12178, fo.5r). This guards against a view that women found in the mortmain may have been at a disadvantage compared to men,<sup>433</sup> and removes a potential selection bias in the data.

Overall, from the whole database across the period 1349–1450, there were 25,610 deaths recorded. The vast majority of these names were adults and subadults—that is to say the mortmain does not systematically record children. This is because the mortmain applied to all men and women who had reached “age of majority,” and in the Southern Netherlands this was generally quite high—anything between 18 and 25 years.<sup>434</sup> A proportion of the database (1.8%) were not identifiable as male or female (and thus excluded from the calculation of sex ratios in mortality), and given that they often came with the note “child of *x*,” it would be reasonable to assume that they were the few children that managed to appear in the record. Even these were not all children, however, but often simply adults or subadults still living in the same household as their parents and explicitly indicated as being of legal age to purchase the impounded goods from their deceased parent/s (ADN B 12178, fo. 6v). Overall then, we know that 98.2% were almost definitely adults or subadults. Accordingly, the mortmain can only be used to assess the sex-selective effect of plagues on adult and subadult mortality. Although it would be preferential to separate sex-selective mortality into various age brackets, since some previous works have suggested that the sex ratio of plague victims varied according to age,<sup>435</sup> the mortmain does not provide us with the exact ages of the dead.

If we take the whole database from 1349 to 1450 we acquire an average sex ratio in mortality of 1.25:1.<sup>436</sup> However, some select localities had special stipulations leading to an under-assessment of women in the database. Maubeuge was removed because women with children were not included in this city’s assessment,<sup>437</sup> and this decision is corroborated by its average sex ratio in mortality of 4.31:1—quite anomalous to the rest of the database. A few rural localities were also excluded from the overall database, for they deviated from the general rule of including all men and women (as described above), and had a bias towards men for a specific reason.<sup>438</sup> An example of one of

431 Blockmans, ‘Social and economic effects’; Sivéry, ‘La Hainaut et la Peste Noire’.

432 Verriest, *Le servage*, pp. 248–50. For nearby Flanders: Kittell, ‘Death and taxes’.

433 On the relatively poorer position of single females in medieval and early modern Europe: Bennett and Froide, eds., *Singlewomen*. A more positive view in: Devos, De Groot, and Schmidt, *Single life*.

434 Howell, *The marriage exchange*, p. 108; Verriest, *Le servage*, pp. 305–6.

435 Hollingsworth and Hollingsworth, ‘Plague mortality rates’; Ell, ‘Three days in October’. Other works did not find this. For a synthesis: Alfani and Murphy, ‘Plague and lethal epidemics’, pp. 323–4.

436 A sex ratio of 1:1 is equal parity in proportion of males and females dead.

437 Verriest, *Le servage*, p. 309.

438 *Ibidem*, p. 308. These localities were Froidchapelle-Fourbechies, Rousies, Montbliart, Solre-Saint-Ge’ry, Villers, Vaulx, Leval-sous-Beaumont, Acren-Saint-Martin, Rance, Taisnieres, and Vieux-Condé.

these locally-specific customs was that if the wife died first, no mortmain was to be paid in the village of Froidchapelle-Fourbechies (and thus no record of her death).<sup>439</sup> After the exclusion of all localities with female-specific exemptions, the number of individuals in the mortmain database was 22,247, and this produced an overall average sex ratio for the period 1349–1450 of 1.07:1. Still, even this figure may reflect a certain degree of female exclusion, but ultimately the value of this source is not in the absolute figures it provides, but in the relative figures—essentially how the sex ratio in mortality changes over time and how it can be systematically compared between plague and “nonplague” years.

Aside from recording women to a much fuller degree than other contemporaneous documentary sources such as the heriots, another quality of this database is that men and women can be accurately identified using a multitude of approaches. We attribute female status to a recorded name on the basis of (a) first names, (b) kinship ties where it was mentioned that an individual was the wife, mother, daughter or sister of *x*, (c) impounded goods were sold back to the husband of the individual that died (providing further proof we are not dealing with only widows), (d) goods were sold to “*a se baron*” (only mentioned for women, and likely referring to a form of male patronage), and (e) mention of “*se meskine*”.<sup>440</sup>

Of course, there are some limitations to the source—some very general ones characteristic of many medieval documents such as delayed or incomplete registration during political strife and conflict, although their value is that mortality trends can be compared in known “crisis” years (such as known plagues) with “normal” or “noncrisis” years.<sup>441</sup> However, mortmain cannot be viewed as a “direct” indicator of mortality, since it could also increase or decrease depending on differential enforcement of the rights of the overlord to extract possessions after death. In nearby Flanders, the Count was increasingly able to subject more people to mortmain payment in the late fourteenth century: it was only after 1380 that people were recorded in a standardized way, the rubric of the document itself began to change, and explicit reference to the precise item seized occurred.<sup>442</sup> Fortunately, this does not appear to have been the case for Hainaut though as the structure and terminology of the documents did not change from the first extant document of 1349 all the way up to 1500, indicating a standardized procedure in place from the start. Moreover, there do not seem to be any structural increases in the amount of people recorded that are not linked to a period of high mortality identified in the literature. The issue here instead was that the number of districts (and therefore localities) included in the account showed some fluctuations over time. Indeed, certain cities were able to secure freedoms from assessment. Native burghers of Ath were exempt from 1284 (at the latest), in Mons in 1295, in Valenciennes at an unidentified date, in Binche in 1265, in Beaumont (only the fortified area) in 1383, in Soignies (only the franchise) in 1142, and in Le Roeulx at an unidentified date.<sup>443</sup> Many of these cities still appeared in the assessment, however, since the privileges did not apply to “nonburghers” or recent immigrants—in fact only Valenciennes failed to appear at all. However, these issues

439 Ibidem, p. 308.

440 Referring to female social status and/or profession: Bourguignon and Dauven, ‘Une justice au féminin’.

441 Thoen and Devos, ‘Pest in de Zuidelijke Nederlanden’, p. 128.

442 Kittel, ‘Death and taxes’, p. 192.

443 Verriest, *Le servage*, pp. 323–33.

relate to calculation of overall plague mortality rates, rather than substantially distorting relative male-female mortality ratios. The exemptions for native burghers of the aforementioned cities applied equally to men and women, and were in place well before the first extant record with the exception of Beaumont. In any case, we try to cater for this issue by also testing a set of localities across a shorter timespan that are almost ever-present, in addition to the overall results from the whole database (see pp. 99).

### *Identifying plagues*

The reason why many bioarchaeological studies have focused on the initial Black Death outbreak rather than any other recurring outbreak of medieval plague is because almost all places in Western Europe experienced it (reaching Southern Europe earlier than the North). There can be little contention then about whether plague occurred in these years or not. In fact, this issue has been settled in recent years with the various confirmatory findings of the causal bacterial agent *Yersinia pestis* in various mid-fourteenth-century burial sites.<sup>444</sup> Indeed, one of the strengths of bioarchaeological research into the East Smithfield burial site in London is that it was founded in 1349 explicitly in anticipation of having to bury the plague dead—thus allowing control for cause of death to a greater extent than other mortality samples with many different causes of death.<sup>445</sup>

In our mortmain database, the very first extant record fortunately comes from 1349 and so we can cover the Black Death period up to May 1352, after which the mortality peak subsided. It must be noted that the record begins in June 1349, and thus there is a possibility that it may already have missed some plague deaths by this time. However, indications from sources across the Southern Netherlands such as pressures on existing cemeteries, outbreaks of Jewish persecution, flagellant movements, and so on suggest that the Black Death only began to reach its height from the summer of 1349 onwards (see the appendix to chapter three for more details).<sup>446</sup> There is no evidence that the Black Death had reached Hainaut by 1347–8 as it had done in the Mediterranean. In fact, it is said to have arrived in Valenciennes in June 1349, followed by Tournai, Mons, and Lille in early July.<sup>447</sup> Considering the timing of the Black Death in Hainaut, it is likely that the first extant mortmain account starting on 24 June 1349 was constructed as a direct consequence of hyper-mortality—and thus we can be confident that we are able to capture the major part of the Black Death period. However, it must be acknowledged at least that the mortmain account available for Hainaut offers an absolute minimum assessment with regard to the mortality effect of the Black Death, as shown by Figure 1 where the mortality spike for the Black Death was still smaller than some recurring plagues. This is down to some issues with the Hainaut mortmain accounts. First, the initial account for 24 June 1349–11 April 1350 only covers a period of 10 months, while other documents cover a full 12 months. Second, there was some disruption in local administration due to the death of local bailiffs: during the Black Death period we see counts having to be performed by different local officials, which is something that does not happen in

444 The different studies described in Benedictow, *The Black Death and later plague epidemics*, pp. 81-2; Little, *Plague historians*.

445 DeWitte, 'Sex differentials', p. 290.

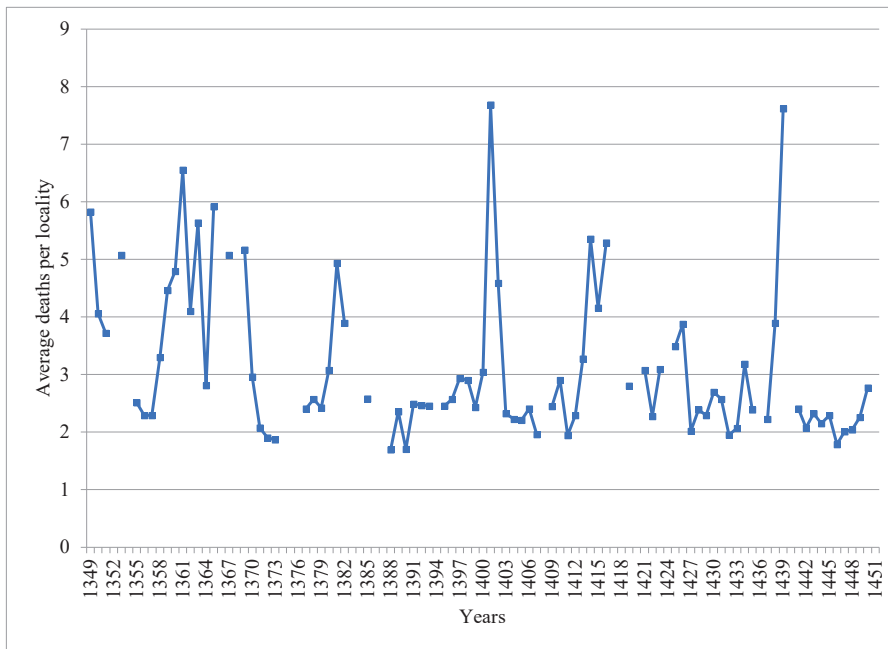
446 Since chapters three and four use the same dataset of plague mentions in the Low Countries, no separate appendix was constructed for chapter four.

447 Benedictow, *The Black Death, 1346-1353*, p. 113; Sivéry, 'La Hainaut', p. 438.

any other year (NAB, I, 004, 17867). Third, since the first extant document was triggered by hyper-mortality, local administration was likely caught off guard during the very initial stages of the epidemic. Fourth, the first manuscripts of the mortmain are in a much worse state than the manuscripts that follow—possibly extending the missing information to an estimated 15–20% on account of the size of missing sections and average number of individuals recorded per folio. Fifth, we must also take into account the notion that many of the recurring plagues seen in the late-medieval Southern Netherlands were also very severe.<sup>448</sup>

We are also fortunate to have a long run of accounts, notwithstanding a few missing years, for a period of 102 years up to 1450 where we can examine the sex-selective effects of recurring plagues too. This is important given too much research at present is polarized between the initial Black Death outbreak on the one hand, and the early modern plagues of the sixteenth- and seventeenth centuries (likely due to the increasing appearance of documentary source material that can be employed quantifiably). Indeed, it has been recently remarked that “we know little about the outbreaks in the century immediately after the Black Death”,<sup>449</sup> that is to say the recurring outbreaks of the late fourteenth- and fifteenth centuries.

**Figure 1.** Annual mortality based on individuals owing mortmain, Hainaut, 1349–1450 (average deaths per locality)



Source: Archives Départementales du Nord, Lille, B, pp. 12122–12226; National Archives of Belgium, Brussels, I, 004, pp. 17867–73

448 Sivéry, ‘La Peste Noire’; Thoen and Devos, ‘Pest in de Zuidelijke Nederlanden.’  
 449 Alfani and Murphy, ‘Plague and lethal epidemics’, p. 318.

One issue, however, is how we identify which years from 1349 to 1450 were plague years. As well as the aforementioned DNA evidence of *Yersinia pestis* for the Black Death, there is good evidence of this pathogen as causal agent for the second plague outbreak of 1358–63 in the Southern Netherlands. Recent evidence has overturned the initial identification of *Yersinia pestis* DNA at Bergen-op-Zoom as the specific Black Death strain (which was mistakenly dated to 1349/50),<sup>450</sup> instead identifying it as the same strain present in the “*pestis secunda*” outbreak in London (London *Yersinia pestis* genome 6330).<sup>451</sup> Nonetheless, due to a lack of studies identifying the bacterial agents in other recurring plague outbreaks, current research often has to rely on those years which are said to have been “plague-years” in the historiography, accepting the disease diagnosis at face-value. This is problematic since according to some scholars, the paucity of sources and the considerable gaps exhibited, often make it impossible to separate late-medieval plague from other diseases and causes of mortality.<sup>452</sup> However, we propose a threefold approach which can help identify likely plague years, even if we have to acknowledge that the only period in which we can be reasonably sure that epidemic mortality was almost wholly attributable to plague was the initial Black Death. In the first stage of our approach we isolate years where there were unusual mortality spikes compared to normal years. This can be done on the basis of the mortmain record itself, and thus represents an indicator of ‘possible plague years’. In Figure 1 below, plague years could possibly have occurred in the mortality spikes (those years with an average rate of mortalities per locality of more than three), 1349–51, 1353, 1358–63, 1365, 1367–9, 1380–2, 1400–2, 1413–16, 1421, 1423, 1425–6, 1434, and 1438–9.<sup>453</sup> Given the issue of the changing territorial reach of administration of the mortmain record (more localities could be included in some years); an average rate of deaths per locality mentioned in the record is preferred to simply calculating the spikes by aggregate numbers of mortmain dead.

Once we know the main dates in which mortality was higher than normal, our second method is to compare these dates with a new database of “explicit plague mentions in archival sources” (see appendix to chapter three). A similar enterprise was undertaken by Biraben on a pan-European level,<sup>454</sup> which has recently been subject to some high-profile digitization.<sup>455</sup> However, this original pioneering work inevitably suffered from geographical disparities in scholarly attention, presenting France as the epicenter of all Second Pandemic plagues, while the Low Countries experienced virtually no plagues across a period of 400 years. Our database is also an improvement in distinguishing between different “types” of source reference, using a three-category division of quantifiable, contemporary description, and later histories or memories.<sup>456</sup> Naturally, caution should be shown with this kind of exercise, since many of the works indicating a plague in a particular year in the medieval period do not provide absolute

450 Haensch et al., ‘Distinct clones’.

451 Bos et al., ‘A draft genome’; Green and Schmid, ‘Tiny changes’; Spyrou et al., ‘Historical *Y. pestis* genomes’.

452 Thoen and Devos, ‘Pest in de Zuidelijke Nederlanden’.

453 Because there are no issues with male-female exemption, the full database of 25,610 deaths is used in Figure 1. The choice of over three average mortalities per locality is partially arbitrary, but represents the major spikes seen.

454 Biraben, *Les hommes et la peste*.

455 Büntgen et al., ‘Digitizing historical plague’, p. 1587; Christakos et al., *Interdisciplinary public health reasoning*, pp. 202–3; Schmid et al., ‘Climate-driven introduction’; Voth and Voightländer, ‘Gifts of Mars’; Yue, Lee, and Wu, ‘Navigable rivers’.

456 Proposed originally by Blockmans, ‘Social and economic effects’.

unequivocal evidence for plague per se, but either explicitly point to a disease of some kind, or give an indication of a mortality crisis that may have been caused by plague. Only from the second half of the fifteenth century do we begin to see explicit differentiation in the diseases from the Low Countries sources: a good early example are the references for the epidemic in the Duchy of Guelders in 1472–3 and 1497–8, which are described as “*rode loop*” and “*rood melisoen*” (dysentery) and “*pokken*” (smallpox) respectively.<sup>457</sup> However, we are helped by escaping localism and establishing a broader geographical and temporal view. The term “*peste*” found in one locality in 1 year may be rather weak evidence, if it were not for other localities also mentioning “*peste*” in the same year. Furthermore, the medieval Low Countries sources often produced a number of other terms to more explicitly refer to the plague: “*haestige sieckte*” (rapid sickness) referred to the disease’s key feature which was the short period between visible symptoms and imminent death.<sup>458</sup> Other frequent terms included the “*heete siecte*” (hot sickness) and the “*heete ongemac*” (hot discomfort), in reference to the burning feverous state that the afflicted experienced, as well as the “*gave gods*” or the “*gods vandinge*” (the gift from God), in reference to the providential explanation of the disease’s origins.

Overall, by matching the years with mortality spikes with the years found in our database of plague mentions in the sources for the medieval Low Countries, we suggest that plague outbreaks occurred in 1349–51, 1358–63, 1368–9, 1380–2, 1400–2, 1413–16, 1425–6 and 1438–9, even if we have to accept that other mortality causes occurred around or simultaneous to these outbreaks. For other raised mortality years in 1353, 1364–7, 1421, 1423, and 1434, there was no specific documentary evidence to point to likely plague outbreaks, even if the presence of the disease cannot be entirely ruled out.<sup>459</sup> Many of these mortality spikes instead were likely down to famine or famine-related diseases judged on the evidence of contemporary commentators from the Southern Netherlands and neighboring German regions citing, for example, incessant rainfall and scarcity in 1366,<sup>460</sup> a combination of storms, cold weather and rain in the period 1421–3<sup>461</sup> (leading to numerous flood events<sup>462</sup>), ‘horribly severe cold’ and ‘terrible frost’ in 1434<sup>463</sup> and storms across the whole of the Low Countries.<sup>464</sup> An outbreak of “*blarenpest*” (smallpox) was cited in nearby Limburg for 1367.<sup>465</sup>

As a third and final stage in the process, we also subject these identified plague years between 1349 and 1450 to an analysis of household clustering of deaths. One of the hallmarks of Second Pandemic plagues it has been suggested is the frequent death of those in close proximity to one another. This has led to the suggestion that plague may have been contagious—passed not only

457 Schaik, *Belasting, bevolking en bezit*, pp. 305–6.

458 Cohn, ‘Epidemiology of the Black Death’.

459 In the period 1420–3, evidence for plague was found in the Northern Netherlands, but none was forthcoming for the Southern Netherlands; see appendix to chapter three.

460 Pertz, ed., *Annales Fossenses*, IV, p. 35.

461 Easton, *Étude statistique*, p. 77.

462 Buisman, *Duizend jaar weer*, p. 446.

463 Despars, ed., *Cronijcke van den lande*, 3, p. 337.

464 Gottschalk, *Stormvloeden en rivieroverstromingen*, 2, p. 142.

465 Rutten, “*De vreselijkste aller harpijen*”, p. 32.

between humans via a vector, but even passed directly from human-human interaction.<sup>466</sup> Of course, this is a highly debatable and unresolved topic, but what is less debatable is the basic historical evidence that humans in close proximity were dying in greater numbers during plagues than in normal times.<sup>467</sup> It must be noted, however, that this household clustering of mortality cannot be invoked on its own as evidence for the presence of plague. Indeed, many contagious diseases or other diseases connected to insalubrious or unhygienic conditions, for example, may have produced similar clustering of deaths. The idea here is simply to show that any noticeable increase of household-clustered mortality is a further indication that a mortality peak was caused by the presence of an infectious disease.

As soon as two or more members of the same family died in a given year, they were linked together through their kinship tie in the mortmain database. Here, given the limitations of the medieval sources, we have to make an assumption that the linked kin were actually resident within the same physical household—which of course was not always the case. Figure 2 shows both the absolute number of instances where multiple members of the same household were dying as well as a percentage of total mortality these multiple household deaths represented.<sup>468</sup> To calculate this, we counted, for example, a household with three dead members as three individuals and a household with five dead members as five individuals—therefore coming to a total of eight individuals dying within a household clustering rather than two instances. This was done to account for different sizes of households and to allow for calculation of the proportion of clustered deaths within the total mortality figures. Overall, Figure 2 indicates an association between multiple family members dying and the suggested “plague-years” we have already identified above, lending further credence to our view, even if this cannot be seen as outright absolute confirmatory evidence.

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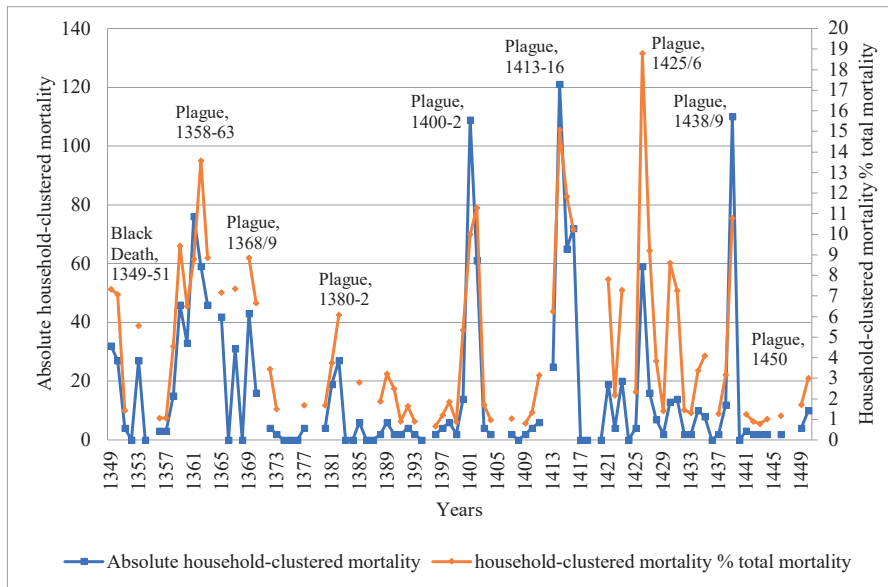
466 Ayyadurai et al., ‘Body lice’; Cohn, ‘Epidemiology of the Black Death’, Huffhammer & Walløe, ‘Rats cannot have been’, p. 71; Welford and Bossak, ‘Body lice’.

467 Alfani and Murphy, ‘Plague and lethal epidemics’, Cohn and Alfani, ‘Households and plague’; Whittles and Didelot, ‘Epidemiological analysis’; although all of this evidence is from the early modern period.

468 Because there are no issues with male–female exemption, the full data- base of 25,610 deaths is used in Figure 2.



**Figure 2.** Household-clustered mortality patterns, Hainaut, 1349–1450



Source: Archives Départementales du Nord, Lille, B, pp. 12122–12226; National Archives of Belgium, Brussels, I, 004, pp. 17867–73

## Results

Figure 3 below shows the main plague periods from 1349 to 1450, the relative mortality spikes they caused, and this time compared with the sex ratios in mortality. Ultimately, our main finding is that when a major plague occurs, there is generally an inverse relationship with the sex ratio in mortality: that is to say it often correlates with a decline in the sex ratio, suggesting that more women were dying during plagues than in normal periods. This case could be made for the identified plague periods of 1349–51, 1358–63, 1368–9, 1380–2, 1400–2 and 1425–6, to a lesser extent in 1438–9, but is not strongly discernible for 1413–16. That the plague years 1413–16 and 1438–9 did not conform to trends of the other plague years is perhaps less surprising given these two periods were also characterized by upsurges in conflict in the southerly parts of the Southern Netherlands,<sup>469</sup> and thus the increased presence and death of soldiers may have led to some excess male mortality—especially since 1438–9 was also simultaneous to a serious famine<sup>470</sup> linked to the exceptionally cold decade of the 1430s.<sup>471</sup> Recent research into differential spatial concentration of mortality in the city of Dijon in Eastern France has suggested that while the 1400–1 epidemic was likely plague, raised mortality in 1438–40 may in fact have a “different,

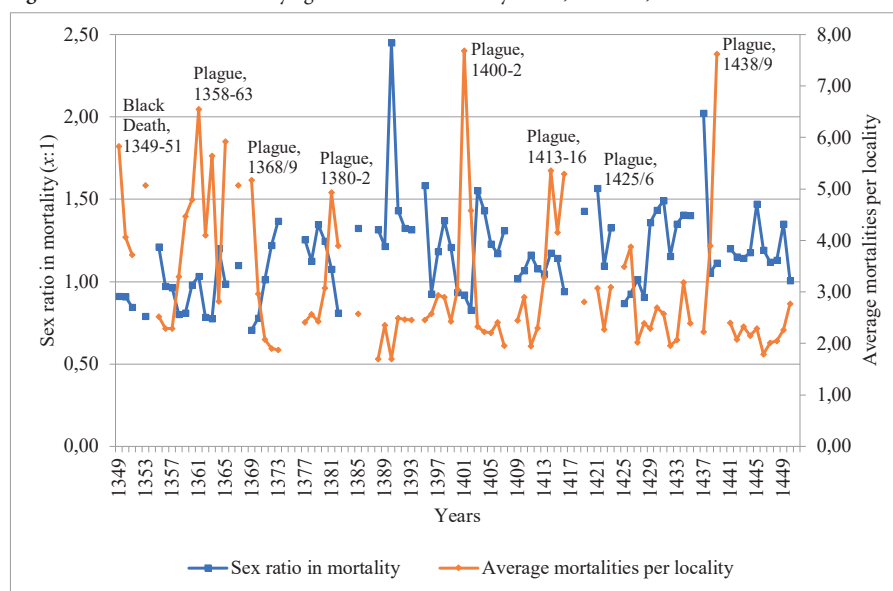
469 Bocquet, *Recherches sur la population*, p. 51.

470 Curtis et al., ‘The Low Countries’; Derville, *L’agriculture du nord*, p. 215; Verhulst, ‘L’économie rurale’, p. 70.

471 Camenisch, ‘Endless cold’.

possibly waterborne, disease involved,” even if plague co-existed simultaneously.<sup>472</sup> Overall, for such a large series of data (102 individual years), a negative Pearson correlation coefficient of -0.47 for mortality against sex ratios in mortality is strong, though this negative correlation may have been even stronger given that raised mortality in some years had causes other than plague and thus was not necessarily correlated with a lower sex ratio. The famine of 1390, for example, was correlated with a raised sex ratio—in line with expectations of a “female mortality advantage” during periods of severe malnutrition.<sup>473</sup> That proportionately more women were dying during the main plague years than in “normal” years can be further demonstrated from Table 1 below. There is a gap of 0.24 between the sex ratios in mortality calculated for plague and non-plague years, and an extremely statistically significant association between outcomes (male/female deaths) and groupings (plague/non-plague years). Furthermore, the results show that the Black Death did not differ in its sex-selective effect from other recurring plague outbreaks, as evidenced by the insignificant statistical association.

**Figure 3.** Sex ratios in mortality against overall mortality levels, Hainaut, 1349–1450



Source: Archives Départementales du Nord, Lille, B, pp. 12122–12226; National Archives of Belgium, Brussels, I, 004, pp. 17867–73

472 Galanaud, Galanaud, and Giraudoux, ‘Historical epidemics cartography’.

473 Macintyre, ‘Famine and the female mortality advantage’.

**Table 1.** Sex ratios in mortality, Hainaut, 1349–1450

	Total	Male	Female	Unknown	Sex ratio
All years	22,247	11,292	10,559	396	1.07:1
Just plague years	9,213	4,332	4,634	247	0.94:1
Years without plague	13,034	6,960	5,925	149	1.18:1
Fisher's exact test	p-value <0.0001				
Only Black Death	865	342	383	140	0.89:1
Only recurring plagues	8,348	3,990	4,251	107	0.94:1
Fisher's exact test	p-value 0.5352				

Source: Source: Archives Départementales du Nord, Lille, B, pp. 12122–12226; National Archives of Belgium, Brussels, I, 004, pp. 17867–73

Notes: A large  $p$  value ( $>0.05$ ) indicates weak evidence against the null hypothesis, thus we do not reject the null hypothesis. A small  $p$  value ( $<0.05$ ) indicates strong evidence against the null hypothesis, thus we reject the null hypothesis. This is applicable for Tables 1–4.

As mentioned in Section 2, there is an issue that some localities disappear from the record and then reemerge—put simply, not all localities are ever-present across the whole 102 years of the mortmain record we analyze. Often this refers to small villages or hamlets that normally record only one or two deaths anyway, and thus we do not expect this to significantly shape the results. To be more certain of this, however, we have decided to take a sample of localities that are almost ever-present across a much shorter time period. In Table 2, therefore, we also have a sample of 61 localities that reappear in at least 8 of the 13 years between 1395 and 1407.<sup>474</sup> We chose this sample period on the basis of (a) it includes an almost definitely identifiable plague period (1400–2), (b) this plague period is one of the strongest to hit Hainaut in the late Middle Ages, and (c) the period 1395–1407 is one of the few times where there is a clear run of years without any gaps. As Table 2 shows, even when looking at a shorter period with a sample of mainly present localities, the same phenomenon described above in Table 1 and Figure 3 is seen—a reduced sex ratio in mortality during the plague years when compared to nonplague years—and this time by an even clearer degree. We can be more confident then that the disappearance and reappearance of certain localities in the database is not driving the results we identify.

**Table 2.** Sex ratios in mortality, select sample in Hainaut, 1395–1407

	Total	Male	Female	Unknown	Sex ratio
All years	2,489	1,298	1,183	8	1.10:1
Just plague of 1400/2	890	414	470	6	0.88:1
Years without plague	1599	884	713	2	1.24:1
Fisher's exact test	p-value <0.0001				

Source: Archives Départementales du Nord, Lille, B, pp. 12122–12226; National Archives of Belgium, Brussels, I, 004, pp. 17867–73

<sup>474</sup> We do not use localities that appear in every single year between 1395 and 1407 as that would create a sample size that is too small. Additionally we must acknowledge that many of these localities not present for a couple of the years between 1395 and 1407 is down to the fact that they had no mortalities to record in those years, rather than “disappearing” from the record, since they were often small hamlets.

That late-medieval plagues were associated with divergences from the norm in the sexual distribution of mortality is clear. However, we need to determine whether this was down to the intrinsic differences in resistance to the disease between the sexes, or instead a matter of differential male-female exposure to the disease. For example, scholars have suggested that from the late Middle Ages onwards more women than men began to live in the cities, and this is significant when considered in tandem with the assumption that plagues were more severe in the cities than the countryside.<sup>475</sup> We review this assumption by systematically separating urban environments from rural. Although accurate population indicators for individual localities are scarce for the late-medieval Southern Netherlands, it is known that the so-called “*bonnes villes*” (richest localities that were usually fortified) were not subject to the fiscal hearth count.<sup>476</sup> Hearth counts were only conducted in the countryside, and thus any locality in the mortmain found in the hearth count can be considered rural. The localities classified as urban in the mortmain record are labeled on the map of the County of Hainaut below (Figure 4)—only the city of Valenciennes never appeared in the mortmain.

Our results from Table 3 below suggest that the differential exposure hypothesis had some role to play. The decrease in sex ratio in mortality for plague years when compared to nonplague years was larger in the cities than in the countryside—0.31 in the cities compared to 0.22 in the countryside. However, even if it was not as sharp, plagues still led in the countryside to heightened female mortality relative to male compared to the norm: the phenomenon was seen regardless of urban or rural environment. In both urban and rural environments the association between outcome (male/female deaths) and grouping (plague/non-plague years) was extremely statistically significant, and just like with the overall results in Table 1, the Black Death showed similar sex-selective effects to the other recurring plagues in both city and countryside, as evidenced by the insignificant statistical association. Indeed, we would not expect a strong skew of women towards the cities in late-medieval Hainaut anyway, given that this southerly region did not have the kind of urban network able to consistently attract steady streams of migrants—a small scattering of aforementioned towns but nothing to compare to the dense patchwork of powerful cities in Flanders, for example.<sup>477</sup>

Although we suggest in the Hainaut case that lower sex ratios in mortality during plagues was unlikely to have been only a case of more women resident in the cities, the differential exposure hypothesis could have applied in other ways, however. For example, on the micro level of the household, it may have the case that women were more likely to be in physical positions conducive to the spread of plague. Given that as already mentioned, recent literature has asserted the possibility that plague could have spread human-human (whether through a vector or directly), afflicting people at close quarters (seen in household patterns of infection), a case could be made for the effects of women spending disproportionate amounts of time in houses and attributed a ‘care-giving’ role within their own family.<sup>478</sup>

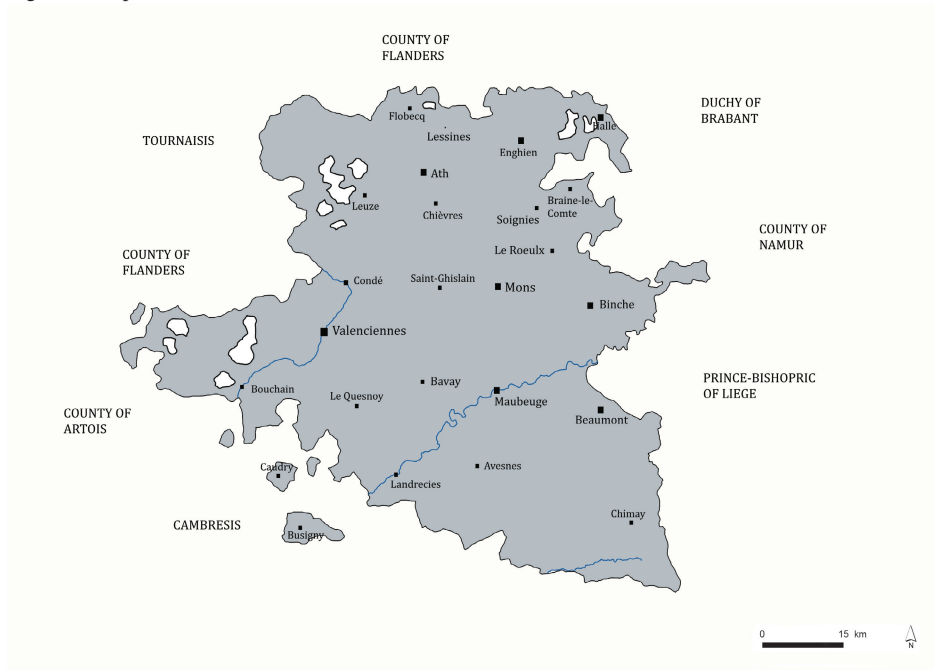
475 Bardsley, ‘Missing women’; Kowaleski, ‘Singlewomen’.

476 Arnould, *Les dénombremets*, p. 67-8.

477 Blockmans et al., ‘Tussen crisis en welvaart’, p. 46.

478 Rawcliffe, *Medicine and society*, p. 182-3.

**Figure 4.** Map of Hainaut with urban localities in mortmain database



Produced by the author, based on M.A. Arnould, *Les dénombrements de foyers dans le comté de Hainaut (XIVe-XVIe siècle)*, Publications de la Commission Royale d'Histoire, Brussels.

4

The mortmain database gives us a rare opportunity to explore this hypothesis further, by only focusing on those mortalities clustered in households—that is to say only including those cases where two or more people from the same (assumed) household have died (as reconstructed already in Figure 2). Only those cases have been included in which we know the sex of all household members—therefore a number of cases have been omitted and indicated as a percentage of sex ‘unknown’. In plague years this was a higher amount than in non-plague years—11% compared to 4%—and the high amount in the Black Death period in particular was simply down to the greater damage to the manuscript itself which prevented accurate gendering of more individuals in the mortmain. After isolating only household-clustered mortality, what can be discerned from the results is that the increased mortality of women vis-à-vis men during plagues compared to non-plague years seen in Tables 1–3 did not appear to be driven by spatial inequalities between the sexes within the household. Indeed, Table 4 below shows that for specifically deaths occurring in clusters of two or more, the sex ratio in mortality was lower in plague years than non-plague years but the difference was small—0.85:1 compared to 0.88:1. While in some of the plague years in Figure 5, females dominated the household clustering of mortality such as in 1358–63 or in 1425–6, there were clearly many other identified plague years when this was not the case. Indeed, there was no overall statistical significance in association between outcomes (male/female deaths) and groupings (plague/non-plague years), with the Black Death behaving in the

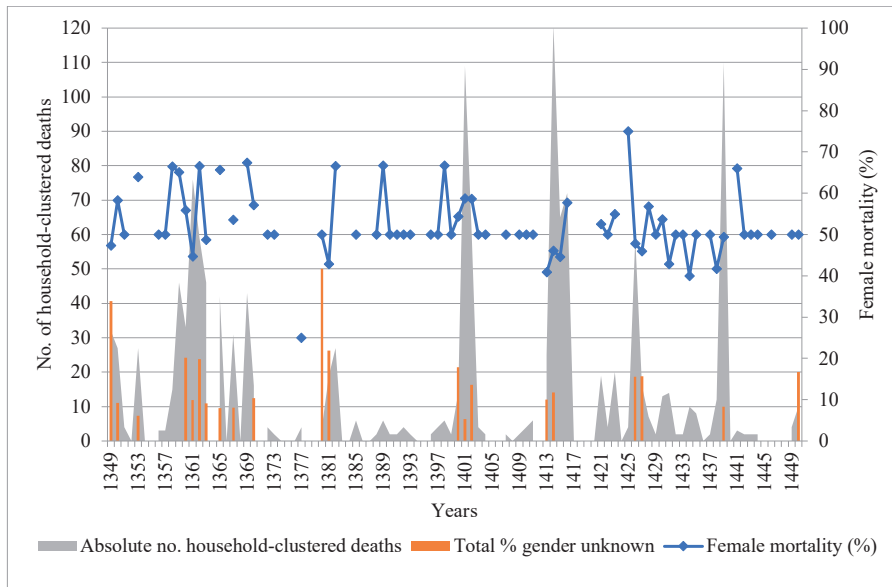
same way as the other recurring plagues. Ultimately what we can infer from these results is that either (a) women were not spending more time than men in houses or offering care-giving roles, contrary to our assumptions, or (b) women were doing so, but this was not an important driver of overall increased female susceptibility to the disease, or (c) our reconstruction of household clustering, where sources do not allow for identification of household members spared by the plague (therefore making it difficult to reconstruct exactly the sex structure of the household and to measure differential risks of infection) might not be of a level needed to detect the effects of care-giving or spending time in houses.

**Table 3.** Urban and rural sex ratios in mortality, Hainaut, 1349–1450

	URBAN				
	Total	Male	Female	Unknown	Sex ratio
All years	5,188	2,620	2,483	85	1.06:1
Just plague years	2,183	999	1,126	58	0.89:1
Years without plague	3,005	1,621	1,357	27	1.20:1
Fisher's exact test	p-value <0.0001				
Only Black Death	223	84	101	38	0.83:1
Only recurring plagues	1,960	915	1,025	20	0.89:1
Fisher's exact test	p-value 0.7				
	RURAL				
	Total	Male	Female	Unknown	Sex ratio
All years	17,059	8,672	8,076	311	1.07:1
Just plague years	7,030	3,333	3,508	189	0.95:1
Years without plague	10,029	5,339	4,568	122	1.17:1
Fisher's exact test	p-value <0.0001				
Only Black Death	642	258	282	102	0.92:1
Only recurring plagues	6,388	3,075	3,226	87	0.95:1
Fisher's exact test	p-value 0.654				

Source: Archives Départementales du Nord, Lille, B, pp. 12122–12226; National Archives of Belgium, Brussels, I, 004, pp. 17867–73

**Figure 5.** Female mortality in household clusters (%), Hainaut, 1349–1450



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Source: Archives Départementales du Nord, Lille, B, pp. 12122–12226; National Archives of Belgium, Brussels, I, 004, pp. 17867–73

**Table 4.** Sex ratios in household-clustered mortality, Hainaut, 1349–1450

	Total	Male	Female	Unknown	Sex ratio
<b>All years</b>	1,417	592	688	137	0.86:1
<b>Just plague years</b>	1,024	419	492	113	0.85:1
<b>Years without plague</b>	393	173	196	24	0.88:1
<b>Fisher's exact test</b>		p-value 0.8046			
<b>Only Black Death</b>	63	22	25	16	0.88:1
<b>Only recurring plagues</b>	961	397	467	97	0.85:1
<b>Fisher's exact test</b>		p-value 1			

Source: Archives Départementales du Nord, Lille, B, pp. 12122–12226; National Archives of Belgium, Brussels, I, 004, pp. 17867–73

## Discussion

We suggest that women died in greater proportions during plagues compared to normal times, and is something seen in Hainaut, Belgium, during the initial Black Death but also frequently throughout many recurring late-medieval plague outbreaks up to 1450 suggesting this feature may have persisted over the long term. Of course, we must take into account the fact that although we know the overwhelming majority of the data to represent adult and sub-adults, we cannot dis-aggregate these results further into precise age brackets—and so we cannot be sure whether a particular adult age-group is driving these results.

Although we considered the possibility that this could have reflected simply an inequality in exposure to the disease, the evidence does not support this—in as far as we can feasibly test for it. Overall we show that the trend of a lowering in the sex ratio in mortality during plagues cannot be wholly put down to more women resident in cities since it was a phenomenon clearly discernible for both urban and rural environments. Furthermore, evidence from the clustering of deaths in households suggests that the likelihood of women spending more time in houses in domestic or care-giving roles was also not likely a key driver in this trend, although we should be cautious on this second point: we still know relatively little about the actual environment in which the plague victims lived. We should also clarify that the results have been taken from one region only, and thus it remains to be seen if comparable data from the same or different periods in other parts of Europe would corroborate our findings.

By not supporting an interpretation based on differential exposure, this gives some credence to the possibility that the intrinsic interaction with the disease and differential male-female resistance to plague played a role in the skewed sex ratios in mortality. If this was indeed the case, this is in contrast to a number of other diseases caused by bacteria, viruses, fungi, and parasites seen in the modern period,<sup>479</sup> which shows that we cannot assume that the pre-industrial epidemiological experience should necessarily mirror the modern. Indeed, it is also known that other diseases such as malaria and chronic obstructive pulmonary disease disproportionately affect women.<sup>480</sup> Furthermore, if we accept an “intrinsic” rather than “exposure” explanation, we differ from much literature on modern forms of plague that assert differences in behavior. So plague mortality is said to be skewed towards men in the United States through hunting and ranching activities,<sup>481</sup> with increased risks of engaging directly with infected animal vectors.<sup>482</sup> Elsewhere, in Lushoto, north-eastern Tanzania, women are said to be more commonly infected on account of sleeping on the floor (men sleep in beds).<sup>483</sup> Overall, we must remain cautious in the absence of more confirmatory data from other places and periods, and that we still know relatively little about the daily behavior of men and women in the medieval period.

479 Blondiaux et al., ‘Tuberculosis and survival’; Falafas, Vardakas, and Mourtzoukou, ‘Sex differences’, p. 627; Jansen et al., ‘Sex differences’; May, ‘Gender’; Mehrai et al., ‘Effect of sex’; Owens, ‘Ecology and evolution’.

480 Cote and Chapman, ‘Diagnosis and treatment’.

481 Butler, ‘The Black Death’; Poland, ‘Plague’.

482 Cleri et al., ‘Plague pneumonia’; Perry and Fetherston, ‘Yersinia pestis’.

483 Davis et al., ‘Demographic and spatiotemporal variation’; Kamugisha et al., ‘Pattern and spatial distribution’.



## Conclusion

Recent scholarship has increasingly suggested that early modern plagues were (a) not all the same in their epidemiological characteristics,<sup>484</sup> and (b) may have been selective in some respects,<sup>485</sup> even if this was not a straight unilinear process from a less selective to a more selective disease.<sup>486</sup> This contrasts with the Black Death of the mid-fourteenth century which has often been portrayed as a “universal disease”,<sup>487</sup> testament to its great severity, which disrespected age, sex, health, and socio-economic position. Only in recent bioarchaeological work has evidence been put forward that suggests a level of selection was discernible with the Black Death too on the grounds of age and frailty,<sup>488</sup> while on the grounds of sex it was, at the very least, not ruled out either.<sup>489</sup> This article lends support to the notion that the initial Black Death does not necessarily deserve to be considered as “anomalous” or “separate” to other outbreaks that followed in its wake, and may have displayed at least some similar features and specifically the capacity to be sex selective. This is the first time that an effort has been made to compare a characteristic of the Black Death such as sex selectivity to other recurring plagues and to other “nonplague years” in the same (large) region over a long (early) period using the same (fairly standardized) source. Our main finding is that the sex ratio in mortality tended to decrease during the Black Death and recurring plagues in comparison with non-plague years, and by comparing urban and rural sex ratios in mortality, as well as mortality clusters within households, we suggest that this was not necessarily driven by differential exposure to the disease between the sexes.

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484 Alfani, ‘Plague in seventeenth-century Europe’; Curtis, ‘Was plague an exclusively urban phenomenon?’.

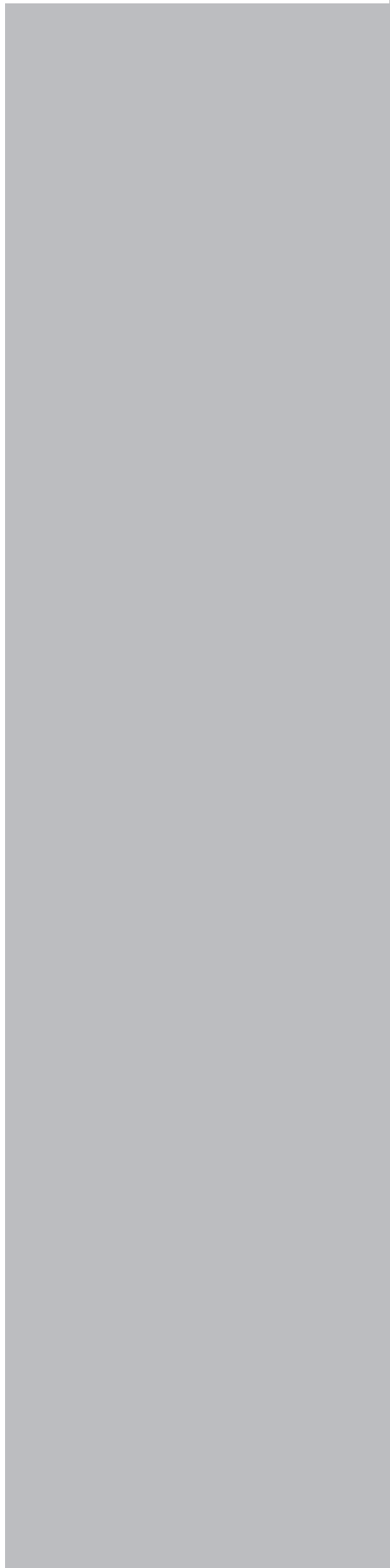
485 Alfani and Murphy, ‘Plague and lethal epidemics’.

486 Alfani, ‘Plague in seventeenth-century Europe’.

487 Naphy and Spicer, *Plague*.

488 DeWitte, ‘Age patterns of mortality’; DeWitte and Hughes-Morey, ‘Stature and frailty’; DeWitte and Wood, ‘Selectivity of Black Death mortality’.

489 DeWitte, ‘Sex differentials’.



# 5

## **The Black Death: window of opportunity or disaster? Demographic growth, stagnation and decline in the County of Hainaut (1349–1541)<sup>490</sup>**

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490 Unpublished and single-authored.

**Abstract:** Historians have observed a strong degree of divergence in population trends after the Black Death across Europe. A comprehensive explanation for this divergence is still missing and previous scholarship has cited the importance of either endogenous or exogenous factors. The most prominent exogenous factor cited in the literature is regional variation in the impact of the Black Death and repeat plague outbreaks, while explanations referring to the effect of endogenous factors have pointed to the role of fertility as a prime mover in long-term demographic developments instead. This chapter will use the county of Hainaut in the Southern Low Countries as a case study to analyze the effect of endogenous socio-institutional factors on diverging regional population developments. However, by using data from a single (nearly) continuous source of mortmain accounts, this chapter will also take into account long-term mortality trends. This chapter concludes that diverging regional population trends after the Black Death in the county of Hainaut are mostly due to endogenous societal factors and not differentials in exogenous mortality trends in the long run.

## Introduction

Historians have observed considerable differences in the timing of demographic recovery between different regions in Europe after the Black Death. These differences persisted not just a few decades after the mid-fourteenth century, but continued for centuries down the line.<sup>491</sup> A comparison can be made between England which only reached pre-plague population levels in the eighteenth century, and parts of the Low Countries which already recovered during the fifteenth century.<sup>492</sup> This demographic divergence also occurred on a more restricted geographical scale and even adjacent regions within the Low Countries -with seemingly very similar agrarian potential- could experience sharply diverging population trends.<sup>493</sup> For example, while inland Flanders and the county of Holland experienced demographic recovery in the course of the fifteenth- and sixteenth centuries; coastal Flanders, the Guelders river area and Artois experienced long-term stagnation lasting until the eighteenth century.<sup>494</sup> Although these diverging population trends are well established in the literature, there is currently no consensus regarding the underlying causes.

Previous historiography explained late medieval population trends by recourse to the neo-Malthusian model.<sup>495</sup> Basic Malthusian reasoning holds that population numbers grow exponentially while agricultural productivity only increases linearly. If left unimpeded by preventive checks that curtail birth rates, the population eventually rises to such a level that it outgrows the agricultural capacity to feed itself, a situation that would result in disaster. According to Malthus, positive checks such as famine, disease and warfare invariably followed in the wake of overpopulation to push population levels down to within the margins of available resources.<sup>496</sup> This model closely resembles the pattern of late medieval population developments on the European countryside. Between the tenth and the thirteenth centuries, the European population had more than doubled and agricultural resources were increasingly put to the test. By the early fourteenth century overpopulation resulted in Malthusian catastrophe as the Great Famine swept across northern Europe. The Black Death, which followed some decades later, has also been interpreted as part of an unavoidable Malthusian crisis, striking a malnourished population more susceptible to infectious disease.<sup>497</sup>

However, it is with respect to the impact of the Black Death and the population developments that followed, that the neo-Malthusian model falls short of the mark.<sup>498</sup> First, most historians now interpret plague as an exogenous shock to the population, one that is not linked to famine caused by Malthusian pressures on agricultural resources.<sup>499</sup> As such, it is no longer regarded as

491 Observed also for differences in economic developments, see: Allen, 'The Great Divergence'.

492 Malanima, 'Economic consequences', p. 314.

493 van Bavel, 'People and land', p. 10.

494 van Bavel, *Manors and markets*, pp. 282-283; Thoen and Soens, 'Family or the farm'.

495 Abel, *Agrarkrisen und Agrarkonjunktur*; Postan, *The medieval economy*; le Roy Ladurie, 'L'histoire immobile'.

496 Crafts and Mills, 'From Malthus to Solow', p. 69.

497 For the link between the Great Famine and the Black Death see: Jordan, *The Great Famine*, pp. 108-124. Although some authors have argued instead that the Great Famine removed the frailest individuals and actually made later generations more resilient to disease; DeWitte and Slavin, 'Between famine and death', p. 47.

498 As noted in: van Bavel, 'People and land'.

499 Herlihy, *The Black Death*, p. 38; Epstein, *Freedom and growth*, p. 54; van Zanden, 'The skill premium', p. 136. A view also supported by biologists and epidemiologists, see for instance: Crafts and Mills, 'From Malthus to Solow'.

a ‘positive check’, the result of unbridled overpopulation. Second, and crucial for this chapter, is the fact that Malthusian logic cannot explain the strong regional divergence in demographic recovery seen across Europe after the Black Death.<sup>500</sup> Those who survived the mid-fourteenth century demographic collapse generally enjoyed a relative abundance of land, higher wages, rising living standards and improved diets.<sup>501</sup> Factors that should have stimulated population growth and thus spurred demographic recovery.<sup>502</sup> Yet, while some regions indeed experienced comparatively quick recovery, others underwent long-term demographic stagnation or even further decline.<sup>503</sup> Within the neo-Malthusian model it remains inexplicable why population recovery took so long to materialize in some regions and historians have had to look for explanations beyond this traditional framework.

Long-term demographic stagnation in England has been explained by historical demographers in two different -yet not contradictory- ways. One explanation is that the exogenous shock of repeat plague outbreaks kept death rates at such a high level that it counteracted the effect of rising birth rates. A second line of reasoning focuses on the role of endogenous processes within society itself that stunted population growth. The general narrative is that labour shortages after the Black Death enticed a higher share of young women into the labour market which raised the average age at first marriage thereby reducing birth rates.<sup>504</sup> Conversely, swift demographic recovery in parts of the Low Countries has been explained by the combined effect of a mild exogenous plague shock and endogenous societal factors that stimulated population growth.<sup>505</sup> The most prominent of these endogenous factors, identified in the literature, were those that ensured broad population groups had direct access to land and resources through region-specific inheritance systems, property structures and employment opportunities.<sup>506</sup>

While these types of endogenous factors have been explored extensively in the literature, because they are often integral parts of the socio-institutional framework of a given society, quantifiable indicators for long-term mortality trends are less readily available.<sup>507</sup> As a result,

500 Epstein, ‘The late medieval crisis’; van Bavel, ‘People and land’, p. 10.

501 For wages see: Allen, ‘The Great Divergence’; De Pleijt and van Zanden, ‘Accounting’, p. 389. For land-labour ratios see: Thirsk, *Alternative agriculture*, Esp. pp. 7-9. For improved diet; Montanari, *La faim et l’abondance*, pp. 104-109. For Low Countries specifically: Thoen and Soens, ‘Vegetarians’. For rising living standards in general see: Munro, ‘Money matters’.

502 Bailey, ‘Introduction’, p. xx.

503 Campbell, ‘Population pressure’, p. 128; Grantham, ‘French agriculture’; Epstein, ‘Cities, regions’, p. 9; Brenner, ‘The agrarian roots’, p. 26.

504 Bailey, ‘Introduction’, p. xx.

505 Pamuk, ‘Black Death’, p. 308. Claimed for Holland specifically in: van Bavel and van Zanden, ‘Jump-start’, p. 515 & van Zanden, ‘Third road to capitalism?’, p. 90.

506 van Bavel, ‘People and land’. These explanations for diverging population trends are paralleled in the wider literature. Historians allocated a prime role to regional variations in either exogenous shocks caused by plague outbreaks, or endogenous societal factors that influenced population growth, in shaping long-term demographic trajectories. For variations in plague mortality see: Pamuk, ‘Black Death’, p. 293; Hatcher, *Plague, population*; Hatcher, ‘Mortality’, p. 19; Harvey, *living and dying*, p. 145. For endogenous factors see: Herlihy, *medieval and renaissance Pistoia*, p. 117. Driving changes in fertility see: Poos, *A rural society*, p. 113; 120; Dyer, *Lords and peasants*, p. 233. On delayed marriage, inheritance practices and birth control see: Wrigley and Schofield, *The population history of England*. For female labour involvement see: Goldberg, *Women, work and life*. For counterarguments see: Bailey, ‘Demographic decline’, esp. p. 9. On the topic of birth control outside England see: Herlihy and Klapisch-Zuber, *Tuscans and their families*, pp. 439-446.

507 Roosen, ‘Severity and selectivity’, p. 27.

it remains difficult to ascertain the relative importance of the two variables -exogenous and endogenous- in defining diverging population trends.<sup>508</sup> The exact relationship between the two variables has therefore often been assumed rather than empirically tested in previous research. For the Low Countries, this is particularly problematic as the mild impact of plague -deemed so vital for demographic recovery in previous publications- is likely a misconception. It has therefore been hypothesized in chapter 3 that the rapid demographic recovery in parts of the Low Countries is the result of, “*endogenous processes of recovery itself, rather than the chance ‘good fortune’ of experiencing weaker exogenous biological shocks*”.<sup>509</sup> This chapter follows up on this hypothesis by testing the relative importance of (a) exogenous and (b) endogenous factors to explain diverging rural population trends in the county of Hainaut during the late Middle Ages. Hainaut -situated in the Southern Low Countries- was selected as a case study because: (a) it was home to regions that underwent sharply contrasting economic and demographic developments,<sup>510</sup> (b) population figures for the entire county are available at regular intervals starting in 1365 and (c) mortality data are available from a single, nearly continuous source for most of the county from the Black Death onwards.

In the following section, I will discuss endogenous factors that have been identified as highly influential in shaping diverging demographic trajectories within the Low Countries. In section II these factors are then used as criteria to delineate different regions within the county of Hainaut. Next (section III), I will present long-term mortality data for clusters of select localities within these distinct regions to ascertain to what degree exogenous shocks could have influenced long-term population developments. In section IV the hearth counts for the county of Hainaut are introduced and outlined per region to give an overview of population developments between 1365 and 1541. This population data is then compared to the findings of the previous two sections to determine the relative importance of endogenous and exogenous factors in shaping demographic trajectories in Hainaut.

### Endogenous factors

Endogenous societal factors have been explored extensively in the literature in an effort to explain the striking regional diversity in both socio-economic systems and population trends in the Low Countries during the pre-modern period.<sup>511</sup> Authors have noticed that regions showing comparatively quick demographic recovery share several endogenous factors that are inherent to their respective socio-institutional frameworks.<sup>512</sup> Here I focus on three of the most prominent factors that have been identified in previous research: property structures, inheritance systems and employment opportunities.

508 Poos, *A rural society*, p. 111.

509 Roosen and Curtis, ‘Light touch’, p. 21.

510 Sivéry, *structures agraires*, pp. 9-15.

511 As noted in: Soens, Stabel and Van de Walle, ‘An Urbanised Countryside?’. An approach pioneered for the Low Countries in: Thoen, ‘Social agrosystems’. Taken up most notably in: van Bavel, *Manors and markets*.

512 It has been noted that regions delineated on the basis of their socio-institutional framework are the most relevant geographical unit to study long-term socio-economic developments, see: van Bavel, *Manors and markets*, esp. p. 9 & 396.

*Property structures and inheritance systems*

In his study on the link between property structures and diverging population trends in the late medieval Low Countries, Bas van Bavel concluded that in regions dominated by peasant smallholders - characterized by an equitable distribution of land- land users often claimed strong (nearly permanent) rights to land. This allowed smallholders to divide their farms among their offspring which led to a fragmentation of holdings.<sup>513</sup> The opportunity for children to gain access to land was further abetted by customary law, which tended to favour partible inheritance in this type of region.<sup>514</sup> As a result, children gained access to (at least) a small piece of land which allowed them to support a household at a relatively early age.<sup>515</sup> It engendered a demographic regime defined by early marital age, high nuptiality, strong population growth and a high population density.<sup>516</sup> By contrast, regions dominated by large tenant farmers - characterized by an inequitable distribution of land- had a demographic regime defined by late marital age, depressed population growth and low population density.<sup>517</sup> Land users in this type of region often had a weak grip on the land and were forced to compete for short-term leasehold.<sup>518</sup> While successful tenant farmers were able to accumulate and consolidate large holdings, this came at the expense of small and medium-sized farmers who eventually lost access to land.<sup>519</sup> Having invested heavily in the consolidation of their holding, large tenant farmers were often reluctant to subdivide their land among their offspring and inheritance practices in these regions usually favoured forms of monogeniture. As a result, most children only acquired land at a comparatively late age, or sometimes not at all.

*Employment opportunities*

The notion that regions in the Low Countries with an inequitable distribution of land invariably struggled to maintain their rural population numbers has, however, been nuanced. It has been argued that favourable demographic trends could be experienced by these regions, if the rural economy was flexible enough to allow sufficient employment opportunities to develop. The two most prominent factors that have been identified in previous literature are wage labour and proto-industry.<sup>520</sup> Wage labour is defined here as economically dependent yet legally free contractual labour, performed for an employer in exchange for the payment of a wage in either money or in kind.<sup>521</sup> During the late Middle Ages there were strong regional differences in both the importance

513 According to Sivéry, holdings smaller than 5 ha required an additional income to ensure the survival of the household. Sivéry, *structures agraires*, p. 312.

514 van Bavel, *Manors and markets*, p. 245.

515 Brenner, 'The agrarian roots', esp. pp. 29-31.

516 van Bavel, 'People and land'.

517 van Bavel, 'People and land'; Curtis, 'The impact of land accumulation'.

518 van Bavel, *Manors and markets*, pp. 175-176. & pp. 335-336. Leasehold in Hainaut after the Black Death was usually for a term of 3 to 9 years. Sivéry, *structures agraires*, p. 457.

519 Curtis, 'The impact of land accumulation', p. 206. While leasehold also emerged in smallholder regions, the equitable distribution of land meant that accumulation processes barely had a chance to take place. The high population density in this type of region also resulted in high land prices which further discouraged accumulation. See: van Bavel, 'People and land', pp. 19-20.

520 Curtis, 'The impact of land accumulation'.

521 Definition based on: van Bavel, 'Rural wage labour', p. 39.



and the type of rural wage labour in the Low Countries.<sup>522</sup> For instance, demand for labourers – employed either on a permanent or seasonal basis – was higher in regions engaged in commercial grain production than in regions oriented towards labour-extensive animal husbandry.<sup>523</sup> Different types of employment also influenced demographic developments in different ways. For instance, celibacy was seen as a precondition for women employed as servants which had important repercussions for population growth.<sup>524</sup> On the other hand, seasonal wage labour performed by smallholders could ensure the viability of households in regions where holdings were too small to be self-sufficient as a result of ongoing fragmentation.<sup>525</sup> In fact, the average size of holdings and the level of competition on the land market could also influence employment opportunities.<sup>526</sup> To win the competition for leasehold, large tenant farmers operated on a capitalistic basis to maximize their profits. They often achieved this by specialising in labour-extensive types of agriculture and livestock farming, thereby reducing labour input which constituted the chief variable cost.<sup>527</sup> As small tenants were outcompeted on the land market they lost the opportunity to work a farm independently and became increasingly dependent on wage labour to survive.<sup>528</sup> However, in a rural economy specialized in labour-extensive forms of farming such as a pastoral economy, this option was gradually closed off, which had a negative impact on population developments.<sup>529</sup> Moreover, it has been argued that women found relatively more employment opportunities outside the peasant household in the post-Black Death pastoral sector than in arable agriculture, resulting in an increase in marriage ages which negatively affected fertility, a so-called pastoral marriage pattern.<sup>530</sup>

A second type of employment opportunity that could influence population trends is proto-industry.<sup>531</sup> It is defined here as a regional concentration of rural small-scale industrial activities, in which the producers are semi-independent peasants who own at least part of the tools and raw materials, and who combined small-scale industry with agriculture.<sup>532</sup> Proto-industrial demographic patterns are mostly attributed to an internal dynamic in which proto-industry led to population growth and thus a constant supply of labour which, in turn, caused proto-industry to expand even further.<sup>533</sup> According to Hans Medick this resulted in a self-sustained growth-process that was primarily the result of surplus births but to a lesser degree also in-migration from other regions.<sup>534</sup> Proto-industry enabled population growth in two important ways.<sup>535</sup> First,

522 van Bavel, 'Rural wage labour', p. 37.

523 Knotter, 'Problems', esp. pp. 142-147.

524 Voigtländer and Voth, 'How the West', p. 2234.

525 van Bavel, 'Rural wage labour', p. 60.

526 The average size of holdings is also said to be an important indicator for the social division of wealth within a region. See: Thoen and Soens, 'Family or the farm'; Thoen, 'Social agrosystems'.

527 van Bavel, 'People and land', pp. 27-28.

528 van Bavel, 'The transition', p. 296.

529 van Bavel, 'People and land', p. 31.

530 Voigtländer and Voth, 'How the West', pp. 2227-2229. On the link between high labour intensity in agriculture and high fertility see: Vollrath, 'The Agricultural Basis'.

531 van Zanden, 'Third road to capitalism?', p. 99; Thoen, *Landbouweconomie*, pp. 157-162.

532 van Bavel, 'Early proto-industrialization', p. 1114.

533 Mendels, 'Proto-industrialization: the first phase'; Levine, *Family formation*; Levine 'Production, reproduction'; van Zanden, 'Third road to capitalism?', p. 99.

534 Medick, 'The proto-industrial family economy', pp. 82-83.

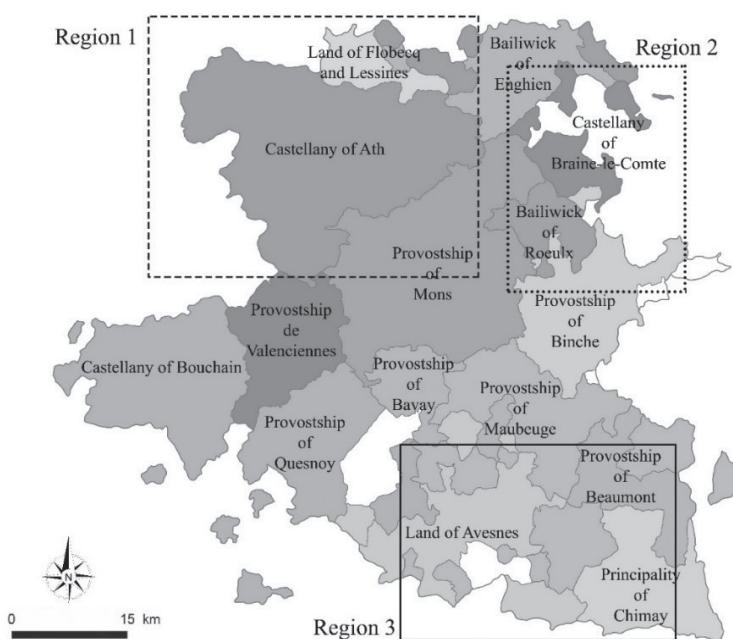
535 Thoen, *Landbouweconomie*, pp. 157-162.

it supplemented the earning from cultivation on small holdings allowing smaller farms to become viable and lessening the need to delay marriage until enough land had been acquired.<sup>536</sup> Second, it enabled smallholders to employ the surplus labour of all household members which meant having a large number of children was a potential advantage.<sup>537</sup> The literature describes proto-industrial regions as characterized by strong population growth, high population densities and the presence of peasant smallholders.<sup>538</sup>

### Delineating Hainaut regions

Using the three endogenous factors -property structures, inheritance systems and employment opportunities- outlined in the previous section, it is now possible to delineate three different regions within the county of Hainaut.<sup>539</sup> It is important to note that these regions have not been demarcated on the basis of their demographic trajectories after the impact of the Black Death, to avoid inductive reasoning.

**Map 1.** Map of the county of Hainaut during the late Middle Ages with indication of administrative districts (in different shades of grey) and regions delineated according to endogenous factors outlined in section I. Produced by the author, based on M.A. Arnould, *Les dénombrements de foyers dans le comté de Hainaut (XIVe-XVIe siècle)*, Publications de la Commission Royale d'Histoire, Brussels.



536 van Bavel, 'People and land', pp. 26-27.

537 Medick, 'The proto-industrial family economy', pp. 291-315.

538 Not always supported by empirical evidence, see: Houston and Snell, 'Proto-industrialization?', pp. 479-483.

539 Although the core-areas of these regions often encapsulate entire administrative districts, these delineations do not follow administrative boundaries which are deemed a poor guide to understanding socio-economic and demographic evolutions during the pre-industrial period, see: Dupâquier, *Histoire de la population Française*, p. 154.

*Northwest Hainaut (region 1)*

The first of the three regions under consideration is the northwest of Hainaut. Although it consisted out of a larger area that included the district of Flobecq-Lessines and the north-western part of the Mons district, it is best represented by the district of Ath as its core area (map 1).

During the late medieval period, this region had a system of social property relations dominated by peasant smallholders similar to inland Flanders and Holland. Land users had a strong grip on the land and were able to subdivide their holdings among their offspring. Customary law in the northwest favoured partible inheritance since the twelfth century, which ensured all children—at least potentially—had access to a plot of land after the death of their parents.<sup>540</sup> Both the inheritance pattern and the strong rights to land offered offspring the prospect of owning land to secure the survival of newly established households, which in turn lowered the average marital age.<sup>541</sup> During the demographic boom of the twelfth- and thirteenth centuries, this resulted in an ongoing fragmentation of holdings. For instance, in 1267 in the village of Herchies around 60 per cent of holdings were smaller than 2 hectares, and 80 per cent below 4.5 hectares.<sup>542</sup> Although the Black Death and recurring plague temporarily reduced the need to split up holdings,<sup>543</sup> fragmentation gained momentum once more during the second half of the fifteenth century. At that time, the average size of a holding in the northwest was around 1.25 hectares, indicating a dominance of peasant smallholders.<sup>544</sup> These circumstances showed a great degree of continuity and by the end of the nineteenth century more than three quarters of holdings in the northwest were smaller than one hectare.<sup>545</sup> This closely mirrors the situation in the Land of Schorisse (one of the five baronies of the Land of Aalst) in inland Flanders, an area directly neighbouring the northwest of Hainaut.<sup>546</sup> In 1571 about 70.5 per cent of the land there was owned by peasant smallholders and almost half of all holdings was smaller than 1 hectare.<sup>547</sup> Here too, long-term continuity manifested itself and by 1790 over 55 per cent of holdings were smaller than one hectare in the villages of Schorisse and Sint-Kornelis-Horebeke.<sup>548</sup> Although leasehold had been introduced at an early stage in Hainaut, it spread comparatively slowly throughout the region and never led to the process of land accumulation that occurred in, for instance, the Guelders

540 The county of Hainaut differed from the county of Flanders in that children only received an inheritance after both parents had died. Hoppenbrouwers, 'Doorgifte van erfgoed', p. 94; Yver, 'Les deux groupes de coutumes', p. 26. On partible inheritance in the northwest of Hainaut see: Gilissen, 'Le privilège de masculinité', p. 208.

541 van Bavel, 'People and land', p. 19.

542 Sivéry, 'Herchies'; Sivéry, *structures agraires*, pp. 316-317.

543 One indication is that the average size of a holding in Lessines was around 4 hectares in 1400, when Hainaut's population had hit an absolute nadir. Sivéry, *structures agraires*, p. 316.

544 Sivéry, *structures agraires*, pp. 317, 538 & 571.

545 Craeybeckx, 'De agrarische depressie', p. 196. In inland Flanders, the subdivision of holdings continued after the late Middle Ages and even intensified in the second half of the eighteenth century. See: Thoen, 'Social agrosystems', p. 54.

546 A region that like the northwest of Hainaut was dominated by peasant smallholders, an ongoing fragmentation of holdings as well as a vibrant proto-industrial linen sector. De Rammelaere, 'Bijdrage tot de landbouwgeschiedenis', p. 21. The land of Schorisse was made up out of seven villages: Schorisse, Mater, Rozebeke, Sint-Blasius-Boekel, Sint-Kornelis-Horebeke, Sint-Maria-Horebeke and Zegelsem.

547 In this way, the northwest of Hainaut had more in common with inland Flanders than with the area directly north of Mons. In the villages of Nimy and Maisières, situated in a transition zone between the northwest and southeast of Hainaut, the share of holdings smaller than five hectares in 1576 was "only" around 66 per cent. van Gelder, *Nederlandse dorpen*, pp. 43-44.

548 De Rammelaere, 'Bijdrage tot de landbouwgeschiedenis'.

river area or coastal Flanders.<sup>549</sup> Some larger holdings had nonetheless emerged during the Middle Ages and co-existed with a sea of smallholders, similar to the situation in inland Flanders.<sup>550</sup> This had important implications for the employment opportunities in this region.

The rural economy in the northwest was mostly oriented towards grain production and the markets of Mons and Ath -alongside that of Valenciennes- played a pivotal role in Hainaut's grain exports.<sup>551</sup> Initially, arable land was divided into large irregular block-shaped parcels, but as holdings were fragmented during the fifteenth century, arable land was parceled out in narrow strips that were tilled individually.<sup>552</sup> Confronted with the ongoing subdivision of holdings and the declining profitability of agriculture, smallholders needed a way to supplement their income. One option available to them, was performing wage labour during seasonal peak moments on the large holdings that existed in the region.<sup>553</sup> This is again reminiscent of the smallholder peasants in inland Flanders who lived in co-dependency with large tenant farmers, trading their labour for grain and credit.<sup>554</sup> Proto-industry, and more specifically the production of linen in combination with the labour-intensive cultivation of flax also became increasingly more important for smallholders in the northwest during the late medieval period.<sup>555</sup> During the thirteenth century, a thriving rural linen industry had developed in inland Flanders, Artois and northern Hainaut.<sup>556</sup> It relied on cheap and specialized labour which was supplied by the masses of smallholders engaged in subsistence farming.<sup>557</sup> Important linen centers were Lessines, Ath, Chièvres in northwest Hainaut.<sup>558</sup> The combination of intensive agriculture on small plots of land and proto-industry remained characteristic for the northwest until the end of the nineteenth century.<sup>559</sup>

#### *Northeast Hainaut (region 2)*

A second region that can be delineated, is the northeast of Hainaut. This region is represented best by the district of Braine-le-Comte as its heartland but was made up of a larger area that encompassed the eastern part of the Mons district, the district of Roelux and the northern part of the district of Binche.

549 Sivéry, *structures agraires*, pp. 457; 563. On the early introduction of leasehold, before the mid-thirteenth century, in Hainaut see: van Bavel and Schofield eds., *The development of leasehold*, pp. 34; 187. However it has been claimed that leasehold was not all-enfolding in Hainaut: Sivéry, *structures agraires*, pp. 200-204; van Bavel, 'People and land', pp. 21-22. In smallholder regions, the equitable distribution of land thwarted the process of land accumulation. van Bavel, *Transitie en continuïteit*, pp. 393-394; 418-423. For coastal Flanders see: Soens & Thoen, 'The origins of leasehold'.

550 For example the farms owned by the abbey of Maagdendale in Ellezelles and Flobecq. Although these were in direct exploitation during the late middle ages. Cauchies, 'Servitudes et temps de guerre'.

551 Sivéry, 'Les profits', p. 607; Derville, 'Le grenier'.

552 Sivéry, *structures agraires*, p. 107. See for other regions: van Bavel, *Manors and markets*, p. 38.

553 van Bavel, 'Rural wage labour', p. 64.

554 For the eighteenth century, see: Lambrecht, 'Reciprocal Exchange', pp. 237-261; Vanhaute and Lambrecht, 'Famine', pp. 155-186.

555 Sabbe, *De Belgische vlasnijverheid*, pp. 74-78; 134-155; Thoen, *Landbouweconomie*, pp. 980-993.

556 van Bavel, *Manors and markets*, p. 345.

557 van Bavel, *Manors and markets*, pp. 367-368.

558 Van Houtte, 'De Zuidnederlandse vlasnijverheid', p. 743; Soly and Thijs, 'Nijverheid in de Zuidelijke Nederlanden', p. 42; Sivéry, *structures agraires*, p. 438.

559 Craeybeckx, 'De agrarische depressie', p. 196.

This region was dominated by large farms that were mostly held in hereditary tenure called ‘*mainferme*’ or ‘*censive*’ in contemporary sources.<sup>560</sup> Already before the fourteenth century, farmers had accumulated and consolidated holdings in this region that were on average larger than twenty hectares.<sup>561</sup> During the late fourteenth century the dominance of this type of holding has been attested in several villages in the district of Braine-le-Comte and the area surrounding the town of Soignies, with some as large as 75 hectares.<sup>562</sup> These holdings remained a stable feature in the northeast throughout the late medieval and early modern period, with some even growing larger as time went on.<sup>563</sup> One example is the village of Ittre, situated some ten kilometres west of Braine-le-Comte, where by the late eighteenth century two-third of the holdings were still larger than seventeen hectares.<sup>564</sup> Two endogenous factors explain this long-term continuity in property structures. On the one hand, holdings were less easily split up than in the northwest because inheritance practices favoured monogeniture in the northeast of Hainaut.<sup>565</sup> On the other hand, it is also likely that tenant farmers employed a specific strategy to ensure their holding remained intact, similar to the situation in coastal Flanders.<sup>566</sup>

The large farms in the northeast were oriented towards large scale commercial grain production on vast blocks of arable land. Unlike in the northwest, this type of landscape remained dominant throughout the late medieval period in the northeast, indicating the long-term continuation of large scale grain production.<sup>567</sup> Large farms required both a permanent staff and additional seasonal labour which resulting in the emergence of a specialized labour force in this region.<sup>568</sup> These agricultural labourers had only a limited amount of arable land at their disposal and became increasingly dependent on wage labour for their income. However, formal wage labour was not the only employment opportunity available to them. Agricultural labourers could also turn to the bolstering proto-industry, that had started to developed in this region since the late thirteenth century, to ensure their livelihood.<sup>569</sup> Enghien, Soignies, Braine-le-Comte and Binche developed into vibrant proto-industrial towns in the northeast of Hainaut.<sup>570</sup>

### *Southeast Hainaut (region 3)*

The southeast of Hainaut coincides with the area east of the river Sambre, encompassing most of the districts of Beaumont and Chimay as well as the Southern parts of the districts of Maubeuge

560 Sivéry, *structures agraires*, p. 314.

561 Sivéry, *structures agraires*, p. 341.

562 For instance, in Plouich near Soignies, in Binche, in Ecaussines and in Petit-Roelx. Sivéry, *structures agraires*, p. 314. But also, more to the north in the villages of Saintes (attested for the eighteenth century), see: Delleaux, ‘Diffusion et application’, p. 36.

563 Sivéry, *structures agraires*, p. 616.

564 Vandenbroeke, *Agriculture et alimentation*, p. 59 ; Delleaux, ‘Diffusion et application’, pp. 27-58.

565 Gilissen, ‘Le privilège de masculinité’, pp. 207-212. In the entire east of Hainaut, male heirs were also privileged in the inheritance of holdings held in hereditary tenure.

566 Thoen and Soens, ‘Family or the farm’.

567 Sivéry, *structures agraires*, p. 107.

568 According to Sivéry, in the county of Hainaut, holdings larger than 20 hectares needed permanent staff to maintain production. Sivéry, *structures agraires*, pp. 312-314 & 538.

569 van Bavel, *Manors and markets*, p. 345.

570 Van Houtte, ‘De Zuidnederlandse vlasnijverheid’, p. 743; Soly and Thijs, ‘Nijverheid in de Zuidelijke Nederlanden’, p. 42; Sivéry, *structures agraires*, p. 438.

and Bavay, but is best represented by the district of Avesnes.<sup>571</sup> While the northwest and northeast of Hainaut exhibited a degree of continuity in both property structures and the type of rural economy before and after the Black Death, the situation was noticeably different in the southeast (region 3).

Strong village communities had developed in this region during the second half of the twelfth century,<sup>572</sup> indicative of the weak position of both local lordship and ecclesiastical institutions.<sup>573</sup> In the southeast, land users enjoyed strong property rights and land was mostly held in hereditary tenure.<sup>574</sup> After the depopulation following the Black Death, short-term leasehold was introduced on many of these lands, which allowed a process of land accumulation and consolidation to set in.<sup>575</sup> During the late Middle Ages, the southeast transitioned from a region dominated by peasant smallholders to one dominated by medium to large tenant farms between 10 and 40 hectares in size.<sup>576</sup> The dominance of this type of holding continued into the early modern period. For example by the mid-eighteenth century, 23 per cent of holdings in the village of Avesnelles were between 10 and 40 hectares.<sup>577</sup> The shift in property structures after the Black Death made it difficult for children to inherit land after their parents had died.<sup>578</sup>

Coinciding with these changes in property structures, the rural economy also went through an important transition phase. Before the Black Death a system of mixed farming had developed, in which cereal cultivation was combined with livestock breeding. Even small-scale peasants had the opportunity to rear livestock as they could rely on the numerous commons present in the region at that time.<sup>579</sup> This situation changed drastically after the Black Death, when the intense demographic shock shifted the focus toward a more labour extensive pastoral economy. It would seem that this shift was not caused by changes in the land-labour ratio alone. After the mid-fourteenth century, Hainaut witnessed both a declining profitability of grain trade and a change in the consumption pattern.<sup>580</sup> After the Black Death, both artisans and labourers enjoyed greater disposable real incomes which (among other things) resulted in an increased demand for meat.<sup>581</sup> Important markets for livestock, cheese and meat emerged during this period in the towns of Prisches and Landrecies, in the district of Avesnes.<sup>582</sup>

The rise of the pastoral economy created a growing need for large pieces of land to pasture livestock. This sparked-off an enclosure movement in the southeast in which commons, previously used as pasture by large groups within the village communities, were leased out to well-to-do farmers.<sup>583</sup> Enclosure kicked into high gear at the end of the fifteenth century and gave rise to the

571 Jessenne, 'Agrosystems and rural change'.

572 Sivéry, *structures agraires*, p. 278.

573 Sivéry, *structures agraires*, p. 200.

574 Sivéry, *structures agraires*, pp. 133 & 261-262.

575 Sivéry, *structures agraires*, pp. 457-458.

576 Jessenne and Rosselle, 'L'histoire rurale', pp. 314-318; Desreumaux, 'Une carte de Hainaut', p. 380.

577 Only one per cent of holdings was larger than 40 hectares. Jessenne, 'Agrosystems and rural change', p. 259.

578 Gilissen, 'Le privilege de masculinité', p. 208.

579 Sivéry, *structures agraires*, p. 75.

580 On the shift from agriculture to livestock in the southeast of Hainaut see: Sivéry, 'Les profits'.

581 Munro, 'Money matters', p. 9.

582 Thoen and Soens, 'Vegetarians'.

583 Sivéry, *structures agraires*, p. 504.

bocage landscape that is still characteristic for the Avesnois region today.<sup>584</sup> The growing demand for pasture was also answered by a process in which land users turned arable land into meadows. This often happened without the prior consent of ecclesiastical institutions who lost tithe revenues on these lands and is again indicative of the power of the village communities.<sup>585</sup> This process started shortly after the Black Death and by the fifteenth century around half the arable land present in the region around 1300 had been turned into pasture.<sup>586</sup> The southeast would remain a pastoral region well into the eighteenth century. For example, in 1717 the authorities of the district of Avesnes and its 25 villages recorded 4 868 head of cattle, compared to 2 470 head of cattle – half as many – noted in the 28 villages of the district of Valenciennes.<sup>587</sup>

### Exogenous plague mortality

Historians have long claimed that the ‘light touch’ of the Black Death -in combination with endogenous factors- was instrumental in the quick and full demographic recovery in several regions of the Low Countries.<sup>588</sup> For example to explain the comparatively swift population recovery in Hainaut, Emmanuel Le Roy Ladurie, wrote that ‘*the less severe the fall, the less steep the climb back*’,<sup>589</sup> However, as chapters 1 and 3 have illustrated, the assumption that the Black Death only had a limited impact -especially in the Southern Low Countries- is no longer justifiable. Much of the data supporting this claim, as well as the way in which it has been used in previous research, is problematic to say the least. Every study on late medieval demography has to tackle a general scarcity of sources, the absence of serial documents and the incomplete nature of the contemporary administration.<sup>590</sup> As a result, historians are forced to extrapolate from very narrow localised data, or calculate mortality rates by relying on indirect figures.<sup>591</sup> In the case of the Low Countries, early research claimed that the Black Death left large parts of this area unscathed, based on the absence of sources mentioning a possible mortality crisis. Although subsequent publications were able to demonstrate that plague activity had in fact been present during the mid-fourteenth century, the impact was nonetheless deemed comparatively mild.<sup>592</sup> However, ongoing archival research has now provided compelling evidence to support that the Black Death was most likely no less severe -or less widespread- in the Low Countries than in other parts of Western Europe.<sup>593</sup>

Even though we should therefore deemphasize the role of a mild exogenous shock of the Black Death, this still does not solve the problem of understanding the relative importance of endogenous and exogenous factors for diverging population trends in the Low Countries. Most

584 Sivéry, *structures agraires*, pp. 80, 133 & 147; Delleaux, *Les censiers et les mutations*. For the situation in the twentieth century see: Gamblin, ‘Le contact Cambrésis-Thiérache’.

585 Sivéry, *structures agraires*, p. 618; Delleaux, *Les censiers et les mutations*, p. 132.

586 Sivéry, *structures agraires*, pp. 81-83.

587 Delleaux, *Les censiers et les mutations*, p. 27.

588 For a full overview of this argument and relevant literature see introduction of: Roosen and Curtis, ‘Light touch’.

589 Le Roy Ladurie, *The French peasantry*, p. 98.

590 On the limitations of late medieval demographic sources see: Thoen, ‘Historical demography’.

591 Klapisch-Zuber, ‘Plague and family life’.

592 Yet even scholars who claimed the moderate population decline after 1348 was very influential for the demographic developments that followed, acknowledge that -as such- it remains unexplained. See: van Zanden, ‘Third road to capitalism?’, p. 99.

593 See chapter 3. A view also supported in: Thoen and Soens, ‘Family or the farm’, p. 195.

historians agree that in order to understand long-term demographic trends, we need to account not just for the one-time impact of the Black Death but for the combined effect of recurring plague outbreaks.<sup>594</sup> In the absence of suitable mortality data, comparative studies have often assumed that exogenous factors driving demographic trends -such as epidemics- were distributed randomly, but in the long-run equally, between neighbouring regions. Epstein, in his study on Sicily and Tuscany, stated that “*no one region would on average and in the long run be hit more severely than any other*”.<sup>595</sup> In the case of the Low Countries, some authors have made a similar claim by stating that diverging demographic patterns after the Black Death cannot be attributed to exogenous epidemiological factors. Instead, they identify structural endogenous factors as the reason why ‘*some regions within the Low Countries saw a dramatic decrease in population in the later Middle Ages while others did not*’.<sup>596</sup> Unfortunately, there is no strong empirical footing to support the notion that plague mortality was roughly similar across regions in the Low Countries.

In order to disentangle the effect of exogenous and endogenous factors, this chapter introduces long-term mortality data for the three regions of Hainaut that have been delineated in section II. The mortmain dataset, which has been introduced in chapters 1, 3 and 4 is analyzed here for the period 1349-1505 to offer a nearly continuous source of long-term mortality trends per region.<sup>597</sup> As indicated in previous chapters, the content of the mortmain accounts is comparable to that of the English heriots. In essence they record a death fee on the best movable item of the deceased, owed to the count of Hainaut. Although not all inhabitants were subject to this type of taxation, it targeted a specific subsection of around ten to fifteen percent of the Hainaut population that remained stable over time.<sup>598</sup> In order to compare long-term mortality trends between the different regions in Hainaut, I have constructed region-specific clusters of localities for which the yearly number of deaths can be traced for the entire period 1349-1505. This provides a standardized sources of long-run mortality data.

There are, however, a number of limitations to the mortmain documents that need to be addressed here. For instance, because the powerful village communities in the district of Avesnes resisted the count’s right to levy mortmain, the accounts did not record any deaths in the core-area of the southeast of Hainaut.<sup>599</sup> In order to gain insight in the mortality trends in the southeast, I have constructed a cluster of eleven localities on the Southern borders of the districts of Bavay and Maubeuge.<sup>600</sup> These localities are part of the northernmost boundaries of the southeast region and are directly adjacent to the Avesnes district. It can therefore be assumed that this

594 For this argument see, for Southern France: Wolff, *Commerces et marchands*, p. 74. For northern France: Fourquin, *Les campagnes*, pp. 291-331. For the Low Countries: Blockmans, ‘Social and economic effects’, p. 834.

595 Epstein, ‘Cities, regions’, p. 17.

596 Thoen and Soens, ‘The low Countries’, p. 221.

597 Archives Départementales du Nord, Lille (hereafter ADN), Lille B, 12122-12273; Algemeen Rijksarchief Brussel (hereafter ARB), I, 004, 17867-73.

598 For an overview of the content of these documents, their demographic and geographical coverage, as well as their usefulness for socio-economic research see: Roosen, ‘Severity and Selectivity’.

599 Sivéry, *structures agraires*, p. 272. The right to levy mortmain was also tied to an earlier status of servility and the number of serfs in the southeast had always been small compared to that in other regions.

600 Southeast proxy-sample: District of Maubeuge: Boussois, Kieuraing, Recquignies. District of Bavay: Audignies, Bellignies, Hon, Hergies, Houdain, Le Flamengrie, Mecquignies, Obies.



cluster is a reliable proxy for long-term mortality trends in the heartland of the southeast as well. The regional clusters for the northwest and northeast, on the other hand, do offer data for the central areas of these regions. For the northwest, the cluster consists of twenty-six localities spread over the districts of Ath, Flobecq-Lessines and (north-western) Mons. While the clusters for the northeast is more restricted in size with only ten localities spread over the districts of Braine-le-Comte, (north-eastern Mons) and Roelux.<sup>601</sup> There is, however, a noticeable gap in the data for the northwest as the entire district of Ath is missing from the mortmain accounts between 1417 and 1440. To overcome this hurdle, I have compiled a subsample of five localities (from the larger northwest cluster) on the north-western border of the district of Mons to provide an estimate of the mortality trends in the entire northwest for this period.<sup>602</sup> As indicated in chapter 3, the mortmain accounts underestimate mortality for the Black Death due to both (a) the administrative disruption during this period and (b) the poor physical condition of the documentation for 1349-1350. No corrective was applied to the mortality data for the Black Death as it can be assumed underestimation affected all regions equally.

The two graphs below show the long-term mortality trends in the northeast, northwest and southeast for the period from the Black Death to the beginning of the sixteenth century. In order to make the data more easily comparable between the three regions, which have varying numbers of absolute deaths, I have calculated the percentage deviation in the number of yearly deaths per regional cluster respective to the mean number of deaths for the period 1349-1505 for each corresponding region. Graph 1 indicates that, apart from a few outliers, mortality trends in the northwest and northeast were roughly similar between 1349-1416 and 1441-1505. The same seems to be true for the period 1417-1440 for which only a limited subsample is available for the northwest. Graph 2 adds further credence to the notion that long-term mortality trends were similar between all three regions in Hainaut, as the southeast appears to have experienced mortality peaks very similar to those in the northwest and northeast.

There are, however, a few notable exceptions when plague mortality was clearly more severe in one of the three regions. A first clear deviation from the trend was the 1400-1402 plague outbreak which seems to have affected the southeast disproportionately. Some six decades later, this was paralleled by the plague outbreak of 1468-1469 when the northeast suffered much higher mortality than the other two regions, while for the northwest, the 1380-1382 and 1438-1439 plague outbreaks seem to have been relatively more severe. Throughout the period 1349-1505 several smaller, less significant, differences in mortality levels can be seen between the three regions. This confirms the claim by Wim Blockmans that recurring plague outbreaks in the Low Countries could be confined locally and regionally.<sup>603</sup> However, no isolated mortality event seems either severe or long-lasting enough to be responsible for steering population developments in the long-run. On

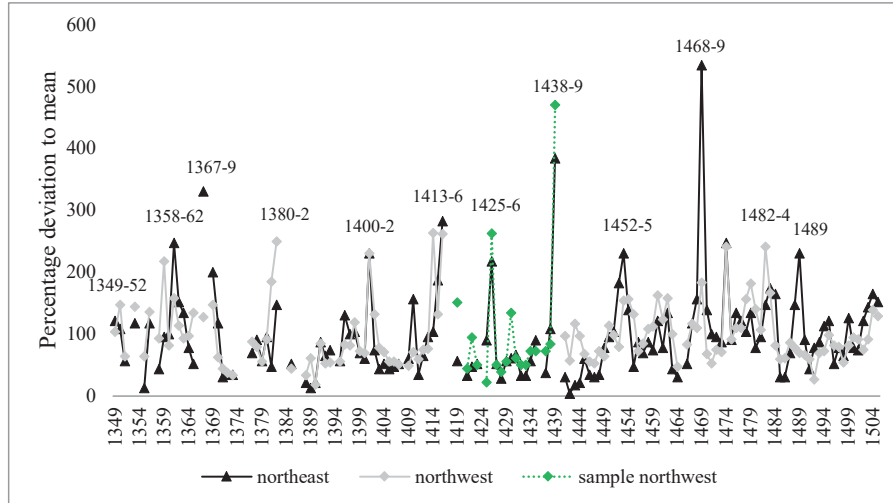
601 Northwest sample: District of Ath: Arbre, Attre, Biévène, Brugelette, Cambron-Casteau, Gibecq, Hellebecq, Isières, Lanquesaint, Maffle, Mainvault, Mévergnies-Les-Lens, Moulbaix, Rebaix, Silly, Villers-Notre-Dame, Villers-Saint-Amand, Wannebecq. District of Flobecq Lessines: Ellezelles, Flobecq, Ogy. District of Mons: Cambron-Saint-Vincent, Erbaut, Herchies, Jurbise, Lens. Northeast sample: District of Braine-le-Comte: Braine-le-Câteaux, Ecaussinnes, Feluy, Haut-Silly, Quenast. District of Mons: Chaussée-Notre-Dame, Horrues, Neufvilles. District of Roelux: Mignault, Naast.

602 The localities in the subsample are: Cambron-Saint-Vincent, Erbaut, Herchies, Jurise and Lens.

603 Blockmans, 'Social and economic effects', p. 850.

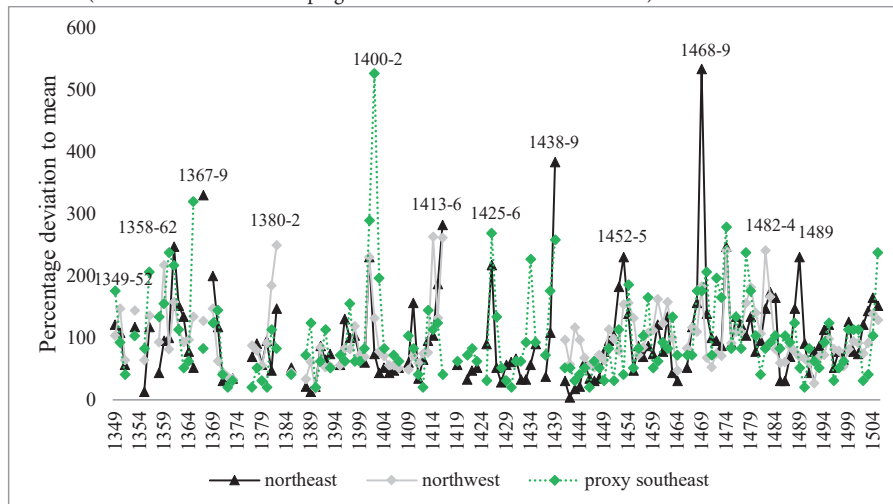
the whole we can conclude that if long-term diverging population trends are witnessed between the northwest, the northeast and the southeast of Hainaut, this should not be ascribed primarily to differences in exogenous factors (mortality trends).

**Graph 1.** mortality trends in northwest and northeast, percentage deviation to mean. Including a subsample of locations in northwest Hainaut for the period 1417-1440. (dates indicate identified plague outbreaks in the Low Countries)



Sources: ADN, B 12122-12273; ARB, I, 004, 17867-73.

**Graph 2.** mortality trends in northwest, northeast and proxy localities for southeast, percentage deviation to mean. (dates indicate identified plague outbreaks in the Low Countries)



Sources: ADN, B 12122-12273; ARB, I, 004, 17867-73.

### Rural population developments

Absolute demographic trends for Hainaut can be derived from the frequently conducted hearth counts that are available from the second half of the fourteenth century onwards. In the mid-1950s, these documents were painstakingly compiled by Maurice-Aurélien Arnould, providing a ready source of census data.<sup>604</sup> As the income derived from direct exploitation of their domains became insufficient, the counts of Hainaut relied increasingly on direct taxation and to this effect, a rural hearth tax was instituted in 1365. The amount of taxes owed by each of the fifteen administrative districts of the county was subdivided among the individual localities. Within these localities all the hearths were counted to divide the burden of taxation over the inhabitants. Only the very poor, the nobility and high-ranking clergy were exempt from taxation in the countryside.<sup>605</sup> More conspicuous is the absence of cities which were not subject to hearth tax, leaving their population unrecorded.<sup>606</sup> For the countryside, however, these documents offer a relatively full overview of late-medieval population numbers. The raw hearth figures were multiplied with a coefficient of five to provide an estimation of the total population, in line with previous research on rural hearth sizes in the Low Countries and northern France during the late medieval period (see chapter 1).

The taxation system did not change from the second half of the fourteenth century until the third quarter of the sixteenth century and the documents thus provide standardized information for this period. Between 1349 and 1541, nine hearth counts have been preserved. Only six of them have been conserved in their entirety –meaning with the recording of hearths for individual localities- those from 1400, 1424, 1440, 1458, 1531 and 1541. For the counts of 1479 and 1501, only the total number of hearths per administrative district are available.<sup>607</sup> For the initial taxation of 1365, the smaller districts of Enghien and Flobecq-Lessines were not yet taxed and no hearth counts were conducted there. To account for their absence, these two districts have been excluded from the analysis of the overall population trends in Hainaut.<sup>608</sup> The year 1541 was selected as end date because it was the first count in which the population for the entire county of Hainaut rose above its 1365 level.<sup>609</sup>

Table 1. Population trends in the county of Hainaut

Hearth count	County of Hainaut							
	1365	1400	1424	1440	1458	1479	1501	1541
Population	136,015	99,975	88,850	121,420	129,225	92,950	103,175	155,725
Index 1365 = 100	100	73.5	65.3	89.3	95	68.3	75.9	114.5

Calculated from Arnould, denombrements.

604 Arnould, *Les dénombremments de foyers*.

605 Arnould, *Les dénombremments de foyers*, p. 135.

606 These were the so-called bonnes villes: Mons, Maubeuge, Le Quesnoy, Condé, Hal, Braine-le-Comte, Ath, Bouchain, Bavai, Saint-Ghislain, Avesnes, Chimay, Beaumont, Landrecies, Le Roeulx and Leuze. Furthermore, Binche, Lessines and Enghien were also not included in the count. Arnould, *Les dénombremments de foyers*, p. 68.

607 For information on how these dates were ascertained see: Arnould, *Les dénombremments de foyers*, p. 128-129.

608 This exclusion does not affect the overall picture dramatically as the districts of Enghien and Flobecq-Lessines only made up 6.3 per cent and 2.8 per cent respectively in 1541. Arnould, *Les dénombremments de foyers*, p. 296.

609 Noted also in: Fossier, 'Peuplement de la France', p. 71.

According to previous literature, the County of Hainaut as a whole experienced population developments nor dissimilar to those in other parts of the Low Countries and northern France. Following a demographic boom at the end of the high Middle Ages, a population peak had been reached in the final stages of the thirteenth century.<sup>610</sup> The overall population density in Hainaut during this time has been estimated at around 112 persons per square km.<sup>611</sup> The beginning of the fourteenth century, however, ushered in a period of intense mortality crises. First at the hand of the Great Famine (1315-17) and afterwards by the Black Death and recurring echo-epidemics.<sup>612</sup> Only a few select Hainaut villages provide pre-Black Death figures for hearths that allow us to estimate the mortality rates in this period. The villages of Pont-sur-Sambre, Forest-en-Cambrésis and Louvignies-Quesnoy -all situated on the south of Hainaut- respectively lost 27 per cent, 60 per cent and 58 per cent of their hearths between the dates of 1286 and 1365.<sup>613</sup> These population losses provide some insight into the combined mortality effects of the Great Famine, The Black Death and *pestis Secunda*. Following the late medieval crisis the county of Hainaut, along with most of northern France, hit a population nadir in the first half of the fifteenth century (see table 1).<sup>614</sup> Afterwards, population numbers started to recover until another stage of population decline set in during the final quarter of the fifteenth century.<sup>615</sup> Falling population numbers during this period were not only the result of plague outbreaks but also warfare. Especially the Burgundian wars (1474-1477) seem to have affected Hainaut severely.<sup>616</sup> This was only a temporary setback, however, and during the first half of the sixteenth century a new phase of population growth had commenced. By the mid-sixteenth century, Hainaut as a whole had surpassed its 1365 population level by around 14.5 per cent. At a disaggregated level, however, there were sharp regional divergences in population trends within the county of Hainaut.<sup>617</sup> In what follows, I will endeavour to ascertain what the relative role was of endogenous and exogenous factors in defining these demographic divergences.

#### *Northwest Hainaut*

Compared to the overall development, the northwest of Hainaut recovered relatively fast from the late medieval crisis. Yet the initial stage of population decline between the mid-fourteenth- and the early fifteenth century was comparatively more pronounced in this region. It is entirely possible that this was the result of the 1380-1382 plague outbreak which was more severe in the

610 Low Countries: Blockmans, Pieters, Prevenier, and van Schaik, 'Tussen crisis en welvaart', p. 59; Northern France: Derville, 'La population'; Fossier, 'Peuplement de la France'. Flanders: Thoen, 'Historical demography', pp. 577-580; Bocquet, *Recherches*, pp. 141-142.

611 Benedictow, *The Black Death, 1346-1353*, p. 113.

612 Sivéry, *structures agraires*, p. 439; Sivéry, 'La Hainaut'; Blockmans, 'Social and economic effects'; Roosen and Curtis, 'Light touch'.

613 Sivéry, 'La Hainaut', pp. 432-433; Arnould, *Les dénombrements de foyers*; Devillers, ed., *Cartulaire*. Similar figures have been recorded for select villages in Walloon Flanders: Bocquet, *Recherches*, p. 37.

614 Fossier, 'Peuplement de la France', p. 70. For Hainaut: Sivéry, *structures agraires*, pp. 610-611.

615 This population decline coincided with a period of intense warfare (Burgundian wars 1474-77 and the war of the Burgundian Succession 1477-82) which caused large scale, albeit temporary, migration towards the cities and towns of Hainaut according to Arnould. Arnould, *Les dénombrements de foyers*, p. 188.

616 Arnould, *Les dénombrements de foyers*, pp. 169-170.

617 Arnould already noted the regional diverging population trends in his original study of the hearth counts. He hypothesised that the internal migration of people was the main cause for these perceived differences. Arnould, *Les dénombrements de foyers*, p. 284.

northwest than in the other regions of Hainaut. The effect of plague mortality only manifested itself over the short term and from the first quarter of the fifteenth century onwards there are clear signs of population recovery. Even the severe plague outbreak of 1438-1439 did not curtail growing population numbers in the long-term. Several smaller plague mortality peaks, such as the one in 1482-1484, combined with warfare in the final quarter of the fifteenth century did cause demographic decline, but this too was short-lived (table 2). By the mid-sixteenth century, population levels were almost a quarter higher than they had been in the second half of the fourteenth century, indicating moderate to strong population growth during the intermittent period. This recovery is also mirrored in the rising population density in the district of Ath which grew from ca. 45 to ca. 55 persons per square km.<sup>618</sup>

**Table 2.** Population trends in the northwest of Hainaut

Hearth count	District of Ath							
	1365	1400	1424	1440	1458	1479	1501	1541
Population	35,685	24,385	25,905	37,695	40,070	31,865	30,885	43,640
Index 1365 = 100	100	68.3	72.6	105.6	112.3	89.3	86.5	122.3

Calculated from Arnould, *dénombrements*.

As indicated in the previous section, long-run mortality trends in the northwest did not differ significantly from those in the northeast and northwest. It can therefore be assumed that the relatively quick and full population recovery witnessed in 1541 was primarily the result of the endogenous factors discussed in section II. It would seem that smallholders in this region were able to benefit from their strong grip on the land, the partible inheritance pattern and the combination of agriculture with proto-industry to achieve demographic recovery. After the mortality crises of the fourteenth- and early fifteenth centuries, the initial stages of demographic recovery were likely stimulated by the ease with which existing holdings could be subdivided by smallholders among their offspring. This meant newly established households acquired sufficient land to ensure their livelihood at a relatively early stage which in turn lowered average marital age and stimulated birth rates. As demographic growth continued during the first three quarters of the fifteenth century, quickly surpassing the 1365 population level, holdings were increasingly fragmented up to the point where they were too small to be self-sufficient. This did not slow down population growth, however, as both (seasonal) wage labour and proto-industry offered additional means of income to these smallholders. Warfare and plague mortality disrupted demographic recovery in the last quarter of the fifteenth century but only in the short-term. The further rise of proto-industrial activities in the northwest of Hainaut likely stimulated a self-sustained growth process that resulted in a strong phase of population recovery in the first half of the sixteenth century. The relatively high population density in the northwest at this time, is a further indication that proto-industrial activities, in combination with small-scale agriculture played an important

<sup>618</sup> Calculated from: Arnould, *Les dénombrements de foyers*, p. 298.

role.<sup>619</sup> Although direct quantifiable evidence of migration is largely missing for the late Middle Ages, there are qualitative indications that proto-industry also influenced migration patterns in the northwest. In 1561, local tax collectors communicated to the administration of the Count that the population in the villages of Buissenal and Frasnes-lez-Buissenal (situated some 11 km northwest of Ath) had declined noticeably due to out-migration triggered by the decline of local proto-industrial activities.<sup>620</sup> Prior to this period, however, we can assume that a reverse process was in effect, in which proto-industry acted as a migratory pull-factor.

#### *Northeast Hainaut*

The northeast of Hainaut witnessed population developments that were much more favourable than in the rest of the county. Instead of experiencing a net decline, this region saw its population rise noticeably between 1365 and 1400. Yet, apart from the 1380-1382 plague outbreak, there are no indications that the northeast suffered a milder late medieval plague regime than the northwest or the southeast. If anything, it would seem that plague mortality was somewhat more pronounced in this region during the second half of the fourteenth century, especially the 1367-1369 plague seems to have struck the northeast comparatively hard. Despite some population decline in the first quarter of the fifteenth century, possibly the short-term effects of the 1400-1402, 1413-16 and 1425-1426 plague recurrences, demographic recovery is clearly visible by 1440 (table 3). For all its severity, the 1438-1439 plague outbreak therefore does not seem to have influenced population trends in the northeast in the long-term. More noticeable is the effect of the 1468-1469 plague and the Burgundian wars, as population numbers declined in the final quarter of the fifteenth century. However, despite these mortality crises overall population numbers in the northeast never sank below their 1365 level, unlike the other two regions. The first half of the sixteenth century heralded in a period of strong population growth and by 1541 the population in the northeast reached nearly double its 1365 level. The evolution of the population density in the district of Braine-le-Comte clearly indicates this remarkable demographic trajectory, between the mid-fourteenth and mid-sixteenth century the population density increased from ca. 12 to ca. 51 persons per square km.<sup>621</sup>

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619 Pounds and Roome, 'Population density', p. 127.

620 Arnould, *Les dénombrements de foyers*, pp. 285-286. Out-migration was reportedly oriented towards Inland Flanders or Walloon Flanders.

621 Calculated from: Arnould, *Les dénombrements de foyers*, p. 298. In the district of Binche it went from 22 persons per square km to 33.

**Table 3.** Population trends in the northeast of Hainaut

District of Braine-le-Comte								
Hearth count	1365	1400	1424	1440	1458	1479	1501	1541
Population	1,175	2,865	3,045	3,705	3,990	3,290	2,585	4,910
Index 1365 = 100	100	243.8	259.1	315.3	339.6	280.0	220.0	417.9
District of Binche								
Hearth count	1365	1400	1424	1440	1458	1479	1501	1541
Population	6,825	8,275	6,305	7,765	7,585	7,680	6,125	10,285
Index 1365 = 100	100	121,2	92,4	113,8	111,1	112,5	89,7	150,7
District of Roelux <sup>622</sup>								
Hearth count	1365	1400	1424	1440	1458	1479	1501	1541
Population	n.a.	2,310	2,100	2,880	2,820	n.a.	n.a.	3,300
Index 1365 = 100	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total northeast (excluding district of Roelux)								
Hearth count	1365	1400	1424	1440	1458	1479	1501	1541
Population	8,000	11,140	9,350	11,470	11,575	10,970	8,710	15,195
Index 1365 = 100	100	139.3	116.9	143.4	144.7	137.1	108.9	189.9

Calculated from Arnould, denombrements.

As section III has indicated the late medieval plague regime in the northeast was not significantly less severe than in the other regions of Hainaut. We can therefore, once again, assume that endogenous factors acted as the prime mover in the favourable population trends in this part of Hainaut. There are no indications of the average birth rate in the county of Hainaut during the late medieval period.<sup>623</sup> However, they would have had to be astronomically high to counteract repeat plague mortality and achieve anything close to both the intermediate and long-term demographic growth trends seen in the northeast between 1365 and 1541. It can therefore be surmised that in-migration played an important role in the swift demographic recovery seen in this region. The initial stages of demographic growth between 1365 and 1400 were likely due primarily to an influx of migrant labourers who took on either permanent or seasonal employment on the large holdings, involved in grain production, that dominated the northeast. As proto-industry rose to prominence in this region during the late medieval period,<sup>624</sup> this too likely acted as an important migratory pull-factor.<sup>625</sup> Once these migrant labourers started to settled down, proto-industry most likely

622 The district of Roelux was counted alongside the district of Mons in a number of hearth counts. It has therefore been excluded from the total for the northeast. Arnould, *Les dénombrements de foyers*, p. 296.

623 Indications for Hainaut during the last quarter of the eighteenth century show that the rate of natural increase (crude birth rates minus crude death rates) was around 7‰ annually. Guignet, 'Cohésion et disparités'.

624 van Bavel, 'Early proto-industrialization'; van Zanden, 'Third road to capitalism?', p. 98.

625 There is also evidence for this proto-industrial migration process in other regions of the Southern Low Countries. For instance, the district of Ferrain in Walloon Flanders saw its population double between 1449 and 1549, parallel to the rise of rural proto-industry in this area. At the same time, other areas in Walloon Flanders lacking a strong proto-industrial sector witnessed much more restricted population growth in this period. Derville and Delmaire, 'L'agriculture de la Flandre Wallonne'. The central proto-industrial centre of Tourcoing even saw its population quintuple between 1449 and 1549. See: Lottin, ed., *Histoire de Tourcoing*, p. 50; Derville, 'La population II', p. 78.

also promoted an internal growth process which helped sustain demographic growth.<sup>626</sup> Unlike in the northwest of Hainaut, however, significant population growth during the fifteenth- and sixteenth centuries did not result in an ongoing fragmentation of holdings as inheritance patterns favoured monogeniture in the northeast. Moreover, since in-migration most likely account for a significant portion of the demographic upswing, the possibility to inherit land from parents residing in the region was closed-off to a large number of newly established households. Instead, the masses of nearly landless labourers caused an increase in both the number and the average size of rural hamlets.<sup>627</sup> The combination of ample employment opportunities on large holdings and the rise of proto-industry acted both as a pull-factor for in-migration and also ensured the livelihood of households on small plots of land.

#### *Southeast Hainaut*

The southeast shows by far the least favourable population developments in terms of recovery and growth. Yet the initial stage of demographic decline between 1365 and 1400 was remarkably similar to that in the northwest and only mildly more pronounced than in Hainaut as a whole.<sup>628</sup> During the fifteenth century, however, the southeast would experience sharply declining population numbers and long-term stagnation thereafter. The effect of the 1400-1402 plague outbreak is very noticeable, the 1424 hearth count show a population level at almost 60 per cent below that of 1365 (table 4). Although the mortality regime in the fifteenth century was very similar to that in the northwest and northeast, we see an absolute population nadir in the final quarter of this century. By the mid-sixteenth century, the population level is still somewhat lower than its 1365-level, indicating long-term stagnation. This stagnation is also reflected in the population density which remained at around ca. 21 persons per km<sup>2</sup> between 1365 and 1541 in the district of Avesnes, the most populated area of this region.

To explain the long-term demographic trajectory of the southeast, endogenous factors once more seem to have played a pivotal role. After the initial impact of the Black Death, both the rural economy and the property structures went through a phase of significant change in the southeast. The region transitioned from being dominated by peasant smallholders engaged in mixed farming to one dominated by medium to large holdings engaged in large scale animal husbandry. The cumulative effect of these changes appears to have been dramatic for subsequent population developments. The changes in the rural economy set into motion an enclosure movement which caused small scale peasants to lose access to communal grazing grounds. At the same time the labour extensive pastoral economy did not offer ample employment opportunities through which

626 Pounds and Roome, 'Population density', p. 127.

627 Sivéry, *structures agraires*, p. 153.

628 Limited data indicates that the district of Avesnes was well populated before 1365. There is population data for just one locality in this district prior to the Black Death, Pont-sur-Sambre. It shows that the population density in 1286 was 78.5 inhabitants per square km, by 1365 it had dropped to 57.5 inhabitants per square km. Devillers, ed., *Cartulaire; Sivéry, structures agraires*, p. 256.



these peasants could have earned an additional income.<sup>629</sup> Eventually, small scale peasants could no longer compete with their more successful neighbours and with little to no additional income,<sup>630</sup> they lost their holdings and were often forced to out-migrate.<sup>631</sup> It is entirely possible that the northeast of Hainaut saw an influx of some of these migrants during various stages of the fifteenth- and sixteenth centuries. Those who remained in the southeast were at trouble to establish new households, because farmers chose not to subdivide their holdings as smallholders did in the northwest. At the same time, it is also likely that women found relatively more employment opportunities in the labour extensive pastoral economy compared to arable agriculture which further increased the average marital age and negatively affected fertility.<sup>632</sup> In short, there were both strong incentives for out-migration and a lack of internal demographic growth processes present in the southeast that caused intense demographic decline and subsequent long-term stagnation.

**Table 4.** Population trends in the southeast of Hainaut

District of Avesnes								
Hearth count	1365	1400	1424	1440	1458	1479	1501	1541
Population	7,455	5,120	3,135	4,745	6,450	1,545	3,925	7,310
Index 1365 = 100	100	68.7	42.1	63.6	86.5	20.7	52.6	98
District of Beaumont								
Hearth count	1365	1400	1424	1440	1458	1479	1501	1541
Population	548	410	272	355	379	309	282	564
Index 1365 = 100	100	74.8	49.6	64.8	69.2	56.4	51.5	102.9
District of Chimay								
Hearth count	1365	1400	1424	1440	1458	1479	1501	1541
Population	348	282	134	194	238	303	749	354
Index 1365 = 100	100	81.0	38.5	55.7	68.4	87.1	215.2	101.7
Total southeast								
Hearth count	1365	1400	1424	1440	1458	1479	1501	1541
Population	8351	5812	3514	5294	7067	2187	4956	8228
Index 1365 = 100	100	69.6	42.4	63.4	84.6	25.8	59.3	98.5

Calculated from Arnould, denombrements.

629 Some labour opportunities remained, as people were needed to herd livestock. Most of these labourers were employed on a permanent basis and maintained small arable fields no larger than 1.5 ha. Sivéry, *structures agraires*, pp. 133 & 397.

630 Some systems of poor relief did exist. However, they were organized through so-called “terres des pauvres” in the southeast. Lands were tilled by wealthy farmers on behalf of the poor table. During the fifteenth century, evidence for this systems comes from multiple villages in the Avesnes district such as Marbaix, Maroilles and Noyelles-sur-Sambre. Sivéry, ‘Recherches sur l’aménagement’, pp. 18-19.

631 Sivéry, *structures agraires*, p. 133, 117-119 & 504. By the eighteenth century, out-migration of mostly younger generations still plagued the Avesnois region. The labour extensive pastoral economy and the difficulty to get access to land were strong migratory push-factors. See: Guignet, ‘Cohésion et disparités’.

632 Voigtländer and Voth, ‘How the West’, pp. 2227-2229.

## Concluding remarks

In the field of ecological studies, the concept of ecological resilience is defined as the extent of disturbance an ecosystem can withstand before it redefines its structure by changing the variables and processes that control behaviour.<sup>633</sup> Recently, this concept has been applied by economic historians to past societies dealing with hazards and shocks as well. With this new definition, an event can be deemed a disaster when it redefines the structure and behaviour of a society.<sup>634</sup> Applied to the specific case study of the demographic trends within the county of Hainaut after the impact of the Black Death, it helps to provide an answer to the question posed in the title of this chapter. The three regions and their distinct demographic trajectories indicate that even within the relatively small geographical area of Hainaut, the impact of the Black Death and recurring plague, in a demographic sense, could result in either disaster or a window-of-opportunity. For the southeast of Hainaut, the shock of the Black Death and recurring plague was clearly a disaster as this region witnessed both substantial societal change in property structures and the type of rural economy as well as long-term demographic decline and subsequent stagnation. Although in an economic sense those tenant farmers who were able to accumulate and consolidate large pastoral holdings, benefitted from the demographic downturn. The demographic trajectories in the north of Hainaut fared substantially better by comparison. While the northwest saw moderate levels of demographic recovery between the mid-fourteenth- and mid-sixteenth century, recovery in the northeast of Hainaut was nothing short of expeditious. For this region, the Black Death and recurring plague seem to have functioned as a window of opportunity with regard to population developments. In fact, when analysing the available hearth counts for this region in isolation, any historian would be inclined to assume that the northeast did not suffer any noticeable mortality crisis in the second half of the fourteenth century. The major contribution of this chapter, then, is the fact that it has introduced data from a single (nearly) continuous source of mortmain accounts to gain insight in the long-term mortality trends for different regions of Hainaut. As such, it has endeavored to analyze the effect of endogenous factors in defining diverging post-plague population trends, in isolation from exogenous factors (plague mortality). Reconstructions of long-term deaths indicate that the northwest, northeast and southeast of Hainaut all witnessed similar mortality regimes during the fourteenth- and fifteenth centuries. It would therefore seem that the regional differences in demographic recovery rates in the county of Hainaut were not driven by regional variations in long-term mortality trends. Instead what mattered from demographic recovery after the Black Death were endogenous societal factors, or more broadly the socio-institutional framework that was already in place before the mid-fourteenth century and which consisted of institutions that were not geared specifically to preventing or mitigating the severe population shock.<sup>635</sup> For a population shock as unprecedented as the Black Death, it was the socio-institutional framework that defined whether a region in the county of Hainaut achieved relatively rapid demographic recovery, or whether it saw its population struggle to reach pre-plague levels for centuries down the line.

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633 Gunderson, 'Ecological Resilience', p. 426; Gunderson, 'Ecological and human community resilience'.

634 van Bavel, et. al., *Disasters and history*, chapter 2, section 2.b.

635 van Bavel and Curtis, 'Better understanding disasters'.





# General conclusion

While it is generally accepted that the Black Death and recurrent plague outbreaks of the Second Pandemic had inequitable demographic consequences across Europe, there is unresolved debate regarding the causal mechanisms behind this phenomenon. This dissertation has endeavoured to further this debate by posing one central research question, “*Why is it that some societies proved highly vulnerable in the face of plague, while others were resilient, achieving relatively swift and sustained demographic recovery?*”. To answer this question, my research has focused on the relative importance of two variables -exogenous mortality shocks (primarily plague) and endogenous societal factors- in defining regionally diverging population trends in the wake of the Black Death.

Where a previous tradition of historiography relied on neo-Malthusian reasoning to explain late medieval population developments in Europe, current historiography lacks a similar unifying theory. Historians can, by and large, be divided into two distinct schools of thought on the subject of diverging patterns of post-plague demographic recovery. One line of reasoning attributes a prime role to exogenous mortality shocks, brought on primarily by plague, to explain regionally diverging population trends after the Black Death. While the other focuses on the importance of endogenous societal factors instead. For some European regions, the effects of exogenous and endogenous factors have been combined to explain population trends in the wake of the Black Death. Historians of the Low Countries, for example, have pointed to the dual effects of endogenous societal factors that stimulated population growth as well as a mild exogenous plague shocks, to explain the comparatively swift post-plague demographic recovery in this region. The combined effect of both exogenous and endogenous variables has also been used by historians to explain why even adjacent regions within the Low Countries could experience sharply diverging population trends.<sup>636</sup> Both of these elements -the combination of two lines of reasoning and diverging post-plague demographic patterns on a relatively restricted geographical scale- make the Low Countries an ideal setting for a case study. More specifically, this dissertation focuses on a region in the Southern Low Countries, the County of Hainaut, because high resolution data on both mortality- and population trends is available in the secondary literature and the archives for this region. These factors combined make the County of Hainaut the ideal candidate to analyse how endogenous societal factors and exogenous plague shocks defined population recovery in the wake of the Black Death. And, in doing so, answer the central research question of this dissertation.

Due to the general lack of quantifiable indicators for both population figures and long-term mortality trends for the late medieval period, the exact relationship between exogenous and endogenous variables has often been assumed in previous research, rather than empirically tested. For instance, the notion of a mild plague regime -an important part of the explanation for the swift demographic recovery in the Low Countries after the Black Death- is based primarily on historical insights from the 1980s.<sup>637</sup> The first chapter of this dissertation illustrated how a number of assumptions regarding the severity and selectivity of late medieval plague in the Southern Low Countries have been based on a selective (and at times incorrect) reading of secondary literature

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636 van Bavel, ‘People and land’.

637 Several recent works have shown that the Black Death had a greater presence than previously assumed: Vandeburie, ‘De Zwarte Dood’; Vermeersch, ‘De Zwarte Dood’.

and archival sources. It seems that some datasets on plague severity therefore do not provide an adequate basis for comparing regional severity across space and time. Chapter two illustrated how this problem is also present on a broader scale by exploring the issue of noncritical use of historical data -of Second Pandemic plague occurrences- in a wider European and interdisciplinary context. It reached a similar conclusion as the first chapter, when scholars fail to reflect on the content of the data they are using, the reliability of their results becomes questionable. This is an important realisation when trying to understand regionally diverging population trends, as this type of analysis requires reliable long-run data on both population developments and mortality trends for all the regions under investigation. The first two chapters made it obvious that any attempt to test the causal mechanisms behind diverging post-plague population trends would have to begin with collecting reliable data. Chapter two concluded that scholars looking to perform empirical studies on historical plague, should limit the scope of their study either in a geographic or temporal sense to limit problems of inequalities in the availability of source materials. Instead of compiling datasets of different kinds of references to plague on a multitude of geographical levels, a dataset that offers long-term information from a single source and adhering to one clear geographical unit, offers more possibility for systematic comparison.

With this in mind, chapter three sought to challenge the persistent notion that the Southern Low Countries only suffered a mild impact from the Black Death and the plague outbreaks that followed, in comparison to other European regions. The supposed 'light touch' of the Black Death has been a component of the most important explanations for the relative ease with which parts of the Low Countries saw their post-plague population numbers recover. Yet an analysis of the mortmain database revealed that late medieval plague was likely no less severe in the Southern Low Countries than in other parts of Europe. The mortmain accounts provided mortality data from a single source type on a nearly year-to-year basis for large parts of the County of Hainaut. The long-run analysis of these documents provided an insight in the mortality trends for this region not attained by datasets in which different source types -with varying degrees of quantitative accuracy- are combined. The re-evaluation of the notion of a 'light touch' of plague in the Southern Low Countries has consequences for how we explain the full and swift post-plague population recovery. Instead of reduced mortality levels, it seems that endogenous societal processes explained the remarkable demographic recovery in the Southern Low Countries after the Black Death. This realisation shaped the central hypothesis that was tested in the final chapter of this dissertation, "*rapid demographic recovery in parts of the Low Countries is the result of, endogenous processes of recovery itself, rather than the chance 'good fortune' of experiencing weaker exogenous biological shocks*".

Before putting this hypothesis to the test, however, chapter four diverted somewhat from the central tenet of the dissertation. Linking up to an important current debate in the field of bioarchaeology, it investigated the possible sex-selective mortality effects of the Black Death and recurring plague. Apart from the direct finding that late medieval plague indeed killed more women than men, this chapter also reached a more general conclusion. Although the Black Death is often seen as a "universal disease", testament to its great severity, which disrespected age, sex, health, and socio-economic position. This chapter lends support to the view that the initial Black Death should not necessarily be considered separate from the plague outbreaks that followed.

At least with regard to sex-selectivity and within the narrow confines of the County of Hainaut, the Black Death displayed similar features as later outbreaks. Although this is only one of many epidemiological characteristics, it nonetheless reveals an important aspect of the way in which plague may have affected subsequent demographic recovery, as women are considered vital to the “fertility side of the demographic equation”.<sup>638</sup>

Chapter five, brought together the information gathered in the previous chapters to answer the central research question of this dissertation. Within the County of Hainaut there were different socio-institutional regions that underwent sharply diverging population trends in the wake of the Black Death. Regions that witnessed swift demographic recovery (or even growth) did not appear to have been touched more ‘lightly’ by plague than the region showing long-term demographic stagnation, nor was the overall impact of the Black Death for the entire County mild. More important than the severity of the biological shock of plague was the regional socio-economic context within which the mortality crisis occurred.<sup>639</sup> Endogenous societal factors that influenced population trends after the Black Death -in late medieval Hainaut- were region-specific property structures, employment opportunities and inheritance systems. Depending on their regional constellations, these factors could have a positive or negative effect on population growth. For the County of Hainaut, the direct causal mechanisms behind diverging population trends seem to have been fertility and migration patterns.

In the southeast of Hainaut the Black Death and recurrent plague caused long-term demographic decline. After the population decline of the mid-fourteenth century, this region transitioned from one dominated by peasant smallholders engaged in mixed farming to one dominated by medium to large holdings engaged in large scale animal husbandry. This transition also set into motion an enclosure movement of the common field on which small-scale peasants had relied for communal grazing. Moreover, the labour extensive pastoral economy offered little employment opportunities. As competition for short-term leasehold intensified, successful tenant farmers outcompeted small-scale peasants. With little to no additional income, this group of peasants was eventually forced to out-migrate. Those who remained were at trouble to establish new households as inheritance practices favoured monogeniture. In short, strong incentives for out-migration and a lack of endogenous societal factors conducive for population growth were present in the southeast Hainaut. Together, this caused long-term demographic stagnation. The northwest of Hainaut was a region dominated by peasant smallholders who were able to subdivide their holdings among their offspring. This region also saw the rise of a vibrant proto-industrial sector during stages of the fourteenth century. The combination of these factors meant that this region was able to show relatively swift demographic recovery after the Black Death. Although in-migration seems to have played a part in this, population recovery was likely achieved mainly through a self-sustained growth process aided by proto-industry and partible inheritance. Finally, the northeast of Hainaut showed a remarkable phase of demographic growth shortly after the Black Death. Despite some temporary setbacks in the decades that followed, long-term population growth was nothing short of remarkable for this area. The rise of proto-industry in this region,

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638 Poos, *A rural society*, pp. 113-120

639 Campbell, *The great transition*, p. 15.



combined with the ease with which labourers could settle in the rural hamlets, functioned as an important migratory pull-factor. Both before and after the Black Death, this region has been dominated by large farms held in hereditary tenure, farms that were not subdivided among offspring. Yet these farms were engaged in large-scale grain production and as such created employment opportunities for labourers looking to settle down in the northeast.

All three regions of Hainaut experienced very similar plague shocks and yet all witnessed sharply diverging population trends. For the specific case of the County of Hainaut, it seems that endogenous societal factors, unique to each region were decisive in causing post-plague demographic divergences. Even pre-industrial societies, which lacked modern tools for combating disease such as antibiotics or vaccines, were not completely at the mercy of deadly pathogens. Granted they succeeded in weathering the initial storm, it was the socio-economic constellation of societies that decided whether or not long-term demographic decline would set in, not the severity of the exogenous shock.



# A

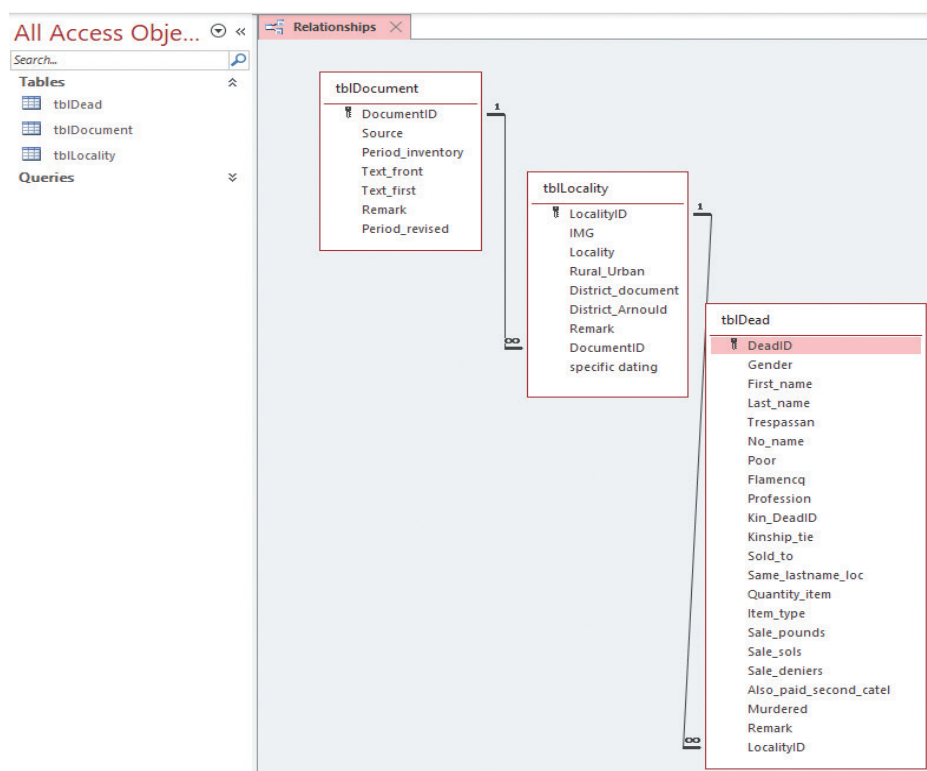
## Appendices

## Appendix to introduction: database description

This appendix describes the data structure of the mortmain database. This Access-database was constructed using the mortmain accounts of the County of Hainaut for the period 1349-1505. The content of these accounts is described throughout the chapters of this dissertation. This appendix will explain how the archival documents were digitized and how the data were structured. For a detailed description of the documents and their content, I refer to chapters one, three and four.

### Table relationships

The database consists out of three tables namely: (a) **Document**, (b) **Locality** and (c) **Dead**. These tables are linked with a ‘one-to-many’ relationship. Within this specific data structure this entails that one document can contain multiple localities, while one locality can contain multiple individuals that died (dead) for whom mortmain was levied. This structure, as well as the names of these tables, was decided upon after a first general inspection of the archival documents during an early stage of the research. Each table is linked through a primary key and a foreign key in Access in order to keep track of the contents of each archival document. These keys are easily identifiable as they appear with the appendix “-ID”. The image below provides insight into the table relationships.



*Fields*

Each table records a specific subset of variables found in the mortmain accounts. These variables are recorded in Access through the use of different fields within each table. The image above already provided an overview of these fields, I will describe them in more detail in this section.

For the table **Document**, the following fields were identified:

1. **DocumentID.** This is an auto-number field which provides a unique identifying numerical for each individual archival document.
2. **Source.** This field provides the archival inventory number for each mortmain account. The following archives were used, spanning the period 1349-1505: Archives Départementales du Nord, Lille (hereafter ADN), Lille B, 12122-12273; Algemeen Rijksarchief Brussel (hereafter ARB), I, 004, 17867-73.
3. **Period\_inventory.** This field contains the period (dd-month-yyyy) for which a specific mortmain account was recorded, according to the archival inventory.
4. **Text\_front.** This field was created with the intent of recording the text that appears on the cover of each mortmain document. This variable was subsequently abandoned because it was not directly relevant for my research. This field is left blank.
5. **Text\_first.** This field was created with the intent of recording the text that appears on the first page of each mortmain document. This variable was subsequently abandoned because it was not directly relevant for my research. The information on this page was used in a more qualitative sense, however, to check the specific dating of each document. This field is left blank.
6. **Remark.** Each table contains a ‘remark’ field in which information is noted down that cannot easily be placed in a field designated for a specific variable. Within the Document table, I chose to note down the physical condition of the mortmain accounts in this field. Document degradation could influence the amount of information I was able to derive from it, and as such seemed interesting to record.
7. **Period\_revised.** Not every mortmain account covered the same exact year-to-year/January-to-December period. Some accounts had to be combined, others split up for the data to be comparable over the long-term. This field indicates to which ‘standardized’ year a document adheres to.<sup>640</sup>

The image below provides an overview of how the different fields of the **Document** table are integrated in Access.

DocumentID	Source	Period_inventory	Text_front	Text_first	Remark	Period_revised
1	ADN B 12122	24 june 1349 - 11 april 1350			Document severely damaged by what appears to be fire, tea	1349
2	ADN B 12123	25 april 1351 - 1 may 1352			Document is mildly damaged by what appears to be fire and	1351
3	ADN B 12124	15 july 1353 - 18 november 1353			Document is mildly damaged by what appears to be fire and	1353
4	ADN B 12125	18 november 1353 - 24 august 1354			Document is in good condition but on some pages the ink ha	1353
5	ADN B 12126	30 june 1355 - 13 november 1355			Document is in good condition but has a different size than t	1355

640 Chapter 3 describes this issue in more detail.

For the table **Locality**, the following fields were identified:

1. **LocalityID**. This is an auto-number field which provides a unique identifying numerical for each individual locality as it appears per mortmain account/document. This entails that when the same locality appears in multiple accounts, it will receive a different numerical each time it appears. This, however, only occurs very infrequently.
2. **IMG**. This field contains the number of the corresponding JPEG image file. A digital photograph was taken for each page of each mortmain account that was consulted.
3. **Locality**. This field contains the name of the locality in which individuals, who died and owed mortmain to the Count of Hainaut, were recorded.
4. **Rural\_Urban**. Initially this field was set up to record whether a locality was rural or urban. After working with the documents during the initial period of my research, I decided to consult existing literature to make this distinction during the analysis of the data. This field is left blank.
5. **District\_document**. Each mortmain account is divided into different administrative districts, each containing multiple localities. This field was created to note down, per locality, which district it belonged to according to the mortmain accounts.
6. **District\_Arnould**. During the mid-1950s, Maurice-Aurélien Arnould reconstructed the hearth counts for the County of Hainaut during the late medieval period. In an effort to make my research comparable with his findings, this field records to which district a locality adhered to according to Arnould's analysis. Some fields have been left blank due to certain localities not appearing in the hearth counts analysed by Arnould.<sup>641</sup>
7. **Remark**. Each table contains a 'remark' field in which information is noted down that cannot easily be placed in a field designated for a specific variable. This field was left mostly blank in the Locality table. Very infrequently I recorded that some information in the document was missing due to damage.
8. **DocumentID**. This field links a locality to a specific mortmain account. Within one account, there were multiple localities. To maintain this relationship in the archival documents, a one-to-many relationship was established between the Document table and the Locality table.
9. **Specific dating**. In some mortmain accounts, the recording of certain localities localities is subdivided over smaller periods of time which, when taken together, make up the full period recorded in a given document.

The image below provides an overview of how the different fields of the **Locality** table are integrated in Access.

LocalityID	IMG	Locality	Rural_Urban	District_document	District_Arnould	Remark	specific date
322	215	Mons		District of Mons	Provost of Mons		
323	215	Saint-Symphorien		District of Mons	Provost of Mons		
324	215	Herchies		District of Mons	Provost of Mons		

641 Arnould, *Les dénombrements de foyers*.

For the table **Dead**, the following fields were identified:

1. **DeadID.** This is an auto-number field which provides a unique identifying numerical for each individual that appears in the mortmain documents. Individuals are only recorded in the accounts upon their death when they owe mortmain to the Count of Hainaut.
2. **Gender.** This field records gender based on several indicators, the most important being the individual's first name and marital status (husband or wife of "x").<sup>642</sup>
3. **First\_name.** This field lists the first name of the individual. Due to the labour-intensive nature of recording this variable and occasional palaeographic challenges, some fields were left blank. The main purpose of recording this variable was to establish gender, this is why I opted to only note gender starting from the 1449 document onwards.<sup>643</sup> As indicated in the description of the '*gender*' field, first names were still used to attribute a gender to an individual, even if they were no longer noted down in the database.
4. **Last\_name.** This field lists the last name of the individual. Due to the labour-intensive nature of recording this variable and occasional palaeographic challenges, some fields were left blank. The main purpose of this variable was to record kinship ties, to this end the '*Kinship\_tie*' and '*Kin\_DeadID*' fields were created, which made recording the last names of individuals obsolete for the purpose of my research.
5. **Trespasnan.** For individuals who died in the city of Mons it is sometimes mentioned that they died as a so-called '*trespasant/trespasans/trespasnan*'. Non-residents who died in Mons were still subjected to paying mortmain to the Count. The exact origins of this specific stipulation for Mons are described by Leo Verriest in his volume on servitude in the County of Hainaut.<sup>644</sup>
6. **No-name.** This field indicates when an individual died without the account mentioning a first- or last name. Often this was the case with individuals who were specifically mentioned as 'poor' or 'beggar'.
7. **Poor.** In some cases, an individual was indicated specifically as being 'poor', a 'poor beggar' or a 'beggar'.
8. **Flamencq.** Some individuals were mentioned as being a 'Flamencq', in other words, being from the County of Flanders.
9. **Profession.** Although very infrequent, the profession of some individuals was at times mentioned in the mortmain accounts.
10. **Kin\_DeadID.** This field is used in combination with the '*Kinship\_tie*' field to record instances of multiple familymember deaths recorded in the same locality in the same mortmain account. The '*Kin\_DeadID*' field records the '*DeadID*' auto-number of the first familymember that is mentioned in the account, while the '*Kinship\_tie*' field records the nature of the kinship of each additional dead familymember.
11. **Kinship\_tie.** This field is used in combination with the '*Kin\_DeadID*' field to record instances of multiple familymember deaths recorded in the same locality in the same mortmain account. The '*Kin\_DeadID*' field records the '*DeadID*' auto-number of the first familymember

642 A full description is provided in chapter 4.

643 ADN, Lille B, 12215-12273 & ARB, I, 004, 17871-73.

644 Verriest, *Le servage*, p. 310.

- that is mentioned in the account, while the 'Kinship-tie' field records the nature of the kinship of each additional dead family member.
12. **Sold\_to.** After the death of an individual who owed mortmain to the Count of Hainaut, the heirs were obligated to show the three best movable items of the deceased to the local bailiff. The bailiff would then decide on the best item, which was subsequently impounded and sold at public auction.<sup>645</sup> Often, these impounded goods were sold to family members of the deceased.
  13. **Same\_lastname\_loc.** This field was originally created to record which individuals that died in the same locality had the same family name. However, because it offered only an indirect indication of family member mortality, I decided to abandon this variable at an early stage.
  14. **Quantity\_item.** Although the best item (or good) that was impounded by the local bailiff usually consisted of one physical item, at times multiple items (of the exact same type) were impounded. This field records the number of items. In certain localities, the Count did not own the full mortmain right, but only half or a third of the mortmain that was owed after death. In these cases, the quantity is recorded as 0,5 or 0,33 respectively.
  15. **Item\_type.** This field records the type of item that was levied as mortmain. A wide range of items can be found in the accounts and they have been recorded in their medieval terminology, as they appear in the mortmain documents.
  16. **Sale\_pounds.** This field records the amount of pounds the impounded mortmain item was sold for at auction. The mortmain accounts used a so-called *monnaie de compte*, an accounting currency. In the case of the mortmain accounts, this was the livre tournois de Hainaut for which the following value division applies: 1 livre (pound) = 20 sols = 240 deniers.<sup>646</sup> (Note that this field does not record the full amount for which an item was sold at auction as sols and deniers are recorded separately. When taken, together the pound, sols and deniers field make up the total amount an item was sold for at auction.)
  17. **Sale\_sols.** This field records the amount of sols the impounded mortmain item was sold for at auction. The mortmain accounts used a so-called *monnaie de compte*, an accounting currency. In the case of the mortmain accounts, this was the livre tournois de Hainaut for which the following value division applies: 1 livre (pound) = 20 sols = 240 deniers.<sup>647</sup> (Note that this field does not record the full amount for which an item was sold at auction as pounds and deniers are recorded separately. When taken together, the pound, sols and deniers field make up the total amount an item was sold for at auction.)
  18. **Sale\_deniers.** This field records the amount of deniers the impounded mortmain item was sold for at auction. The mortmain accounts used a so-called *monnaie de compte*, an accounting currency. In the case of the mortmain accounts, this was the livre tournois de Hainaut for which the following value division applies: 1 livre (pound) = 20 sols = 240 deniers.<sup>648</sup> (Note that this field does not record the full amount for which an item was sold

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<sup>645</sup> Verriest, *Le servage*.

<sup>646</sup> Sivéry, 'La fin de la guerre de cent ans', p. 312.

<sup>647</sup> Sivéry, 'La fin de la guerre de cent ans', p. 312.

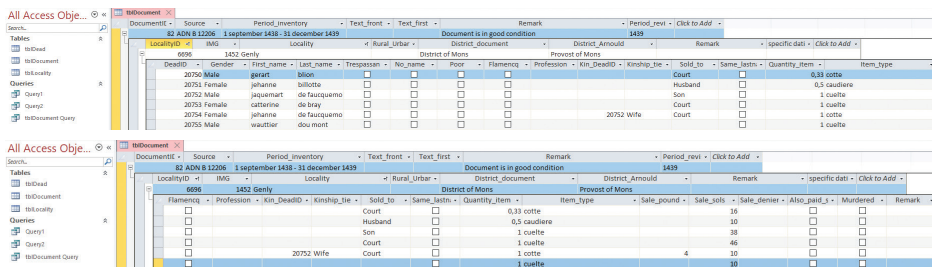
<sup>648</sup> Sivéry, 'La fin de la guerre de cent ans', p. 312.



at auction as pounds and sols are recorded separately. When taken together, the pound, sols and deniers field make up the total amount an item was sold for at auction.)

19. **Also-paid-second-catel.** This field records whether a second item was levied as mortmain, in addition to the obligation to pay mortmain.
20. **Murdered.** This field contains instances in which it is specifically mentioned that an individual was murdered, instead of dying from (presumably) natural causes.
21. **Remark.** Each table contains a 'remark' field in which information is noted down that cannot easily be placed in a field designated for a specific variable. This field was left mostly blank in the Dead table.
22. **LocalityID.** This field links a deceased individual to a specific locality within a specific mortmain account. Within one account, there were multiple localities which could contain multiple dead. To maintain this relationship in the archival documents, a one-to-many relationship was established between the Locality table and the Dead table.

The image below provides an overview of how the different fields of the **Dead** table are integrated in Access.



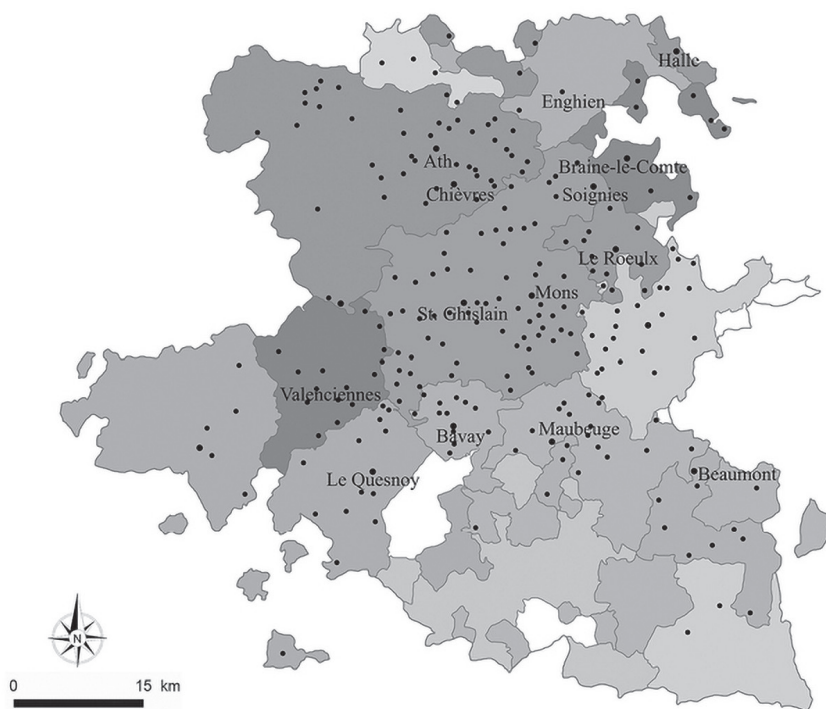
## Appendix to chapter 1

### Sources and dataset

In section 3 of the article, it is mentioned that the number of districts (and as a direct consequence the number of localities) included in the mortmain accounts fluctuated over time. Map 2 below shows the distribution of rural- and urban localities as they appear in the accounts in the period 1349-1450.<sup>649</sup> It illustrates how the heartland and the northern part of the County of Hainaut are better represented than the southern part. Urban localities have been indicated by name so they are easily distinguishable from the rural localities.

Figure 4 gives an indication of the total number of rural- and urban localities as well as the number of districts throughout the period 1349-1450.<sup>650</sup> We can clearly see a trend towards a higher inclusion of districts over time. During certain periods the right to levy mortmain in a specific district could be leased out, this explains (in part) the fluctuations in the number of districts.

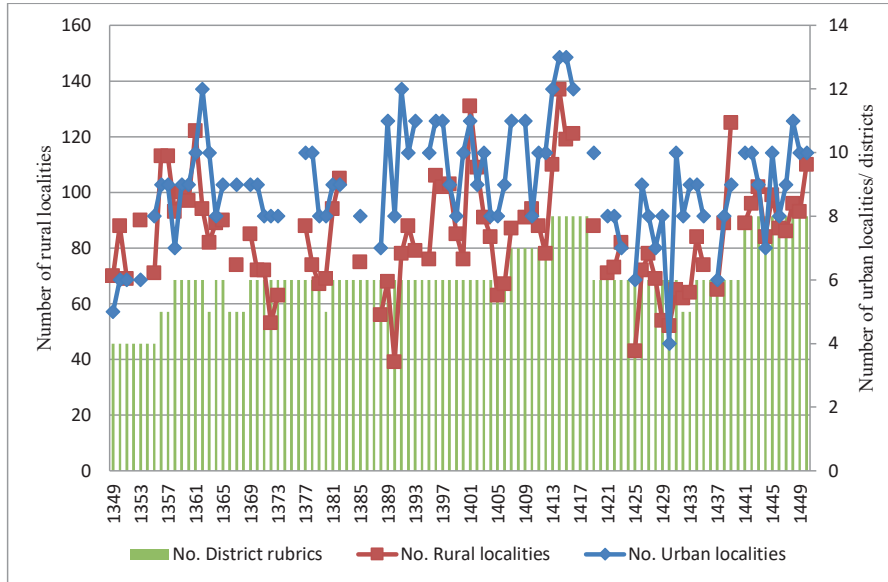
**Map 2.** Map of the county of Hainaut with indication of rural localities and cities found in the mortmain documents, 1349-1450



<sup>649</sup> The numbering of graphs, tables and maps continues from chapter 1.

<sup>650</sup> Because districts are clustered together at certain times without mention of the individual districts, their quantity is indicated through the number of rubrics in the accounts that illustrate the counts of a new district.

**Figure 4.** Number of rural and urban localities appearing in the mortmain accounts, 1349-1450



Source: ADN, B 12122-12226; ARB, I, 004, 17867-73.

The most common pattern is that plague years not only cause higher mortality in localities that are ever-present in the accounts, it also causes low-population (or localities where the population subject to mortmain is low) localities to appear in greater numbers. These are localities that, in ‘normal’ mortality years, do not show a death in every single account, hence they are not ever-present. The increase in the number of (especially rural) localities during plague years has a direct impact on the representation of plague severity in figure 1. Because this figure calculates mortality over the number of localities, the actual severity may be underestimated. This is the result of the high number of localities that are present in these years that are not ever-present in ‘normal’ mortality years. The total number of deaths are therefore divided by a much larger group of localities. However, the increase in localities is in itself a sign of widespread mortality and thus a factor of plague epidemics. In any case, it does not influence the conclusion made in section 4 that the 1400-1401 plague outbreak was more severe than several previous plague waves. The number of localities in 1400-1401 is higher than at any point in the fourteenth century and still the severity is noticeably elevated.

*Estimated coverage of mortmain accounts*

In an effort to analyze the importance of the Hainaut mortmain accounts relative to the total population in the County of Hainaut, I present an estimation of the coverage. In correspondence with the available hearth counts, a coverage has been calculated for 1406 and 1444.<sup>651</sup> The

651 Arnould, *Les dénombrements*, p. 771.

calculations below are based on a number of assumptions which will be explained more in-depth in the final section of this appendix. Most important are the average size of hearths (expressed as a multiplier) and the average mortality during ‘normal’ years (expressed as a percentage of total population).

**Table 3.** Estimated coverage of mortmain, 1406

Estimate for 1406		Estimated total population			
		Multiplier 3.5	Multiplier 4	Multiplier 4.5	Multiplier 5
Total hearths <sup>652</sup>	4861	17013,5	19444	21874,5	24305
5y avg. mortmain <sup>653</sup>	96.4				
		Mortality 3%			
		595,5	680,5	765,6	850,7
	Coverage % mortmain	16,2	14,1	12,6	11,3
		Mortality 3.8%			
		646,5	738,9	831,2	923,6
	Coverage % mortmain	14,9	13	11,6	10,4
		Mortality 4%			
		680,5	777,7	875	972,2
	Coverage % mortmain	14,1	12,4	11	9,9

**Table 4.** Estimated coverage of mortmain, 1444

Estimate for 1444		Estimated total population			
		Multiplier 3.5	Multiplier 4	Multiplier 4.5	Multiplier 5
Total hearths <sup>654</sup>	6863	24020,5	27452	30883,5	34315
5y avg. mortmain <sup>655</sup>	136.2				
		Mortality 3%			
		840,7	960,8	1080,9	1201
	Coverage % mortmain	16,2	14,2	12,6	11,3
		Mortality 3.8%			
		912,8	1043,1	1173,6	1303,9
	Coverage % mortmain	14,9	13	11,6	10,4
		Mortality 4%			
		960,8	1098	1235,3	1372,6
	Coverage % mortmain	14,2	12,4	11	9,9

652 Arnould, *Les dénombrements*.

653 The 5 year average of the following years in the mortmain accounts were used: 1404, 1405, 1406, 1407, 1409 (no data for 1408). Archives Départementales du Nord, Lille B, 12165-12171.

654 Arnould, *Les dénombrements*.

655 The 5 year average of the following years in the mortmain accounts were used: 1442, 1443, 1444, 1445, 1446. Archives Départementales du Nord, Lille B, 12208-12212.

Tables 3 and 4 use the following method to calculate the coverage. (1) First they take the absolute number of hearths for those localities that appear both in the mortmain account and in the hearth count. (2) Next, a multiplier ranging from 3.5 to 5 is applied to calculated the total population represented by the hearth counts for these localities. (3) Based on these results we attain a number that indicates the 'estimated total population' of those localities. These differ according to the average hearth size (multiplier) that has been applied. (4) The following step is to calculate the average mortality using 'normal' mortality rates of 3, 3.8 and 4 per cent. (5) This results in the number of people that likely died during the year in which the hearth count was performed based on the assumption that it was a year showing average mortality. (6) Based on the mortmain accounts, a five year average is calculated of the people that died in the selected localities, the corresponding hearth count year is used as middle value for this calculation. This has been done to ensure that any outliers specific to one single year are removed from the calculations, thereby providing an estimate of the average mortality. (7) This result is compared to the total number of deaths attained by the previous calculation to arrive at a percentage that indicates the likely coverage of the mortmain accounts in the recorded localities. The calculation is represented schematically below.

$$\frac{\text{Mortmain 5y avg}}{(\text{HearthCount} * \text{multiplier}) * \text{avg mortality \%}} = \text{est coverage \%}$$

Based on the calculations, the overall coverage of the mortmain is very similar for 1406 and 1444, between 10 and 16 per cent. However, the sample is not completely constant as the number of localities that were registered in the mortmain accounts fluctuated over time. Overall, there were 72 overlapping localities for both years.

#### *Information regarding hearth size and mortality rate*

This section provides further information regarding the average size of a hearth and the 'normal' mortality rate that have been used in the calculation of the coverage of the mortmain accounts.

#### *Average size of hearth*

In his study on medieval overpopulation in France and the Low Countries, Norman Pounds employed a multiplier of 5 on the assumption that the resulting total would be large enough to cover the classes excluded from hearth surveys.<sup>656</sup> This multiplier also seems to fit the data for rural population in other parts of Europe.<sup>657</sup> In a later publication by Pounds and Roome, it was explained that such a multiplier would cover both successful attempts at evasion and those classes which were exempt from the hearth tax: the nobility, the clergy, and the homeless, wandering poor.<sup>658</sup> However, in using this multiplier, Pounds did not differentiate between countryside and town. He did indicate that it perhaps underestimated urban population and, more likely, overestimated rural population. Pounds himself admitted that a multiplier of 4 might in fact be closer to reality for the countryside.<sup>659</sup> A multiplier between 4 and 5 has been put forth for

<sup>656</sup> Pounds, 'Overpopulation in France and the Low Countries', pp. 225-47.

<sup>657</sup> Mols, *Introduction à la démographie historique*, I, pp. 69-70.

<sup>658</sup> Pounds and Roome, 'Population density', pp. 116-30.

<sup>659</sup> Pounds, 'Overpopulation in France and the Low Countries', p. 230.

northern France. For the Artois countryside, Bocquet proposed a multiplier of 4.5 for 1469.<sup>660</sup> Maurice Arnould, who studied the hearth counts for Hainaut proposed a multiplier of 4.5 for rural hearths in 1540/1.<sup>661</sup> However, lower multipliers have also been proposed in the literature, for instance Russell preferred a multiplier of 3.5 for hearths,<sup>662</sup> and the same figure was proposed by Alain Derville for rural hearths in northern France around 1300.<sup>663</sup> It should be noted that there is a degree of artificiality in choosing a fixed multiplier. As Pounds pointed out, it is probable that the average size of a hearth tended to fluctuate quite considerably during the late Middle Ages.<sup>664</sup> For example, Jan Dumolyn claims that after a period of scarcity, famine and epidemic disease the multiplier should be lowered.<sup>665</sup> This is why the calculated coverage of the mortmain accounts used multipliers ranging from 3.5 to 5 when estimating the total population.

#### *Mortality rate*

The tables below give a brief overview of the mortality rates that have been proposed in the literature for the Southern Netherlands during the late medieval period. Because the hearth counts for Hainaut only contain rural localities, the choice was made to use the mortality rates for rural settings.

**Table 5.** Average mortality rate<sup>666</sup>

period	#/1000	region
Late 14 <sup>th</sup> -early 15 <sup>th</sup> century	40-50	Land of Aalst
End 15 <sup>th</sup> century	30-35	Land of Aalst
Ancien Régime (general)	25-30	County of Flanders

**Table 6.** Average mortality rate (urban vs rural)<sup>667</sup>

period	#/1000	region
1395-1423	38	Land of Aalst
1395-1423	47	City of Ronse

**Table 7.** Average mortality rate per period<sup>668</sup>

period	#/1000	region
1395-1404	51.7	Land of Aalst
1405-1414	30.8	Land of Aalst
1415-1425	34.1	Land of Aalst

660 Bocquet, *Recherches sur la population rurale*, p. 197.

661 Arnould, *Les dénombrements*, p. 292.

662 Russell, 'Late Ancient and Medieval Population', p. 152.

663 Derville, 'La population du Nord', pp. 501-30.

664 Pounds, 'Population and settlement', pp. 369-402.

665 Dumolyn, 'Population et structures professionnelles', pp. 43-64.

666 Thoen and Devos, 'Pest in de Zuidelijke Nederlanden', pp. 20-43.

667 Ibidem.

668 Thoen, *Landbouweconomie en bevolking in Vlaanderen*, p. 77.

## *Appendix to chapter 3. Plague mentions in the Low Countries sources, 1349-1499<sup>669</sup>*

### **Regions:**

Br = Duchy of Brabant; Ha = County of Hainaut; PoC = Pale of Calais; Gu = Duchy of Guelders; Fr = Frisia; Lo = County of Loon; Fl = County of Flanders; Ov = Oversticht; Ar = County of Artois; Lu = Duchy of Luxembourg; Ca = Cambrésis; To = Tournaisis; Ho = County of Holland; Ne = Nedersticht; Na = County of Namur; Li = Prince-Bishopric of Liege; LvA = Land van Aalst; Lim = Duchy of Limburg; UG = Upper Guelders; Bo = Boulonnais; Ze = County of Zeeland; Me = Lordship of Mechelen; Be = County of Bentheim; Cl = Duchy of Cleves; Jü = Duchy of Jülich; LvW = Land van Waas; VA = Vier Ambachte

### **Archives**

ARB – Algemeen Rijksarchief Brussel (Brussels)  
 ACM - Archives Communales Mons  
 ADN - Archives Départementales du Nord (Lille)  
 ADPdc - Archives Départementales Pas-de-Calais (Arras)  
 ARA - Archives Municipales d'Arras  
 AML - Archives Municipales de Lille  
 AMSO - Archives Municipales Saint-Omer  
 BASO - Bibliotheque d'Agglomération de Saint-Omer  
 BHIC - Brabants Historische Informatie Centrum (Den Bosch)  
 ELO – Erfgoed Leiden en Omstreken  
 HCOvD – Historisch Centrum Overijssel vestiging Deventer

HUA - Het Utrechts Archief (Utrecht)  
 RA – Rijksarchief te Antwerpen (Antwerp)  
 GA – Gelders Archief (Arnhem)  
 GV – Gemeentearchief Venlo  
 RAZ – Regionaal Archief Zutphen  
 RB - Rijksarchief te Brugge (Bruges)  
 RK - Rijksarchief te Kortrijk (Courtrai)  
 SG – Stadsarchief Gent (Ghent)  
 SB - Stadsbibliotheek Brugge (Bruges)  
 SK – Stadsarchief Kampen  
 WBA – West Brabants Archief (Bergen-op-Zoom)

<sup>669</sup> We are grateful to Remi van Schaik for access to his '*calamiteiten kalender*' that pointed us to a number of references to plague in the Northern Netherlands that we had not discovered previously.

## 1349-52

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ha; Br; PoC; Gu; Fr; Lo; Fl; Ov; Ar; Lu; Ca; To Ho; Ne; Lim; Li; Na;	Lille (1); Ghent (2); Izel (3); Esquerchin (4); Aduard (5); Bruges (6); Ypres (7); Ath (8); Mons (9); Maubeuge (10); Soignies (11); Chièvres (12); Cambrai (13); Bapaume (30); St.-Omer (31); Aire (32); Kennemerland (33); Utrecht (34); Deventer (25); Béthune (26); Douai (44)	Sint-Truiden (14); St. Bertin (15); Wittewierum (16); Bavay (35); [Limburg] (39); Liege (40); St.-Omer (42); Béthune (29); Lille (38); Hesdin (37); Arras (24); Bas-Warneton (23); Hannut (22); Nieuwport (43); Zwolle (46)	[Frisia] (17); Valenciennes (18); Tournai (19); Arras (20); Ghent (36); Antwerp (41); Namur (27); Arnhem (28); Gorinchem (21); Amay (45)

- (1) M. Aubry, 'Les mortalités lilloises, 1328-69', *Revue du Nord*, 65 (1983), p. 333. The mortality of *rentiers* between 1328 and 1369 shows the third highest spike in the period. A. Derville, 'La population du Nord au Moyen Age', *Revue du Nord*, 80 (1998), p. 525. For the hospital of St. Saveur, two documents from 1349 and 1355 show out of 65 living tenants, 45 had disappeared (69%), and for the countryside 12 out of 34 had disappeared (32%). Actual source: ADN, Archives Hospitalières de Lille, VI E7, fo. 9v.
- (2) J. Vermeersch, 'De Zwarte Dood in Vlaanderen en Europa, economische impact en politieke reacties' (unpub. MA thesis, Univ. Ghent, 2015), p. 15; 7 out of 36 names struck through indicating death, when in previous years this was usually one (1349).
- (3) A. Bocquet, *Recherches sur la population rurale de l'Artois et du Boulonnais pendant la période bourguignonne, 1384-1477* (Arras, 1969), p. 37. Households decline 26% between 1347 and 1351.
- (4) *Ibid.*, 37. Households decline 18% between 1347 and 1351.
- (5) J. Mol, ed., *De abtenkroniek van Aduard: studies, editie en vertaling* (Hilversum, 2010), p. 30. The abbey chronicles suggest 92 deaths of 'scholares', and 46 out of roughly 100 monks in 1350 (46% death rate).
- (6) J. Vandeburie, 'De Zwarte Dood te Brugge. Een status questionis en enkele nieuwe beschouwingen', *Handelingen van het Genootschap voor Geschiedenis te Brugge*, 147 (2010), pp. 269-308. Calculated total mortality rate of 35%.
- (7) Vandeburie, 'De Zwarte Dood'.
- (8) W. Blockmans, 'The social and economic effects of plague in the Low Countries, 1349-1500', *Revue Belge de Philologie et d'Histoire*, 58 (1980), p. 838.
- (9) G. Sivéry, 'Le Hainaut et la Peste Noire', *Mémoires et Publications de la Société des Sciences, des Arts et des Lettres du Hainaut*, 79 (1965), p. 438.
- (10) Over 100 mortmain dead in 1349 compared to average between 1349 and 1450 of roughly 33. ADN, B 12122.
- (11) Sivéry, 'Le Hainaut', p. 437.
- (12) A total of 64 mortmain dead in 1349 compared to average between 1349 and 1450 of roughly 29. ADN, B 12122.
- (13) Derville, 'La population', p. 524. Excess mortality of nearly 15% for the chaplains of the cathedral and over 35% for their farmers. Actual source: ADN, 4G, nos 6849, 6853.
- (14) E. Lavigne, ed., *Kroniek van de abdij van Sint-Truiden, 1138-1558. Vertaling van de Gesta Abbatum Trudonesium*, II (Assen, 1988), p. 187.
- (15) B. Delmaire, 'Contribution à l'étude de la peste au bas moyen âge. Un fragment de compte inédit de l'abbaye de Saint-Bertin pour Bas-Warneton', *Mémoires de la Société d'Histoire de Comines-Warneton et de la Région*, 11 (1981), p. 48.
- (16) H. Jansen, ed., *Kroniek van het klooster Bloemhof te Wittewierum* (Hilversum, 1991).
- (17) Worp of Thabor (Prior), *Chronicon Frisiae libri tres*, ed. J.G. Ottema (Leeuwarden, 1847), p. 190. Sixteenth-century chronicles.



- (18) J-N. Biraben, *Les hommes et la peste en France et dans les pays Européens et Méditerranées*, I (Paris, 1975), p. 76.
- (19) C. Dury, 'L'évolution démographique de Tournai au Moyen Age', in *Autour de la ville en Hainaut. Mélanges d'archéologie et d'histoire urbaines offerts à J. Dugnoille et à R. Sansen* (Ath, 1986), pp. 185-203.
- (20) A. Guesnon, ed., *Inventaire chronologique des chartes de la ville d'Arras; documents* (Arras, 1863), no. 97. On 5 July 1352, Queen Jeanne gave financial aid to the city and mentioned the great mortality as reason for this: « *par la mortalité qui a esté par universel monde, ladite ville est si grandement amoindrie, tant de personnes et habitants comme de revenus et biens temporels, qu'elle est en voie de desolation* ».
- (21) C. van Zomeren, *Beschryvinge der staet Gorinchem, en landen van Arkel...* (Gorinchem, 1755), p. 285; "zo gevoelden deze Stad ook die zwaare straf...dat den Pastoor, Kapellaan, eenige Schepenen en wel vier hondert andere Menschen wierden weg gerukt".
- (22) G. 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), p. 205. Two documents from 1360 referring to plague in Hannut.
- (23) Delmaire, 'Contribution à l'étude de la peste', fn. 13.
- (24) R. Berger, ed., *La nécrologie de la confrérie des jongleurs et des bourg d'Arras (1194-1361)* (Arras, 1963), no. 10. It was noted on 6 October 1349 that « *la mortalité était pour le temps moult grande en ladite ville* ».
- (25) Blockmans, 'The social and economic effects of plague', p. 843. The necrology of Lebuinus Church in Deventer had 52 deaths recorded with a highpoint of 25 in July, while in the previous 20 years there had been no more than 45.
- (26) Delmaire, 'Contribution à l'étude de la peste'. Out of six aldermen, four died during the initial Black Death outbreak.
- (27) M. Galliot, *Histoire Générale, Ecclésiastique et Civile de la Ville et Province de Namur*, V (Namur, 1788-91), p. 4 « *Cette année [1349] et la suivante, durant le regne du comte Guillaume premier du nom, une cruelle peste ravagea toutes les provinces...Ce mal augmenta a Namur par le débordement de la Meuse et de la Sambre, par la raison que les eaux s'étant écoulées, il resta sur le rivage, un limon corrompu et puant qui fortifia l'infection de l'air* ».
- (28) G. Leppink and R. Wientjes, *Het Sint Catharinae gasthuis te Arnhem in de eerste vier eeuwen van zijn bestaan (1246-1636)* (Hilversum, 1999).
- (29) O. Bled and D. Haigneré, eds., *Les chartes de Saint-Bertin d'après le Grand Cartulaire de Charles-Joseph Dewitte*, II (St. Omer, 1892), no. 1693.
- (30) Derville, 'La population', p. 524. Mortality rates suggested as high as 60%.
- (31) AMSO, *Registre au Renouveau de la Loi*, no. 5. In 1349 33 'changeurs' existed in the city; by 1352 only 13 remained, a loss of 61%.
- (32) Derville, 'La population', pp. 523-5. The number of 'echoites' of bastards and escheated property multiplied by 9, indicating roughly 33% mortality. Actual source: ADN, B, no. 13632.
- (33) D. de Boer, *Graafen grafiek: sociale en economische ontwikkelingen in het middeleeuwse 'Noordholland' tussen 1345 en 1415* (Leiden, 1978), p. 34; spikes in deaths of serfs, bastards and foreigners in the accounts of the Count of Holland.
- (34) R. Rommes, 'Op het spoor van de dood. De pest in en rond Utrecht', *Jaarboek Oud-Utrecht* (1991), p. 118. Also mention of flagellants in 1351 in a sixteenth-century chronicle collection; J. Joosting, ed., 'Cornelis Block's kroniek van het regulierenklooster te Utrecht', *Bijdragen en Mededeelingen van het Historisch Genootschap*, 16 (1895), p. 23.
- (35) ADN, B, no. 10817. An account from 4 August 1349 mentions the burning of Jews after plague.
- (36) A. van Heule, ed., *Memorieboek der Stad Ghent van 't jaar 1301 tot 1793*, I (Ghent, 1852), p. 59; "In dit jaere stont eene peste oppe, die wel dry jaren duerde, zoo dat wel dhelft van den volcke op de werelt zijnde starf" (1345). Followed in 1349 (pp. 67-8) by a long description of a large flagellant movement in the city.
- (37) ADPdC, Arras, A85, nos 8, 10.
- (38) AML, AA142/2633, nos 1650, 1652.

- (39) T. Elhen von Wolfhagen, *Die Limburger Chronik*, ed. O. Hermann Brandt, IV (Jena, 1922), no. 31; “*In Limburg starben ohne die kinder mehr denn 2400 menschen. In dem jahre 1350 hörte das sterben auf*” (1349).
- (40) F. Graus, *Pest – Geißler – Judenmorde* (Göttingen, 1987), p. 38. Recalls the songs translated into French from German in the town of Liege by the flagellants there. Liege is said to have escaped this outbreak of Black Death according to C. Renardy, ‘Un témoin de la Grande Peste: Maître Simon de Couvin, chanoine de Saint-Jean l’Evangéliste à Liège (f 1367)’, *Revue Belge de Philologie et d’Histoire*, 52 (1974), fn. 8; but ‘*pestis*’ is mentioned in E. Bacha, ed., *La chronique liégeoise de 1402* (Brussels, 1900), pp. 341-2.
- (41) J.C. Diercxsens, *Antverpia Christo nascens*, II (Antwerp, 1774), p. 104.
- (42) A. Derville et al., *Historie de Saint-Omer* (Lille, 1981), p. 73. Communal graveyards were pressed to the limit and so on 16 July 1349, the city administration asked the vicars of the bishop to open a new cemetery in the parish of St. Michel. Actual source: AMSO, B 241.36.
- (43) In an agreement drawn up between the coastal town of Nieuwpoort and Furnes-Ambacht on 3 April 1350, it is explicitly mentioned that plague mortality was the cause of inhabitants moving from the villages of Leke and Klerken to the town; L. Gilliodts-Van Severen, ed., *Coutumes des pays et Comté de Flandre: Quartier de Furnes*, II (Brussels, 1872), p. 119.
- (44) Derville, ‘La population’, p. 524. A third of the city’s aldermen died, and six out of nine vicars of the college of Saint-Amé.
- (45) Bacha, ed., *La chronique liégeoise*, p. 343; ‘*mortalitas*’ mentioned in 1351.
- (46) F.C. Berkenvelder, ed., *Zwolve regesten*, I (Zwolle, 1980), no. 3; “*ten gevolge van de nu heersende epidemie bij het klooster begraven*” (12 January 1351).

1358-62

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ne; Fl; Ca; Ar; Ho; Fr; Gu; Na; Li; Ha	Lille (1); Cambrai (2); St. Omer (3); Beuvry (4); [Rijnland] (5); Ghent (6); Ypres (15); Bergen-op-Zoom (17)	Utrecht (city & countryside) (7); Rhenen (8)	Arras (9); [Frisia] (10); Namur (11); [Liege] (12); [Hainaut] (13); Ghent (14); Huy (16)

- (1) Aubry, ‘Les mortalités lilloises’, p. 333. Spike in mortality of *rentiers* (annuity information). Actual source: ADN, CC, no. 16012 (1317-1318) - 16095 (1368-1369).
- (2) Derville, ‘La population’, pp. 525-6. Chaplains of the cathedral and farmers both reaching surplus of mortality of roughly 33%. Actual source: ADN, 4G, nos 6856-8. Also the accounts of the St.-Julien hospital of Cambrai mention plague in 1360: A. Derville, ‘L’hôpital Saint-Julien de Cambrai au XIVe siècle: étude économique’, *Revue du Nord*, 70 (1988), pp. 285-318.
- (3) Bled & Haigneré, eds., *Les chartes de Saint-Bertin*, no. 1710. Between 1357 and 1366 there was a decline of the number of communicants by roughly 48% (10,200 to 5,350). The abbot of the St.-Bertin abbey in St.-Omer reported in September 1361 that « *son [the plague] trespassament de jour en jour pour la tres grant pestilence de mortalité* ». Furthermore, in St.-Denis the number of *pascalisans* dropped from 2500 to 1200, in St.-Sépulcre from 2600 to 1300-1400, in St.-Aldegonde from 1800 to 1000, and in St.-Margueritte from 3300 to 1800; see A. Derville, ‘Le nombre d’habitants des villes de l’Artois et de la Walloon Flanders (1300-1450)’, *Revue du Nord*, 65 (1983), pp. 281-2. Actual sources: AMSO, B 46, passim; B 53, nos 5-10, 49; B 54, nos 4-5; B 55, nos 1, 5.
- (4) Derville, ‘La population’, p. 526. Actual source: ADN, B, nos 15022-42.
- (5) R. Ladan, *Gezondheidszorg in Leiden in de late Middeleeuwen* (Hilversum, 2012), p. 45.

- (6) SG, Archief H. Geesttafel van St. Nikolaaskerk, no. 30. Clear increase in the number of purchased coffins compared to following years. Furthermore, there is a spike in the inventories after death in the years 1360/1, 106 and 130 acts respectively compared to 37 on average in the previous decade; L. Wynant, ed., *Regesten van de Gentse staten van goed: 1349-1400*, I (Brussels, 1979), pp. XVIII-XXI.
- (7) C. Rutgers, *Jan van Arkel, bisschop van Utrecht* (Groningen, 1970). Actual plague year mentioned was 1359.
- (8) Ibid. Actual plague year mentioned was 1359.
- (9) ADPdC, A92, no. 5.
- (10) P. Winsemius, *Chronique ofte Historische geschiedenisse van Vrieslant* (Franeker, 1622), p. 205.
- (11) Galliot, *Histoire Générale*, V, p. 4; « Une maladie pestilentielle qui s'étoit manifestée par plusieurs reprises dans le pays de Liège et dans la Hesbaye, vint infecter le comté de Namur, où elle fit un terrible ravage, parmi les hommes et les bestiaux. On croit que l'hiver, qui fut très rude cette année, ne contribua pas peu à purifier l'air, et à dissiper le souffle contagieux ».
- (12) Ibid. Also « très grande mortalité de la bouche » (1362) in S. Balau & E. Fairon, eds., *Chroniques liégeoises*, II (Brussels, 1931), p. 190.
- (13) Ibid. Also large rise in mortalities in the mortmain; ADN, B 12130-2.
- (14) Van Heule, ed., *Memorieboek*, I, p. 84; "Item, in dit jaer was't eene groote sterfte van der haestichede; de lieden waren snaevonts fraey ende snuchtensdoot" (1360).
- (15) Vandeburie, 'De Zwarte Dood'. Based on issue payments.
- (16) Bacha, ed., *La chronique liégeoise*, p. 347; "maxima mortalitas...ex epydímia qui tune regnabat in mundo" (1360).
- (17) M. Green, <<https://contagions.wordpress.com/2016/06/29/plague-dialogues-monica-green-and-borischmid-on-plague-phylogeny-ii/>> (2016). Bio-archaeological evidence of *Yersinia pestis* in burial site attributable to these years. Originally erroneously dated to the Black Death period of 1349/50; S. Haensch et al., 'Distinct clones of *Yersinia pestis* caused the Black Death', *PLoS Pathogens*, 6 (2010), e1001134.

1367-9

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Fl; Ar; Ca; Ov; Ho; To; LvA; Br; Li; Ne; Ze; LvW; Na; Ha	Lille (1); Beuvry (2); Béthune (3); Cambrai (4); Ghent (5); Leiden (8); Tournai (9); Oudenaarde (10); [Land van Heusden] (11) Vlijmen (14); Hazerswoude (15); Zegwaart (17); Zoetermeer (18); Zoeterwoude (19); Gelderswoude (20); Schoonhoven (21); Beveren (22); Ypres (24); Petegem (25); Brekel (28); [Hainaut] (31)	Lillers (12); Namur (26); Lille (27);	Liege (13); [Ghent-Flanders-Artois-Brabant-Holland-Zeeland] (23); Tournai (29); Gorinchem (30); [Brabant] (16); Leiden (6); Utrecht (7);

- (1) Aubry, 'Les mortalités lilloises', p. 333. Largest spike in mortality of *rentiers* (annuity information) between 1329 and 1369. Actual source: ADN, CC, nos 16012 (1317-1318) - 16095 (1368-1369). Also ADN, Archives Hospitalières de Lille, VI E9; information from St. Saviour hospital.
- (2) Derville, 'La population', p. 526. Normal rate of 'reliefs' was 8.25 per year. In 1368 this shot up to 163 (minimum). Actual source: ADN, B, nos 14601-16. According to Derville's calculations, in 166 days more than 40% of the adult population in Beuvry had died. *Idem.*, p. 526.

- (3) Ibid., p. 526. Normal rate of 'reliefs' was 8.62 per year. In 1367 this shot up to 52 and in 1368 this was 126. Actual source: ADN, B, nos 14601-16.
- (4) Ibid., p. 527. There was a recorded death rate of 10% for the cathedral chaplains and 25% for their farmers. Actual source: ADN, 4G, nos 6859-63. Also mentioned in the accounts of St.-Julien hospital of Cambrai in 1369-70; Derville, 'L'hôpital Saint-Julien'.
- (5) SG, Archief H. Geesttafel van St. Nikolaaskerk, no. 30. Clear increase in the number of purchased coffins compared to following years. Furthermore, there is a spike in the inventories after death in 1368-70, 160, 193 and 171 acts respectively compared to 75 on average in the previous decade; Wynant, ed., *Regesten*, I, pp. XVIII-XXI.
- (6) ELO, Archieven van het Sint Pancraskerk, Antiquum registrum A, no. 415, fo. 29; "*In de loop van het jaar 1369 nam de genoemde pestilentie of epidemie ergst toe in de stad Leiden en omliggende plaatsen, zozeer dat in dat jaar meer dan drieduizen mensen ... uit genoemde stad aan genoemde ziekte op ellendig wijzen zijn overleden; onder welke mensen van beiderlei kunnen en uiteenlopende leeftijd de meesten toch kinderen en jonglieden waren; en bijna alle zwangere vrouwen stierven...*". Also H.G. Hamaker, ed., 'Historische aantekeningen in het 'Memoriale fautorum capitulli Sti Pancratii' te Leiden, 1367-1408', *Bijdragen voor Vaderlandsche Geschiedenis en Oudheidkunde*, 6 (1869/70), p. 127 (1368); "... *gravis pestilentia seu morbus quem physici epidemiam vocant...*"; again in 1369; Idem, p. 128; "...*dicta pestilentia seu epidemia gravissime...*".
- (7) *Kronijk van Arent toe Bocop* (Utrecht, 1860), p. 355 (1368). Also in N. Bruch, ed., *Chronographia Johannis de Beke* (The Hague, 1973), p. 336; "...*anno Domini mcccclxviii magna mortalitas seu epidimia fuit in civitate Traiectensi...*" (1368).
- (8) Ladan, *Gezondheidszorg*, p. 45; De Boer, *Graaf en grafiek*, pp. 74-5. Peak in the number of dead 'fautores' of the St. Pancras church in Leiden in 1369 (50 dead), when only 8 in 1368 and 5 in 1367. In later years only 5 in 1370, 3 in 1371 and 8 in 1372. Mortality in 1369 shows seasonal pattern associated with plague - 0-2-0-2-5-3-12-17-3-5-1-0 (per month).
- (9) Blockmans, 'The social and economic effects of plague', p. 851.
- (10) E. Thoen, *Landbouweconomie en bevolking in Vlaanderen gedurende de late Middeleeuwen en het begin van de Moderne Tijden. Testregio: de kasselrijen van Oudenaarde en Aalst* (Ghent, 1988), pp. 1141-53.
- (11) P. Hoppenbrouwers, *Een middeleeuwse samenleving. Het Land van Heusden (ca. 1360-ca. 1515)* (Wageningen, 1992), p. 58.
- (12) ADPdC, A880. « *Le mortuoire dura del entrée d'auost jusqu'à le Candler* ».
- (13) G. Guttman, ed., 'Jean à la Barbe. Traité sur la peste', in *Die Pestschrift des Jean à la Barbe (1370)* (Berlin, 1903).
- (14) Hoppenbrouwers, *Een middeleeuwse samenleving*, p. 60.
- (15) De Boer, *Graaf en grafiek*, pp. 98-100, 347; decline of 43.3% in names between the inquisition of 1369 and a 'naamlijst' from 1371.
- (16) Despy, 'Grand peste noire', p. 205. Fn. 27 makes reference to the research of a one Uyttebrouck who noted plague in « *Icomptes de la recette générale de Brabant* ».
- (17) De Boer, *Graaf en grafiek*, pp. 101-2; decline of 26.8% in names between the inquisition of 1369 and a 'naamlijst' from 1371.
- (18) Ibid., pp. 101-2; decline of 30% in names between the inquisition of 1369 and a 'naamlijst' from 1371.
- (19) Ibid., pp. 102-5; decline of 29.2% in names between the inquisition of 1369 and a 'naamlijst' from 1371.
- (20) Ibid., pp. 102-5; decline of 46.5% in names between the inquisition of 1369 and a 'naamlijst' from 1371.
- (21) C.J. de Lange van Wijngaarden, *Geschiedenis der heeren en beschrijving der stad van der Goude*, I (The Hague, 1813), p.754; "*rekende men te Sinte Gheerdenberghe, om der starften wille die tScoenhoven groot was*" (22 November 1369).
- (22) W. Vangassen, 'De pestepidemieën na 1350, voornamelijk deze van 1400 en 1438 in Vlaanderen en Henegouwen' (unpub. Ph.D. thesis, Univ. Ghent, 1952), p. 8. Increased death of servants according to accounts of 1368/9. Actual source: ARB. De Nelis, nos 8-15, Rekeningen Lopen van St. Jansmesse tot St. Jansmesse.

- (23) Van Heule, ed., *Memorieboek*, I, p. 91; “Item, in dit jaer was’t groote sterfte in Vlaenderen, Brabant, Hollant, Zeelant en in Artoeys” (1367). Also for Flanders, Brabant and Picardy; Jan van Dixmude, Dits de Cronike, *Corpus cronicunum Flandriae*, ed. J. J. De Smet (Brussels, 1856), p. 232, 618; “Anno MCCCLXVII fuit magna mortalitas in Flandria, Brabantia et Picardia, homines subitanea ac morte improvien moribantur”.
- (24) Vandeburie, ‘De Zwarte Dood’. Based on issue payments.
- (25) Vangassen, ‘De pestepidemieën’, pp. 8-9. Clear peak in the ‘*Ontfaen van Doetcoepe*’ between June 1368 and June 1369 (13 compared to average of 4), compared to previous and following years. Actual source: ARB, De Nelis, nos 51-60.
- (26) L. Génicot, *L’économie rurale Namuroise au bas Moyen Age (1199-1429)*. 1. *La seigneurie foncière* (Namur, 1943), p. 285. In the accounts of the hospital of Schayn it was noted that « encore doit on rabatre les parties d’espialt qui s’ensuivent dont les hirretayes sunt démenées et sunt à present vaghe par le mortalieit de gens et de chevaux ».
- (27) ADN, 16G (Chapitre Saint-Pierre de Lille), no. 1034; proceedings of the chapter against Jean de Ferlin with mention of the plague outbreak of 1369.
- (28) De Boer, *Graaf en grafiek*, pp. 108-11.
- (29) Van Dixmude, *Corpus cronicunum Flandriae*, III, p. 240; « A le paque l’an 1367 commencha à Tournay I grant mortolle, qui dura dusques au Noël ensievant et fu le mortelle si grant que a miervelle et fist on plusieurs ordonnanches sur le fait dudit mortolle ».
- (30) A. Kemp, *Leven door doorluchtige heeren van Arkel ende jaarbeschrijving der stad Gorinchem* (Gorinchem, 1656), p. 89, 102.
- (31) High mortalities in the mortmain; ADN, B 12138.

## 1380-2

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Fl; Ca; Ho; LvA; Br; Gu; Ne; Na; Ov; Lu; Ar; Ha; Li	Douai (1); Cambrai (2); [Kennemerland] (3); [Rijnland] (4); Haarlem (5); Leiden (7); Oudenaarde (8); Breda (9); Izel (16); Esquerchin (17); Lille (18); Ghent (20); [Hainaut] (22);	[Guelders] (10); Leiden (15); Lille (19); Deventer (11)	Ghent (14) Deventer (13); [Flanders] (21); [Brabant] (12); Den Haag (6); Bilzen (23)

- (1) J. Deregnaucourt, ‘Autour de la mort à Douai: attitudes pratiques et croyances, 1200-1500’ (unpub. Ph.D. thesis, L’Université Charles de Gaulle, 1992), I, p. 60. Clear spike in the number of wills written.
- (2) H. Neveux, ‘La mortalité des pauvres à Cambrai (1377-1473)’, *Annales de Démographie Historique* (1968), p. 79.
- (3) De Boer, *Graaf en grafiek*, p. 64; raised numbers of ‘*besterften*’ in 1382 (23) and 1383 (45) when the previous decade offered no more than 9.
- (4) *Ibid.*, p. 64; as above.
- (5) *Ibid.*, pp. 83-4 (in 1381).
- (6) *Ibid.*, p. 67; noted on 18 October 1382 that “*omt ghestant vander sterfte aldaer te vernemen ende mire vrouwen aen te brengen*”.
- (7) Ladan, *Gezondheidszorg*, p. 45.
- (8) Thoen, *Landbouweconomie*, pp. 1141-53.
- (9) F. Gooskens, ‘Pestepidemieën in Breda tijdens de middeleeuwen (1382-1535)’, *Jaarboek De Oranjeboom*, 39 (1986), pp. 18-54.

- (10) J. van Veen, 'De pest en hare bestrijding in Gelderland, in het bijzonder te Arnhem', *Bijdragen en Mededelingen Gelre*, 6 (1903), pp. 1-66.
- (11) Death of Geert Grote on 20 August 1384 through plague mentioned in the *cartusia maior* chronicles of 1385; H. Scholtens, 'De priors van het kartuizerklooster Monnikhuizen bij Arnhem', *Archief voor de Geschiedenis van het Aartsbisdom Utrecht*, 56 (1932), p. 11. Also D.A. Brinkerink, ed., 'Dit is genamen uyten leven onses weerdigen vaders meyster Gerijt die Grote', <[http://www.dbnl.org/tekst/\\_lev018biog01\\_01/\\_lev018biog01\\_01\\_0002.php](http://www.dbnl.org/tekst/_lev018biog01_01/_lev018biog01_01_0002.php)>, p. 423; "...waert hij begaeft van Gode mitter pestelencie" (1384).
- (12) Despy, 'Grand peste noire', p. 205; fn. 27 makes reference to the research of a one Uyttebrouck who noted plague outbreaks of 1382-3 in « *Icomptes de la recette générale de Brabant* ».
- (13) P. Molhuijsen, 'Vroegere ongezondheid van Deventer' *Overijsselsche Almanak voor Oudheid en Letteren*, 7 (1842), p. 64. In 1384 according to the 18th-century '*Kronijk van Deventer*' by Sef Moonen.
- (14) Van Heule, ed., *Memorieboek*, I, p. 112; "Item, in dit jaer was 't groote aertbevinghe ende sterfte, ende midts der orloghe stont de stede Ghent langhe zonder heere" (1381).
- (15) B. Leverland, *St. Pancras op het Hogeland: kerk en kapittel in Leiden tot aan de Reformatie* (Hilversum, 2000), p. 99. Priest Pieter Jacobsz fled to Solesmes in Hainaut (where he died in 1380) on account of the raging plague in Leiden. Also ELO, Archief van de Sint Pancraskerk, Antiquum Registrum A, no. 415, fo. 76; notes over the plague in 1381.
- (16) Bocquet, *Recherches sur la population rurale*, p. 37, 53, 80. Households decline almost 26% between 1377 and 1385.
- (17) *Ibid.*, p. 37, 53, 80. Households decline 45% between 1377 and 1385.
- (18) In Lille's St.-Saver hospital, there were no recorded deaths of poor people between 1371 and 1375, while a large number were found in the deceased of 1381; ADN, Archives Hospitalières de Lille, VI E, no. 10.
- (19) The city of Lille was said to be depopulated in 1382, on account of a previous mortality; ADN, Inventaire Godefroy, 11, no. 1100, fo. 104.
- (20) There is a spike in the inventories after death in 1383, 152 acts compared to 75 on average in the previous decade; Wynant, ed., *Regesten*, I, pp. XVIII-XXI. Issue rights also increase, but it is difficult to compare with surrounding years which are also crisis periods; Vangassen, 'De pestepidemieën', p. 26.
- (21) A. De Roovere, *Dits die excellente cronike van Vlaenderen...* (Ghent, 1531), fo. 70.
- (22) Large rise in mortalities in the mortmain; ADN, B 12147; ARB, I 004 17869.
- (23) Bacha, ed., *La chronique liégeoise*, p. 394; "magna mortalitas hominum" in 1382.

#### 1400-2

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ar; Ha; To; Fl; Ca; Ov; Ho; Gu; Br; Ne; LvA; Na; Fr; Ze; Lim; Li; Cl	Arras (1); Mons (7); Tournai (8); Douai (9); Lille (10); Cambrai (11); Ghent (12); Leiden (15); Breda (20); Oudenaarde (21); [Amstelland] (24); [Waterland] (25); [Kennemerland] (26); [Delfland] (27); [Schieland] (28); Gouda (29); Schoonhoven (30); Woerden (31); Aalst-Geraardsbergen (40); Bruges-Franc of Bruges (41); Courtrai (42); Sluis (43); [Hainaut] (44); Liege (46); Jemeppe (47)	Fampoux (3); [Bailliages of Arras, Avesnes, Aubigny and Quiéry] (4); [Artois] (5); Mons (6); Deventer (14); [Veluwe] (19); Zwolle (38); Tournai (35); Harelbeke (34); Middelburg (17); Dunkirk (13); St. Omer (39); Vivegnis (48); [Nederbetuwe] (50); Almelo (52); Frenswegen (53)	Arras (2); Amersfoort (16); [Frisia] (23); Ghent (32); Bruges (33); Deventer (37); Binche (36); Namur (22); [Rijnland] (18); Maastricht (45); Kampen (49); Bommel (51); Geldern (54)

- (1) ADPdC, Archives Hospitalières d'Arras, no. 1, E10. From 1 October 1399 to 30 September 1400, the hospital Saint-Jean of Arras buried 246 bodies, while the normal number of burials was rarely more than 50 per year. Unfortunately this account is not part of a series, and the previous preserved dates are 1371-1373 and the following 1414-1415.
- (2) Guesnon, ed., *Inventaire chronologique des chartes de la ville d'Arras*, no. 151. « *Le peuple de nostre dicte ville est moult diminué par la pestilence et mortalité qui, par l'espace de trois ans ou environ, a esté continuellement en ycelle nostre ville* ».
- (3) Bocquet, *Recherches sur la population rurale*, p. 72. On 8 March 1402, Duchess Marguerite ordered her receiver in Fampoux to repay the inhabitants of the village a tax they had paid earlier because of their poverty and the recent mortality crisis; « *Et pour la mortalité icelle nostre ville soit moult despeulée et amenrie de manans et residens et leurs tenemens tourne en ruine* ». Actual source: ADN, B, no. 1872.
- (4) Ibid., p. 72. The duke lowered the aide/taxation in the Bailiwicks of Arras, Avesnes, Aubigny and Quiéry; « *ou nos subgés sont très fort diminuez par la mortalité* ». Actual source: ADN, B, no. 1874.
- (5) Ibid., p. 73. The duchess had a personal encounter with plague and we learn that she hastened to Rémy; « *pour logier, par certain temps, sa personne et son etat et ses gens, ouquel temps la mortalité régnoit en nostre ville d'Arras, en laquelle elle faisoit sa residence lors* ». Because she still did not feel safe, she left for Douai « *pour cause de la mortalité qui estoit au comté d'Artois...* ». Actual source: ADN, B, no. 1901.
- (6) G. Decamps, 'La maladie contagieuse de 1400-1401 à Mons et dans le Hainaut', *Annales du Cercle Archéologique de Mons*, 41 (1912), p. 139. « *Vers le mois de juiun s'élèva en la ville ung air pestilentieux et causa grand mortelle et mourut bien ung tierch des boines gens y demorans tant du petit que du grant et des mieux moyennés. Le capitle perdit en cest an plusieurs canoines capellains et maisnies* ». Also Idem., p. 145; on 6 January 1401 the aldermen assemble and go to the Count of Ostrevant to « *s'excusant de ne pas ester venus plus tost à cause de la piteux mortalitet qui avoit estet en la ville* ».
- (7) Ibid. p. 139. The disease had a severe impact as seen from the expenses in the account from 'la grande aumone' that ran from St. Jan Baptist 1400 until St. Jan Baptist 1401 and paid for 438 coffins. For a normal year this was only 50 on average. Better off citizens also seemed to have been afflicted as the 'Comptes des draps de mort ou de bouguerants' from St. Waudru lists 177 dead, although the author does not give a comparative figure for 'normal' years; Idem., p. 139.
- (8) H. Vandebroek, *Extraits analytiques des anciens registres des Consaux de la ville de Tournai (1385-1422)*, I (Tournai, 1861), p. 47. For the year 1400, there were 339 wills in the Tournai Archive, while for a 'normal' year this was never more than 80 (a rise of 424%).
- (9) The number of testaments reached a peak in 1400; Deregnacourt, 'Autour de la mort à Douai', I, p. 60.
- (10) In the hospital of St.-Saveur in Lille, two nuns died as well as 40 patients. ADN, Archives Hospitalières de Lille, VI E 11.3.
- (11) Derville, 'La population', p. 67. Farmers' excess mortality was roughly 24%. Actual source: ADN, 4G, nos 68884-7.
- (12) Vangassen, 'De pestepidemieën', p. 26. Based on the issue rights. Furthermore, there is a spike in inventories after death in 1400-1 of 124 and 169 compared to 68 on average in the previous decade; Wynant, ed., *Regesten*, I, pp. XVIII-XXI.
- (13) S. Curveiller, *Dunkerque: ville et port de Flandre à la fin du Moyen Age: à travers les comptes de bailliage de 1358 à 1407* (Lille, 1989), p. 19. (In 1397-8). Original source found in ADN, B, no. 5984.
- (14) T. Mertens, 'Rondom het sterfbed van Lubbert ten Busch. De Moderne Devoten en de pest te Deventer in 1398', in *De Pest in de Nederlanden: medisch-historische beschouwingen 650 jaar na de Zwarte Dood* (Brussels, 1999), pp. 141-58. (In 1398). Also Brinkerink, ed., 'Dit is genamen uyten leven onses weerddigen vaders meyster', p. 331, 338 (1398); "waert begaëft mitter pestilencie".
- (15) Ladan, *Gezondheidszorg*, p. 233. In 1398 the memory book already mentioned deaths by *pest*. The number of benefactors increased to 21 in 1399 and 18 in 1400 – more than 50% over the norm. The number of graves given out in the St. Peters Church went from 10 in 1398/9 to 20 in 1399/1400 and to 30 in 1400/1, and then afterwards fell back to roughly 4 and 5.
- (16) C. van Kalveen, 'Problemen rond de oudste geschiedenis van het fraterhuis en van het Nieuwe Gasthuis te Amersfoort', *Jaarboek Oud-Utrecht* (1981), pp. 101-24.

- (17) F. van den Driest, 'Hondenbaan: hondenslayers op Walcheren', *Heemkundige Kring Walcheren*, 38.1 (2009), p. 38; in the years 1399/1400 were there an exceptional 252 dogs slaughtered (often response to plague).
- (18) De Boer, *Graaf en grafiek*, p. 67.
- (19) J. Kuys, ed., *De Tielse Kroniek. Een geschiedenis van de Lage Landen van de Volksverhuizingen tot het midden van de vijftiende eeuw, met een vervolg over de jaren 1552-1566* (Hilversum, 1983), pp. 137-8; the period 1400/1 described as "die grote starft".
- (20) Gooskens, 'Pestepidemieën', p. 31. Necrology data.
- (21) Thoen, *Landbouweconomie*, pp. 1141-53.
- (22) J. Borgnet, *Histoire du Comté de Namur* (Namur, 1850), p. 155. Also Galliot, *Histoire Générale*, V, p. 11; « Sous le règne du comte Guillaume second du nom, la peste se fit de nouveau sentir à Namur, & y fit bien du dégât. La mortalité fut si grande, qu'on dut demolir l'école de la collégiale Notre-Dame, pour agrandir le cimetière de cette paroisse, qui ne pouvoit plus suffir pour y enterrer les morts ».
- (23) P. Jacobson of Thabor, *Historie van Friesland* (Leeuwarden, 1973), pp. 9-11.
- (24) De Boer, *Graaf en grafiek*, p. 67
- (25) *Ibid.*, p. 67.
- (26) *Ibid.*, p. 67.
- (27) *Ibid.*, p. 67.
- (28) *Ibid.*, p. 67.
- (29) *Ibid.*, p. 67.
- (30) *Ibid.*, p. 67.
- (31) *Ibid.*, p. 67.
- (32) Van Heule, ed., *Memorieboek*, I, p. 134; "In dit jaer waren in Italien vergadert wel tachtich duusent mannen, dewelcke men hiet de Groote Compaignie, ende onder desen hoop waren veele hertoghen, graven en baenderheeren, ende zy waeren ghecleet met witte cleederen en zy strafden zeere de zonen der meynschen, ende ghemerct dat de sterfte in deze landen zeere regnierde zoo beloefden zy elcken die onder huerlieder compaignie quamen dat zy vry zouden wesen van der siecte van der pestilentie" (1399). And in 1401, (p. 136), "[In 't zelve jaer was te Ghendt een groot pardoen het jaer van gratie ende 't was t' Onze Vrouwekercke te Ste. Pieters, en was doe een groote sterfte. (Pr. Ar.B.)] Item, in dit jaer was te Ghent groote sterfte ende al Nederlant duere".
- (33) SB, *Kroniek van Vlaanderen*, Handschrift 436, Band B, no. 38 (f°CLVIII r°b-v°a); "Item int jaer van XIIIIC b, zo was te Roome groot aflaat ende was tjaer van graciën ende elkerlyc liep te Roome omme te hebbene aflaat a pena et a culpac. Ende int zelve jaer zachd men int weste staen // een planete ende een sterre met eenen langhen sterte. Ende int zelve jaer was al omme groot sterfte van der pestelencie".
- (34) Vangassen, 'De pestepidemieën', pp. 30-1. Between 1 October 1399 and 10 July 1400, the bailiff Francois Camphin dies, and then his successor dies directly after him in the period 10 July 1400 to 12 September 1400. Actual source: ARB, Rekenkamer, no. 14229.
- (35) Vandenbroeck, *Extraits analytiques*, I, p. 47. The aldermen enacted a regulation on 17 July 1400 that forbade the ringing of the bells to honor the dead. *Idem.*, pp. 47-8; on 21 July 1400 a procession was announced in the St.-Martinus Church « pour multiplier et sauver les biens de la terre et preserver le peuple de l'epidemie et de mort soudaine ». 'Mort soudaine' refers to the swiftness of death, and therefore could be a good indication of plague.
- (36) In 1401/2 ; F. Vinchant, ed., *Annales de la province et comté de Hainaut*, III (Mons, 1848), p. 32.
- (37) Molhuijsen, 'Vroegere ongezondheid', p. 64. In 1398 according to the 18th-century 'Kronijk van Deventer' by Sef Moonen.
- (38) T. Hemerken a Kempis, *Opera Omnia*, ed. M.J. Pohl, VII (Freiburg im Breisgau, 1922), p. 373 (1401).
- (39) M. Pagart d'Hermansart, ed., *Un ordonnance médicale contre la peste vers 1400* (St. Omer, 1901).
- (40) Vangassen, 'De pestepidemieën', p. 29. An increase in the mortmain payments for 1400/1. Actual source: ARB, Rekenkamer, no. 13547.
- (41) *Ibid.*, p. 30. An increase in the goods of bastards that passed on to the lord after their death. Actual source: ARB, Rekenkamer, no. 13680; also bailiff accounts.
- (42) *Ibid.*, p. 32. An increase in the mortmain payments for 1400/1. Actual source: ARB, Rekenkamer, no. 13812; also bailiff accounts.



- (43) Ibid., p. 30. An increase in the goods of bastards that passed on to the lord after their death. Actual source: ARB, Rekenkamer, no. 13925; also bailiff accounts.
- (44) Large rise in mortalities in the mortmain; ARB, I 004 17870.
- (45) Bacha, ed., *La chronique liégeoise*, p. 442; “*resurrexerunt flagellatores*” in 1400.
- (46) J. De Stavelot, *Chronique, 1440-1449*, ed. A. Borgnet (Brussels, 1861), p. 17; high mortality suggested of 12,000 victims in 1401.
- (47) Ibid., p. 17; 500 mortalities close to Jemeppe.
- (48) Ibid., p. 17; mentions troubles of the inhabitants of Vivegnis.
- (49) J. Bijndop, ed., *Kamper Kronijken: De annalibus quaedam nota*, I (Deventer, 1862), p. 2; “*Jnt jair ons heren m.cccc was hier omtrent ouer al jn den lande grote pestilencie*” (1400).
- (50) P.N. van Doorninck, ed., *Acten betreffende Gelre en Zutphen 1400-1404* (Haarlem, 1901), pp. 28-9; ordinance against the flagellants (4 May 1400).
- (51) A. van Slichtenhorst, ed., *XIV. Boeken van de Geldersse geschiedenissen. Van 't begin af vervolghd tot aen de afzweeringh des Konincx van Spanien* (Arnhem, 1654), p. 172; “*...verslond de smetziekte veele menschen...Bommel in Gelderland zoud alleen 4000 dooden hebben geteld...*” (1400).
- (52) H. Frensw., *Het Frensweger handschrift*, eds. W.J. Alberts & A.L. Hulshoff (Groningen, 1958), pp. 166-72; “*Ende desghelijck mitter selver pestilencien stroven in heer Everds hues oerre veel van priesteren, clerken ende leken*” (1401).
- (53) Ibid., pp. 166-72; all residents of Marienwolde at Frenswegen die one after another (June 1401).
- (54) F. Nettesheim, *Geschichte der Stadt und des Amtes Geldern* (Crefeld, 1863); found in Stadsarchiv Geldern A15; Willem van Gullik mentions great amounts of death there (26 June 1401).

## 1409-11

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Na; Lim; Fl; Ho; Br; To; Ze; Gu	Bruges (1); Leiden (2); Breda (3); Gorinchem (4); Middelburg (6)	Maastricht (7); Zutphen (8)	St.-Omer (5);

- (1) Blockmans, ‘The social and economic effects of plague’, p. 852.
- (2) Ladan, *Gezondheidszorg*, p. 234. In 1411 there were 38 dead *fautores*, roughly 50% above the norm – peak mortality in September and October. The St. Catharine’s *gasthuis* received 48 bequests, compared to just over 12 in the general period 1401-20, and there were 70 graves dug in the cemetery compared to just under 29 per year 1401-7 and 1413-20. The *gasthuis* took on extra personnel in the summer of 1411 on account of ‘*doet starf*’.
- (3) Gooskens, ‘Pestepidemieën’, p. 31. Necrology data.
- (4) J. Zuijderduijn, ‘Living la vita apostolica. Life expectancy and mortality of nuns in late-medieval Holland’, *CGEH Working Paper Series*, 44 (2013), p. 21.
- (5) Derville et al., *Histoire de Saint-Omer*, p. 73. The bishop fled to the refuge of Arques at this time to escape the plague.
- (6) Van den Driest, ‘Hondenbaan’, p. 38; 522 dogs killed between 1407 and 1409.
- (7) J. Habets, ed., ‘Chronijk der Landen van Overmars’, *Publications de la Société Historique et Archéologique dans le Duché de Limbourg*, 7 (1870), p. 15; mentions “*groet sterfte*” after the city was under siege the year before.
- (8) RAZ, Arch. Bornhof, 688, no. 89; “*deser die crancken plegen te liggen die an pestilentie tijden*” (1408).

## 1413-16

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ar; Fl; Ca; Ho; To; Ha; Ze	Arras (2); Douai (4); Cambrai (5); Gorinchem (6); Middelburg (9); [Hainaut] (10)	Arras (1); Bailiwick of Hesdin (3); Conchy (7)	[Artois] (8)

- (1) Archives Municipales d'Arras, BB 5, fo. 37v. The aldermen that came together on 3 October 1413 asked for a tax exemption « *tant pour la mortalité comme pour che que en icelle ville queurt peu ou neant de merchandise* ». Also on 27 June 1416, John the Fearless recalled his subjects from the surroundings of Arras were severely hit by war and disease « *grande et piteuse mortalité d'ypedimie par quoy les laboureurs et peuple... ont esté et sont si vexez, travailliez et diminuez...* », and the mortality lasted two years. Bocquet, *Recherches sur la population rurale*, p. 73. Actual source: ADN, B, no. 13903.
- (2) ADPdC, Archives Hospitalières d'Arras, 1E 13. The account of the Hospital of St-Jean in Arras for 1414/15 indicates 250 burials. This is an isolated account.
- (3) Bocquet, *Recherches sur la population rurale*, p. 73. In the account of the Bailiwick of Hesdin there is a patent letter from 28 September 1414, referring to the terms of a pastoral letter of 8 May that gave a discount of 100 pounds to Jean Billet, farmer provost of Hesdin (from 300 pounds). The duke granted this rebate, « *pour cause de la mortalité et pestilence, guerre et aultres causes et consideracions* », and because the situation had worsened since 8 May. Another patent letter from 10 October 1414 reimbursed 200 pounds to Jehan Guerboede, wood merchant for the losses he had suffered « *à cause de la mortalité qui oudit temps a esté ou pays d'Artois et meismement en ladictte ville de Hesdin, comme pour les guerres qui ont esté en icelli pays, pour lesquelles mortalités et guerres plusieurs marchans et aultres dises de la dicte foret n'ont osé ne peu aller ne venir querir lesdictes denrees et marcandises...* ». Actual source: ADN, B, no. 15325.
- (4) Deregnaucourt, 'Autour de la mort à Douai', I, p. 60. Rise in the number of wills.
- (5) Neveux, 'La mortalité des pauvres', p. 79.
- (6) Zuijderduijn, 'Living la vita apostolica', p. 21.
- (7) Bocquet, *Recherches sur la population rurale*, p. 74. Pierre Evrelenc, Bailiff of Conchy, received a rebate of 40 pounds from the Duke, because merchants did not dare venture into his land. Actual source: ADN, B, no. 15325.
- (8) J-A. Buchon, *Chroniques d'Enguerrand de Monstrelet : en deux livres, avec pièces justificatives (nouvelle édition)*, II (Paris, 1858), p. 468. It was noted in 1414 by Picardy chronicler Monstrelet that « *régnait par toutes les parties du royaume de France et en divers pays une maladie qui se tenoit en la tête, de laquelle moururent plusieurs personnes, tant vielz que jeunes ; et nommoit-on ladictte maladie la coqueluche* ».
- (9) Van den Driest, 'Hondenbaan', p. 38; 390 dogs killed between 1415 and 1416.
- (10) Large rise in mortalities in the mortmain; ADN, B 12177.

## 1420-3 (only in Northern Netherlands)

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ho; Fr; Ne; Gu; Ov; Br; Gr; Fl; LvA;	Leiden (1); Breda (11); Gorinchem (12);	Rotterdam (2); Oudewater (4); Utrecht (city and countryside) (5); Arnhem (6); [Guelders] (8); Groningen (10); Zwolle (7); Aalst (13); Grave (14); Kempen (15)	East Friesland (3); Deventer (9)

- (1) Ladan, *Gezondheidszorg*, p. 235. Leiden was under siege in 1419, but evidence suggests a plague epidemic in the follow-up years of 1420/1, where there were 75 buried in the St. Catharine's *gasthuis* cemetery, more than double the average for the general period 1412-25.
- (2) H. Moquette, 'Pestepidemieën in Rotterdam', *Rotterdamsch Jaarboekjes*, 3.3 (1925), p. 12.
- (3) C. Schotanus, *Beschryvinge end Chronijk vande heerlickheydt van Frieslandt Tusschen 't Flie end de Lauwers* (Franeker, 1655), passim.
- (4) N. Plomp, *Ziekenezorg in Woerden* (Woerden, 1980).
- (5) Kuys, ed., *De Tielse Kroniek*, no. 769; "In 1421 heerste er in bijna het gehele bisdom Utrecht zware pest (ook in Gelre was er ernstige pest), zodat in Utrecht op één dag meer dan honderd mensen de dood vonden".
- (6) Benders & Borsch, 'Samenleving', p. 159; mentions flight of aldermen due to plague, found in city accounts. Also van Veen, 'De pest', p. 4, 8-10; "ordinieren...omme der pestilencien wille" (1421).
- (7) Hemerken a Kempis, *Opera Omnia*, VII, p. 385 (1421/2); "Eodem anno [1421] in mense Septembri pestilential adhuc graviter invalescente quosdam de nostris familiaribus hic moribus invasit. In octava nativitatis Mariae virginis obii infra summan missam quidam laicus...".
- (8) Kuys, ed., *De Tielse Kroniek*, no. 769; "In 1421 heerste er in bijna het gehele bisdom Utrecht zware pest (ook in Gelre was er ernstige pest), zodat in Utrecht op één dag meer dan honderd mensen de dood vonden".
- (9) Molhuijsen, 'Vroegere ongezondheid', p. 64. In 1421 according to the 18th-century 'Kronijk van Deventer' by Sef Moonen. Also Hemerken a Kempis, *Opera Omnia*, VII, p. 385
- (10) F. Bakker and R. Nip, 'De abdij van Aduard en de Cisterciënzer Orde', in Mol (ed.), *De abtenkroniek van Aduard*, p. 70.
- (11) Gooskens, 'Pestepidemieën', p. 31. Necrology data.
- (12) Zuijderduijn, 'Living la vita apostolica', p. 21.
- (13) Ordinance mentioned for 1423 in H. Pleij, *De sneeuwpoppen van 1511. Literatuur en stadscultuur tussen middeleeuwse en moderne tijd* (Amsterdam, 1988), p. 147.
- (14) van Veen, 'De pest', p. 3; "Item soe hefft meyster Laurens doen maecken yn der apotheken tot Arnhem yn Johan Tolhus huys tot behoeff mijnre gnedige vrouwen tegen die pestilentie ende haeren gnedige gesant tot Grave" (1419).
- (15) Hemerken a Kempis, *Opera Omnia*, VII, p. 385; "...fuit notabilis pestilentia...in mense Septembri pestilential adhuc graviter invalescente" (1421).

## 1426-9

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ho; Br; Ar; Ha; To; Me; Ho; Gu; Fl	Leiden (1); Breda (2); Mechelen (7); [Hainaut] (9); Ghent (14)	St.-Omer (4); Valenciennes (5); Halle (8); Ath (10); Gouda (11); Arnhem (12); Steenderen (13)	Tournai (6); Hoorn (3);

- (1) Ladan, *Gezondheidszorg*, p. 235. A modest increase in dead *fautores* (17 in 1426), and was roughly 50% above average. The memory book labels 'pest' as the cause of much death in January 1426 (1 case) and in October 1426 (many cases).
- (2) Gooskens, 'Pestepidemieën', p. 32. Necrology data.
- (3) Velius, *Chronyk*, p. 49. First published in 1604.
- (4) BASO, MS 930, 1, fos 256, t2, 62v, 170; MS 933, fo. 365. AMSO, Registre des délibérations échevinales, B fos 27, 73v, 77; C fo. 56v; B 248.3; B 239.2; 2G 453 fos 5, 40, 44v; 2G 454, fos 7, 32, 115-6, 139v-41, 146v.
- (5) ADN, 40 H, no. 167; in 1428.

- (6) On 3 July 1426 a procession was announced; « *pour fair cesser les tres grieves pestilences et mortalités qui soudainement a present de jour en jour sont en icelle ville* ». A. de le Grange, ed., *Extraits analytiques des registres des consaux de la ville de Tournai, 1431-1476* (Tournai, 1893), p. 209.
- (7) A spike in the necrology of the ‘*geschoeide karmelieten*’, 11 in 1426 and 10 in 1427 when double figures was rare; <http://www.mechelsegenealogischebronnen.be/Databank>>. Also an explicit mention of someone who died ‘fleeing the plague’ in 1426.
- (8) M. Van Den Weghe, ‘Hallensia III. Besmettelijke ziekten te Halle’, *Gedenkschriften van de K. Geschieden Oudheidkundige Kring van Halle*, 10 (1934-5), p. 7. There were no masons available to restore the mill on account of the high plague mortality in 1428.
- (9) Moderate rise in mortalities in the mortmain; ADN, B 12187.
- (10) E. Fourdin, ed., *Inventaire analytique des archives de la ville d’Ath*, I (Brussels, 1873), p. 15; raising of the ‘*maltôte*’ (special tax on consumption) in June 1428 to compensate for population losses on account of the epidemic of the past years.
- (11) D.P. Oosterbaan, ed., ‘Kroniek van de Nieuwe kerk te Delft’, *Haarlemsche Bijdragen: Bouwstoffen voor de Geschiedenis van het Bisdom Haarlem*, 65 (1958), p. 109; “*een man was, die die gave Gods hadde...tot Gouda*” (1426).
- (12) D. De Man, ed., *Hier beginnen sommige stichtige punten van onsen oelden zusteren* (The Hague, 1919), p. 104, 107; “*Hiernae waert si zieck ander pestelenciën*” (1429).
- (13) GA, Arch. Kerk Steenderen, 1, fo. 1; priest Johan van Walbeck mentions in his parish “*magna viguit pestilentialia*” (1429).
- (14) SG, Oud Archief, no. 330; there is a spike in inventories after death in 1425-6 of 122 and 149 acts respectfully compared to 77 on average in the previous decade.

1435-40

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Fl; Ar;	Bruges (9); Tournai (11); Cambrai	Zuydcoote (1); [Artois]	Auxi-le-Château
To; Ca;	(12); Breda (16); [Hainaut] (17);	(2); Eclimeux (6);	(3); Aubin (4);
Ne; Ho;	[Liege] (18); [Flanders] (20); Leiden	Ecquermicourt (7); Utrecht	Rollepot (5); Aire
Br; Ha;	(21); Arras (34); Houdain (35);	(city & countryside) (14);	(8); Bruges (10);
Li; Na;	Vilvoorde (37); Aalst-Geraardsbergen	Rotterdam (15); Antwerp	Amersfoort (13);
Ov; LvA;	(38); Deinze (39); Courtrai (40);	(24); Zwolle (25); St.-Omer	[Namur] (19); Ghent
Gu; Dr	Tielt (41); Molenbeek (42); Puttem	(36); Ghent (31); Den Haag	(26); Ypres (27);
	(43); Ruislede (44); Wingene (45);	(22); Delft (49); Culemborg	[Artois] (28); Utrecht
	Ursel-Wessegem (46); Zomergem (47);	(50); Arnhem (51); Anloo	(33); [Utrecht,
	Waarschoot (29); Lovendegem (30);	(52)	Amersfoort,
	Utrecht (32); [Hainaut] (48); Ghent		Gelderland, Holland,
	(53)		Zeeland] (23)

- (1) Bocquet, *Recherches sur la population rurale*, p. 74. The aldermen of Zuydcoote signalled that in the account of 1435/6, like they had done previously in 1431, the ‘*assis*’ had brought in only a small amount of money « *pour ce que en icelles annee, on y dispensa peu de breuvages pour le grant mortalité quy fut audit lieu et environ en l’année précédente* ». That year the ‘*assis*’ only yielded 34 pounds compared to 54 pounds in 1433.
- (2) *Ibid.*, p. 74. In 1439 the Duke ordered Martin Cornille, the aid recipient of Artois and Picardy to take 1400 pounds « *obstant les meschiefs, mortalitez, guerres et famines et povreté du peuple des pays* ». Actual source: ADN, B, no. 1967.

- (3) Ibid., p. 74. In 1441, the Duke gave a tax rebate to Auxi-le-Château, « *par la mortalité qui esté en ladicté ville, plusieurs des residens en icelle sont trepassés et tellement que [...] ladicté ville, pour la plus grant partie, est demouree inhabitee et desolee* ». Plague occurred together with war in this locality, and in 1437 the English had burned between 160 and 180 households. Idem., p. 156. Actual source: ADN, B, nos 1973, 17672.
- (4) Ibid., p. 74. In 1441 the Duke also recalls mortality in Aubin, « *grant famine et povreté a esté, dont très grant mortalité s'est ensuyé audit pays et par especial, dans la dicté ville, qui par ce moyen, apres la desolation faite par les Anglois est encore diminué de peuple et de biens...* ». Actual source: ADN, B, no. 1979.
- (5) Ibid., p. 74. On 23 October 1443, the seigneur of Rollepote wrote: « *Les habitants de ma dicté terre de Rollepote sont telement diminuez, tant par le fait de guerres, comme par mortalitez et autrement que des piéça, il ne y en a encores quelquepersonne demourant en icelle terre, sy non seulement mon censier* ».
- (6) Ibid., p. 74. The accounts of the aides signal that in Eclimeux, « *pour la grant mortalité qui a esté en ladicté ledit temps durant [1438-1439], est ladicté ville demouree inhabitee jusques a present* ».
- (7) Ibid., p. 74. In Ecquemecourt they did not receive any payment for the aides, « *tant pour la povreté des gens et la grant mortalité, comme pour ce que ladicté ville a esté arse par les Anglois...* ».
- (8) P. Bertin, *Une commune flamande artésienne, Aire-sur-la-Lys, des origines au XVIIe siècle* (Arras, 1947), p. 388. Letters from Philip the Good dated October 1439, where he revoked certain customs for the city of Aire. Here we read that « *pour la grant mortalité qui esté en ladicté ville en l'an 1438, ou il y a mort 4000 personnes ou plus, icelle ville est inhabitee et une grant partie des maisons gastees et en grant desolacion* ». This is an over-exaggeration or poor estimate because Aire did not have more than 4000 inhabitants in total.
- (9) One in three 'bastards' had died. The 'Bien des Batards' was a source that recorded the possessions that came into the hands of the Duke upon their death, found in the Bailiwick accounts. Van Gassen, 'Pestepidemieën', pp. 61-70. Actual source: ARB, RE Baljum, no. 13773.
- (10) Van Dixmude, *Corpus croniconun Flandriae*, III, p. 103. "In Vlaanderen storven vele lieden van honghere, ende het was al Viaendren duere eene groote staerfte generael van der bootze, van den brande, van hitteghe cortsen ende van der epedemye; seensdaeghs was tvolc ghezont, tsanderdaeghs siec, sdaerdaeghs men begrouft in der eerden; ende deze staerfte beghonste in de Mey ende gheduerde tot na St. Martinsmesse (11th November 1438)". Daily 22-24 corpses were counted in four parishes, sometimes 29-30. On 16 August there were 36 victims in one parish and 39 in another; in the first parish they numbered 35 on the 19th and 32 on the 20th. "Men zeide voorwaer te Brughe omtrent St. Baefsdagh (1st of October) dat dat vijfste deel van den volke van Brugghe was ghediminueert ende ghemindert bij der straeften, dat sonderlinghe vele Heden doot waren, de zomeghe gevloon van aermoede, de zomghe omme de quade neringhe of van sculden de stede van Brugghe ruumden". SB, Kroniek van Vlaanderen, Handschrift 436, Band A: Band B, no. 193 (f°CCIII v°b); 7 July 1438, "Item up den zevensten dach van hoymaent, doe was onthoofte bij den souverain Pieter Christiaens, deken van den sceppers te Malen. Ende up de zelve tijt zo starf so zeere te Brughe datter up zommeghe dach waren XXXVI lijcken. Ende binnen den zelve jare zo storven te Brughe wel XXIIIM personen van der pestelencie".
- (11) Vangassen, 'De pestepidemieën', p. 71. Despite destruction of the archives during the Second World War, Adolphe Hocquet published an alphabetical table of wills, which show a clear rise in 1438 to 328 when most years rarely exceeded 100, and often no more than 50.
- (12) ADN, 3H273; obituary from Abbaye du Saint-Sepulcre de Cambrai, « *1438 la peste estoit a Cambrai* » (1438).
- (13) W. van Rootselaar, *Amersfoort 777-1580* (Amersfoort, 1878), p. 35.
- (14) A. van der Weyde, 'Bijdrage tot de geschiedenis der pest te Utrecht', *Nederlands Tijdschrift voor Geneeskunde*, 71b (1927), p. 3119. Also K. Burman, ed., *Utrechtse jaarboeken van de vyftiende eeuw, vervattende het merkwaardige in het gesticht...*, I (Utrecht, 1754), no. 512; "de pest bracht veel sterfte in het Sticht". A prayer in protection against the plague from 1440; M.H. Hulshof, ed., 'Gebed en voorschriften tegen pest in een Utrechtsch getijdenboekje uit 1440', *Nederlands Tijdschrift voor Geneeskunde*, 83 (1939), pp. 533-5. Also *Kronijk van Arent toe Bocop*, p. 525; "dat derde iaer daerna [after 1437] quam hyer in den lande een grotte swarre pestelencie und ffort dye Ryn opwers" (1440).
- (15) Moquette, *Pestepidemieën*, p. 12.

- (16) Gooskens, 'Pestepidemieën', p. 33. Necrology data.
- (17) Vangassen, 'De pestepidemieën', pp. 30-4.
- (18) Ibid., pp. 56-70. Also De Stavelot, *Chronique*, 145; « mortaliteit...par fivres contagieux...chaudes maladies in 1438 ».
- (19) Galliot, *Histoire Générale*, V, no. 1438; « Sous le règne de Philippe-le-Bon, duc de Bourgogne, le comté de Namur, fut affligé par deux grands fléaux, la peste et la famine ».
- (20) Vangassen, 'De pestepidemieën', pp. 30-4.
- (21) Ladan, *Gezondheidszorg*, p. 236. The number of benefactors increased in 1439 to 30, when the average over the period 1427-49 was little more than 6. The intensity of mortality peaked in August-October 1439, and the memory book had already noted plague in June and August of that year. The number of testaments also made increased in 1439 (30) compared to 8 in 1440/1 and 12 in 1441/2, and there was a large increase in the number of coffins bought – 55 in 1439 was much higher than that seen in the middle of the 1430s.
- (22) T.S. Jansma, *Raad en rekenkamer in Holland en Zeeland tijdens hertog Philips van Bourgondië* (Utrecht, 1932), p. 159. Clerk Pieter van der Tannerie died in 1439 of plague in the Den Haag.
- (23) A. van Bommel., *Beschrijving der stad Amersfoort*, I (Utrecht, 1760), p. 927; "1439 Was 'er t'Utrecht, t' Amersfoort en in 't gantsche Stricht, alsmede in Gelderland, Holland, Zeeland en langs de Rhyn een grote Pestilentie onder de menschen, zo dat alhier in die tyd in een klooster aan de besmetting gestorven zyn een en twintig Nonnen".
- (24) RA, Correctie boeck, 1414-1512, fo. 67v. On 13 July 1439, it was noted that Katline van den Berghe was punished "overmits dat veele haestlinge van der haestiger ziecte, in de stove, die de selve Katline houdt, in der nacht gestorven zyn, en dat zy daer en boven rechtvoert de stove ophielt en stoefde, verbiedende hoeren familien dats niemand en seyde noch wt brachte, twelc emmers was om de gantze stad te punieren en in sterfte te brengen".
- (25) Hemerken a Kempis, *Opera Omnia*, VII, p. 390 (1440).
- (26) Van Heule, ed., *Memorieboek*, I, p. 210; "Item, in dit jaer was te Ghent eene groote sterfte" (1439).
- (27) ARB, Rekenkamer, 14548; « De feu sire perpian Kerayser pauvre bastauqui terspassa en la dite ville dur la seigneurie d'aratrique de la malvaise maladie ».
- (28) H. van der Linden, 'Eene reis door de Nederlanden in 1438', *Société Chorale et Littéraire des Mélaphiles de Hasselt*, 46 (1906), p. 43.
- (29) J. De Smet, 'Le dénombrement des foyers en Flandre en 1469', *Bulletin Commission Royale d'Histoire*, 99 (1935), pp. 105-50. Increase in the mortmain payments in the years 1437/8 compared to previous and following years. In 1438 it went up to 38, when it was never more than 3 between 1434 and 1440. Actual source is the 'Rekeningen van de baljuw van Oudburg'.
- (30) Ibid. Increase in the mortmain payments in the years 1437/8 compared to previous and following years. Actual source is the 'Rekeningen van de baljuw van Oudburg'.
- (31) Vangassen, 'De pestepidemieën', p. 58. The aldermen of Ninove were called to an assembly of the 'Raad van Vlaanderen' in Ghent, but did not go because they wanted to avoid plague raging there in 1437/8; "Mits der sterften ende andersins dat mijn voors heeren van den Rade hen absent hilden van der Cameren langhen spacie van tide, te wetene tusschen der impetracie der voors lettren en den 6en dach van novembre". Actual source: ARB, Rekenkamer, Stadsrekening Ninove 1437-8.
- (32) Only two residents remained in the Regulierenklooster (monastery) in Utrecht after the plague of 1439; C. Block, 'Kroniek van het Regulierenklooster te Utrecht', *Bijdragen en Mededelingen van het Historisch Genootschap*, 16 (1895), p. 58.
- (33) L.G. Visscher, 'Oorspronck, beginsel ende voortganck, voorders wat Fundateurs, Overste ende Regeerders dattet convent int Geyn buyten Utrecht gehadt heeft, byeenvergadert door Io. Buysling, pater aldaer, anno 1574', *Tijdschrift voor Geschiedenis, Oudheden en Statistiek van Utrecht*, 8 (1842), p. 186.
- (34) The accounts of the hospital St.-Jean in Arras form a continuous series starting from 1437/8. In that year they buried 295 bodies, 802 in 1438/9 and 149 in 1439/40. In 1440/1, the situation normalized and they did not dig more than 46 pits. ADPdC, Archives Hospitalières d'Arras, 1 E, no. 16; and following years. From 1 E no. 21 (1442-3) all of the accounts for the fifteenth century have been burnt, and their previous existence is known through an inventory published in 1914.

- (35) The accounts for the domain of Houdain include a section on the rights of the bourgeoisie, where each burgher paid 4 deniers. The accounts are accompanied by lists of those included for years 1436/7 and 1443/4. In 1436/7, 72 burghers paid, though we only have names for 42 because the list is damaged. In 1443/4, the largest part of these names do not correspond with those from the 1436/7 account, and some lands were abandoned after the death of owners. There were only 44 bourgeois subject to the levy. These numbers, together with defaults in payments, suggest that the plague of 1438 had significant demographic impact here; ADN, B, nos 14482-15484.
- (36) Derville, 'La population', p. 67. Actual sources: BASO, MS 930, 1, fos 256, t2, 62v, 170; MS 933, fo. 365. AMSO, Registre des délibérations échevinales, B fos 27, 73v, 77; C fo. 56v; B 248.3; B 239.2; 2G 453 fos 5, 40, 44v; 2G 454, fos 7, 32, 115-6, 139v-41, 146v.
- (37) J. Cuvelier, ed., *Les dénombrements de foyers en Brabant (XIVe-XVIIe siècle)* (Brussels, 1912), no. CXLIX. Cuvelier refers to the plague outbreak of 1438 which caused a decline of 130 households compared to the numbers of 1437.
- (38) Vangassen, 'De pestepidemieën', p. 29. Increase in the mortmain payments between September 1437 and September 1438 compared to previous and following years. Actual source: ARB, Rekenkamer, no. 13547.
- (39) *Ibid.*, p. 30. Increase in the mortmain payments in the years 1438/9 compared to previous and following years. Actual source: ARB, Rekenkamer, no. 13901.
- (40) *Ibid.*, p. 32. Increase in the mortmain payments in the years 1438/9 compared to previous and following years. Actual source: ARB, Rekenkamer, no. 13816.
- (41) *Ibid.*, p. 33. Increase in the mortmain payments in the years 1437/8 compared to previous and following years. Actual source: ARB, Rekenkamer, no. 13816. Also noted « *Nommen son trespassex hastement de l'impedemie* ».
- (42) *Ibid.*, p. 33. Increase in the mortmain payments in the years 1437/8 compared to previous and following years. Actual source: ARB, Rekenkamer, no. 13816. Also noted « *Nommen son trespassex hastement de l'impedemie* ».
- (43) *Ibid.*, p. 33. Increase in the mortmain payments in the years 1437/8 compared to previous and following years. Actual source: ARB, Rekenkamer, no. 13816. Also noted « *Nommen son trespassex hastement de l'impedemie* ».
- (44) *Ibid.*, p. 33. Increase in the mortmain payments in the years 1437/8 compared to previous and following years. Actual source: ARB, Rekenkamer, no. 13816. Also noted « *Nommen son trespassex hastement de l'impedemie* ».
- (45) *Ibid.*, p. 33. Increase in the mortmain payments in the years 1437/8 compared to previous and following years. Actual source: ARB, Rekenkamer, no. 13816. Also noted « *Nommen son trespassex hastement de l'impedemie* ».
- (46) *Ibid.*, p. 34. Increase in the mortmain payments in the years 1437/8 compared to previous and following years. Actual source: ARB, Rekenkamer, no. 14455.
- (47) De Smet, 'Le dénombrement des foyers'. Increase in mortmain payments in the years 1437/8 compared to previous and following years. In 1438 it was 17, when it never exceeded three between 1434 and 1440. Actual source is the 'Rekeningen van de baljuw van Oudburg'.
- (48) Large rise in mortalities in the mortmain; ADN, B 12205-6.
- (49) Oosterbaan, ed., 'Kroniek', p. 206, 208; "Anno XXXIX was die grote sterft..." (1438).
- (50) A. van de Ven, ed., *Het oud-archief van de gemeente Culemborg* (Utrecht, 1938), no. 187; stadsrekening 1438/9 "van dat sij die wake snachts verwairt hebben inder starften dat men doe quellie waicte"; Also idem, no. 188; stadsrekening 1439/40 "Broeder Elyas, soe hy in der sterften in onss alre nooit bystont" (1440).
- (51) GA, Oud Archief Arnhem, Stadsrekeningen, 1244, 1439/40, fos 11, 35, 44; "burgermeesters, scepenen ende rade ende waren weder inkom die meiste deel die uyt geweest waren omme der pestilencie...want men gheen baden gekrijgen en conde ende oick want hy omme der pestilencie wille, daer quellicken by een omme gekrijgen conden...ende waren the samen alle dieghene die vaste buyten der stat om der pestilencie wille geweest waren".
- (52) F. Keverling Buisman, ed., *Ordelen van de Etstoel van Drenthe 1450-1504 (1518)* (Zutphen, 1994), p. 60, 62-3 (August 1441).

- (53) SG, Oud Archief, no. 330; a spike in inventories after death in 1439 of 211 acts compared to 71 on average in the previous decade.

1450-9

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ca; Ar; Ho; Ne; Ov; Gu; Fl; Br; Ha; LvA; Na; Bo	Cambrai (1); Leiden (3); Bruges (8); Brussels (9); Mons (10); Breda (13); Oudenaarde (17); Louvain (30); Tienen (31); Landen (32); Aerschot (24); Sichem (25);	Dordrecht (4); Utrecht (5); Zwolle (6); Monnickendam (11); Rotterdam (12); IJsselstein (18); [Brabant] (20); Kampen (22); Antwerp (26); St.- Omer (28); [Artois] (29); Arras (7); Hoorn (16); Hasselt (14); [Gelre] (34); Rosendaal (35); Venlo (36); Zutphen (37); Deventer (38); Arnhem (42); Oosterwijk (43); [Holland] (44)	Lens (2); Amersfoort (19); Montreuil (23); Namur (21); Deventer (15); Douai (27); Zutphen (33); Harderwijk (39); Gouda (40); Diepenveen (41);

- (1) Neveux, 'La mortalité', 78.
- (2) Bocquet, *Recherches sur la population rurale*, p. 76. In 1456 the duke was advised to reimburse the inhabitants of Lens their part of the aid funds. This city was seen as a fortress of the highest importance, and so it was deemed appropriate that after the epidemic that « *le peuple qui y est de present n'ait cause de l'abandonner de en départir, mais que ceulx qui à l'occasion de la dicte pestilence s'en sont éloignez... aient cause de y retourner. De present, pour cause de la mortalité qui derrenièrement a esté en icelle ville, n'y sont demeurez que environ quatre vins feux au plus, povres gens vivans de labour* ». Actual source: ADN, B, no. 17679.
- (3) Ladan, *Gezondheidszorg*, p. 236. The number of benefactors was 20% above the norm in 1449, 15 *fautores* died in 1450, against an average of 4 between the years 1440-66. The memory book mentioned in 1450 plague as cause of much death in June, October and November 1450.
- (4) J. Fruin, ed., *De oudste rechten der stad Dordrecht en van het Baljuwschap van Zuidholland* (The Hague, 1882), p. 294; plague ordinances announced in 1450, 1452 and 1458; also confirmed in J.L. Van Dalen, 'Oude maatregelen in Dordrecht tegen de pest', *Vragen van den Dag*, 15 (1900), p. 127.
- (5) Van der Weyde, 'Bijdrage tot de geschiedenis der pest', p. 3119 (for 1450). Also (1450) Burman, ed., *Utrechtse jaarboeken*, I, no. 180; "In den zomer van dit jaar heft de pestziekte veele menschen in deeze Stadt het leven benomen"; describes measures taken by city: prohibited to exit the city, prohibition on the sale of consumer goods from infected households. Corroborated by N. van der Monde, 'Pestziekte', *Tijdschrift voor Geschiedenis, Oudheden, en Statistiek van Utrecht*, 2 (1836), p. 151; city council decide that it was not permissible for aldermen to stay more than eight days outside the city. Also later (1455); Burman, ed., *Utrechtse jaarboeken*, I, no. 180; "door de pest veel inwoners van Utrecht overleden. Velen trekken buiten de stad om aan besmetting te ontkomen"; found again in HUA, Stadsbestuur, I, no. 16.
- (6) Hemerken a Kempis, *Opera Omnia*, VII, p. 411 (1450 & 1453). Also in 1458, Gerardus Tydemanni was sent to Zwolle to help the people of regulierenconvent of Bethlehem which was struck by a terrible plague; Pohl, *Opera Omnia*, VII, pp. 442-3.
- (7) Bocquet, *Recherches sur la population rurale*, p. 76. Plague mentioned in Arras in 1454.
- (8) Blockmans, 'The social and economic effects of plague', p. 853. Also RtB, Bishopric Archives, Acta Capitularia Sancta Donatiani; the canons of the St.-Donatian were allowed to leave the town on 17 August 1458 "for fear of the plague which was in several places in the vicinity of Bruges".
- (9) Ibid., p. 853.
- (10) Ibid., p. 853.



- (11) Two plague deaths mentioned in the Galilea Minor monastery in 1451; J. Besteman and H. Heidinga, *Het klooster Galilea Minor bij Monnickendam* (Dordrecht, 1975).
- (12) Moquette, *Pestepidemieën*, p. 12.
- (13) Gooskens, 'Pestepidemieën', p. 33.
- (14) Ordinance of 1450 noted in J. Benders, 'Demografie van de stad Hasselt (Ov.) tot 1535', *Overijsselse Historische Bijdragen*, 109 (1994), p. 10.
- (15) Molhuijsen, 'Vroegere ongezondheid', p. 64. In 1458 according to the 18th-century 'Kronijk van Deventer' by Sef Moonen.
- (16) J. Steendijk-Kuypers, *Volksgezondheidszorg in de 16e en 17e eeuw te Hoorn: een bijdrage tot de beeldvorming van sociaal-geneeskundige structuren in een stedelijke samenleving* (Rotterdam, 1994), 166. Plague of 1452: Philip of Burgundy declared to Holland and West-Frisia that he would not come to collect his taxes because of the raging epidemic: original source found in Oud Archief Hoorn, no. 118, fo. 14.
- (17) Thoen, *Landbouweconomie*, pp. 1141-53.
- (18) B. Heesters, 'O.L. Vrouwenberg te IJsselstein', *Historische Kring IJsselstein*, 22 (1982), pp. 42-8.
- (19) Van Rootselaar, *Amersfoort*, p. 35.
- (20) R. Van Uytven, 'Politiek en economie: de crisis der late XV eeuw in de Nederlanden', *Revue Belge de Philologie et d'Histoire*, 53 (1975), pp. 1100-1.
- (21) Galliot, *Histoire Générale*, no. 1455 « *Une maladie contagieuse fit encore de nouveaux ravages, cette année, à Namur, où en moins de six mois, elle emporta jusqu'à deux milles quatre cent personnes* ».
- (22) W. ten Kate, 'De pestkeuren te Kampen', *Nederlands Tijdschrift voor Geneeskunde*, 66 (1922), p. 1555.
- (23) Bocquet, *Recherches sur la population rurale*, p. 76. In 1459, the inhabitants of Montreuil reveal « *la povreté et les affaires d'icelle ville et la ruine de la fortification d'icelle et aussi les mortalitez qui ont esté et continue par longtemps, par quoy le siege de la justice, qui y est la principal membre de nostre bailliaige d'Amiens, y a vacqué* ». Actual source: ADN, B, no. 2035.
- (24) Cuvelier, ed., *Les dénombremens des foyers*, nos CXLV-CXLVI. Clear decline in population from hearth counts of 1437 to 1464, and explicit mention of plague outbreak in this region in 1458.
- (25) *Ibid.*, nos CXLV-CXLVI. Clear decline in population from hearth counts of 1437 to 1464, and explicit mention of plague outbreak in this region in 1458.
- (26) A. Van Schevensteen, 'Over pestepidemiën te Antwerpen in vroeger tijden', *Verlagen en Mededelingen van de Koninklijke Vlaamse Academie voor Taal- en Letterkunde* (1932), pp. 1056-7. Ordinance from 1454 states the closure of trading shops for fear of contagious disease.
- (27) In 1457, Jacques du Clercq mentions an epidemic « *en plusieurs villes et villages, très fort spécialement à Amiens, Compiègne, Noyon, Douai et ailleurs* ». J. Du Clercq, 'Mémoires', in H. Herluison, ed., *Choix des chroniques et mémoires sur l'histoire de France* (Paris, 1875 [1838]).
- (28) BASO, MS 930, 1, fos 256, t2, 62v, 170; MS 933, fo. 365. AMSO, Registre des délibérations échevinales, B fos 27, 73v, 77; C fo. 56v; B 248.3; B 239.2; 2G 453 fos 5, 40, 44v; 2G 454, fos 7, 32, 115-6, 139v-41, 146v. Also on 15 and 24 January 1456 the aldermen forbade the second-hand clothes dealers to sell the possessions of the dead, « *pour ce que encore ne avoit eu forte gelee ne souffisant pour avoir purgié le mauvais aer mais avoit le temps esté moyte* ». On 19 February, because there had long been no deaths, the second-hand clothes dealers were allowed to sell their products again but under regulations; AMSO, Registre aux délibérations échevinales, B, fo 27. In 1452 and 1454 there was mention of 'maladies dangereuses'; Bocquet, *Recherches sur la population rurale*, p. 76.
- (29) A letter from the Chambre des Comptes of Lille on 12 March 1454 stated that the pilgrimage of Boulogne had to be delayed because of the war in Flanders and that mortality prevailing in the region had stopped many notables and their servants from coming. ADN, B, no. 17676.
- (30) Cuvelier, ed., *Les dénombremens des foyers*, nos CXLV-CXLVI. Clear decline in population from hearth counts of 1437 to 1464, and explicit mention of plague outbreak in this region in 1458; anon., *Annales Parchenses, MGH SS XVI* (Hannover, 1869), p. 608; "Eodem etam anno regnavit pestilentia magna in eadem civitate".
- (31) *Ibid.*, nos CXLV-CXLVI. Clear decline in population from hearth counts of 1437 to 1464, and explicit mention of plague outbreak in this region in 1458.

- (32) Ibid., nos CXLV-CXLVI. Clear decline in population from hearth counts of 1437 to 1464, and explicit mention of plague outbreak in this region in 1458.
- (33) RAZ, Inventaris van de collectie Johannes Gimberg (1850-1930), 0142, no. 68, fo. 1; chaplain said to have died from plague in 1458.
- (34) GA, Hertogelijk Archief, no. 272, fo. 167; plague in the accounts kept by Arnold van Goer, 'landrentmeester' of Gelre (1449/50); "[...]so des boschmeesters wyff vanden pestilencien syeck was, ende der huecke nyet en hebbe derven toe tasten dan alst wat voirder kompt...". Again for the accounts 1450-2, wife of the 'bosmeester' "ander pestilencien sieck lach"; idem., no. 274, fo. 1. Also idem., no. 738, fo.35v-36; accounts of the tollenaar Lobith; "so et pestilentie was" and "so die tijt sterflich was ende die pestilentie seer regneerde gekoft vur siecken luden ende tot preservativen ende is onder den siecken vast gedeult in affwesen mijnr [...] pestilencienpolver".
- (35) GA, Rekening Korenmeester 1439-50, no. 429, fo. 90v; three children of Willem Nollen died of 'pestilentia' in 1449/50 at Roosendaal.
- (36) GA, Hertogelijk Archief, Rekening Rentmeester Venlo 1450/51, no.1555, fo. 4v; plague mention. Also GV, Oud-archief Venlo, no. 1194, Stadsrekening I, fos 15-18; plague mentions.
- (37) RAZ, Oud Archief Zutphen, 0001, no. 1044, overrentmeesterrekening 1458/59; the week before 15 August 1458, wine donated to the chaplain for three plague processions.
- (38) HCOvD, Oud Archief Deventer MA, no. 130, Cameraarsrekening 1458, fos 7, 14; "int leste vander sterfte doe weren hyr twee observanten gecomen alse die prior van Zutphen mit ene brueder ons te prediken..." and "van Steven Kistemaker hondert ende 66 doetvaete soe cleyn ende groet die luyden omme gads willen inder sterfte gegeven worden...".
- (39) J.T. de Voecht, *Narratio de inchoatione domus clericum in Zwollis. De kroniek van het fraterhuis te Zwolle*, ed. M. Schoengen (Amsterdam, 1908), p. 118; "in Harderwijck, ubi nonnichil grassabatur pestilentia..." (1450).
- (40) G. Kooijman, ed., *Kroniek van Gouda: 1250 jaar Goudse geschiedenis in jaartallen* (Gouda, 1984), p. 28; "Dominus Theodricus Hoern, tactus pestilencia, obiit..." (1451); other friars also infected (p. 31).
- (41) Anon., 'Van den doechden der vuriger ende stichtiger susteren van Diepen Veen', <[http://www.dbnl.org/tekst/\\_van005vand02\\_01/](http://www.dbnl.org/tekst/_van005vand02_01/)> (1904), p. 155, 263, 305, 308-9; on 28 Decemeber 1452, the last nun of the convent died of plague.
- (42) van Veen, 'De pest', p. 5, 38-9; mention of plague in city accounts (1455); "om der sterftt wille eyn wijle tijts van hyn mytter woeyngen te well getaigt was" and "om der sterffte wil die lude oir kynder te huys hileden ende der schoelre voill gestorven sijn ende die schoelmeister dairomme ledich heeft moeten gaen lange tijt".
- (43) RAT, Oud Rechterlijk Archief Oisterwijk, no. 157, fo. 8 [1449]; act from the magistrates noting 'Godsgave' and 'haestigen dood' in Tilburg where the wife of Claes Jan Maes, her 2 children, her parents, and the maid all were victims.
- (44) NATH, Oud Archief Stadsbestuur Delft, no. 1691; Duke of Burgundy held up in Holland through plague (1452).

## 1467-73

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ho; Ne; Ov; Gu; UG; Ze; Fl; Br; Fr; Lim; Ar; Ha; PoC; Li	Leiden (1); Doesburg (9); Bruges (15); Breda (16); Gorinchem (23); Douai (25); Arras (26)	Rotterdam (2); Utrecht (6); Kampen (8); Amsterdam (11); Venray (13); Diest (14); Aduard (17); Antwerp (21); Courtrai (22); Louvain (24); St.-Omer (27); Bergen-op-Zoom (18); Cassel (19); Haarlem (20); Alkmaar (3); Delft (4); Schiedam (5); Dordrecht (12); Bruges (28); Ypres (29); Veurne (30); Wervik (31); Oudenburg (32); Calais (33); Liege (35); [Liege city and countryside] (36); Mons (37); Kampen (38); Montfort (39); Roermond (40); [Overkwartier] (41); Buren (42);	Amersfoort (7); Zierikzee (10); Zutphen (34); Zwolle (44)

(1) Ladan, *Gezondheidszorg*, p. 59. Also Adam van Cleve was required in 1468 to investigate the parts of Leiden which were afflicted by plague; NATH, Archief Grafelijksheidsrekenkamer, Rekeningen, no. 169, fo. 70v.

(2) H. Brunner, 'Pest-epidemieën van de 15<sup>e</sup> tot de 17<sup>e</sup> eeuw te Rotterdam', *Nederlands Tijdschrift voor Geneeskunde*, 90.2 (1946), p. 620; ordinance evidence from 1467.

(3) For Alkmaar, NATH, Archief Grafelijksheidsrekenkamer, Rekeningen, no. 169, fo. 70v.

(4) Jan Lodijk was required in 1468 to investigate parts of Delft afflicted by plague; M. Damen, *De staat van dienst: de gewestelijke ambtenaren van Holland en Zeeland in de Bourgondische periode (1425-1482)* (Hilversum 2010), p. 118.

(5) For Schiedam, *Ibid.*

(6) Van der Weyde, 'Bijdrage tot de geschiedenis der pest', p. 3120. Also Burman, ed., *Utrechtse jaarboeken*, I, no. 502; "de pest vergt weer veel slachtoffers in de stad Utrecht".

(7) Van Rootselaar, *Amersfoort*, p. 35.

(8) Ten Kate, 'De pestkeuren', p. 1655. Also Bijndop, ed., *Kamper Kronijken*, 1, p. 17; "Int jair ons heren m cccc lxxviii was hier in der stat eene groete pestilentie, durende van St. Petersdach ad Vinoula thent Alrehwillegen dach off dairomtrent" (1468).

(9) A. Weiler, ed., *Necrologie, kroniek en cartularium c.a. van het Fraterhuis te Doesburg (1432-1559)* (Leiden, 1974), p. xvii. Also GA, Hertogelijk Archief, no. 512, rekening van Johan van Holthuysen rentmeester van der Schuilenburgse goederen, 1467/8, fo. 6; "alsoe id bynnen Doisborch began to starffen en wolden Johan Hoen, Arnt van Huysen ind die andere rutere nytt langer dair blyven, so byn ick mit de selven aldair oppgebraken ind to Doetincjem gereden des guesdaigen na onser vrouwen dach nativitatiss" (9 September 1467).

(10) G. De Moor, *Verborgen en geborgen: het Cisterciënzerinnenklooster Leeuwenhorst in de Noordwijkse regio (1261-1574)* (Hilversum, 1994), p. 200.

(11) Adam van Cleve was required in 1468 to investigate the parts of Amsterdam which were afflicted by plague; NATH, Archief Grafelijksheidsrekenkamer, Rekeningen, no. 169, fo. 70v. Also plague ordinance announced in 1471; J. Breen, ed., *Rechtsbronnen der stad Amsterdam* (The Hague 1902), pp. 79-80.

(12) Jan Lodijk was required in 1468 to investigate parts of Dordrecht afflicted by plague; Damen, *De staat van dienst*, p. 118. Also Van Dalen, ed., 'Oude maatregelen', p. 127; plague ordinance in 1469.

(13) M. Flokstra, 'Pest-epidemie in Venray 1469', *Jaarboekje met Jaarverslag*, 2 (1984), pp. 1-2.

(14) C. De Backer, 'Maatregelen tegen de pest te Diest in de vijftiende en zestiende eeuw', in *De Pest*, p. 284.

(15) Blockmans, 'The social and economic effects of plague', p. 853. The *Acta Capitularia S. Donatiani* of Bruges mention cases of mortality by the plague in 1469 and 1471; SB, Bisschoppelijk Archief, *Acta Capitularia S. Donatiani*.

- (16) Gooskens, 'Pestepidemieën', p. 33. Necrology data.
- (17) Mol, ed., *De abtenkroniek van Aduard*.
- (18) Plague ordinance of 27 June 1471; WBA, Stedelijk Archief van Bergen op Zoom tot 1810, no. 8, fos. 71.
- (19) A letter from the Duke of Burgundy (1472) to the nuns of the hospital of Cassel mentions that plague was present in Cassel in 1471: « *et en temps de pestilence ou autres maladies contagieuses y recevoir et garder tous pauvres malades de notre dite ville et semblablement lesdits passans pelerins et autres miserables personnes illec surprises et demeurans gisans devant leur gisines et faire enterrer les mors trepassez audit hospital dont ils y ont eu l'année passée plus de cent cinquante personnes qui tous y moururent de ladite pestilence ou demaladies contagieuses* ». P.J.E. De Smyttère, *Topographie, historique, physique, statistique et médicale de la ville et des environs de Cassel* (Paris, 1828), pp. 39-41.
- (20) Adam van Cleve was required in 1468 to investigate the parts of Haarlem which were afflicted by plague; NATH, Archief Grafelijksheidsrekenkamer, Rekeningen, no. 169, fo. 70v.
- (21) Van Schevensteen, 'Over pestepidemiën', p. 1057. New ordinance on 4 April 1472, urging plague sufferers to hold the white stick in public, and mark their infected houses with a bundle of straw accordingly.
- (22) RK, Oud Stadsarchief Kortrijk, 101/3, nos 5319.
- (23) Zuijderduijn, 'Living la vita apostolica', p. 21. Also Jan Lodijk was required in 1468 to investigate the parts of Gorinchem which were afflicted by plague; Damen, *De staat van dienst*, p. 118.
- (24) L. Torfs, *Fastes des calamités publiques survenues dans les Pays-Bas*, I (Tournai, 1859), p. 60; E. van Even, ed., 'Reglement over de pest, afgekondigd door het stedelyk bestuer van Leuven, anno 1473', *Vaderlandsch Museum voor Nederduitsche Letterkunde, Oudkunde en Geschiedenis*, 2 (1858), pp. 132-5. Ordinance announced by the Louvain magistrates on 12 April 1473. Another ordinance in 1474; A. Huttmann, A., 'Ordonnances municipales antipesteuses provenant de la région entre Rhin et Meuse et la Belgique actuelle', *Histoire des Sciences Médicales*, 17.1 (1982), p. 133.
- (25) Significant rise in the number of wills; Deregnacourt, 'Autour de la mort à Douai'.
- (26) The accounts for the hospital of St.-Jean in Arras show a prolonged and severe epidemic from 1466/7 until 1471 based on the number of graves that were dug; In 1465/6 (25), in 1466/7 (96), 1467/8 (346), 1468/9 (176), 1469/70 (122), 1470/1 (174), 1471/2 (158), 1472-3 (64). Bocquet, *Recherches sur la population rurale*, p. 77. Original source Archives Hospitalières d'Arras, 1 E, no. 16 and following years.
- (27) BASO, MS 930, 1, fos 256, t2, 62v, 170; MS 933, fo. 365. AMSO, Registre des délibérations échevinales, B fos 27, 73v, 77; C fo. 56v; B 248.3; B 239.2; 2G 453 fos 5, 40, 44v; 2G 454, fos 7, 32, 115-6, 139v-41, 146v. The city also opened a new cemetery in 1470, "pour les pestiférés"; Derville et al., *Histoire de Saint-Omer*, p. 84.
- (28) Comments on 'reeuwerij' in 1468 (workers charged with employment in plague-infected houses) and their potential role in poisoning people; J. Huyghebaert, 'Reeuwers in Vlaanderen in 1468', *Biekorf*, 68 (1967), p. 98.
- (29) Ibid.
- (30) Ibid.
- (31) Ibid.
- (32) Archives mention substances found at a house of a known 'reeuwer' that suggested his guilt (of attempting poisoning) in 1468; E. Feys and D. Van de Castele, *Histoire d'Oudenbourg*, II (Bruges, 1873), p. 444.
- (33) ELO, Archief der Secretarie van de stad Leiden, Stadsbestuur 1, no. 1069, reg. 797; "...daar thans te Calis hevig de pest woedt".
- (34) RAZ, Inventaris van de collectie Johannes Gimberg (1850-1930), 0142, no. 68, fo. 1; plague said to have raged in 1468 – reference taken originally from city accounts.
- (35) A. D'Oudenbosch, *Chronique* (Liege, 1902), p. 230; mentions 'pestilentia' in 1470.
- (36) Habets, ed., 'Chronijk', p. 43; "grote sterft...als van den louppenden buyck ovel in den buyck" in 1473.
- (37) ACM, Registre de résolutions du Conseil, no. 1297, fo. 40; "plusieurs des mannans de Mons pour cause de la pestilence se departoient de le ville et se alloient tenir a villaige" (6/8/1468).
- (38) SK, RA 8, digestum vetus 1448-1478, fo. 79; butchers, bakers and brewers who had a plague victim in the household could not resume their craft until one month after plague had subsided from their household.

- (39) GA, Hertogelijk Archief, no. 1671, schattingsregister Land van Montfort, sub Odoliënberg, fos 12v-13; lack of payment due to plague mortality (1468); “*Item tot Momfoirt op sente peters avont ad vincula die schattinge van Berge, Postert ind Vlodorp gesat soe die pestenlentie inden dorpen seer was avermytz, den drosset scholtet schepen ind schatmeisters verteert in geritz huys...*” and “*...tot ruremunde in lenart koxs huys soe die van Berge Postert Lynne Vlodorp indo ick deels van Swalmen oir schattinge dair betailden so idt se opter vurs dorpen starff vander pestilentie...*”.
- (40) *Ibid.*
- (41) GA, Hertogelijk Archief, no. 1602, rekeningen Overkwartier, fos 39-40; plague mention.
- (42) GA, Hertogelijk Archief, no. 339, rekening rentmeester Buren en Beusichem 1469/70, fo. 38; retrospectively (thus 1468), “*also dan te Beuren wall die vierde mensche ghestorven was*” – one in four had died in Buren.
- (43) Bijndop, ed., *Kamper Kronijken*, 1, p. 17; “*In den selven jare quemen die van Deventer hier liggend voir die pestilencie in der tijt regnierde toe Deventer*” (1467).
- (44) de Voecht, *Narratio*, p. 150; “*tempore pestis*” (August 1472).

1481-4

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ho; Fl; Ha; Li; Lim; Na; Fr; Gu; Ov; Br; Ne; LvA; Ar; Ze	[Flanders] (3); [Hainaut] (4); [Liege] (4); Maastricht (5); [Namur] (6); Leiden (8); Dudzele (20); Middelburg (11); Zutphen (14); Kampen (1)	Gorinchem (2); Amsterdam (9); Groningen (10); Culemborg (15); Utrecht (16); Heesbeen (17); Diest (18); Antwerp (19); Aalst (13); Turnhout (7); Dordrecht (21); Arnhem (22); Delft (23)	Deventer (12); Zandwijk (24)

- (1) Eighteen councillors died in Kampen in 1483/4; V. Robijn, ‘Brothers in life and death. Religious and social aspects of the Kampen ‘*schepenmemorie*’ (1311-c.1580)’, in H. Brand, ed., *Trade, diplomacy and cultural exchange: continuity and change in the North Sea area and the Baltic, c.1350-1750* (Hilversum, 2005), p. 180. Also Ten Kate, ‘De pestkeuren’, p. 1655; plague ordinances in August and November 1483.
- (2) M. van Anel, ‘Pestepidemieën te Gorinchem’, *Nederlands Tijdschrift voor Geneeskunde*, 57 (1913), pp. 1844-62.
- (3) Blockmans, ‘The social and economic effects of plague’, p. 854.
- (4) *Ibid.*, p. 854.
- (5) Ubach and Evers, eds., *Historisch encyclopedie*, pp. 409-10.
- (6) Blockmans, ‘The social and economic effects of plague’, p. 854.
- (7) E. Adriaensen, ‘Turnhout in het verleden’, <<http://www.stadsarchiefturnhout.be/turnhout-in-jaartallen>> (catalogue of manuscripts in Turnhout City Archive); the sheriff’s accounts mention a ‘*febris pestilentialis*’ – a pestilential fever in 1480.
- (8) Ladan, *Gezondheidszorg*, p. 59.
- (9) Plague ordinance announced in 1483; Breen, ed., *Rechtsbronnen*, pp. 79-80.
- (10) F. Huisman, *Stadsbelang en standsbesef. Gezondheidszorg en medisch beroep in Groningen, 1500-1730* (Rotterdam, 1992), p. 22.
- (11) Van den Driest, ‘Hondenbaan’, p. 38; 684 dogs killed in 1483.

- (12) Molhuijsen, 'Vroegere ongezondheid', p. 64. In 1483 according to the 18th-century 'Kronijk van Deventer' by Sef Moonen; "...was soe groote en sware pestilencie binnen Deventer, dat die een vrunt van den anderen liepen ende nyet by malkanderen dorsten blyven". Also the rector and 7 sisters of the Lamme van Diesehuis die through a sickness in 1483, prompting the compilation of the so-called 'Sisters Book'; O.A. Spitzen, ed., 'Het leven der eerwaardige moeder Andries Yserens, overste van het Lammenshuis te Deventer, overladen in den jare 1502', *Archief voor de Geschiedenis van het Aartsbisdom Utrecht*, 2 (1875), pp. 189-216. Also HCOvD, Oud Archief Deventer, Cameraarsrekening 1483, I, fos 3-4; mentions mortality on 27 July, 11 August, 5 October and 11 October; also in Idem., II, mentions plague on 18 August; "scepene ende raet verbaet ten Diepenvene om der pestilencien willen...".
- (13) ARB, Rekeningen Aalst, no. 31480, fo. 27v; "Willeme Den Nokere es gheghevene gheweest over zinen arbeyt van dat hy ontrent St. Andriesmesse lestleden als de pestilencie tAelst begonste te cesseerne ende de goede mannen vanden wet ende andere die uut der stede ghevloten waren weder begonsten in te commene tcuyschte, vierde ende verluchtende tscепенhuus boven ende beneden omme alle corruptie te weeren" (1485).
- (14) R. van Schaik, 'Zutphense geschiedenis: van de elfde tot het einde van de zestiende eeuw', in W. Frijhoff, B. Looper and J. van der Kluit, eds., *Geschiedenis van Zutphen* (Zutphen, 1989), p. 66; from 1483 to 1489, a necrology shows that 61 new brothers entered the Fraternity of Aldermen, likely linked to the epidemic known for 1483/4.
- (15) M. van Malenstein, 'Het Sint-Pietersgasthuis te Culemborg: een archief-studie vanuit medisch-historisch oogpunt', *Gewina: Tijdschrift voor de Geschiedenis van Geneeskunde, Natuurwetenschappen, Wiskunde en Techniek*, 6 (1982), p. 72. Also van de Ven, ed., *Het oud-archief*, no. 1277, Rekening St. Petersgasthuis Culemborg; raised expenses for purchase of coffins in 1482/3. Also Idem., no. 231; "dat sy twee goede mannen huerden in die sterfft, die waken soude so dat volck zere verstorven was ende vele wt der stat waeren".
- (16) Van der Weyde, 'Bijdrage tot de geschiedenis der pest', p. 3120.
- (17) BHIC, Kloosters Mariënkroon en Mariëndonk in Heusden, 1245-1631, 239, no 87.
- (18) R. van de Ven, 'Een pestordonnantie van het Diestse stadsbestuur (1483)', *Ons Heem*, 26 (1972), pp. 148-51.
- (19) Van Schevensteen, 'Over pestepidemiën', p. 1057. New ordinance on 10 July 1484.
- (20) K. Dombrecht, 'Plattelandsgemeenschappen, lokale elites en ongelijkheid in het Vlaamse kustgebied (14<sup>de</sup>-16<sup>de</sup> eeuw)' (unpub. Ph.D. thesis, Univ. Antwerp, 2014), pp. 81-2. There was a clear increase in the number of deceased parents in 1483 and 1484 compared to previous and later years. Actual source: RB, Registers Brugse Vrije, nos 16469-81.
- (21) Van Dalen, ed., 'Oude maatregelen', p. 127; plague ordinance (1482).
- (22) GA, Stadsrekening Arnhem, 1483/4, fo. 28; "om die pestilence wil ind duer tijt".
- (23) Oosterbaan, ed., 'Kroniek', pp. 232-3; "Anno LXXXVIII omtrent Paeschen begant seer te sterven van der pestilencien" (1484).
- (24) J. van Veen, ed., 'Keuren en buurspraken van Tiel en Sandwijk', *Verslag en Mededelingen Oud Vaderlandsch Recht*, 5 (1908), pp. 359-60; "Dat niemand in den dorpe van Santwyck eenyge vremden siecken van der pestilentiën aenemen solden in zynnen huysen te verwaeren" (3 May 1483).

## 1487-90

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Br; Fl; Na;	[Flanders] (3);	Antwerp (1); Heesbeen (2); Gouda	Namur (4); Brussels (9);
Ha; Ho;	[Hainaut] (5);	(6); Gorinchem (7); Mechelen (8);	Louvain (10); Ghent (11);
Me; Ar	Brussels (12)	Namur (14); Brussels (15); Ypres (16); Turnhout (13)	[Brabant] (17); [Holland] (18)

- (1) L. Torfs, *Nieuwe geschiedenis van Antwerpen*, II (Antwerp, 1865), p. 154. In 1487 it was noted that “*begonst men tot Antwerpen seer te sterven van de peste, maer doen er briefkens van den H. Naem Jesus voor byna elck huys geset warden, dan cesseerde terstont de peste...*”.
- (2) BHIC, Kloosters Mariënkroon en Mariëndonk in Heusden, 1245-1631, 239, no 1463.
- (3) Blockmans, ‘The social and economic effects of plague’, p. 854.
- (4) Galliot, *Histoire Générale*, no. 1489; « *Une peste désola cette année une grande partie des Pays-Bas. Elle fut si cruelle que pendant l’espace de dix-sept mois, qu’elle dura, elle moissonna plus cinquante mille personnes dans Namur, Bruxelles, Louvain et les lieux circonvoisins* ».
- (5) Blockmans, ‘The social and economic effects of plague’, p. 854.
- (6) L. Rollin Couquerque and A. Meerkamp van Embden, eds., *Rechtsbronnen der stad Gouda* (The Hague, 1917), pp. 170-3.
- (7) Van Andel, ‘Pestepidemieën’.
- (8) F. Berlemont, ed., *Mechelse kronieken van het jaar 1 tot 1945* (Brussel, 1975).
- (9) Galliot, *Histoire Générale*, no. 1489; See fn. 4.
- (10) *Ibid.*, no. 1489; See fn. 4.
- (11) Van Heule, ed., *Memorieboek*, I, p. 354; “*In dit jaer storven binnen Ghendt van der peste xl duusent personen onder jonck ende audt*” (1489).
- (12) Cuvelier, ed., *Les dénombrements de foyers*, nos CCII-CCIII. Based on reduction of hearth counts, coupled with two events. First of all, the Duke of Saxony accompanied by a large group of nobles and 2000 German infantry entered Brussels on 25 August 1489, but rushed away soon after for fear of decimation by the raging disease. Second, the Brussels magistrate requested a consultation with four famous doctors to find out the best ways to combat the plague in the city. Actual source (for second example): ARB, Cartulaire et Manuscrits, no. 71, fo. 75.
- (13) Adriaensen, ‘Turnhout’; the sheriff’s accounts mention the plague twice in 1690; described as the “*haestige sieckte*” and “*besiect van der gaven van drie santen*”.
- (14) Torfs, *Fastes*, II, p. 214.
- (15) *Ibid.*, II, p. 214.
- (16) *Ibid.*, II, p. 214.
- (17) P. van Doornick, ed., *Geldersche kronieken*, II (Arnhem, 1908), p. 62; “*Was seer groote sterfte van den peste in Brabant, Holland ende ander plaetsen*” (1489).
- (18) *Ibid.*, 62.

1493-4

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ho; Br; Ov; Gu; LvA; Ne; Fr; Ze; Fl; Ar	Leiden (1); Oudenaarde (7); Middelburg (20); Bruges (22)	Antwerp (2); Utrecht (8); Haarlem (10); Amsterdam (11); Gouda (18); Heusden (4); Lille (3); Zutphen (21); Sluis (23)	Tiel (5); Amersfoort (9); Hoorn (6); Ede; (12); Barneveld (13); Nijkerk (14); Doesburg (15); Harderwijk (16); Elburg (17); Frisia (19)

- (1) Ladan, *Gezondheidszorg*, p. 59.
- (2) H. Dupont, ‘Sie eens ‘t verzwakte volk. De bestrijding van pest in Antwerp tijdens de vijftiende en de zestiende eeuw’, *Stadsgeschiedenis*, 2 (2007), p. 89.
- (3) ADN, 56 H, no. 34. Document of the *Sœurs Noires* or Augustines of Lille on the construction of “*retraits*” to evade the spread of plague, dated from 1496.
- (4) BHIC, Kloosters Mariënkroon en Mariëndonk in Heusden, 1245-1631, 239, no 312. (In 1495).
- (5) E. Dirk Rink, *Beschrijving der stad Tiel* (Tiel, 1836), p. 48.

- (6) T. Velius, *Chronyk van Hoorn* (Hoorn, 1740), p. 161.
- (7) Thoen, *Landbouweconomie*, pp. 1141-53.
- (8) HUA, Stadsbestuur, 1, no. 16.
- (9) Van Rootselaar, *Amersfoort*, p. 35.
- (10) A. Enschedé (ed.), *Index op de keur- en gebodsregisters der stad Haarlem* (The Hague, 1875), pp. 55-6.
- (11) L. Noordegraaf and G. Valk, *De Gave Gods. De pest in Holland vanaf de late Middeleeuwen* (Bergen, 1988), p. 225.
- (12) Dirk Rink, *Beschrijving der stad Tiel*, p. 48.
- (13) *Ibid.*, p. 48.
- (14) *Ibid.*, p. 48.
- (15) *Ibid.*, p. 48.
- (16) *Ibid.*, p. 48.
- (17) *Ibid.*, p. 48.
- (18) Rollin Couquerque and Meerkamp van Embden, eds., *Rechtsbronnen*, p. 170.
- (19) H. Nijboer, 'De Slaande Engel gie om de Aldehou: Eat oer de pest yn Ljouwert', *De Vrije Fries*, 75 (1995), pp. 62-3.
- (20) Van den Driest, 'Hondenbaan', p. 38; 630 dogs killed in 1492.
- (21) RAZ, Inventaris van de collectie Johannes Gimberg (1850-1930), 0142, no. 68, fo. 1; priest observes special service on account of the plague.
- (22) SB, Hallegeboden, I, nos 104, 108, 113, 115, 121, 124, 128, 134. Seven hallegeboden (city regulations) announced on the subject of plague in 1492, and three in 1493.
- (23) SB, Hallegeboden, I, nos 104, 108. Noted in Bruges hallegeboden that a new outbreak of plague had occurred in August 1492, and thus a number of new restrictions on trade and mobility of Bruges citizens was now applied.

### Loose years

#### 1376

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Z	[Zeeland] (1)		

- (1) ELO, Archief van de Sint Pancraskerk, Antiquum Registrum A, no.415, fo. 51; reference to mass mortality in Zeeland in 1376 along with sighting of a comet.

#### 1387-9

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Li; Na; Gu		[Guelders] (3)	Liege (1); Namur (2)

- (1) Bacha, ed., *La chronique liégeoise*, p. 404; "pestis super cunctum populum, tussis et raucitas".
- (2) *Ibid.*, p. 404.
- (3) van Veen, 'De pest', p. 3; products such as pills and apples bought to counter 'pestilentiam' (1389/90).



## 1393-4

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ho	Leiden (1)		

- (1) Ladan, *Gezondheidszorg*, p. 45.

## 1397

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ne			Utrecht (1)

- (1) *Monumenta-handschriften* of A. van Buchel, 'Inscriptiones', <[http://www.hetutrechtsarchief.nl/collectie/handschriften/buchelius/inscriptions/003#\\_edn4](http://www.hetutrechtsarchief.nl/collectie/handschriften/buchelius/inscriptions/003#_edn4)>, p. 3; "Andreas ille peste sublatus est anno».

## 1407-8

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Ar	St.-Omer (1)		

- (1) Based on the number of *aveux* and counts served by the vassals of St. Bertin from 1403 to 1411. In a succession per year the figures were 3, 0, 1, 14, 39, 19, 11, 1 and 3; therefore the mortality was severe from 1406 to 1408. Haignère and Bled, eds., *Les chartes de Saint-Bertin*, nos 2168-2411.

## 1431

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Fr		Weidum (1)	

- (1) Nijboer, 'De Slaande Ingel', pp. 62-3; chronicle reference from 1431.

1476

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Fr		Louvain (1)	

- (1) van Even, ed., 'Reglement', p. 135; plague ordinance from 1473 reannounced in 1476.

1486

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Br		[Taxandria] (1)	

- (1) Van Bussel, 'De pest', p. 168; Jacops Wautgers loses his wife and children to plague in 1486.

1496-9<sup>670</sup>

Region	Quantifiable evidence of raised mortality	Descriptive mentions of plague in the contemporary sources	Descriptive mentions of plague in later sources
Li; Ze; Fl	Middelburg (2)	Diest (1); Lille (3)	

- (1) Ordinance mentioned in Backer, 'Maatregelen', p. 184.  
 (2) Van den Driest, 'Hondenbaan', p. 38; 1165 dogs killed in 1497.  
 (3) ADN, 56H, 34; construction of isolated housing to escape plague contagion from the Archive Soeurs Noires of Lille (1496).

670 The 'Spanish' or 'Naples Pox' (syphilis) broke out in 1497, in for example, Gorinchem; W.F. Emck, 'De voormalige pesthuizen te Gorinchem', *Nederlands Tijdschrift voor Geneeskunde*, 73.2 (1929), p. 3571. The pox (pokken) was noted in 1496 in the hallegeboden of Bruges: SB, Hallegeboden, I, nos. 238-9.

## Nederlandse wetenschappelijke samenvatting

Weinig historische relaties zijn intiemer of dodelijker dan die tussen mensen en infectieziekten. Vanaf de vroegste sedentaire samenlevingen hebben besmettelijke ziektes het verloop van de menselijke geschiedenis beïnvloed. Grootschalige epidemieën, in het bijzonder, worden door historici gezien als katalysatoren voor maatschappelijke ontwikkelingen op economisch, cultureel en demografisch vlak. Geen enkele epidemie spreekt in dit opzicht meer tot de verbeelding dan de Zwarte Dood. Deze pestuitbraak kostte tijdens het midden van de veertiende eeuw het leven aan meer dan de helft van de Europese bevolking en wordt daardoor beschouwd als een van de dodelijkste epidemieën uit de geschiedenis. De Zwarte Dood wordt daarom door veel historici gezien als een cruciaal kantelpunt voor de maatschappelijke ontwikkelingen tijdens de late middeleeuwen in Europa. Toch was het enkel de spreekwoordelijke punt van de speer, de eerste uitbraak van de tweede pestpandemie die gedurende vijf eeuwen zou woeden in Eurazië en Afrika.

Aanvankelijk omschreven geschiedkundigen het Europa van na de Zwarte Dood, als een gebied dat langdurig geteisterd werd door economische depressie, geweld en maatschappelijk verval. In recent onderzoek wordt echter nadrukkelijk gewezen op sterke regionale en chronologische verschillen op vlak van socio-economische en demografische neergang en herstel. Wanneer we als voorbeeld het debat over de *'Great Divergence'* nemen, dan wordt de Zwarte Dood gezien als oorzaak voor zowel positieve als negatieve economische gevolgen. Voor West-Europa zou de demografische schok onder meer een proces van institutionele *'creative destruction'*, het einde van het feodale systeem, verbeteringen in de landbouw en een stijging van de reële lonen hebben veroorzaakt. Terwijl voor het Midden-Oosten, dat een vergelijkbare impact van de Zwarte Dood onderging, de mortaliteitscrisis net een lange periode van economische stagnatie zou hebben ingeluid. Ook binnen Europa zorgde de Zwarte Dood voor sterke regionale verschillen. In het kader van het zogenaamde *'Little Divergence'* debat wordt vaak gewezen op het feit dat de massale sterfte zorgde voor een stijging van de reële lonen en een toename van menselijk kapitaal. Deze factoren zouden vervolgens hebben bijgedragen tot de economische groei van het Noordzeegebied tijdens de vroegmoderne tijd. In Oost-Europa leidde de peststerfte echter tot een verarming van de boerenstand, die terecht kwam in een nieuwe fase van lijfeigenschap. Ook in Zuid-Europa worden pestuitbraken tot in de zeventiende eeuw vaak gezien als belangrijke factor in de economische achteruitgang. Terwijl sommige historici een rechtstreeks verband zien tussen lage sterftcijfers en snel economisch herstel in regio's die relatief milde pestuitbraken meemaakten, suggereren anderen dat regio's met hoge peststerfte net gunstigere economische ontwikkelingen meemaakten op de lange termijn. Er zijn ook geschiedkundigen die deze rechtstreekse correlaties (positief of negatief) volledig tegenspreken. Zij wijzen erop dat niet de ernst van de sterftecrisis, maar wel de maatschappelijke context waarin deze plaatsvond, bepalend was voor de langetermijneffecten van de Zwarte Dood.

Historici zijn het er over eens dat het demografisch herstel na de Zwarte Dood sterke regionale verschillen vertoonde in Europa. Ondanks deze consensus zijn de onderliggende oorzaken voor deze verschillen nog steeds onderwerp van debat. Hoe kan het dat sommige regio's na de Zwarte Dood eeuwenlang bleven worstelen met demografische neergang, terwijl andere regio's op relatief

korte termijn hun bevolkingsaantallen zagen herstellen? De historiografie over dit onderwerp kan worden onderverdeeld in twee verschillende denkrichtingen. Een eerste redenering schrijft een belangrijke rol toe aan verschillen in sterftcijfers tijdens (exogene) sterfteschokken, voornamelijk veroorzaakt door de pest, om de regionaal uiteenlopende bevolkingsontwikkelingen na de Zwarte Dood te verklaren. Een tweede denkrichting richt zich op het belang van verschillen in endogene maatschappelijke factoren als verklaring voor diverse trajecten van demografisch herstel of neergang.

Demografisch herstel tot het bevolkingsniveau van vlak voor de Zwarte Dood vond in verschillende regio's van de Zuidelijke Nederlanden al plaats in de loop van de zestiende eeuw. In veel andere Europese gebieden zou dit herstel duren tot in de achttiende eeuw. Om dit opmerkelijke herstel uit te leggen, hebben geschiedkundigen voor de Zuidelijke Nederlanden gewezen op het gecombineerde effect van endogene maatschappelijke factoren die de bevolkingsgroei stimuleerden, evenals een milde exogene peestschok. Deze combinatie van exogene en endogene factoren wordt ook gebruikt om te verklaren waarom zelfs aangrenzende regio's in de Zuidelijke Nederlanden sterk uiteenlopende bevolkingsontwikkelingen konden meemaken na de Zwarte Dood. Toch is het idee dat laatmiddeleeuwse pest relatief weinig sterfte veroorzaakte in de Zuidelijke Nederlanden niet algemeen aanvaard. Vanwege het gebrek aan kwantificeerbare demografische gegevens voor de late middeleeuwen kan de exacte relatie tussen exogene en endogene variabelen vaak niet empirisch getest worden. Mijn proefschrift neemt het graafschap Henegouwen als casestudy, omdat er in de secundaire literatuur en de archieven betrouwbare gegevens beschikbaar zijn over zowel sterfte- als bevolkingsontwikkeling voor dit gebied. Mijn onderzoek richt zich op het relatieve belang van exogene sterfteschokken (voornamelijk veroorzaakt door pest) en endogene maatschappelijke factoren, bij het verklaren van regionaal uiteenlopende bevolkingstrends in de nasleep van de Zwarte Dood in het graafschap Henegouwen.

### **Hoofdstukken**

De hoofdstukken in dit proefschrift werden geschreven als afzonderlijke artikelen. Als zodanig bevatten ze enige herhaling, vooral wat betreft hun inleidingen, de analyse van bestaande literatuur en de bespreking van gebruikte archiefdocumenten.

**Hoofdstuk één** richt zich op een aantal algemene aannames over de ernst en selectiviteit van laatmiddeleeuwse pest in de Zuidelijke Nederlanden. Hoewel de Zwarte Dood door veel historici wordt beschouwd als een vormende gebeurtenis in de Europese geschiedenis, hebben we nog steeds het raden naar een aantal fundamentele gevolgen en kenmerken van de ziekte. Ondanks een gebrek aan directe demografische gegevens uit laatmiddeleeuwse archiefbronnen, worden sommige veronderstellingen over de Zwarte Dood naar voren geschoven als quasi-waarheden in de bestaande literatuur. Belangrijk voor het onderwerp van dit proefschrift, is het idee dat de Zwarte Dood in de Zuidelijke Nederlanden slechts een milde sterftecrisis veroorzaakte. Hoofdstuk één richt zich op een specifieke dataset, samengesteld door Christakos et. al., van sterftcijfers tijdens de Zwarte Dood in de Zuidelijke Nederlanden. Door sterfteschattingen voor specifieke plaatsen te vergelijken met de archiefbronnen en de secundaire literatuur waaruit ze zijn verkregen,

wordt het duidelijk dat sommige verwijzingen uit hun verband zijn gehaald en een numerieke waarde hebben toebedeeld gekregen (een sterftecijfer) dat niet strookt met de inhoud van de geraadpleegde bronnen. Dit soort dataset is daarom niet geschikt om peststerfte zowel tussen verschillende regio's als doorheen de tijd te vergelijken. Als historici het belang van endogene en exogene factoren willen achterhalen om demografisch herstel na pestuitbraken te verklaren, dan hebben zij daarvoor betrouwbare gegevens voor deze beide variabelen nodig. Voordat we de uiteenlopende richtingen van sociaaleconomische en demografische ontwikkelingen na de Zwarte Dood in Europese regio's kunnen begrijpen (en empirisch kunnen testen), moeten we de epidemiologische kenmerken van de pest tijdens de late middeleeuwen in kaart brengen. Om meer licht te werpen op de sterftegraad (en selectiviteit) van de Zwarte Dood en terugkerende pestuitbraken in de Zuidelijke Nederlanden, introduceert het eerste hoofdstuk de centrale dataset die doorheen de rest van dit proefschrift gebruikt zal worden. De 'mortmain dataset' is gebouwd op basis van de mortmain-rekeningen, een soort erfenisbelasting, die vanaf 1349 beschikbaar zijn voor het graafschap Henegouwen. Het vormt de fundamentele empirische bijdrage van dit proefschrift en wordt in hoofdstukken drie en vier gebruikt om een gedetailleerd beeld te schetsen van de sterftegraad en selectiviteit tijdens de Zwarte Dood en terugkerende pestgolven in het graafschap Henegouwen. In hoofdstuk vijf wordt deze dataset gebruikt om de sterftegraad in drie verschillende regio's van het graafschap Henegouwen over een lange periode (1349-1505) in kaart te brengen.

**Hoofdstuk twee** beschrijft hoe historische gegevens over pestuitbraken zijn verzameld en gebruikt in eerdere literatuur. Waar hoofdstuk één zich voornamelijk bezighoudt met gegevens over de peststerfte, richt hoofdstuk twee zich op de meest gebruikte dataset van Europese pestuitbraken tijdens de tweede pandemie. Halverwege de jaren zeventig van de vorige eeuw, vatte de Franse geleerde Jean-Noël Biraben een ambitieus plan aan om referenties van gedocumenteerde pestuitbraken in Europa, vanaf de Zwarte Dood tot de negentiende eeuw, samen te stellen. Hoewel deze dataset aanvankelijk bijna uitsluitend door historici werd gebruikt, veranderde dit toen de dataset van Biraben in 2012 werd gedigitaliseerd als onderdeel van een kort correspondentiestuk in een toonaangevend epidemiologisch tijdschrift. Helaas paste deze publicatie geen enkele vorm van historische kritiek toe op de bijna vijftig jaar oude dataset van Biraben. Het duurde niet lang voordat een breed scala aan geleerden, uit diverse wetenschappelijke disciplines, de Biraben-dataset begon te gebruiken om complexe analyses uit te voeren waarin pestuitbraken gecorreleerd werden met een verscheidenheid aan factoren, variërend van de nabijheid van bevaarbare rivieren tot klimaatschommelingen. Ook deze publicaties pasten meestal geen enkele vorm van bronnenkritiek toe. Dit scheidt een gevaarlijk precedent voor het interdisciplinair gebruik van historische pestgegevens. Hoofdstuk twee behandelt dit probleem, niet alleen door te wijzen op de nood aan bronnenkritiek, maar ook door een aantal oplossingen aan te bieden voor wetenschappers die de Biraben-dataset willen blijven gebruiken. De Zuidelijke Nederlanden worden gebruikt als casestudy om een aantal leemtes in de ruimtelijke en chronologische dekking in de gedigitaliseerde Biraben-dataset te illustreren. De dataset geeft immers aan dat er in een periode van vier eeuwen nauwelijks pestuitbraken voorkomen in dit gebied. Door in dit hoofdstuk gebruik te maken van een nieuwe dataset van pestvermeldingen die zijn samengesteld uit secundaire literatuur,

uitgegeven bronnen en primaire bronnen voor de Zuidelijke Nederlanden, worden deze hiaten duidelijk gemaakt. Bovendien illustreert dit voorbeeld de noodzaak om nieuwe datasets samen te stellen om verder te gaan dan simpelweg bestaande datasets te kopiëren en te digitaliseren. De wens van sommige wetenschappers om cruciale eigenschappen van laatmiddeleeuwse en vroegmoderne pestuitbraken - zoals dodental, verspreiding en epidemiologische kenmerken - te kwantificeren, heeft in sommige gevallen geleid tot misbruik van historische gegevens en bronnen. Om deze reden blijft het essentieel om nieuwe datasets te construeren op basis van archiefonderzoek en een zorgvuldige lezing van de secundaire literatuur.

**Hoofdstuk drie** kijkt kritisch naar de opvatting dat de Zwarte Dood in de Zuidelijke Nederlanden minder sterfte zou hebben veroorzaakt dan in veel andere Europese gebieden. Het idee van milde peststerfte is een centraal onderdeel van een aantal bestaande verklaringen voor het relatief snelle demografische herstel in delen van de Zuidelijke Nederlanden na de Zwarte Dood. Na een diepgaande analyse van de 'mortmain dataset' en de dataset van pestvermeldingen die in hoofdstuk twee werd geïntroduceerd, blijkt echter dat de Zwarte Dood waarschijnlijk niet minder ernstig was in de Zuidelijke Nederlanden dan in andere delen van West-Europa. Bovendien lijkt het erop dat pest zowel in steden als op het platteland voor een hoge sterftegraad heeft gezorgd. Op basis van deze bevindingen oppert dit hoofdstuk de hypothese dat relatief snel demografische herstel na de Zwarte Dood in delen van de Zuidelijke Nederlanden, gezien moet worden als het resultaat van endogene maatschappelijke herstelprocessen en niet van zwakkere (exogene) peestschokken. Deze hypothese wordt in hoofdstuk vijf empirisch getest voor drie verschillende regio's in het graafschap Henegouwen.

**Hoofdstuk vier** analyseert de potentiële gendersselectiviteit van de Zwarte Dood en de daaropvolgende laatmiddeleeuwse pestgolven in het graafschap Henegouwen voor de periode 1349-1450. Hoewel recente publicaties in de bioarcheologie hebben aangetoond dat de Zwarte Dood vaak dodelijker was voor ouderen en personen met een zwakkere gezondheid, is het bewijs voor een gender specifiek sterfterisico niet eenduidig. Het grootste probleem voor de archeologie is het vinden van voldoende skeletten van pestslachtoffers, binnen de context van eenzelfde opgraving, om sluitende uitspraken te kunnen doen. Ook voor geschiedkundigen is het moeilijk om sluitend bewijs te vinden door een algemeen gebrek aan demografische bronnen voor de late middeleeuwen en het feit dat vrouwen vaak ondervertegenwoordigd zijn in deze documenten. In de mortmain-rekeningen van het graafschap Henegouwen werden de sterfte van mannen en vrouwen echter in gelijke mate geregistreerd. Deze unieke bron stelt ons daarom in staat om het sterfterisico tijdens pestuitbraken te correleren met het geslacht van een individu. Hoofdstuk vier analyseert 25.610 sterfgevallen geregistreerd in het graafschap Henegouwen in de periode 1349-1450 en concludeert dat vrouwen tijdens pestjaren in grotere aantallen stierven dan mannen. Dit effect werd niet alleen tijdens de Zwarte Dood vastgesteld, maar tijdens bijna elke grote pestgolf in de daaropvolgende eeuw. Laatmiddeleeuwse pestuitbraken in dit deel van de Zuidelijke Nederlanden waren dus ongetwijfeld selectief op basis van geslacht. Deze conclusie nuanceert de algemene opvatting van de Zwarte Dood als een '*universele moordenaar*', een ziekte die geen rekening hield met leeftijd, geslacht, gezondheid of sociaaleconomische status.

**Hoofdstuk vijf** analyseert de effecten van endogene maatschappelijke factoren (op sociaaleconomisch en institutioneel vlak) en exogene pestchokken (sterfte) om uiteenlopende regionale bevolkingsontwikkelingen in het graafschap Henegouwen na de Zwarte Dood te verklaren. Dit onderzoek vereist langetermijngegevens over zowel de bevolkings- als de sterftecijfers van de onderzochte regio's. Na een zorgvuldige overweging heb ik daarom gekozen om het graafschap Henegouwen te gebruiken als casestudy. Enerzijds, omdat de 'mortmain dataset' een nagenoeg doorlopende bron van jaarlijkse sterftegegevens biedt voor een groot deel van dit graafschap vanaf 1349, het jaar waarin de Zwarte Dood uitbrak in de Zuidelijke Nederlanden. Anderzijds, omdat er voor het graafschap Henegouwen op regelmatige tijdstippen bevolkingsgegevens werden bijgehouden door de administratie van de graaf. Deze gegevens zijn in de archieven bewaard gebleven vanaf het jaar 1365. Bovendien zijn de gegevens over deze twee belangrijke demografische variabelen beschikbaar op het niveau van zowel individuele lokaliteiten als volledige administratieve districten, waardoor er geen behoefte is aan intra- of extrapolatie op basis van beperkte gegevens. Uit de analyse van deze bevolkings- en sterftecijfers kan met zekerheid gesteld worden dat het graafschap Henegouwen gekenmerkt werd door regio's die sterk uiteenlopende bevolkingsontwikkelingen ondergingen na de Zwarte Dood. Daarbij kon ik vaststellen dat regio's die relatief snel demografisch herstel vertoonden na deze sterftecrisis niet minder te lijden hadden onder laatmiddeleeuwse pestuitbraken dan regio's die demografische neergang of stagnatie vertoonden. Dit resultaat bevestigt de hypothese die in hoofdstuk drie werd geopperd, namelijk dat verschillen in regionale bevolkingspatronen na de Zwarte Dood eerder verklaard moeten worden door te kijken naar endogene maatschappelijke factoren en niet naar regionale verschillen in peststerfte. De voornaamste maatschappelijke factoren die de bevolkingstrends in het graafschap Henegouwen na de Zwarte Dood beïnvloedden waren: regio specifieke eigendomsstructuren, werkgelegenheidskansen en overervingsssystemen. Afhankelijk van hun regionale configuraties konden deze factoren een positief of negatief effect hebben op het bevolkingsherstel. De belangrijkste oorzakelijke mechanismen waren hierbij trends in vruchtbaarheid en migratiepatronen.

In het zuidoosten van het graafschap Henegouwen veroorzaakten de Zwarte Dood en terugkerende pestgolven een langdurige demografische achteruitgang. Na de bevolkingsafname in het midden van de veertiende eeuw, veranderde deze regio van een samenleving die gedomineerd werd door kleine boeren die zich bezighielden met gemengde landbouw naar een regio die beheerst werd door commerciële bedrijven die zich bezighielden met extensieve veeteelt. Deze maatschappelijke transitie zorgde op termijn ook voor het verdwijnen van de gemene gronden doordat ze door grote veehouders geprivatiseerd werden om dienst te doen als graasweiden. De arbeidsextensieve veeteelt bood daarnaast ook weinig mogelijkheden op bijkomende werkgelegenheid voor kleine boeren. Naarmate de concurrentie voor pachtgronden toenam, werd de concurrentie van de succesvolle grootschalige pachtboeren moordend voor de kleinschalige boeren. Met weinig mogelijkheden om buiten landbouw in hun onderhoud te voorzien, werd deze groep boeren uiteindelijk gedwongen te emigreren. In het zuidoosten van Henegouwen waren er sterke prikkels voor emigratie en een gebrek aan endogene maatschappelijke factoren die de bevolkingsgroei bevorderden. Samen veroorzaakte dit een langdurige demografische stagnatie na de Zwarte Dood. Het

noordwesten van het graafschap Henegouwen kende een heel andere bevolkingsevolutie. Tijdens de late middeleeuwen werd dit gebied vooral gekenmerkt door een grote groep kleinschalige graan producerende boeren. Deze boeren hadden in een eerdere periode sterke grondrechten verworven en bij overerving werd hun bezit en grond evenredig over hun kinderen verdeeld. Het noordwesten zag daarnaast ook de opkomst van een levendige proto-industriële sector tijdens de veertiende eeuw. De combinatie van deze factoren zorgde ervoor dat deze regio na de Zwarte Dood een relatief snel demografisch herstel vertoonde. Hoewel immigratie hierin een rol lijkt te hebben gespeeld, werd het bevolkingsherstel voornamelijk bereikt door een zelfvoorzienend demografisch groeiproces, geholpen door de proto-industrie en het evenredige erfensysteem. Het noordoosten van het graafschap Henegouwen kende na de Zwarte Dood een opmerkelijke fase van bevolkingsgroei. De opkomst van proto-industrie in deze regio, in combinatie met het gemak waarmee arbeiders zich in de landelijke gehuchten konden vestigen, fungeerde als een belangrijke migratiefactor. Zowel voor als na de Zwarte Dood wordt deze regio gedomineerd door grote landbouwbedrijven die bij erfenis niet werden onderverdeeld onder de nakomelingen. Maar omdat deze grootschalige boerderijen zich vooral op commerciële graanproductie richtten, waren ze een sterke motor voor de werkgelegenheid in de regio. De combinatie van deze factoren maakte het noordoosten een aantrekkelijke bestemming voor arbeidsmigranten na de Zwarte Dood. Alle drie deze regio's van het graafschap Henegouwen kenden zeer vergelijkbare peptschokken en toch werden ze gekenmerkt door sterk uiteenlopende bevolkingsontwikkelingen na de Zwarte Dood. Voor het specifieke geval van het graafschap Henegouwen lijken endogene, regio specifieke maatschappelijke factoren doorslaggevend te zijn geweest voor de verschillende trajecten van demografisch herstel. Belangrijke factoren voor endogene groeiprocessen waren regio-specifieke eigendomsstructuren, werkgelegenheid en overervingssystemen waarbij de bezittingen evenredig over alle kinderen werden verdeeld.



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Finally, I would like to end with the final sentences of a poem by Tennyson dedicated to the memory of Rik Umans and Daan De Swaef.

*We are not now that strength which in old days  
Moved earth and heaven, that which we are, we are,  
One equal temper of heroic hearts,  
Made weak by time and fate, but strong in will  
To strive, to seek, to find, and not to yield.*  
Alfred Lord Tennyson, Ulysses

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