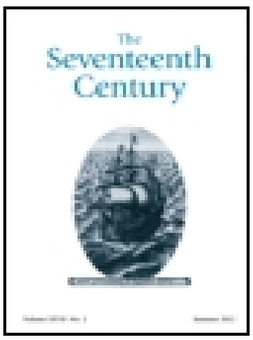

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The escape from famine in the Northern Netherlands: a reconsideration using the 1690s harvest failures and a broader Northwest European perspective

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ABSTRACT

A long historiography has concluded that the Northern Netherlands was famine free by the seventeenth century. However, this view has been established on limited grain price data and an unclear chronology, lacking a broader comparative perspective, and relying heavily on the explanation that Amsterdam was the centre point of the international grain trade. Using newly compiled burials data for the Northern and Southern Netherlands and Northern France, and integrating these with rye prices, we confirm empirically that price spikes had reduced mortality effects in the Northern Netherlands compared to the Southern Netherlands and Northern France, though the escape was greater in the cities than the countryside. The only time in the period 1551–1699 that a strong and generalized association between price spikes and mortality occurred across wide areas of the Northern Netherlands was in the famine of 1556/7. However, the international grain trade cannot explain everything. Markets in the Northern Netherlands were no more effective at smoothing out food crises than in the Southern Netherlands or Northern France. We offer alternative explanations: the reduced role of famine-related diseases spread by warfare, and the interaction (especially in the cities) between wages and poor relief.

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I. The escape from famine

One narrative firmly established in the social and economic history of the Low Countries is the early "escape from famine" in the Northern Netherlands.[1] For the sixteenth century, scholars have suggested that the Northern Netherlands still experienced food crises with emphasis on dearth years 1556/7, 1565/6, 1586/7, and 1595/6.[2] However, it has been argued that severe famines were absent for the entirety of the seventeenth century.[3] Accordingly food riots were less intense than seen elsewhere in Europe.[4] Significant famine-related mortality apparently only returned to the Northern Netherlands towards the later stages of the eighteenth century,[5] though some scholars have gone further and even queried whether firm connections between price spikes and

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Supplemental data for this article can be accessed here.

mortality rises can be discerned in the late eighteenth century.[6] The early disappearance of famines in the Northern Netherlands is significant given other parts of Europe continued to suffer from them in the early modern period.[7]

The explanation for this "early escape" has rested on two elements. The most prominent argument is that the Northern Netherlands negated harvest failures via its exceptional position vis-à-vis the international grain trade, ensuring a steady supply of cheap wheat and rye. The second argument, which often remains implicit, holds that since real wages in the Northern Netherlands were relatively high, people did not live as close to the edge as elsewhere.[8] The two arguments are, of course, related: in any calculation of premodern real wages, prices of grain or bread form an important element. Therefore, a re-examination of the explanation for the escape from famine in this article holds central an investigation into the consequences of the Northern Netherlands' position in the grain trade.

The escape from famine apparently coincided with the establishment and consolidation of the central position of Amsterdam in the European grain trade. Until the last quarter of the fifteenth century, grains mainly came from the Seine region in France and to a lesser extent from the inland Eastern Netherlands and adjacent German lands. The role of Baltic grains grew during the food crises of the late fifteenth century through disturbed political relations with France, and gained further importance in the second quarter of the sixteenth century. Amsterdam became an important grain trade centre, at first mainly for the Northern Netherlands, but increasingly also for other parts of Europe from the 1530s–40s onward.[9] A decisive point was the crisis of the 1590s, when the Italian merchant republics, cut off from their traditional areas of supply around the Black Sea by the expansion of the Ottoman Empire, looked north for a replacement.[10] From the late sixteenth to the mid-seventeenth century, the Amsterdam staple market dominated the grain supply of much of Europe.

Both the empirical validity and the explanation for the escape from famine in the Northern Netherlands are now quite well accepted. This is curious, however, given that very little quantifiable data has been employed to show a reduced famine-related mortality effect in the seventeenth century: certainly not over wide areas and not viewed relative to other neighbouring areas of Europe. Significant issues remain with the explanation too. While the suggested onset of the escape from famine may roughly match up chronologically with the consolidation of Amsterdam's central position in the international grain trade, a prolonged period of contraction of the Baltic grain trade after 1650 set in due to a combination of factors which included the emergence of new regions of production and the instability of demand. Amsterdam lost its dominant status on the international scene.[11] The number of ships bringing grain through the Sound from the Baltic to Holland in the period 1700–50 was less than 50% of what it had been in the period 1600–50.[12] Given this decline in the fortunes of the international grain trade for Amsterdam, how can we then account for continued and persistent ability to withstand harvest failures after 1650, apparently not translating into widespread famine-related mortality until at least the late eighteenth century? The lack of chronological consistency suggests other factors were also involved.

The objective of this article is to re-examine both the empirical foundations and the explanatory narrative for the escape from famine in the Northern Netherlands, by systematically employing our newly-compiled database of burials and prices for the period

1551–1699, and placing them in direct comparative perspective with similar databases we compiled for the Southern Netherlands and Northern France.[13] In Section II, we use the long-term perspective of the burials and prices data to show that mortality and price spikes in the Northern Netherlands did not strongly coincide at all in the seventeenth century. We use the prices and (scarcer) burials data for the sixteenth century to push the "escape" story back in time. Although there were moderate increases in mortality through famines in the mid-1580s and mid-1590s, they were not as high as expected given these were some of the worst excesses of the Dutch Wars of Independence. We suggest that the harvest failures of 1556/7 were the only time in the period 1551–1699 that a strong general famine-related mortality effect was seen in the Northern Netherlands.

From Section III onward, we focus on the explanation of the escape from famine. In Section III, we offer a comparative view of the harvest failures of the 1690s, a general European phenomenon,[14] to show that the Northern Netherlands negated the worst mortality effects of the crises, though this was seen to a greater degree in the cities than the countryside. In the period 1692–4 this was unsurprising given that price spikes in the Northern Netherlands were not as sharp as elsewhere, but the continued absence of significantly raised mortality in 1698/9 was curious: the price spikes were not only sharper than in 1692–4, but also sharper than in the Southern Netherlands and Northern France. Ultimately we show that mortality barely increased in the Northern Netherlands (during one of the worst general Northwest European famines), despite evidence of significant market volatility, weakening the traditional explanatory emphasis put on the efficiency of the international grain trade in reducing price spikes. In Section IV, we invoke two factors to explain why the Northern Netherlands so effectively managed to limit the mortality effect of the 1690s famine period, and generally throughout the seventeenth century. The first is the different role of warfare and spread of famine-related disease, which we examine by comparing the Northern and Southern Netherlands. Second, we return to the issue of wage levels, which we place within a broader context of poor relief provision and emergency aid – especially in the cities. Here, we compare the Northern Netherlands and Northern France.

II. Comparing price and mortality spikes in the Northern Netherlands, 1551–1699

Figure 1 below shows the main mortality spikes in the Northern and Southern Netherlands and Northern France during the period 1551–1699. Figures 2–4 show the main mortality spikes and the extent of their chronological correlation with price spikes in grain. However first of all, we comment on the sources used to construct these new databases, and the methodologies employed.

The mortality spikes are calculated from a database of church burial records, some taken from printed transcriptions and indexes, but most come from original manuscripts consulted either digitally or in archives across the Low Countries and Northern France.[15] The burial records are unsuitable for calculating absolute aggregate figures for total amounts of death in a particular locality because they do not systematically record all deaths.[16] Relatives of the dead did not always have the finances to pay for a church or cemetery burial, and in times of harvest failure, the struggle to come up with funds was particularly hard. Many of the dead were buried in sites attached to hospitals or

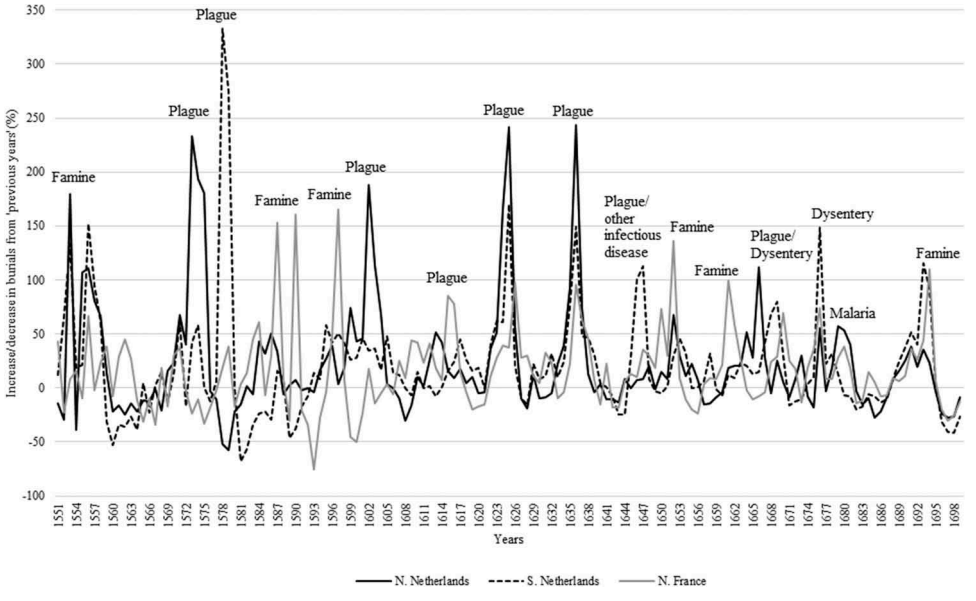

Figure 1. Mortality crises in the Low Countries and Northern France, 1551–1699.

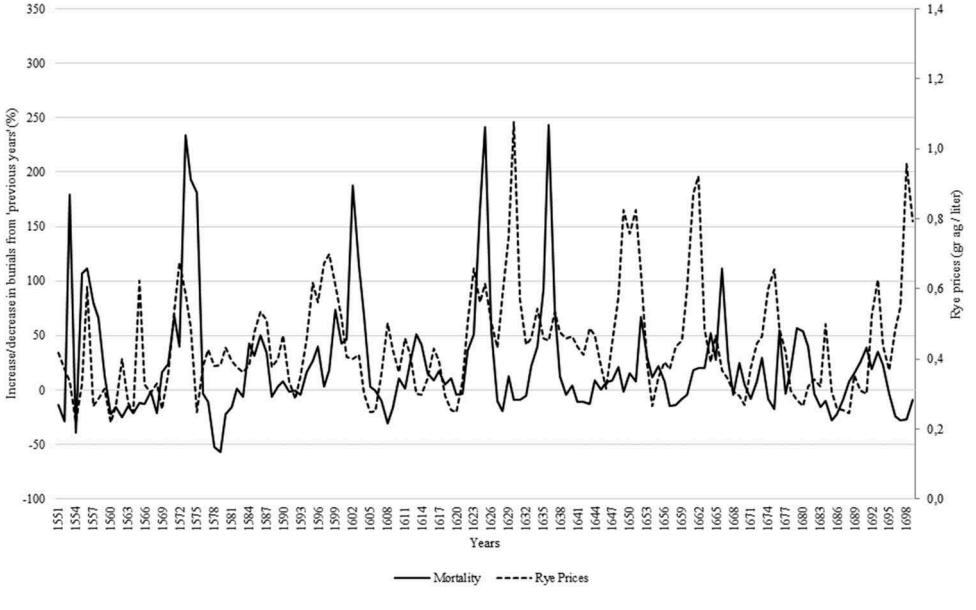

Figure 2. Mortality against rye price averages in six towns in November (gr ag/liter), Northern Netherlands 1551–1699.

plague houses, especially during disease outbreaks. Another feature of the burial records was that they were not always systematic in recording the deaths of children: some places did, but many more failed to do so, with no obvious geographical pattern to this.[17] In any case, our knowledge of precise population levels to compare mortality in the early modern Low Countries and Northern France is often not particularly

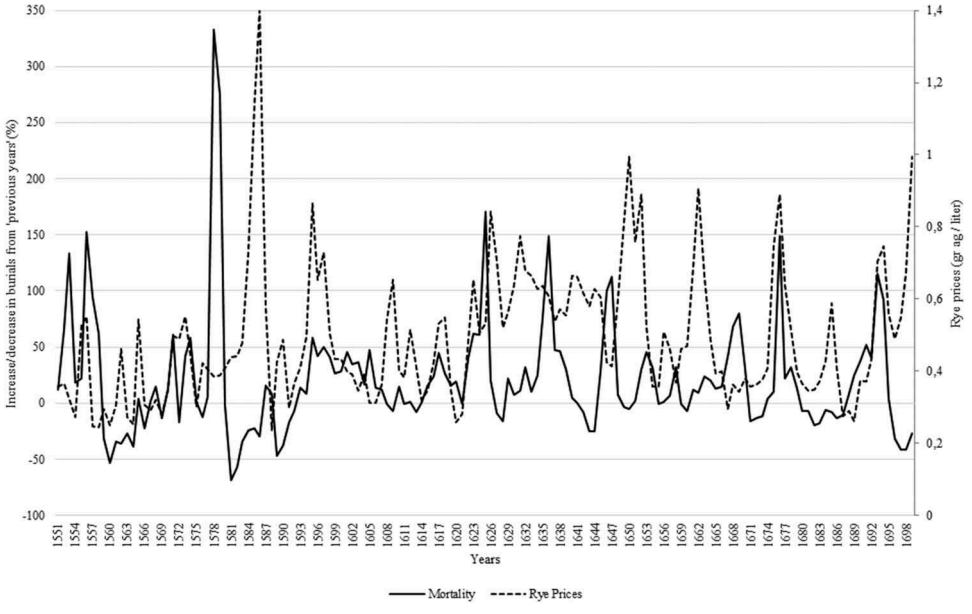

Figure 3. Mortality against rye price averages in six towns in November (gr ag/liter), Southern Netherlands 1551–1699.

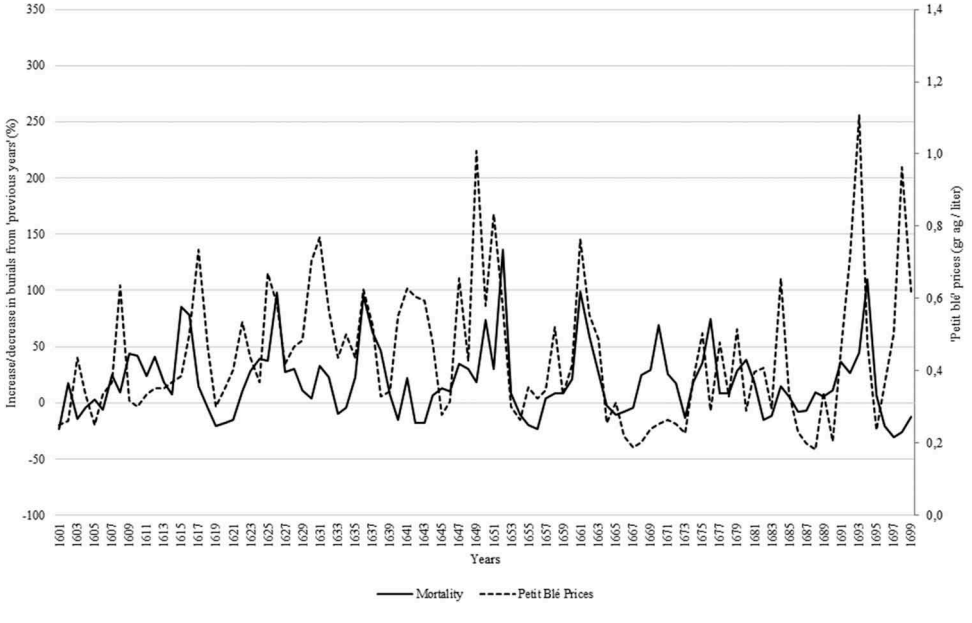

Figure 4. Mortality against "petit blé" averages in Amiens in November (gr ag/liter), Northern France 1601–1699.

definitive – certainly not for rural areas. The value of the burial records instead is that they can be used relatively to compare deaths in "crisis years" (such as harvest failures) with deaths in "previous years". The only assumption made here is that the quality of

scribal practice remains roughly constant across time and between religious denominations.

A number of different methods for calculating the severity of mortality crises have been developed over the years, particularly by French historical demographers and rural historians, but the technique used in this paper is one pioneered originally by the Italian historical demographers, Lorenzo Del Panta and Massimo Livi-Bacci, and has had recent re-adaptation and use.[18] The methodology is very suitable for the purposes of seventeenth-century burial records with gaps and missing years, requires no other information apart from burial data itself, and can be placed in direct comparison with other recent works employing the same techniques. To calculate burials in "previous years", one skips a year back in time, and takes an average of the burial figures for the past five consecutive years, not including the highest and lowest figures. This allows us to calculate a percentage increase or decrease in burials in a particular year compared to the average "previous years" figure. A "significant mortality crisis" was when "short-term perturbation of mortality reduces the dimensions of the generations so much that they are unable to reproduce themselves entirely even when making full use of their potential for recovery".[19] It has been suggested, therefore, that a 50% increase in mortality over the "previous years" figure was the minimum threshold needed to prevent the generation born in the year of the crisis from fully reproducing.[20] That is to say in this article we identify a mortality crisis, either locally or across a region, when burials went over this 50% threshold.

Figure 1 above is a consolidation of all the average increases and decreases from the "previous years" rate from all the years for all the settlements in the Northern Netherlands included in the database (203 localities and 868,698 burials), placed in comparison to similar data collected for the Southern Netherlands (172 localities and 404,430 burials) and Northern France (137 settlements and 124,408 burials): a total of 511 localities and 1,397,536 burials. These averages are not weighted by differences in population numbers between the localities, since this lessens the likelihood that any mortality spike is skewed by an anomalous or extreme result from one very large settlement, and moreover, gives a better indicator of how many localities were affected by the mortality crisis over a wide area. The discussion of this data is in reverse chronology – dealing with trends after 1600, before turning attention to the period 1551–99.

Figure 1 shows that the most severe seventeenth-century mortality shocks in the Northern Netherlands were plagues – indeed, the three largest seventeenth-century mortality spikes in the graph were attributable to severe plagues in 1601–4, 1624/5, and 1635/6.[21] This contrasted with the epidemiological experience seen further south. In the Southern Netherlands, the most severe seventeenth-century mortality spikes were still plagues, as well as the dysentery epidemic of 1676, but they were much shallower than those seen in the Northern Netherlands. In seventeenth-century Northern France, plagues had a much smaller impact on mortality, and famine-related mortality played a more prominent role – three of the most severe mortality spikes were famines in 1632, 1652 and 1662.[22]

To supplement this information, Figures 2–4 show the same mortality trends for the Northern Netherlands, the Southern Netherlands, and Northern France, each taken in turn, but compared with grain price data (for the whole period 1551–1699 in the Low Countries, and just for the seventeenth century in Northern France). Instead of the frequently used price series for good quality wheat, we employed prices of rye, or wheat of inferior quality in one case. These were grains commonly consumed by the poor, and

during crises also by others who saw their purchasing power drop. As a consequence, these were also grains that witnessed the sharpest price rises. All price series refer to either market prices at urban markets or price evaluations (based on market prices) established by urban or ecclesiastical authorities for the transformation in cash of rents or taxes originally levied in kind. All but two prices series are November or December prices: the Arnhem price series in the Northern Netherlands refers to averages of prices in the months November to February, and the Coutance series in Northern France refers to annual averages. In all but one case prices were taken from published series; the exception being Amiens, where grain prices were collected afresh from the archives. All prices are converted to grams of silver per litre.[23]

Adding the price data to the picture, Figures 2–4 further confirm the story that over the course of the seventeenth century, food crises in the Northern Netherlands had a reduced mortality impact when compared to the Southern Netherlands, and even more so when compared to Northern France. In the French case in Figure 4, four of the five sharpest mortality spikes matched up exactly or very closely preceding price spikes – the only one where this was not the case was after the price spike of 1698/9. In the case of the Northern Netherlands in Figure 2, however, the opposite could be said. Four of the five sharpest price spikes failed to match up exactly or very closely with any kind of raised mortality: not during the spikes of 1630/1, 1661/2, 1675/6, or 1698/9. The only exception was the price spike of 1649–51 (after a previous gradual increase in the preceding period 1647–9), where prices still remained fairly high in 1652. This was met with a moderate mortality spike in that very same year of a 67% increase. The Southern Netherlands in Figure 3 represented a state of affairs in-between the Northern Netherlands and Northern France. Like the Northern Netherlands, some of its sharpest grain price spikes were not met with any substantial mortality – in 1630/1, 1648–51, 1660/1 and 1698/9, for example. Yet at the same time, like Northern France, some of its sharpest price spikes occurred together with a mortality effect – raised mortality in 1676 (caused by dysentery) after the price spike of 1675/6 (in the context of the Franco-Dutch War and a hot dry summer) and raised mortality in 1693/4 together with prices spikes in the same years. Overall, the Pearson correlation coefficients in Table 1 below show only Northern France to have had a consistent connection between burial and rye price increases in the seventeenth century, though some connection between mortality and prices was seen for the Southern Netherlands in the second half of the seventeenth century. Thus, although it has become rather fashionable of late to stress the importance of "nature" as a key historical protagonist of social and economic development,[24] we have evidence here that shows that even when large geographical areas experienced

Table 1. Pearson correlation coefficients for mortality and rye prices, Low Countries and Northern France, seventeenth century.

	Northern Netherlands	Southern Netherlands	Northern France
1600–99	−0.01	0.05	0.23
1600–1650	0.05	−0.11	0.17
1651–1699	−0.13	0.19	0.26
Rural 1600–99	−0.03	0.13	0.23
Urban 1600–99	−0.02	−0.03	0.13

Sources: Authors' databases. Urban settlements were those considered to be over 2000 inhabitants as suggested as the minimum for "small town" status for early modern Northwest Europe by Clark, *European Cities*.

similar climatic pressures, leading to extreme weather shocks, the consequences, at least in terms of mortality, were quite different between regions.

The data we present then provides firm empirical evidence for the support of the "escape from famine" narrative during the seventeenth century. We may go on, however, to ask how early this escape actually took place. More than 60 years ago Astrid Friis argued that the crisis of 1556/7 led to the last real famine in the Northern Netherlands.[25] Although later authors such as Faber and Noordegraaf did not explicitly deny this, their strong focus on late sixteenth-century crises suggested a later escape.[26] Friis based her conclusions not on mortality data, but on grain prices and qualitative indicators such as "social disruption". No hard evidence has been produced yet to show when the sixteenth-century harvest failures in the Northern Netherlands actually stopped producing high mortality – was it only with the onset of the seventeenth century or did it occur before 1600? We must, however, be more cautious with our conclusions for the sixteenth century in comparison to the seventeenth. Fewer localities have extant records this early – indeed we start from 1551 instead of 1500 for that very reason.[27] Sixteenth-century burial records are also more fragmentary, with more missing years, especially in those vital "crisis periods" when compared to seventeenth-century records. The data is also more restricted in geographical scope, largely limited to towns with few rural figures.

Our impression from Figure 2 above suggests Friis was right: the final time in the sixteenth century in which price spikes were closely associated with excess mortality appears to have been during the famine of 1556/7. This was on account of the extremely hot and dry summer in 1556 leading to widespread harvest failures.[28] Strong emphasis in the literature has been put on the harvest failures of 1565/6, likely because it predated the iconoclasm of 1566 and marked the start of the Dutch Wars of Independence,[29] and yet the mortality effects during this period were entirely negligible. Of course substantial raised mortality occurred in the period 1573–5, after an upsurge in troop activity and pillaging of the countryside in 1572/3,[30] but these deaths were mainly due to a severe plague outbreak.[31] In the seventeenth century this is not an issue as plague years almost never overlap with harvest failures, adding further confirmation that plague was not a disease connected with malnutrition – at least not by this stage of the early modern period.[32] Given that some of the worst excesses of the Dutch Wars of Independence occurred in the last 20 years of the sixteenth century, one may have expected a much more severe mortality effect than seen in Figure 2. Raised grain prices in the mid-1580s did lead to excess mortality, but it was moderate (just reaching a 50% increase in 1586) and driven by localized crises in the areas bordering the Southern Netherlands such as Brabant, Upper Guelders and Limburg. Raised prices in the period 1595–8 led to little increased mortality in the Northern Netherlands, and the spike by 1599 was connected to the plague, which lasted until 1604 in some localities.

The trends in Figure 2 for the Northern Netherlands are partially mirrored in the Southern Netherlands in Figure 3: substantially raised mortality linked with the price peaks of 1556/7, a massive increase in deaths connected to the plague of the 1570s (though its most severe phases coming in 1578/9),[33] and an entirely absent mortality effect from the price spikes in 1565/6 and the mid-1580s (despite enormous price spikes in 1584–6).[34] The only difference from the Northern Netherlands was the moderate increase in mortality during the price spikes of 1595–7 (increases of 58% and 50% in

1595 and 1597 respectively), not unexpected given that the upsurges in military activity mainly afflicted the southern border areas. The escape from famine in the Northern Netherlands was more complete than in the Southern Netherlands, even if both shared elements of the same story and chronology.

III. The famine of 1692–4 and the international grain trade argument

The combination of our price and burials data over the long term, for many urban and rural localities, and placed in a broader comparative perspective, has shown that the Northern Netherlands did indeed make an "escape from famine" over the seventeenth century, while the more limited data from the sixteenth century in fact suggests that the last time (in the early modern period) that price and mortality peaks were closely associated over a wide area may have been during the famine of 1556/7, notwithstanding a moderate mortality increase in 1652 in the wake of an extended period of high prices. In this section we turn our attention to the explanation of why this was the case. As mentioned already, a dominant view is that Amsterdam's central position in the grain trade from the Baltic helped shield the Northern Netherlands from the price spikes seen elsewhere in Western Europe. we focus on the example of the 1692–4 famine, a significant one affecting large parts of Europe, to cast some doubt over the entrenched place of this international grain trade narrative as a convincing explanation – at least on its own.

The crises of the 1690s had their origins in widespread harvest failures across much of Western Europe, caused by prolonged inclement weather as a result of an inversion of the climatic cycle (from warming to cooling) at the end of Little Ice Age.[35] Burial records actually explicitly refer to indicators of environmental pressures at the time: for example, it was noted in the Upper Guelders village of Sevenum in 1692 that there was a great earthquake that shook all the dwellings, and in the Artois village of St-Pierre-Brouck the tremors were so great that they led to the church tower falling down.[36] For certain parts of Western Europe, this was aggravated by the simultaneous waging of the Nine Years' War from 1688 to 1697.[37] Table 2 below is a consolidation of all burial data for the 1692–4 period across the whole of the Low Countries and Northern France, comprising in total 326 settlements (74 urban, 252 rural): 109 from the Northern Netherlands, 115 from the Southern Netherlands, and 102 from Northern France.[38] Famine-related mortality was assessed on a regional level and based on an average increase in burials above the "previous years" (%) taken from each locality's "most severe" year – i.e. the highest figure from 1692–4. The results are presented in three ways – a weighted average increase/decrease in burials (%) according to differences in population between the localities,[39] a mean average increase/decrease in burials (%) (not taking into account relative population), and the likelihood a locality would be afflicted by the famine in the region. This last indicator is measured by the proportion of localities with a 50% or more increase in burials over the "previous rate", a method employed in recent work on territorial pervasiveness of mortality shocks.[40] A composite overall ranking of famine severity is then calculated by adding all the three rankings together, with the lowest score being the most severely afflicted region.

It is illuminating that the bottom four regions together comprised the greater part of the Northern Netherlands. The minimal mortality effect of the 1692–4 harvest failures was seen in regions as diverse as the urbanized and commercial core of Holland in the

Table 2. Famine-related mortality (1692–4) across regions of the Low Countries and Northern France.[a]

Regions	Overall rank	No. of settlements (of which urban)	No. burials in worst famine year	Weighted average burial increase (%)	Rank	Mean average burial increase (%)	Rank	Probability of famine occurring (%)	Rank
Haute Normandie	1	20 (1)	859	224	1	221	2	95	1
Inland Flanders	2	40 (16)	5829	175	2	223	1	95	2
Feudal East	3	26 (6)	1422	160	3	194	3	81	4
Picardy	4	28 (1)	1011	116	4	129	4	82	3
Coastal Flanders	5	25 (6)	3665	91	6	112	7	80	5=
Paris Basin	6	27 (4)	1536	99	5	115	6	78	8
Campine	7	15 (0)	670	85	7	104	8	80	5=
The South	8	14 (2)	1243	59	9	116	5	79	7
Basse Normandie	9	27 (2)	1018	68	8	77	9	70	9
Central River Area	10	36 (9)	1609	43	10	63	11	56	10
Frisia	11	13 (2)	1021	34	11	66	10	46	11
Holland/Zeeland	12	48 (24)	8951	24	13	60	12	44	12
The East	13	8 (2)	321	26	12	31	13	13	13

Sources: Authors' databases.

The probability of famine occurring is calculated through the percentage of localities in any of the years in the period 1692–4 that have an increase in burials of 50% or more over the "previous years" figure.

[a]"Inland Flanders" corresponds roughly to the inland parts of the County of Flanders, Lordship of Mechelen, and parts of the Duchy of Brabant not in the Campine. The "Feudal East" refers to all areas in the east of the Southern Netherlands including the Duchy of Limburg, the Bishopric of Liege, the Duchy of Luxembourg, and the assorted small ecclesiastical lordships. The "Paris Basin" refers to all areas surrounding the hinterlands of Paris. Picardy refers to the historical province of Picardy, the Boulonnais, and the areas comprising the contemporary department of Pas-de-Calais. Coastal Flanders refers to the coastal areas of the County of Flanders, including the French-speaking Flandre Maritime up to Dunkirk, and Flanders of the States (Zeelandic Flanders). The Campine area refers to those parts of the Duchy of Brabant and the Bishopric of Liege that comprised the natural inland region of moors, wastelands, and sandy heaths. "The South" refers to all those areas in the far south of the Southern Netherlands including the County of Namur, the County of Hainaut, the County of Artois, the lordship of Cambrai, and the Walloon area of the County of Flanders. The "Central River Area" refers to those central and southern parts of the Northern Netherlands that comprised the areas of Brabant of the States, the Duchy of Guelders, and Bishopric of Utrecht that followed key rivers such as the Meuse and the Waal. "Frisia" includes the far northerly lordships of Groningen and the Ommelanden, and Frisia. "The East" includes the inland regions of the County of Drenthe and the lordship of Overijssel. "Holland/Zeeland" refers to the Counties of Zeeland and Holland. "Haute Normandie" and "Basse Normandie" comprise of all areas currently part of those contemporary departments. The historical territorial regions mentioned here refer to all places as they were divided by 1648 and the end of the Dutch Wars of Independence.

coastal west and the rural and subsistence-oriented regions of Drenthe in the inland east. This was despite the fact that these areas experienced the same extreme weather conditions and harvest failures seen further south. Scattered evidence still points to suffering that occurred in the Northern Netherlands at this time. In Zaamslag in Zeeland, for instance, 29 people had their burial financed by poor supplements on account of their desperate condition, when in preceding years it was annually no more than one or two,[41] while in the small northern village of Weiwerd (Groningen), a young girl who had contracted *pokken* (smallpox) in 1694 was described as "*nagelaten*" – left behind and abandoned to her fate during an obvious period of hardship.[42] In the village of Den Dungen in 1694, the daughter of a woman who had been violently assaulted had died of "*verhongering*" (starvation), and in the same famine year, offences in the criminal records of Den Bosch and surrounding rural hinterlands had increased by 153% over the "previous years".[43] Typical acts of desperation around this year included theft from the commons at Sint-Michielsgestel, violent coercion of those with unpaid tithes at Heesch, and even infanticide in one case at Riethoven.[44]

Despite these obvious pressures and hardships, however, the greater excess mortality was experienced in various regions of the Southern Netherlands and Northern France. It is well known that many parts of Northern France suffered badly during the first half of the 1690s, and thus it is unsurprising that the area of Haute Normandie registered the most severe mortality effect. Some areas of the Southern Netherlands were not so far behind – especially badly afflicted were the inland areas of Flanders and the eastern areas such as Liège and Hainaut. As with the Northern Netherlands, the mortality trends did not follow a clear pattern according to "type" of region: mortality neither favouring coast nor inland area to an obviously greater degree, and neither commercialized nor more autarkic region. Of further interest, however, are the disaggregated results by urban-rural environment (see Table 3). The "escape" from the 1692–4 famine in the Northern Netherlands was clearly much more complete in the cities and towns than in the countryside: in fact rural areas had an average burials increase over the 50% minimum marker, even if this was still much lower than seen in rural areas of the Southern Netherlands and Northern France. This kind of result mirrors events in, for example,

Table 3. Urban and rural famine-related mortality (1692–4) across the Low Countries and Northern France.

	Northern Netherlands	Southern Netherlands	Northern France
RURAL			
No. of settlements	74	84	94
Burials in worst famine year	2488	4306	3287
Mean average burial increase (%)	77	162	131
Probability of famine occurring (%)	62	85	81
URBAN			
No. of settlements	35	32	8
Burials in worst famine year	9275	8662	1137
Mean average burial increase (%)	21	192	109
Probability of famine occurring (%)	11	91	75
RURAL + URBAN (weighted by urbanization rate)			
Mean average burial increase (%)	58	169	129
Probability of famine occurring (%)	45	86	81

Sources: Authors' databases. Urbanization rates based on figure in 1700 taken from de Vries, *European Urbanization*, 39. The probability of famine occurring is calculated through the percentage of localities in any of the years in the period 1692–4 that have an increase in burials of 50% or more over the "previous years" figure.

Northern Italy during the famine of 1590–3, where Alfani noted that the most vulnerable places were the rural communities that enjoyed less protection from the authorities, provoking mass migration into the cities by those in search of food.[45] However, it was not a model necessarily seen everywhere: in the Southern Netherlands, urban famine mortality even exceeded that of the countryside – although it was high in both.

However, such disparities between the Northern Netherlands and the other two more southerly regions should not be seen as a surprise if we take grain price information into account. While Figure 7 shows that rising grain prices reached extraordinary peaks in 1693/4 in various markets of Northern France, this contrasts with the image shown in Figure 5 where the price spikes of the early 1690s in the towns of the Northern Netherlands were nothing special compared with many other years of the seventeenth century. Yes there were price increases for grain, but about seven other years exhibited much sharper peaks, while in Northern France the early 1690s stand out clearly from the rest. On the surface then, the finding of higher mortality further south in the Low Countries and Northern France together with sharper rising grain spikes,

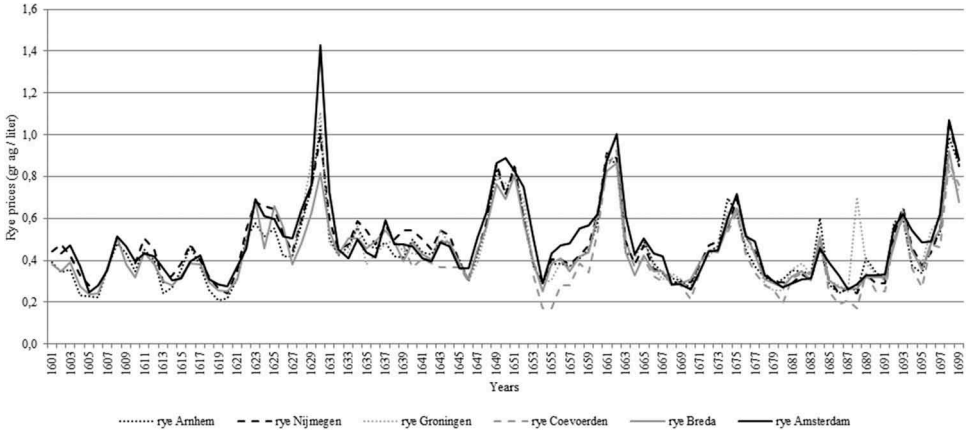

Figure 5. Prices of rye in six towns of the Northern Netherlands, seventeenth century (gr agr/liter).

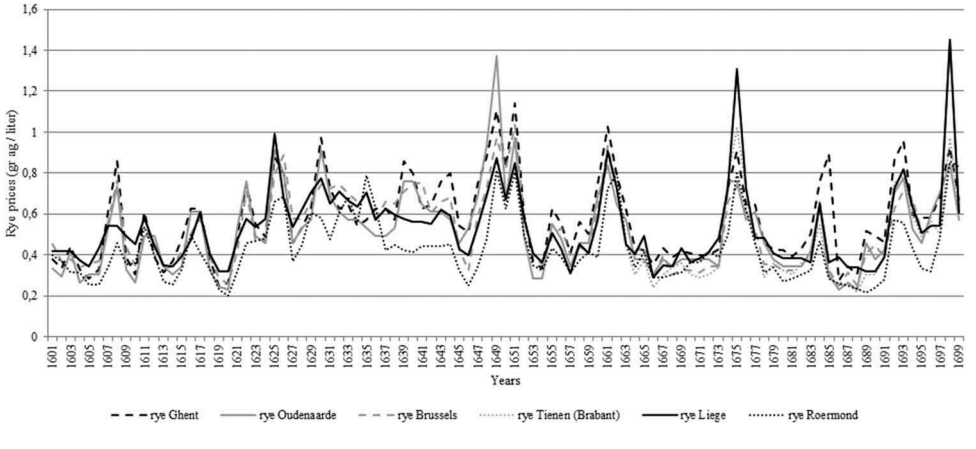

Figure 6. Prices of rye in six towns of the Southern Netherlands, seventeenth century (gr agr/liter).

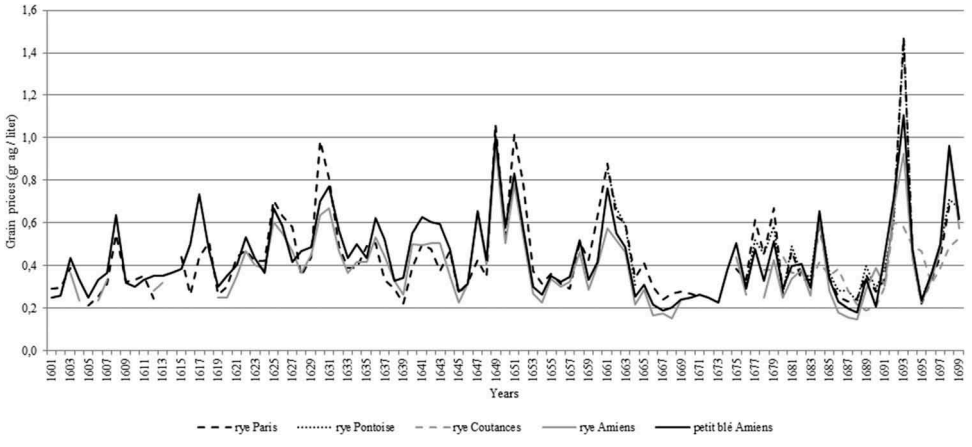

Figure 7. Grain prices in Northern France, seventeenth century (gr agr/liter).

and the finding of lower mortality in the Northern Netherlands with much reduced price spikes, tends to support the traditional story of an efficient marketing system likely supported by the central place of the international grain trade in Amsterdam – particularly given that the cities experienced the "escape" to a fuller degree. However, on closer inspection the logic to this is not altogether sound. A look at Figures 5–7 suggests that in the seventeenth century as a whole prices in the Northern Netherlands were not remarkably low (certainly not when compared to Northern France), and that price spikes were as familiar to the north as they were to the south.

An analysis of price levels and price volatility (measured through the coefficients of variation of rye prices in time) confirms this in Table 4, though pointing to some interesting differences. In the first half of the century there were no marked differences in price volatility between regions. In the second half price volatility increased almost everywhere – Flanders (Ghent and Oudenaarde) appears to have been the exception –

Table 4. Averages (gr ag/hl) and coefficients of variation of rye prices in in various towns.[a]

	Years 1600–49		Years 1650–99	
Towns	Average	C.V.	Average	C.V.
Northern Netherlands				
Amsterdam	48.36	0.084	49.71	0.100
Arnhem	43.70	0.090	46.04	0.096
Nijmegen	49.38	0.078	46.04	0.099
Breda	43.66	0.078	44.45	0.093
Southern Netherlands				
Ghent	57.62	0.091	57.39	0.086
Oudenaarde	54.26	0.099	49.00	0.093
Brussels	55.65	0.081	48.15	0.092
Liège	54.41	0.065	52.40	0.092
Roermond	43.58	0.086	42.47	0.098
Northern France				
Paris	42.80	0.097	44.73	0.117
Amiens (*petit blé*)	46.36	0.084	41.09	0.123

Sources: as cited in fn. 24.

[a]Only towns for which there is price data for the entire seventeenth century have been included. The coefficient of variation is the standard deviation expressed as share of the average. Calculations are based on the logs of prices in gr ag/hectoliter.

but the increase was greatest in Northern France. In the Northern and Southern Netherlands the increase of price volatility was much milder, but perhaps even more remarkable is that in comparison to the Southern Netherlands, the Northern Netherlands does not stand out favourably. If anything, in the second half of the seventeenth century price volatility was higher in the northern towns than in the Southern Netherlands. Nevertheless, famine-related mortality in the Northern Netherlands was very modest, as already shown in Figures 1 and 2 and already demonstrated by focusing on the harvest failures of 1692–4 in Tables 2 and 3. This very point can be demonstrated further by looking at another crisis point in the 1690s – at the end of the decade in 1698/9.

While Northern France exhibited the worst famine years in the first half of the 1690s, it is clear that in other parts of Europe the most severe problems came only in the second half of the 1690s. This was especially true, for example, of Scandinavia and Scotland, whose "ill years" were described as between 1696 and 1699.[46] Could it possibly be that the Northern Netherlands, rather than escaping the 1690s famine, simply had a different famine chronology, coming later in the decade? Certainly that would make sense given that problems were seen in the autumn of 1698, which even saw a ban on the export of grain from Amsterdam,[47] and rioting in Leiden, Gouda, Rotterdam and Delft.[48] Indeed, of particular relevance for the Northern Netherlands (given its reputation as centre of the international grain trade), grain production and distribution problems began to occur in the late 1690s in areas of the Baltic itself.[49] We can see from the data shown in Figure 8 that in contrast to markets in Northern France, the price spikes for the Northern Netherlands were much more pronounced at the decade's end than during the period 1692–4.

The substantial price spikes seen in the Northern Netherlands at the very end of the seventeenth century, however, once again did not translate into substantial mortality. The exact same process for Tables 2 and 3 and 1692–4 has been repeated below for

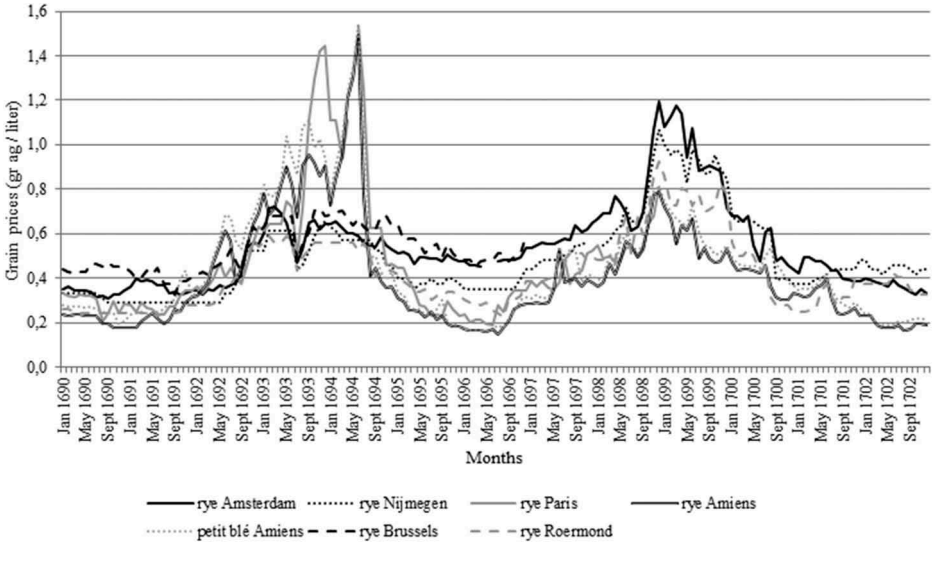

Figure 8. Monthly grain prices in select towns, 1690–1702 (gr ag/liter).

Tables 5 and 6 and 1698/9, with a total of 295 settlements across the Low Counties and Northern France. Given that any high burial figures from 1692–4 may raise the "previous years" rate and obscure any mortality effect seen in 1698/9, the burials for 1698/9 were calculated against a "previous rate" taken from the period 1686–90, when mortality crises tended not to occur and burials were not usually that high, notwithstanding the odd exceptional locality. Despite these measures, none of the 13 regions even registered anything close to the 50% burials increase threshold for a mortality crisis – both for weighted and mean averages – and only Haute Normandie appeared to have anything like a significant number of its localities affected by famine mortality (32%). No significant differences in these trends were seen between urban and rural settlements.

Thus what we have demonstrated in this section by recourse to the crises of the 1690s, viewed in a wider seventeenth-century perspective, is that regardless of price spikes in the Northern Netherlands (and grain markets were volatile here), famine-related mortality always stayed relatively low. In other words, the position of Amsterdam as an important marketing node in the international grain trade did not prove itself effective at smoothing out crises in the production or supply of subsistence foodstuffs, but still the Northern Netherlands displayed a comparatively better position vis-à-vis other parts of the Low Countries and Northern France in limiting excess deaths – particularly in its cities, though still a phenomenon seen in the countryside too, if to a lesser degree.

IV. Explaining the "escape from famine"

If, as we have shown, the success of the Northern Netherlands in its early "escape" from famine-related mortality was not entirely tied up in the fortunes of Amsterdam's central position in the international grain trade from the Baltic, then the obvious follow up question is: what determined this relative success? That price spikes in the Northern Netherlands did not lead to equivalent or even more serious levels of famine-related mortality than further south in the Low Countries during much of the seventeenth century is curious. Many of the agricultural regions of the Northern Netherlands, particularly coastal, should have been exceptionally vulnerable to sudden price shocks, given the proportion of people exposed to the vicissitudes of the market. The coastal regions in the west could not feed themselves, as subsidence of the peat soil had made bread grain cultivation impossible in all but a few places. By the late sixteenth century Holland had to import 75% of its grains.[50] This was compounded by the fact that peasant forms of agriculture already by the late sixteenth century were giving way to urban-financed large farms worked by landless agricultural labourers.[51] These people working solely for wages and without their own independent means of sustenance had to buy almost the entirety of their daily provisions such as bread from the market – problematic when prices were volatile and unpredictable. Furthermore, the potato had not spread fully in the Low Countries until much later in the eighteenth century: the dual wage and labour-intensive small-plot subsistence economy did not take off properly until then.[52] Similar predicaments could be found in the Holland towns, which during the first half of the seventeenth century became inundated with the mass arrival of poor labourers from afar – many of whom were highly sensitive to food price rises. Many of the Holland towns took on Huguenot refugees in the wake of the 1690s food shortages in Northern France – an influx

Table 5. Famine-related mortality (1698/9) across regions of the Low Countries and Northern France.

Regions	Overall rank	No. of settlements (of which urban)	Burials in worst famine year	Weighted average burial increase (%)	Rank	Mean average burial increase (%)	Rank	Probability of famine occurring (%)	Rank
Basse Normandie	1	28 (2)	943	34	2	33	1	32	1
Holland/Zeeland	2	41 (20)	9078	43	1	22	2	15	4=
Feudal East	3	27 (4)	453	13	3	17	3	15	4=
Paris Basin	4	26 (4)	716	4	4	12	4	15	4=
The East	5	6 (2)	234	−4	6	2	5	17	3
The South	6	11 (1)	424	−31	13	−3	7=	18	2
Inland Flanders	7	36 (16)	1660	−13	11	−2	6	8	7
Campine	8=	14 (0)	287	2	5	−3	7=	0	12=
Central River Area	8=	29 (7)	913	−13	9=	−3	7=	7	8=
Picardy	10	27 (1)	451	−7	7	−6	11	7	8=
Haute Normandie	11	17 (1)	208	−8	8	−4	10	6	10
Coastal Flanders	12	25 (6)	1371	−13	9=	−15	12	4	11
Frisia	13	9 (1)	99	−30	12	−28	13	0	12=

Sources: Authors' databases.

The probability of famine occurring is calculated through the percentage of localities in any of the years in the period 1692–4 that have an increase in burials of 50% or more over the "previous years" figure.

Table 6. Urban and rural famine-related mortality (1698/9) across the Low Countries and Northern France.

	Northern Netherlands	Southern Netherlands	Northern France
RURAL			
No. of settlements	61	80	90
Burials in worst famine year	1180	1455	1686
Mean average burial increase (%)	4	3	10
Probability of famine occurring (%)	8	14	17
URBAN			
No. of settlements	28	29	8
Burials in worst famine year	7844	2814	632
Mean average burial increase (%)	5	−8	18
Probability of famine occurring (%)	11	4	13
RURAL + URBAN (weighted by urbanization rate)			
Mean average burial increase (%)	4	0	11
Probability of famine occurring (%)	9	12	17

Sources: Authors' databases. Urbanization rates based on figure in 1700 taken from de Vries, *European Urbanization*, 39. The probability of famine occurring is calculated through the percentage of localities in any of the years in the period 1692–4 that have an increase in burials of 50% or more over the "previous years" figure.

that should have provoked greater mortality rises, not least through susceptibility to the spread of new infectious diseases.[53] In the following section then, we discuss some potential explanations as to why the Northern Netherlands defied these conditions. We point to the reduced severity of famine-related diseases spread by warfare, which can be attributed to a combination of two factors: the dependence of the Northern Netherlands on grain imports and the timing of major war episodes. In the cities this was supplemented by a particular interaction between high real wages and sufficient poor relief efforts – helping explain lower urban famine mortality compared to the countryside too.

4.1. *Warfare and disease*

While famine is frequently accompanied by warfare and the outbreak of epidemic disease, relations between these three factors are complex.[54] Wartime destruction of fields and farms or trade disturbances may jeopardize food provisioning, while troop movements and displacement of the population facilitates the spread of infections. Conversely, severe epidemics can lead to disruptions of the production and marketing of food stuffs. Food shortages can give rise to violent conflict – revolts, and even wars, over scarce resources. Malnutrition may also increase the susceptibility of the human body to diseases such as typhus, tuberculosis and dysentery (although notably not necessarily to plague). Hunger moreover induces people to leave their homes in search of food, taking them into crowded, unhygienic circumstances. For pre-industrial famines at least, the proportion of people dying from hunger per se was small when compared to deaths via nutritional, migratory, and hygiene-based diseases.[55]

For the Southern Netherlands, scholars have drawn links between warfare, subsistence crises, and mortality during the seventeenth century.[56] It is indeed clear that the 1692–4 famine occurred not only simultaneous to a period of extended disruptive weather conditions, but also after the resumption of intense periods of fighting during the Nine Years' War. The heavy amount of troop activity in the Southern Netherlands, where many key battles were fought, ties up very well with the fact that many of the regions here experienced extremely high mortality increases in the period 1692–4. So,

for example, the burial records of the Onze-Lieve-Vrouw Gasthuis (a hospital) in Mechelen unusually have a separate section for the death of soldiers, which represented 358 of 853 burials recorded in the years 1692–7 (42%) for the institution.[57] High mortalities were not simply the result of additional military casualties, however. Warfare, especially during famine, helped spread disease for civilian populations. It is unsurprising then that the worst-afflicted places in the famine of 1692–4 were those where disease was a major killer, linked to intensity of troop movements – indeed, civilians often provided lodgings for soldiers.[58] That four out of five institutions registered more than a 600% increase in burials over the "previous years" in the town of Sint Truiden (Bishopric of Liège) was down to the raging "*dissenteria*" and "fever-like" symptoms among the "miserable paupers" explicitly mentioned in the burial records simultaneous to military occupation.[59] The same was seen in the countryside too. In the small village of Muizen near Mechelen, the term "*contagio*" was included after the names of the dead during the 1692–4 famine period, while numerous diseases such as dysentery, fevers, and tuberculosis were listed in the Oirsbeek burial records (Duchy of Limburg) simultaneous to residents explicitly noted as dying through exhaustion.[60] In this area of Brabant and Limburg, "hot or burning fevers" were found frequently in these famine years: for example, one man from Cadier in 1694 ran in a "confused state" into water, was pulled out by his hair by a neighbour, but did not survive.[61] The only disease not mentioned explicitly in the burial records was typhus – perhaps the symptoms remaining indistinguishable for those making the diagnosis (often family or neighbours of the deceased), and simply falling under the broad umbrella of "fevers".

In contrast, when looking through the Northern Netherlands burial records of the 1690s, explicit record of diseases is much less forthcoming. This is perhaps no surprise in view of the fact that in this decade the Northern Netherlands escaped the worst of direct troop activity. However, the issue is less clear cut going back in time. Troop movements were a feature from the final third of the sixteenth century through to the mid-seventeenth century in the context of the Dutch Wars of Independence, followed up by the battles of the Anglo-Dutch Wars, with terrible consequences for ordinary civilians – especially in the countryside.[62] Recent research has moreover shown that warfare did stimulate massive amounts of seventeenth-century mortality in the Northern Netherlands through the spread of epidemic disease. Major upsurges in military action in the Northern Netherlands facilitated the spread of some of the worst plague outbreaks seen in the Low Countries – some of the most famous sieges such as that of Breda in 1624/5 or the Bishop of Munster campaigns of 1666–9 in Groningen occurring simultaneous to terrible plague outbreaks.[63] These plagues, especially in 1624/5 and 1635/6, were far deadlier than any famine-related mortality seen elsewhere in the Southern Netherlands – even compared to the worst famines recorded for Northern France. This, however, was not usually accompanied by excessively raised grain prices.

In part, the reason for the absence of a clear link between war and famine is probably related to the dependence of the Northern Netherlands on grain imports rather than internal production – here then, the international grain trade did have a role, although in a different way from what has previously been assumed. Because much of the grain was imported anyway, havoc wrought in the countryside by troop incursions did not have the same impact on the availability of bread grains as in regions reliant on home-

grown grains. Admittedly, grain prices in the Northern Netherlands were pushed up when war in the Baltic region resulted in a disturbance of grain imports.[64] However, as long as these occasions did not happen to coincide with military activity in the Northern Netherlands itself, no vicious circle of war, famine and disease materialized. In other words: the international grain market did not shield the north from price peaks, but importantly these peaks were not dictated by direct troop incursions – the main cause of mortality. This links to a second part of the explanation – timing. Many major episodes of strong military conflict fortuitously did not occur simultaneous to sustained bad weather in the Northern Netherlands in the seventeenth century,[65] unlike further south. Rye price spikes seen in the Northern Netherlands in, for example 1630/1, were met with only localized raids, price spikes in 1652 occurred simultaneous to the First Anglo-Dutch War (1652–4), fought entirely at sea, and the price spikes of 1698/9 occurred a considerable time after the worst excesses of the Nine Years War (1688–97) had finished. Only when the two collided, such as the escalation of the Franco-Dutch War in the mid-1670s together with the hot weather of 1675 and the wet summer of 1676, did this create conditions for extreme mortality: in this case a terrible dysentery outbreak decimating towns, but especially villages, in Guelders, Limburg and Brabant.[66] As one can see then, the complex and close link between disease, warfare, and famine and food access was to a certain extent broken in the Northern Netherlands.

4.2. *Wages and poor relief*

As mentioned in the introduction, the traditional explanation for the absence of famines in the Northern Netherlands includes a second element, although it has received less attention than the overall grain trade narrative: the favorable wage levels in the Northern Netherlands mitigated the effects of raised prices. Real wages for unskilled labour in the seventeenth-century Northern Netherlands were indeed relatively high. Figure 9 shows the development of the welfare ratio for unskilled labour in Amsterdam, Antwerp, and

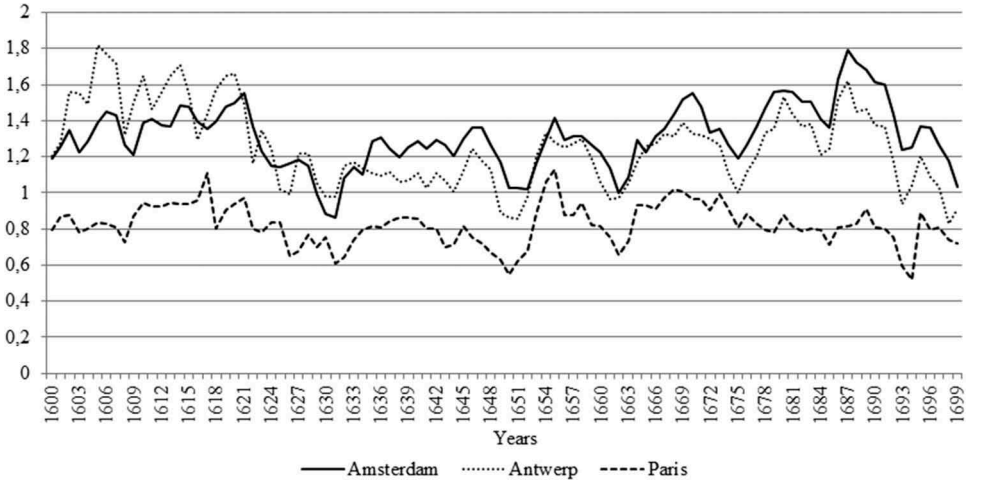

Figure 9. Welfare ratios of unskilled labourers in Amsterdam, Antwerp and Paris in the seventeenth century.

Paris: the number of "subsistence baskets" representing the commodities minimally required to keep a family of four alive that wages of an unskilled labourer could buy. With only a few exceptions – all of them in years of extreme price spikes – unskilled labourers in Amsterdam enjoyed standards of living significantly above subsistence level. Wage levels were certainly much higher than in Paris; after the first three decades of the century they were usually above Antwerp levels too.

However, not everybody received wages at the level of a fully employed male labourer. Firstly, even at the best of times some groups were unable to support themselves through labour: the sick, the disabled, and the elderly. Secondly, those that could work may not always have received full wages – here widows and single women were clearly at a disadvantage – or they may not have been able to find employment.[67] As long as the economy flourished this was not a great problem, but in the last quarter of the seventeenth century economic conditions in the Northern Netherlands deteriorated. Wage levels remained high, but employment opportunities contracted as important sectors such as the textile industry and herring fisheries declined and demand for casual labour fell.[68] As a consequence, the proportion of people vulnerable to price spikes increased.

More important than wage levels in themselves were the mechanisms for redistribution of income: the poor relief system. We restrict our discussion to a comparison between the Northern Netherlands and Northern France because the two regions display clear differences in how poor relief was organized. The systems in the Northern and Southern Netherlands were similar, thus unlikely to explain the differences in scale of famine-induced mortality between the two regions (which are more likely to be connected to the above-mentioned factor of warfare and disease). In early modern Northern France, on the other hand, the situation was radically different. A lack of poor relief has typically been cited as one of the reasons for the dramatic general impact of famines in France.[69] Poor relief in the Northern Netherlands, in contrast, has often been exalted for its "liberality".[70] In fact, Bas van Bavel and Auke Rijpma have recently suggested that welfare expenditure was higher in the Northern Netherlands than anywhere else in Europe.[71] Here we consider the contribution of poor relief to the alleviation of food crises in further detail, largely focusing upon two forms of relief best suited to combat the consequences of dearth: regular formal outdoor relief (support in food or cash provided to people living in their own homes on a regular basis by designated institutions), and emergency aid provided by local, regional, or national authorities during food crises.

In the Northern Netherlands, regular poor relief was provided, both in towns and in the countryside, by local, religious or semi-public institutions who, although subjected to supervision by local authorities in varying degrees, enjoyed considerable autonomy and had their own sources of income: mainly gifts and landed property.[72] The share of households that received poor relief was substantial. For Amsterdam it has been estimated at 8–12%, for modest-sized Delft at 10–15%, and for Zwolle, smaller still and in the east of the country, at 6%.[73] In the countryside shares varied widely: for some villages in Holland figures of 3–14% have been noted.[74] During price spikes, poor relief institutions were confronted with raised demand, which they could only partially meet because of the inelasticity of their financial means. In the towns, additional relief was provided by the urban authorities. Amsterdam, for instance, purchased grain in most years of high prices in the seventeenth century; Alkmaar too, and scattered evidence

from other towns suggests that they were familiar with this practice as well.[75] No taxes were levied for this purpose, but if needed, towns took out loans, as did Leiden in 1698.[76] The grain was usually resold at reduced prices to local poor relief institutions, which then used it for the distribution of bread to regular dependents. In some cases towns also set up a system of subsidized bread distribution for a larger group of households: people that could fend for themselves in normal years, but were unable to cope during severe dearth. In 1698/9 this happened in Amsterdam and, although at a rather late stage and on a smaller scale, also in Rotterdam.[77] Not much is known about crisis relief in the countryside, but existing research on rural poor relief suggests that village authorities did not take similar measures.[78]

Whereas in the Northern Netherlands emergency aid was an addition to the normal relief system, in Northern France it was the main sort of relief available – to those that happened to be in the right place. In all of France the seventeenth century witnessed gradual concentration of poor relief in large cities and towns, with enforced internment of paupers in *hôpitaux généraux*.[79] By the late eighteenth century the majority of French villages (more than 60% in the diocese of Rouen) had no funds for poor relief whatsoever. In the seventeenth century the situation was not as bad: many hospitals in small towns and large villages providing outdoor relief were still in operation. However, pressure to shut them down and redirect assets to large *hôpitaux généraux* increased in the final third of the century, leading to a reduction in their numbers.[80] In periods of severe dearth the capacity of the *hôpitaux* did not suffice, necessitating instead emergency aid through outdoor relief. In every parish, the poor that needed assistance were registered and a local poor tax was imposed, payable by the more affluent members of each community, to cover the costs of grain purchases and bread distribution among the registered.[81] Substantial donations from the Crown to particularly hard-hit towns and regions provided additional financial support. During the famine of 1692–4, however, the costs of the Nine Years' War weighed heavily on the state budget, thus eroding this system of royal *charités*.[82] Only in Paris was the Crown willing to cover the expenses of emergency aid to prevent rioting and unrest, spending the very considerable sum of 120,000 livres per month.[83]

Elsewhere in Northern France, relief depended on the revenues of the local poor tax. Even in a large town like Rouen it was not easy to collect this tax: the wealthy and influential were shielded by privileges and earlier tax increases to finance the war had depleted the financial reserves of many households.[84] In the countryside the situation was decidedly worse. Although the obligation to maintain the poor was also imposed on rural communities, in practice the availability of emergency relief in rural Northern France seems to have depended on the benevolence of individual lords.[85] Even when money could be found, locating grain supplies posed additional problems. Provisioning of the northern armies drove up the prices of the scarce remaining domestic supplies, while efforts to buy grain in the Baltic were complicated by the absence of a pre-existing network of trade relations and by English naval dominance.[86]

Did these differences in systems and coverage translate into differential benefits to the poor – potentially vital during hardships such as dearth? For the famine years of the 1690s some comparative calculations can be made, although only for those towns and cities for which more or less reliable information exists.

Table 7. Emergency aid and regular poor relief per inhabitant per month in the 1690s in selected towns in the Northern Netherlands and Northern France.

	In grams of silver	In kg bread	In daily wages unskilled labor
Emergency aid			
Paris, 1693/4	1.75	0.71	0.28
Rouen, 1693/4	1.44	0.59	0.23
Amsterdam, 1698/9	0.49	0.31	0.06
Leiden, 1698/9	0.55	0.35	0.07
Regular poor relief			
Amsterdam, 1698/9	1.46	0.92	0.17
Delft, 1698/9	2.48	1.56	0.29

Sources: Emergency aid: Paris: Cole, *French Mercantilism*, 204. Rouen: Lemarchand, "Crises économiques", 171–5. Amsterdam: SAA, Archief van Burgemeesters: stadsrekeningen, no. 5014-128. Leiden: ELO, Stadsarchief van Leiden 1574–1816, no. 0501a-2543. Regular poor relief: Amsterdam: Wagenaar, *Amsterdam*, 511 (estimate based on 90% of the expenditure of the Dutch Reformed diaconate, plus 50% to account for other poor relief organizations). Delft: GD, Archief Kamer van Charitate, nos 447-288 (calculations based on 90% of average expenditure of the Chamber of Charity; we thank Danielle Teeuwen for allowing us to use her database). Daily wages and bread prices: Allen, databases "Amsterdam" and "Paris".

Table 7 above suggests that differences in quantitative terms were small: while in Northern France regular outdoor poor relief may have been very limited, during the famine of 1692–4 the substantial sums spent on emergency aid largely compensated for this. This, however, is only part of the story. Firstly, Paris and Rouen were not representative of the region as a whole: in smaller towns and especially in the countryside, relief was highly irregular. In the Northern Netherlands, on the other hand, regular poor relief was available in the countryside as well, even though village authorities probably did not provide additional emergency aid by making grain purchases. Secondly, although the financial means of Dutch poor relief organizations were relatively inelastic, they were not directly affected by political developments and arbitrary decisions at the state level. In other words: aid during food crises in the Northern Netherlands was relatively robust because it relied on a pre-existing system that had independent financial means and covered both towns and countryside.

V. Conclusion

Although a long historiography had already suggested that the Northern Netherlands made an early escape from the hardships of famine, some parts of the story were still obscured from view. This view had been established only on the basis of prices in a few restricted localities, was not clear on chronology, had not been placed in a broader Northwest European perspective, and had relied almost entirely on the explanation that Holland, or rather Amsterdam, was the centre point of the international grain trade.

Using our newly-compiled series of burials information for the Low Countries and Northern France, over a long time period, and integrating these series with price data for poor quality grains (rye), we achieve a number of things. First we confirm empirically the notion of an early escape from famine in the Northern Netherlands, which compared favourably to a less complete escape in the Southern Netherlands, and especially to Northern France, where similar kinds of price spikes produced consistent and more pronounced mortality effects. We also show, however, that this escape was more complete in the cities than in the countryside of the Northern Netherlands.

Second, we also sharpen the chronology of this process, showing that not only was the seventeenth century clear of significant famine-related mortality in the Northern Netherlands, but the last widespread and general association between price spikes and significant mortality spikes (as opposed to localized and moderate mortality effects) came in the famine of the mid-1550s. Third, our careful comparison of prices and mortality trends over the long term allows us to refine the traditional explanation for this process. The international grain trade was not enough on its own to account for the reduced mortality impact in the Northern Netherlands: in fact, markets in the north did not prove themselves any more effective at smoothing out crises in the production or supply of subsistence foodstuffs than in the Southern Netherlands or Northern France. Fourthly, we have offered some alternative explanations in the form of the differential role of warfare and associated spread of famine-related disease, and the role of wages and poor relief institutions and aid. These of course remain tentative, but their validity may become clearer with future micro-level testing on carefully selected case studies.

Notes

1. The following abbreviations for archives are used in this article: Archives de la Somme, Amiens (ASA); Regionaal Archief Zutphen (RAZ); Stadsarchief 's-Hertogenbosch (SH); Zeeuws Archief, Middelburg (ZA); Groninger Archieven (GA); Regionaal Historisch Centrum Limburg, Maastricht (RHCL); Gemeentearchief Delft (GD); Erfgoed Leiden en Omstreken (ELO); Stadsarchief Amsterdam (SAA); Archives Départmentales du Nord, Lille (ADN).
2. For 1556/7: Friis, "An Inquiry"; for 1565/6: Kuttner, *Het hongerjaar 1566*; Van Dixhoorn, "The Grain Issue"; for 1586/7 and 1595/6: Noordegraaf, "Dearth," 74-7. Throughout the article the notation "x/ y" is used to indicate harvest years.
3. Noordegraaf and Van Zanden, "Early Modern Economic Growth"; Noordegraaf, "Levensstandaard"; *Hollands welvaren?*.
4. De Vries, *The Dutch Rural Economy*, 181-3; Dekker, *Holland in beroering*.
5. Faber, *Dure tijden*.
6. Noordam, *Leven in Maasland*; 't Hart, *De stad Utrecht*; Mentink and Van der Woude, *De demografische ontwikkeling te Rotterdam*. One thing for certain is that the Northern Netherlands was hard hit by the famine connected to the potato failures of 1845-50; Paping and Tassenaar, "The Consequences of the Potato Disease".
7. For the areas and chronology consult the essays in Alfani and Ó Gráda, eds. *Famine in European History*. For the essay on the Low Countries see Curtis et al., "Low Countries".
8. Faber, *Dure tijden*, 6; Noordegraaf, "Dearth," 76, 80; De Vries and Van der Woude, *The First Modern Economy*, 199-200.
9. Van Tielhof, *De Hollandse graanhandel*.
10. Noordegraaf, "Dearth," 78; Alfani et al. "Italy", 46; Alfani, *Calamities*, 71-2; Aymard, *Venise*, 155-65.
11. Van Tielhof, *The 'Mother of All Trades'*, 50-8.
12. Faber, "The Decline of the Baltic Grain Trade," 118.
13. The burials database has at its foundation the recently compiled series used for Curtis, "Was Plague an Exclusively Urban Phenomenon?". The database has been supplemented with additional data for localities not included in the previous version.
14. As a general phenomenon see the reference to the 1690s in the essays in Alfani and Ó Gráda, eds. *Famine in European History*.
15. The exact localities included can be found in Authors' databases. All figures and tables in this article use the same database, unless specifically indicated otherwise.

16. On the potential and limitations of the burial records in the Low Countries: Curtis, "Was Plague an Exclusively Urban Phenomenon?"
17. Around 35% of the burial records in the database appear to systematically record children.
18. For the original work: Del Panta and Livi-Bacci, "Chronologie." For the recent re-adaptation: Alfani, "Plague"; Curtis, "Was Plague an Exclusively Urban Phenomenon?"; Alfani and Ó Gráda, eds. *Famine in European History.*
19. Alfani, "Plague," 418.
20. Ibid., 418.
21. The signs and evidence to identify the causes of the various seventeenth-century mortality crises have already been elucidated upon in Curtis, "Was Plague an Exclusively Urban Phenomenon?".
22. These have already been identified as famine years in a long line of literature cited in Chevet and Ó Gráda, "Famine". For recent confirmation of the chronology also see Chevet and Béaur, "France."
23. ASA, Archives Communales antérieures à 1790, Subsistances, HH14 – HH22; Amsterdam: Posthumus, *Nederlandse prijsgeschiedenis*, I, 573-6; Groningen: Tijms, *Groninger graanprijzen*, table 5; Coevorden: Tijms, *Prijzen*, II, 28-32; Arnhem: Ibid., I, 136-44; Nijmegen: Ibid., I, 311-24; Breda: Ibid., I, 164-9; Ghent: Verlinden and Scholliers, eds. *Dokumenten*, II, 62-6; Oudenaarde: Ibid., I, 84-7; Brussels: Ibid., I, 496-500; Tienen: Ibid., I, 525-31; Liège: Pieyns and Tijms, "De graanprijzen," table 7; Roermond: Ruwet, "Prix des céréales," 49-90; Paris: Hoffman, "Global Prices"; Pontoise: Dupâquier et al., *Mercuriales*, 31-99; Coutances: Hauser, *Recherches*, 173-5.
24. The most convincing and nuanced work being Campbell, "Nature as Historical Protagonist."; *The Great Transition.*
25. Friis, "An Inquiry."
26. Faber, *Dure tijden*; Noordegraaf, "Dearth."
27. Exceptional cases of burial records for the pre-1550 period are from Haarlem (St. Bavo), Mechelen (St. Rombouts), Alkmaar (St. Laurentius) and Louvain (St. Michiel).
28. Buisman, *Duizend jaar weer*, III, 550-1.
29. Kuttner, *Het hongerjaar 1566*; Van Dixhoorn, "The Grain Issue."
30. For example; Offermans, *Arbeid*, 122; Boogman, "De overgang van Gouda."
31. Numerous pieces of evidence can be found to demonstrate plague from the archives. The church masters of Zutphen distributed three different sums of money to plague sufferers in 1576: RAZ, Archief van de Kerkmeesters van de Hervormde Gemeente te Zutphen, Rekening van kerkmeester Derrick van Thyll (buiten), 1576, no. 292. A certain Wabbe Goldtsmydt was found complaining to the Groningen magistrate in 1575 that his master's house was too dangerous as it had been infected: Huisman, *Stadsbelang*, 27. *Gasthuis* workers at Culemborg remarked upon plague mortality at the village of Buren in 1574: Van Malenstein, "Het Petersgasthuis," 73.
32. This contrasts with earlier plagues in the fifteenth century, for example, where a much closer association between famine and plague outbreaks was suggested: Blockmans, "The Social and Economic Effects of Plague".
33. In Sint Truiden (St. Gangulfus), a more than 15-fold increase in burials in 1578 over the "previous years" was recorded, as well as 83 burials between 1577 and 1580 explicitly recording "*peste*"; http://www.pallas.be/sast/prr.htm.
34. The reduced mortality in 1565/6 is, as with the Northern Netherlands, quite surprising given that these harvest failures have been suggested to have been rather serious in the Southern Netherlands: Segers, "Armenzorg"; Van der Wee, "The Economy."
35. Eddy, "The Maunder Minimum."
36. http://landvankessel.nl/Geneaolgie/Sevenum/uitwerking_van_registerdood.htm; ADN, 5 Mi 026 R 046, Saint-Pierre-Brouck BMS 1595-1736.
37. Emphasized in Chevet and Ó Gráda, "Famine."
38. The urban settlements, as in Table 1, have been given urban status by having 2000 or more inhabitants, as suggested as the minimum criteria for "small town status" in early

modern Northwest Europe suggested in Clark, *European Cities*. Some urban settlements were calculated as a "whole" and some were calculated by being broken down into different institutions charged with burying the dead – depending on the format of the sources we consulted. For the rural settlements generally there was only one institution, although some places did have simultaneous Roman Catholic and Dutch Reformed burial sites for a period – assessed separately.

39. The weighted average is calculated according to relative differences in the populations of the localities included in the database. Given that we do not have accurate population figures for many of these localities, a proxy for population size is used. Each locality has their burials increase/decrease figure weighted against their average annual number of burials for the whole period 1551-1699.
40. Alfani, "Plague."; Alfani & Ó Gráda, eds., *Famine in European History*.
41. ZA, DTBL Zaamslag 1A, Nederduits Gereformeerde Overlijdens- en Begraafregister, 1654-1741.
42. GA, Kerkeboek 1621-1743, Kerkelijke gemeente Weiwerd, Collectie DTB, 124, no. 512.
43. Record of '*verhongering*' found at SH, Criminele sententies en vonnissen, no. 2265. Same methodology applied as already described for burial records.
44. SH, Criminele sententies en vonnissen, nos 1437, 1778, 1963.
45. Alfani, "The famine of the 1590s," 31-2.
46. Cullen, *Famine*.
47. Van Dillen, "Dreigende hongersnood," 195.
48. Dekker, *Holland in beroering*, 23-25.
49. Kirby, *Northern Europe*, 257; Jutikkala, "The Great Finnish Famine," 61-2; Lappalainen, "Death."
50. Van Tielhof, "Grain Provision."
51. Van Bavel, "Rural Development."
52. See this phenomenon described in Curtis, *Coping with Crisis*, ch. 5-6.
53. Van der Linden, *Experiencing Exile*, 31.
54. Alfani, *Calamities*, 43-46; Alfani and Ó Gráda, "Famines in Europe: An Overview", 18-9, 20; Pérez Moreda, "Una nueva interpretación."
55. Mokyr and Ó Gráda, "What Do People Die of During Famines?"
56. Gutmann, *War*, esp. ch. 2-3; the "Southern Low Countries" section of Curtis et al., "Low Countries."
57. The manuscripts can be consulted online at http://www.mechelsegenealogischebronnen.be/Databank.
58. Kersemans, "De sociaal-demografische toestand," 160.
59. The manuscripts can be consulted online at http://www.pallas.be/sast/prr.htm.
60. The manuscripts for Muizen can be consulted online at http://www.mechelsegenealogischebronnen.be/Databank. For Oirsbeek; RHCL, Oirsbeek, Lambertus: Overlijdensregister 1687-1796.
61. RHCL, Lottum, Gertrudis en Quirinus: DHO register 1651-1773, fo. 121; for the pool of water case; RHCL, Cadier en Keer, Kruisverheffing: DHO register 1661-1735, fo. 104.
62. 't Hart, *The Dutch Wars of Independence*; Adriaenssen, *Staatsvormend geweld*.
63. Curtis, "Was Plague an Exclusively Urban Phenomenon?"
64. Noordegraaf, *Hollands welvaren?*, 42-43; Van Tielhof, *Mother of all trades*, 53-54.
65. Gutmann, "Putting Crises into Perspective," 112-13.
66. Bruneel, *La mortalité*, I, 213-317. See also Kappelhof, "Pest," 85.
67. On gendered differences in wage-earning potential in the Dutch Republic: Van Nederveen Meerkerk, "Market wage".
68. De Vries and Van der Woude, *The First Modern Economy*, 635-641, 645-7.
69. Chevet and Ó Gráda, "Famine," 727.
70. See the literature mentioned in Curtis et al., "Low Countries."
71. Van Bavel and Rijpma, "How Important were Formalized Charity."
72. Prak, "Armenzorg"; Heerma van Voss and Van Leeuwen, "Charity."

73. Van Leeuwen et al., *Armoede*, table 7; Van der Vlis, *Leven in armoede*, 64; Van Wijngaarden, *Zorg voor de kost*, 86.
74. Dijkman, "Het dagelijks brood," 106.
75. Van Dillen, *Duurtemaatregelen*, 8-10, 14-15; Van Dillen, "Dreigende hongersnood," 194, 204; Noordegraaf, "Levensstandaard," 75-6. Other examples are Amersfoort and Delft: Rommes, "De zeventiende en achttiende eeuw," 266; van der Vlis, *Leven in armoede*, 62.
76. ELO, Stadsarchief van Leiden 1574-1816, no. 0501a-2543.
77. Van Dillen, "Dreigende hongersnood," 215-16; Hazewinkel, "Misgewas," 172-3.
78. Dijkman, "Bread for the Poor"; Gras, *Op de grens*.
79. Hufton, *The Poor*, 139-59.
80. Hickey, *Local Hospitals*, 5-6, 50-4, 182. Even in the well-known Pontchartrain case, subsidies were made to hospitals and schools on the Count's estates as a direct result of the low level of local community funds: Berger, "Rural Charity."
81. Lemarchand, "Crises économiques," 175; Lachiver, *Les années misérables*, 127.
82. Berger, "Pontchartrain," 41-3.
83. Cole, *French Mercantilism*, 204.
84. Lemarchand, "Crises économiques," 171-5.
85. As suggested by the records of a convent in the Oise region cited by Lachiver, *Les années misérables*, 486.
86. Berger, "Pontchartrain," 52-4, 69-70.

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