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Social inequalities in famine mortality in the manorial system of the tsarist Russian province of Livland in the mid-1840s

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Abstract

By relying on longitudinal data on two rural parishes in the Russian Baltic province of Livland, the article analyses two questions concerning famine's short-run effects on mortality in a manorial system: (1) whether there is evidence of a social gradient in mortality during the famine of 1844–6 and (2) whether the manors could protect the peasants against the hardships. The analysis reveals that neither the status of a farmer peasant nor the landlord saved the local inhabitants from an increased risk of dying during the famine of 1844–6. The conventional assumptions about the protective effect of the higher socio-economic status or type of manor against subsistence crisis found very little support in the study.

KEYWORDS
famine, manorial economy, mortality, socio-economic status

Severe food shortages were a recurrent phenomenon in pre-industrial Europe, but conditions rarely deteriorated to famine levels. Literature on pre-industrial Europe suggests that the link between famines and production shortfalls (harvest losses) and population pressure weakened from the eighteenth century onwards, and the role of human agency in 'making' the famines, that is, failing to prevent devastating food shortages and mitigate their immediate effects on demographic outcomes, increased considerably thereafter.[1] In situations of extreme hardship, nutrition of individuals was affected by individual and household coping strategies as well as reactions from public actors.[2]

[1] Alfani and Ó Gráda, 'Famine and disease', p. 134.

[2] Vanhaute, 'Famines', pp. 231–2.

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Famine as an extreme deprivation of food produces significant excess mortality due to either starvation or hunger-induced diseases.[3] In crisis times, malnutrition and infectious disease were inevitably intertwined, and in most cases it is very difficult, if not altogether impossible, to distinguish between these two factors of mortality.[4] Mortality in the past was sensitive to severe food shortfalls and in some settings also to smaller yearly fluctuations in food prices or harvest outcomes.[5] Mortality upswings, nevertheless, mostly resulted from non-nutritional factors.[6]

Being the first of its kind based on Eastern and Central Europe, this article contributes to two ongoing debates concerning famine's short-run effects on mortality. First, socio-economic inequalities and poverty clearly heighten the risk of famine,[7] but there is little research based on individual-level data exploring social differentials in famine mortality.[8] While the first part of the article explores whether the effects of famine were moderated by socio-economic status, the second part examines the protective effect of an institutional framework – whether the manorial system or a certain type of it provided a safety net. It is commonly suggested that levels of mortality indicate the ability of a society's institutions to offer protection to inhabitants' lives in the face of pre-existing vulnerabilities.[9] An examination of the possible protection of manors for its peasants against economic hardship and hunger-induced mortality shocks constitutes part of a greater debate over landlord–peasant relationships in the areas dominated by the East Elbian manorial system,[10] as well as contributes to the strands in famine research that emphasize the role of local institutions and elites in famines.[11] Until the mid-nineteenth century, large noble estates and manorial economy dominated the economic landscape of the Russian Baltic provinces of Estland, Livland, and Kurland.

Individual-level data on vital events, socio-economic status, and migration extending back to times when famines were present exist only for a limited number of rural areas in pre-industrial Europe. By relying on well-preserved and high-quality longitudinal data on two Estonian parishes, Helme and Paistu (figure 1), we address two research questions: (1) whether there is evidence of a social gradient in mortality during the famine of 1844–6 and (2) whether the manors could protect the peasants against the hardships. Empirical analysis of specific famines has proved to be a fruitful way of exploring the inner workings of historical economies.[12]

Our analysis reveals that neither the social status of a farmer peasant nor the landlord safeguarded the local inhabitants from an increased risk of dying during the famine of 1844–6. In circumstances where hunger promoted the outbreak of devastating epidemics (dysentery and typhus), landed peasants were not better equipped to shield themselves against infection than the

[3] Alfani and Ó Gráda, 'Famines in Europe', p. 6; Dyson and Ó Gráda, 'Introduction', p. 1; Vanhaute, Paping, and Ó Gráda, 'The European subsistence crisis', pp. 25–8; Howe and Devereux, 'Famine intensity'.

[4] Post, 'Famine, mortality', p. 26; Ó Gráda, *Famine*, pp. 109, 116; Alfani and Ó Gráda, 'Famines in Europe', p. 6; Dyson and Ó Gráda, 'Introduction', pp. 1, 10, 14; Nefedov and Ellman, 'Excess mortality', pp. 174–5; Voutilainen, *Poverty*, p. 22.

[5] Bengtsson et al., *Life under pressure,* pp. 38, 43–4.

[6] Wrigley and Schofield, *The population history*, p. 354.

[7] Voutilainen, 'Income inequality', p. 6.

[8] Such studies mostly analyse mortality response to short-term price fluctuations over longer periods.

[9] Van Bavel et al., *Disasters*, p. 124.

[10] Hagen, *Ordinary Prussians*; Peters, ed., *Gutsherrschaft*.

[11] Vanhaute, 'From famine', pp. 47–65; Vanhaute and Lambrecht, 'Famine', pp. 156–7, 181; Curran, Luciuk, and Newby, 'Famines', p. 9.

[12] Alfani and Ó Gráda, 'Famine and disease', p. 135.

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FIGURE 1 Map of Estonia. The two parishes included in the study are highlighted in grey, Paistu (1), in which Holstre is located, and Helme (2). Mapped by Ago Tominga.

landless. The protective effect of a 'good' or 'paternalist' lord, however, was detected at early ages. Peaks in infant (0–1 years) and childhood (1–4 years) mortality were reduced on the state estate, compared with privately owned manors. Infants living on the manors owned by 'good' lords similarly experienced a lower death risk. There were no substantial differences in mortality risks for older children and adults between the different manor types. Thus, the conventional assumptions about the protective effect of the higher socio-economic status or type of manor against subsistence crisis found very little support in our study.

The rest of this article is structured as follows. Section I summarizes the relevant discussions and empirical findings of earlier studies. Section II characterizes the famine of the mid-1840s in Livland. The empirical hypotheses concerning the differences in mortality risks in the short run are outlined in section III. Section IV introduces our data and methods. In section V, we present results of relative risk models to study short-term mortality differences by socio-economic status and manor type during the famine of 1844–6. The article concludes with a discussion in section VI.

I | STATE OF THE ART

Literature suggests that, during famines, mortality has an inverse relationship with socio-economic status and income.[13] Vulnerability to famine is affected by underlying chronic

[13] Carter and Kelly, 'Social inequalities'; Ó Gráda, *Famine*, p. 90; Dyson and Ó Gráda, 'Introduction', p. 11; Häkkinen and Forsberg, 'Finland's famine years', pp. 106, 108; Voutilainen, *Poverty*, p. 185; Pitkänen, 'The patterns of mortality'.

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undernutrition, susceptibility (e.g. dependency on a single livelihood), and limited assets at the disposal of individuals and households.[14] Unequal access to assets (in a pre-industrial rural society, most importantly to land), credit and social networks and support, made lower social groups more vulnerable to harvest failures and resulting price shocks.[15] In the countryside, landless labourers were more vulnerable than farmers, and substantial farmers were more likely to survive than smallholders.[16] However, if infectious disease wreaked havoc, even the better-off groups did not escape increased mortality.[17] Socio-economic mortality differences could also vary, either widen or diminish, over the course of the famine, depending on the amount of social disruptions and government policy measures. Some twentieth-century famines were socially highly selective. In Vietnam (1944–5) the landless and those dependent on wage labour, lacking entitlement to rice rations and losing most of their income in the midst of soaring food prices, were by far more likely to die of famine than other social groups.[18] Furthermore, even a small parcel of land afforded a valuable safety net for its owners and dramatically reduced household death rates. In one of the very few papers dealing with famine mortality and social class in a pre-industrial society, Pitkänen confirms that, during the Finnish famine of 1866–8, the risk of death increased less for farmer peasants than for crofters and labourers.[19]

Recent literature suggests that pre-industrial societies did not exhibit social class differences in mortality in normal years, except in some cases in early childhood.[20] However, several studies exploring the influence of economic fluctuations on individual mortality risks have been able to identify sizeable differentials in the mortality response to changes in food prices before the onset of modern economic growth.[21] Socio-economic differences in mortality varied by age. For example, social gradients in mortality response to changes in grain prices, which were often negligible or missing for infants, became increasingly more apparent in early childhood.[22] Studies on mortality differences by socio-economic status among working-age adults have produced inconsistent results.[23] In very few historical settings, the parish death records have been digitized to allow for a more detailed analysis of famine mortality on an individual level, which makes the current study an important contribution to this field.

In a manorial system, the question of mortality response to economic hardships was intrinsically related to the issue of the protective role of manorial lords. In international research, there is a widespread view that manors insured their farmer peasants against uncertainties.[24] It is believed that the relation between tenant and landlord was contractual, in which the tenant worked for the landlord in exchange for various forms of protection. The large size of estates

[14] Howe, 'Famine systems', p. 146.

[15] Carter and Kelly, 'Social inequalities'.

[16] Ó Gráda, *Famine*, pp. 90–1.

[17] Bengtsson et al., *Life under pressure,* pp. 63–4.

[18] Huff, 'The Great Vietnam famine', pp. 287, 298–300.

[19] Pitkänen, 'The patterns of mortality'; see also Häkkinen and Forsberg, 'Finland's famine years', p. 108.

[20] Bengtsson, Dribe, and Helgertz, 'When did the health gradient'; Jaadla et al., 'Infant'.

[21] Bengtsson, Dribe, and Helgertz, 'When did the health gradient', p. 956; Bengtsson et al., *Life under pressure*; Willführ and Störmer, 'Social strata'; Jennings, Quaranta, and Bengtsson, 'Inequality'.

[22] Van Poppel, Jonker, and Mandemaker, 'Differential infant'; Breschi, Manfredini,and Pozzi, 'Mortality'; Willführ and Störmer, 'Social strata'.

[23] Bengtsson and van Poppel, 'Socioeconomic inequalities'; Bengtsson, Dribe, and Helgertz, 'When did the health gradient'.

[24] For a review, see Dribe, Olsson, and Svensson, 'Was the manorial system', pp. 296–7.

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offered opportunities to insure its subjects against extreme events, such as harvest failures, which would otherwise be impossible to achieve without extensive public intervention. Recent literature emphasizes the protective effect of manors, particularly in the context of serfdom, claiming that it was in the interests of the nobles and the state to make sure that serfs were guaranteed subsistence.[25] Research has revealed that during the crisis of the 1840s, the response of landlords was mostly proactive, for example, in Scotland, but much less supportive in Ireland and East Prussia.[26]

Despite the claim that manorial lords often undertook action to help, historians have seldom presented empirical evidence showing that manors' support to the peasants facing subsistence problems saved the latter from increased mortality in times of severe food shortages.[27] In a microstudy of Borshevka parish in nineteenth century Russia, Hoch detected little connection between mortality and harvests or grain availability, but explained it with household patterns and mechanisms of land distribution that kept the portion of the rural population without access to a sizeable plot of land small, and not with the support from the manors.[28] Similarly, for the large Voshchazhnikovo estate in Iaroslavl' province, Dennison and Nafziger found no references to grain shortages or to mortality crises even in the years of poor harvests.[29] Their research, furthermore, did not reveal special instructions to bailiffs regarding efforts to cope with harvest failures or petitions from local peasants requesting famine relief.

Several famine researchers have established that it was rather the actions of public institutions and relief measures that affected the outcomes and characteristics of famines.[30] In the context of the Hungry Forties, however, the effectiveness of measures taken by the central authorities has been questioned, whereas the role of locally based institutions like municipalities and voluntary organizations in coping with the subsistence crisis has been highlighted.[31]

Recently, Dribe, Olsson, and Svensson tried to measure the efficiency of the manorial system in protecting its inhabitants against economic stress in southern Sweden 1749–1859 by studying the impact of grain prices on mortality outcomes on the basis of parish-level data on vital events.[32] For children living in parishes characterized by a high degree of manorialism, there appears to have been a protective effect in the short run, as there was no mortality response to current prices; however, this protective effect disappeared after 1 year. For adults, the pattern of mortality response was similar to that of children. The authors concluded that the manorial estate was able to protect its inhabitants against the risks of economic stress, but the protective effect was highly imperfect and only functioned in the short term. Categorizing parishes according to the percentage of land

[25] Klussmann, 'Leibeigenschaft', pp. 238–40; Prange, 'Das Adlige Gut', 67–8; Behrens, *Das Adlige Gut Ahrensburg*, 46–7; Moon, 'Reassessing Russian serfdom', pp. 503–6; Moon, *The Russian peasantry*, p. 88.

[26] Devine, 'Why the Highlands'; Vanhaute, Paping, and Ó Gráda, 'The European subsistence crisis', p. 31; Bass, 'The crisis', pp. 194–5, 199.

[27] For example, Hagen, one of the most prominent authors in the camp of 'revisionists', has failed to produce such evidence. In Stawenov, severe harvest failures led to high mortality. Farmers borrowed grain from landlords at high prices, but the landlords at least charged no interest and awaited with repayment. Farmers also suspended seigneurial rent in hard years. Hagen, *Ordinary Prussians*, pp. 193–4.

[28] Hoch, 'Famine'.

[29] Like in Livland, in 1844 excessive moisture ruined part of the harvest, and in 1845, due to the drought, grains turned out poorly: Dennison, *Institutional framework*, pp. 33, 36; Dennison and Nafziger, 'Living standards', pp. 429–33.

[30] Post, 'Famine, mortality', p. 22; Alfani and Ó Gráda, 'Famines in Europe', pp. 3, 19–24; Nefedov and Ellman, 'Excess mortality', pp. 183–4.

[31] Vanhaute, Paping, and Ó Gráda, 'The European subsistence crisis', pp. 30–5.

[32] Dribe, Olsson, and Svensson, 'Was the manorial system'.

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owned by manorial lords made it possible to measure the insurance effect or its absence in a manorial system as a whole, but did not make it possible to distinguish between different types of manorial lords. In manorial economies, however, there was considerable variation in the way landlords managed their estates and made use of the powers at their disposal, and the degree of variation appears to have been higher east of the Elbe. In addition, the analysis of parish-level demographic response to short-term fluctuations in rye prices prevents the exploration of how the mortality response at the time of economic stress influenced social differentials within estate populations.

II | FAMINE OF THE MID-1840S IN LIVLAND

Famine is often defined through its effects on mortality. The 2017 volume *Famine in European history* explains that it is 'a shortage of food or purchasing power that leads directly to excess mortality from starvation or hunger-induced diseases'.[33] The editors of the volume also define a common methodology to be applied to regional reconstructions relying on time series of deaths/burials. There was crisis if the number of deaths exceeded the 'normal' (calculated by different methods) by 50 per cent or more.

The subsistence crises of the 1840s in Europe, known as the Hungry Forties, were regional phenomena, and the reasons for these regional differences may be attributed to the organization of the regional and local economy and society.[34] The latest comparative volume on famine in European history assures that this famine was confined to a 'fairly limited part of the continent'.[35] This statement may need to be reconsidered in the light of data on eastern and central Europe. In Europe, the crises were mostly triggered by the failure of the potato crop due to blight. By contrast, in the three Baltic provinces of Russia, two successive grain failures in 1844–5 led to a spike in grain prices in 1845–6, producing a strong mortality response, most notably in Livland.[36] Famines lasting more than 1 year, so-called back-to-back famines, were rare in world-historical perspective, and when they occurred, they often turned out to be lethal.[37] The case of Livland illustrates the point. In 1845–6, even population growth was negative in the Estonian part of Livland (figure 1), around −2 per cent.[38] The rural population suffered much more than the urban population.

The study area was among the less affected areas in the Estonian part of Livland. The territories east and south of the study area were particularly badly hit, while those to the west were the least afflicted by the crisis in the Estonian part of mainland Livland.[39] In the two parishes, Paistu and Helme, mortality estimates in 1845 were 150 and 120 per cent higher than average in the preceding 10 years (1834–43); in 1846, crisis-related mortality increase was very light – 18 and 10 per cent, respectively.[40] Figure 2 presents yearly death occurrence rates for four age groups in the

[33] Alfani and Ó Gráda, 'Famines in Europe', p. 2.

[34] Vanhaute, Paping, and Ó Gráda, 'The European subsistence crisis'.

[35] Alfani and Ó Gráda, 'Famines in Europe', p. 16.

[36] Klesment and Lust, 'Short-term economic stress', p. 29.

[37] Ó Gráda, *Famine*, p. 8; Ó Gráda, 'Making famine history', pp. 7–9

[38] According to the annual reports of the Governor: National Archives of Estonia [hereafter RA, EAA. f. 296, n. 4, s. 1179 (hereafter 296/4/1179]; Latvian State Historical Archives [hereafter LVVA, 1/ 4/317]).

[39] Comparative figures are provided for a number of areas in Lust, 'The question', pp. 54–5, table 1, and figure 2. The reasons for regional variation in Livland mainland have not been studied.

[40] The figures pertain to the whole parishes and not only the selected manors.

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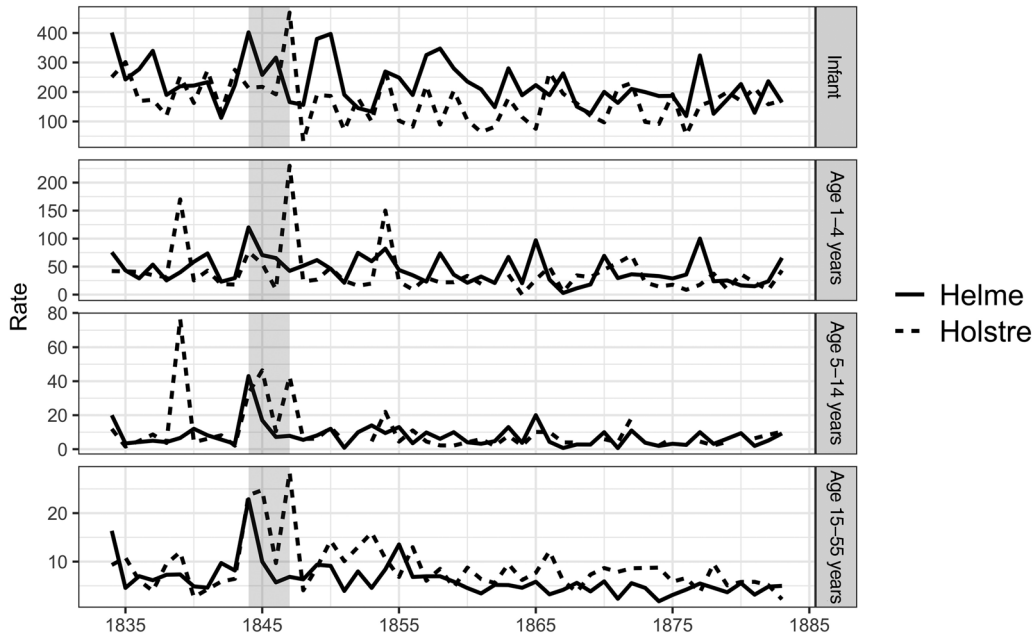

FIGURE 2 Yearly death occurrence rate by parish, 1834–84. *Note*: The years highlighted in grey had the worst harvest failures, 1844–6.

two parishes separately. Throughout the period of 1834–84, the years of 1844 and/or 1845 stand out as one of the years of highest death rates for almost all age groups. During the years of 1845–6, the hunger-related diseases dysentery, typhus, or 'typhus-like' diseases[41] accounted for a large share of the deaths among individuals above the age of 1 year. Reduced fertility is also a common effect of famine. The decline in births is presented in figure 3. During those years, the numbers of births declined equally for all social groups.

As several other famine-prone societies, the Baltic provinces were low-productivity agricultural areas, characterized by high socio-economic inequality.[42] Virtually all agricultural land belonged either to nobles or to the Russian crown. Noble manors as well as state estates were large-scale agricultural enterprises based on corvée (labour rent). The main sources of income for manors were distilling liquor from grain and potatoes, and fattening oxen with the draff for sale on the Russian market.[43] Sheep farming was of minor importance. The commercial manor economy existed side-by-side with the highly self-sufficient peasant economy, characterized by limited market production and a heavy dependence on rye and barley for subsistence. Due to the high concentration of land in the hands of Baltic German nobles, and low level of urbanization and industrialization, the share of landless labourers and semi-landless cottagers was large: They formed roughly two-thirds of the rural population in the study area, and for most being a farm or manor worker was a lifelong occupation.

[41] Vanhaute, Paping, and Ó Gráda, 'The European subsistence crisis', p. 26; Voutilainen, *Poverty,* p. 16.

[42] Voutilainen, *Poverty*, p. 17.

[43] Kahk and Tarvel, *An economic history*, p. 83.

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FIGURE 3 The size of birth cohorts in Helme and Holstre parishes by father's socio-economic status, 1834–52. *Note*: The years highlighted between two dashed lines had the worst harvest failures, 1844–6.

Natural conditions within the boundaries of a parish did not vary much, and the possibilities of earning supplemental income from non-farming activities were fairly similar. The nearest town lay a half-day's walk from Holstre (Viljandi), and roughly a day's walk from the Helme manors (Valga) (figure 1). Large and middle-sized farms dominated the area (table 1). The tenant farmers paid rent, normally in the form of labour dues and dues in kind, and the rates were determined either by the manor owner (on noble manors) or the state (on state estates). On noble manors, tenancies were short term and unstable.

To have sufficient labour to discharge labour duties to the estate and to work the large holdings, a farmstead population normally included servants in addition to the family of the farmstead's head. The farmstead servants were both male and female, and included married and unmarried people. Multiple-family farmsteads were typical of the area, with the average number of conjugal units per farmstead ranging from 2.7 to 3.6.[44] Besides the families of farmstead heads, servants, cottagers, widows and widowers, incapacitated veterans, wives of conscripts, paupers, and orphans all showed up as members of the farmstead. Some of them were also related by blood or marriage. Archival sources do not distinguish between those who dwelt in separate cottages and those who lived with a farmer, but customarily cottagers and married servants lived separately, while unmarried servants shared the house and the same bowl and table at meals with the farm head's family. Married servants were given a small patch of land, foodstuffs, clothes, lodging, heating, and the right to keep cattle, a pig, etc., while unmarried servants received fixed payments in kind and cash. In general, the non-monetary remuneration and home production made up most of their income. The heads of farmsteads who were responsible for operating the farm and fulfilling the

[44] Lust, 'A not so undesirable status', pp. 79–80.

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TABLE 1 The size-structure of farms and land:population ratio in the study area, during the first half of the nineteenth century.

Manor	Number of farms				Farm size by thaler value[b]		Total		Land: population ratio
	Large	Medium	Small	Total	Mean	SE	Thalers	People[a]	
Holstre state estate	35	68	–	103	18.3	5.2	1929.25	2528	0.76
Helme church estate	1	5	–	6	15.7	4.3	94.38	146	0.65
Jõgeveste	18	15	2	35	18.9	4.4	661.21	663	0.99
Riidaja	–	35	–	35	17.8	1.6	650.33	654	0.99
Lõve	21	18	–	39	20.8	4.6	853.25	756	1.13
Helme	37	9	–	46	24.1	5.4	1108.71	1029	1.1
Patküla	39	5	–	44	21.6	2.8	942.23	795	1.19
Leebiku-Vanamõisa	12	21	1	34	19.2	7.5	652.57	566	1.15
Total	163	176	3	342	19.8	5.3	6891.93	7137	0.96

[a]The population size derives from the 1834 poll tax list.

[b]The size of farms was measured in thalers. Medium farms were 10–20 thalers and large farms were over 20 thalers. One thaler of land amounted roughly to 2.2 hectares of agricultural land. Later, the size in thalers served as a basis for calculating the rates of money rent and land purchase prices. As the farms' size in thalers derives from different years from the period 1817–41 (the value increased with time as a result of the increase of arable in size and land improvement), the differences between estates were probably smaller. Furthermore, it might be that the higher value of thalers for the noble estates rather reflects the incentives of their owners to request higher dues from the tenants, as the dues were traditionally assessed on the basis of farm's size in thalers (even if formally, the dues were subject to the arbitrary will of the manor owner) than real differences in land size and soil fertility. For example, using the size of arable land as a basis for classification of farm sizes, large farms with arable land over twelve hectares constituted two-thirds of the farms in Holstre.

Notes: SE, standard error.

Sources: RA, EAA 567/1/370; EAA 932/1/6; EAA 934/1/2e; EAA 934/1/2 h EAA 934/1/2m; EAA.1296/1/326; EAA 2419/1/381.

duties and obligations to the owner of the manor and to the crown divided the duties (e.g. corvée days) among the able-bodied inhabitants of the farmstead, apportioned the land, and set the conditions according to which each family unit in the farmstead would till it. Joint residence and eating habits, kinship relations, short-term tenancies, and the farmstead head's duty to maintain his labourers all reduced the social gap between the landed peasants and the landless.

Hunger struck first the southeast of the Estonian-speaking part of Livland in 1840–1.[45] In this province, the general food availability started to decline further after the harvest failure in 1844. In the worst afflicted parishes, the crisis was still raging as late as in spring 1847. In 1844, frequent rainfall and storms damaged the potato, grain crops, and hay. The resulting lack of forage and the use of rotten hay led to a massive loss of horses and cows.[46] A shortage of good-quality seed grain heightened the food crisis into the next harvest. Contemporary observers described the years

[45] Kruus, *Talurahva käärimine;* Kahk, *Murrangulised*, pp. 45–8.

[46] RA, EAA 296/4/1177, annual report of Livonian Governor Georg von Fölkersahm to the Emperor, 1845.

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1844–5 as 'some of the hardest and most miserable times Livland has ever seen'.[47] Due to a drought in 1845, yields fell to about half. In Viljandi County (including the parishes of Paistu and Helme), rye yielded roughly three grains per seed sown in 1844 and 2.5 grains in 1845; barley yielded two grains in 1845.[48] As far as the estate administrations' reports tell, the yields were probably slightly lower in Holstre than in the manors of Helme.

Official reports and correspondence speak almost univocally about 'general misery' and do not highlight social strata differences as a factor in coping. They mention differences between manors rather than between various social groups in the villages.[49] Famished individuals ate unhealthy food substitutes for sustenance. Eating chaff, half-rotten potatoes, sparrowgrass, sainfoin, nettle, burdock, thistles, and other indigestible substitutes made the peasants, according to the governor of Livland, susceptible to typhus and dysentery.[50] The needy might have tried to augment their odds of survival by migrating, but the crisis generated little migration from the area under study to towns or less affected parishes. In Livland, out-migration from the stricken areas was possible only with permission from the local noble estate-owners or peasant community authorities. Any person who left the community without authorization and was caught begging for alms was forcibly returned home by local police courts.[51] The law required that the community 'feeds all its poor'. Temporary migration was also limited because the areas lying to the south, east, and north of the study area were affected more severely than the area itself. In the wake of the subsistence crisis, mass conversions from the Lutheran church to the Russian Orthodox Church took place in Livland in the hope for purported social and material benefits of taking the 'tsar's faith'.[52]

The serf emancipation laws of 1816–9 had left the provision for the peasantry on noble estates solely to communal and public institutions (the provincial food supply commission) and had declared that henceforth peasants would lose their right to demand advance loans from manorial lords. Communal granaries containing spring and winter grain supplies gathered from landed peasants were meant to provide the needy with assistance in the form of loans in times of distress, and in extraordinary situations, when granary supplies became insufficient, the community authorities were able to apply for a state relief loan. Due to low productivity, a portion of the region's tenant farmers needed to take advance loans from the communal granary stocks almost every spring, and not only in years of crop failure. In 1845–7, the imperial government directed 674 506 rubles of aid in money, and tens of thousands of *chetverti* of grain and flour to Livland.[53] Overall, the state assistance loan to Livland in both forms amounted to about 1.2 million rubles.[54] The first shipments of food supply from Russia began to arrive in summer 1845. Monetary aid was mostly used to purchase grain and redistribute it within the province.

General poverty and collective responsibility for repaying the relief loans made the community authorities unwilling to include the landless sufferers in their appeals for relief loans, regardless of

[47] RA, EAA 1267/1/36, f. 16; Kahk, *Murrangulised*, p. 106.

[48] Klesment and Lust, 'Short-term economic stress', p. 25.

[49] Lust, 'Feeding the landless', p. 95.

[50] Kahk, *Murrangulised neljakümnendad*, p. 45; RA, EAA 296/4/1177, annual report of Livonian Governor Fölkersahm to the Emperor, 1845.

[51] Lust, 'Feeding the landless,' p. 95.

[52] Kruus, *Talurahva käärimine*.

[53] 1 *chetvert* of rye = 3 bushels = 360 pounds = 147 kg, 1 *chetvert* of barley = 300 pounds = 123 kg.

[54] Lust, 'Feeding the landless', p. 91.

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the official regulations and sanctions against the delinquents.[55] The rate of relief loans for peasants – a maximum of a pound of grain per day per adult – was similar for all peasant strata, but grain rations were cut for everybody when relief reserves became scarce. Tenant farmers could also borrow grain for seed and consumption from the communal granary stocks.

The manorial lords commanded ample resources that could have been used for helping the needy.[56] Its grain stocks far exceeded the needs of the noble family and their servants and other hired personnel; manorial lords had access to bank credit and could create jobs. Bailiffs and overseers were well informed about the economic capacity of the farms and the villagers' need for help. From manorial reserves, grain could be delivered without much delay. The Livonian provincial authorities explicitly obliged manorial lords to grant subsistence loans to needy peasants,[57] which was primarily a practical necessity, because, under corvée labour, the welfare of manor farming depended directly on how the farms fared, and how many workmen and draught horses the farms could provide. Official reports, as well as correspondence, contain many references to providing peasants with both seed grain and baking grain from the manors.[58] In addition to advance loans to tenant farmers, the manorial lords also sold large quantities of grain to the communities that paid the 'market price', that is, almost double the price compared with the non-famine years, for it. Communities purchased the grain from the manors with the sums they had received from the state as a relief loan. For manorial lords, it was a profitable transaction. Furthermore, the production of vodka was not officially limited, although it swallowed a great share of the grain and potatoes produced on the demesne. Neither the nobility nor the governor favoured restrictions on distilling, as it would disrupt the functioning of the manor economy and the fulfillment of the crown's orders for vodka and, therefore, diminish the profits of manor renters and state tax revenues from selling vodka.[59]

To sum up, the crisis in the study area was relatively short and weak within the context of the province. In the areas under analysis, in 1844 and 1845, harvests failed twice, causing grain prices to soar between 1845 and 1846. This influenced demographic patterns in the short term – there was a distinctive mortality crisis in 1845 but also a decline in births in 1845–6. In regions characterized by export-oriented manor economy and a large number of landless agricultural labourers, as in East Prussia and Livland, economic and social access to food and the relief regime affected the scale of the crisis considerably more than the aggregate grain availability.[60]

III | RESEARCH QUESTIONS

Our paper addresses two main research questions. First, we are interested in whether mortality risks for some social groups were exacerbated during the period of extreme hardship and famine in local rural society. Based on previous research we expect to see indications of social differences in

[55] Ibid., pp. 96–7.

[56] In southern Estonia, manors over 1000 ha constituted 90 per cent of all noble manors. On noble manors, the ratio of demesne to peasants' land was 1:2; on the state estate of Holstre, it was roughly 1:10.

[57] Lust, 'Feeding the landless', p. 100; RA, EAA 291/1/8270, fo-s 424–8v: Governor Fölkersahm to Governor-General Golovin, 22.11.1845.

[58] Lust, 'Die Rolle', pp. 233–43.

[59] Ibid., p. 228; minutes of the Livonian food supply commission, 5.10.1845: LVVA 29/1/1451, fo-s 117–22.

[60] For East Prussia, see Bass, 'The crisis'.

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mortality, namely that the landless strata were more vulnerable to harvest failures and subsequent food scarcity than tenant farmers, and thus experienced a higher risk of mortality. However, as mentioned earlier, social gaps in local farmsteads were not very large among landed and landless peasants.

In rural areas, access to land largely determined the socio-economic status of an individual and a family. Our study sample is divided into three broad categories: tenant farmers with large and medium-sized farms, skilled workers, and the semi-landless (cottagers) and landless. Cottagers had only a small parcel of land or no land at all and normally worked for wages. Those without land circulated among the farmsteads and manors as hired labour.

Parish registers normally do not differentiate between different segments of landless and semi-landless strata, or do so inconsistently. The greater vulnerability of cottagers relative to farmhands and manorial workers is not made evident by our data. Different households within the same socio-economic group experienced food shortages to a different extent.[61] As these social groups exhibited within group variation, income level would be a more precise measurement of socio-economic inequality. In the absence of an income tax (instead, there was a flat poll tax) and income data, the available sources allow differentiation only between the three main social categories. This might have a levelling effect on relative mortality risks.

Second, the paper addresses whether the type of manor or manorial lord played a role in reducing the vulnerability of villagers in times of harvest failures. Practices in manorial societies varied across manor types and from landlord to landlord. Based on previous research, we hypothesize that state estates and/or paternalistic landlords could protect peasants relatively more effectively against increased mortality risks when the crops failed and subsistence problems occurred.

Our study encompasses six privately owned manors and one church estate in the parish of Helme. For comparison, we use a large state-owned estate of Holstre in the parish of Paistu. The legal as well as economic situation of the state peasants was better than that of their counterparts living on noble manors and church estates.[62] Unlike on noble manors, the tenant farmers living on state estates had the prerogative to renew the farm contract if they had fulfilled their duties and obligations to the estate and crown. The rent level was fixed and lower than on noble manors. On noble land, by contrast, the labour dues were unlimited, and landlords could extract as much labour rent and rent in kind from the tenant farmers as could be obtained without compromising the viability of farm households.

We categorize the noble manors in the parish of Helme according to the characteristics of the manorial lord and the relationship between the lord and the peasants.[63] First, we consider the manorial lord paternalistic if the farms were permanent and seldom changed hands, if labour dues and monetary payments were lower than on nearby manors, and if in- and out-migration levels were low. Second, the rate of conversion to the Orthodox Church in the mid-1840s gives insight into the nature of lord–peasant relationships. The converts were seeking freedom from manorial authority, tax relief, monetary aid, and so on. If the conversion rate remained low (less than 5 per cent, according to Riidaja and Jõgeveste manor), the landlord–peasant relationships were likely better. Third, the manorial lord is considered to be paternalistic if folklore, oral tradition collected in the 1920s and 1930s, and published memoirs support it. According to these three criteria, Riidaja manor, Jõgeveste manor, and the Helme church estate were owned by paternalistic

[61] Van den Berg, Pinger, and Schoch, 'Instrumental variable estimation', p. 466.

[62] Klesment and Lust, 'Short-term economic stress', pp. 25–6.

[63] Ibid., p. 26.

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landlords. These three were grouped together and coded as 'paternalistic'. The other four manors in Helme – Helme, Lõve, Patküla, and Leebiku-Vanamõisa – were owned by conventional landlords. This resulted in three different manor groups: one state estate, one paternalistic group, and one conventional group divided into two sub-groups.

IV | DATA AND METHODS

In this study, we make use of a dataset that draws on individual-level data from parish registers and listings of migrants. Famines rarely have clear-cut beginnings or endings, and the excess mortality only refers to the terminal phase of the process.[64] As a crisis period, we define the 2 years that witnessed serious harvest failures and food scarcity – from harvest 1844 (1 October) to harvest 1846 (1 October). As shown above, these 2 years featured extraordinarily low harvests as well as extraordinary relief measures by local and state institutions, in particular.

For the analysis of short-run mortality effects, our dataset includes, besides vital and migratory events, also data from the 1834 poll tax list, which provides us with an enumeration of the year's population, comprising 4737 persons on the seven manors in Helme, and 2537 on Holstre in Paistu. The poll tax list includes data on sex, age, marital status, and socio-economic status (SES). To this 'initial' dataset, all following births in the area until 1856 are added from the Lutheran and Russian Orthodox parish registers. In addition to births, people who migrated to the manor are recovered from migrant listings, parish member registers, and church certificates (*Parochial Schein*). Annual listings of migrants include time of arrival or departure. Similarly, parish member registers provide the date of migration. Church certificates, issued by the pastor, also include the date of birth of the migrant. These sources were used to determine the time of arrival or departure of people moving in and out of the community. Linking migration records to poll tax list and birth records, we obtained a combined dataset, which includes people who lived in the area under observation between 1834 and 1856. To this combined dataset, the information on time of death was linked from parish registers. As a result, for each individual, we have information about the time of entering under observation (birth, in-migration) and leaving it (death, out-migration).

From the observed population, we excluded those without information on sex and date of birth, as well as stillbirths. In total, we have 11 616 observations for the analysis. From this we had to also exclude 381 people who lacked information on SES, thus the final study sample includes 11 235 individuals (table 2).

Data on SES is derived from birth and death registers and poll tax lists. In the regression modelling, we focus on the three main groups – farmers, skilled workers, and landless and semi-landless labourers – by grouping together certain History of Work Classification System (HISCLASS) categories.[65] The first group, corresponding to HISCLASS 8, is comprised of tenant farmers. The second group includes 'skilled workers' (Classes 6–7) – families of individuals who did not make their living from agricultural production (e.g. forest wardens, peasant school teachers, storekeepers, bailiffs, foremen, gardeners, innkeepers, and millers). The third category, 'landless and semi-landless', consists of low-skilled (Classes 9–10) and unskilled workers (11–12), and includes families whose land holdings were below subsistence level (i.e. semi-landless cottagers, landless labourers, and artisans).

[64] Voutilainen, *Poverty*, p. 24; Howe and Devereux, 'Famine intensity', pp. 356–64; Carter and Kelly, 'Social inequalities', p. 7.

[65] Van Leeuwen and Maas, *HISCLASS*.

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TABLE 2 The size of the study sample by manors and socio-economic status, 1834–56.

	Socio-economic status							
	Farmers		Skilled labourers		Labourers		Total	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Manor type								
Paternalist[a]	815	210	138	26	1416	404	2369	640
Conventional[b]	1737	558	288	91	3335	1042	5360	1691
State estate[c]	1003	293	110	31	2393	701	3506	1025
Total	3555	1061	536	148	7144	2147	11 235	3356

Notes: Number of observations and deaths: (1) Number of observations; (2) Number of deaths.

[a]Jõgeveste, Riidaja, and Helme church manor.

[b]Helme, Leebiku-Vanamõisa, Lõve, and Patküla.

[c]Holstre.

Our empirical strategy is to apply Cox proportional hazard model. As not all individuals in the dataset are followed from birth to death, accounting for censoring is necessary. To compute survival times, being at risk of death starts at birth and ends when an individual reaches the age of 55 years (or the end of observation window in November 1856), after which they are considered right censored. Right censoring also occurs in the event of out-migration: The individual is considered right censored as of the month of departure. For those born before 1834 or who moved into the parish after their birth, hazard rate is conditional on their survival to 1834, or to the month of in-migration.

Addressing the research questions requires accounting for calendar time. To include calendar time in the regression models, we categorize the relevant timespan into two longer (1834–44 and 1846–56) and one shorter period (1844–6), each beginning on 1 October. The inclusion of the 10-year periods before and after the crisis facilitates comparison of relative risks of dying. In the models, the first period (1834–44) is the reference category, that is, the baseline against which the two following periods are compared.

Since our focus is on mortality up to the age of 55 years, this broad age range still accommodates substantial differences in risk of death by age but also considerable differences in risk factors associated with mortality across the age range. For this reason, we estimate regression models separately for four age groups: infants up to 12 months of age, children aged 1–4 years (early childhood), older children aged 5–14 years, and adults aged 15–55 years. The mortality of those above working age is not considered since, in older ages, the socio-economic status differences between retired tenants and cottagers were fuzzy before the introduction of peasant land ownership.

Our models include socio-economic status and type of manor, plus control variables for the calendar period and sex of the individual. To gain further insight into the role of socio-economic status and type of manor over time, we also added interaction terms of these two variables to the models. For easier interpretation, the hazard ratios obtained from the interaction models are presented in graph form.

V | RESULTS

We fitted four Cox proportional hazards models – one for each age group – as shown in table 3. The estimate for the period of the subsistence crisis (1844–6) reveals a rise in infant mortality of

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TABLE 3 Hazard ratios for different age groups in Helme and Holstre, 1834–56.

	Infant	Age 1–4 years	Age 5–14 years	Age 15–54 years
Time period				
1834–44	1	1	1	1
1844–6	1.284*	2.010***	3.558***	2.272***
1846–56	0.966	1.247**	1.105	0.919
Sex				
Male	1	1	1	1
Female	0.858**	1.129†	0.981	1.008
Manor				
Paternalist	1.050	1.007	0.566***	0.654***
Conventional	1.376***	1.142†	0.761*	0.767***
State estate	1	1	1	1
SES				
Farmers	1	1	1	1
Skilled workers	1.084	0.889	0.599†	0.615†
Labourers	1.040	1.031	1.206†	1.105
No. of subjects	6298	5588	5763	6062
No. of deaths	1234	914	424	781

†$p < 0.10$.
*$p < 0.05$.
**$p < 0.01$.
***$p < 0.001$.

approximately 28 per cent over the previous 10-year period. Regarding sex differences, girls had an approximately 14 per cent lower risk of dying during their first year than boys. We also find differences by manor group, as infants in conventional manors exhibit a significantly higher risk of dying in the first year of life than infants in the state estate and the paternalistic estates. There are no clear SES differences in infancy.

The next model in table 3 applies to children aged 1–4 years. Unlike the infant mortality model, in which the period effects were only moderately influenced by the subsistence crisis, the risk of dying in the early childhood model doubles during the crisis period. The differences between manor groups follow the same pattern as that of infant mortality, with the other groups exhibiting a higher risk than the state estate.

The third model in table 3 reveals children aged 5–14 years as the most vulnerable group in the face of distress: their risk of dying more than triples in the crisis years. The results also demonstrate a clear social gradient in mortality. As expected, being a skilled worker is associated with considerably lower risk of dying (–40 per cent) and being landless with slightly higher risk of dying (+20 per cent) compared with farmers. In contrast to the first two models, children aged 5–14 years living in both the conventional and paternalist manors exhibit lower mortality risks than those in the state estate. The relative advantage of living on paternalistic manors accords well with our initial hypothesis about the better conditions in estates owned by 'good lords'. However, the beneficial effect of manor type on survival at times of hardship appears to be age dependent.

For adults aged 15–55 years, the years of the subsistence crisis are associated with a mortality risk 2.3 times higher than the preceding decade. There also appears to be a social gradient that

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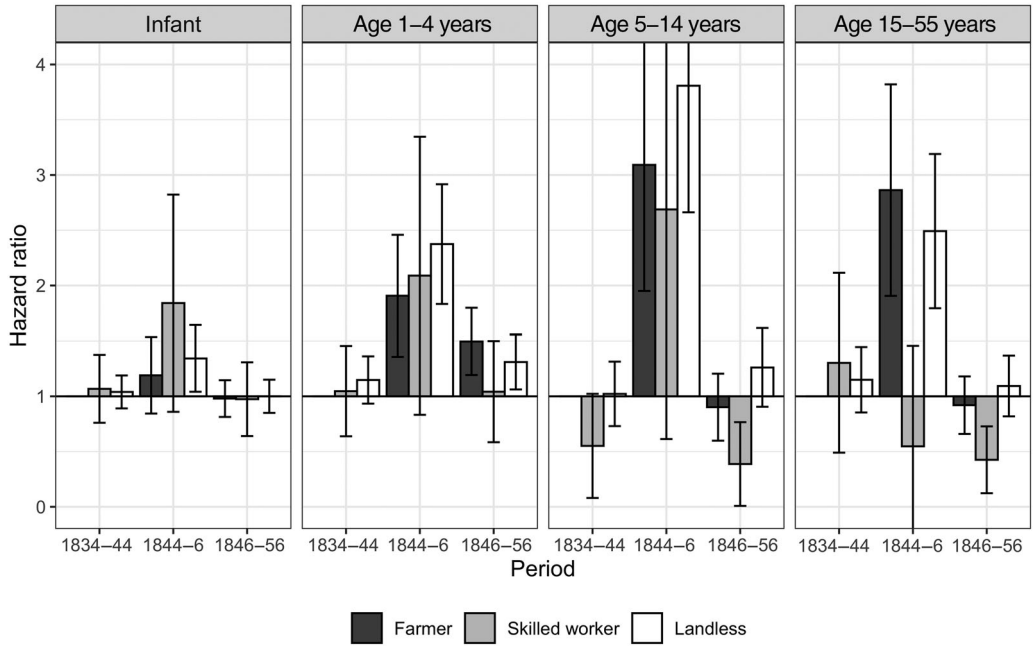

FIGURE 4 Socio-economic status and calendar period interaction effects, 1834–56. *Notes*: 90 per cent confidence intervals of predicted values. Interaction models include controls for the sex of the child and the parish of birth. Farmer in 1834–44 as a reference group.

puts skilled workers at a lower risk (–38 per cent) compared with farmers, while landless labourers show 10 per cent higher (though statistically not significant) risk of dying. The model again predicts pronounced differences between manor groups. Similar to children aged 5–14 years, the mortality risk of adults was lower in noble estates, regardless of their owner, than in a state estate.

In conclusion, the models on infant and early childhood mortality support our hypothesis with respect to the protective effect of a state-owned manor, compared with those that belonged to noble lords. The type of lord also proves important, as the mortality risks were higher on manors owned by conventional as opposed to paternalistic lords. However, after the age of 5 years, the picture appears to be reversed, with the risk of dying being highest in the state estate. Regarding socio-economic status, we find the strongest social gradient in mortality between the ages of 5 and 14 years. The mortality analysis of age group 15–55 years does not support our hypothesis regarding the disadvantaged position of the landless and semi-landless in comparison to landed peasants. As expected, the skilled workers demonstrate lower mortality risks compared with farmers. The positive effect of higher status is markedly stronger for young adults and adults.

To disentangle the social gradients in mortality during times of extreme hardship and famine conditions, we estimated another set of models with interaction effects of socio-economic status, type of manor, and calendar period. We used fitted models to predict hazard ratios with respect to the reference category of the interacted variables. The hazard ratios resulting from each model are shown in figures 4–6.

First, to explore further if landless groups were more vulnerable during the famine of 1844–6, the models in table 3 were extended by adding SES and calendar period interaction terms. Hazard ratios were then predicted using farmers in 1834–44 as a reference group, and the results are

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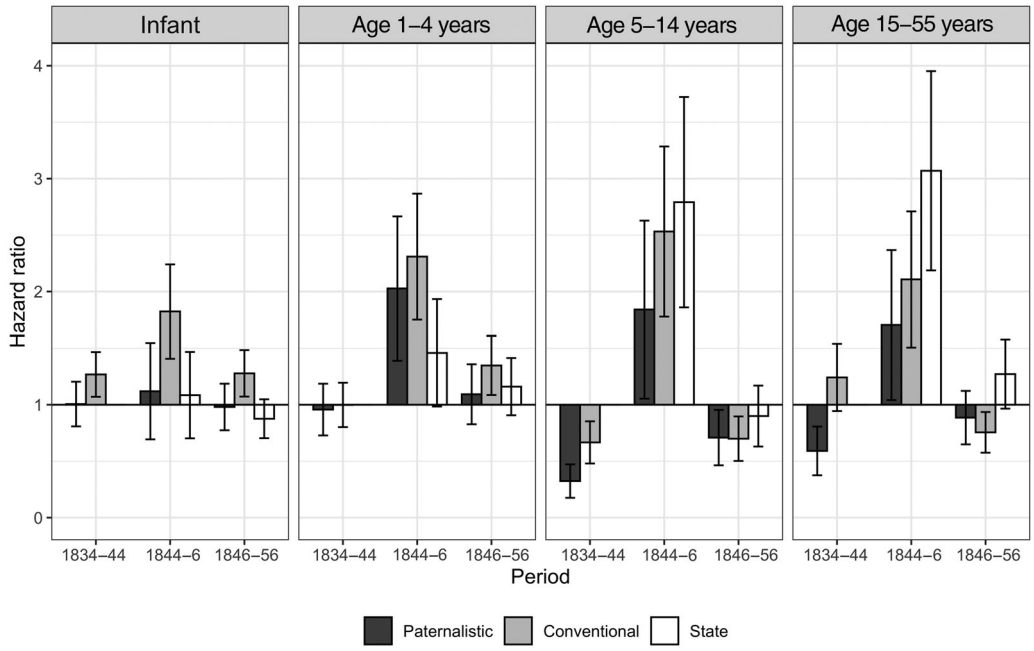

FIGURE 5 Manor group and calendar period interaction effects, 1834–56. *Notes*: 90 per cent confidence intervals of predicted values. Interaction models include controls for the sex of the child and SES of the father at birth. State estate in 1834–44 as a reference group.

shown in figure 4. We find a short-term increase in mortality during the crisis years for all four age categories. The increase in infant mortality during the period of 1844–6 relative to the risk of dying in infancy in a farmer's family in earlier period (1834–44) is relatively small (over 1.5 times only for 'skilled workers') and statistically significant only for the landless group. In contrast, the subsistence crisis elevates the risk of death for all SES categories in early childhood (1–4 years), compared with the base level. However, the increase predicted by the model is statistically significant for farmers and landless. In the two older age categories, the hazard ratio during the crisis years is 2.5–3.8 times higher compared with the base level, except for skilled workers, who again do not show a statistically significant difference from the comparison level. As mortality rise is similarly present in both major socio-economic groups, the results suggest that farmers (landed peasants) did not have an advantage for survival compared with landless groups during this crisis period.

Second, to test whether different types of manors could protect their peasants against hardship, we estimated another set of models with interaction terms between the calendar period and manor group variables (figure 5). Again, relative risks were predicted with respect to the reference group, which in this case is state manor in the period of 1834–44. In the following, each age group is examined separately with regard to the developments that occur within the manor groups.

Regarding the overall short-term effect of the famine, the mortality rate in all age groups rose during the years of the crisis. This temporary increase is smallest for infant mortality, but still exhibits a gradient by manor group. For state-owned and paternalistic manor groups, the predicted hazard ratio during the crisis is not significantly different from the level of the state manor before

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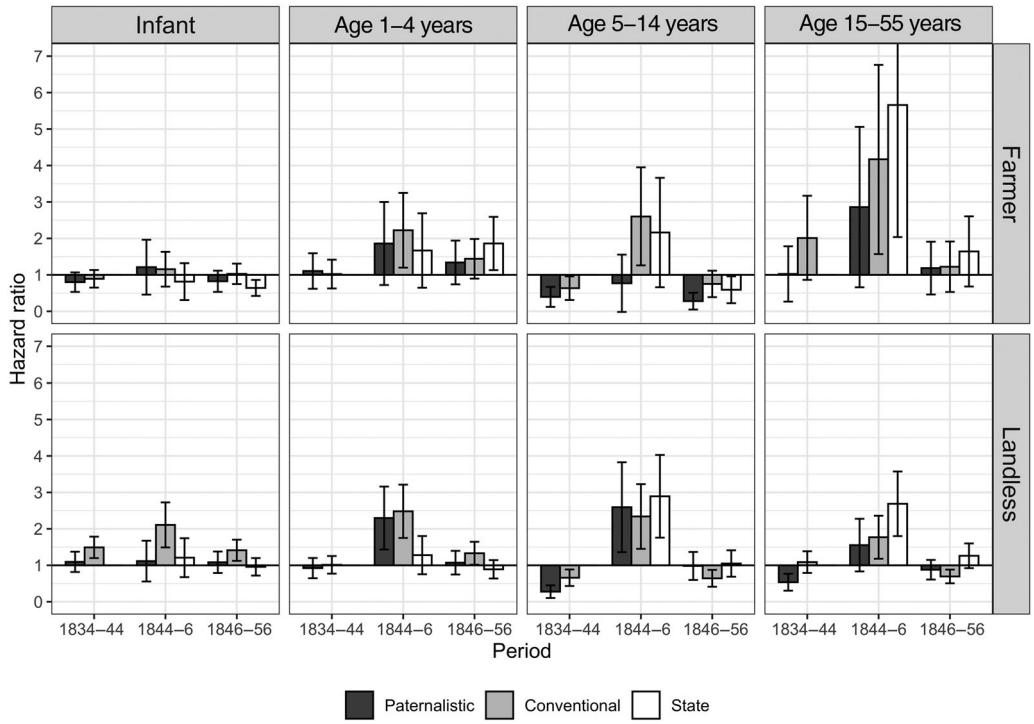

FIGURE 6 Manor group and calendar period interaction effects by socio-economic status, 1834–56. *Notes*: 90 per cent confidence intervals of predicted values. Model controls for sex. State estate in 1834–44 as a reference group.

the crisis. By contrast, for conventional manors, the infant mortality rate is significantly higher compared with the state estate before, during, and after the crisis period 1844–6.

In the models fitted for the three older age groups, all manor groups show statistically significant higher mortality during the crisis over the reference level, with the exception of children aged 1–4 years on the state estate. For the latter, confidence intervals of prediction overlap with the reference level. This finding pertaining children aged 1–4 years further supports our hypothesis with respect to the protective effect of the state estate, as already shown in table 3. The protective effect of paternalistic lords compared with conventional lords, by contrast, remains modest and is clearly discernible only for infant mortality.

The state estate appears less favourable in the 5–14 years and 15–55 years age categories. Outside the crisis period, mortality in paternalistic, and conventional estate group is estimated to be lower than for the state estate. During the crisis period, all estate groups show a statistically significant increase in mortality over the level during the previous period. Given the large confidence intervals of prediction for 1844–6, it is not likely that any of the manor groups would be substantially less affected during the crisis, although the estimates in comparison with the reference category are biggest for the state estate.

Third, as a sensitivity test of our results above, we further investigated the vulnerability of farmers and the landless peasants during times of crisis across different manor types. For this we fitted separate models for the subsets of farmers and the landless by age group, applying interaction

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between calendar period and type of manor. In each of the eight groups by age and SES, the reference category is living on a state estate in 1834–44 (figure 6).

First, during the subsistence crisis there is a marked survival disadvantage for farmers beyond infancy in conventional estates. On a state estate this disadvantage applies only to farmers who are adults. Importantly, farmers on paternalistic estates do not show statistically significant higher mortality in relation to the state estate during 1844–6 in any age group. Before the crisis period, children aged 5–14 years on conventional and paternalistic manors exhibit even lower mortality compared with the state estate.

The landless are somewhat more disadvantaged during the crisis period if they live on a conventional manor. Infant mortality of the landless is consistently higher on conventional manors and is about twice as high during the crisis time compared with the landless on the state estate. Early childhood mortality during the crisis years is significantly higher both in paternalistic and conventional manors in relation to the state estate, whereas in the latter there is no significant rise in risk of dying. With regard to the children aged 5–14 years during the crisis years, we infer that their death risk increases more in paternalistic and conventional manors, since, relative to the state estates, they show a lower level of mortality before the crisis years. For the adult landless, there is an increase in mortality across all manor types in times of hardship.

The comparison of interaction models of farmers and the landless suggests that both groups shared some common features. Regarding early childhood survival, they were both more vulnerable when living on conventional estates compared with the state estate. Also, in terms of adult mortality, on conventional and state estate they both experienced higher mortality during the crisis years. Differences between the landless and the farmers appear in infant mortality – the landless labourers' survival was worse on conventional estates. Landless young children also show significant mortality increase during the crisis years on paternalistic and state estates. Along the same lines, their older children and adults were exposed to higher crisis period mortality in all estates, whereas for farmers this happened only in some types of estates. Overall, mortality response of the landless is more likely stronger across the estates.

VI | CONCLUSION AND DISCUSSION

This article has considered two contested, yet little studied, aspects of famine mortality: mortality differentials by socio-economic status and the protective role of manor type. We tested two hypotheses. First, we expected to find socio-economic differences in mortality between farmer peasants and landless and semi-landless labourers during famine years. The second hypothesis suggests that manorial lords protected their peasants from economic hardship in times of distress, and we expected to find that the type of manor – state- or privately-owned – played a role in its inhabitants' mortality risk. Using the individual-level longitudinal data from two Estonian rural parishes, Helme and Paistu, we addressed these questions by applying survival regression techniques.

Our interaction models suggest that the response to short-term economic stress was generally strongest in the 5–14 years age group and weakest among infants. Among the latter, only the landless exhibit statistically significant higher mortality during the stress years, while for the other groups the increase remains within the margin of error. Comparing the mortality response of the landless with the farmers, point estimates suggest that the rise in children's mortality rates during the crisis years was bigger for landless labourers. However, the difference in how much the risk of death increases is not statistically significant between the two groups. In the same way, the

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mortality response of adults exhibits a considerable overlap between the landless and the farmers, although the landless fare slightly better in this age group.

The absence of significant disparities between mortality responses of the two major socio-economic groups can be partly explained by factors that counteracted the gains from better resources. Even though tenant farmers had (better) access to land, credit (especially, from the manor), and support networks in the years of crisis, the persistence of the habit of living and eating together, and of old rural hygiene and sanitary customs, made all household members similarly vulnerable to epidemics.[66] Crop failures also turned tenant farmers into 'deficit producers' who were forced to apply for loans to meet their household needs. As the peasant household cared for the maintenance of orphans, the elderly, the sick, and the poor who lived (as 'lodgers') in peasant households, this may have further diluted the effects of social differences in mortality in the mid-1840s, when households took subsistence loans to provide for its landless members. Tenant farmers as employers had to feed, clothe, and accommodate landless rural workers – corvée workers as well as farmhands. Furthermore, in some localities such as the state estate of Holstre, farmhands and farmers were often relatives, diminishing effects of status differences in survival. As mentioned above (in section III), the category of unskilled labourers may also be more heterogeneous than could be determined on the basis of our sources, including subgroups with higher risk of mortality. There were clear nutritional differences between manorial servants on the one hand (fed by the manor) and cottagers on the other hand, who could not expect sufficient support from the tenant farmers unless the cottagers were their close relatives. Initially, cottagers were not entitled to aid from communal granaries, but as the food scarcity considerably increased in 1845, they could also apply for relief. The fixed norm of aid, one pound per person, however, was very low. In the words of one parish magistrate, it was barely enough to avoid death by starvation.[67] The aim of our study, however, was not to delineate the exact hierarchies of suffering among various social segments of rural people but to reveal whether the social class mortality differences appeared at all during the crisis. Our results reveal that there were no statistically significant differences between the landed and landless groups in mortality.

Our second hypothesis regarding the protective role of the type of manor or manorial lord found more support. During the crisis years of 1844–6, infants on a state estate and estates owned by a paternalistic lord had lower mortality than on conventional manors. As better conditions in these estates probably resulted in more favourable work schedules for mothers, the positive impact on infant mortality is expected. Early childhood mortality on the conventional and paternalistic manors more than doubled during the period of economic stress, but on the state estate, the increase was more moderate – approximately 50 per cent. Such a clear difference probably reflects less exploitative conditions on a state estate. The protective effect of manor type, however, did not extend to older ages. In the 5–14 years age group, the risk of death during the crisis years multiplied in all estate groups. In the oldest age group, the state estate exhibited an approximately threefold increase in mortality risk, while for the others the risk was doubled.

Our findings indicate that, in post-emancipation Livland, the protective effect of the manors against hunger-induced mortality increases was probably even more constrained than it has been demonstrated in southern Sweden. In the latter case, the protective effect for children and adults was limited to 1 year.[68] In our study, we found no protection for older children and

[66] Pärdi, *Eesti argielu,* pp. 45–210.

[67] Lust, 'Die Rolle', p. 243.

[68] Dribe, Olsson, and Svensson, 'Was the manorial system', p. 307.

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adults. Moreover, large differences apparent in mortality risks between manor types in age groups above 5 years over the entire study period (1834–56) become statistically insignificant in the years of distress. To sum up, neither the manorial system nor the 'paternalist' landlord could shield its inhabitants from increased mortality risk in times of severe food shortage, although the well-developed manorial economy commanded resources that could have been used for feeding the rural population in times of distress.

In general, the absence of consistent and significant differences in mortality between the two major socio-economic groups in the villages in times of distress might be partly associated with the exploitative manorial system in the Baltic provinces, which kept peasants poor through burdensome taxes in labour and kind, and restricted their mobility. If surplus product did not accumulate in the hands of tenants but was appropriated by the manorial lords by raising the rent, the farm economy withered. Short-term tenants on noble land lacked the security of tenure and the control over farm succession that were vital economic incentives for pre-industrial tenant farmers. In Russia proper, agricultural productivity (e.g. seed-yield ratios) was also very low, and much of the surplus was similarly confiscated by the landlord or the state, but there the manorial system was combined with communal land tenure and looser restrictions on (temporary) migration. As long as there is no up-to-date research on subsistence crises in pre-emancipation rural Russia, we might acquiesce to Hoch's suggestion that communes and multiple-family households, sizably reducing the harvest-sensitive portion of the population, really afforded protection from hunger-induced mortality shocks in a manorial system.[69] Greater flexibility and diversity in the economic activities of the Russian peasants might have mattered, as well.[70]

The negative effects of calamity were difficult to absorb 'locally' if epidemics broke out. The case of Livland rather suggests that the functioning of the relief system at large was of great importance. Government aid, even if it arrived with delays and in the form of interest-bearing loans, mitigated the food shortage and mortality response to harvest failures as well as soaring grain prices for those who had survived by the time of the aid's arrival (Supporting Information).

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[69] Hoch, 'Famine', p. 363.

[70] The two micro-studies denying the connection between mortality increases and grain shortages in Russia in the mid-nineteenth century give much reason to assume that actually there might have been several factors at play. Migratory work, engagement in trade and rural industry, and payment of feudal dues in cash and kind rather than in labour services are some of them.

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