Mortality in the family of origin and its effect on marriage partner selection in a Flemish village (18th-20th century)

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Abstract
This paper addresses the role of health related characteristics as a basis of marriage partner selection in a pre-industrial population with a low level of social differentiation and a high level of mortality. We measured health characteristics by the level of infant and child mortality in the family of origin of the marriage candidates. We observed a homogamous marriage pattern according to mortality in the family of origin. We argue that mortality in the family of origin is deliberately used to evaluate potential marriage partners. The level of infant and child mortality in a family can be seen as an indicator of the health status, (future) social position, physical appearance or life style of the potential partner.

Introduction[1]

This paper addresses the role of health related characteristics as a basis of marriage partner selection in a pre-industrial population with high mortality. Partner selection leads to a solid, sometimes lifelong, union between two individuals, their families and friends. Partner selection offers a tool to attract new people into the family network. Hence, it is a crucial decision and the choices made concerning partner selection, whether instrumental or expressive, always reveal important characteristics of society.

In mainstream historical-sociological research the significance of health for partner selection is not that often discussed. Yet, there are some good reasons to address the topic. Health is a central fact in pre-industrial society. In this society, mortality is typically high, making health simply a daily concern. Furthermore, pre-industrial (agricultural) labour requires a strong physical input (De Beule, 1962) and this evidently requires good health. Consequently, health is a crucial determinant of life chances and therefore presumably a central element in partner selection strategies. Shorter (1975: 145) confirms this by citing pre-industrial sources: "You chose the richest person,…, aside from that, the morality and health of the parents were taken into account". There are some indications that this view is correct. Indirect evidence comes from research on the effect of marital status on mortality. One of the reasons of the higher mortality of the unmarried seems to be that they are 'selected', which means that the unhealthy have less chance to marry (infra). There is also some direct evidence. For some pre-industrial (and modern) populations it is shown that physical characteristics such as stature, strength, body weight or previous health experience affect marriage partner selection (Baten & Murray, 1998; Sköld, 2003; Helmchen s.d.).

It is therefore a relevant question whether in a pre-industrial high mortality environment, health affects partner selection. However, partner selection research mainly focuses at socio-economic (e.g. class, wealth) and cultural factors (e.g. religion) without much reference to possible physical characteristics. There is an enormous amount of literature on partner selection that is based on the idea that wealth (and not health) matters.

In this paper we try to integrate the ideas on the role of health in mainstream partner selection research. We aim to respond to four questions. First, is the partner selection pattern homogamous according to health? Second, if so, is this the consequence of the intentional use of health as a criterion or is it simply the unintentional consequence of structural causes such as the association between social position and health? Third, what is the relation with other criteria? When does one use health instead of wealth? And finally, can we give more precise reasons why health is important?

In section 1 and 2 we discuss theoretical and methodological issues concerning the relation between health and partner selection. In section 3 we perform an empirical analysis of the role of health characteristics (infant and child mortality in the family of origin) in marriage partner selection in a pre-industrial Flemish village.

1. Theory

To evaluate the role of health and to integrate it in partner selection theory, we first take a closer look at the assumptions underlying the view that health matters for partner selection. In section 1.2. we turn to

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a more systematic approach on the selectivity of marriage regarding health characteristics, that incorporates the remarks made below.

1.1. Assumptions underlying the influence of health on marriage

The underlying logic is that partner selection, as a means of attracting new people into the family network, will use any criterion that enhances one's life chances. If health is crucial for life chances, then health related characteristics are likely to be a target of partner selection strategies.

But this mechanism requires that some conditions are met. A first assumption is that it is possible to choose partners based on health characteristics. Before being entered in the partner evaluation process, health conditions need to be visible, and they must be evaluated as negative for one's own or one's family's future health. To detect the quality of the potential partner, individuals evaluate signals for physical characteristics.[2] Often, detection is very evident. Some characteristics are highly visible, for example for the limb, deaf, blind and disabled. In practice, detection of health characteristics is often not an easy job. And sometimes this is practically impossible (some diseases require high tech screening). Nevertheless, even in pre-industrial society, or perhaps in particular, evaluating health is not impossible. Diseases may affect physical appearance. Smallpox, for example, leaves scars on the face (Sköld, 2003). Village dwellers probably also knew very well about the number of infants and children that died in a given family, about the history of diseases in specific families, and so on.

Also important is that health characteristics are not evaluated in a uniform way. That is, these signals may be interpreted as signals for other characteristics. Therefore these health signals may also be used for different reasons. Drinking may refer to a specific lifestyle, and this lifestyle can be evaluated regardless of its effects for health. Similarly, some physical characteristics may not only reveal past or future health threats, they can also lead to a lower sex appeal (and not necessarily to a weaker health), depending on the societal norms in a given population (e.g. obesity, scars). In short, the evaluation process is extremely complicated. The main issue here is that some health characteristics will not be used in partner selection because they are not visible for potential partners and that some characteristics can also be used for other reasons than health.

Furthermore, even if humans are able to detect the health status of possible partners, there are no reasons why they automatically use them in partner selection. This leads us to the second assumption, which holds that humans choose their partners instrumentally in function of enhancing one's own and one's family's life chances and that health characteristics are used rather than wealth characteristics *or* that they unconsciously do select the healthiest partner.[3] In our view, the importance of health is dependent upon the societal context. Partner selection is not the same in every period or location, nor it is for every social group.

The third assumption is that partner selection is a matter of free individuals being able to make a free choice of marriage partner. Yet, partner selection is constrained by the "marriage market". The

[2] Fu & Goldman (1996) distinguish three types of health characteristics: health conditions (physical and mental illnesses and limitations), physical attributes that may be associated with past or future health (obesity, short stature) and health related behaviours (smoking, drinking, drugs, risk taking behaviour). Physical attributes and health related behaviour are used as health signals to evaluate underlying health conditions.

[3] The latter view is prominent in biological theory. It claims that individuals are designed or selected to act like this. Those individuals who do not, and marry a 'weak and unhealthy' partner, will to some extent experience reduced life chances and will have less children. The selection strategy of these individuals will be less spread in the next generation, on the condition of course that this partner selection strategy has a genetic basis. Also this second assumption is a rather strong one.

distribution of health characteristics over the population, the relation between the number of unhealthy males and females, the restriction of meeting opportunities between healthy and unhealthy individuals, … , all these factors influence the partner selection pattern according to health in a given society and therefore they need to be accounted for.

1.2. The meaning of health for marriage access and partner selection

The selective effect of marriage operates on two levels. The first concerns the question "who marries". This question involves both the decision to marry, by oneself or by others, and the desirability as a potential partner. The second concerns the question "who marries whom". This partner selection question evolves around the notion of desirability.

Access to marriage

There are basically three reasons to remain unmarried: an individual may simply not want to marry (this individual is no marriage candidate), other involved parties such as parents decide that the marriage candidate should not marry (that person is no effective marriage candidate) or one does not find a (suitable) partner. The first and second reason may occur irrespective of the evaluation of a potential partner, say as a principle decision.

This decision not to marry is usually debated in terms of the Malthusian marriage pattern and is connected with the norm that one should be able to establish an economically independent household. Hence, if health conditions are so bad that it strongly affects the chance to run a household, it may lead to celibacy. Even if the marriage candidate or his parents do not evaluate their situation in this way, potential partners may do so and the competition with other, healthy marriage candidates is likely to put these unhealthy in a disadvantageous position. Health may therefore be connected to both the decision that an individual or his family makes whether to marry or not, as with one's desirability as a partner (Fu & Goldman, 1996).

There is an important argument in favour of the view that health is related to marriage access. It has been shown that unmarried people have higher mortality than married people. This is a classic debate in (historical) demography since Louis Henry stressed the higher mortality of singles. This can be caused by the protection marriage offers, but this may also be caused by a selection effect, that is, that the unhealthy have less chance to marry (Hu & Goldman, 1990: 233-250, van Poppel, 1976, Ben-Shlomo et al., 1993).

The existence of a selection effect cannot be ignored. Yet, it is important to stress that for the large majority of people, bad health as such does not withhold them from developing a wish to marry. Being unhealthy, the question is rather to find a partner. Here the marriage market enters the debate. If we assume that the distribution of health characteristics is not different for men and women, there are always potential marriage partners with the same bad health characteristics and consequently there will be mating opportunities for unhealthy people. If so, this signifies that the relation between marriage and health is mainly a matter of the desirability of the marriage partner. This assortative mating effect implies that there is no selection mechanism based on health that regulates marriage access

The question is which of these two principles are operating. For the extremely unhealthy marriage access will be limited. Although also this category of people may of course develop a wish to marry, and we cannot exclude the possibility of assortative mating, social control actors may play an important role in preventing them to marry. Also the fact that in practice there will be only a few potential partners with the same extreme absence of health hinders their marriage chances. These individuals

may have difficulties in meeting each other, as for example in pre-industrial society there were probably fewer institutions in which they were living together.[4]

For the others, those who are in bad but not extremely bad health, there will always be potential marriage partners on the marriage market. But pre-industrial societal conditions are favourable for a strong selection effect. Under a malthusian marriage pattern we can expect that entry into marriage is that restricted that health related characteristics are used along with direct economic requirements such as the possibility to establish an independent household. Also a different access to marriage between men and women limit the assortative mating effect on marriage access. The quantitative disadvantage may result in stronger selection of the disadvantaged sex and this may result in a difference between males and females in the possibility of entering the marriage market if unhealthy. In short, if the possibility to marry is limited, selection is hard and this may lead to a higher chance to marry for those born in a low mortality family of origin.

Partner selection

The basic idea of partner selection research is to observe whether marriage partners have similar (= homogamy) or dissimilar (= heterogamy) characteristics. We give an overview of the reasons why there is possibly homogamy according to health characteristics. To organise the discussion, we use a simple framework of partner selection determinants. We distinguish between three main groups of determinants of partner selection: structure, preferences and social control (van Leeuwen & Maas, 2002; van Poppel, 2001; Van de Putte, 2005).

1. Structure: the supply of potential partners
The distribution of the partner selection characteristics (health, wealth, etc.) strongly determine the level of homogamy (Van de Putte, 2005). The chance to marry healthy or unhealthy partners depends on the precise number of potential partners that are healthy or unhealthy in a given society in a given period. As such this is not a very interesting factor, but to measure the preference for a specific type of partner, we have to control for this structural effect (see methodology).

But the role of structure is complex. Often societal organisation unites people with similar characteristics. For example, schools and neighbourhoods often recruit people with a specific social background. If for this reason healthy people have more chance to meet other healthy people, then homogamy according to health will be observed, irrespective of the preference of healthy persons to marry a healthy partner. For example, if health is unevenly distributed over villages and parishes, and if people tend to meet and, for that reason, marry more frequently with persons living in the same village or parish, then we inevitably will observe homogamy according to health characteristics. As both the association between health and location as homogamy according to place of residence have been frequently observed, this is likely to be a cause of homogamy according to health. This effect we call the meeting opportunities effect.

A special case of the effect of meeting opportunities is the so-called byproduct effect (Uunk, 1996). If there is an association between two variables (e.g. health and social class) and if there is homogamy according to one of these variables (social class), there will automatically be homogamy according to the other variable (health). Also the relation between health and social position has often been observed (Fu & Goldman, 1996). A similar effect may be present for migrants as migrants often marry within their own group (Van de Putte, 2003) and as their geographical background and common social situation may affect health characteristics.

[4] And these with very bad health may seriously influence mortality levels and therefore be the cause the observed difference according to marital status.

2. Preferences

The evaluation marriage candidates make of each other is a second determinant. Health characteristics can be used directly (to estimate health) or indirectly (to estimate other characteristics). We distinguish between three types of evaluation criteria:

- instrumental criteria

Visible health characteristics that are evaluated as important or even crucial to the survival chances of the household are a logical target of partner selection (supra). Apart from this direct instrumental use of health, there is possibly also an indirect instrumental use. By this we mean that health may be used as a signal for past, present and future social position. There is some empirical evidence for such an effect. Baten and Murray (1998: 124-135) show that there is a relation between stature and marriage chances. Stature indicates physical strength and therefore economic position, it is assumed by the authors. This aspect of the relation between social position and health has to be distinguished from the byproduct-effect which does not assume a conscious evaluation of health.

- romantic-expressive criteria

Sometimes partners are chosen because they are the only true, irreplaceable partner. It is difficult to connect this with health. Perhaps related to this is the role of physical attraction.[5] Fu & Goldman (1996) on contemporary United States and Sköld (2003) on pre-industrial Sweden show that health may be important for marriage access and partner selection as it sometimes has severe consequences for one's physical appearance.

- group belonging

People tend to wish to marry a partner belonging to the same social group as theirs. These groups may, for example, be based on life style or on the occupational identity of the parents. Partner selection based on occupational groups, e.g. miners, farmers and weaponmakers, is not uncommon (Van de Putte et al., 2005). As health is often related to values, tastes and lifestyles (e.g. smoking behaviour) and these are often markers for group membership, homogamy according to health characteristics is probable (Fu & Goldman, 1996). Also in this case, health is used as a signal for other characteristics (indirect effect).

3. Social control

Social control simply refers to the preferences of third parties, such as parents and colleagues etc. (see above for social control of marriage access of the extremely unhealthy). Even if marriage candidates do not intend to use health as a criterion, social control actors may force them to do so. But as such, this factor does not enter new arguments into the debate as also these social control actors' preferences are shaped by the above mentioned criteria.

Some additional factors require discussion. First, health is in competition with other characteristics. Although wealth and health are often correlated, this is of course not a one-to-one relationship. Second, the use of health characteristics in partner selection does not necessarily lead to homogamy. Another possible pattern is that health and wealth are exchanged.

Competition with other criteria

It cannot be excluded that under some conditions it is possible to combine health and social origin. In that case, even if there is no priority given to health, we will observe homogamy according to health characteristics. The possibility to combine is probably strongest for large social groups. If in a society

[5] Although we could also see beauty as a prestige offering characteristic, and then health is used in an instrumental way.

farmers count for 50% of the total population and if they do not differ strongly in terms of property, then it is easy to find another farmer and other characteristics can be used as a partner selection criterion.

If it is difficult to combine both characteristics, marriage candidates have to choose between both characteristics. If there is a priority on health, than we will observe homogamy according to health. But if there is a priority on social origin or social position then heterogamy according to health will be the observed pattern. A crucial question is, therefore, to which criterion people give priority. It is difficult to determine, and the topic has not yet been addressed in many researches, under what conditions people choose health as the main characteristic. Perhaps the role of health is most important in societies that have high levels of mortality and hard living and working conditions that put a lot of pressure on the physical condition of its population.

Also social position matters. We might consider health as a necessary condition that needs to be fulfilled in order to fully realize one's economic potential. Yet, this does not count for everybody to the same extent. Individuals with secure access to property (e.g. farmers with large property) or who are employed in physically less demanding occupations, such as civil servants, teachers, etc., will probably be less dependent upon their health to ensure their life chances, or will be less dependent upon their health to attract a marriage partner. This leads to the conclusion that health is particularly important for the partner selection of farmers with limited access to land and for the lower classes, groups that are the large majority in the village under observation.

But, for groups that have no secure access to land (sons of ordinary workers, day labourers, etc.), we would expect that there is more reason to select partners based on purely economic reasons (land or skills). Or maybe more precise, we expect a competition for those individuals who have acquired some land (what is not impossible). Another way of saying this is that health is used on the condition that some wealth characteristics are met. One could argue that small farmers have a more or less secured access to land, so they have the freedom to use health.

It is even harder to determine under what conditions romantic criteria and group belonging are important. However, we would expect that if these are important criteria, they are also most likely adopted by groups that have to some extent the economic freedom to use them, making both the highest as the lowest social categories less likely to adopt them compared to the middle groups.

Exchanging wealth for health?

So far we assumed that health was important for both partners. This is not necessarily the case. First, health characteristics are not necessarily equally important for males and females. It has been argued that it is usually the men's task to bring in economic resources, while women are mainly evaluated upon their social, domestic and physical qualities (Fu & Goldman, 1996: 73). However, in agricultural society everybody in the household was exposed to hard living conditions. Hence, everybody benefited largely form good health and physical strength. In our view there is no clear argument to expect that there is by definition a greater need for good health for one of the sexes.

Second, partners may bring in different resources. Men or women with property can use this to 'buy' health of the other partner. If this is the case, we will not measure homogamy according to health, but higher class men or women may have a better chance to attract healthier partners (*differential exchange effect).*

1.3. Partner selection according to infant and child mortality in the family of origin

Which health characteristics are important and can be examined? The historical sources impose a serious limit to the possibility to analyse the role of health. In standard historical demographic databases, there are not many variables that indicate health characteristics of marriage partners. An interesting feature that can be measured is the level of infant and child mortality in the family of origin (the number of siblings of the spouses that died as an infant or as a child). The level of infant and child mortality in the village under observation, as in many other places, is high (reaching a peak level of about 300 infants dying per thousands births in the last decade of the 19th century, infra). This makes it a very visible characteristic. And the level of infant and child mortality differs between families (see section 2). This implies that contemporaries were able to distinguish between low and high mortality families.

Table 1. Overview of the possible role of infant and child mortality in the family of origin for partner selection

Determinants of partner selection	**Infant and child mortality related to:**
Structural	
- distribution over marriage candidates	
- meeting opportunities	Parish
- byproduct effect	Class, migration
Preferences	
1. instrumental	
- direct	Health (e.g. physical/genetic constitution, health in later life)
- indirect	Negative economic qualities (e.g. poverty, expected social mobility) Positive economic qualities (e.g. no competing siblings)
2. expressive-romantic	
- beauty	Appearance (e.g. smallpox)
3. group belonging	
- indirect effect	Reputation (e.g. breastfeeding, hygiene, child care)
Social control	

The level of infant and child mortality is a signal for its underlying causes and consequences, and these can be interpreted in the partner selection scheme (see table 1). Let us start by considering the causes. First, the biological constitution of the family is important. Genetical causes are thought of as being important for infant and child mortality (Johansson, 2004: 117-118). Therefore, if instrumental considerations determine partner selection, it may be worthwhile to evaluate infant and child mortality.

Second, poverty can lead to infant and child mortality (Johansson, 2004: 113) mainly via bad housing conditions, malnutrition (Scott & Duncan, 2000) and lack of decent medical care. If correct, this suggests that information on infant and child mortality offers a valuable and rather visible piece of information about the economic strength of a family. If so, the level of infant and child mortality leads to a better assessment of social position (indirect instrumental partner selection). Yet, research does not systematically confirm the relation between particularly infant mortality and class. Higher infant mortality figures for peasants than for the unpropertied are often reported (Bengtsson, 1999: 121). The main reason for this is the strong effect of breastfeeding practices.[6]

Third, infant and child mortality may reflect values and life styles and therefore are possibly connected to group membership. There are several reasons why values are at play: hygiene practices,

[6] Other factors that limit the impact of social class on infant mortality are infanticide, the delay of the mortality response with several years, underregistration of infant mortality, …(Bengtsson, 1999: 123).

breastfeeding practices[7] (Bengtsson, 1999: 121), the ideas parents have about the time and effort to invest in their children (Johansson, 2004: 116), patriarchal values about the internal family food distribution[8], … they all may affect mortality. Breastfeeding may be of crucial importance here. It is known that breastfeeding was not a generally applied habit in catholic regions. Breastfeeding was a target of all kinds of prejudices. The yellow/orange colour of the colostrums was 'devilish', sexual intercourse could have bad consequence for the quality of the mother milk, etc. (Jachowicz, 2002). In short, infant (and child) mortality is heavily related to hygiene and breastfeeding practices and these probably were central elements of the reputation of families. Some families were probably seen as nonchalant, or even lousy and this is shown, for example, in high numbers of infants and children dying in that family. If that reputation was taken into account, homogamy according to health characteristics can be expected.

So, infant and child mortality may possibly signal bad health, weak socio-economic position and life styles. Yet, while the number of infants and children that died is probably visible in a given village, it may be less clear, even for the contemporaries, what the underlying causes are. Perhaps it is the combination of these factors that is seen as the underlying cause. It seems plausible that in a society in which mortality is high and in which social stratification is not extremely sharp (they are all individuals in bad living conditions) infant and child mortality is one of the best indications of whether a family has problems coping with their bad living conditions and is therefore possibly a good indicator of the general quality of a family. It may, in the absence of other features, be a good practice not to ignore this aspect and it might sometimes even be more visible than wealth.

Also the consequences of infant and child mortality in the family of origin might be a target of partner selection strategies. First, bad living conditions and disease load, indicated by high levels of infant and child mortality, may have consequences for the rest of one's life. Research of Barker (1998), Bengtsson and Lindström (2003) and Fridlizius (1989) confirms that early life conditions affect health in later life. Research on the effect of early life conditions also shows its effect on social mobility (Svensson et al., 2004). If this effect on later life is strong, if this mechanism is visible for contemporaries and if infant and child mortality in the family of origin is a good indicator of this disease load, then infant and child mortality can be used in a direct (future health) or indirect (future social position) instrumental way. Second, also one's physical appearance may be affected by disease experience during childhood (supra).

A complicated question is whether there is a difference between infant and child mortality. There seem to be differences in causes of mortality. Other causes are important during the first month of life (endogenous causes), in the period of breastfeeding and in the period after breastfeeding (here poverty may have become more important). Yet, it is less clear whether contemporaries were aware of this and whether they evaluated infant and child mortality differently. If we assume that the level infant and child mortality is evaluated in a different way by contemporaries, then we can make the following conclusions. If we only find an effect of child mortality, this suggests that mortality is used to refine one's insight in economic characteristics of the family of origin. If, on the contrary, also or mainly infant mortality matters, this suggests that mortality is not evaluated because it is used to refine insight in the economic position of the family.

[7] For example breastfeeding practices may be different according to the social group one belongs to. Religious groups have been shown to differ in this respect (van Poppel, 2005; Kintner, 1987). As peasants also have substitutes (milk) (Bengtsson, 1999: 121) they possible breastfeed their children less.

[8] The position of females and their level of education is an important cause of decreasing infant and child mortality in contemporary societies. A better position of women seems to be associated with a more democratic (= not only the father and adult sons get food) distribution of medical care and allocation of food (Caldwell & McDonald, 1982).

Apart from different underlying causes, also the different visibility between infant and child mortality may be important. Infant mortality is typically higher, which probably created more variation amongst families in terms of the number of infants dying. The majority of families did not experience child mortality and the large majority would experience maximally once the death of a child between 1 and 5 (section 2).

So far, we treated infant and child mortality as a signal of negative characteristics of the family of origin. It can however not be excluded that the level of infant and child mortality in the family of origin has a positive effect. Infant and child mortality may limit the number of surviving children in a family. The fewer children, the better the chances for the surviving children to receive higher proportions of the resources present in the family.

1.4. Hypotheses

On the basis of this overview we derived the following hypotheses:

1. Under the condition that it is not extremely bad health, that the malthusian pressure on marriage is weak and that there is no different significance of health for one of the sexes, there is not necessarily a strong selection against bad health. Access to marriage is not very strongly affected as there is the possibility of assortative mating according to health. Yet, these conditions require almost modern living conditions. In pre-industrial society health is probably related to marriage access.

2. Health is important for the partner selection pattern. There are many potential reasons why there is homogamy according to health characteristics. Structural reasons (distribution of health over population, meeting opportunities, byproduct effect), but also preferences for partners with specific health characteristics are possibly important, in an direct instrumental way (health) or as a signal for other characterics (such as wealth, group membership, physical appearance).

3. We expect that health is most important for the partner selection of the (large) middle groups, that is, those with some secure access to land.

2. Context, data and methodology

2.1. Data

The database includes information from parochial and civil registers. It contains information on individuals who were born, married or died in Moerzeke.[9] The family reconstitution data represent the so-called stable population. This restricts the analysis in two ways. First, as we need information on the infant and child mortality of the family of origin, in practice the research will be limited to spouses whose parents lived in the village, as we almost have no information on migrants' parents' mortality experience and on their own marital behaviour. This means for example that we might miss the effect of mortality in the family of origin on marriages outside the village. This effect might be stronger than for marriages within the village, if we assume that those born in higher mortality families have less

[9] In the analysis we have information on the marital behaviour and on the mortality in the family of origin for individuals born between 1727 and 1908. The number of observations is about 1800 for the analysis of marriage access and about 1400 for the analysis of partner selection.

chance to marry and therefore have to migrate and find a spouse elsewhere (if we assume that mortality matters). Nevertheless, this does not mean that the expected effect should not be visible for the stable population. It simply means that we might measure not all effects of mortality in the family of origin.[10]

Second, the figures on infant and child mortality shown below are probably somewhat biased. We do not have information about the precise age at death of emigrants, nor do we have information on the precise migration date. Children who emigrated and who died before their fifth anniversary are not included in the number of dead children of a given family. We assume that emigrants survived their fifth anniversary. So if we refer to the level of infant and child mortality of a given family we refer to the observed and therefore minimal level of mortality.

However, this bias will not be very strong. The bias is present only if someone who marries in Moerzeke (and with parents living in Moerzeke) has siblings that emigrated and died before their fifth anniversary. As emigration before the fifth anniversary is much likely to be a family event, this implies that also the marrying individual probably emigrated (with his family of origin), and in particular given the low level of immigration (infra), the chance that this individual returned to the village to marry is not very large. Although it cannot be excluded that the family emigrated with very young children and came back with at least one child (the marrying child) while not with other children (for whom we do not have information on their age at death).

2.2. Context

Moerzeke is a small village in the centre of Flanders (Belgium), in the province of Eastern Flanders. It is geographically isolated as it is almost completely surrounded by the river Scheldt. The population of Moerzeke rose from approximately 2,000 in 1761 to 4,706 in 1950 (De Beule, 1962). Before we discuss mortality in Moerzeke, we first shortly discuss the economy and the social structure.

The agricultural sector was dominant until well into the 20th century. During the second half of the 19th century the rural textile industry became gradually more important, but in 1960 about 60% of the employed males were still involved in farming (De Beule, 1962). To classify the occupations present in the database we followed De Beule (1962) who distinguishes between three important groups in Moerzeke: the farmers, labourers and a rest group of non-manual occupations, the petty bourgeoisie, etc. The large majority of farmers had only access to a small piece of land. In the course of the 19th century the plots of land even became smaller. The other occupations can be divided in a lower status group that consists of occupations such as 'workers', day labourers, domestic servants, etc. ('lower class') and a higher status group which consists of bakers, doctors, owners, civil servants, etc. ('elite').

There is homogamy according to social origin.[11] The odds for sons of farmers to marry a daughter of farmers is 1,6 times higher than the odds for sons of lower status fathers ($p = 0,001$). The odds for sons of elite fathers to marry a daughter of elite fathers is 2,8 times higher than the odds for sons of lower status fathers ($p = 0,000$).

Moerzeke was a rather closed society in terms of geographical mobility. Immigration in particular was very limited (De Beule, 1962). Table 2 shows the migration status of grooms and brides that married in Moerzeke between 1700 and 1900. 62% of grooms and 66% of brides were born and died in Moerzeke.

[10] As will be shown in footnote 20 in section 3, there is more chance to emigrate if one is born in a high or medium infant mortality family, but the effect is not very strong.

[11] Data not shown. Measured using multinomial logistic regression with social origin bride as dependent variable and controlled for group sizes and year of birth of the groom.

Some 9% of males and about 18% of females was born in Moerzeke and died elsewhere. 16% of males were not born and did not die in Moerzeke. As it was the habit in Flanders to marry in the place of residence of the bride, they probably came to marry a local bride and lived elsewhere thereafter. Only 13% of males and 12% of females were born elsewhere and died in Moerzeke.[12]

Table 2. Couples marrying in Moerzeke between 1700 and 1900 according to migration status, percentages

	Males	**Females**
Born and died in Moerzeke	62.07	65.81
Born in Moerzeke, died elsewhere	8.69	17.99
Not born and not died in Moerzeke	16.07	4.19
Born elsewhere, died in Moerzeke	13.17	12.01
N	1898	1790

Next we provide some information on mortality in Moerzeke. The level of infant and child mortality was high (De Ridder, 1984). Table 3 shows the percentages of children dying at a given age (for individuals born in Moerzeke).[13] Of males born in Moerzeke some 9,7% died within one month, 14,5% after their first month and before their first anniversary and some 10% died between age 1 and 5. This means that about 35% of children died as an infant or as a child. The pattern for females is not very different, but with only 7,2% of deaths within the first month.

Table 3. Percentages of individuals dying at a given age

Males	**N**	**Percentage**	**Females**	**N**	**Percentage**
died within first month	643	9,7	died within first month	450	7,2
died after first month and before first year	961	14,5	died after first month and before first year	917	14,6
died between 1 and 5 years	687	10,3	died between 1 and 5 years	667	10,6
died after fifth year	2829	42,6	died after fifth year	2808	44,8
missing/emigrant	1518	22,9	missing/emigrant	1422	22,7
Total	6638	100	Total	6264	100

Table 4. Percentage of families that experience the death of children at a specific age

Number of deaths	**Neonatal**	**Infant**	**Child**	**Infant and child**
0	65.54	28.95	61.33	18.85
1	25.19	30.44	25.19	27.40
2	6.22	17.36	9.07	19.11
3	1.49	9.78	3.43	12.37
4	1.04	6.74	0.71	9.26
5	0.19	3.04	0.26	5.96
6	0.26	1.62		3.04
7	0.06	0.78		1.49
8		0.97		1.42
9		0.32		0.52
10				0.45
11				0.13
N	1544	1544	1544	1544

[12] We show this table as we use the marriages in Moerzeke later in the analysis. However, as information for the family of origin is required, only those born in Moerzeke are included in the analysis. The table also underestimates emigration as those marrying elsewhere are not included.

[13] In this section we present some general descriptive information on men and women born between 1727 and 1908, unless stated otherwise.

Table 4 shows the number of dead children by age for couples born in Moerzeke. For neonatal mortality we observe that about 65% of the couples (that at least have one child), does not experience a single death of one of their children during its first month. For 25% of the couples there is one death. These figures suggest that differentiation according to neonatal mortality is not very visible. This is different for infant mortality. Two extreme groups emerge. About 29% of the couples have no children dying during their first year, while 23% of the couples have at least 3 infants who died. This makes differentiation in infant mortality a very visible phenomenon. For child mortality, differentiation is not very visible, as about 86% of the couples do not have more than one dead child. In short, if visibility is a criterion, it is infant mortality that matters.

In the 18th century major mortality crises (mainly dysentery) occurred but these became less grave as the 18th century advanced (De Ridder, 1984). The village under study was possibly strongly affected by malaria, as the ecological conditions there were favourable for the development of this disease (Devos, 2001). Malaria patients had less resistance against, for example, dysentery, smallpox and typhus. Both typhus and dysentery are related to hygiene and contaminated food and water. Smallpox is a 'democratic' disease almost hitting everybody regardless social class. Malaria declined in Flanders during the 19th century (Devos, 2001). In the 19th century also the importance of smallpox declined due to vaccination programs, although there was regional variation in the strength of these programs.

Yet, infant mortality did not drop until the first decades of the 20th century. On the contrary, the number of infants that died increased in the second half of the 19th century. While this number was about 200 per thousand in the 18th century and in the first half of the 19th century, it gradually increased to more than 300 per thousand in the final decade of the 19th century. Reduced breastfeeding may be a plausible explanation for the high and increasing level of infant mortality. Breastfeeding gives advantages in terms of nutrition, immunity and sterility (Kintner, 1987). Therefore infectious diseases may have a less strong impact on breastfed babies. Catholics in general do less often breastfeed their children than others (Wolleswinkel-van den Bosch et al., 2000). In Flanders this habit even became less strong in the late 19th century. Also this habit can have strong regional variation. Yet, according to Buysse (1997) breastfeeding practices declined in the neighbouring village of Hamme. Furthermore, in an analysis restricted to children that died before their first anniversary we did not observe a relation between the number of days a child lived and the length of the birth interval to the subsequent birth (data not shown). As the death of the child coincides with the end of the breastfeeding period, the number of days the child lived should be related to the birth interval to the next child, if breastfeeding practices were strong (although the relation between infant death, breastfeeding and birth interval is far more complicated).[14] All this may indicate that infectious diarrheal diseases such as typhus and dysentery could have a strong and strengthening impact (Wolleswinkel-van den Bosch et al., 2000).

The seasonality pattern of infant mortality suggests the same development. Huck (1997) claims that for some English villages increased summer mortality is related to reduced breastfeeding practices as it is associated with diarrheal diseases (dysentery) that have peak mortality in july, august and september. Artificial food is known to have contributed to summer peaks in deaths due to diarrheal diseases. Respiratory diseases, on the contrary, are more dangerous in winter (Huck, 1997: 378). Smallpox has a peak in spring (april, may, june) while is at its lowest level in september, at least in Sweden (Sköld, 1996: 149). The pattern of seasonality of infant mortality for Moerzeke shows a clear peak in late summer months august and september. This peak is visible for males and females and became stronger for infants born between 1851 and 1900 (more than 16% while in the period 1700-1800 this was about 10% for males and 8% for females).

[14] A factor that complicates this relation is for example the practice of replacing the death child by a new one. The relationship may also be reversed: the long birth interval may increase survival chances of the previous child.

Finally we compare the level of infant and child mortality between different groups. First, the byproduct effect is not necessarily very large as the difference between farmers, elite and the lower class in the level of infant and child mortality is not very large, although mortality is bit lower for the elite in almost every category, except child mortality (table 5). This seems to suggest that, for contemporaries, infant and child mortality is probably not strongly associated with wealth.

Table 5. Mean number of children dying on a specific age in a family, according to social position of the family[15]

	Farmers	Elite	Lower class
Neonatal	0.43	0.44	0.51
Infant	1.52	1.33	1.54
Child	0,71	0,75	0,72
Infant and child	2.23	2.08	2.26
N	701	323	930

As Moerzeke is composed of two parishes (centrum and Kastel) there might also be a byproduct according to parish. We can classify the population only indirectly (see further). There seem to be some mortality differences between the parishes, with Kastel consequently showing the highest figures (table 6).

Table 6. Mean number of children dying on a specific age in a family, according to place of residence

	Centrum	Mixed	Kastel	Unknown
Neonatal	0.47	0.61	0.52	0.48
Infant	1.62	1.77	2.00	1.56
Child	0.50	0.61	0.69	0.58
Infant and child	2.12	2.37	2.69	2.14
N	303	145	132	1013

2.3. General methodological issues

Before we give details on the models and the variables we address some general methodological issues. As we examine the partner selection of all individuals in the village, we have to deal with the problem of non-independent observations. The analyses include brothers and sisters. This makes it necessary to adopt a multilevel strategy. Consequently, we will add a family identification variable to the model. We estimate a random intercept but do not estimate random slopes. The latter is not necessary as we do not intend to evaluate the different effects the variables have in each family. Clearly, this does not make much sense in a case like this in which level 2-units (families) only have few or even only one observation. In practice the non-independency of observations turned out to be unproblematic. As there are many persons that do not have brothers or sisters in the analysis, in particular in the partner selection analysis (this signifies that they are the only person of a family who marries in Moerzeke), adding this family identification variable did not lead to very different results than we would have obtained in an analysis without the multilevel design.

We look at information on the partner selection of first marriages. Although the partner selection of remarrying persons is not without significance, at this stage we aim to keep the analysis simple and avoid that remarriage, that differs in many ways from first marriages (Matthijs, 2002), affects the analyses.

[15] These figures might be misleading in the sense that family sizes are not taken into account. But it is difficult to control for this as also mortality might influence family size.

To estimate the number of dead infants and children in the family of origin we look at the children of the biological parents of the individual for whom marriage access or partner selection is examined. This is the most direct estimation of the mortality of the family of origin, yet, this means that information about children born to one of the biological parents and a new or previous partner is not counted. For some individuals, we will underestimate the level of mortality within their close environment. Yet, simply adding the number of dead infants and children of the subsequent or previous family of one of the biological parents is probably also misleading. Does one interpret mortality of the 'biological' family and the new or old family with stepfather or -mother in the same way? Not using this information may lead to 'noise', as not all mortality is counted, but that may be preferred above mixed, difficult to interpret information. Furthermore, in the analyses about 87% of the spouses have a family of origin composed of both biological parents.

2.4. Models and variables

Marriage access

We will perform two sets of multilevel logistic regression analyses. First we address the role of infant and child mortality for marriage access.[16] The analysis is straightforward. We selected individuals (men and women separately) having reached at least the age of 50 (ensuring that every individual had the opportunity to marry before they died) and examined whether men and women born in families with high infant and child mortality had less chance than others to marry. We use two different sets of models to measure the effect of mortality in the family of origin on marriage access. In the first set we use a combined variable measuring infant and child mortality. In the second set we use seperate variables for infant and child mortality.

This strategy has the advantage that we will be able to observe whether infant rather than child mortality is used as a criterion. If, for example, mainly infant mortality shows an effect, it might be that combining it with child mortality makes its effect less clear. If, however, the effect is caused by both infant as child mortality, it is possible that the latter strategy does not lead to any significant result (although it is not impossible that both will have a significant effect) as these variables are used in the same model and control for each other (what does not make sense if the villagers do not distinguish between both types of mortality). In fact, although it is pretty likely that infant mortality has the largest effect (being the most visible of the two types of mortality), it seems to us that child mortality is probably not evaluated very differently, as if it were an irrelevant characteristic of the family of origin. Indeed, the less strong impact of breastfeeding in this catholic village is also a factor that makes the difference between infant and child mortality less strong. Furthermore, both variables are to some extent correlated. Substantially this means that it is less imporant for the villagers to seperate them. Technically this means that controlling for one of these variables makes it more difficult to find significant results for the other variable. Therefore, we will devote most of our attention to the analysis of the combined effect, and add the separated variables to check whether the combined effect is mainly the result of infant or child mortality.

For each model the *dependent variable* is whether individuals marry or not. For each set of models (combined and seperate variables), we start by using a basic model (model A) containing mortality and year of birth as independent variables. In the next step we add control variables to see whether the assumed effect of mortality can be explained by one of these (model B). In model C we add interaction

[16] We perform different analyses for marriage access and partner selection as they have different underlying selection mechanisms (see for example the principle decision of whether to marry or not, supra) and we do not want to mix up these differences.

variables (with social position and social origin) to evaluate whether the effect of mortality in the family of origin is different according to social position or origin. We analyse grooms and brides in separate analyses.

Independent variables:
- Infant and child mortality in family of origin[17]
1 (low) = number of infants and children that died is lower or equal to 1
2 (medium) = number of infants and children is equal to 2
3 (high) = number of infants and children that died is higher than 2 (reference category)

- Infant mortality in family of origin
1 = number of infants that died is lower or equal to 1
2 = number of infants is equal to 2
3 = number of infants that died is higher than 2 (reference category)

- Child mortality in family of origin
1 (low) = number children that died is equal to 0
2 (medium or high) = number children that died is equal to or higher than 1 (reference category)

Control variables:
We add these variables as they may be both related to mortality as to marriage access.
- Year of birth
- Birth rank
- Number of male siblings surviving until the age of 20
- Number of female siblings surviving until the age of 20

- Social origin of father
1 = farmer
2 = elite
3 = lower class (reference category)

- Social position
Same categories as social origin. For women we added the category "no information".

- Parish of residence
The village under observation includes several parishes. There is not much doubt that meeting opportunities are greater for inhabitants of the same parish (De Beule, 1962). Unfortunately, we do not have information on the place of residence. We do have some information that may give a hint. De Beule lists family surnames that are typical for the village center and for Kastel. We constructed a variable that measures parish by using this information.
1 = Center
2 = Mixed
3 = Kastel
4 = Unknown (reference category)

[17] Another possibility is to use the 'failure rate' (percentage of children in a given family that died as an infant or child) instead of the absolute number of deaths. In our view the absolute number is more revealing as for instance four infant deaths on nine children is probably more informative for the contemporaries than a failure rate of 50% in a family with two children. Yet, the choice between these two types of categorizations is not problematic as the percentage and the number of deaths is strongly correlated. The high failure percentage families do also have a larger absolute number of deaths compared to low failure families. Furthermore, replacing the variables in the analyses did not lead to very different results (not shown).

- Migration
1 = born and died in Moerzeke, the stable population
2 = others (reference category)

Partner selection

Second, we address partner selection. We chose to use the characteristics of one of the spouses as the dependent variable, framing the analysis in terms of avoiding marriage with a high mortality spouse, rather than use characteristics of the marriage (homogamous or heterogamous according to mortality) as the dependent variable. The models estimate the chances that grooms have to marry specific types of brides and vice versa. This strategy permits to interpret control variables such as social position, as another characteristic that can be used to avoid high mortality partners, in a straightforward way. The differential exchange effect would not be measured if we used mortality homogamy as the dependent variable. However, this choice is only a matter of semantics, as also homogamous preferences will be measured (in that case high mortality grooms will have higher chances to marry high mortality brides), if present. We analyse grooms and brides in separate analyses.

We use three sets of models. The first uses a combined variable for infant and child mortality for both the independent as the dependent variable. In the second and third set the level of infant and child mortality are used separately as independent variables. In the second we use the level of infant mortality and in the third the level of child mortality as the dependent variable.

Dependent variable in the analysis of partner selection of grooms (brides)
- Marrying a partner with a medium or high level of *infant and child* mortality in the family of origin:
0 (low) = number of infants and children that died is lower or equal to 1
1 (medium or high) = number of infants and children that died is higher than 1

- Marrying a partner with a medium or high level of *infant* mortality in the family of origin:
0 (low) = number of infants that died is lower or equal to 1
1 (medium or high) = number of infants that died is higher than 1

- Marrying a partner with a medium or high level of *child* mortality in the family of origin:
0 (low) = number of children that died is equal to 0
1 (medium or high) = number of children that died is higher than 0

Independent variables:

- level of infant and child mortality in family of origin groom:
See variables for marriage access models

Structural causes

Controlling for the basic structural effect of the distribution of the level of mortality does not require a group size variable if the dependent variable is marrying a partner belonging to a specific mortality category. If 60% of the families of origin of the brides have a low level of mortality, then every groom, irrespective of his social background, has 60% chance to marry a bride belonging to this category (in case of random partner selection). Controlling for group size is important when modelling frequencies

of homogamy (as in loglinear analysis) or when modelling chances to marry homogamous. The byproduct and the meeting opportunities effect do require control variables:

- Social origin of groom/bride (see marriage access models for categories)
If mortality is associated with social origin, than some groups have a greater chance to marry a partner with the same mortality level in the family of origin (if there is homogamy according to social origin). This controls for the byproduct effect.

- Migration (see marriage access models for categories)
The same goes for migration. If migrants have a different level of mortality, then homogamy according to geographical origin inevitably leads to homogamy according to mortality. If migrants have lower mortality, than migrants will have a better chance of marrying a low mortality spouse. So if we control for being a native or migrant, we will know whether there is an effect independent of migration.

- Parish of residence (see marriage access models for categories)
Idem.

- Period
Technically, also period determines meeting opportunities. If subperiods have different mortality levels, and usually they do of course, then, inevitably, high levels of homogamy will be measured. To control for this, we add year of birth of the spouse.

Preferences
Distinguishing between the different types of preferences is impossible by introducing additional variables. If there is an effect of the level of mortality of the family of origin, then this indicates homogamy. But whether there is homogamy because couples use mortality for its information on health, beauty, group bonds or economic characteristics, is not possible to determine by introducing variables to the model.

Other control variables
- Social position of groom/bride
With this variable we examine whether social position can be used in an exchange with health characteristics.

- Family of origin: identification number of the family
Variable introduced to control for the multilevel effect.

- Number of females and males surviving until their 20^{th} anniversary
Variable introduced to control for the positive effect of the mortality of siblings.

- Birth rank
Although there is an egalitarian inheritance system, we cannot exclude an effect of birth rank on marriage access and partner selection.

3. Results

3.1. Access to marriage

Table 7 shows the results of the logistic regression analysis of the chance for men to get married versus to remain unmarried. The level of infant and child mortality in the family of origin is as such not related to marriage access (model A). The estimates for 'infant and child mortality' increase after adding control variables (model B) but remain insignificant (p = 0,12). The estimates for social origin show that sons of farmers and of the elite have less chance to marry. The groom's own social position is also important, but the relation is different: lower status men have lower chances to marry. Striking are the positive effect of birth rank (the higher the birth rank, the more chance to marry) and the negative effect of the number of female siblings that survive until their 20th anniversary. The first can be seen as the consequence of the policy of parents to keep their oldest son at home to assist them coping with the household's economic needs (De Beule, 1962). The latter effect is puzzling. That the number of adult siblings has a negative impact on marriage access, is plausible. Yet, why in particular the number of female siblings has such an effect is unclear.

The picture about the role of mortality in the family of origin on marriage access becomes clearer when we look the results of model C that includes interaction effects. The main effects show the effects for the reference groups included in interaction terms (lower class). For this reference group, the estimate for infant and child mortality is not significant, yet, if we use farmers as reference groups then the effect of infant and child mortality is significant (t = 2,02; p = 0,04; not shown in table). Model C also shows that for sons who themselves belong to the elite, infant and child mortality has a significantly weaker effect on marriage access. It appears that the negative effect of high mortality is compensated by upward social mobility.[18]

In table 8 we separate infant and child mortality in two different variables. This analysis shows that men born in families in which infant mortality was low or moderate have a greater chance to marry (model A). Or to put it different, those men born in high mortality families with at least three infants that died, have a smaller chance to get married. The control variables do not explain the effect of infant mortality (model B). Model C shows interaction effects. For men that themselves belong to the elite, the infant mortality effect is less strong. This shows again that they use their upward mobility to attract a healthy spouse. For men that are farmers there is a significant stronger effect of child mortality on marriage access.

The analysis shows somewhat different results for women (table 9 and 10). Using a combined variable for infant and child mortality shows that low mortality women have a greater chance to marry (model A). The control variables do not explain this effect (model B). The effect of social origin and position on marriage access is less strong for women.[19] There are no interaction effects (model C). These results might signify that selection into marriage was somewhat strong for women.[20] Or it might signify that it was somewhat easier for men to compensate their bad health characteristics by economic resources.

[18] This may be the product of both the direct exchange for health as the better chance to marry an elite woman, who has to some extent more chance to be born in a low mortality family (section 2).

[19] The effect of 'no occupation' is probably misleading as for women that did not marry there was a less strong chance that an occupation was recorded, as the main source of information on occupations was the marriage certificate.

[20] This difference between men and women might be related to some specific characteristics of the marriage market of the village. Of the population dying in Moerzeke after their 50th anniversary, the percentage of men that married was about 8% higher than for women. Emigration was a bit stronger for men (the percentage of emigrating man was 2% higher) and immigration stronger for women (the percentage of immigrating women was 2% higher), creating a marriage market that was to some extent less favourable to them. Furthermore, for those women who reached the age of twenty, the percentage of

Table 7. Logistic regression of the chance to marry versus remaining unmarried, men (N = 1834, 1565 and 1565 respectively)[21]

	Model A		Model B		Model C	
	B	**Sig.**	**B**	**Sig.**	**B**	**Sig.**
Constant	6,30	0,09	18,25	0,002	17,89	0,003
Infant and child mortality						
Low (0 or 1)	0,125	0,51	0,38	0,12	0,38	0,33
Medium (2)	0,091	0,69	0,14	0,62	0,22	0,64
High (more than 2) (ref.)						
Year of birth	-0,002	0,23	-0,008	0,007	-0,008	0,01
Social origin						
Farmer			-0,65	0,005	-0,69	0,09
Elite			-1,17	0,001	-0,94	0,17
Lower class (ref.)						
Social position						
Farmer			1,47	0,001	1,28	0,001
Elite			2,48	0,001	3,34	0,001
Lower class (ref.)						
Parish						
Center			0,14	0,61	0,012	0,65
Mixed			-0,30	0,40	-0,36	0,32
Kastel			0,56	0,18	0,55	0,20
Unknown (ref.)						
Migration						
Born and died in the village			-0,21	0,44	-0,21	0,46
Migrant (ref.)						
Birth rank			0,11	0,001	0,11	0,001
Number of male siblings above 20			-0,08	0,28	-0,09	0,25
Number of female siblings above 20			-0,38	0,001	-0,40	0,001
Interaction effects						
*Social origin*infant and child mortality*						
Farmers*low infant and child mortality					0,26	0,63
Farmers*medium infant and child mortality					-0,36	0,58
Elite*low infant and child mortality					-0,12	0,87
Elite*medium infant and child mortality					-0,50	0,59
*Social position*infant and child mortality*						
Farmers*low infant and child mortality					0,21	0,59
Farmers*medium infant and child mortality					0,43	0,35
Elite*low infant and child mortality					-1,61	0,01
Elite*medium infant and child mortality					-0,43	0,56

low infant mortality families was about 7% higher for natives than for emigrants, suggesting that there was some stronger pressure for the unhealthy to move. For men this was about 3%. For child mortality no similar differences were found.

[21] In the table we show b-parameters, not exponents. We did not print the multilevel estimates of the intercept. Tolerance statistics for all analyses showed that there were no problems of multi-collinearity.

Table 8. Logistic regression of the chance to marry versus remaining unmarried, men (N = 1834, 1565 and 1565 respectively)

	Model A		Model B		Model C	
	B	**Sig.**	**B**	**Sig.**	**B**	**Sig.**
Constant	5,63	0,13	16,4	0,006	14,4	0,01
Infant mortality						
Low (0 or 1)	0,56	0,01	0,67	0,017	0,92	0,03
Medium (2)	0,91	0,001	1,03	0,002	1,48	0,008
High (more than 2) (ref.)						
Child mortality						
Low (0)	-0,01	0,90	0,33	0,11	0,30	0,35
Medium or high (1 or more)						
Year of birth	-0,002	0,24	-0,008	0,01	-0,007	0,02
Social origin						
Farmer			-0,63	0,005	-0,34	0,53
Elite			-1,17	0,001	-1,93	0,04
Lower class (ref.)						
Social position						
Farmer			1,39	0,001	1,33	0,001
Elite			2,45	0,001	4,45	0,001
Lower class (ref.)						
Parish						
Center			0,23	0,41	0,22	0,43
Mixed			-0,16	0,65	-0,24	0,50
Kastel			0,72	0,07	0,62	0,13
Unknown (ref.)						
Migration						
Born and died in the village			-0,19	0,47	-0,20	0,46
Migrant (ref.)						
Birth rank			0,09	0,001	0,10	0,001
Number of male siblings above 20			-0,10	0,19	-0,11	0,15
Number of female siblings above 20			-0,34	0,001	-0,35	0,001
Interaction effects						
*Social origin*infant mortality*						
Farmers*low infant mortality					0,16	0,78
Farmers*medium infant mortality					-0,67	0,37
Elite*low infant mortality					1,67	0,09
Elite*medium infant mortality					0,91	0,43
*Social position*infant mortality*						
Farmers*low infant mortality					-0,53	0,24
Farmers*medium infant mortality					-0,42	0,44
Elite*low infant mortality					-3,02	0,001
Elite*medium infant mortality					-1,18	0,25
*Social origin*child mortality*						
Farmers*low child mortality					-0,52	0,26
Elite*low child mortality					-1,00	0,11
*Social position*child mortality*						
Farmers*low child mortality					0,87	0,009
Elite*low child mortality					0,32	0,54

Separating infant and child mortality makes the effect insignificant (table 10). This suggests that infant and child mortality had a conjoint effect. It might be that both phenomena were evaluated as a whole. Infant and child mortality are to some extent also correlated, with low infant mortality families also

having a greater chance to be a low child mortality family.[22] Nevertheless, also for women the estimates for infant mortality are largest.

These results show, in general, that infant and child mortality in the family of origin affects the chances to marry. This suggests that the principle is 'better no husband/wife than an unhealthy one'. Given the absence of good agricultural ground and farms, it was not easy to establish an independent household in Moerzeke (De Beule, 1962). And in these conditions, one might expect that selection into marriage is stronger than is the case when it is easier to establish an independent household. It is in this aspect important that the strongest effect is observed for farmers' sons. In short, the selection effect rather than the assortative mating effect determines access into marriage.

Table 9. Logistic regression of the chance to marry versus remaining unmarried, women (N = 1616, 1372 and 1372 respectively)

	Model A		**Model B**		**Model C**	
	B	**Sig.**	**B**	**Sig.**	**B**	**Sig.**
Constant	-3,25	0,32	-8,07	0,11	-7,98	0,12
Infant and child mortality						
Low (0 or 1)	0,38	0,02	0,50	0,02	0,40	0,23
Medium (2)	0,25	0,19	0,33	0,18	0,16	0,68
High (more than 2) (ref.)						
Year of birth	0,002	0,19	0,005	0,04	0,005	0,04
Social origin						
Farmer			0,06	0,76	-0,18	0,63
Elite			-0,20	0,44	-0,71	0,11
Lower class (ref.)						
Social position						
No occupation			-2,71	0,001	-2,38	0,001
Farmer			0,43	0,03	0,53	0,10
Elite			-0,85	0,00	-0,87	0,12
Lower class (ref.)						
Parish						
Center			0,17	0,52	0,17	0,52
Mixed			-0,14	0,66	-0,10	0,75
Kastel			0,31	0,38	0,30	0,39
Unknown (ref.)						
Migration						
Born and died in the village			-0,46	0,12	-0,47	0,12
Migrant (ref.)						
Birth rank			0,004	0,83	0,003	0,89
Number of male siblings above 20			-0,12	0,06	-0,11	0,07
Number of female siblings above 20			-0,07	0,33	-0,08	0,28
Interaction effects						
*Social origin*infant and child mortality*						
Farmers*low infant and child mortality					0,16	0,73
Farmers*medium infant and child mortality					0,80	0,16
Elite*low infant and child mortality					0,68	0,26
Elite*medium infant and child mortality					1,15	0,13
*Social position*infant and child mortality*						
No occupation*low infant and child mortality					-0,43	0,33
No occupation*medium infant and child mortality					-0,72	0,17
Farmers*low infant and child mortality					-0,05	0,91
Farmers*medium infant and child mortality					-0,50	0,36
Elite*low infant and child mortality					0,35	0,63
Elite*medium infant and child mortality					-0,72	0,41

[22] For men, the proportion of low infant mortality families is 15% higher for low child mortality families than for medium and high child mortality families. For women this proportion is 14%.

Table 10. Logistic regression of the chance to marry versus remaining unmarried, women (N = 1616, 1372 and 1372 respectively)

	Model A		Model B		Model C	
	B	**Sig.**	**B**	**Sig.**	**B**	**Sig.**
Constant	-4,09	0,22	-8,46	0,11	-7,73	0,16
Infant mortality						
Low (0 or 1)	0,31	0,12	0,36	0,15	0,34	0,40
Medium (2)	0,04	0,85	0,29	0,32	-0,06	0,89
High (more than 2) (ref.)						
Child mortality						
Low (0)	0,04	0,78	0,11	0,55	-0,48	0,12
Medium or high (1 or more)						
Year of birth	0,002	0,12	0,005	0,04	0,005	0,05
Social origin						
Farmer			0,005	0,89	-0,18	0,73
Elite			0,02	0,29	-1,61	0,02
Lower class (ref.)						
Social position						
No occupation			0,16	0,001	-3,08	0,001
Farmer			0,03	0,07	0,08	0,84
Elite			-0,29	0,01	-0,76	0,38
Lower class (ref.)						
Parish						
Center			0,16	0,51	0,27	0,33
Mixed			-0,09	0,77	-0,07	0,82
Kastel			0,38	0,30	0,34	0,36
Unknown (ref.)						
Migration						
Born and died in the village			-0,40	0,17	-0,41	0,17
Migrant (ref.)						
Birth rank			-0,001	0,93	-0,001	0,95
Number of male siblings above 20			-0,08	0,21	-0,08	0,21
Number of female siblings above 20			-0,11	0,18	-0,12	0,14
Interaction effects						
*Social origin*infant mortality*						
Farmers*low infant mortality					-0,37	0,51
Farmers*medium infant mortality					-0,28	0,67
Elite*low infant mortality					0,82	0,26
Elite*medium infant mortality					0,67	0,45
*Social position*infant mortality*						
No occupation*low infant and child mortality					-0,07	0,89
No occupation*medium infant and child mortality					0,86	0,17
Farmers*low infant mortality					0,01	0,97
Farmers*medium infant mortality					0,51	0,42
Elite*low infant mortality					0,50	0,58
Elite*medium infant mortality					-0,11	0,91
*Social origin*child mortality*						
Farmers*medium and high child mortality					0,95	0,03
Elite*medium and high child mortality					1,28	0,02
*Social position*child mortality*						
No occupation*medium and high child mortality					0,07	0,84
Farmers*medium and high child mortality					0,30	0,45
Elite*medium and high child mortality					-0,65	0,31

3.2. Partner selection according to infant and child mortality in the family of origin

Table 11 shows the results of the logistic regression analysis of the chance to marry a high or medium level infant and child mortality partner versus marrying a low level mortality partner for men. In table 12 and 13 we perform the same analysis, but now for infant and child mortality separately.

For men, the conclusion is rather straightforward: if one is born in a family with low infant and child mortality, one has more chance to marry a bride that was born in a low infant and child mortality family (tabel 11, model A). The estimate of -0,31 signifies that the odds for men born in a low mortality family of origin to marry a bride born in a low mortality family is 1,36 times higher compared to men born in a high mortality family of origin. The crude observations (not shown) in percentages show that the percentage of men that marries a low mortality bride is about 10% higher for men born in a low mortality family than men born in a high mortality family.

Model B shows that this effect is not caused by the control variables. Model B also shows that sons who belong to the elite do have less chance to marry a high mortality bride. This is not because they are possibly also sons of elite fathers (the model controls for social origin), but suggests the existence of an exchange effect. These elite sons are possibly exchanging their socio-economic position for the low mortality of the family of the bride. The effect for farmers is not but almost significant ($p = 0,065$). Model C adds interaction effects. The interaction effect shows that the effect of infant and child mortality of the family of origin of the groom is strongest for sons of farmers. The effect does not differ between the elite and the lower class. This shows that homogamy according to infant and child mortality is strongest in the 'middle group' of the village's social structure. Among the lower class sons and daughters, the competition for scarce marriage candidates with land is probably extremely important and therefore it is difficult for them to combine it with a rigorous application of health criteria. An illustrative example of this is the higher level of homogamy according to social position (of the couple) for sons and daughters of lower class fathers. For sons and daughters of lower class parents, farmers' homogamy is much stronger than among sons and daughters of farmers.[23]

The interaction effect of social position and infant and child mortality shows that the effect of mortality is less strong for elite sons. This suggests, again, that their social position is more important tool on the marriage market.

Table 12 (model A en B) shows that sons of low infant mortality families have less chance to marry high infant mortality brides. The effect of low child mortality in the family of origin on the chance to marry a high child mortality bride (table 13) is only present after adding the control variables. Note also that there is to some extent an effect of the level of infant mortality of the groom on the level of child mortality of his bride, and vice versa. These results show that there is no distinction between infant and child mortality, and seperating both effects is in fact not necessary.

[23] For marriages composed of sons and daughters of lower class workers (a category with a low level of homogamy according to health), homogamy of farmers is 1,5 times stronger than is the case for marriages composed of sons and daughters of farmers (a category with high homogamy according to health). This is not to say that sons and daughters of farmers chose their partners irrespective of their social background. Yet, for farmers' children marrying farmer's children, health characteristics were more important than for children of lower class workers who still had to compete for the scarce potential spouses that had some land at their disposal.

Table 11. Logistic regression of the chance to marry a medium or high *infant and child* mortality bride (N = 1348, 1208 and 1208 respectively)

	Model A		**Model B**		**Model C**	
	B	**Sig.**	**B**	**Sig.**	**B**	**Sig.**
Constant	-7,09	0,007	-14,15	0,001	-14,3	0,001
Infant and child mortality						
Low (0 or 1)	-0,31	0,01	-0,39	0,01	-0,31	0,24
Medium (2)	-0,17	0,28	-0,30	0,08	-0,53	0,09
High (more than 2) (ref.)						
Year of birth	0,004	0,005	0,008	0,001	0,008	0,001
Social origin						
Farmer			0,11	0,42	0,52	0,04
Elite			-0,008	0,96	0,07	0,83
Lower class (ref.)						
Social position						
Farmer			-0,27	0,06	-0,55	0,04
Elite			-0,50	0,009	-0,84	0,01
Lower class (ref.)						
Parish						
Center			-0,12	0,42	-0,10	0,51
Mixed			-0,16	0,47	-0,13	0,57
Kastel			-0,04	0,83	-0,04	0,85
Unknown (ref.)						
Migration						
Born and died in the village			0,11	0,51	0,10	0,53
Migrant (ref.)						
Birth rank			-0,02	0,35	-0,02	0,34
Number of male siblings above 20			-0,03	0,43	-0,03	0,49
Number of female siblings above 20			-0,01	0,80	-0,01	0,74
Interaction effects						
*Social origin*infant and child mortality*						
Farmers*low infant and child mortality					-0,70	0,03
Farmers*medium infant and child mortality					-0,39	0,32
Elite*low infant and child mortality					0,001	0,99
Elite*medium infant and child mortality					-0,55	0,32
*Social position*infant and child mortality*						
Farmers*low infant and child mortality					0,25	0,45
Farmers*medium infant and child mortality					0,57	0,15
Elite*low infant and child mortality					0,22	0,60
Elite*medium infant and child mortality					1,07	0,04

Table 12. Logistic regression of the chance to marry a medium or high **infant** mortality bride (N = 1348, 1208, and 1208 respectively)

	Model A		**Model B**		**Model C**	
	B	**Sig.**	**B**	**Sig.**	**B**	**Sig.**
Constant	-16,6	0,001	-24,2	0,001	-24,6	0,001
Infant mortality						
Low (0 or 1)	-0,39	0,02	-0,39	0,03	0,12	0,73
Medium (2)	-0,49	0,01	-0,47	0,02	-0,19	0,64
High (more than 2) (ref.)						
Child mortality						
Low (0)	-0,16	0,17	-0,26	0,04	-0,14	0,53
Medium or high (1 or more)						
Year of birth	0,009	0,001	0,01	0,001	0,01	0,001
Social origin						
Farmer			0,00	0,99	0,41	0,26
Elite			-0,28	0,16	-0,03	0,96
Lower class (ref.)						
Social position						
Farmer			0,004	0,97	0,49	0,22
Elite			-0,22	0,26	-0,13	0,78
Lower class (ref.)						
Parish						
Center			-0,10	0,52	-0,10	0,53
Mixed			0,03	0,87	0,06	0,77
Kastel			-0,04	0,85	-0,03	0,88
Unknown (ref.)						
Migration						
Born and died in the village			-0,12	0,46	-0,13	0,44
Migrant (ref.)						
Birth rank			-0,008	0,70	-0,01	0,53
Number of male siblings above 20			0,01	0,71	0,03	0,46
Number of female siblings above 20			-0,04	0,35	-0,05	0,26
Interaction effects						
*Social origin*infant mortality*						
Farmers*low infant mortality					-0,28	0,47
Farmers*medium infant mortality					-0,06	0,89
Elite*low infant mortality					-0,14	0,83
Elite*medium infant mortality					-0,34	0,64
*Social position*infant mortality*						
Farmers*low infant mortality					-0,58	0,17
Farmers*medium infant mortality					-0,45	0,38
Elite*low infant mortality					-0,53	0,34
Elite*medium infant mortality					0,20	0,75
*Social origin*child mortality*						
Farmers*medium and high child mortality					-0,41	0,15
Elite*medium and high child mortality					-0,23	0,58
*Social position*child mortality*						
Farmers*medium and high child mortality					-0,02	0,93
Elite*medium and high child mortality					0,48	0,24

Table 13. Logistic regression of the chance to marry a medium or high **child** mortality bride (N = 1348, 1208, and 1208 respectively)

	Model A		**Model B**		**Model C**	
	B	**Sig.**	**B**	**Sig.**	**B**	**Sig.**
Constant	9,77	0,001	9,53	0,008	9,83	0,007
Infant mortality						
Low (0 or 1)	-0,21	0,19	-0,26	0,12	-0,13	0,68
Medium (2)	-0,38	0,03	-0,45	0,02	-0,48	0,21
High (more than 2) (ref.)						
Child mortality						
Low (0)	-0,16	0,14	-0,24	0,04	-0,51	0,01
Medium or high (1 or more)						
Year of birth	-0,005	0,001	-0,005	0,008	-0,05	0,008
Social origin						
Farmer			0,15	0,26	0,06	0,85
Elite			0,05	0,76	0,15	0,81
Lower class (ref.)						
Social position						
Farmer			-0,10	0,44	-0,002	0,99
Elite			-0,21	0,25	-0,61	0,20
Lower class (ref.)						
Parish						
Center			0,05	0,72	0,05	0,72
Mixed			0,33	0,11	0,43	0,04
Kastel			0,09	0,65	0,06	0,75
Unknown (ref.)						
Migration						
Born and died in the village			0,01	0,91	0,01	0,91
Migrant (ref.)						
Birth rank			-0,02	0,24	-0,02	0,23
Number of male siblings above 20			0,003	0,94	0,01	0,82
Number of female siblings above 20			0,009	0,84	0,02	0,70
Interaction effects						
*Social origin*infant mortality*						
Farmers*low infant mortality					-0,22	0,54
Farmers*medium infant mortality					0,76	0,09
Elite*low infant mortality					-0,18	0,78
Elite*medium infant mortality					0,32	0,66
*Social position*infant mortality*						
Farmers*low infant mortality					-0,26	0,49
Farmers*medium infant mortality					-0,64	0,17
Elite*low infant mortality					0,43	0,41
Elite*medium infant mortality					-0,35	0,57
*Social origin*child mortality*						
Farmers*medium and high child mortality					0,14	0,60
Elite*medium and high child mortality					-0,12	0,74
*Social position*child mortality*						
Farmers*medium and high child mortality					0,35	0,21
Elite*medium and high child mortality					0,40	0,28

For women the situation is somewhat different.[24] Here again it is the combined variable that shows an effect (table 14). Women born in a family with low infant and child mortality have more chance to

[24] The somewhat different results for men and women are at first sight somewhat puzzling as after all the same marriages are analysed. To understand this it is instructive to have the partner selection table (infant mortality men versus infant

avoid a medium and high mortality groom than high mortality women. For the separate variables, these results were not found (table 15 and 16). The estimates are, as expected, negative, but are from statistically significant. This again shows that it is not really necessary to seperate these variables, but mind that the largest effect is usually found for the level of infant mortality.

Table 14. Logistic regression of the chance to marry a medium or high *infant and child* mortality groom (N = 1230, 1068 and 1068 respectively)

	Model A		**Model B**		**Model C**	
	B	**Sig.**	**B**	**Sig.**	**B**	**Sig.**
Constant	-7,39	0,006	-6,87	0,07	-7,38	0,06
Infant and child mortality						
Low (0 or 1)	-0,34	0,01	-0,41	0,01	-0,33	0,15
Medium (2)	-0,11	0,46	-0,16	0,35	-0,14	0,60
High (more than 2) (ref.)						
Year of birth	0,004	0,004	0,003	0,05	0,004	0,04
Social origin						
Farmer			0,20	0,17	-0,09	0,70
Elite			-0,12	0,54	0,25	0,50
Lower class (ref.)						
Social position						
No occupation			0,12	0,61	0,37	0,40
Farmer			-0,14	0,31	0,06	0,81
Elite			0,19	0,55	0,83	0,32
Lower class (ref.)						
Parish						
Center			-0,15	0,39	-0,15	0,37
Mixed			-0,05	0,81	-0,04	0,84
Kastel			-0,13	0,54	-0,09	0,68
Unknown (ref.)						
Migration						
Born and died in the village			0,001	0,99	-0,01	0,92
Migrant (ref.)						
Birth rank			0,012	0,58	0,01	0,61
Number of male siblings above 20			-0,01	0,70	-0,07	0,86
Number of female siblings above 20			-0,06	0,19	-0,06	0,20
Interaction effects						
*Social origin*infant and child mortality*						
Farmers*low infant and child mortality					0,20	0,55
Farmers*medium infant and child mortality					0,84	0,03
Elite*low infant and child mortality					-0,60	0,21
Elite*medium infant and child mortality					-0,29	0,62
*Social position*infant and child mortality*						
No occupation*low infant and child mortality					0,04	0,93
No occupation*medium infant and child mortality					-1,28	0,07
Farmers*low infant and child mortality					-0,16	0,61
Farmers*medium infant and child mortality					-0,55	0,16
Elite*low infant and child mortality					-0,52	0,58
Elite*medium infant and child mortality					-1,38	0,20

For women we did not observe an interaction effect by social origin or position that is comparable with the ones found for men. This signifies that if we sort the marriages by social origin of the bride, we do

mortality women) in mind. The difference stems from the fact that the partner selection table is not fully symmetrical. The difference in the chance to marry low mortality men between low and high mortality women is less strong than the difference in the chance to marry low mortality women between low and high mortality men. In the analyses for men and women we look at different aspects of the partner selection table.

not find differences in homogamy, while we do find differences if we sort the marriages according to social origin of the groom. Furthermore, there are no direct effects of social origin or position, which means that these are not used to be exchanged for health.

Table 15. Logistic regression of the chance to marry a medium or high **infant** mortality groom (N = 1230, 1068 and 1068 respectively)

	Model A		**Model B**		**Model C**	
	B	**Sig.**	**B**	**Sig.**	**B**	**Sig.**
Constant	-15,04	0,001	-17,7	0,001	-18,4	0,001
Infant mortality						
Low (0 or 1)	-0,17	0,29	-0,13	0,47	0,17	0,55
Medium (2)	-0,31	0,11	-0,22	0,29	0,17	0,63
High (more than 2) (ref.)						
Child mortality						
Low (0)	0,09	0,44	0,17	0,20	0,24	0,25
Medium or high (1 or more)						
Year of birth	0,007	0,001	0,009	0,001	0,009	0,001
Social origin						
Farmer			0,24	0,09	0,23	0,51
Elite			-0,01	0,94	0,26	0,65
Lower class (ref.)						
Social position						
No occupation			0,10	0,69	0,82	0,27
Farmer			-0,45	0,002	0,18	0,62
Elite			-0,01	0,97	0,57	0,45
Lower class (ref.)						
Parish						
Center			0,002	0,99	-0,01	0,94
Mixed			-0,04	0,82	-0,05	0,81
Kastel			-0,02	0,91	-0,06	0,79
Unknown (ref.)						
Migration						
Born and died in the village			-0,06	0,72	-0,03	0,85
Migrant (ref.)						
Birth rank			0,02	0,31	0,02	0,29
Number of male siblings above 20			-0,03	0,51	-0,04	0,38
Number of female siblings above 20			0,05	0,33	0,05	0,31
Interaction effects						
*Social origin*infant mortality*						
Farmers*low infant mortality					-0,03	0,92
Farmers*medium infant mortality					0,15	0,74
Elite*low infant mortality					-0,42	0,47
Elite*medium infant mortality					0,05	0,93
*Social position*infant mortality*						
No occupation*low infant and child mortality					-0,60	0,44
No occupation*medium infant and child mortality					-0,77	0,36
Farmers*low infant mortality					-0,52	0,18
Farmers*medium infant mortality					-1,01	0,03
Elite*low infant mortality					-0,56	0,52
Elite*medium infant mortality					-2,65	0,05
*Social origin*child mortality*						
Farmers*medium and high child mortality					0,05	0,85
Elite*medium and high child mortality					-0,03	0,94
*Social position*child mortality*						
No occupation*medium and high child mortality					-0,29	0,56
Farmers*medium and high child mortality					-0,19	0,52
Elite*medium and high child mortality					0,28	0,69

Table 16. Logistic regression of the chance to marry a medium or high **child** mortality groom (N = 1230, 1068 and 1068 respectively)

	Model A		**Model B**		**Model C**	
	B	**Sig.**	**B**	**Sig.**	**B**	**Sig.**
Constant	-2,5	0,34	3,26	0,39	3,6	0,36
Infant mortality						
Low (0 or 1)	-0,20	0,19	-0,32	0,06	-0,82	0,004
Medium (2)	0,05	0,77	-0,01	0,95	-0,40	0,24
High (more than 2) (ref.)						
Child mortality						
Low (0)	-0,07	0,48	-0,06	0,63	0,11	0,59
Medium or high (1 or more)						
Year of birth	0,001	0,34	-0,001	0,47	-0,001	0,48
Social origin						
Farmer			0,03	0,82	-0,11	0,74
Elite			-0,41	0,04	-0,32	0,58
Lower class (ref.)						
Social position						
No occupation			-0,25	0,28	-1,00	0,17
Farmer			-0,03	0,81	-0,68	0,05
Elite			-0,15	0,61	0,09	0,90
Lower class (ref.)						
Parish						
Center			-0,14	0,40	-0,17	0,34
Mixed			-0,40	0,06	-0,41	0,05
Kastel			0,18	0,41	0,19	0,39
Unknown (ref.)						
Migration						
Born and died in the village			-0,02	0,88	-0,05	0,77
Migrant (ref.)						
Birth rank			0,0001	0,99	-0,003	0,89
Number of male siblings above 20			-0,035	0,42	-0,02	0,55
Number of female siblings above 20			-0,10	0,04	-0,11	0,04
Interaction effects						
*Social origin*infant mortality*						
Farmers*low infant mortality					0,27	0,45
Farmers*medium infant mortality					0,22	0,62
Elite*low infant mortality					0,04	0,94
Elite*medium infant mortality					0,14	0,83
*Social position*infant mortality*						
No occupation*low infant and child mortality					0,84	0,26
No occupation*medium infant and child mortality					0,69	0,39
Farmers*low infant mortality					0,94	0,01
Farmers*medium infant mortality					0,78	0,08
Elite*low infant mortality					0,28	0,73
Elite*medium infant mortality					0,22	0,83
*Social origin*child mortality*						
Farmers*medium and high child mortality					-0,19	0,51
Elite*medium and high child mortality					-0,29	0,48
*Social position*child mortality*						
No occupation*medium and high child mortality					0,14	0,76
Farmers*medium and high child mortality					-0,17	0,53
Elite*medium and high child mortality					-0,86	0,18

Conclusion and discussion

The starting point of this research was the idea that in a pre-industrial high mortality environment health characteristics are plausible criteria to be used in the selection of marriage partners. We measured health characteristics by the level of infant and child mortality in the family of origin of the marriage candidates.

A first important result is the observation of homogamy according to mortality in the family of origin. Spouses born in high mortality families have a higher chance to marry partners that were also born in high mortality families. Apart from this, wealth is probably used to buy health at the marriage market, as revealed by the greater chance of elite sons to marry a low mortality partner (differential exchange). Second, this homogamy according to mortality in the family of origin is in our view the product of the intentional use of this characteristic in the partner selection process. The effect was present after controlling for possible structural causes. Homogamy according to mortality is not simply the byproduct of homogamy according to social origin or parish. A third conclusion is that homogamy according to mortality is to some extent related to social position. Sons of farmers have a higher level of homogamy according to mortality compared to elite sons, a smaller group that gives strong priority to social origin/position as a criterion, and compared to sons of lower class fathers. The strong competition for access to land is a probable reason why the latter group gives priority to social position.

The question why precisely the mortality characteristics are used, is less easy to answer. It cannot be excluded that high exposure to disease in childhood affects one's physical appearance. In particular in the case of smallpox this phenomenon is probably strong (Sköld, 2003). Yet, the mortality pattern in the village under study suggests that diarrheal diseases such as dysentery were probably more important.[25] Also the possible explanation that mortality is simply used as a more refined indicator of the economic position of the family of origin of the spouses is perhaps not that strong. As the effect is strong for infant mortality and the role of social position is usually most strongly expressed for child mortality, we can conclude that other factors or involved. But as breastfeeding was perhaps not that strong in this village, this was probably not a strong test of this effect.

It might be that the level of mortality is used by the villagers as an indicator of future physical qualities (e.g. physical strength) that were highly valued in farmers' communities. Therefore, health may be seen as a good indicator of expected social mobility. It might also be that the level of mortality is used as an indicator of the lifestyle of a given family. If mortality is related to the decision to breastfeed children (an option that is probably not automatically chosen by the inhabitants), hygiene, the care given to children, etc., then the level of mortality is a very visible proof of this 'lifestyle'. The bad reputation of the high mortality family might be a subtle but very strong handicap on the marriage market. These explanations do not contradict each other. It cannot be excluded that the analytical distinction made here is not used by the contemporaries. Mortality is maybe an indicator of the past, present and future general quality of a family, both in terms of economic as symbolic value (reputation).

Also the analysis of marriage access fits to this picture. Children of low mortality families have a better chance to marry. This confirms the idea that in pre-modern conditions there is a health selection underlying the access to marriage.

However, these conclusions do not close the debate. The analysis is based on the research of one village. The village has a high level of infant mortality, is composed of small farmers and farm workers, presents hard physical conditions for agricultural work and is rather closed in terms of geographical mobility. It cannot be excluded that these conditions are beneficial for selection based on

[25] The effect of disease in early childhood on physical appearance is of course not necessarily limited to smallpox.

health. At the other hand, these conditions are far from exceptional and consequently this pattern should not necessarily only be observed in this village. The advantage of our strategy is that replication of the research does not require exceptionally documented databases. No difficult to find individual-level information such as stature or causes-of-death is needed. Comparative analysis of the impact of infant and child mortality on partner selection might lead to a better insight in the precise reasons underlying it.

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