This is the published version of a chapter published in *Nordic Demography in History and Present-Day Society*.

Citation for the original published chapter:

Fure, E. (2001)  
Mortality in history: The Decline in Mortality in the Norwegian Parish Asker and Baerum ca. 1750-1850.  
In: Lars-Göran Tedebrand and Peter Sköld (ed.), *Nordic Demography in History and Present-Day Society* (pp. 165-177). Umeå: Umeå universitet

N.B. When citing this work, cite the original published chapter.

Permanent link to this version:  
http://urn.kb.se/resolve?urn=urn:nbn:se:umu:diva-132498
The Decline in Mortality in the Norwegian Parish Asker and Bærum ca. 1750–1850

Eli Fure

The dominant opinion about the timing of the decline in mortality in Norway is that it belongs to the 19th century, the year 1815 has been conceived as the watershed, strikingly coinciding with the new liberal constitution of the country in 1814. The distinct decline in the crude death rate (CDR) from 1815 has enticed analysts to look for possible causes of decline compatible with this timing. The statistician Julie Backer noted, however, already in 1961, a slight decline during the 18th century.3 The English historian Michael Drake, by analyzing the different parts of the country separately, was able to show that mortality started to decline in the western and southern parts of Norway (the dioceses of Bergen and Kristiansand) already by the end of the 18th century.2 For the eastern, middle and northern parts for Norway (the dioceses of Akershus and Trondheim) the CDR dropped abruptly from 1815.

Before the question of causality can be raised, the timing of the decline must be established, and the importance of years with normal mortality versus years with crisis must be ascertained. A hypothesis has been that mortality started its decline already during the later part of the 18th century, but that the decline was interrupted by the years of crisis mortality in the wake of the Napoleonic wars.3

This paper will examine when mortality started to decline in Asker and Bærum, a large coastal parish in the southeastern part of Norway (the diocese of Akershus), i. e. in an area where the CDR did not fall before 1815. The parish has particularly good sources for the study of population after 1815. The historian Sølvi Sogner has previously
analyzed the decline in mortality in the diocese of Akershus during the 18th century and found low mortality in the inland, high mortality along the coast.

The crude death rate in Asker and Bærum 1733–1878

For the computation of the CDR for Asker and Bærum, the numbers of burials in the ministerial books for Asker and Bærum from 1733 to 1878 were counted. The development until 1807 will be examined first in order to find out whether the mortality already was declining during this period. The turn of the century has no interest by itself, but the time up to 1807 was a continuous period of peace in Norway.

The population at risk is mainly based on census figures. In the census of 1769 there are listed 4076 persons, in the 1801 census the number has risen to 4596 persons. The mean population before 1769 is set to the population this year, minus the difference between the number of baptisms and burials back to 1733. No adjustment is done for migrants because the extent and the direction of the migratory movements for this period is unknown. For the years between 1769 and 1801 there was a net out-migration of 450 persons. The yearly population at risk after 1769 is computed by adding the yearly natural increase and subtracting the average number of out-migrants. For the years after 1801 the mean population is computed by distributing population increase in the intercensal period evenly to each year. For the three years after 1875 the yearly population increase is estimated to be equal to the yearly growth rate in the preceding period (1865–1875).

Figure 1 shows the CDR in Asker and Bærum for the period 1733–1878 in moving five years averages. We can identify three periods with extremely high mortality, the years 1742–43, 1772–73 and 1808–1809.

A usual statistical model for examining secular trends, is an ordinary linear regression model. Even if the assumption of linearity is not completely true, the model should nevertheless be useful for testing the zero hypothesis of no change.
The regression analysis estimated the yearly decline in the CDR to be 0.12 per thousand for the period 1733 to 1807. For the total period, i.e. 75 years, the estimated total decline is a little less than 10 per thousand points, i.e. from around 30 per thousand at the beginning of the period to around 20 per thousand at the end. Even if the yearly variations were great, the result is statistically significant at a level lower than 0.007. The regression line and the yearly observations are shown in Figure 2.

Figure 1. Five year moving averages in CDR (FLCDR) in Asker and Bærum 1733–1878.

Figure 2. Regression line for the CDR in Asker and Bærum 1733–1807. The points represent the CDRs for each year. The line is drawn according to the method of least squares. The slope shows the estimated yearly decline in mortality.
Decline in infant mortality in Asker and Bærum

The decline in infant mortality accounts for almost 30 per cent of the decline in the CDR for the period up to 1807. For the period 1810-1878 the decline in infant mortality accounts for more than 40% of the total decline in the CDR. The historian and demographer Ståle Dyrvik has earlier estimated that about 25% of the decline in the CDR can be attributed to the decline in the infant mortality rate (IMR). The decline in infant mortality is thus an important part of the general decline in mortality.

The development of infant mortality in Asker and Bærum is shown as five years moving averages in Figure 3. The yearly number of baptisms varied between 90 and 170, the number of burials between 20 and 50. In spite of the smoothing effect of moving averages, the crisis years stand out. In addition to the crisis years in the CDR, IMR was extremely high in 1748 and 1761. The infants were by no means protected from mortality crises.

Figure 3. Five years moving averages of IMR (SPDODFL) in Asker and Bærum 1733–1878.

The IMR declined after the last crisis year in 1809, but it was just as low during certain years at the end of the 18th century as after 1809. What is remarkable about the years after 1809 is the sequence of so many years with comparatively low and stable mortality.
The same linear regression model as was used for the CDR gives 0.6 per thousand yearly decline in the IMR for the period 1733–1807, see Figure 4. For the whole period the IMR declined with 45 per thousand points. The level before 1750 was about 225 per thousand, the level around 1807 was about 180 per thousand.

Figure 4. Regression line for the IMR (SPDORATE) in Ask 
\textit{er} and Barrum 1733–1807. The points represent the IMR for each year. The line is drawn according to the method of least squares. The slope shows the estimated yearly decline in IMR.

![Regression line for the IMR (SPDORATE) in Ask 
\textit{er} and Barrum 1733–1807. The points represent the IMR for each year. The line is drawn according to the method of least squares. The slope shows the estimated yearly decline in IMR.](image)

For the years after 1807 the decline in IMR is very clear, particularly if we start from the year 1808. This is because the crisis in 1809 will exaggerate the level of mortality at the beginning of the period. Even if we look at the period 1810–1878, the estimated yearly decline is 0.9 per thousand. The variance is much lower during the 18th century, and the estimate is statistically significant at a very low level (0.0001 per cent).

Social differences in the infant mortality rate
For the period 1733–1814 the number of baptized and buried infants per year were registered from the church records. For the period 1814–1878 all individual event records from church records, censuses and land registers were computerized and linked together in individual life courses. Information on occupation or social status was coded into two broad categories, the upper group consists of farmers, the
lower group contains cotters, crofters, craftsmen, fishermen, sailors and laborers. The last group grew more quickly than the first during the period, but a rough approximation is that the last group is four times as big as the first group.

Neither in the level around 1814 nor during the decline up to 1878, was there any difference in the IMR between the groups. The only difference was between children born within or out of wedlock. The illegitimate children had almost twice as high mortality as their legitimate counterparts, and there was no improvement for the illegitimate children during the period. Most illegitimate children belonged to the lowest social group, but many of the records lacked information on father’s occupation or social position.

Ståle Dyrvik has analyzed the mortality decline in the parish of Etna in western Norway. He has also found a decline in IMR from the 1780ies. He explains the decline with a change in breast-feeding habits. The hypothesis is not supported by qualitative sources. He uses the mortality pattern to suggest that 18th century women adapted lactation to the changing agricultural work pressure over the year. He examines the timing of the deaths during the first year of life and how mortality varies with month of birth.

Other causes than changing breast-feeding habits may, however, explain variations in the mortality pattern during infancy. Changes in small numbers may be a result of random variations. Etna is a small parish, and the results have not been subjected to statistical tests. The hypothesis of work-dependent lactation habits needs support from investigations from other parishes. The data from Asker and Baerum can only be analyzed in such detail after 1814, and this is after the decline has started. During the 19th century, the seasonal pattern of infant mortality in Etna is different from the latter decades of the 18th century.5

Mortality in normal years and crisis years

A distinct pattern of the mortality decline is that crisis years disappear, but did the mortality decline in normal years before 1807? The years 1742 and 1773 were the most serious crisis years for the CDR. If these years are excluded from the regression analysis, the estimated yearly decrease in mortality is reduced, but it is still statistically significant. The IMR was extremely high also in the years 1748 and 1761, above
300 per thousand in all four years. When these years were excluded from the analysis, the estimated yearly decrease was not significant at a level lower than 5 per cent.

A common feature of the crisis years except for the year 1761, was that the number of births was so low. This poses a methodological question. Is the high IMR an artifact? The IMR is computed by dividing the births of the year by the deaths of the year. If many of the dead children were born the previous year, this will inflate the IMR. Most deaths in infancy occurred, however, during the first months, and unless the peak mortality was in January or February, this disturbing effect will not be important. If the numbers of births and infant deaths in the year before the crisis and in the crisis year are added, the IMR still is very high.

The small number of births in crisis years is normally attributed to the fact that marriages were postponed, and that the normal share of first births was reduced. The number of births was, however, much lower than can be expected from this effect only. Whether sexual activity was lower as a consequence of conscious human planning in difficult times, or an effect of physiological or psychological stress, is not clear. The fecundity, the biological ability to bear children may have been reduced as well.

In Asker and Bærum the decline in mortality started during the 18th century. The tendency is strongest for the CDR, but it is also shown in the IMR. The years of crisis strongly afflicted the infants.

High mortality in 1809, but not in 1813

Demographic research indicates that the crisis years in 18th century Norway were caused by a combination of diseases and malnutrition, but there were certainly years with crop failure without an increase in the mortality, and inversely mortality could be high even if the crops were normal. In the 19th century the CDR was particularly high in the years 1809 and 1813. What were the causes of the crises in 1809 and 1813?

In a circular dated the 16th of January 1816, the authorities made an extraordinary inquiry to the local ministers about the population development from the turn of century as a supplement to the census in 1815. The main purpose was to provide figures for the vital statistics, but the ministers were also urged to give their opinion on the causes of death in years with very high mortality.
For the year 1809 the minister in Asker and Bærum, Jacob Neumann, noted dysentery. In the whole diocese, causes of death were mentioned 115 times, among them dysentery was most frequently noted, 56 times. In addition the minister in Asker and Bærum, along with 14 other ministers, noted mal- or undernourishment.

The dysentery was probably a consequence of the war with Sweden 1808–1809, several of the ministers noted this. Concentration of troops led to increased exposition to infections, which the soldiers in turn brought back home when they were dismissed. To what extent the situation was aggravated by undernourishment is difficult to decide. We know that the crops failed in southern Norway in 1808. The minister in Asker and Bærum noted, however, that the amount of seed grain was almost normal in 1809 thanks to supplies from outside the parish. This weakens the importance of undernourishment as a cause of mortality in the parish.

Historians have for a long time questioned the reliability of contemporary complaints about lack of food, because such statements may be part of a political strategy towards the authorities. While there was little to do about epidemics, the authorities could act to improve the supplies. The ministers attributed the crisis in mortality mainly to epidemics. Even if the minister in Asker and Bærum noted malnourishment as a secondary cause, there is no reason to believe that the supplies were shorter in this parish than in the neighbouring areas. The minister was active in organizing a kind of "grain bank" in the parish. He was naturally preoccupied with the question of provisions.

The most serious crop failure came, however, in 1813. In Norway the CDR was 29 per thousand, i.e. higher than the usual rate which was between 20 and 25 per thousand, but not as high as in 1809 when it reached 35 per thousand. Asker and Bærum was no exception with respect to crop failure in 1812. The summer and fall were cold and rainy, and the grain was not ripe before the winter came. But unlike 1809, there was no mortality increase in 1813 in Asker and Bærum. Why was this so?

During the distress of the war and in order to prevent crop failure in future years, a society of prominent men in the parish agreed to found a "grain bank", a public storehouse for grain, where farmers could borrow seed grain in springtime. The "grain bank" alone was not able to meet the needs during spring 1813, but supplies from the Royal storehouses and a wealthy citizen helped. Most of the fields were sown, but the quality of the seed was poorer than usual.
Maybe the reason why there was no mortality crisis in 1813 was that the population, thanks to the grain bank, was better prepared to handle a crop failure. If the parish is studied in isolation, this explanation may seem plausible. But the amount sown in 1809 was not so bad, and if the mortality crisis in 1809 was mainly caused by disease, the supply situation cannot mean so much. If we look beyond the parish, the causal effect of nutrition is also questionable. While dysentery raged all over the diocese in 1809, there was a distinct geographical pattern of crisis mortality in 1813. Almost only the parishes in the western part of the diocese and the capital, Christiania, were hit. Where the ministers noted the cause, it was again dysentery.

It looks as if Asker and Bærum escaped from the dysentery epidemic in 1813. The parish borders on the “dysentery map” that can be drawn according to the mortality figures in 1813. It is difficult to determine where the dysentery started, but it could be in one of the neighbouring towns on the westcoast of the Oslofiord, Larvik and Fredriksvern (today Stavern). In Larvik there were military hospitals, and hospitals were cradles for infections at the time. The minister in Fredriksvern noted:

“The great mortality in ...1808 and 1809 must be attributed to a very contagious dysentery, which also raged in 1810 and 1813 but to a lesser extent. Among the 95 deaths in 1813 were about 50 Russian seamen from the Russian naval vessel Svevop”.

Did the ship bring the infection, or were the crowded conditions and bad hygiene on the vessel responsible for the high number of deaths? May be the reason why the disease did not spread so quickly to the whole diocese as in 1809, was that it was not so virulent. The epidemic was probably more easily spread in 1809 because of the war. Soldiers from the whole diocese were recruited. Immunity among those who survived the epidemic in 1809 had probably little importance. Why should immunity vary geographically?

Finally, it is difficult to imagine that the “grain bank” can be credited for the normal mortality level in 1813. If this was the case, one should expect a correlation matrix where parishes with “grain banks” or good provisions of grain experienced lower mortality. It is not likely that such parishes correspond to the clear geographical pattern of mortality in 1813.
The whole population was hit in 1809, but several ministers noted that small children and old people were particularly affected. Epidemics, not hunger crises tend to hit specific age groups. The conclusion must be that the main causes of crisis mortality early in the 19th century were epidemic diseases.

Evaluation of explanations to the mortality decline

Unless clear time-specific conditions point to the contrary, the causes operating at the onset of the decline in mortality should also be important for the continued fall. Subsequently, other causes may join in or supersede the original cause(s). The challenge is to find the cause or causes of the onset of the mortality decline, which also explain the continued fall in mortality, as well as explain why infants were so severely hit by the mortality crises.

When the starting point of the mortality decline is pushed back to the time before 1815, there is little reason to look for causes operating only after this year. The smallpox vaccination was introduced shortly after the turn of the century. It might have had importance during the 19th century, but certainly not in the preceding century.

Sølvi Sogner has focused on initiatives from the authorities to improve public health and prevent diseases during the last decades of the 18th century. The figures from Asker and Bærum suggest, however, a decline in mortality from an earlier stage. The presence of doctors or midwives cannot explain the improved chances of survival. Again the decline in mortality was well on its way before the parish had its own doctor. Unskilled local women helped out in most births, up to 1846 there was only one midwife in the parish. The first doctor who actually lived in the parish came in 1863. Health care was not considered to be very important.

Ståle Dyrvik has looked for particular causes to the decline in mortality and stressed the importance of breast-feeding habits. In Asker and Bærum the share of infant mortality in the total mortality was almost the same during the 18th century as the 19th century. This suggests that there were common causes to the decline in the IMR and in the CDR, but the figures indicate that the decline in mortality did not start with the infants.

The infants were severely hit by the crisis years, why was this so? Breast-feeding was very important for survival chances for children in traditional societies. Breast-feeding patterns are partly biologically, partly culturally determined. It is difficult to imagine that breast-
feeding habits were so flexible and so adapted to seasonal work pressure in the agricultural society as Dyrvik argues. It seems more reasonable to believe that breast-feeding patterns were more stable. We do not know the breast-feeding patterns in Asker and Bærum, but a usual assumption is that children were breast-fed 9 to 12 months in the traditional society. Questions about length of lactation period, and when additional food was given, are important for the immunity defense system, but they must be left unanswered. Breast-feeding protects particularly well against gastrointestinal diseases.

Only very serious undernourishment leads to loss of milk in the mother, but epidemics, particularly gastrointestinal diseases may have lead to stress, anguish and loss of fluid and consequently to less efficient breast-feeding. A disease where breast-feeding gives little or no protection at all, raged probably in 1761. This year the IMR was high but the CDR was not striking in any way.

When children born out of wedlock had so much higher mortality, the nutritional status for the mother during pregnancy may have had an adverse effect for the fetus, but lack of opportunities for the mother to breast-feed and care for her child was probably more important.

Thomas McKeown has been the most persuasive advocate of the importance of nutrition. His contention is that the nutritional status, not by itself, but by making the population stronger, will increase the general resistance to the fatal effects of epidemics. McKeown arrives at this conclusion more by rejecting alternative or competing explanations, than by a thorough explanation of how the nutritional status really works in relation to epidemics. McKeown has later been criticized. The effect of malnutrition on epidemics varies with the type of disease. His theory in not accepted as a universal explanation, but it is worth while to keep in mind in this case.

In Asker and Bærum the first potatoes were planted in the 1780ies, but the breakthrough came after the turn of the century. Norwegian historians have debated the importance of the potato. Rather than focusing on the potato alone, the whole supply of food should be studied. This means in addition to the total agricultural yields, also the contribution of fishery and imports of grain. Unfortunately there are no uncomplicated estimates of the total supplies for the country as whole. Most historians maintain that the development in agriculture was positive, but it is not certain whether it kept up with the population growth. For Asker and Bærum the authors of the parish history conclude that the supplies had increased up to 1810.
The import of grain to the country increased during the 18th century, and a parish on the coast of the southeastern part of Norway, like Asker and Bærum, certainly benefited from this. It is, however, not likely that richer supplies had a direct effect on the mortality on the individual level. In such a case, one would have expected that mortality should have varied with social group. Demographic studies of parishes in Norway during the 18th and 19th centuries have not shown a systematic correlation between social group and mortality. In Asker and Bærum, infant mortality during the 19th century declined simultaneously for farmers as well as for cotters, craftsmen, fishermen and sailors.

Even if the population as a whole was better fed, the threat of serious epidemics was still present. The dysentery crisis in 1809 is not a sufficient reason to discard a hypothesis about a more well fed and resistant population. The outburst of serious diseases later in the century, but without such disastrous consequences as during the 18th century and during the Napoleonic wars, is compatible with the explanation. If a population increases its resistance to infection, the effect of epidemics is more limited, but the epidemics do not disappear.

The causes of the decline in mortality in Norway have not been determined in this paper. The analysis of Asker and Bærum shows that the mortality started to decline already during the 18th century, even if the parish is situated within an area of high mortality, and it shows that infants were not spared from mortality crises. The early onset of the decline cannot support a view that government actions had initial importance. Breast-feeding is important for infant survival, but it is doubtful whether the decline in IMR in Asker and Bærum can be attributed to changing breast-feeding habits.

A more general resistance in the population due to better nutritional status is, many years after McKeown, still an explanation which is not easily proven, but it is also difficult to discard. From a theoretical point of view this is not a desirable position. It is, however, well known that the IMR today is considered to be one of the finest indicators of improvements in living conditions. Such improvements may have brought on a decline in mortality already during the 18th century in Norway, long before the magical, political year of 1814.
Notes

7. The National Archives of Norway, the Census in 1815, Akershus diocese.