

Persisting structures? Infant mortality decline and changes in infant feeding practices in Iceland 1850-1920

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Abstract

Prior to the beginning of the twentieth century feeding practices had important bearing upon survival chances of young children in Iceland. Areas with early introduction of solid food and low frequency of breast-feeding had extremely high rates of infant mortality, especially neonatal mortality. After the turn of the century feeding practices had less impact on the survival chances of young children. It is shown that, even though artificial feeding prevailed in many areas, there was a notable decline in infant mortality levels. Knowledge about the transmission of disease, hygienic measures and changes in the preparation of food for young infants influenced infant health and infant survival. In this shift towards better health in infancy midwives played a central role.

Introduction

When I was working on my doctoral thesis during the late 1990s¹, I had the pleasure of discussing traditional child rearing methods and feeding practices with an elderly Icelandic woman, Róshildur Sveinsdóttir.² Róshildur was then almost ninety years old, a dazzling person and extremely active for her age. She remembered vividly details from her own childhood. She was born in 1911 in Ásahreppur in southern Iceland, a parish that even by Icelandic standards was both poor and extremely sparsely populated. The family was relatively well-off and occupied one of the

largest landholdings in the parish.³ Her parents had married in 1902, and their marriage was an unusually fertile one. During the period 1904 to 1925 her mother gave birth to 15 children, the main birth interval being slightly more than 18 months. Twelve of Róshildur's siblings survived childhood.

Róshildur's grandmother, Gyðríður Ólafsdóttir, lived close to the family and served as a midwife in the local community. She was born in 1844 and like many of the midwives of her generation, she had not received any formal education as a midwife but was one of the wise women who were entrusted to carry out the important task of helping women in childbirth. She married in 1865 and gave birth to fourteen children, eight of whom died before the age of one. Despite frequent childbirths, she worked as a midwife in the community until old age. Midwifery was by no

1. My thesis was published in 2002 under the name *Saving the Child. Regional, cultural and social aspects of the infant mortality decline in Iceland, 1770-1920*, Umeå: The Demographic Database, Umeå University 2002. This article is largely based on findings presented in the thesis.

2. Interview with Róshildur Sveinsdóttir, Hofteigur 44, Reykjavík. Interview 7 August 1999.

3. *Ný Jarðabók fyrir Ísland samin eptir tilskipun 27. maí mánaðar 1848 og allramildilegast staðfest með tilskipun 1. aprílmánaðar 1861*. Copenhagen, 1861.



Teat of wood. Source: National Museum of Iceland.

means easy at that time. Like many other agrarian regions in Iceland, the area where the parish of Ásar is located was remote and sparsely populated, and frequently midwives had to travel long distances on horseback across turbulent rivers to attend to child-births.

Qualitative source material collected by the Ethnographic Department (Þjóðháttadeild) at the National Museum of Iceland indicates that it was fairly common during the nineteenth century for midwives to take newborns home with them and care for them for a few weeks while the mother recovered from the delivery.⁴ According to Róshildur, her grandmother frequently stayed with the mother for a number of days and helped out in the household. On other occasions, she took the newborn infant home with her and kept it there for a period of two or three weeks. This was, according to Róshildur, especially true in case of poor families with many young children. The newborns were then given cow's milk diluted with water. The midwife used to take the children back home to

4. The ethnographic source material on Birth, infancy and the first year consists of questionnaire collected during the early 1960s. For further information on the source material see Garðarsdóttir: *Saving the Child*, pp. 204-207.

their mothers dressed in new clothes. Gyðríður helped deliver my informant Róshildur and all her siblings except for the two youngest ones. None of them were ever breast-fed, and Róshildur maintained that breast-feeding was non-existent in the area when she grew up.⁵

Róshildur remembered vividly how as a little girl she used to clean the feeding bottles, a task that was by no means pleasant "...as the milk easily turned sour and used to stick to the bottle". Rubber teats were not available at the time and wooden spools (used for cotton thread) were carved and used as teats.⁶ These wooden teats were covered with a piece of cloth so that they would not hurt the baby's mouth. "My mom used to sew a lot and therefore there were always lots of empty spools that could be used to make the teats", Róshildur claimed. When I asked her if she remembered if infants were given pre-chewed solid food, she answered with disgust: "No, thank God, that is an old custom and was no longer practiced when I grew up! I somehow got the idea that my grandmother worked hard to uproot this disgusting custom during her first years as a midwife in the community."

Through my encounter with Róshildur I caught a glimpse into customs and values of past times. Two elements in particular caught my attention: first, her statement about the total absence of breast-feeding in her home community, and, secondly, the fact that the midwife used to take infants home with her after delivery. When I started to work on my doctoral thesis, it was widely acknowledged among Icelandic historians that breast-feeding was unusual in Iceland during the eighteenth and early nineteenth centuries.⁷ But it

5. This view is also expressed in an autobiography by Róshildur's daughter and her son-in-law. See Brynja Benediktsdóttir, Erlingur Gíslason and Ingunn Þóra Magnúsdóttir: *Brynja og Erlingur fyrir öpum tjöldum*, Reykjavík: Mál og menning 1984, p. 43.

6. Wooden teats are also described by Árni Björnsson: *Merkisdagar á mannsævinni*, Reykjavík: Mál og menning 1996, p. 95.

7. Loftur Guttormsson: "Barnaeldi, ungbarnadauði og viðkoma á Íslandi 1750-1860", in Sigurjón Björnsson (ed.): *Athöfn og orð: afmælisrit helgað Matthíasi Jónassyni áttvæðum*,

was also a common assumption that breast-feeding increased during the second half of the nineteenth century and that most infants in early twentieth century were breast-fed. The rapid decline in infant mortality towards the end of the nineteenth century was seen as evidence to support this. The example referred to above proved to me that reality might have been more complex than indicated in earlier research.

In this article I will discuss regional differences in feeding patterns and show how feeding patterns from earlier periods prevailed into the twentieth century. Four areas are included in the study:

- (1) The capital Reykjavík in the county of Gullbringusýsla. Even though Reykjavík did not count more than a few thousand inhabitants, it was by far the largest town in Iceland. It was characterized by an early provision of medical services, and it was well documented that breast-feeding was relatively common in Reykjavík as early as the first part of the nineteenth century.
- (2) The fishing districts in the county of Gullbringusýsla outside of Reykjavík. Gullbringusýsla was by Icelandic standards densely populated. Most inhabitants were landless cottars who derived their livelihood from fishery. During the fishing season these fishing districts attracted people from different parts of the country. Mortality was traditionally high in these districts, and breast-feeding traditions were weak. Accounts from the eighteenth and the nineteenth centuries suggest that cottars' wives in the fishing districts who had no access to cow's milk tended to breast-feed their babies for a brief period of time, but that the babies were weaned at a relatively young age.
- (3) The rural area of Þingeyjarsýslur in the north where mortality was traditionally low and where

breast-feeding started early. This area was known for early provision of midwives.

- (4) The county of Rangárvallasýsla in southern Iceland which adjoins the county of Skaftafellssýsla where my informant was from and where infant mortality was extremely high and artificial feeding practices predominated.⁸

Feeding practices and infant mortality levels – earlier research

It is a well-known fact that in present day developing countries artificial feeding at early ages is generally associated with increased infant mortality risks. It has been revealed that infants who receive additional food in early infancy are up to two or three times more likely to die than those who are exclusively breast-fed.⁹ The risks, however, are very much connected with household and poverty related factors. Infants from wealthy households with modern facilities, clean drinking water and a sewage system are not usually more at risk of dying young than their counterparts in wealthy western societies, even if they are not breast-fed. The beneficial influence of breast-feeding is greatest where water and sanitation are poor.¹⁰

Historical sources do not normally provide us with the same detailed knowledge on feeding methods as modern medical and ethnographic studies. However, there are a few studies that offer a relatively good picture of feeding practices in the past. It is well-known that in many societies where breast-feeding practices were prevalent, supplementary food was often given at very young ages. Furthermore, demographic and social conditions often resulted in many infants being deprived of the breast at very young

Reykjavík: Mál og menning 1983, pp. 137-170; Gísli Gunnarsson: *The Sex Ratio, the Infant Mortality and Ajoining Societal Response in Pretransitional Iceland*, Lund: Lunds universitet., Meddelande från Ekonomisk-historiska institutionen 32: 1983; Helgi Þorláksson: "Óvelkomin börn" *Saga* 24:1986, pp.79-120.

8. Garðarsdóttir, *Saving the Child*, pp. 138-39.

9. See for example: Lars Smedman: "Promoting breast-feeding in Guinea-Bissau", *Acta Paediatrica* 88: 1999; V. J. Hull: Breast-feeding and fertility in Yogyakarta. The infant feeding study. Semarang site report 1984.

10. See for example: Julie DaVanzo: "A Household Survey of Child Mortality Determinants on Malaysia", *Population and Development. Supplement to vol 10* (1984), p. 703.

ages. Many women in the lower social strata were forced to start working immediately after delivery.

The early introduction of different types of food to the diet of infants that were otherwise breast-fed is likely to have produced differences in mortality rates in historic Europe. Valerie Fildes has, for instance, argued that the drop in neonatal mortality in late seventeenth and early eighteenth century England can mainly be ascribed to the changes in traditional beliefs about the colostrum.¹¹ Towards the end of the seventeenth century it became increasingly common to put the infant to the breast shortly after birth, and the practice of giving infants purifying liquids instead of the colostrum was widely abandoned. As a consequence neonatal mortality fell.

There are a number of areas in pre-industrial Europe where breast-feeding was either very uncommon or totally absent. This was especially the case in southern Germany (in particular Bayern and the Würtemberg area)¹², Austria and districts around the Baltic Sea (northern Finland and northern Sweden).¹³ Large areas in Iceland (especially in rural areas in the southern and western part of the country) were characterized by the almost total absence of breast-feeding, at least in the eighteenth and early nineteenth centu-

ries.¹⁴ In all these societies infant mortality rates were extremely high, between 300 and 400 per 1000 live births. Neonatal mortality rates was generally high, especially in the areas where breast-feeding was totally absent. In areas of Sweden and Iceland where infants were exclusively artificially fed the mortality rates cumulated during the second and third week post-partum.¹⁵

Regional differences in infant mortality

Figure 2 shows the development of infant mortality levels in the research areas. Unfortunately, no regional data in infant mortality is available for the first decade of the twentieth century. Between 1911 and 1920 there is only information on Reykjavík and for the period 1921-1930 there is information available for Reykjavík, other towns and villages lumped together and for rural areas.

Huge differences are seen during the mid-nineteenth century, differences that have chiefly been explained by variations in infant feeding traditions. The rural area of Þingeyjarsýslur and the most urbanized place in Iceland (Reykjavík) displayed comparatively low levels of infant mortality. In the rural area of Rangárvallasýsla, infant mortality levels were by far the highest, almost one out of three babies died before its first birthday in the 1850s. In the fishing districts of Gullbringusýsla this was true for one out of four babies.

As regards development of mortality during individual months of the first year there were different trends in the two high mortality areas. Medical reports from the rural county of Rangárvallasýsla stated that breast-feeding was uncommon in Rangárvallasýsla. Few mothers nursed their newborns, a tradition that produced elevated mortality, especially during the second, third and fourth week of life.¹⁶ On the

11. Valerie Fildes: *Wet Nursing. A History from Antiquity to the Present*. Oxford / New York: Basil Blackwell 1980, pp.317-319.

12. John Knodel: *Demographic behavior in the past. A study of fourteen German village populations in the eighteenth and nineteenth centuries*. Cambridge 1988; John Knodel and Etienne van de Walle:

“Breast Feeding, Fertility and Infant Mortality: An Analysis of some Early German Data”, *Population studies* 21(2): 1967, pp.109-131. Georg Mayr: “Die Sterblichkeit der Kinder während des ersten Lebensjahres in Süddeutschland, insbesondere in Bayern”, *Zeitschrift des königlich bayerischen statistischen Bureau* 2(4): 1870, pp. 201-247.

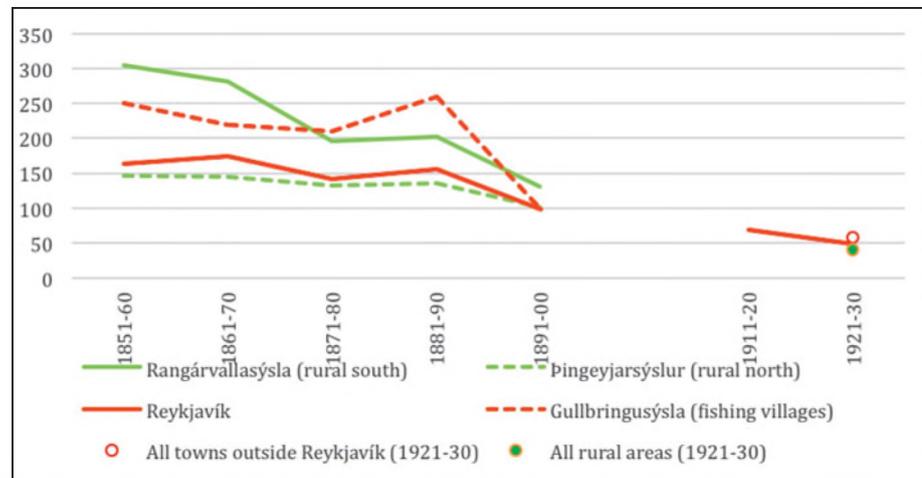
13. Anders Brändström: “*De kärlekslösa mödrarna.*” *Spädbarnsdödlighet i Sverige under 1800-talet med särskild hänsyn till Nedertorneå*. Umeå: Demographic Database 1984; Ulla-Britt Lithell: “Childcare - A Mirror of Women’s Living Conditions. A Community Study Representing the 18th and the 19th Century Ostrobothnia in Finland”, in Anders Brändström and Lars-Göran Tedebrand (eds.), *Society, Health and Population During the Demographic Transition*. Umeå: Demographic Database 1988.

14. Guttormsson: “Barnaeldi, ungbarnadauði og viðkoma á Íslandi 1750-1860”; Garðarsdóttir: *Saving the Child*.

15. Brändström: “*De kärlekslösa mödrarna.*”, pp. 104-106; Garðarsdóttir, *Saving the Child*, pp. 138-39.

16. Garðarsdóttir: *Saving the Child*, pp. 131-142.

Figure 1. Infant mortality (per 1,000 live births) in the research areas 1851-1900 (in Reykjavík 1851-1900 and 1911-1930) and in towns and rural areas 1921-1930



other hand, mortality levels after the second month of life were not particularly high, which may be explained by the fact that most households in the county were farming households. Milk production was thus household-based, and the milk was less likely to be contaminated than in more densely populated areas (e.g., Gullbringusýsla) where few households had access to fresh milk.

Analysis of the infant mortality pattern in Gullbringusýsla indicates that babies were breast-fed for at least the first few weeks. This is also supported by contemporary evidence (see above) that indicates that cottar's wives in the fishing districts tended to breast-feed their newborns for a brief period. At an early age, however, babies in this area were given various solid foods, often pre-chewed by adults. This practice led to elevated mortality after the second month of life.

Figure 1 shows that all four areas in the study experienced decline in infant mortality during the second part of the nineteenth century. The decline was most prominent in the high mortality areas, and towards the end of the nineteenth century there were little regional differences in infant mortality levels. Data from the second and third decade of the twentieth century indicates that there were little differences in mortality levels and development of mortality levels between areas.

The most prominent decline towards the end of

the nineteenth century was in Gullbringusýsla where infant mortality fell from a level of 250 deaths per 1000 live births to 100 per 1000 in just one decade. How were such dramatic changes possible in such a brief time period? It is hardly plausible that such a decline could be explained by modified feeding practices. Human beings are generally rather conservative, and changes in longstanding traditions are prone to take more time than just one decade. In the following section infant feeding traditions in the early twentieth century will be presented.

Persisting traditions

Contrary to earlier periods, source material on feeding practices dating from the first part of the twentieth century is abundant in Iceland. As in most other European societies,¹⁷ interest in infant health problems was profound in the early twentieth century, and several national studies were carried out to assess the extent of breast-feeding contra artificial feeding in different parts of the country. Most of these sources display types of feeding in a more detailed manner than

17. Alice Reid: "Infant and child health and mortality in Derrbyshire from te Great War to the mid 1920s", Unpublished ph.D.-thesis. University of Cambridge 1999; Dorothy Porter: *Health, Civilization and the State. A history of public health from ancient to modern times*. London, Routledge 1999.

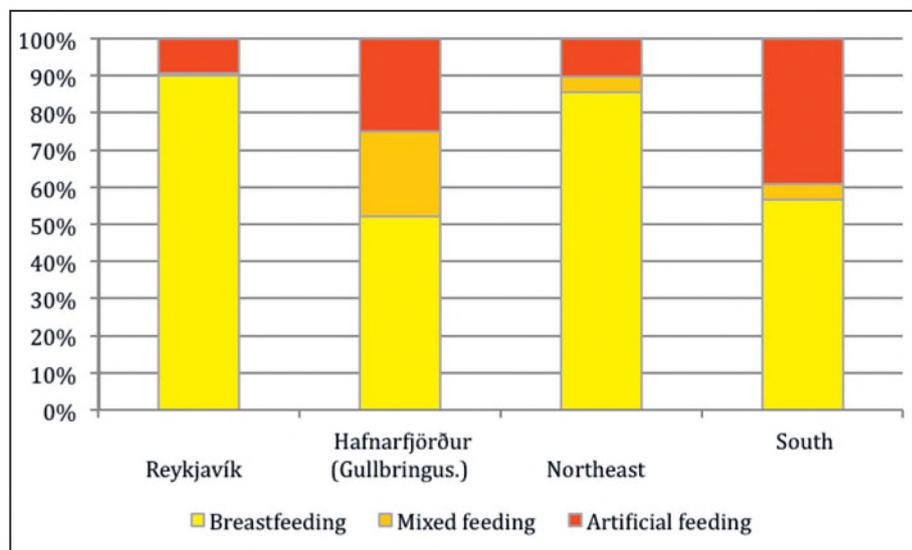


Figure 2. Feeding practices by region at the age of two weeks based on midwives' reports 1913-25.

before, dividing feeding methods into three groups: exclusively breast-fed, mixed feeding and exclusively artificially fed. After 1912 individual midwives were required to write detailed reports on every woman they helped in delivery.¹⁸ Those reports were based on forms that midwives filled out for all births. The forms included detailed information on the child and the mother, together with data on feeding practices in the first two weeks from birth. Each midwife was supposed to send a report to the district physicians based on information from the forms. There is thus relatively detailed information on breast-feeding in individual districts from the early twentieth century.

Another source material with information on breast-feeding is the Icelandic census of 1920. This census is unique in the sense that all households with children under the age of one were asked about feeding practices, that is, whether or not the child was being breast-fed or had been breast-fed and, if so, for how long.

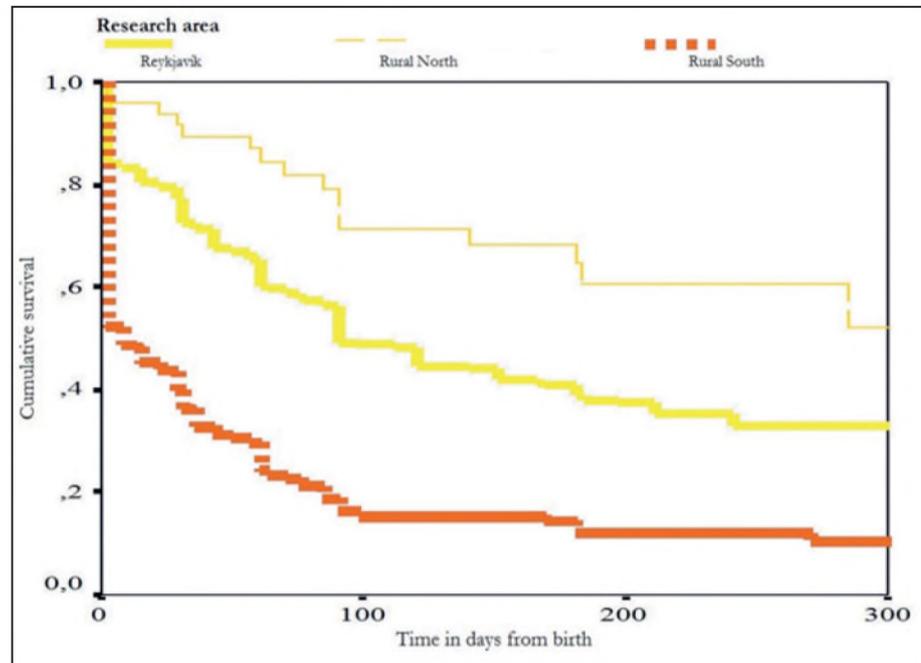
The data in Figure 2 are based on information from the midwives' reports. Generally, midwives attended to childbearing women for about two weeks, and the information is thus likely to reflect feeding practices among babies in their second or third week

of life. It is evident that there were considerable regional differences in feeding traditions, and that those differences reflect infant feeding traditions in earlier periods. In Reykjavík and in the rural areas in the Northeast (where Þingeyjarsýslur is situated) most babies were breast-fed. On the other hand, in the town of Hafnarfjörður (in Gullbringusýsla) it was common that young infants were either not breast-fed at all or received both the breast and the bottle. In the southern part of the country almost half of all babies were bottle-fed. It can thus be concluded that feeding patterns reported for the nineteenth century prevailed into the twentieth century.

Similar patterns are reflected in the information from the 1920 census (See Figure 3.) It is revealed that in areas with strong breast-feeding traditions babies were breast-fed for a longer period than in areas with weak breast-feeding traditions. In the case of Þingeyjarsýslur almost all newborns were put to the breast, and after nine months more than 50 per cent of all babies were still being breast-fed. In the case of the southern areas (where Rangárvallasýsla and Skaftafellssýsla (Ásahreppur) are located) only 50 per cent of all newborns were breast-fed. Most of them had already been weaned at the age of three months when less than 20 per cent were still being breast-fed.

18. *Alþingistíðindi*. Reykjavík 1912.

Figure 3. Duration of breast-feeding in days in three regions according to the Iceland census 1920.



Considering the fact that there was a strong convergence in infant mortality levels towards the end of the nineteenth century the notable differences in feeding practices appear contradictory. How can we explain the relatively low infant mortality levels in Rangárvallsýsla where only half of all newborns were breast-fed? Health reports offer some answers to this puzzle.

The health reports from different areas strongly suggest that there were important differences in the disease panorama between the areas with strong breast-feeding traditions and those where a majority, or at least a large minority, of babies were artificially fed. Gastro-intestinal diseases were thus reported to be the most common diseases among young infants in the areas where breast-feeding traditions were weak. These diseases were uncommon among young infants in areas where babies were breast-fed.¹⁹

The decrease in infant mortality in areas where artificial feeding dominated is without a doubt related to the changes in the preparation of food for infants. This included better knowledge about hygiene and

the custom to dilute milk with boiling drinking water. In agricultural areas milk production was household based, and milk thus presumably fresher than, for example, in large urban centers in Europe where it was difficult to store the milk adequately. Obviously, the late nineteenth and early twentieth centuries were characterized by an improvement in the treatment of animal milk in Iceland. In addition, glass bottles were introduced towards the end of the nineteenth century, and rubber teats became common somewhat later. It goes without saying that the likelihood to be infected with e-coli or other intestinal bacteria decreased when unhygienic wooden vessels were replaced with clean glass bottles. As a consequence, infants who were not at all breast-fed or breast-fed for only a short period after birth had better possibilities of surviving infancy than their counterparts in previous periods. Midwives played a central role in this process. They instructed mothers about the importance of hygiene and they brought about new knowledge about the treatment of food given to infants.

Promoting breast-feeding was of central concern among the medical professions during the late nineteenth and the early twentieth century. However, in

19. Garðarsdóttir, *Saving the Child*, pp. 191-92.

areas with longstanding traditions of artificial feeding of newborns changes in feeding traditions did not happen overnight. Midwives were often recruited in the local community and many of them had thus little personal experience of breast-feeding. Midwives who started their career in an area where most infants were artificially fed, and where this mode of feeding was considered to be in the child's best interest, were not likely to be successful in persuading all women to putting their babies to the breast. Earlier research suggests that the age of both midwives and of childbearing women played a role when it came to promoting breastfeeding. Old midwives who had started their career when artificial feeding was considered natural are likely to have developed routines in their relationship with childbearing women and kept those routines through their career. Midwives who were trained during a period when breast-feeding was seen of central importance for infant health were more likely to attempt to promote breast-feeding. They were not always successful and here the age of the mother was of central importance. A young primipara was more likely to listen to the midwife's advice whereas an experienced mother who had given birth to many children was not likely to take such advice from a young woman.²⁰

Conclusions

This article has shown that prior to the beginning of the twentieth century feeding practices had an important bearing upon survival chances of young children in Iceland. Areas with early introduction of solid food and low frequency of breast-feeding revealed extremely high rates of infant mortality, especially neonatal mortality rates. After the turn of the century feeding methods had less impact on survival chances of young children. The study also indicates that, even though survival chances among young infants increased, morbidity rates were higher in areas with traditions of artificial feeding.

Prevailing traditions do not generally change over

night. During the second part of the nineteenth century, Icelandic midwives and physicians strongly advocated breast-feeding.²¹ Without a doubt, this effort eventually left its imprint on feeding traditions. In the short run, however, other changes had greater impact upon survival chances of young infants. Knowledge about the transmission of disease, hygienic measures and changes in the preparation of food for young infants were important factors affecting infant health and shifts in infant survival. In this move towards better health midwives like Gyðríður, who was introduced in the beginning of this article, played a central role.

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21. Garðarsdóttir, *Saving the Child*, pp. 151-66

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