The decline of infant mortality in Iceland 1770-1930

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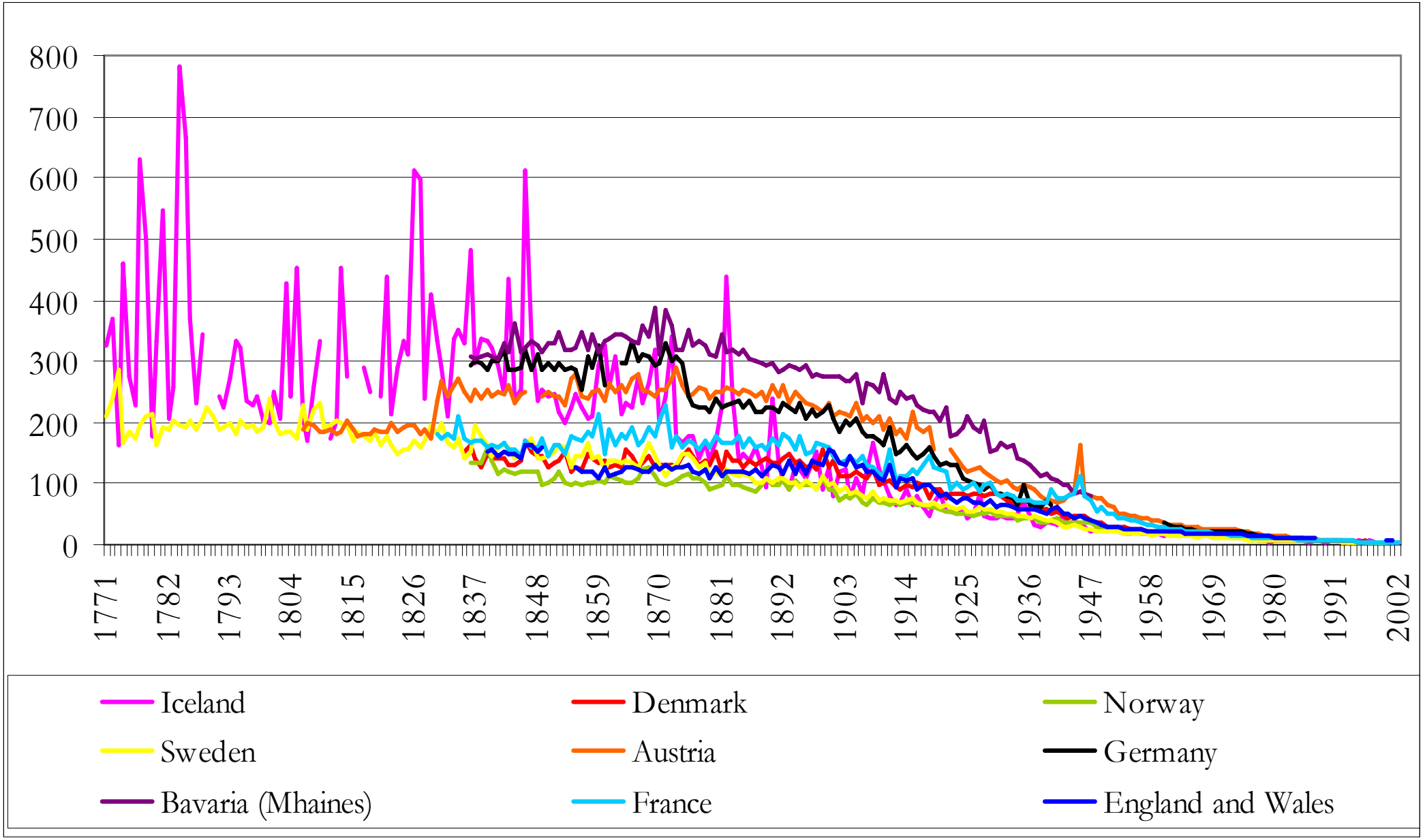
Statistics Iceland

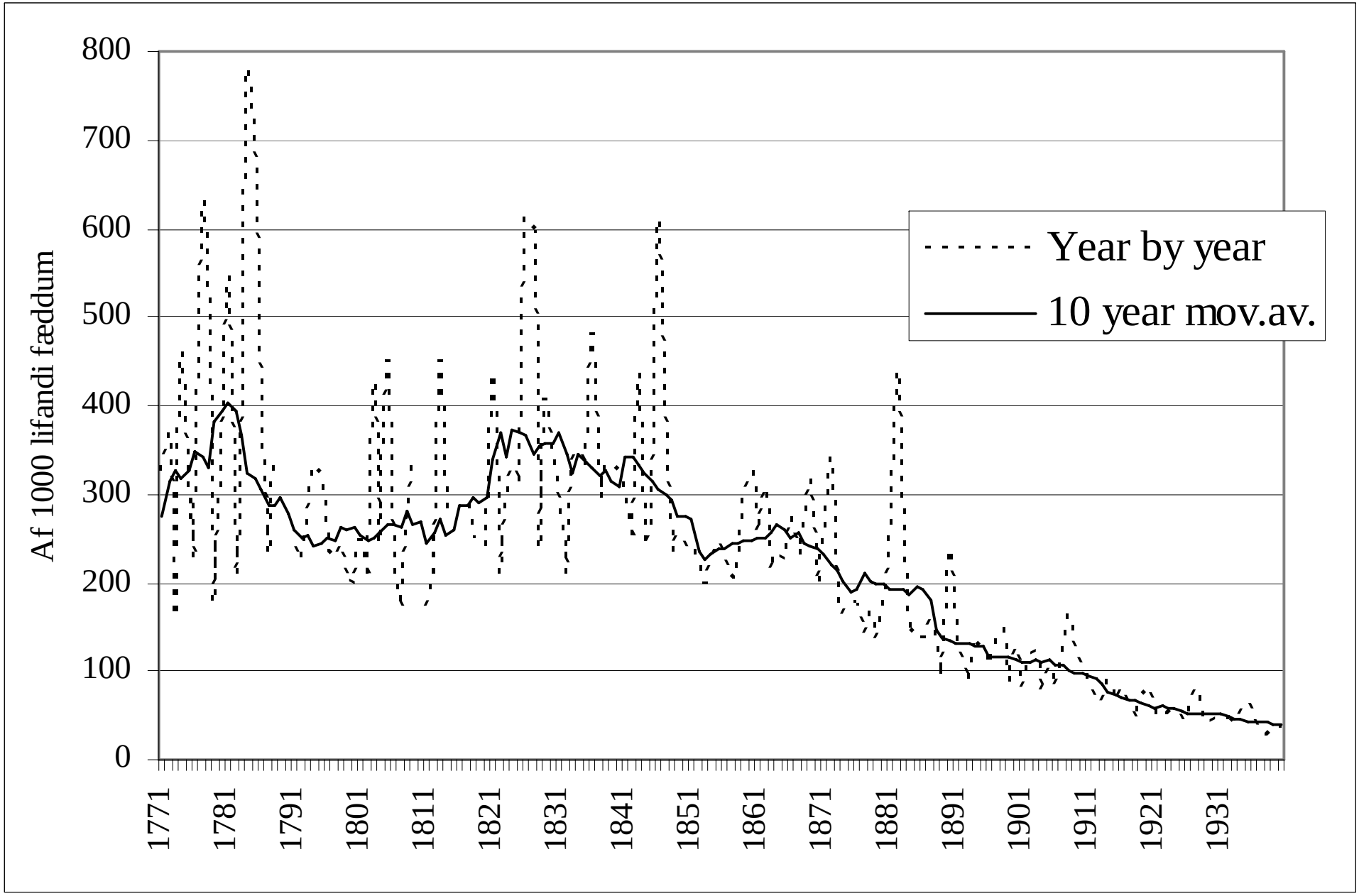
Determinants of infant mortality

- Environoment
  - Population density (urban, rural)
  - Climate
  - Epiemdiolgical regime
- Economic factors, social structure
  - Distribution of ressources
  - Social class
- Cultural factors, value systems, allocation of resources
  - Knowledge
  - Hygiene
  - Infant feeding methods, breast feeding, timing of introduction of supplementary food into infants diet
  - Literacy
  - Female autonomy
  - Division of labour

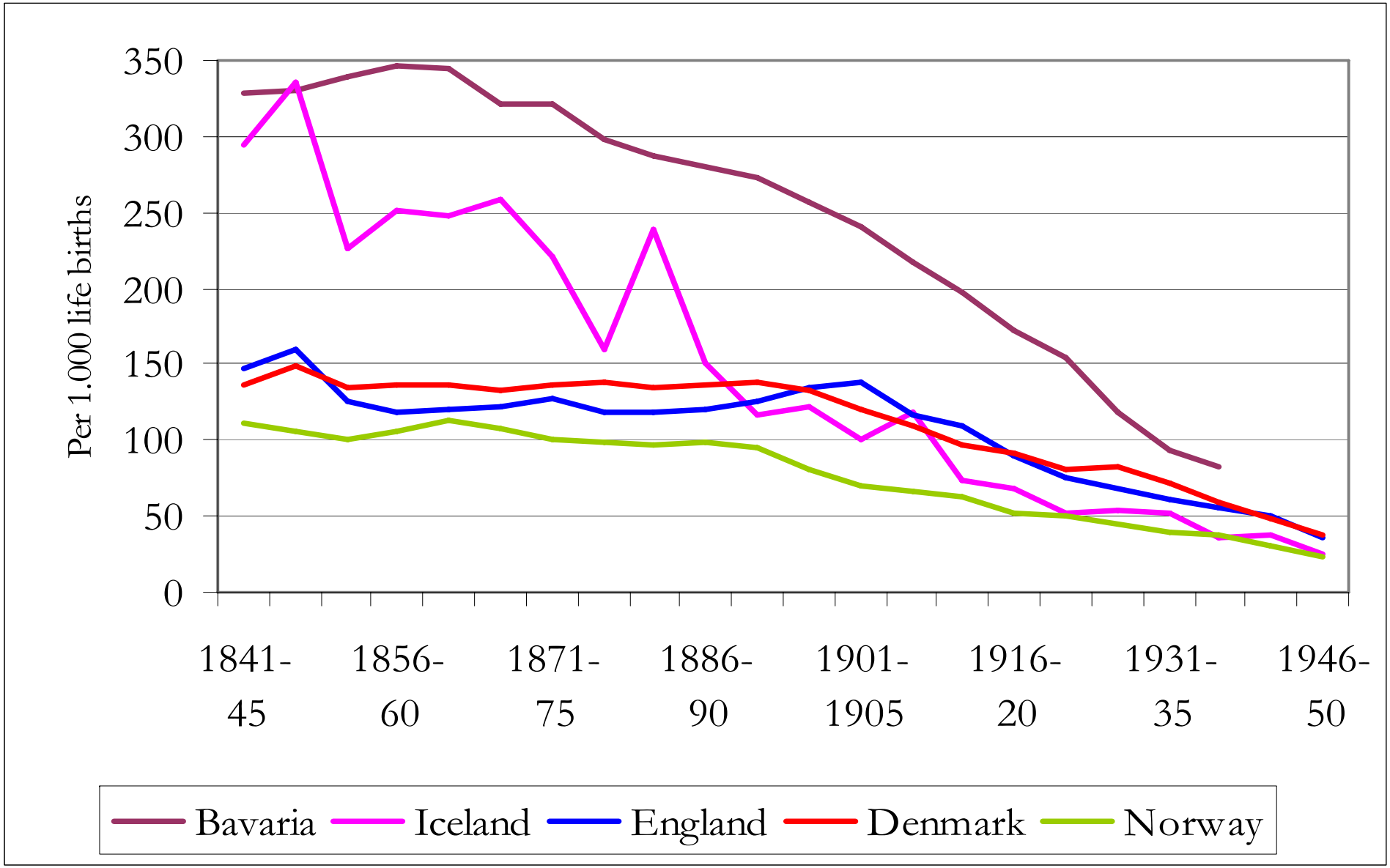
Differences in infant mortality developements 1771-2002



Infant mortality in Iceland 1771-1940. Yearly figures and 10 year moving averages



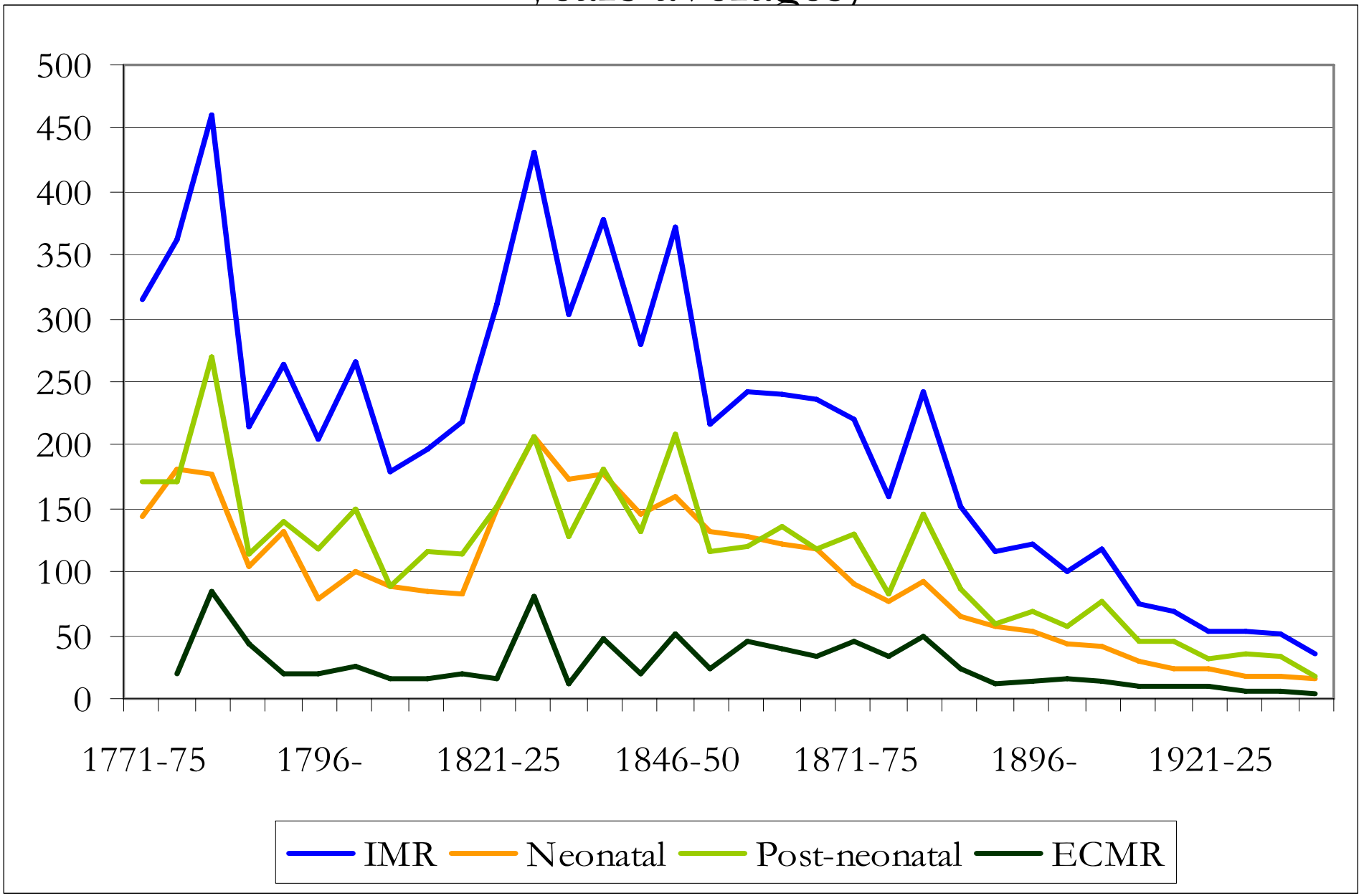
Infant mortality in five European societies 1841-1950



Infant feedig methods in Iceland. Mid 19th century

- Short-term breastfeeding usually practiced in densely populated fishing districts.
- No breastfeeding at all in various rural areas.
- Babies handfed with undilluted cow's milk. Cream or butter commonly given to young babies.
- Sometimes a quill (pipe of a bride's feaher) used to feed ifants.
- Solid food often pre-chewed by adults and infants fed through a rag.

Infant mortality (neonatal and post-neonatal) and early childhood mortality (1-4 years) in Iceland 1771-1940 (five years averages)

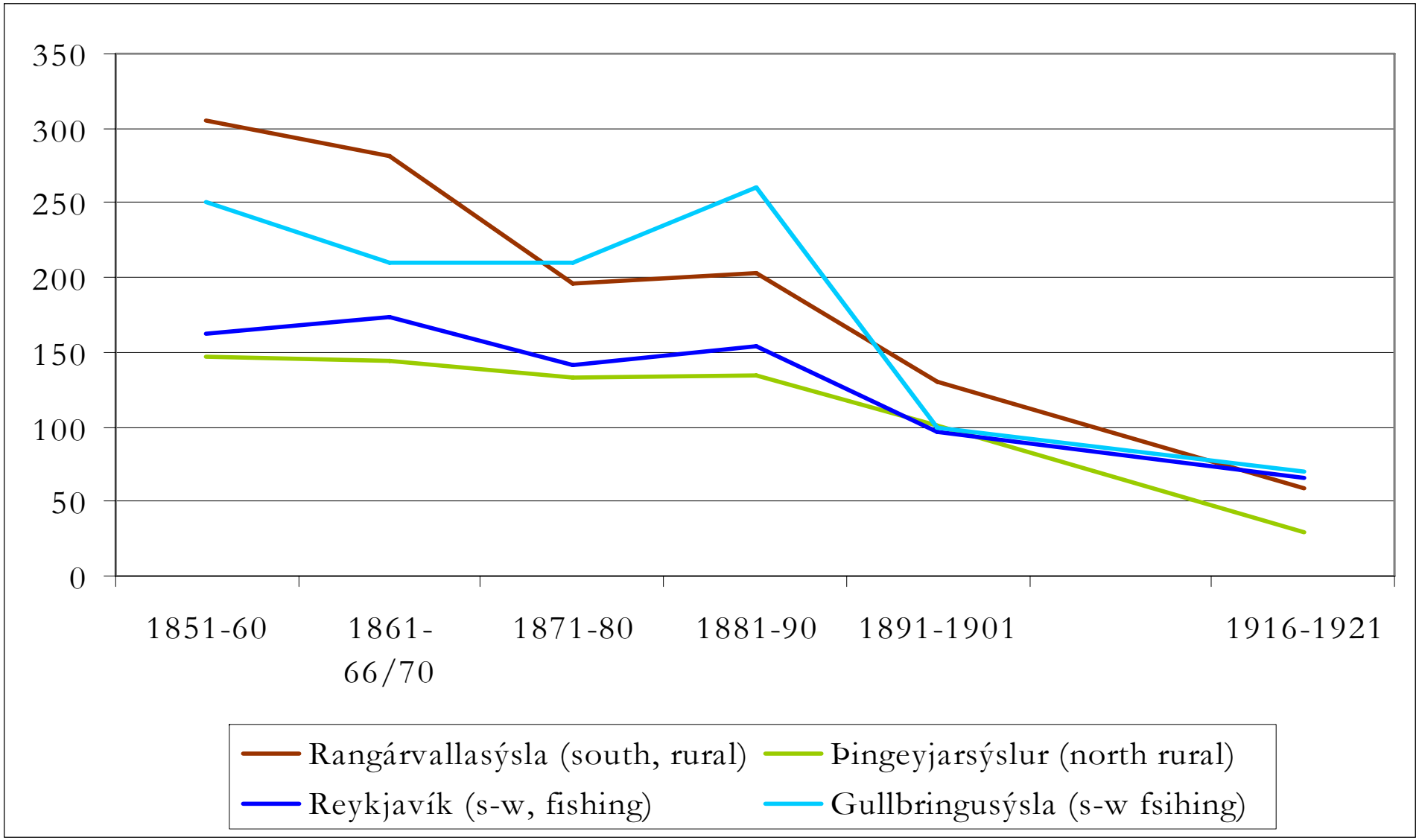


Regional differences

- The pre-transitional period was not only characterized by important differences in infant mortality between countries, but **often huge regional differences within countries**. Often neighbouring societies displayed extreme differences in mortality levels.
- To be able to identify the most important factors behind levels and developments of infant mortality two methods are used:
  - An analysis of differences in infant mortality between regions.
  - In depth studies, micro studies in selected regions.

  This method will make it easier to determine what actors influenced mortality levels. It will also facilitate the search for the most important factors behind the increase in child survival during the late 19th and early 20th centuries.

Infant mortality in three regions. Iceland 1851-1921



Infant mortality in two neighboring fishing districs (s-w). Population recruited in the same areas. Social structure similar, densilty populated

- Gullbringusýsla west of capital Reykjavík
  - Infant mortality high (same levels as generally in s and w Iceland). Neonatal mortality relatively low but mortality increases dramatically during the second and third month of life.
  - Infants often given the breast in the beginning, but supplementary food given after only a few weeks (common in fishig districts were milk was not available).
- Reykjavík in Gullbringusýsla
  - Low infant mortality (both during the neonatal and postneonatal period)
  - Breastfeeding general according to medical reports.
  - Low mortality amongst the poor (daylaborers and single mothers) than farmers and state officials
  - Midwives often of danish nationality (and trained in Denmark)

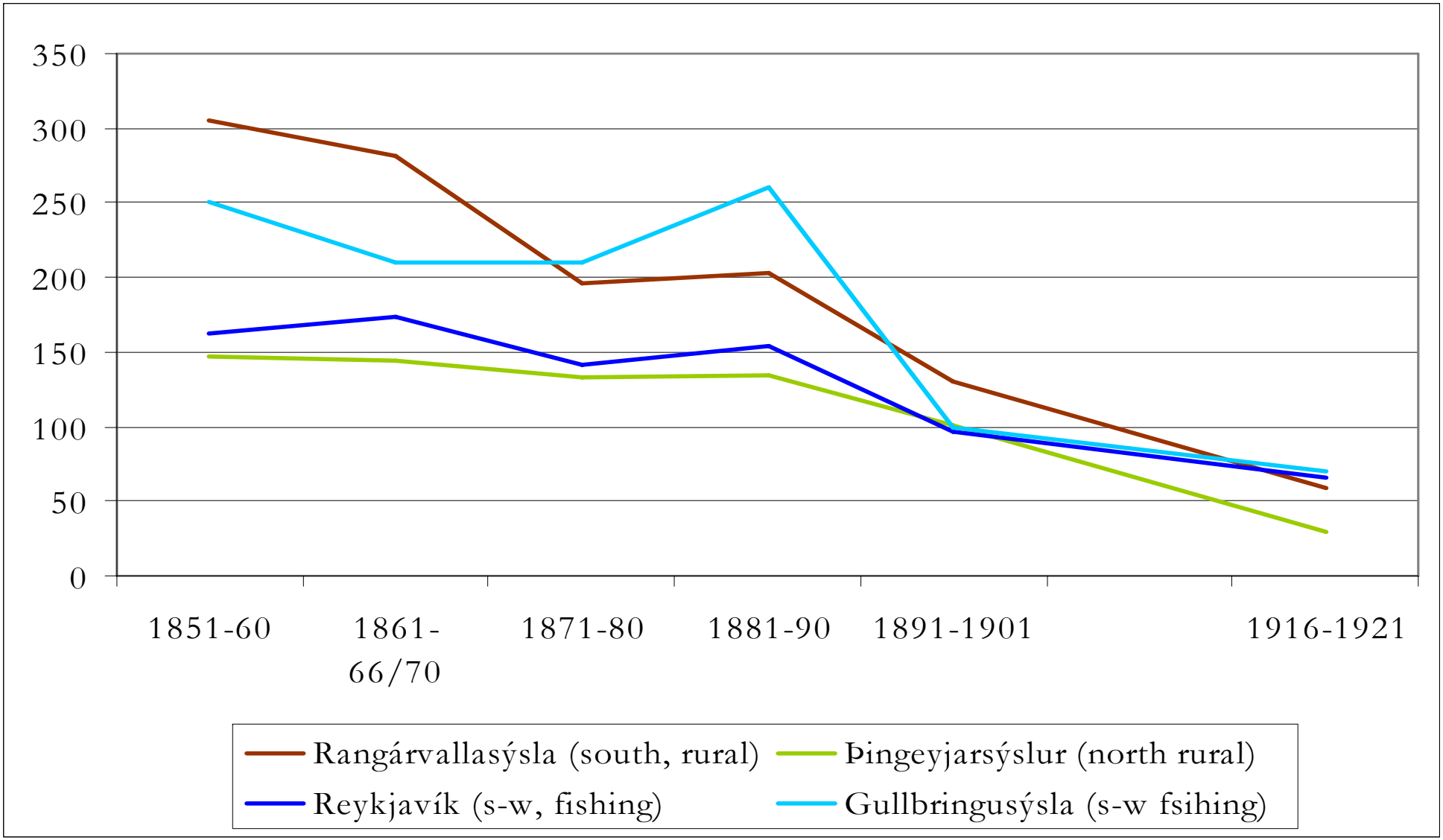
Infant mortality in two agrarian areas

1. Rangárvallasýsla, agrarian area in southern Iceland
   - Animal husbandry (predominance of cattle farming) the main source of livelihood combined with seasonal fishing in distant areas. Women responsible for the household while majority of the male population is absent.
   - Extremely high mortality rates, from day 7 until the third month. Late postneonatal mortality low.
   - Breastfeeding generally not practiced at all. Babies given undilluted milk or pre-chewed solid food.
   - The tradition of midwives taking newborns home with them strong.
   - Few "examined" midwives.
   - Low literacy rates

Infant mortality in two agrarian areas

2. Þingeyjarsýslur, agrarian area in northern Iceland
   - Animal husbandry the main source of livelihood (predominance of sheep farming). No tradition of seasonal migration in connection with the fisheries. Households complete throughout the year.
   - Low infant mortality rates, both neonatal and postneontal
   - Breastfeeding reported to be the general in the area (medical reports as early as 1850)
   - Midwives numerous and well trained. A number of midwives were sent to Denmark to study for midwifery
   - High literacy levels

Infant mortality in three regions. Iceland 1851-1921



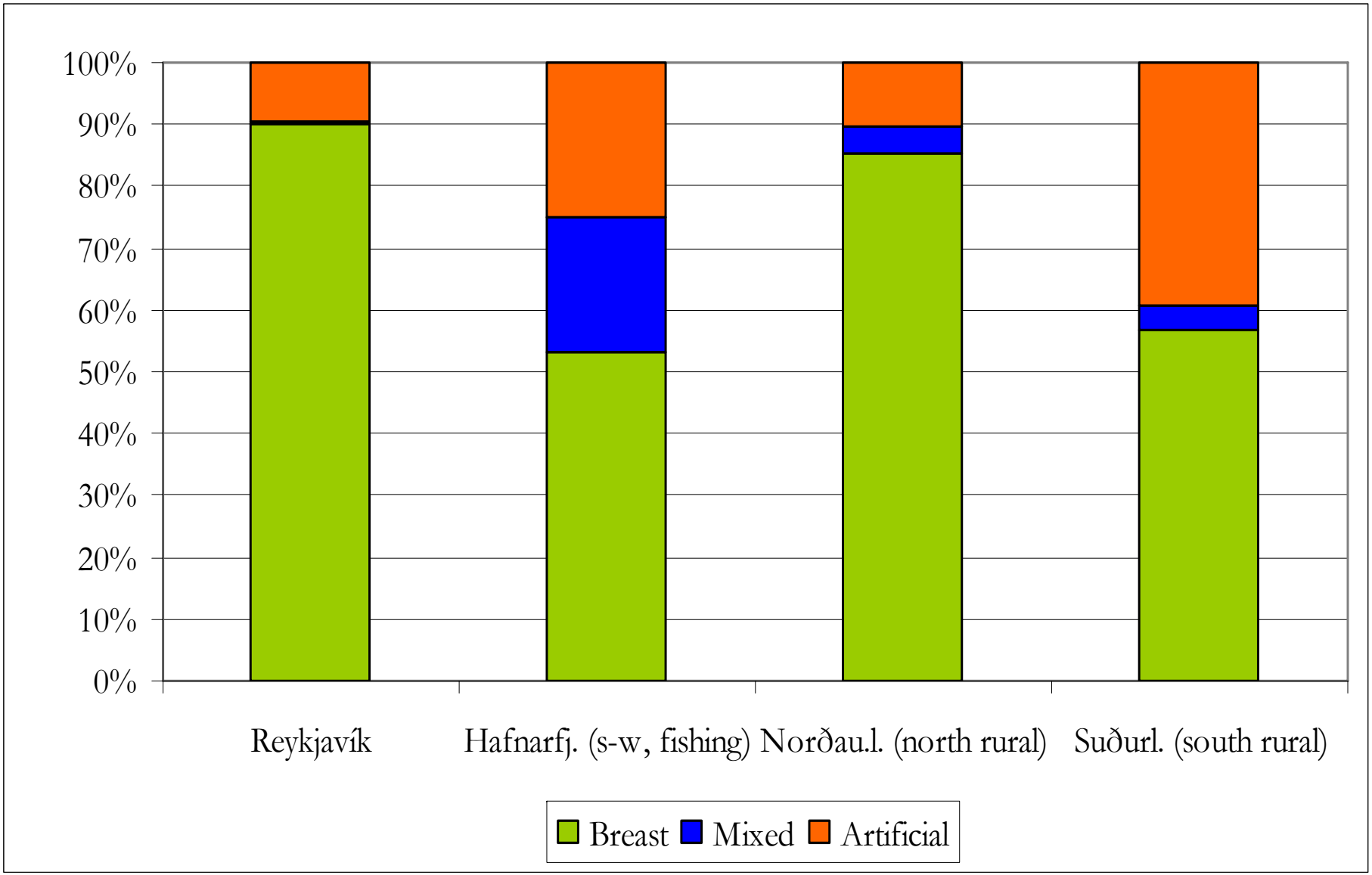
Persisting structures or changing traditions?

- Shortly after 1900
  - Infant mortality in Iceland low in a global perspective and
  - Regional differences in mortality levels were almost non-existent.
- Did this imply that infants were now generally breastfed or were there other factors at work?
- And if they were, how was it possible to change traditions within a time span of only one generation? How could this be possible in areas where no woman had experience of breastfeeding? (Note in this respect that midwives were generally born in the areas they served)

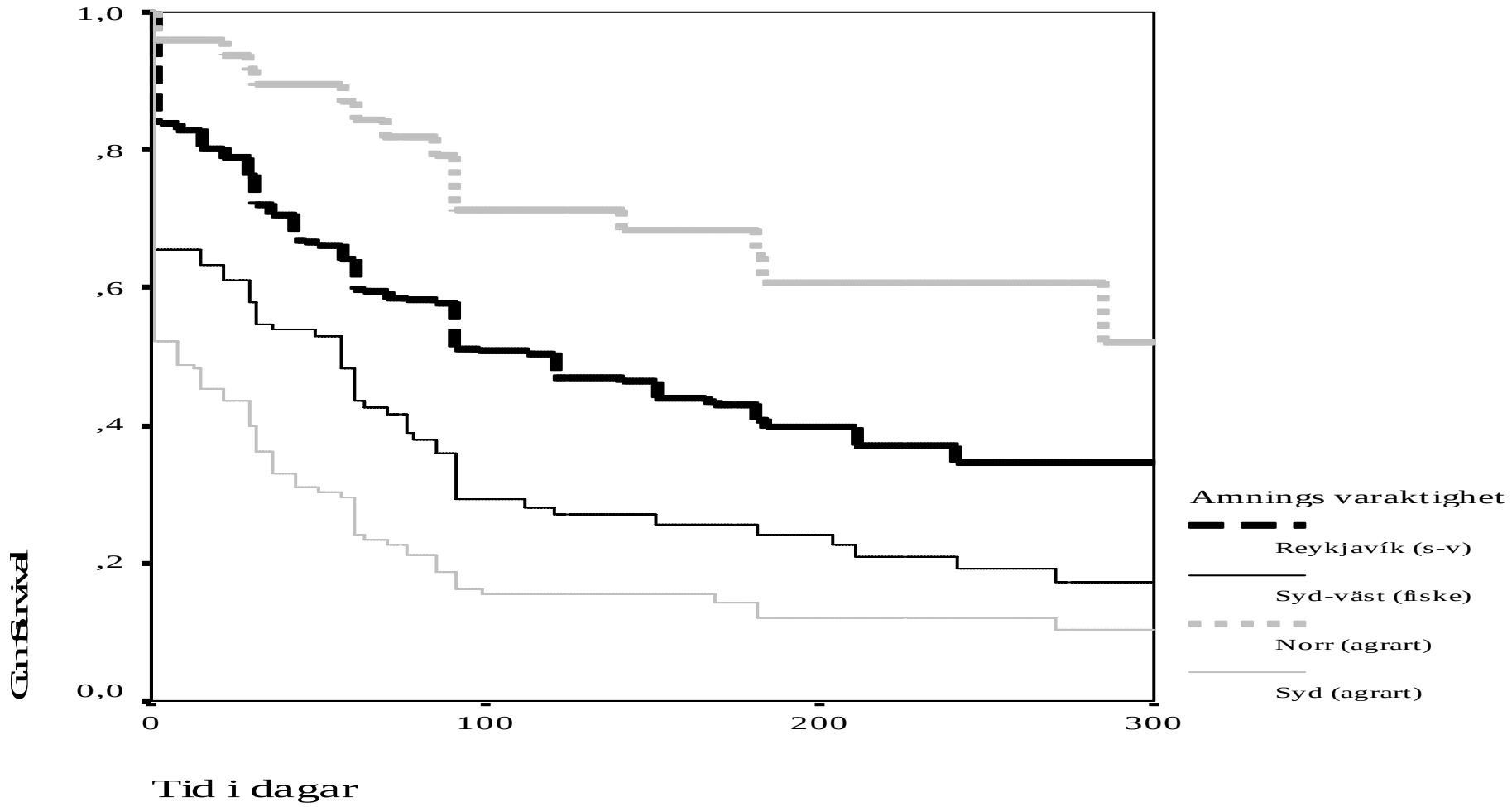
Sources on breastfeeding. Individual level data in the early 20th century

- Midwives' reports since 1912. Information on feeding methods shortly after birth (until 3d (rural areas) or 14th day (villages))
- The census 1920. A question on length of breastfeeding for all children below age one.

Regional differences in infant feeding methods. Iceland 1915-1925



Regional variations in length of breastfeeding (in days 0-300). Iceland 1920



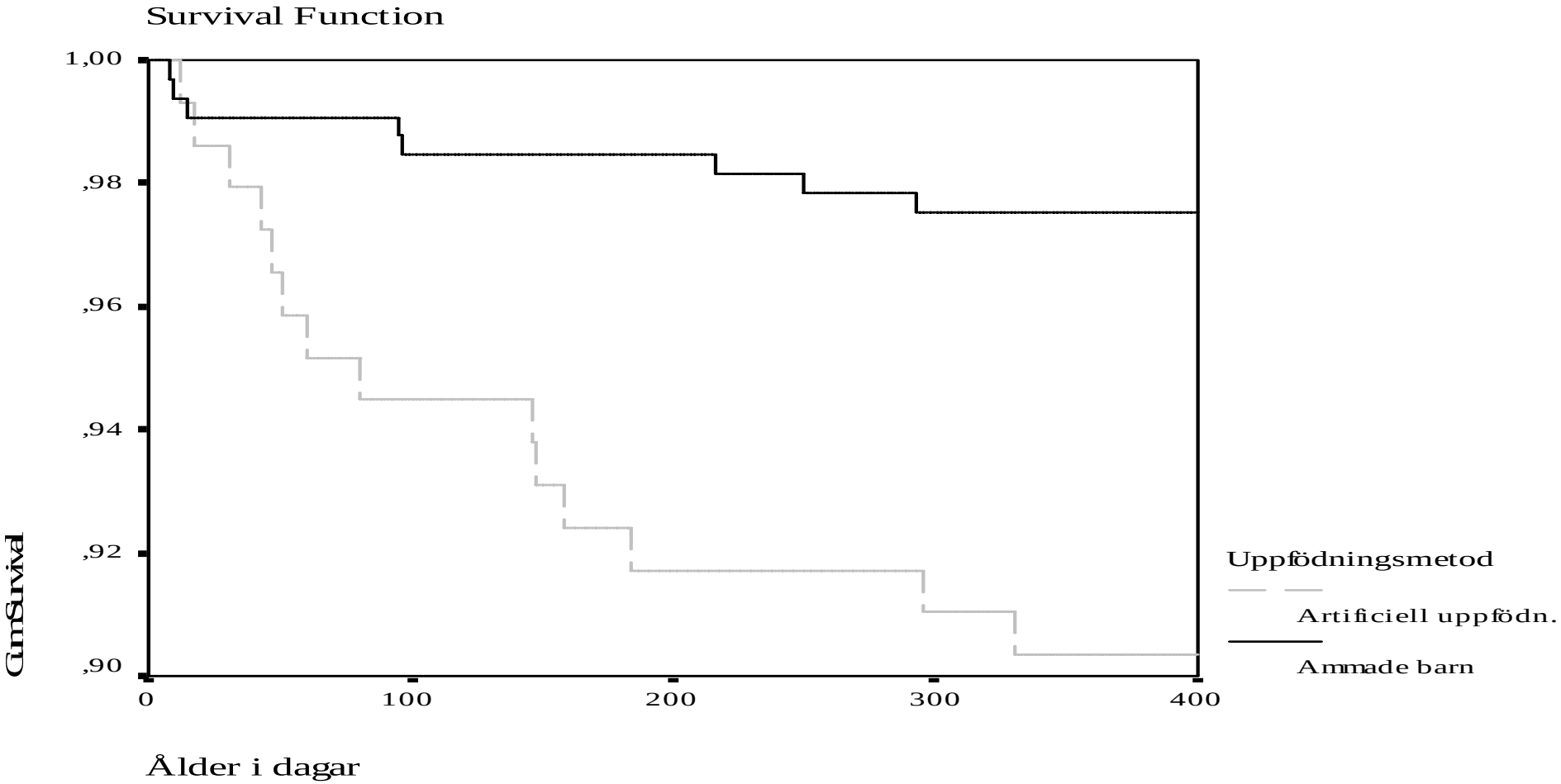
Why declining mortality despite weak breastfeeding traditions?

- Better knowledge of preventive measures
  - Hygiene.
  - Preparation of food given to infants
  - Cow milk dilluted with cooked water (earlier babies were given undilluted milk and fequently cream or butter).
  - More adequate ways were used to feed infants. Introduction glass bottles instead.

Interaction of actors

- Midwives key actors in this development. Not only did they persuade mothers to breastfeed they also supported them in various other ways, instructed them about hygienic measures and the treatment of food.

Differences in cumulative infant mortality between breastfed and bottlefed infants in an Icelandic fishing village. All births 1913-1925



Breastfeeding still had impact upon survival, but more upon health

- Healthier babies and young children in areas where breastfeeding was of long duration. Diarrhoeal diseases reported to be of little importance in those areas.
- In areas where breastfeeding traditions were still weak diarrhoeal diseases were common. However, the measures mentioned above did helped children surviving the most critical period of the first months.

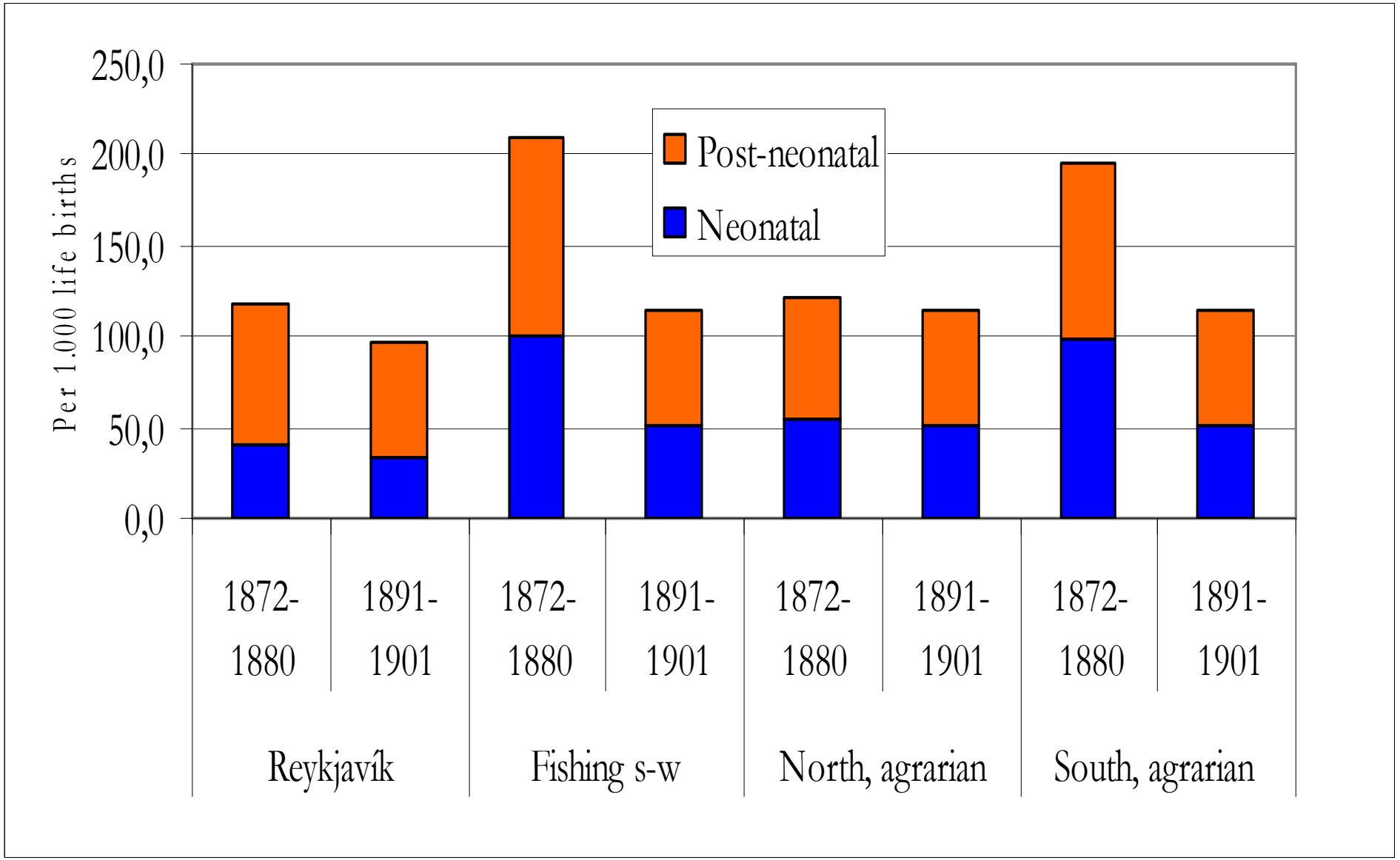
Why the rapid development towards low infant mortality? Underlying explanartory factors

- Literacy levels were high, therefore it was easier to implement changes than in societies with low literacy rates.
- Secularization in the late 19th century lead to increased intrest in public health measures.
  - Reflected in changes in the education of midwives.
  - Increased school attendance amongst girls.

How does female literacy help to prevent infant death?

- education helps women to overcome the barriers posed by low autonomy, low social status and low economic status. … Education enhances competence in a variety of ways through enhancing knowledge, confidence and other responses … (Monica Das Gupta 1990).
- maternal education diminishes the importance of a fatalistic view of infant deaths. Literate mothers are thus generally more likely to use the available health services. It has also been suggested that education is positively related to female autonomy (John Caldwell 1993).

Neonatal and post-neonatal mortality. Regional variations 1871-1880 and 1891-1901



Terminology

- Infant mortality. Deaths before day 365 per 1.000 live births.
- Neonatal mortality. Deaths before day 28 per 1.000 live births.
- Post-neonatal mortality. Deaths during day 28-364 per 1.000 live births
- Early childhood mortality. Generally deaths in the age group 1-4 years per 1.000 population aged 1-4.