

CHAPTER 1

THE DETERMINANTS OF INFANT MORTALITY: HOW FAR ARE CONCEPTUAL FRAMEWORKS REALLY MODELLED?

1. INTRODUCTION

The infant mortality rate (IMR) defined as the risk for a live born child to die before its first birthday is known to be one of the most sensitive and commonly used indicators of the social and economic development of a population (Masuy-Stroobant & Gourbin, 1995). The association between deprivation and poor survival in infancy was already documented with survey data as early as 1824 (Villermé, 1830 quoted by Lesaëge-Dugied, 1972). The association between socio-economic factors and infant mortality was further reinforced when improvements in overall infant mortality levels over time ran parallel with general social and economic development in most industrialised countries during the twentieth century. Furthermore, since the Second World War, corroboration of the strong inverse relationship between socio-economic development and mortality rates has been found repeatedly among countries and areas within countries. At the individual level, significant social inequalities are repeatedly recorded, even when the overall IMR reaches very low levels (Haglund et al., 1993). Links between individual-level social inequalities and regional (aggregate-level) differences are partly explained by relatively high spatial concentration of the deprived and of populations of lower social class (United Nations, 1953; Masuy-Stroobant, 1983).

To explore how demographers have tried to theorise infant mortality as a social phenomenon and the way these theoretical assays are actually translated into statistical models for explaining the widely acknowledged effect of maternal education on infant or child survival, I have reviewed part of the recent demographic literature dealing explicitly with the statistical analysis of this relationship.

2. FROM THE IDENTIFICATION OF DETERMINANTS TO THE DESIGN OF CONCEPTUAL FRAMEWORKS

The high mortality levels experienced by European populations in the past (IMRs ranging from 80‰ and 250‰ by 1900) and the less developed countries today (with populations still experiencing IMRs above 140‰, like Guinea-Bissau, Sierra Leone or Afghanistan as estimated by the US Population Reference Bureau for 1997; Boucher, 1997) show some similarities: their causes of death were and are mainly of

infectious origin, and the high mortality levels experienced during the first year tend to continue, although at lower levels, during childhood (i.e. until age five).

Historical studies on infant mortality brought about the quite general observation that a good deal of its decline could be achieved before efficient preventive and curative medication (vaccination against measles, whooping cough, tetanus... and antibiotics) was made available: "the historical evidence is consistent with the view that medical interventions could only have affected mortality in general and infant mortality in particular after 1930." (Palloni, 1990, p.191).

Even though death is a biological event, mainly caused by a specific disease, the demographic study of the determinants of infant and child mortality will concentrate on the cultural, environmental, social and behavioural factors, which may influence the likelihood of ill health, disease and death in early infancy. Research on the historical decline of infant and child mortality in Europe have thus identified retrospectively a wide series of determinants which are also known to explain the present-day situation in high mortality populations. Climatic and seasonal variations in mortality by diarrhoea have shown the importance of *ecological conditions*; significant spatial correlations between regional IMRs and *infant feeding practices* (whether the infants were breast-fed, bottle fed, currently receiving foster care) were also abundantly documented; *social factors* as indicated by the excess mortality of illegitimate infants, or the striking rural-urban differences observed during the industrialisation process (Naomi Williams and Chris Galley, 1995, p.405 explain the nineteenth century urban disadvantage by the "urban-sanitary-diarrhoeal effect" due to poor sanitation, overcrowded housing, poverty) played also an important role in European history; finally, the *high fertility patterns* we have known, did also exert an effect on infant and child survival, through shortened birth intervals, family size, etc.

Infant mortality started its decline in Europe and the USA by 1900, several decades after a decline in early childhood and general mortality had begun. Nutritional improvements (McKeown, Brown and Record, 1972), sanitary reforms (i.e. the provision of sewage disposal and clean water supply systems in towns) and improved personal hygiene (Ewbank and Preston, 1990) were put forward to explain the decrease in general and childhood mortality. Infant mortality appears to resist to these improvements until quite similar "Child Welfare Movements" were organised in most European countries and the USA (Masuy-Stroobant, 1983) by the very end of the nineteenth beginning of the twentieth century. Their health education activities were built on an increasing awareness of the germ theory of disease (Louis Pasteur in the 1880s) and the growing agreement "*that the mother needed education in proper infant care practices*" especially regarding feeding practices. Major emphasis was thus placed on breast-feeding, on providing clean and adequate food to the non breast-fed infant—heating of milk and sterilisation of bottles were important innovations in this regard—and on keeping the baby and its direct environment clean. At first based on private initiatives, various educational activities aimed at mothers were progressively implemented through the organisation of Milk Depots (in French, "Gouttes de Lait" ensuring the distribution of ready-to-use clean and bottled milk to the poorer mothers who could not breast-feed their infant), Infant Consultations, where the babies were weighted and examined by a medical doctor,

networks of Home Visiting Nurses and midwives. Educational efforts were also aimed at schoolgirls; they were taught "...the value of domestic hygiene, the dangers of filth, and what to do about infectious diseases" (Ewbank & Preston 1990, p.127). Mass education campaigns were also organised by the Red Cross during the First World War to teach mothers the basic principles of the "new" child care practices by means of public demonstrations. The content of the information/education provided did not vary much from one country to another since International Congresses were held to exchange information and experiences gained in the different countries (Congrès Internationaux des Gouttes de Lait, Paris 1903; Bruxelles 1906; Berlin 1912) in order to improve the action. These often local initiatives were later on (around the First World War) institutionalised and generalised in Europe through the Maternal and Child health Systems, whose main objectives were and are still the development of preventive care through information, education and early detection of health problems.

Training in the "new" infant care practices seemed thus to be the key to reduce infant mortality. Later evidence however (Boltanski, 1969) worked out in the context of inter-war France has shown that *the general education level of the mother* was more efficient towards adoption of the new infant care practices (and of a more general preventive attitude) than any specific training course in those matters.

Moving towards less developed countries, John C. Caldwell (1979, pp. 408–410) with reference to Nigeria argues that "(...) maternal education cannot be employed as a proxy for general social and economic change but must be examined as an important force in its own right (...). Furthermore, in Nigeria, as doubtless in much of the Third World, education serves two roles: it increases skills and knowledge as well as the ability to deal with new ideas, and provides a vehicle for the import of a new culture." He then further develops three main hypotheses on the mechanisms through which maternal education is supposed to exert its effects on the health of children:

“ • The first explanation is usually given as the only reason. That is that mothers and other persons involved break with tradition or become less “fatalistic” about illness, and adopt many of the alternatives in child care and therapeutics that become available in the rapidly changing society.(...)

• The second explanation is that an educated mother is more capable of manipulating the modern world. She is more likely to be listened to by doctors and nurses. (...) She is more likely to know where the right facilities are and to regard them as part of her world and to regard their use as a right and not as a boon.

• There is a third explanation, which may be more important than the other two combined. (...) That is, that the education of women greatly changes the traditional balance of familial relationships with profound effects on child care.”

This paper usually referenced in the demographic literature as Caldwell's “seminal paper” or Caldwell's theory was a few years later completed by a series of analytical frameworks for the study of child survival determinants in developing countries. The frameworks published by Meegama (1980), Garenne & Vimard

The Explanatory Power of Models
Bridging the Gap between Empirical and Theoretical
Research in the Social Sciences

Franck, R. (Ed.)

2002, X, 310 p., Hardcover

ISBN: 978-1-4020-0867-2