

Infant Mortality Now and Then

The Dual Role of Economic Resources

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A lesson for social policy in developing countries trying to lower their infant mortality is that although improving a nation's economy may be necessary, it is not sufficient.

Introduction

C ONTEMPORARILY, THE infant mortality rate is used as a proxy for a society's welfare level, on the assumption that a society where many children die in infancy lacks adequate resources to keep them alive.¹ When comparing statistics on infant survival with economic indicators such as the Gross Domestic Product per capita, we see how children in rich countries have the best chances to survive through infancy.² Such use as a proxy can also be found in historical studies, for instance together with other indicators of economic development in the Habsburg Empire leading up to World War I.³ This article explores to what extent the positive relationship between economic resources

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and infant survival holds true historically. Was the connection weaker or could the relationship be reversed so that access to economic resources was associated with *higher* infant mortality? In the case of a reversed relationship, how did it arise? Such historiography is in line with the expressed need to summarize historical demography research.⁴ While these are interesting historical questions, they can also have consequences for the ongoing fight to reduce infant mortality in developing countries. Especially in Sub-Saharan Africa these campaigns have proved more difficult than expected, the goals for infant mortality not being reached in several nations. One reason may be that the connection between economic development and mortality levels is complex, and not enough attention is paid to the difference between the past and current situations among researchers of infant mortality.⁵

The relationship between economy and infant mortality is part of the debate within historical demography about the degree to which economic growth caused the demographic transition during the 19th and 20th centuries. Most researchers agree that economic factors influenced the mortality decline, but many argue that the epidemic climate was more important and that the economy affected nuptiality and fertility more than mortality. While the transition is complex and not uniform across nations, there is little doubt that its first phase in the Nordic region was reduced mortality.⁶ However, the debate about why it declined, and the reduction in crises mortality after the Napoleonic Wars remains open.⁷ Infant mortality made up a significant proportion of gross mortality and often spearheaded the demographic transition.⁸ Their need for special nourishment and the high mortality among infants makes it likely that economic factors influenced their mortality in different ways than for other age groups.⁹ By distinguishing between age groups, we can in the next round find analogue correlations for the mortality of older groups with data about economic trends, such as those published for Norway.¹⁰

Mortality and Economy

A VARIETY OF resources influence infant care: breast-milk versus artificial nourishment, clean water, waste disposal, housing quality, parental education, social capital, etc.: in sum, “the resources of reproduction.”¹¹ These resources can to some extent be regarded as economic, but the present paper will limit itself to a discussion of two main aspects of economic resources relating to infants. First there is the economic standing of the society, typically the nation at large, usually measured in macro-economic terms such as the Gross Domestic Product (GDP). Second, there is the economic status of the family (family income), or the household head’s occupational status. The two levels

are connected and family-level indicators may tell much about the distribution of resources available in the society's macro-economy. A nation may make its riches unavailable to the majority of families, and thus unavailable for infant care, but economic resources may benefit infants through alternative channels, e.g. through infant care centers and hospitals.

This article includes findings based on source material from a wide time span, for countries ranging from modern, post-industrial nations through developing countries to historical societies. Are their economies, occupational groupings and overall conditions for infants and their families too different to make comparisons realistic or valuable? This question is valid, especially when we discuss the underlying causes of infant death or survival. Obviously, the complex web of factors causing differential rates of infant mortality changed over time.¹² However, it can still be maintained that insights about how some countries reduced their infant mortality can be of value for the developing part of the world where infant mortality rates are close to 100 per 1,000 live births.¹³ Furthermore, insights from fieldwork in high infant mortality settings may strengthen our understanding of why infant mortality was previously so high in today's developed countries, and why the rates varied significantly both geographically and chronologically. Another motivation is the common physiology shared by all women and infants. For instance, diarrhea type diseases were a serious killer of infants historically, and still are in present-day developing countries.

Defining infant mortality seems simple: the proportion of live born children who die before reaching their first birthday. However, when we operationalize the concept, several source-critical questions emerge. Were stillborn infants included in the number of children born or dead? How was stillbirth defined, e.g. were live infants considered stillborn if they died during their first day—as was the case in 19th century Norway? Are the records of births and deaths complete, or were certain social groups omitted?¹⁴ Are surveys representative of the whole country or do they leave out, e.g., ethnic groups in remote areas? When using retrospective census variables, are there details for infants or must we combine them with older age groups?¹⁵ Whereas most Scandinavian records are complete enough for the study of social differences in IMR after the Napoleonic Wars,¹⁶ this is more problematic in much of the rest of Europe until the mid-19th century. Family reconstitution data show how under-registration of infant deaths also affects the results based on full count Scandinavian records.¹⁷ Where full reconstitution data is missing, it is difficult to evaluate the representativeness of the burial records, although the distribution of infant deaths during the year may alert us to lacunae in these sources.¹⁸ The surveys and censuses we rely on in most developing countries may be unrepresentative of some population groups and not fine-grained enough to capture local developments. They do, however, give a consistent enough picture to be trusted for long-term national developments. In this article I shall limit

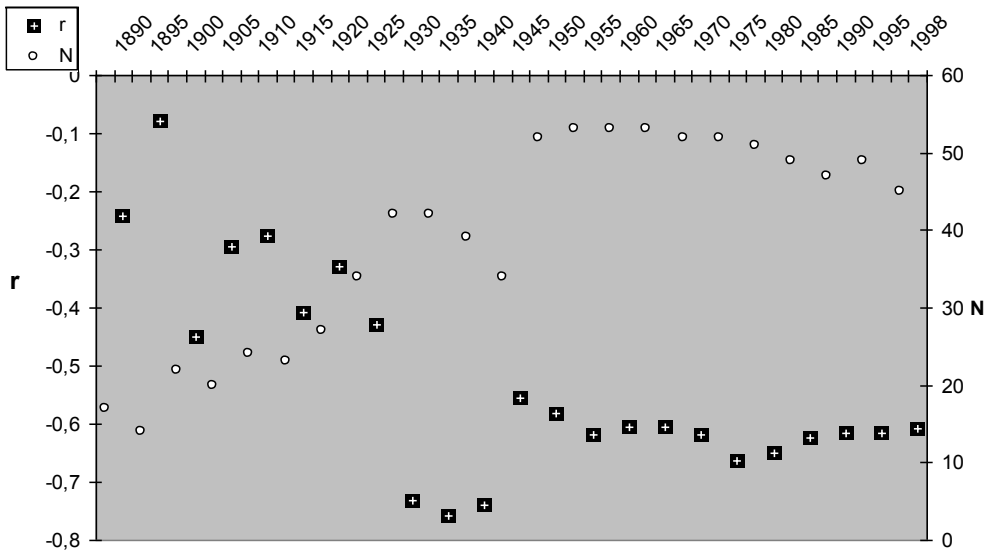
myself to a discussion of all infant deaths (i.e. those taking place under one year), although it would be interesting to juxtapose the factors determining the different patterns of stillbirths, neonatal (deaths under one month) and post-neonatal mortality (deaths in the second to twelfth months) in different societies.

Nation Level Correlations

STATISTICAL ANALYSIS can show more comprehensively the relationship between the national economy and infant mortality rates. For the 20th century we have Gross Domestic Product per inhabitant for an increasing number of nations, and national IMR is available for somewhat fewer countries.¹⁹ The problems mentioned above apply to both statistical series, and it disturbs the analysis that the number of countries with the necessary aggregates decreases when moving backwards in time. While the available figures may be inaccurate, they still give a roughly correct picture of the level of the national economy and the level of infant mortality.

Infant mortality rates were found for up to 64 countries, which could be matched with historical GDP figures for all but Iceland, Northern Ireland and Barbados. Moving five-year averages were computed from the yearly infant mortality rates, while such smoothing is unnecessary for the more stable GDP. Pearson's *r* correlating national GDP and IMR was computed for every quinquennium from 1890 through 1998. In Figure 1, the squares represent correlations plotted against the left scale, while the number of countries included in each year is plotted as circles against the right scale. The rightmost part of the squares show stable correlations since World War II with coefficients around or above 0.6; thus, from a third to half of the variation in IMR can be explained by the GDP per inhabitant. For the period before 1930, however, Pearson's *r* is lower, varying erratically from quinquennium to quinquennium. It seems that the connection between national economy and infant mortality grew stronger before the First World War, but the war reversed the trend. We can ascribe the lower correlation for the postwar years to the effect of the war and to the Spanish influenza, which raised mortality also in wealthy nations. When correlating the 1920 figures for national IMR and GDP without adjusting with moving averages, the correlation is close to zero. Thus, it was difficult to reduce the effect of this epidemic on infants even with adequate economic resources. The high coefficients from 1930 to 1940 may be due to resources in wealthy nations being used to launch effective campaigns for the rapid improvement of infant survival once the postwar crises were over, and a more homogeneous group of countries provided the necessary statistics before WWII.

FIGURE 1. QUINQUENNIAL PEARSON'S R BETWEEN NATIONAL GDP AND IMR
1885–1998 REPRESENTED BY DARK SQUARES



NOTE: Number of observations represented by light circles. Confer also explanation in the text.

The Positive Role of Economic Resources

THE MESSAGE above was that infant survival may benefit from economic prosperity, although the outlier nations and the historical data warn us that the correspondence is far from perfect. Since Malthus, many publications argue that economic factors cause the mortality cycles, and we can present only a few here. In his classic study *The Modern Rise of Population*, Thomas McKeown stressed improved nutrition rather than healthcare as the principal cause of mortality decline *in general* (he devoted less attention to *infant mortality per se*). Only from the 1930s, he believed that medical advances played a significant role, with the exception of smallpox vaccination. Even if his agenda was to stress the importance of economic improvements and social reforms rather than expensive medical measures for increased longevity in the industrialized world, his views are relevant for demographic policies in contemporary developing countries. McKeown highlighted the *combined* effect of nutrition and illness, stressing that epidemics and other diseases killed many malnourished persons.²⁰ McKeown met severe criticism pinpointing the synergy between nutrition, health and the role of societal advances behind the mortality decline from the

early 19th century.²¹ Nor did he account for the effect of nutrition in infancy on health later in life, or that the survival chances of a mother's offspring might decline if she was born during a crisis.²²

Edward A. Wrigley emphasized how industrial methods enabled the population to produce and buy more food and other resources with less effort. One consequence was fewer stillbirths because the improved economy gave mothers a better diet.²³ There are several problems with this hypothesis—primarily that it drew on available neonatal mortality rates rather than stillbirth data. Changing fertility and infant mortality could alternatively be due to increased breastfeeding. In a local study, Sølvi Sogner found increased incomes from timber export to nearby Sweden to be the likely background factor explaining how infant (and female) mortality declined in the parish of Rendalen in southeastern Norway, in the decades after 1791. Men's forestry work was tough, which might explain why male mortality did not decline.²⁴

The Eurasia project also investigated infant mortality during periods of economic crises in the 18th and 19th centuries in parts of Sweden, Belgium and Italy.²⁵ Short-term economic stress did not affect infant mortality, but it affected death rates among older children—most severely in the winter and spring. It seems the food shortage affected the mothers' ability to breastfeed infants less than the direct effect, which the crises had on older children. In the Belgian and Swedish localities, more unclear indications of excess mortality among the poor were found than among the wealthy. A selective fertility effect may explain this—poor women were less fecund during periods of economic stress. Just like in the Dutch hunger winter, undernourished women could not conceive (cf. below). Also, infant deaths among the poor may more likely go unnoticed because these events or their social status were not noted in the sources. Since the deaths of infants and children up to two years old were merged in the Eurasia project, these differentials became less clear.

The positive effect of economic growth and welfare on infant survival is stronger today than in past centuries, due to the information and healthcare available in rich societies. The success of Japan's IMR declining to record levels from high values in the 1950s is unthinkable without the parallel development of the country's economy. We can illustrate the other ends of the resources and IMR continua with the Arusha region in Tanzania, where the independent variable most strongly predicting perinatal mortality was the circumference around the mother's upper arm.²⁶ Thus, hard-working and less well-fed mothers bore babies with lower survival potential. This may explain the historically higher infant mortality among the land-owning peasant families compared to the landless: the work of peasant women, even when pregnant, was more in demand

on big than on small farms. In 19th century towns, however, the lower social groups' infants suffered from low birth weights due to mothers being over-worked and undernourished.²⁷

While these cross-sectional studies establish a positive relationship between economic resources and infant survival, this relationship becomes weaker when looking at the *development* of the economy. In the *World Health Chart*, China, for instance, moved nearly vertically during recent decades, indicating significant IMR improvement without much change in its GDP per inhabitant. Inspecting the constituent factors of the Human Development Index (HDI), we find that when the HDI improved for most developing countries, it is more due to improved life expectancy than to changing economic indicators. Thus, even today there is not always a consistent positive relationship between changes in the economy and changes in mortality.²⁸ A study from the mid-1980s attempted to correlate welfare measures with infant mortality and life expectancy in 99 Third World Countries.²⁹ Per capita income correlated positively with the mortality measures, but the effect of other variables was stronger when measured at the national level. First came the proportion of females in primary schools one generation earlier, before other education and family planning measures. The relative number of physicians scored significantly higher than per capita income, indicating that the employment of a nation's wealth is more important than national wealth. We should not forget, however, that a basic level of economic means is needed to provide for the necessary education, health services etc. Of especial importance is the provision of a nutritional floor during a woman's pregnancy and lactation.

High infant mortality rates in developing countries are often combined with low education, poor hygiene, lack of sanitation and health programs that also hinder economic development. How consistent is this opposite effect when we consider historical studies of countries which are now industrialized?

Unclear or Negative Effects of Economic Resources on Infant Mortality

PERRENOUD FOUND parallel developments in infant mortality throughout the Francophone area for the mid-18th century, hypothesizing that improved infant mortality might be explained by warmer climate after "the little ice age" in Europe.³⁰ The relationship between mortality and climate is complex, however. Warmer summers may produce better harvests, but also bacteria in food and milk, provoking diarrhea in infants. Thus, it is hard to compute significant correlations between mortality and temperature, although there were connections between summer temperatures and infant diarrhea casualties in late

nineteenth century English towns.³¹ Thus, good conditions for food production may affect infant mortality negatively.

Turpeinen studied the high infant mortality (more than 200 deaths per 1,000 births) in Finland from 1749 to 1865.³² The annual IMR fluctuations did not correlate with the success of the harvests. Rather, the highest IMR was found in wealthier districts, and the moderate decline district-wise in the Finnish IMR can hardly be explained by rising living standards.³³ Pitkänen (1983) found higher infant mortality among the lower than the higher social classes, particularly in Finnish towns, linked to the higher illegitimacy among the poor. Opposite social differentials were found on the Swedish side of the border, an area dominated by ethnic Finns, in Brändström's (1984) study of the dramatic infant mortality decline in the Haparanda area. The campaign to change childcare practices, particularly the introduction of breastfeeding in the 1840s and 1850s, succeeded through the dedicated work of the physician and the midwife.³⁴ Infant mortality declined first among the middle class in Haparanda town, then among the proletariat and last among the more affluent peasants. This group-specific development was due to the midwife's employment first being used by the Swedish urban elite, and last by the peasants, who had to pay for her services. In addition, easier access to cow's milk among the peasants made them prioritize women's work over breastfeeding. Health workers' campaigns help explain why infant mortality declined rapidly in many localities, and such local factors determined what social groups pioneered the decline.³⁵ 19th century Sweden lacked a correlation between measures of wealth and infant mortality levels at the regional level, local studies showing lower infant mortality among poor crofters than among wealthier people on neighboring farms.³⁶

A national study of infant mortality differentials, involving linked individual level 1801 census and parish register data for 48 of the 325 parishes in Norway, showed a somewhat higher mortality rate among peasants than the property-less.³⁷ The explanations were consistent breastfeeding among mothers lacking cow's milk and farmer families' exposure to contagion in more centrally located homes. Positive effects on the epidemic climate from the more spacious farmhouses are difficult to demonstrate. The social differences in mortality levels were moderate, however, and the social ranging of occupations can be misleading. Similar findings emerged from a study of Alsace from 1750 to 1870, with only small surplus mortality among the children of workers and servants, but the demographic differences between the Catholics and Protestants were notable, the latter having significantly lower IMR.³⁸ There were also significant differences in mortality between the religious groups in the city of Ekaterinburg, Russia, during the decades leading up to World War I, but here the Catholic minority had lower infant mortality.³⁹

Higher infant mortality in urban than in rural areas may also indicate that richer places might have unfavorable infant mortality. In late 19th century England and France, mortality declined a couple of decades earlier for older children than for infants, because the older ones enjoyed better living conditions based on incomes from industrialization.⁴⁰ Infants, however, suffered because their mothers worked more. Also, there were more illegitimate births among the many female in-migrants to cities who could not provide adequate infant care and breastfeeding. In addition, we should consider the rising urban levels of pollution. A study of late 19th century Preston in England focused on industrial smoke and the deleterious impact of flies enjoying horse dung resulting from urban transportation.⁴¹ This enlarged the diarrhea problem, while the smoke exacerbated pulmonary deceases. High infant mortality in the areas with polluting industry has also been found in a study of contemporary Indonesia.⁴²

Other factors could offset the unfortunate circumstances of urban babies. In the 19th century towns of Reykjavik (Iceland) and Hammerfest (Northern Norway) infant mortality was lower than in the surrounding countryside. Women there had easier access to childcare information (e.g. about breast-feeding), while the surrounding fishing villages were over-populated with temporary in-migrating fishermen and experienced a tougher epidemic climate.⁴³ In 19th century Venice, the Jews had significantly lower IMR than other ethnic groups. People in the congested ghetto were poor, but followed strict cleanliness rules prescribed by Kosher norms. Under tough circumstances, nutrition can play a complex role. During the 1945 winter hunger in the Netherlands, perinatal mortality did not increase. One explanation is that only the better-off were fecund, so the foodless simply could not get pregnant.⁴⁴ The lack of fit between business cycles and long-term infant mortality rates in 20th century Western Europe indicates that above a certain level of access to nutrition and other economic resources, extras have little influence on infant mortality.

In both North and South America, unexpected relationships between the economy and child mortality levels have been found. The US studies of late 19th century child mortality, based on retrospective variables in the 1900 census, found better survival chances than expected among black babies in poor districts because they were protected by their rural environment.⁴⁵ A less quantitatively-oriented study from the Nord-Este region in Brazil during the second half of the 20th century shows how replacing a peasant economy with industry work gave the mothers less chances to breastfeed, resulting in increased infant mortality. This development was reinforced by cultural factors when fathers sought to help by providing infant formula food.⁴⁶

The intricate nature of social and economic influences on differential infant mortality rates can be further illustrated by a study of recent Pakistani immi-

grants to Oslo. On the basis of a detailed birth register including ethnic ancestry, it was found that children born to intermarried cousins had higher death rates than Pakistani children born to unrelated spouses in Oslo, because genetic characteristics were strengthened by a more limited gene pool. Cousin intermarriage is favored for economic reasons in many Pakistani families, since it increases the chances that family farms can be inherited undivided.⁴⁷ Thus, even today ownership of a positive economic asset can become a negative factor, causing lower survival chances for the infants. The mid-nineteenth century social scientist Eilert Sundt made a similar point about marriage strategies among land-holding peasants in certain districts of contemporary Norway. Two farmers would enter an agreement to let sons and daughters marry into each other's farms reciprocally. Thus the farms could stay intact while at the same time two children from each family gained favorable livelihoods.⁴⁸ In the small farming communities this might involve marriage partners related by blood ties. To what extent this increased infant mortality is a matter awaiting future research.

Socio-economic Inequality

TO WHAT extent did infant mortality levels depend alternatively on the general level of economic resources versus the distribution of those resources amongst all social classes?

Infant mortality was not a neutral political question. In late 19th century Copenhagen, the campaign to reduce the capital's high infant mortality rates encountered stern opposition from the conservative city physician, arguing that helping the single mothers care for children would increase the social problems among a growing proletariat and support bastardy. By the 1880s his policy was deemed so reactionary that he had to resign.⁴⁹ Already from 1763 men were obliged to pay for illegitimate children in Denmark, Norway and Iceland. Although reckoned among the roots of the welfare state, this remained much of a formality until the 20th century when legitimate and illegitimate children received equal inheritance rights, and illegitimate infants were cared for in special mothers' centers. Similarly, the lack of will to interfere with family matters within a setting of liberalistic economic policies has been blamed for bringing about the relatively high IMR in 20th century USA.⁵⁰

The British debate about the role social capital played for the development of mortality in England during the 18th and 19th century covers adult, child and infant mortality.⁵¹ By social capital is meant measures implemented by the society to protect its citizens against hardships such as famines. Mercantilist

measures which worked in growing industrial centers such as Birmingham and Manchester in the 18th century were weakened in the more liberalist 19th century. For infants the resources in the social network surrounding mothers could neutralize the negative effect of illegitimacy.⁵² Social capital can, therefore, affect infant mortality different from deaths among older persons. In the urban centers social capital was more significant for survival among the children born to unwed mothers than for the mothers themselves.⁵³ The special trajectory for infant mortality is part of the reason why mortality development in the above-mentioned industrial centers was different in London and in the countryside.

Most researchers agree that social equality is correlated with infant survival in contemporary developed nations and that, e.g., the lower infant mortality in Sweden than in Britain can be explained by a flatter social distribution in Scandinavia.⁵⁴ Another study compared infant mortality in four developing countries with their economic potential and distributive policies at the turn of the millennium.⁵⁵

TABLE 1. THE RELATIONSHIP BETWEEN GNP PER PERSON AND THE IMR (DEATHS UNDER ONE YEAR PER 1,000 LIVE BIRTHS) IN FOUR DEVELOPING COUNTRIES

GNP per person	High IMR	Low IMR
High (\$ 7,138–17,016)	Brazil (35)	South Korea (8)
Low (\$ 1,516 B 3,460)	Bangladesh (70)	Sri Lanka (16)

The main point in Table 1 is the absence of a relationship between the levels of these nations' wealth and infant mortality. While both Bangladesh and Sri Lanka were among the poorest developing countries, only Bangladesh had the high infant mortality level (70 per thousand children born) that one would accordingly expect. By contrast, South Korea had an IMR of only 8 per thousand, whereas Brazil still had one of 35. While Sri Lankan and South Korean authorities have managed to distribute more wealth, Brazil and Bangladesh are characterized by large socioeconomic differences. These differences are rooted in the political systems. Both Brazil and Bangladesh were ruled by military dictators, in Brazil supported by the 'triple alliance' between multinational corporations, state bureaucracy and local bourgeoisie, distributing means of production and benefits unevenly. IMR levels peaked at 122 per 1,000 in the northeastern province, while rates in the central, urban areas were below average. In Bangladesh political decisions have tended to favor rich farmers, ignoring the miserable conditions of the landless. Bangladesh experienced little trickle-down effect from any economic growth. Both countries relied on commercial healthcare systems providing services for those who can pay.

In Sri Lanka and South Korea land reforms resulted in more resources being made available to the peasants. In Sri Lanka, egalitarian policies stemmed from a democratic climate, with widespread literacy, universal adult suffrage and shifting governments. The population has general access to the government's network of healthcare institutions. The healthcare system in South Korea, however, is different and dominated by a private sector with large traditional disparities in availability and quality between the urban and rural areas. The state has, however, improved sanitary conditions, water supply and health insurance programs and educated many health workers. South Korea achieved lower IMR than the USA according to *CIA World Factbook* statistics.

Table 2 bears out the importance of resource distribution for infant mortality as well as its limitations. In Brazil and South Korea the IMR figures are significantly lower than in Bangladesh and Sri Lanka, due to the higher gross income levels in the former pair of countries. Accordingly, infant survival improved more rapidly in the two richest of the four countries. Kidanemariam's study would have given a better basis for evaluating the relative importance of economic growth and more equal distribution of resources if he had supported the quantitative information with more evidence. It is interesting to note that Sri Lanka is one of few developing countries holding a century-long IMR series. Countries which early on financed such statistics tend to have low IMR levels today.

TABLE 2. INFANT MORTALITY RATES AND KEY INDEPENDENT VARIABLES
FOR FOUR DEVELOPING COUNTRIES

	Bangladesh	Brazil	Sri Lanka	South Korea
GNP per inhabitant 1999	\$ 1,516	\$ 7,138	\$ 3,460	\$ 17,016
Gini	0.66 (1978)	0.60 (1976)	0.35 (1973)	0.34 / 0.31 (1978)
Female illiteracy 1980	83.3	27.2	20.5	11.2
Female illiteracy 1990	77.0	18.8	15.4	6.6
IMR 1985 per thousand	123	68	30	27
IMR 1999 per thousand	70	35	16	8
IMR 2006 per thousand	61	28	14	6

NOTE: The Gini index is zero with complete equality, 1 with complete inequality in the distribution of land or income. GNP and IMR data for 1999 and 2006: cf. *CIA World Factbook*. Other figures from Kidanemariam.

Similarly, Caldwell listed a number of countries with impressive life expectancy relative to their gross national product per inhabitant, e.g. communist countries

such as China or Cuba and others like Kerala or Costa Rica. This is explained by their allocation of resources for education, especially for women, universal provision of basic medical facilities, including neonatal care and a reasonable level of nutrition for the whole population.⁵⁶ However, especially developing nations in Sub-Saharan Africa were far from reaching their millennial infant mortality rate goals. Medical researchers are no longer optimistic about the eradication of infectious diseases.⁵⁷ This is to a large degree due to poverty and to international economic agencies forcing the countries to cut spending on basic health and education.

Conclusion

STUDIES OF contemporary infant mortality generally find that access to economic resources lowers infant mortality at all levels of aggregation. Improving the economy usually has beneficial consequences for infant survival, and on average both rich nations and rich families experience relatively few infant deaths. But the connection between infant mortality and economic measures is not consistent and strong even today, when only a basic level of resources is needed to provide adequate infant care. The equal distribution of wealth is a crucial factor and non-economic factors such as the extent of female education correlates highly with IMR. Historically, the connection between access to economic resources and infant mortality grows weaker when we move backwards in time, whether we study the national or the household level. Several historical studies show how access to economic resources could be associated with *higher* infant mortality rates. The results from studies connecting infant mortality with social status are contradictory, and one reason for juxtaposing contemporary and historical infant mortality research is the quite common finding that in past times, infants in relatively poor families experienced somewhat lower mortality than infants in richer families. The reasons for this are complex, but one important factor was that before the 20th century most people were unaware of those adequate childcare methods by which a good economy—be it national or familial—could be turned into optimal childcare. This neutralized the potential beneficial effect of economic resources on reducing infant mortality. Consistent breastfeeding forced by lack of alternatives and living in remote locations with a milder epidemic climate could further reduce mortality risks among infants in relatively poor families. Also, since the wealthy groups used to be relatively small, the methods and data necessary to distinguish the poor from the rich in historical sources may hide some of the effects of the economy, and chances are that more burials among children from poor homes went unregistered.

As more historical studies measure the strength of the independent variables behind infant mortality, it will become increasingly possible to employ meta-analysis to get a clearer picture of the reasons why historical studies relating infant mortality to economic resources are so contradictory. A lesson for social policy in developing countries trying to lower their infant mortality is that although improving a nation's economy may be necessary, it is not sufficient. Distributing a nation's resources more equally and teaching mothers adequate childcare are just as important measures. The infant mortality decline in the rich part of the Western world happened over many decades and against a background of improving economies. In addition, the trigger effect of individual reformers, often educated midwives employed locally, must not be forgotten. Their services should be replicated in the contemporary developing world, since it would make adequate and inexpensive infant care available to all mothers. □

Notes

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Abstract**Infant Mortality Now and Then: The Dual Role of Economic Resources**

This article attempts to show that comparisons between historic and contemporary research on infant mortality are difficult, since economic causal factors played quite different roles in contemporary and historical settings. Economic resources can contribute to infant survival in both positive and negative ways, and mortality corresponds differently to economic factors according to age group. If these caveats are taken into consideration, today's campaigns to improve child-care in developing countries may still learn from historical studies of declining infant mortality in industrializing regions. Results based on individual level data as well as national aggregate data are discussed.

Keywords

infant mortality, economy, socio-economic inequality, statistical analysis