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Short version 2

Narrowing social inequalities in health? Analysis of trends in mortality among babies of lone mothers

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Editorial
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Abstract

Objectives To examine trends in mortality among babies registered solely by their mother (lone mothers) and to compare these with trends in infant mortality for couple registrations overall and couple registrations subdivided by social class of father.
Design Analysis of trends in infant death rates from 1975 to 1996 for the three groups. The data source was the national linked infant mortality file, containing all records of infant death in England and Wales linked to the respective birth records.
Setting England and Wales.
Participants All live births (n = 14.3 million) from 1975 to 1996; all deaths of infants from birth to 12 months of age over the same period (n = 135 800).
Main outcome measures Death rates in the perinatal, neonatal, and postneonatal periods and for infancy overall.
Results For the babies of lone mothers infant mortality has fallen to less than a third of the 1975 level, with a clear reduction in the gap between the mortality in these babies compared with all couple registrations: the excess mortality in solely registered births was 79% in 1975 reducing to 33% in 1996. Most of the narrowing of the sole-couple differential was associated with the neonatal period, for which there is now no appreciable gap. For couple registrations analysed by social class of father, infant death rates have more than halved in each social class from 1975 to 1996. The reductions in mortality were greater in the late 1970s and early 1990s. Infant death rates in classes IV-V remained between 50% and 65% higher than in classes I-II. Differentials between social classes were largest in the postneonatal period and smallest in the perinatal and neonatal periods. The gap in perinatal and neonatal mortality between the babies of lone mothers and couple parents in social classes IV-V has disappeared.
Conclusions The differential in infant mortality between social classes still exists, whereas the differential between sole and couple registrations has decreased, showing positive progress in the reduction of inequalities. As the reduction in the differential was confined to the neonatal period these improvements may be more a reflection of healthcare factors than of factors associated with lone mothers' social and economic circumstances.

Introduction

Infant mortality is an important indicator of a population's health, and any social differentials in this indicator are regarded as unacceptable. The traditional way of analysing social trends in infant mortality has, however, become increasingly problematic: growing numbers of infants are excluded from such an analysis, not least the babies of lone mothers. The size of this potentially vulnerable group has increased from 5% of births in 1975 to 8% in 1996. In Britain a high proportion of lone mothers live in poverty, [1 2] and their children face socioeconomic disadvantage and have higher risks of health problems such as accidents and infections. [3 4]

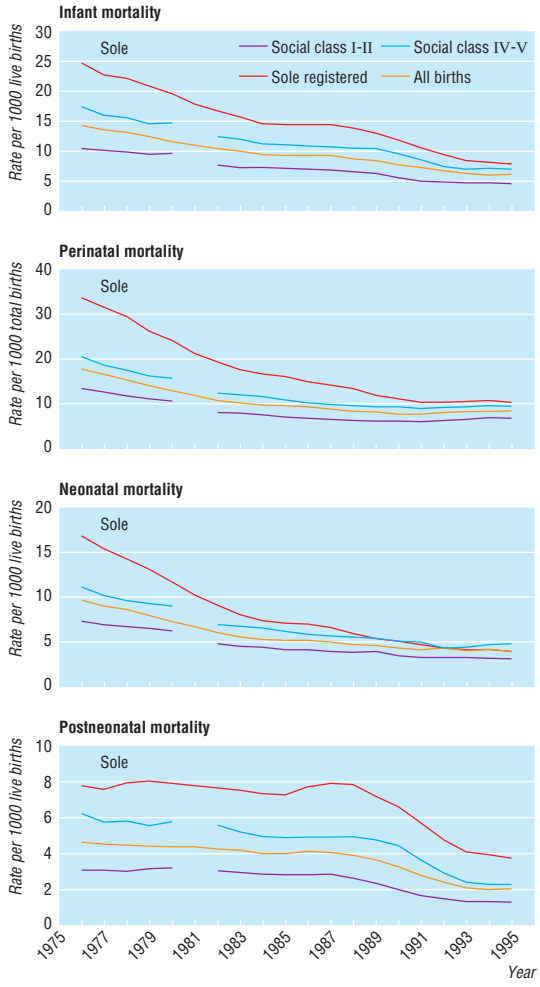
We analysed trends in mortality in babies of lone mothers and compared these with mortality trends in babies of couple parents from different social classes, whether married or not.

Methods

The numbers of live births, stillbirths, and early neonatal, late neonatal, and postneonatal deaths for each year from 1975 to 1996 were obtained from the Office for National Statistics for babies born inside marriage, babies born outside marriage but jointly registered by both parents, and babies born outside marriage registered solely by the mother.

Since 1975 registrations of infant deaths in England and Wales have been linked to birth records, which means that the more detailed information collected at birth on a range of sociodemographic factors can be used in the analyses of deaths. All social class analyses are based on a 10% sample of coded records. Data relating to births outside marriage registered solely by the mother were placed in a separate category.

Mortality for various ages within infancy was calculated from 1975 to 1996 for the babies registered solely by the mother and for each social class. Data for births inside marriage were combined with those outside marriage jointly registered by both parents—the



Infant mortality, England and Wales, 1975-96 (3 year moving averages). Registrar general's social class I-II: professional, managerial, and technical occupations; IV-V: partly skilled and unskilled occupations; sole registered: babies whose birth is registered solely by the mother; all births: all births, regardless of type of registration. Data for social class for 1981 are not available because of industrial action by registrars in that year

combination referred to here as "couple registrations" or "couple parents." Data for social class I were combined with class II and those for class IV with class V to increase the robustness of the calculated rates. Three year moving averages were calculated for the same reason. Confidence intervals around the mortalities were calculated by the methods of Breslow and Day.[5]

Results

Mortality trends varied for each stage of infancy and by social grouping (figure) At the beginning of the period, mortality was highest for the babies of lone mothers followed by a gradient from classes IV-V down to classes I-II with the lowest mortality. Infant mortality fell steadily for the sole registration category until 1984 and remained stable until 1989, when the decline resumed. There was also a narrowing of the differential between the sole and couple registrations. In the mid-1970s infant mortality was 79% higher in the sole registrations compared with the couple registrations, and by 1996 this had reduced to a 33% excess (table).

Most of the narrowing resulted from greater improvements in mortality of solely registered births in the perinatal and neonatal periods from the mid-1970s and throughout the 1980s, and the difference was no longer significant by 1994-6 (table) in contrast with postneonatal mortality. The postneonatal mortality differential between sole and couple registrations has been large and has shown no tendency to narrow.

There has been only a little narrowing of the differential between social classes IV-V and I-II. In 1975-7 infant mortality was 64% higher in classes IV-V, since when it has fluctuated, but was still 52% higher in 1996. What is striking, however, is the clear reduction in the differential to a negligible amount between the infant mortality of the solely registered group and that of classes IV-V (table).

Discussion

This analysis shows an improvement in mortality in babies registered solely by their mothers. In absolute terms, infant mortality for this group has declined to a third of its 1975 rate. In addition, the mortality of babies in this group relative to other groups has fallen. Although infant mortality is still 33% higher than for couple registrations, the gap has reduced from an excess of 79%. Furthermore, there is now little difference between the death rates of solely registered babies and those of classes IV-V, in contrast with the findings of studies in the 1970s[6] and the 1980s.[7] Much of this improvement for the solely registered babies up to 1990 occurred during the perinatal and neonatal periods rather than the postneonatal period. Our results raise the possibility that improvements in maternal and neonatal health have been particularly beneficial for the babies of lone mothers or that their access to the relevant services has improved, or both.

Limitations of this study are, firstly, that some babies of lone mothers may also be included in the

Trends in infant mortality (95% confidence interval) for sole and couple registrations, England and Wales, 1975 to 1996

Year	Sole registrations	Couple registrations	Excess mortality sole/couple (%)
Perinatal mortality/1000 total births			
1975-7	34.2 (33.0 to 35.5)	17.2 (17.0 to 17.3)	100
1982-4	17.8 (17.1 to 18.6)	10.1 (9.9 to 10.2)	77
1989-91	11.5 (11.0 to 12.0)	7.8 (7.7 to 7.9)	47
1994-6	10.6 (10.1 to 11.1)	8.6 (8.4 to 8.7)	24
Neonatal mortality/1000 live births			
1975-7	17.1 (16.2 to 18.0)	9.5 (9.3 to 9.6)	81
1982-4	8.2 (7.6 to 8.7)	5.7 (5.6 to 5.8)	43
1989-91	5.3 (4.9 to 5.6)	4.4 (4.3 to 4.5)	19
1994-6	4.2 (3.8 to 4.5)	4.1 (4.0 to 4.1)	2
Postneonatal mortality/1000 live births			
1975-7	7.6 (7.1 to 8.3)	4.4 (4.3 to 4.5)	74
1982-4	7.5 (7.0 to 8.0)	3.9 (3.8 to 4.0)	91
1989-91	6.6 (6.2 to 7.0)	3.0 (2.9 to 3.0)	123
1994-6	3.7 (3.4 to 4.0)	1.8 (1.7 to 1.9)	103
Overall infant mortality/1000 live births			
1975-7	24.7 (23.7 to 25.9)	13.9 (13.7 to 14.0)	79
1982-4	15.7 (14.9 to 16.4)	9.6 (9.5 to 9.7)	63
1989-91	11.9 (11.3 to 12.4)	7.4 (7.3 to 7.5)	61
1994-6	7.8 (7.4 to 8.3)	5.9 (5.8 to 6.0)	33

Perinatal refers to age under 7 days, neonatal to age under 28 days, postneonatal to age 28 days and over but under 1 year, infant to age under 1 year.

joint registration category, and these cannot be identified separately from published sources. This form of misclassification has probably not changed over the study period in a way that would affect the interpretation of trends. Secondly, the status of the baby at death may be different from that at birth, but this is unlikely to be an issue for most of the deaths occurring within 1 month of birth.

The research highlights the need for lone and unsupported mothers to be given every possible help after the birth of their babies, not just in the neonatal period but on a sustained basis.

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Competing interests: None declared.

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Social inequalities and health: ecological study of mortality in Budapest, 1980-3 and 1990-3

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Until recently, the health systems in eastern Europe, with minor variations, were all based on the Soviet model. The Soviet principles of health care, formulated in 1918, included provision of care to the poorest sections of the population.[1] Since 1990, however, in Hungary a national approach based on health insurance has been introduced. We compared a social disadvantage indicator with standardised mortality ratios for 1980-3 and 1990-3 in Budapest.

Methods and results

Budapest comprises 22 local administrative districts ranging in population size from 34 778 to 174 509. We used three census indicators of disadvantage in 1980 and 1990: the percentage of unskilled workers among the economically active population; the percentage of residents aged ⩾25 years who had not completed a course at university or college; and, as an indicator of overcrowding, the number of people per 100 rooms in occupied dwellings. We converted each indicator to a z score (with a mean of 0 and a standard deviation of 1). These z scores were summed to give a composite social disadvantage indicator.[2] We sorted the districts in descending order of disadvantage, on the basis of the mean composite indicator for 1980 and 1990, and grouped together the five most disadvantaged districts and the five least disadvantaged.

We defined "amenable" mortality as deaths in the age group 0-64 years that were potentially preventable by direct, timely, and appropriate medical care; we defined "non-amenable" mortality, including ischaemic heart disease, as deaths from all causes in the age group 0-64 years minus amenable mortality. Except for maternal deaths, all mortality data were standardised for age and sex by the indirect method, by using total age, sex, and cause specific rates from 1980-3. Using the confidence interval analysis program,[3] we calculated the ratio of the standardised mortality ratios (and 95% confidence intervals) of the most to the least disadvantaged group of districts and, within each group, the ratio of 1990-3 to 1980-3.

The recorded standardised mortality ratios in each diagnostic category and time period were universally lower in the least disadvantaged group of districts than in the most disadvantaged group. The ratios of the standardised mortality ratios of the most to the least disadvantaged groups were all in excess of unity and showed significantly higher mortality for the most disadvantaged group. Moreover, each ratio increased between 1980-3 and 1990-3 (table).

Within the group of most disadvantaged districts, the ratio of standardised mortality ratios in 1990-3 compared with 1980-3 increased significantly in males for all causes (1.05 (95% confidence interval 1.02 to 1.09)) and non-amenable causes (1.08 (1.04 to 1.12)). In the least disadvantaged group, in both sexes and each diagnostic category, the ratios decreased, with the confidence intervals also lying below unity, except for non-amenable mortality in males (0.96 (0.91 to 1.01)).

Comment

The increase in inequality of mortality with time among the disadvantaged populations compared with the affluent populations in Budapest, encompassed both amenable and non-amenable categories. These findings are not markedly different from those in Britain during a similar period, although absolute mortality reductions have been smaller in Hungary.[4] There was no convincing evidence to resolve whether the health effects were the result of absolute or relative differences in deprivation. Between the two periods relative differences between the most and least