Measurement and Meaning: Community-Based Research on Child Mortality in Rural Kenya

Miroslava Prazak and Heather Booth

Working Papers in Demography

No. 59
1995

The Australian National University
Canberra
Abstract

This article explores child mortality in one small region of rural Kenya, based on longitudinal, ethnographic data. Child mortality in the community studied is believed to have fallen in the late 1980s, most likely due to improvements in maternal education. In the early 1990s, however, this trend was reversed. Reasons for this reversal include drought, increased pressure on resources and the resultant local strife, cutbacks in health services, agricultural factors and the 1994 malaria epidemic. The in-migrant population was found to have lower fertility and higher child mortality than the non-migrant population. The article also addresses the measurement issues involved in demographic estimation from ethnographic data and the meaning of child death to the families involved.

Acknowledgments

The authors gratefully acknowledge the comments of Jack Caldwell, Gavin Jones, Robert Pini and Susan Watkins on an earlier draft of this paper.

MEASUREMENT AND MEANING:
COMMUNITY-BASED RESEARCH ON CHILD MORTALITY
IN RURAL KENYA

Miroslava Prazak* and Heather Booth**

In the course of community-based research on fertility patterns in rural south-western Kenya, some rather surprising general attitudes became repeatedly apparent. Most of the people surveyed expressed the belief that modern health care facilities are less able to cope with the illnesses of today than the traditional healers were able to cope with the illnesses of the past. What is more, most people also expressed the belief that there are more diseases nowadays and that these are much more virulent when compared with the past, even though health care centres now exist in this area where before there were none. This ever-growing menace of disease and death is one of the reasons people cite for being reluctant to limit the number of children they have.

In this article we explore the patterns of child mortality in one small region of rural Kenya. We have three objectives in mind. Our primary concern is substantive, to try to determine levels of child mortality and to relate these to the local context. Implicit in this is a methodological concern centring on the question of whether, in the study of child mortality, small-scale, longitudinal studies pose fewer problems than the more commonly used large-scale, cross-sectional databases. In doing this, we examine the utility of indirect estimation techniques for child mortality vis-a-vis small-scale studies. Finally, using long-term ethnographic data, we examine the meaning of the death of their children to the mothers in the communities studied.

* Anthropologist, Mellon Postdoctoral Fellow, Demography Program, ANU.
** Demographer, National Centre for Development Studies, ANU.
THEORETICAL BACKGROUND

The interrelationship between mortality and fertility has received a great deal of attention. Classical demographic transition theory has at its core a tripartite transition composed of a pre-transitional phase of high fertility, high mortality; a transitional phase of falling mortality which eventually leads to a fall in the fertility level; and a post-transitional phase characterised by low vital rates (Davis 1945; Notestein 1945). But the substantial demographic literature on the relationship shows not only an effect of child mortality on fertility but an effect of fertility on child mortality (Greenhalgh 1994; Hobcraft et al 1985; Hyatt and Milne 1993; Menard 1990; Okoje 1991; Ruzicka and Kane 1987). Some of these studies (e.g., Odedokun 1991) demonstrate the mutual nature of the relationship; "Mortality influences fertility, but is in turn affected by it" (Chowdhury et al. 1976:258).

Several recent articles challenge the idea that a reduction in fertility follows the decline of mortality, especially vis-a-vis data gathered in Africa, specifically in Kenya (see for example, Barbieri 1994:27; Government of Kenya/UNICEF 1992). The general thrust of these is that though a fertility transition is now under way, child mortality is on the increase. This view is echoed in the perceptions of the Kuria people in south-western Kenya, who are the subject of this article.

Most studies of child mortality are based on large-scale surveys, such as the World Fertility Survey (e.g., Mott 1982; Somoza 1980), or on vital registration statistics (e.g., Knodel and Chamstra-Priory 1978; Honegadoro 1979). Getting accurate data, however, is very difficult. Respondents are reluctant to talk about children who have died, resulting in under-reporting, and the appearance of the incidence of child mortality as lower than it actually is. This is a problem in both large- and small-scale studies, though it is probably easier to recognise the extent to which this happens and to correct for it in small-scale and longitudinal studies.

Where survey research sometimes has difficulty in getting valid data (e.g., Brass & Jolly 1993:30-31), micro-demographic approaches have been used to get an understanding of what is happening at the grassroots level. As McNicoll (1988:10) states, "For a number of years, many would agree, survey research on demographic behaviour has been experiencing diminishing returns... The micro-approaches to demographic research that are the subject of this volume promise ways out of the impasses. The survey-generated demographic accounting system is retained, but the crude correlates of demographic change can now be refined to reveal the inner logic of survey-based relationships; the ambivalences suppressed in multiple-choice responses can be explored. A new, deeper empirical understanding of population change is attained." Anthropological methods are ideal for this type of micro-demographic approach, and as soon as the issue of the importance of mortality in Kuria respondents' fertility thinking was revealed, we started to concentrate on child mortality (1) to ascertain a trend and (2) to connect local events and interpretations to this trend.

Here too, it was difficult to gather information systematically on children who had died. One well-known example of the problems of this type of research comes from Napoleon Chagnon's classic study of the Yanomamo. Chagnon spent one-and-a-half years collecting genealogies only to find that he was overwhelmed with fictitious data because of the prohibition of mentioning the names of the dead (Chagnon 1968:10-13). Even later, when he overcame some of the obstacles and succeeded in gathering what he considered to be accurate genealogies, he encountered further trouble in cross-checking the data. "...I occasionally hit a name that put the informant into a rage, such as that of a dead brother or sister that other informants had not reported. This always terminated the day's work with that informant, for he would be too touchy to continue any further, and I would be reluctant to take a chance on accidentally discovering another dead kinsman so soon after the first (1968:12)."

Though the Kuria are not as violently opposed to talking about the dead as the Yanomamo, they are nonetheless quite reluctant, and often, would terminate or threaten to terminate the interview if discussion were to remain on the deceased. However, longitudinal cross-checking of the survey data made it possible to verify the collection of reliable data.
POPULATION DYNAMICS IN KENYA

Since the first census carried out in 1948, Kenya has had a population growth rate of over 3.3% per annum. Despite government recognition that such a rate could undermine the nation’s development efforts, and despite the establishment in Kenya of one of the first family planning programs in Africa, rapid population growth has continued. The total fertility rate in the 1960s and 1970s was about 8 births per woman. A substantial literature regarding fertility in Kenya continued, until the late 1980s, to preoccupy itself with possible reasons for the apparent failure of the family planning program and the apparent impossibility of accomplishing a fertility transition (Dow and Werner 1981, 1983; Frank and McNicoll 1987). In the early 1990s, however, Kenya watchers were surprised by a decrease in fertility rates. And since about 1991, reanalyses of data yielded through large-scale fertility and contraceptive prevalence surveys, and analyses of two demographic and health surveys, confirm an apparent transition in progress, pinpointing its beginning to the decade between the late 1970s and late 1980s (Bradley 1990; DHS 1989; Robinson 1992; Cross et al 1991; Dow et al 1994). During that decade, fertility in rural areas fell by 17%, and in urban areas by 23%. From a high of over 8 births per woman, by 1989 the total fertility rate fell to 6.7 births per woman, and by 1993 to 5.4 births per woman (DHS 1994).

So what has led Kenya to these changes? In a report published in 1992, the working group on Kenya of the Panel on the Population Dynamics of Sub-Saharan Africa of the National Research Council’s Committee on Population concluded that Kenya seems launched into its transition. Mortality has fallen and fertility seems to be following, but overall growth seems to be rapid. "Economic and social changes have led the way, with demographic changes following after a delay. Changes in the material conditions of life and also in the attitudes, aspirations and motivations of the people seem to have been the driving forces behind the demographic changes. But government policies and programs have played a major role as well." (Brass and Jolly 1993:24).

The data from the large-scale surveys, particularly the DHS, have been through extensive statistical analyses, to surprisingly tenacious results. Mortality among children under five has fallen to approximately 110 per 1000 births in 1984. But child mortality has been falling since the 1950s at an even pace (Brass and Jolly, 1993:46). Attempts to link this trend to socioeconomic factors revealed a strong relationship to maternal education (predictably, given the work done in this area previously, e.g., Caldwell 1979, 1994), and to adult literacy. Perhaps more surprisingly, little association was found between decreases in child mortality and district level health services (Brass and Jolly 1993:148). This finding accords with the field observations from the present study, which found respondents signaling the inability of modern health care facilities, providers and medicines to meet their needs.

THE COMMUNITIES

The Kuria, among whom the research for this paper was carried out, live in southwestern Kenya, in what is now known as the Kuria District, which was created in 1993. Prior to then these Bantu people were incorporated in one administrative division of South Nyanza District. The Kuria also live in northern Tanzania, but this paper is concerned only with Kenyan Kuria. The ethnographic, demographic and economic characteristics of the Abairege, a descent segment comprised of 18,289 people (Republic of Kenya 1994:1-105), were first systematically described based on 1987-89 fieldwork (Prazak 1993).

The Kuria live in a highland area of rolling hills, reaching an elevation of approximately 6,000ft (1,800m). Blessed with two rainy seasons per year, people practice mixed farming and petty entrepreneurship. Most people farm at least part time and produce much of their subsistence. Cash crops cultivated include tobacco and coffee. The area is relatively prosperous and was the breadbasket of South Nyanza District before becoming its own administrative jurisdiction. Nonetheless, smallholdings are declining in size, population density is increasing, and prosperity is increasingly defined by and related to the market, both for employment and for sale of cash crops. This solidly ties the Kuria to the cycles of national and international economy.
THE DATA

Quantitative data used to address the issue of mortality in Bukuria were gathered through three separate surveys. The baseline data are drawn from a socioeconomic/demographic survey that was carried out in 1988 (1988 SEDS). This survey comprised a census of eight administratively-defined communities in a single sub-location of what was then Kehancha Division of South Nyanza District. These communities comprised 233 homesteads. Altogether, the survey covered 2,162 individuals.

The socioeconomic/demographic survey targeted the homestead head as the respondent. In cases where the homestead head was dead, or living elsewhere (outside the survey communities), his senior wife was the first substitute, then his subsequent wives and/or sons. In many cases, wives were present during the interview.

The section of the questionnaire on demographic issues included questions about the wife/wives and daughters-in-law of the homestead head and their offspring. For each homestead resident, the following information was obtained: name, relationship to homestead head, age, educational attainment, whether currently in school, the individual’s contribution to the family farm effort, whether or not s/he is employed off-farm, and if so, the type of work and monthly income. For non-resident offspring, information gathered included name, age, marital status, educational attainment, current domicile, reason for living there, and type of work being done.

Initially, respondents were also asked to give information about children who had died, but during both pre-tests and field tests of the questionnaire the response was overwhelmingly negative that we decided not to continue asking the question. Both men and women were upset when asked so directly about dead children, they refused to talk about them, and on some occasions, they refused to continue with the interview. Fearing the loss of other valuable information as a result of this, we decided to not pursue the issue.
In 1994, the socioeconomic/demographic survey (1994 SEDS) was repeated in the same eight communities, which now included 342 homesteads, and 3,020 individuals. The same questions were asked as in 1988, but the mortality question was included this time, though in a different guise. Instead of asking directly if the respondent had any children who died, the question asked whether all the children s/he had given birth to/fathered were prospecting. In response, the interviewee would say, for example, "no, two of my children died." Respondents were then asked for the name of the child, and its place in the birth order. They were not asked the age at death, or the cause of death. With the exception of the mortality information, the data gathered in the 1988 and 1994 section on demography are directly comparable, providing a double check on much of the information that was gathered. Care was taken in 1994 to account for every person identified in 1988, and to record all births occurring in the intersurvey period including those that had died, leading to what we believe to be an accurate reporting of deaths in the intersurvey period. Most deaths occurring before 1988 were omitted in the 1988 SEDS, and thus were only identified in the 1994 SEDS. It is probable that omissions still occurred for the period before 1988.

Valid data were obtained for 440 married women in 1988 and 624 in 1994, with an additional 67 and 156 single women in 1988 and 1994 respectively. For married women included in both surveys, valid data were obtained for 358 women, representing 81 per cent of the 1988 sample but only 75 per cent of the 1994. Valid data were available for 110 married women in migrant households in 1994; and for 476 married women in non-migrant households in 1994.

After the completion of the 1994 SEDS, a fertility survey (1994 FS) was carried out on a sample of 219 women, selected from the initial survey. The fertility survey gathered information from women of reproductive age. Though quite broadly based in terms of collecting information regarding many aspects of reproductive life, the questionnaire also gathered information about the woman's reproductive history, including the number of pregnancies she experienced, the number of miscarriages, live births, the number of children who died, their age at death and cause of death.

In addition to the above, information was obtained on the esaro, or circumcision group, to which each woman belongs. The esaro defines a fairly narrow range of possible ages since circumcision occurs at around puberty. Circumcision now occurs in December, normally every 3 years, but in the past occurred after the long harvest, that is in August or September, at intervals of one, two or three years, depending on the needs of the community for adults. Information on esaro was reported in all three surveys. Also, age at circumcision was reported in the 1994 FS.

Accuracy of age reporting

Aside from the reluctance of respondents to disclose information regarding deceased children, an additional problem in data collection comes from the general irrelevance of the concept of chronological age in this cultural setting, particularly in the past. Estimation of ages in the field becomes an integral part of the data collection process, and one that is often undertaken by the interviewer/enumerator (Ewbank 1981). Though enumerators are trained to deal with this problem, individual strategies and abilities vary, introducing discrepancies which become particularly apparent through comparison of longitudinal data.

Checks on the accuracy of age reporting were made through comparison of the several reports available from the three surveys. In the two SEDS surveys, the ages of women were reported by the homestead head in just over 50% of the cases. In 1988, wives reported their own age in 32% of the cases, and in 1994 in 21% of the cases. In the 1994 FS, age was self-reported. Comparison of these sources is shown in Table 1.

The greatest discrepancy in reporting occurs between the two reports of age from the 1988 SEDS and 1994 SEDS. The difference between the two reported ages was exactly 6 years in only 15 per cent of cases and only 50 per cent of women were reported as being in the same 5-year cohort in the two surveys. A further 40 per cent were reported as being in an adjacent cohort, with most of the remainder being reported with a difference of two cohorts.
Table 1  Differences in reported age between surveys

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>6.31</td>
<td>&lt;0.01</td>
<td>0.34</td>
<td>0.01</td>
</tr>
<tr>
<td>Sd Dev</td>
<td>4.55</td>
<td>1.51</td>
<td>1.84</td>
<td>2.88</td>
</tr>
<tr>
<td>Sd Error</td>
<td>0.24</td>
<td>0.10</td>
<td>0.13</td>
<td>0.15</td>
</tr>
<tr>
<td>Minimum</td>
<td>-11</td>
<td>-5</td>
<td>-4.4</td>
<td>-11.0</td>
</tr>
<tr>
<td>Maximum</td>
<td>22</td>
<td>12</td>
<td>5.6</td>
<td>24.2</td>
</tr>
</tbody>
</table>

Given the time elapsed between the 1994 SEDS and the 1994 FS, we would expect to see the difference between ages at -0.3 years. The smaller, actual difference (<0.01) with low variation is due to fieldwork methodologies: FS interviewers were furnished with information concerning the respondent, including age as reported in the 1994 SEDS as part of the sample definition, and it is possible that in some cases the woman did not dispute an erroneous age from the previous survey. Nevertheless, some discrepancies were found. Moreover, since people often do not know their birth dates, they calculate age based on the calendar year, which means the actual difference would vary considerably if the new year had occurred during the elapsed three months. Conversely, since the elapsed time was during the middle of the year, there was smaller than expected change.

Data on esaro exhibit great consistency between the three reports, with less than 1 per cent of cases requiring data editing, which was made on examination of the case in question or on the assumption that self-reporting was more accurate. Since women in the same esaro are approximately the same age, information on esaro can be used to assess the accuracy of age-reporting. In fact, ages vary very little by reported esaro, indicating good accuracy, except at older ages (>50). In Table 1, age is compared with average age of all women in the relevant esaro based on reported age at circumcision (CIRCUM1), for women in esaro 1 to 15 (corresponding to about age 15-49). Whilst the mean difference can be mostly attributed to the bias (0.3) in age referred to above, the small variation is reassuring. A comparison of age from the 1994 SEDS with average current age of all women in the relevant esaro based on current age (CIRCUM2) shows slightly greater variation.

These checks indicate that the 1994 reports on age are consistent and reliable and that the discrepancies between 1988 and 1994 are due predominantly to error in 1988. In estimating mortality, the 1994 data consist of age from the 1994 FS wherever possible and age from the 1994 SEDS otherwise. The 1988 data consist of age as determined for 1994 less 6 years wherever possible and age from the 1988 SEDS otherwise. These adjustments to age made a significant change to the age pattern of proportions of children dead obtained from the 1988 data and slight changes in the proportions obtained from the 1994 data for ages 30+.

ESTIMATING THE LEVEL OF CHILD MORTALITY

Since the SEDS data provide only numbers of children who have died and not age at death, it is appropriate to estimate mortality indirectly from proportions dead (Brass et al 1968; Trussell 1975). It is assumed that the mortality pattern of the Kuria follows that of the total Kenyan population, for which the North pattern (Coale and Demeny 1966) has been found most appropriate (United Nations 1990).

In comparison large-scale survey data, the present data suffer from fluctuation due to the relatively small numbers involved, but gain reliability due to the greater accuracy of age reporting and completeness of parity and deaths reporting afforded by intensive fieldwork methods. These data also differ from large-scale survey data in that, for the majority of women covered, they are longitudinal. For those women who were present in both 1988 and 1994, the two sets of data are essentially the same: the 1988 experience is encompassed in the 1994 experience. Data for the intersurvey period are believed to be of very good accuracy. The main source of error, after age correction, is believed to be omissions in 1988 even though those that were later reported in 1994 are included. The fact that omissions in 1988 carry through, though with reduced impact, to the 1994 data leads to the expectation that the pattern over age (or time) in the mortality estimates from the 1994 data will be similar to that from the 1988 data for women aged 6 years younger.
Proportions of children dead are shown in Table 2 for all women (including single women) in 1988 and in 1994. Insofar as fluctuation allows, omissions are evident in the 1988 data for age groups 30-34 and 40+ and in the 1994 data for age group 40-44. It is noted that the low proportion of children dead for women in age group 30-34 in 1988 corresponds to an exceptionally low proportion of children dead for women who were circumcised in 1969 (average age 33.4 years in 1988). It is unclear whether the low proportion of children dead for women in age group 25-29 in 1994 is due to omissions.

Indirect estimates were obtained for all women in the 1988 and 1994 SEDS. Estimates of child mortality (the probability of dying before age 5) are shown in Figure 1, where the lower estimates from the 1988 data confirm expected omissions. The dissimilarity in the patterns over time suggests that omissions are not the main source of fluctuation, however. Some dissimilarity, in both fluctuation and level, arises from the six-year interval and consequent incongruence between age groups and true cohorts, which serves to iron out some of the fluctuation seen in the 1988 estimates, and from the difference in the populations at the two points in time.

The 1994 estimates show a constant level of mortality at about 100 per 1000 except for the dip to 60 per 1000 for the age group 25-29 referring to 1990. The recent estimates are likely to be more complete than the less recent estimates because of better reporting by younger women and the fact that the intersurvey period constitutes a greater proportion of their experience. Hence, the 1994 estimates are likely to conceal a decline in mortality over time.

The intersurvey estimates take into account any bias arising from changing mortality rates, but they are upwardly biased due to the lesser completeness of the 1988 data. This differential in completeness may be exaggerated if, as is possible, some omissions of deaths in 1988 were reported as occurring in 1988-94: in other words, if the 1988 data are under-reported and the 1988-94 data over-reported. It is noted that the fluctuation in the intersurvey estimates reflects the differential in reporting between 1988 and 1994. Averaging over ages 20 to 34 suggests a child mortality level of 113 per 1000, referring to early 1991.

The low estimate for women aged 25-29 in 1994 is anomalous. It suggests both a temporary dip in mortality over time and lower mortality to 1994 than to 1988 for this "cohort" of women. Whilst a real effect cannot be discounted, the intersurvey estimate suggests higher mortality in the intersurvey period. This contradiction is examined in greater detail using only data for married women included in both surveys. Women aged 25-29 and 40-44 in 1994 have lower proportions of children dead (Table 2) than women aged 20-24 and 35-39 respectively in 1988. Part of the explanation lies in the incongruence between age groups and true cohorts. For women aged 25-29 in 1994, 31 per cent were aged 15-19 in 1988 such that their lower proportion dead contributes significantly to the relatively low proportion dead in 1994 for women aged 25-29. Similarly, this incongruence contributes to the low proportion in 1994 for women aged 40-44. When true cohorts are examined, only the lower proportion at age 25-29 persists, though the differential is reduced. This differential accords with the earlier finding of higher infant mortality amongst first births (Rutstein 1984 p.32), most of which now occur at age 20-24 because of later marriage following stricter enforcement of prohibition on marrying girls out of primary school. It is noted that for women in both surveys the proportion of children dead for women aged 25-29 in 1994 is only slightly lower than that for women aged 20-24 in 1994.

![Figure 1 Estimated child mortality (under-five years)](image)
Table 2. Proportions of children dead

<table>
<thead>
<tr>
<th>Age</th>
<th>All women</th>
<th>All women</th>
<th>All women</th>
<th>Women(^2) in both surveys</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1988</td>
<td>1994</td>
<td>intersurvey(^1)</td>
<td>1994</td>
</tr>
<tr>
<td>15-19</td>
<td>0.036</td>
<td>0.056</td>
<td>0.056</td>
<td>1994</td>
</tr>
<tr>
<td>20-24</td>
<td>0.057</td>
<td>0.092</td>
<td>0.103</td>
<td>0.060</td>
</tr>
<tr>
<td>25-29</td>
<td>0.085</td>
<td>0.058</td>
<td>0.082</td>
<td>0.051</td>
</tr>
<tr>
<td>30-34</td>
<td>0.048</td>
<td>0.116</td>
<td>0.121</td>
<td>0.108</td>
</tr>
<tr>
<td>35-39</td>
<td>0.130</td>
<td>0.124</td>
<td>0.194</td>
<td>0.101</td>
</tr>
<tr>
<td>40-44</td>
<td>0.103</td>
<td>0.115</td>
<td>0.168</td>
<td>0.116</td>
</tr>
<tr>
<td>45-49</td>
<td>0.130</td>
<td>0.157</td>
<td>0.225</td>
<td>0.155</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Migrant women(^2)</th>
<th>Non-migrant women</th>
<th>Non-migrant women</th>
<th>Women(^3) in both surveys</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1994</td>
<td>1994</td>
<td>intersurvey(^1)</td>
<td>1988-94(^3)</td>
</tr>
<tr>
<td>15-19</td>
<td>0.000</td>
<td>0.071</td>
<td>0.071</td>
<td>1994</td>
</tr>
<tr>
<td>20-24</td>
<td>0.148</td>
<td>0.076</td>
<td>0.087</td>
<td>0.029</td>
</tr>
<tr>
<td>25-29</td>
<td>0.094</td>
<td>0.051</td>
<td>0.064</td>
<td>0.031</td>
</tr>
<tr>
<td>30-34</td>
<td>0.141</td>
<td>0.105</td>
<td>0.093</td>
<td>0.096</td>
</tr>
<tr>
<td>35-39</td>
<td>0.205</td>
<td>0.101</td>
<td>0.142</td>
<td>0.113</td>
</tr>
<tr>
<td>40-44</td>
<td>0.100</td>
<td>0.110</td>
<td>0.114</td>
<td>0.108</td>
</tr>
<tr>
<td>45-49</td>
<td>0.179</td>
<td>0.158</td>
<td>0.174</td>
<td>0.208</td>
</tr>
</tbody>
</table>

\(^1\) Estimated proportions applying to hypothetical intersurvey cohort.
\(^2\) Married women only; since births to single women are rare, comparison between proportions for all and married women is valid.
\(^3\) Based on births in the period 1988-94 only.

The major difference between the 1988 and 1994 populations is the presence of immigrants in 1994. They experience lower marital parity at ages 20 to 44 than women in both surveys. If this is due to omissions, which are possible since these women were not interviewed in 1988 and hence there were no checks on data and data collection, we would also expect to see lower proportions of children dead. In fact, this is not the case: women in migrant households have higher proportions of children dead than women in both surveys at ages 20 to 39 (Table 2). This higher mortality amongst migrants inflates the 1994 and in particular the intersurvey mortality estimates, seen in Figure 1, above what would be observed for women present in both surveys. This inflation is greatest at ages 20-24 and 35-39.

Thus, the apparent contradiction at age 25-29 in 1994 is explained by the inclusion of a large proportion of women aged 15-19 in 1988 and by the pattern of child mortality experienced by migrant households. The intersurvey estimates are upwardly biased by two factors: better reporting in 1994, with possible displacement of some births and deaths from pre-1988 to the intersurvey period, and the higher mortality experience of the migrant population included in the 1994 population. The effect of the latter factor can be assessed by examining the non-migrant population in 1994 (Table 2). The pattern of mortality for this population closely resembles that for all women, though the dip at age 25-29 is less pronounced and the overall level is lower. Averaging intersurvey estimates over ages 20 to 34 gives an estimate of 90 per 1000 referring to early 1991.

Given the superior accuracy of intersurvey reporting, births and deaths in the intersurvey period are examined. The data distinguish between deaths to births occurring in the period and deaths to previous births. For married women present in both surveys, 37 deaths occurred amongst 497 births, i.e., 7.4 per cent. It is seen in the final panel of Table 2 that proportions of children dead for women aged 20 to 29 are considerably lower than for older women. Since these proportions refer to the same point in time, differentials are due to the characteristics of the women.

Whilst age and parity are expected to account for a general increase in proportions of children dead with age of woman from age group 25-29, these factors would also be
expected to result in higher proportions dead for women aged 20-24 as seen previously. The fact that this does not occur here can be attributed in part at least to the fact that the women included in both surveys have all been married for at least 6 years and many will have had their first birth prior to the 1988 survey. In addition, the large increase in proportions dead at age 30-34 would not normally be expected to be due to age/parity alone. Other factors, such as maternal education, may be instrumental.

THE EXPERIENCE OF LOSING A CHILD

There are several barriers to gathering accurate mortality data. By custom, Kuria do not count their children. Doing so can bring bad luck that may cause living children to die and fertile couples to become barren. Also, people rarely discuss family tragedies openly. And, children who die uncircumcised are not meant to be remembered. Circumcision elevates the youngsters to membership within the lineage, and it is usually by marriage and propagation that a person gains the right to have children named after him/her when he/she dies. That is how proper social order is maintained.

Though mothers do not usually discuss the children they bore who have died, they do carry vivid and intimate recollections of those children. Having built a long term relationship with them sometimes allows the researcher to broach this topic, and actually gain some information. The women who shared their experiences discussed in this section were all part of the 1994 FS. With some of them a relationship of 10 years’ duration had already been established at that point. Not all of them chose to divulge the details of the deaths of their children. Because the actual survey period coincided with a malaria epidemic—during which many families lost children—some of our respondents were quite indignant to be questioned on this topic, and blamed the death of the children on being “counted.” Other mothers, however, saw that in making their suffering known, perhaps some improvement in the services available to them would result. At the time of the study, there was a crucial lack of medications at the government clinic, and since the private clinics were charging in many cases much more than the families could afford to pay, their children died without receiving any medical attention.4

In the fertility survey, 219 women of all ages within the reproductive span of 15-49 were interviewed. Of these, 11 had never given birth, so they had never been exposed to the risk of one of their children dying. Altogether, the women had given birth to 887 children. Of these, 121 had died. In other words, about one out of seven children died. Seventy-seven of the women interviewed lost at least one child.5 Slightly more than one out of three women had experienced the death of an offspring, and since the first-born children have a greater mortality rate than later births, the experience can colour a woman’s reproductive strategy right from the start. Women of all age groups have had the experience of losing a child. Further, women of all levels of educational attainment, living in all types of domestic organisation, as well as under all types of homestead heads, have had children die.

What are the children dying from? By and large, the cause of death that was given in the course of the survey was one that the mother identified, rather than one identified by a doctor. So in a number of cases, symptoms, rather than illnesses were given. There are no doctors within the area in which this research was carried out. A permit is necessary to bury the deceased, which carries the cause of death, and it is usually what is reported by the kin of the deceased. Young children are often buried without a permit being issued. This situation is quite common throughout Africa (see, for example, Ewbank and Griebble 1993:17), making the cause of death more difficult to study than mortality levels and trends.

The mothers reported malaria as the most common cause of death (45 cases, 41% of the 109 responses). Though malaria is indeed endemic, there is no facility within the survey areas for testing blood, and thus malaria is diagnosed on the basis of clinical symptoms. Since malaria is notorious for a multitude of clinical symptoms, it is quite possible that other illnesses are misdiagnosed and treated as malaria. For example, any high fever may be seen as malaria, which can masquerade as diarrhoea and vomiting, if fever is present.

Anaemia was given as the cause of death in 11 cases. This is a relatively recent diagnosis, used widely in the 1994 malaria epidemic. People in the community reacted in
puzzlement to the diagnosis of "lacking blood," since no one could understand what was causing the blood of their children to diminish. Anaemia is in fact quite prevalent, but it is the combination of sickle cell anaemia and malaria that leads to many cases of death.

Despite intensive efforts at child inoculation by the government clinics, by mission mobile clinics and by non-government organisation-sponsored campaigns, measles accounted for 10 cases of death. According to Ewbank & Gribble (1993:21), measles is often the most common cause of death in Africa at ages 1 to 4 years. Oboronyi ya ompona (literally translated as "illness of children", and described as "convulsions" by the community nurses practicing in the area) accounted for 7 cases of the responses.

In 12 cases, the mothers did not know the cause of their child's death. Twenty-four cases were classed as "other." These include 5 cases of fever; 5 cases of vomiting, diarrhoea and stomach ache; 5 cases of external causes (including bee stings, drowning, suffocation, and murder); 4 cases of pneumonia; 3 of witchcraft; one each of kwashiorkor and infection, and 2 undefined.

At what ages are the children dying? Of the 108 children whose age at death was known, almost 30% died before the age of 1, with almost a further 60% dying before the age of 5. These are all children who would not be remembered within the lineage and community, because they had never achieved a status which would qualify them to become ancestors, and thus remembered.

The case of Weisiko Rioba (approximately 70 years old) illustrates the experience which continues to inform ideas about appropriate family size. "I gave birth to a total number of nine children, but if you say that we plan our family among the nine children, I gave birth to four that died, and now I have five remaining children. Suppose the number wasn't large, I could now be having nothing."

But when she elaborates, it becomes clear that she actually lost five children, though only three of these during childhood. "I gave birth to six baby boys but now I have only two .... I gave birth to three daughters, but now have two of those daughters."

Three of her sons died of malaria, two when they were "still very young", and the third when he was about to be weaned (probably between 2 and 3). One adult son "departed from home saying that he was going to work in the city. ... I was just at home when I found him being brought by a vehicle to be buried, and I didn't know what killed him, because when he departed from home he was normal and healthy." "One of my daughters was married and she recently died in the home she was married to." Her husband had been a driver, who had gotten into a serious quarrel with another driver. He was dismissed from his job, and he came home. Here he became harsh and started beating his wife without proper reason. He continued doing that beating always, and eventually the woman died. She left three children."

Though Weisiko's experience of child loss is perhaps unusual in terms of the number of children who died, there is no "typical" or "average" experience. The case of Rael Muchera provides another example. Rael was married at 13 to a man six years her senior and for the subsequent nine years bore no children, though her husband fathered a number of children by other women (who were not his wives). Rael did conceive once during those years, but the pregnancy was lost in the third month: a severe case of malaria was treated by the private clinic with a chloroquine injection leading to spontaneous abortion. In the tenth year of her marriage she conceived again, and gave birth to a daughter, followed by another daughter two years later.

When Rael's second daughter was nine months old, she became ill during the 1994 malaria epidemic. Rael and her husband took the baby to the mission clinic, where she was treated for malaria for about ten days, after which the treatment was stopped. Rael and her husband had no more money, and the treatment seemed to be doing no good. About a month after the onset of the illness, they decided to take the child to a district hospital. They borrowed money, using one of their plough oxen as security, and took the very ill child to the hospital 60 kilometres away to have her examined. The doctors ordered blood and fluids for the baby, but she died the next day. The cause of death was heart failure, brought on by sickle cell anaemia: her heart was unable to withstand the strain of trying to supply oxygen to the body. The ox was sold to pay for the hospital charges, the transport of the body back to Kuria District and the funeral. Both Rael and
her husband hopes to have another child to fill the void left by their daughter's death.

DISCUSSION AND CONCLUSIONS

Our initial intersurvey estimate of child mortality of 113 per 1000 refers to all women in the survey area and is clearly too high. The main reason for the overestimation is the presence of migrants in the population. For only the non-migrant population, the level is estimated to be 90 per 1000 in early 1991. This latter estimate may also be slightly high due to differential omissions in the two surveys at ages 20 to 34 and the fact that it also includes most first births.

It seems there was a decline in child mortality during the period 1988-1990, possibly due to increased education of women, respite from intra-ethnic warfare, etc. The decline is supported by the data from the intersurvey experience (final panel of Table 2). We suggest that maternal education may be an important factor in determining child mortality levels: of women aged 25-29 in the 1994 SEDS, 39% had no education, 59% had primary education and 12% secondary education whereas amongst women aged 30-34, these percentages were 68, 29 and 2 respectively. This is substantiated by the findings from the 1994 FS, showing that at most ages women with primary education experience lower proportions of children dead than women with no education. The data regarding women with secondary education are ambiguous, due to small numbers and factors confounding the relationship between education and child survival, specifically the mother's absence from the home due to employment, and the practice of childcare by uneducated and unqualified caregivers, especially the very young.

If education has been instrumental in reducing child mortality its effect has been short-lived. The estimates for women aged 20-24 in 1994 and the intersurvey estimates suggest an increase for the period from mid-1990 to early 1992 at least (the more recent estimate is based on too few deaths to be reliable). This increase can only partly be attributed to demographic factors: ie, through the higher mortality of first births. Some of the reasons why mortality may have increased since mid-1990: 1) the three-year drought which killed both crops and cattle (Daily Nation, 10 January 1994; 17 February 1994; 15 March 1994), 2) drain on resources caused by influx of evicted Kuria squatters, 3) subsequent increase in inter-family/lineage strife, 4) SAP cutbacks to health care programs (Daily Nation, 8 October 1993; 16 December 1993), 5) deregulation of cereals and marketing board, leading to lower incomes, 6) increased unemployment affecting those who had off-farm incomes prior to this period, and especially affecting those finishing school and training programs, 7) the 1994 malaria epidemic would have disproportionately affected the child mortality of women aged 20-24, because most of their children are very young, and 8) prior to the heavy long rains of 1994, an agricultural shortfall in cereals caused by unproductive hybrid seeds.

A conundrum involves the migrant population. Our data suggest that they experience lower fertility and higher child mortality than the non-migrant population. Because we do not have longitudinal data for this group, we cannot determine whether their experience from 1988 to 1994 differed from the rest of the population, or all the differences stem from their previous experience. Most interestingly, the recent increase in child mortality is more pronounced for migrant women than for non-migrant women (Table 2).

Virtually all the migrants came from the Kuria squatter area in adjoining Rift Valley Province, where they were farming lands nominally owned by the pastoralist Maasai. The resources they enjoyed there were probably superior to those enjoyed by the population within Kuria Province, in that the land was not exhausted through overcultivation. There was no rigid demarcation of plots, and so squatters could expand their holdings as need arose. The limiting factor on production was labor, thus we would expect the squatters to have had higher fertility during that time. A larger number of children would also be advantageous in the defence of the holdings against the Maasai. Since the 1950s, when this type of squatting became common, an on-going level of conflict has been recorded, by the colonial officers, by local folklore and by law-enforcement authorities.

There were, however, causes for higher mortality levels in the area. These included the violence experienced on an almost everyday level; the distance from health
care facilities, disadvantaging particularly pregnant women and children, for whom there would be virtually no transport available; the monotony and lack of nutritional value in the subsistence diet of boiled maize meal unsupplemented by market-bought produce; the distance from shops dispensing over-the-counter drugs, especially anti-malarial medication; and lower rates of education. It is possible that these same conditions contributed to lower levels of fertility than expected from social factors, through low maternal nutritional status and high rates of miscarriage.

In coming to these conclusions we have had to deal with several methodological issues. These include sample size, data quality, costs, and timing. Though the small sample size of community-based research leads to greater sampling error, this is offset by the greater accuracy that the approach affords. The community-based approach facilitates the minimisation of omissions, which have been shown to be prevalent in Kenya (Brass & Jolly 1993:36). The effectiveness of this minimisation increases if repeat visits to the field are made because previous omissions can be corrected and because second and later visits need only concentrate on the relatively recent events in the interim. The present analysis, based on only two visits, has clarified the extent of omissions in the earlier data and their effect on intersurvey estimates. To provide more accurate estimates, longitudinal data for more than two points in time are preferred. Ideally, these should provide the detail and accuracy required for direct estimation and should be arranged at intervals of five years to facilitate comparison of cohorts and indirect analyses. These considerations of number and frequency of visits should be weighed against the costs involved.

The effects of fluctuation arising from small sample size have been minimised by the use of indirect estimation. With a community-based approach, opportunities exist for the correction of errors. This analysis also used data on esaro (circumcision set), which proved to be very accurate. Moreover, several reports of esaro were available, through the community and from the women themselves.

An additional advantage of longitudinal data is that true cohort experience can be used. This is particularly useful where fertility and mortality are changing and in indirect estimation removes the need to estimate cohort experience from two different surveys (Zlomnik and Hill 1981). In the present application, true cohort experience could not be used effectively due to truncated data, the six year interval and fluctuation.

A longitudinal intensive community-based approach to the collection of data allows for the detail and accuracy that are needed to gain not only an accurate representation of the level of mortality but also insight into the meaning of death. This type of research allows the identification of factors that on the local level coincide with changes in demographic behaviour. Their applicability in a larger setting can then be tested through the large-scale surveys which are the domain of demographers. Only when these two have been satisfactorily combined can researchers fully address the issue of mortality.
NOTES

1. Research on which this paper is based was carried out by M. Prazak in two fieldwork seasons. The first, in 1987-89, was funded by a fellowship from the International Doctoral Fellowship Program of the Joint Committee on Africa of the American Council of the Learned Societies and the Social Science Research Council. Additional funds were provided by the Yale Center for International and Area Studies, and the National Science Foundation. The second, in 1993-94, was funded by the Andrew W. Mellon Foundation.

2. Nabahoro does not have an exact, literal translation into English, but carries the nuances of both to be living and to be prospering.

3. The 6 year interval has not been adjusted since sampling and non-sampling errors are far greater than any change in mortality in a one-year period; adjustment would have little effect on estimates for 20+. The use of cohort fertility (estimated) to take into account the possibility of declining fertility, as suggested by parties to age 40, gave almost identical results.

4. This truncates the 1994 data at young ages: there are no married women aged 15-19 and those aged 20-24 are likely to have higher parity due to early marriage. It was not possible to identify relevant numbers of single women for this subset; marital proportions of children dead rather than estimates of mortality are thus discussed.

5. Late marriage may be more apparent than real, because fathers and husbands would be reluctant to admit that they had never been married before.

6. Healthcare facilities within the research area include one government clinic, one mission clinic, and two private ones. They serve a population of more than 12,000. The most highly qualified medical personnel are community nurses, who handle all the cases. They can refer patients to other facilities, but that requires travel and monetary outlay on the part of the patient or his/her family, and is thus not always an option.

7. 54 women lost one child, 11 women lost 2, 7 lost 3, 3 lost 4, and 2 lost six children each.

8. The difference between the proportion of children dead for non-migrant women in 1994 and that for births in 1988-94 to women in both surveys lies in the fact that most first births are excluded from the intersurvey experience of women in both surveys due to truncation, whereas the 1994 data not only include these first births that would have taken place at teenage years but also all other first births to women who married into the households during the intersurvey period.

REFERENCES

Barbieri, Magali

Bradley, Candice

Brass, William

Brass, William et al

Brass, William and Carole Jolly, eds.

Caldwell, John C.


Chagnon, Napoleon A.

Chowdhury, A.K.M. Alauddin, Atiqur Rahman Khan and Lincoln C. Chen

Coale, A.J. and P. Demeny

Cross, Anne R., et al.


Davis, Kingsley

Dow, Thomas E. Jr. and Linda H. Werner


Dow, Thomas E. Jr., Linda Archer, Shanyisa Khatiani and John Kekevole

Ewbank, Douglas C.

Ewbank, Douglas C. and James N. Gribble, eds.,

Frank, Odile and Geoffrey McNicoll

Government of Kenya and UNICEF

Greenhalgh, Susan

McNicoll, Geoffrey

Menard, Scott

Hoberg, J.N. J.W. McDonald and S.O. Rustein

Hongladarom, Chira

Hyatt, D.E. and W.J. Milne

Knoedel, John and Apiwat Chansrivichitr


Notestein, F. W.

Odedokun, M.O.

Okojie, Christiana E.E.

Prazak, Miroslava


Robinson, Warren C.

Rutstein, Shea Oscar

Ruzicka, Lado T. and Penny Kane

Somoza, Jorge L.

Trussell, T. James

United Nations

Zlotnik, Hania and Kenneth Hill